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Mastery Learning Leads to Better Learning: 7th Grade

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Interactive Qualified Project

Department of Computer Science

Worcester Polytechnic Institute

Mastery Learning Leads to Better Learning: 7th Grade Stretching and Shrinking

Submitted to the Faculty

Of the

WORCESTER POLYTECHNIC INSTITUTE

In partial fulfillment of the requirements for the

Degree of Bachelor of Science

By

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ABSTRACT

This Interactive Qualifying Project is an experiment project designed to analyze the relationship between mathematical test performance and the amount of mathematical practices a student undertakes. The proposed hypothesis is that there exists a positive proportional relationship between students' mathematical performance and the amount of practices the students complete. The experiment was performed on subjects of middle school students in grade seven and eight using Assistment math training and testing system. By analyzing the results obtained from the experiment, we found a reliable difference of the performance gains between the control and experiment (mastery) groups (Control of 6% and experiment of 21%) [Aggregate Analysis: Mean, Page 22]. Based on this significant difference, we argue that students who completed our mastery learning process learned much more mathematical knowledge. Also, the effect size of the experiment is 0.64 [Aggregate Analysis: Effect Size, Page 25], which indicates the difference in performance gains is significant for large population distribution in a practical sense. Therefore, we conclude that there does indeed exists a positive proportional relationship between students' mathematical performance and the amount of practices they complete. In other words, mastery learning leads to better learning.

ACKNOWLEDGEMENTS

First, we would like to thank the many students who have devoted a large amount of their time towards our project. The web team has made enormous contributions this year, especially adding the capability to create variablized Assistment problems. We would also like to thank both Neil Heffernan and Cristina Heffernan who have spent a great deal of time and effort on maintaining this project. Without their help this project would not be possible.

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INTRODUCTION

Background

Our project employs a system called Assistment. This system was created to help ongoing studies aimed at improving the educational techniques provided by institutions for students. The Assistment system, founded by Professor Neil Heffernan with the help and collaboration of many students at Worcester Polytechnic Institute, was created to provide a medium to implement the Mastery Learning technique for middle school students.

The Assistment system has proven to be a very powerful tool in the education of mathematical skills of young students. It allows students to solve math problems with tutoring strategies designed to guide them through the solving process for that specific type of problems. Teachers also have the ability to assess each student's math skills individually and assign them with more mastery practices where the student has difficulties. This allows the teacher to easily track the material learned by individual students and distribute specific types of practices to them.

The Assistment problems we created were built using the newest generation of the system. This new version contains an updated builder with the capability to create a variablized problem. Variablized templates provide a solution to increase the amount of mathematical problems generated using a single template.

Project Overview

In this project, we analyze the relationship between mathematical test performance and the amount of mathematical practices a student must take to master a specific skill using the Assistment system. Over the course of the development process, problems were taken from various selected MCAS(2001-2007) exams and built into the Assistment system, then deployed to several schools in Worcester, MA.

The problems selected from the MCAS were built using the Assistment builder. Once they were transferred to the Assistment system, tutoring strategies were created for these problems. Then, each of them went through several stages of refinement, which ensured the correctness of the problems and the effectiveness of the tutoring strategies. These problems were then used as templates for the variablized assistments.

The ability to variablized assistments is very important, because it increases the amount of practice problems that could be deployed. In previous years, students would have to create more individual assistments. We were able to generate fifty to sixty variations based on each template. This provided a larger amount of problems that could be easily deployed to schools, which in turn produced a greater amount of data for our experiment.

The experiment separated subject students into two groups, control and mastery, where each group was subjected to a pre and post-test. The pre-test was conducted with our tutoring system while the post-test without. Students in the mastery group were given additional practice problems after the pre-test, which also included tutoring. With each additional practice problem

set, students could test out by getting the first problem right without tutoring. Otherwise, they were required to continue solving different variations of the same type of problem until they got three correct in a row. All the students were then asked to complete the post-test several days later.

LITERATURE REVIEW

Effectiveness of Mastery Learning Programs: A Meta-Analysis

Mastery learning techniques have been applied since the 1920's but were not widely used until the late 1960's. Two of the most influential contributors, James and Chen-Lin Kulik have published many in-depth analyses on similar experiments. In the paper Effectiveness of Mastery Learning Programs: A Meta-Analysis, Kulik and Kulik studied two different approaches of Mastery Learning which both provided positive results.

Bloom's Learning for Mastery (LFM) technique requires that the material is teacher presented. Students are then required to proceed in these courses at a pace controlled by the teacher. If a student fails a unit test they usually receive tutoring help on that unit before moving towards new material. Keller's Personalized System of Instruction (PSI) is similar. Courses using the PSI technique were presented through written material. Students in these courses were then expected to move through lessons at their own rates. If the student failed a unit test they were required to restudy the material and take another test until they were able to demonstrate mastery.

James and Chen-Lin based their results from student performance on final exams given at the end of each course. Event-though the effects were higher on locally prepared exams rather than on standardized tests, mastery learning provided positive results for both tests. From the 108 studies conducted in Kulik's experiment, all but seven studies proved that mastery programs displayed the positive effects (Chen-Lin C. Kulik, 1990). In their analysis, they discovered that the average effect size in the studies was 0.52 (Chen-Lin C. Kulik, 1990). It was also found that

67 of the studies showed very positive effects (Chen-Lin C. Kulik, 1990). In these studies, the amount learned by the mastery compared to the control group was significantly large.

During their analysis, Kulik and Kulik also found additional data, which led to additional outcomes that were unexpected. They found that the effects of mastery programs were not consistent on all students in a course. They concluded that students that received low marks on examinations previous to the study were found to have higher gains from the mastery instruction. It was also evident that more positive effects were found in courses relating to social sciences rather than on math and natural science courses (Chen-Lin C. Kulik, 1990). In conclusion, the results provided by Kulik and Kulik's analysis show that mastery learning can be a successful candidate over traditional methods.

Cognitive Tutors: Lessons Learned

In 1995, John R.Anderson, Albert T. Corbett, Kenneth R. Koedinger, and Ray Pelletier published the article, Cognitive Tutors: Lessons Learned, based on the ten year history of tutor development based on advanced computing theory. In the article, the authors reviewed production system models in ACT, which were developed at Carnegie Mellon University to study how students solved problems in several fields such as geometry and algebra. Although previous studies concluded that some students showed significant achievement gains, they were able to find that in certain occasions students were learning the same amount of material from that of a regular course but in one third of the time.

In the late 1980's, John R. Anderson invested large amounts of time outlining a mathematical approach to cognition. He eventually published the Adaptive Control of Thought (ACT) theory which revolutionized computer based tutoring. This theory revolved around three main assumptions; procedural-declarative distinction, knowledge compilation and strengthening. Using these three assumptions they were able to conclude, "The apparent complexity of learning a cognitive skill results from the inherent complexity of the domain being learned. That complexity is reflected in the complexity of the rule set that has to be learned, but the learning of each production rule is quite simple." (John R. Anderson, 1995) In other words, if the skill necessary to solve a specific problem can be separated into steps, it can become much easier to teach.

Their initial work on tutoring was composed of three different principles; Model, on-path actions and off-path actions. The model would have to perform the task in which the student was expected to learn. Its main purpose was to be able to produce a set of sequences that would represent correct solutions to the given problem. On-path actions represented the course of action to take if the student did something correct. If the student was correct, the tutor can simply advance to the next section. If the student were incorrect, off-path instructions would be invoked. These instructions focused on making sure the student got back on-path, essentially tutoring them over what they did wrong and the proper way to approach that part of the problem.

Using this approach, they developed a geometry-tutoring program. After applying this tutor to several classes, each one of them reported large achievement gains from the students. J. R. Anderson and his group then preformed several regression analyses aimed at attempting to predict a students' performance at a final evaluation exam about proofs. They were able to come up with the following equation. (John R. Anderson, 1995)

35 + 7.5 * (letter grade in algebra(1=D to 4=A))

+ 14 (if the student had access to the computer alone)

+ 4 (if two students worked in pairs at computer)

Their results demonstrated that if a student had access to the tutor they averaged to get 5 out of 8 proofs correct (John R. Anderson, 1995). Those who did not have access averaged at around 3 proofs. Although their paper did not outline any statistical data, it shows that giving a student access to a good tutoring system can have significant results.

METHODOLOGY

Types of Assistments

Each assistment contains one or more problems. Problems consist of question, answers and tutoring. Answers can be either in the form of multiple choices or open fill-in. There are two types of tutoring, hints and scaffolding. Hints are messages that offer guidelines to students on how to solve a problem. Scaffolding is a set of sub-problems related to the original one that guide students towards the final step by step.

Assistment can be variablized. The difference between variablized and normal assistments is that the variablized ones can contain text, numbers and images that are randomly drawn from a pre-defined set.

Building Normal Assistment with scaffolding

First, text for the problem should be written. It may contain images. Let us look at an example of a problem with image:

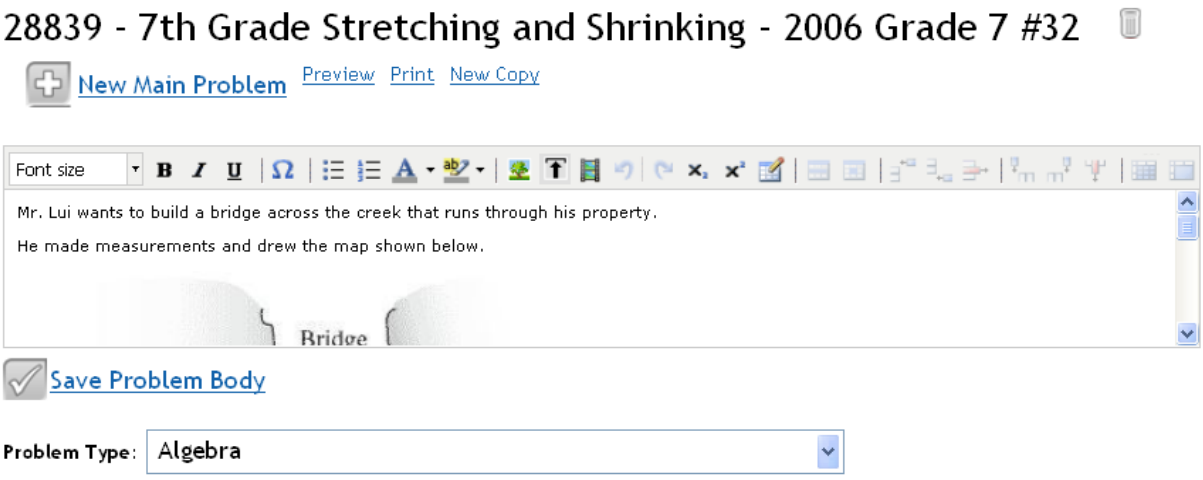


Figure 1

After writing text, answers should be added.

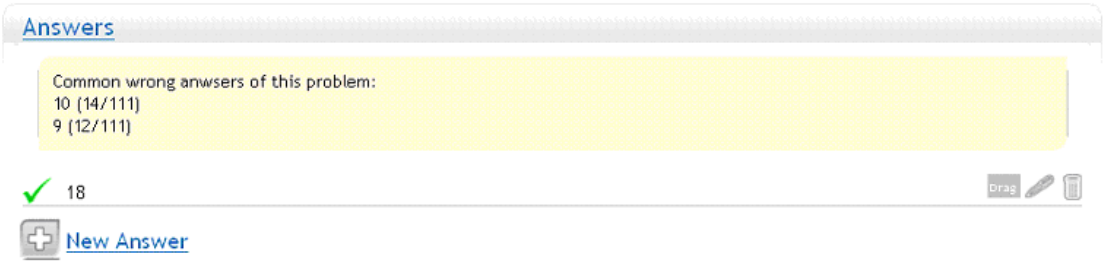


Figure 2

For tutoring strategies we create a scaffold and edit it.

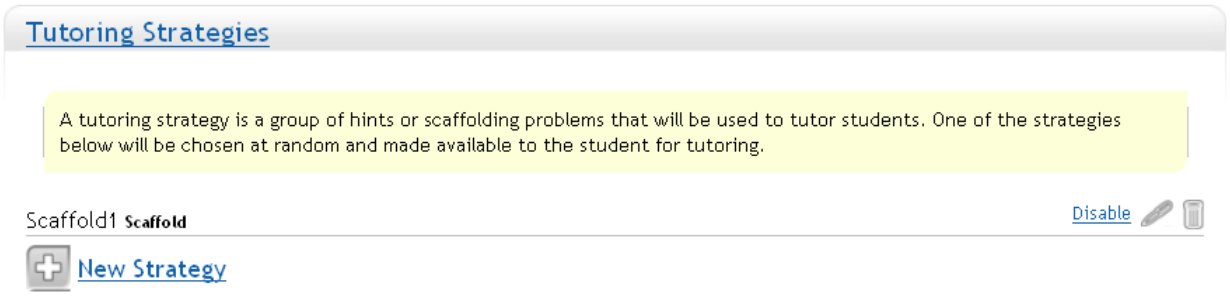
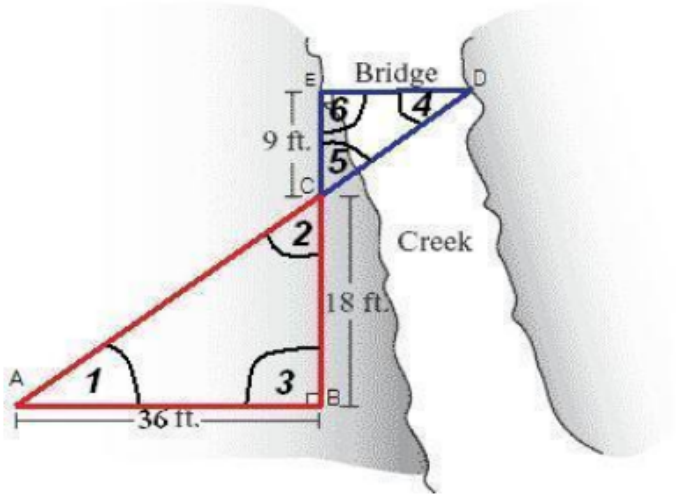


Figure 3

After we add scaffolding problem, editing is the same as for any other problems. Here is an example:

Scaffold:



The red and blue triangles are similar. We are going to use the known lengths to find the length of the bridge. First to show that two triangles are similar you need to show that they have 2 congruent (same measure) angles.
Angle 2 is congruent to which angle ?

Multiple choice:

- ✗ A) 1
- ✗ B) 3
- ✗ C) 4
- ✓ D) 5
- ✗ E) 6

Figure 4

Building Variablized Assistment with hints

To create number variables we can just add a number variable and randomize it by using the rand function.

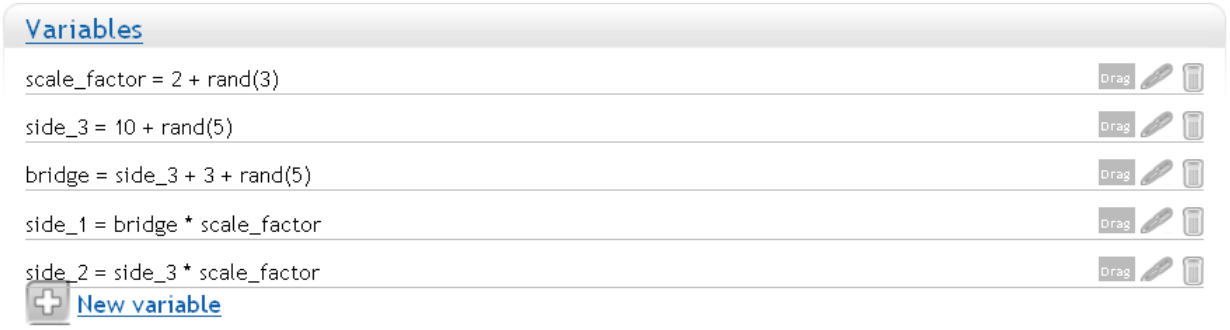


Figure 5

In this example we are randomizing the scale factor and one of the sides in two similar triangles. All other data can be calculated by using this information. Besides numbers, we can also variablize texts and images. In order to variablize images we create variable sets that contain a set of filenames:

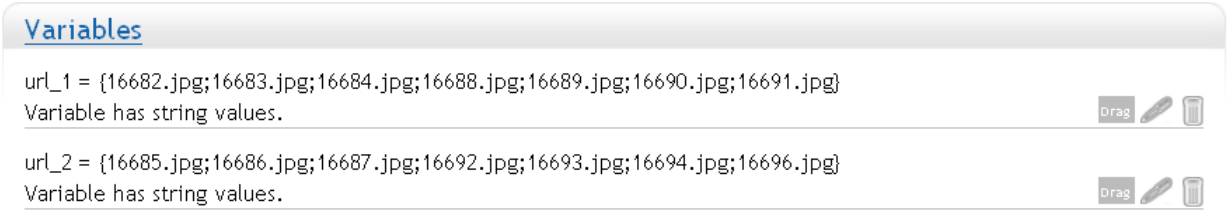


Figure 6

These names are going to be included in the location of the image. When creating these variables we need to put them in a set.

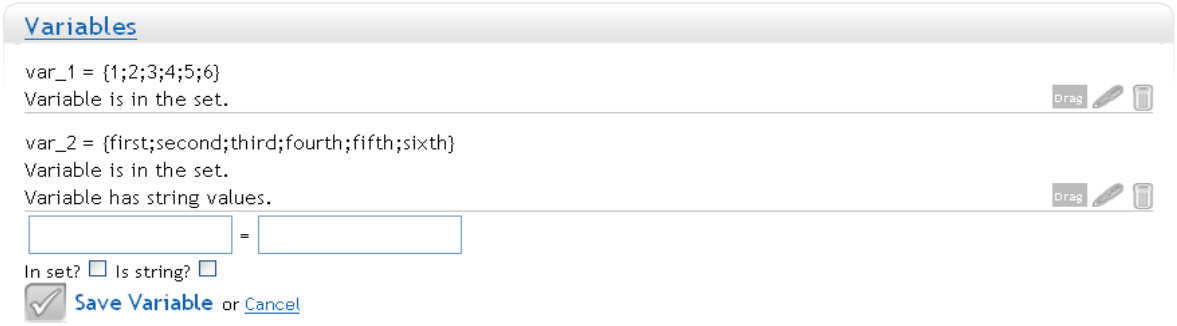


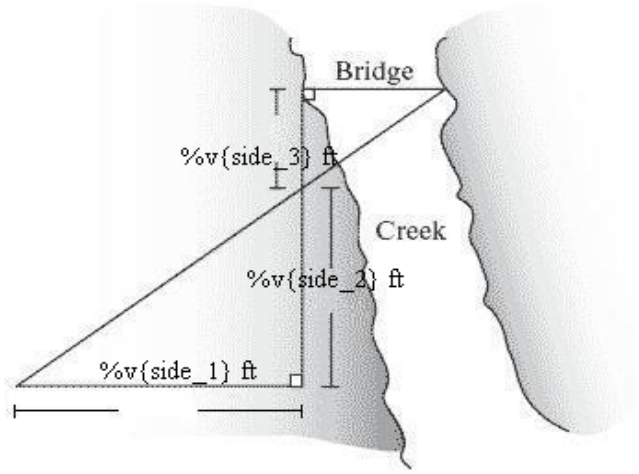
Figure 7

In this example numbers from "var_1" set are connected with their matching order adjectives in "var_2" set.

For displaying any of the variables we use the symbol "%v{variable_name}".

Assistment #30484 "30484 - 28839 - 7th Grade Stretching and Shrinking - 2006 Grade 7 #32"

Mr. Lui wants to build a bridge across the creek that runs through his property.
He made measurements and drew the map shown below.



Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge?

Algebra:

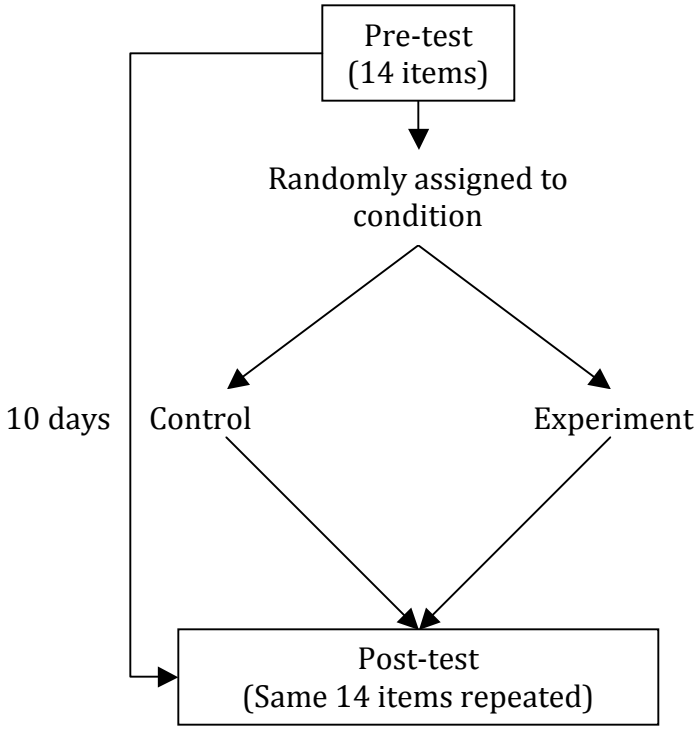
✓ %v{bridge}

Figure 8

Experimental Design

Research we conducted involved 80 students from Oak Middle School in Shrewsbury, MA. Students were taken from four different 7^{th} grade classes and they were given pre-test. Afterwards, two classes were randomly chosen to be in the experiment group, while other two represent control group (see Figure 9). Experiment group was given practice problems. For each item on the pre-test they had to do a mastery learning problem set that contained many similar problems. In order to finish the set, they had to either get the first item correct or get three correct items in a row afterwards.

Post-test was given to all students about 10 days after pre-test. The number of days varies (See Appendix – Data set table). All results from pre-test, post-test and mastery learning were collected and analyzed.



Experiment Flow Diagram

The subject unit of our experiment was an entire class of students instead of individual ones. It is evident that it would be a much more powerful study if the subject unit was defined as individual students and each of them is randomly assigned to one condition. However, due to logistics, we decided to only assign an entire class to a condition. It would simply be too resource consuming if we had to explain the experiment procedure to each individual student. For instance, explaining to half of the class that they needed to complete some amount of mastery learning assistments while having the other half not, seems to be logistically too difficult to arrange.

Analysis Methodology

To fully analyze our collected data set in search for evidence to support our initial hypothesis, we perform a series of statistical analyses including aggregate analysis, item analysis, data resampling and meta-analysis.

We first perform an aggregate analysis to determine the performance gain difference between control and mastery groups on the aggregate level, followed by a detailed item analysis to investigate the performance gains for each individual assistment item. After this, data resampling with bootstrapping procedure is performed to extend our results to large population distribution. And finally we use meta-analysis to determine how effective the results really are.

DATA ANALYSIS

Measurement

Since our goal is to find evidence that supports out hypothesis that practices improve students' mathematical performance, we defined our primary measurement as the performance difference percentages of both control and mastery groups. A student's performance difference percentage value is calculated by subtracting the student's pre-test correctness percentage from his or her post-test correctness percentage. A positive percentage difference value indicates performance improvements of that particular student. And a negative percentage difference value shows that the student's mathematical performance has decreased since the pre-test.

Pre-test balancing analysis

Before we conduct any statistical analyses, we performed a analysis to check if the pre-test correctness percentages of both control and mastery groups are balanced. In other words, we need to first check if both groups start from the same level.

Group	Average Pre-test Correctness Percentage
Control	66.48%
Mastery	61.86%

Table 1 - Pre-test Correctness Percentage Balance Table

The above data is computed based on all data points [Appendix: Data Table]. As the data shows, the pre-test correctness percentages of control and mastery groups are relatively balanced. Even though the slight advantage of the control group may present a bias factor, the results of the analysis is unlikely to be significantly altered. And if the results show that the mastery group obtained a higher performance improvement over the control group, this bias factor will even further support our hypothesis since the mastery group started with a slight disadvantage.

Aggregate Analysis

In this section, detailed analyses are performed on both control and mastery groups to compare the mathematical performance gains of all the students on an aggregate level. Various standard statistical analyses are computed including standard deviation, mean, T-Test, effect size and median.

We first analyze our data by examining the standard deviation values of the performance gain of both control and mastery groups to see how reliable the distribution is in terms of its variability. Then, we compute the mean values of the performance gains of both groups to analyze the relationship between the performance gains and see if this relationship confirms with our hypothesis. Then by using the T-Test, we will attempt to see if there exists a strong difference between the performance gains of control and mastery groups. After that, we further examine the effect size of the computed mean values to see how strong the relationship is likely to hold for large population. And finally, we analyze the median values of the performance gains for both groups to obtain a better sense of the relationship if the distribution has a large variability.

With all these standardized statistical analyses, we are attempting to find evidence to support our initial hypothesis that there exists a positive relationship between students' mathematical performance and the amount of practices they complete.

Standard Deviation

Standard deviation is a statistical measure of variability or dispersion of a data set. A low standard deviation value indicates that the data points tend to be very close to the mean value of the data set, while a high standard deviation value indicates that the data points are very spread out over a large range of values. In addition to analyzing the variability of a data set, standard deviation can also be used to measure the confidence interval in statistical conclusions. A low standard deviation value implies that the data set has a low variability, which in turn can imply a high confidence interval.

By analyzing the standard deviations of the performance gain for both groups, we are able to get a sense of the variability of the data distribution as well as a confidence level of the accuracy of the distribution. The following is a table showing the standard deviation values of the performance gains for both control and mastery groups.

Group	**Standard Deviation**
Control (4/7)	0.2224
Mastery (5/6)	0.2094

Table 2 Control and Mastery Group Standard Deviation

As the data above shows, both control and mastery groups have a very low standard deviation for the performance gains. Based on this, we can conclude that the variability of the performance gains for both control and mastery groups are low, which implies that the data distribution is statistically reliable.

Mean

In statistical analysis, mean is used to express the average value of a data distribution. The mean is the sum of all the data point values divided by the total number of data points. It describes the central location of the distribution if it is a normal distribution. If the mean value is accommodated with a low standard deviation value, we can conclude that the expected value over a large sample of the population should be equal to the mean value of our data set.

In the previous section, we have shown that the variability of the performance gains of both control and mastery groups are very low. This allows us to confidently compute the mean values of the performance gains for both groups and draw the conclusion that these mean values can be used as the expected values of the overall population.

Group	**Mean**
Control (4/7)	6.29%
Mastery (5/6)	21.53%

Table 3 - Control and Mastery Group Performance Gain Mean Values

As the data shows, there is a significant performance gain difference between control and mastery groups. The mastery group obtained a much higher performance gain over the control group. This means that based on our data set, the results confirm with our hypothesis that the students' mathematical performance increases as they complete more practices. And as stated earlier, since our standard deviation values for both groups are low, these mean values can be used as the expected values for the entire population. We can conclude here, that there does exist a positive proportional relationship between students' mathematical performance and the amount of practices they complete.

T-Test

T-Test is a statistical analysis performed under the assumption that the null hypothesis is true. It is usually applied when the sample data set is assumed to be normally distributed with a small sample size. To perform the t-test, a p value is computed and compared to a chosen threshold value usually 0.05. If the p value is below the chosen threshold value, then the null hypothesis can be safely rejected.

In our case, the null hypothesis is that there does not exist a reliable performance gain difference between the control and mastery groups. The alternative hypothesis is that there does exist a reliable performance gain difference between the control and mastery groups. And we use the commonly used 0.05 as our threshold value. The following is the computed p value.

$P = 0.0040$

Evidently, the p value is much lower than our chosen threshold value of 0.05. Therefore, we can safely reject the null hypothesis and conclude that there exists a reliable performance gain difference between the control and mastery groups. This conclusion is consistent with our previous discoveries based on the mean values of both groups.

Effect Size

Effect size is a measure of strength of the relationship between two variables in statistical analysis. It shows how likely that the relationship between two variables exists for a large population distribution.

In previous section, we have computed the mean values of performance gains for both control and mastery groups, and shown that the mastery group obtained a much larger gain over the control group. By computing the mean effect size, we can draw conclusion on how likely this relationship holds for large population distribution.

Effect Size = 0.6399

In various scientific studies, an effect size of 0.2 is considered as small, 0.5 as medium and 0.8 as large. The larger the value is, the stronger the relationship holds true. In our case here, the mean effect size is 0.6399, which can be considered as relatively large. This means that the relationship of the mastery group performance gain is greater than the control group is 63.99% effective for large population distribution. Therefore, we can further conclude that there exists very strong evidence to support our hypothesis that students' mathematical performance increases as they complete additional practices.

Median

In statistics, median is defined as the value that separates the higher half of the data points from the lower half. The median is usually a better measurement of the expected population value than the mean, if the data set is skewed or having a high standard deviation value.

Although our computed standard deviation values for both control and mastery groups are very low, we still examined the median values of performance gains for both groups.

Group	**Median**
Control (4/7)	9%
Mastery (5/6)	17%

Table 4 - Control and Mastery Group Performance Gain Median Values

Not surprisingly, the median values of performance gains for both groups confirm with the mean values. Evidently, the mastery group shows a much larger performance gain over the control group. This clearly indicates that the students' mathematical performance increases as they complete more practices, which is consistent with over previous findings.

Aggregate Data

For the final stage of our aggregate analysis, we present the entire data set sorted by the performance gain in ascending order with a comparison chart that clearly shows the greater gains obtained by the mastery group over the control group.

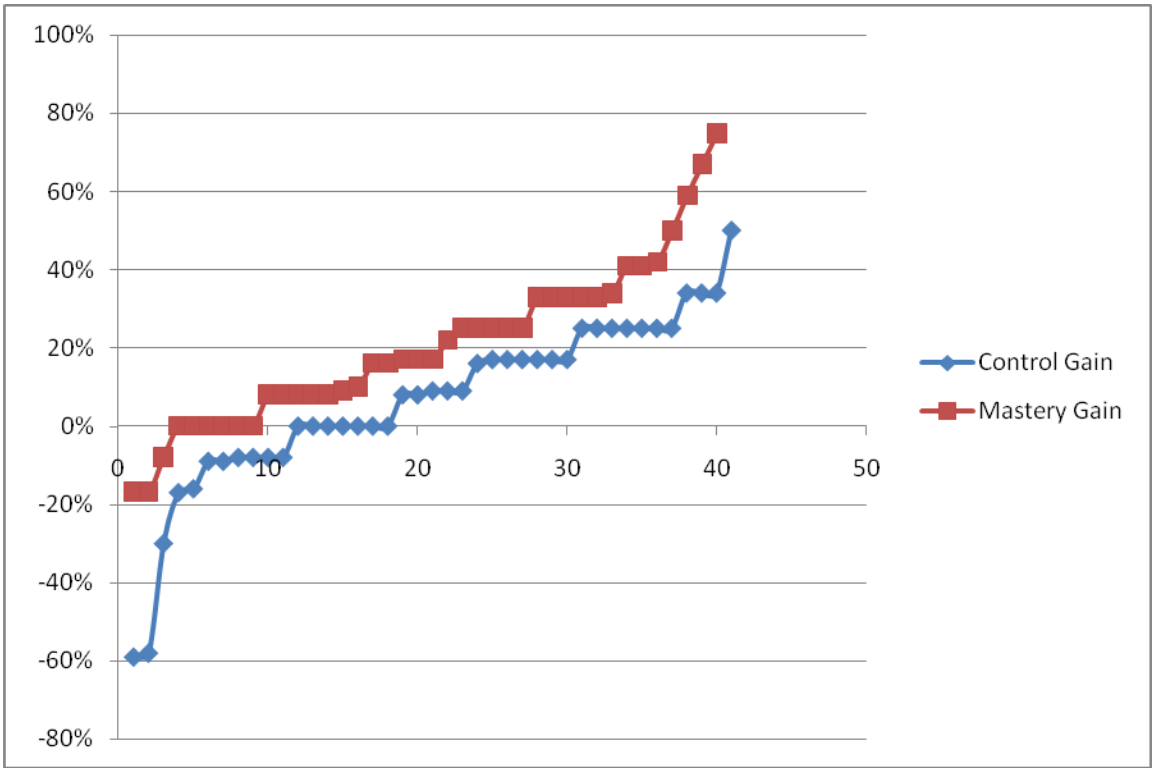


Figure 10 - Mastery Group Performance Gain vs. Control Group Performance Gain X-axis: Student ID number Y-axis: Student performance gain

Item Analysis

Item analysis is concerned with students' improvements on particular assistment. Improvement is computed as a percentage of students who got the item wrong in pre-test and got it right in post-test. In Table 5 below, we can see items sorted by improvement labeled purple if improvement large and yellow otherwise. Unlabeled problems are the ones that we did not consider because of small sample size since not enough mastery group students got the item wrong in pre-test.

One of the factors considered in analysis is how difficult a particular item is. This is computed as the percentage of students who got the item wrong in pre test. In Table 5 below, difficult items are labeled green and others are labeled blue.

Assistment ID	Number of mastery group students who got item wrong on pre-test	Percentage of mastery group students who got the item wrong on pre-test and right on post-test	Percentage of all students who got the item wrong on pre-test
27946	2	100%	5%
14156	20	95%	39%
28936	17	94%	39%
28851	10	90%	21%
14140	16	87%	38%
28839	13	82%	32%
14161	13	69%	25%

27892	20	68%	43%
14159	23	61%	61%
14162	26	58%	58%
28853	23	55%	51%
28912	8	50%	30%

Table 5

The weighted average percentage of students who have shown improvements is 72.7%. Since this value is greater than 50%, it can be considered as evidence that shows there exists a positive proportional relationship between a student's mathematical performance and the amount of practices the student completes.

Let us look at some items individually. Item 28853 had smaller improvement than others.

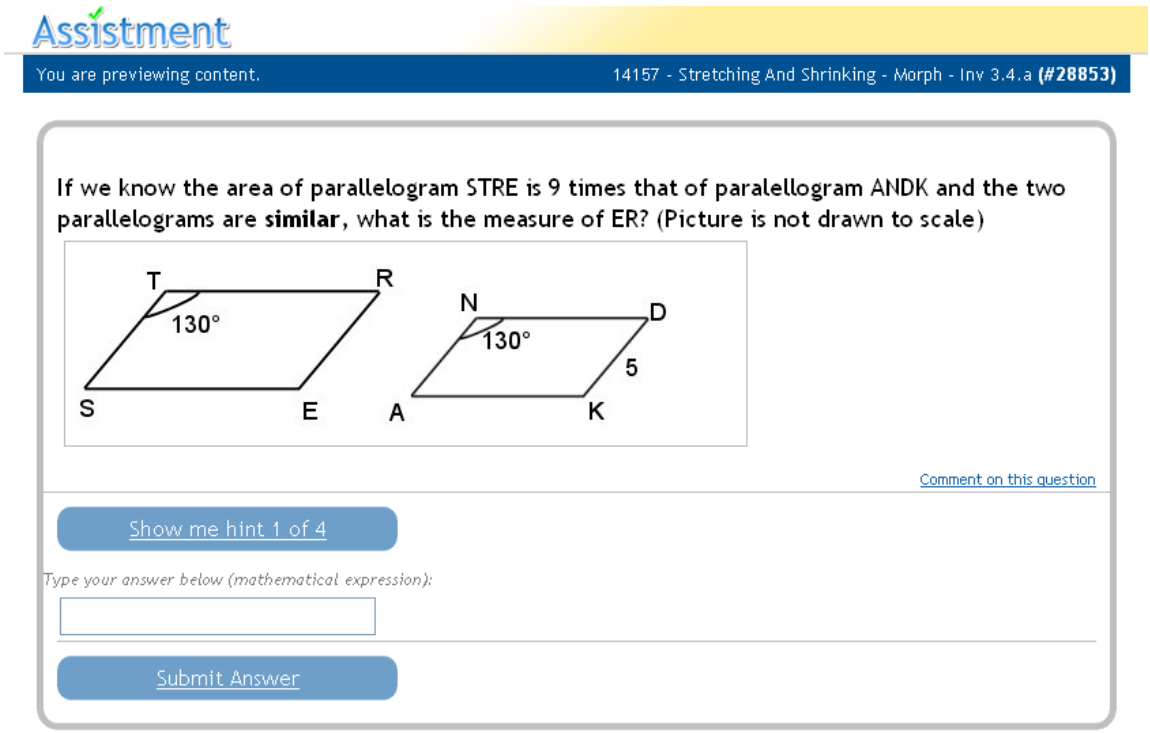


Figure 11

This can be due to the fact that item is very difficult and 51 percent of all people could not get it correct in the pre-test.

Item 28851 is less difficult than others since only 25 percent of people could not get it correct in the pre-test.

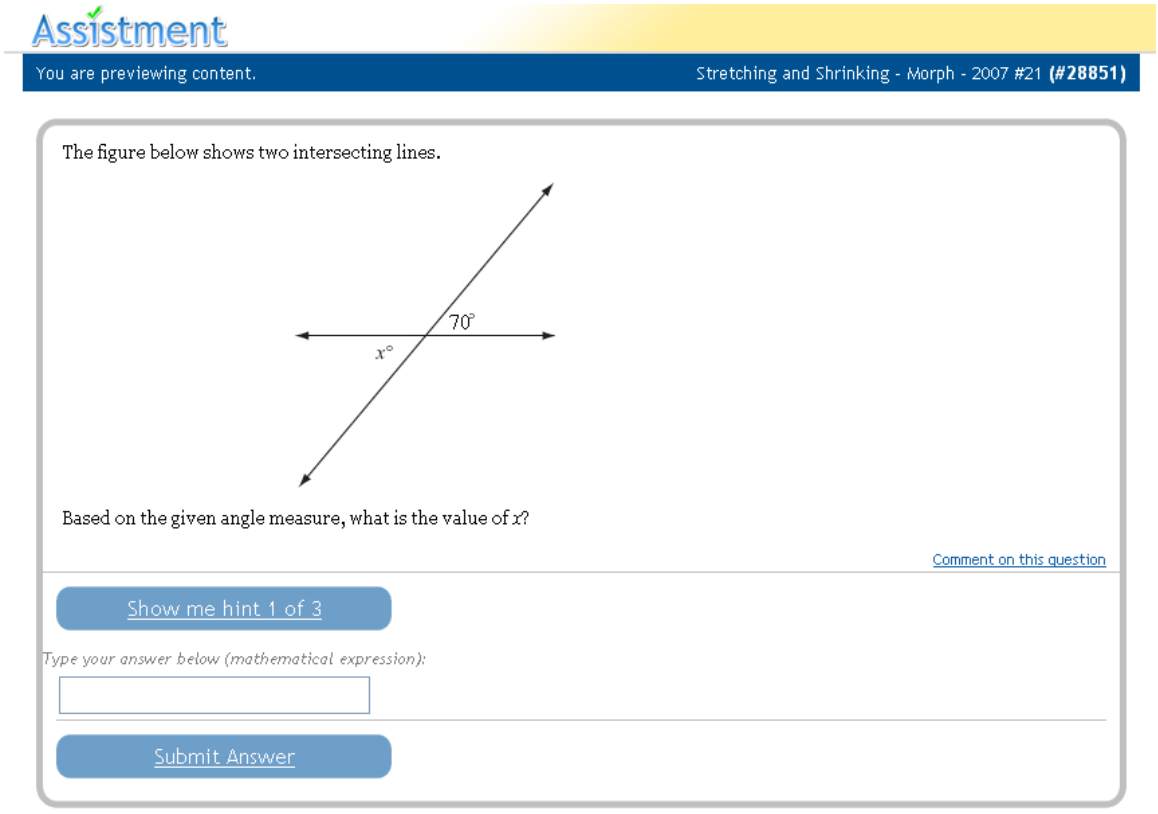


Figure 12

This item also had on of the highest improvements. This can be due to the fact that the item has simple patters and no calculations.

In general, we can see that assistments for which mastery learning had smaller effect were also done poorly by all students in the pre-test. Therefore, they can be considered as difficult

problems and distribution outliers. For the majority data points, the percentages of improved students are significant enough to support our hypothesis that students' mathematical performance increases as they complete more practices.

Meta Analysis

In statistics, Meta Analysis is a method based on computing the effect size of the sample data and using the regression model to predict the distribution of the true population. The result of Meta Analysis gives insight to the overall effectiveness of our study. It also indicates the relative impact of independent variables and the strength of relationship between variables. In our project, this type of analysis is performed to find evidence supporting our initial hypothesis.

The first meta-analysis was performed by Karl Pearson in 1904, in an attempt to overcome the problem of reduced statistical power in studies with small sample sizes; analyzing the results from a group of studies can allow more accurate data analysis. Although meta-analysis is widely used in epidemiology and evidence-based medicine today, a meta-analysis of a medical treatment was not published until 1955. In the 1970s, more sophisticated analytical techniques were introduced in educational research, starting with the work of Gene V. Glass, Frank L. Schmidt and John E. Hunter. ()

Meta Analysis analyzed a large collection of results for the purpose of integrating the finding. It is focused on the relationship between one response and it variable. Thus, it is more effective in determining relationship between the result and its variables. In our project, the relationship between the improvement of the math test score and the number of the math problems a student does is analyzed. Our initial hypothesis states there exists a positive relationship between them. Meta Analysis is performed to support our claim.

We performed the Meta Analysis through the following steps. First, the theoretical relationship of interest is defined. Second, the data of the studies on the relationship is collected. Third, the effect size is computed. Fourth, the distribution of the effect sizes and the impact of moderating variables are analyzed. Fifth, the results are interpreted and reported. Our study is conducted from February to March. 8th Grade Stretching and shrinking pre test and post-test are given to the students in Shrewsbury High School in Massachusetts. A number of 80 students are drawn from the total population to study the relationship between the number of the problems a students do and the gain performance of the same student. The pretest is given around February, 25th, 2009 and the post-test is given around March.10th , 2009.

The null hypothesis states there is not a relationship between the improvement in the math test score and the number of math problems a student practices. The alternative hypothesis is that there exists a positive relationship between the improvement in the math test score and the number of math problems a student practices.

The mean, median, standard deviation of gain in performance is computed for each individual group.

	Mean of Improvement	Median of Improvement	Standard Deviation
Controlled Group	6%	66%	0.2224
Mastery Group	21%	66%	0.2094

Table 6

The effect size is computed using the equation $\delta = \frac{\mu t - \mu c}{\sigma}$. $\delta = \frac{0.21 - 0.06}{0.2224} = 0.6399$

Effect Size	Interpretation
0.0	No Effect. Each group has the same outcome.
0.2	Small Effect. (15% effect*)
0.5	Moderate Effect. (33% effect*) Example: differences in IQ of clerical and semi-skilled workers
0.8	Large Effect (47% effect*) Example: differences in the height of 13 and 18 year old girls

Table 7

Based on the table above, we can conclude that the alternative hypothesis that there exists a positive relationship between the math test performance gain and the number of math problems a student does is 63.9% effective. It also states that it is 63.9% likely that the more math problems a student does, the better performance gain a student will achieve in math test. It is a reasonably strong support for our initial hypothesis.

Thus, Meta Analysis is performed for students with lower score and those with higher score both groups. The expected result is that the students with lower starting score will improve more than the students start with higher score.

	Group	Improvement	Standard deviation
Lower Score	Controlled	11%	0.207
Higher Score	Controlled	-5%	0.2367
Lower Score	Mastery	33%	0.201
Higher Score	Mastery	5%	0.121

Table 8

The measured result shows that. In both control and mastery groups, the students with lower starting score improved more than the ones with higher starting score. The students with lower score in mastery group improved more than those in the control group. The students with higher score in mastery group also improved more than those in the control group. The standard deviation of the performance gain for the mastery group is lower than that of the control group. This means that there is a consistent improvement for students who complete practices.

In order to further analyze the relationship between the math performance gain and the math problems a student does. A regression model is build to analyze the data using software SAS.

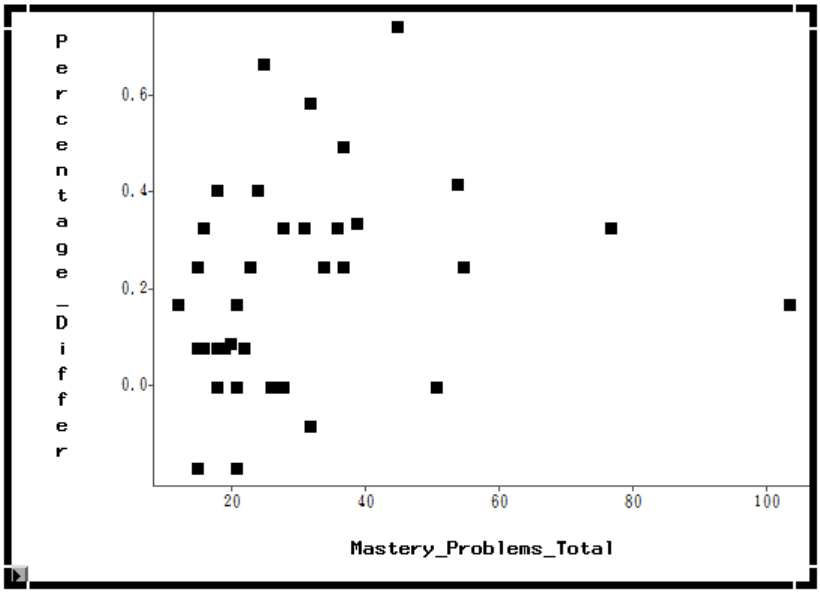


Figure 13 - Linear Regression Model

The figure above displays the relationship between the math test performance gain and the number math problems a student does. There is a positive relationship when the number of math problems a student does is less than fifty.

Re-sampling with Bootstrapping

One of the best statistical analysis methods is data re-sampling. Data re-sampling aims to estimate the precision of sample statistics by resample the limited available data. There exist several procedures to perform re-sampling. We have used a procedure named Bootstrap, perhaps the most popular re-sampling procedure, to resample our collected data.

Bootstrapping procedure estimates the sample distribution by randomly drawing data from the original data collection with replacement to form a new set for distribution. Then standard statistical parameters such as mean and median are computed using the newly formed distribution. This allows us to derive robust estimates of a much larger and general population based on our limited available data set.

However, performing bootstrap re-sampling with a sample size of several thousand is not practical by only using paper and pen. We then developed a re-sampling Java™ program that efficiently performs the re-sampling process and automatically calculates both mean and median of the re-sampled distribution. The following is a set of mean and median parameter results after performing re-sampling with various sample sizes. Both pre and post tests mean and median parameters are calculated for both control and mastery groups. The differences between the pre and post-tests are also computed and listed.

Control Group Data (4/7):

Sample Size	Pre-Mean	Pre-Median	Post-Mean	Post-Median	Diff-Mean	Diff-Median
1000	66.29%	66%	70.43%	83%	4.14%	17%
2000	66.17%	66%	71.36%	83%	5.91%	17%
3000	65.34%	66%	71.45%	83%	6.11%	17%
4000	65.05%	66%	71.12%	83%	6.07%	17%
5000	65.26%	66%	71.69%	83%	6.43%	17%
Average	65.62%	66%	71.21%	83%	5.73%	17%

Table 9

Mastery Group Data (5/6)

Sample Size	Pre-Mean	Pre-Median	Post-Mean	Post-Median	Diff-Mean	Diff-Median
1000	61.79%	66%	80.68%	83%	18.89%	17%
2000	61.68%	66%	81.23%	83%	19.55%	17%
3000	62.14%	66%	81.53%	83%	19.39%	17%
4000	61.92%	66%	81.06%	83%	19.14%	17%
5000	62.15%	66%	80.99%	83%	18.84%	17%
Average	61.94%	66%	81.10%	83%	19.16%	17%

Table 10

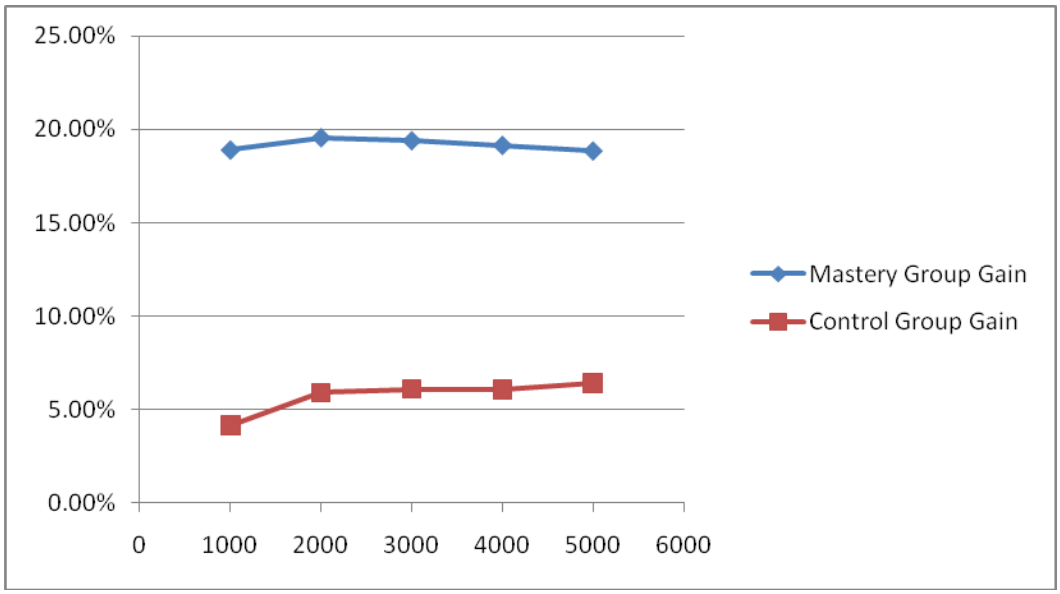


Figure 14 - Mastery Group Gain vs. Control Group Gain

The re-sampled data evidently shows that the mastery group, the group with mastery learning Assistment, receives a much greater average performance gain when compared with the control group, the group without mastery learning Assistment. Since the sample sizes of the re-sampled data set are relatively large, the re-sampling analysis clearly presents reliable evidence that the mastery learning Assistment provides a positive influence on students' mathematical performance. This conclusion strongly supports our initial hypothesis that there exists a positive proportional relationship between a student's mathematical performance and the amount of practices the student completes.

CONCLUSION

With the aggregate analysis, we have shown that first, there exists a significant difference between the performance gains of control and mastery groups using the T-Test. Then by computing the standard deviation and mean values, it is clear that the mastery group obtained a much larger gain over the control group. With median and effect size, we have found that this relationship can be extended from our data set to the general population. By then performing the detailed item analysis for each individual mastery learning assistment, we obtained the same result that the mastery group achieved a much larger performance gain over the control group on a more detailed per-item level. From a different perspective, our meta-analysis provided us with evidence that the same relationship holds true for general population. And finally with our re-sampling program, we are able to obtain strong evidence that this relationship holds true for very large sample sizes.

Based on all this evidence provided by various statistical analyses, we can conclude that the relationship, which the mastery group achieved a much larger performance gain over the control group holds true for both our data set and the general population. Therefore, there exists a positive proportional relationship between students' mathematical performance and the amount of practices the students complete.

COMPARISON OF OTHER SYSTEMS AND ASSISTMENT

There are many other computer based tutoring systems available that offer similar capabilities for both students and teachers. Although they are different from the Assistment system, they are all derived from the basic principle that students can learn better through the use of tutoring. The international media company, Pearson, has created a similar system that also implies tutoring based learning. Pearson's system has been adapted into several versions that pertain to specific subjects. Currently their product line consists of Mastering Physics, Mastering Astronomy, Mastering Chemistry and Mastering Biology. Since they all employ a similar system we will only cover Mastering Physics in detail. Another system that will be covered is WebAssign, which was initially developed at North Carolina State University.

Mastering Physics

Mastering Physics has been Pearson's most successful candidate. It has been widely used because of its compatibility with a large amount of commonly used books in current curriculums. The problems the system supplies correlates directly with the problems contained in selected books. Having consistency between the current books and the mastering system is important because it allows easy integration into course schedules. Many physics professors in colleges and high schools consider this system above others because it is updated frequently and reliable. The basic structure for a Mastering Physics problem is shown below.

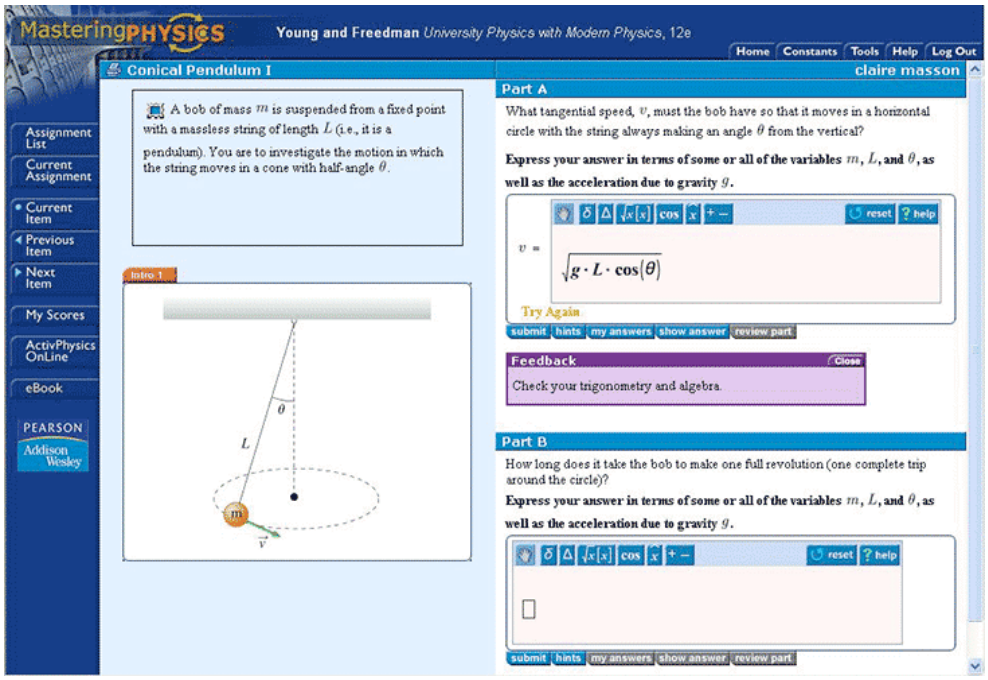


Figure 15 - Mastering Physics

As you can see, Mastering Physics has many features. The system contains a simple method to write up complex mathematical equations with symbols. Symbols are provided to the user with a click on its icon. Some of the symbols provided by Mastering Physics include roots, exponents, powers, division functions, integration, derivation and trigonometric functions. Similar to

Assistment, it also includes the ability to provide hints towards the solution of a problem. Hints also provide instantaneous feedback on what a student might be doing wrong. A figure of the hints supplied by the system is shown below.

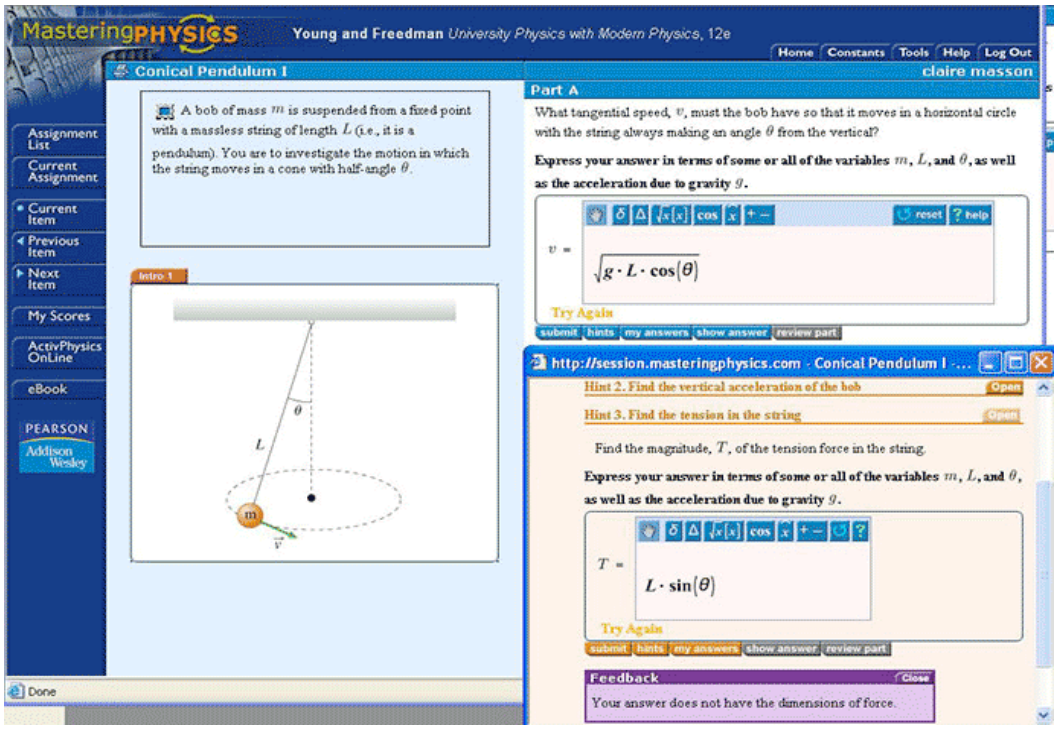


Figure 16

Mastering Physics also offers teachers a thorough analysis based on how the students in a class are doing. This feature makes it simple for the faculty to track grades and progress for individual students. A sample of the teacher grade book is shown below.

Figure 17

Instructors also have access to a diagnostics section. This section provides very useful analysis on class standing. It displays charts with class averages as a whole, or on individual problems. Other chars such as difficulty rating versus individual problems, student scores, and time taken on each problem can be found here. The figure showing the diagnostics section is shown below.

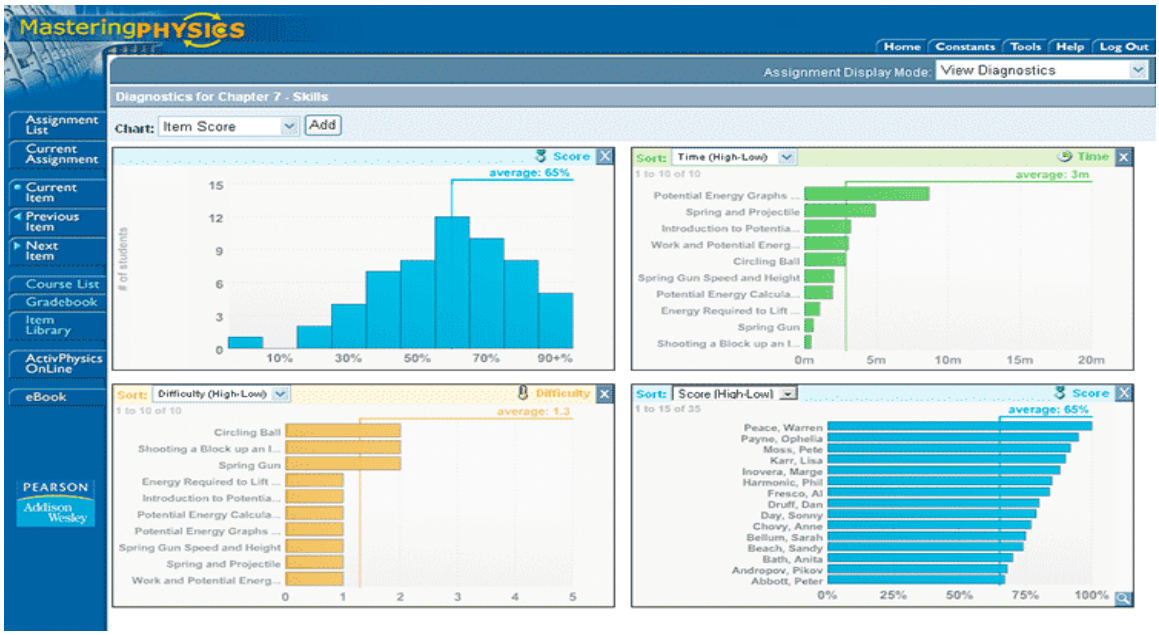

MasteringPHYSICS
Home
Constants
Tools
Help
Log Out
Assignment Display Mode:
View Diagnostics
Diagnostics for Chapter 7 - Skills
Assignment List
Current Assignment
Current Item
Previous Item
Next Item
Course List
Gradebook
Item Library
ActivPhysics OnLine
eBook
PEARSON
Addison Wesley
Chart:
Item Score
Add
Score
average: 65%
# of students
10%
30%
50%
70%
90+%
Sort:
Time (High-Low)
Time
average: 3m
Potential Energy Graphs ...
Spring and Projectile
Introduction to Potentia...
Work and Potential Energ...
Circling Ball
Spring Gun Speed and Height
Potential Energy Calcula...
Energy Required to Lift ...
Spring Gun
Shooting a Block up an I...
0m
5m
10m
15m
20m
Sort:
Difficulty (High-Low)
Difficulty
average: 1.3
Circling Ball
Shooting a Block up an I...
Spring Gun
Energy Required to Lift ...
Introduction to Potentia...
Potential Energy Calcula...
Potential Energy Graphs ...
Spring Gun Speed and Height
Spring and Projectile
Work and Potential Energ...
Sort:
Score (High-Low)
Score
average: 65%
Peace, Warren
Payne, Ophelia
Moss, Pete
Karr, Lisa
Inovera, Marge
Harmonic, Phil
Fresco, Al
Druff, Dan
Day, Sonny
Chovy, Anne
Bellum, Sarah
Beach, Sandy
Bath, Anita
Andropov, Pikov
Abbott, Peter
0%
25%
50%
75%
100%

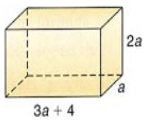
Figure 18

Web Assign

Web Assign is another online tutoring program but is rather different than Pearson's Mastering series. The system devised by North Carolina State University has the ability to incorporate a wide variety of subjects. Currently the Web Assign supports over 600 books with the majority in chemistry, mathematics and physics. It also includes accounting, astronomy, biology, geosciences, statistics and a few others. Although the system itself is complex, it is also very simple to use. Because Web Assign has such a large variety of problem templates, only a few will be shown. Below you can see the basic structure of a few different math problem.

1. 0/3 points All Submissions Notes Question: GALG298 1.1.55.

Geometry Study the rectangular prism below.



(a) Create a formula in terms of a that will determine the total surface area of this rectangular prism. Click here for help with symbolic formatting.

1+2

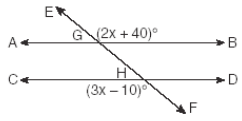
(b) What is the surface area if $a = 2$?

(c) What is the surface area if $a = 6.6$?

Submit New Answers To Question 1 | Save Work | Practice Another Version

3. –/1 points Notes Question: Rmath1 2001.Aug.07.

In the accompanying diagram, transversal $\overleftrightarrow{EF}$ intersects parallel lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ at G and H respectively. If $m\angle EGB = 2x + 40$ and $m\angle FHC = 3x - 10$, what is the value of x?



Submit New Answers To Question 3 | Save Work

4. –/1 points Notes Question: Rmath1 2001.Aug.11.

What is the product of $-4x^5y^7$ and $6x^3y$?

symbolic formatting help

Submit New Answers To Question 4 | Save Work | Practice Another Version

Figure 20

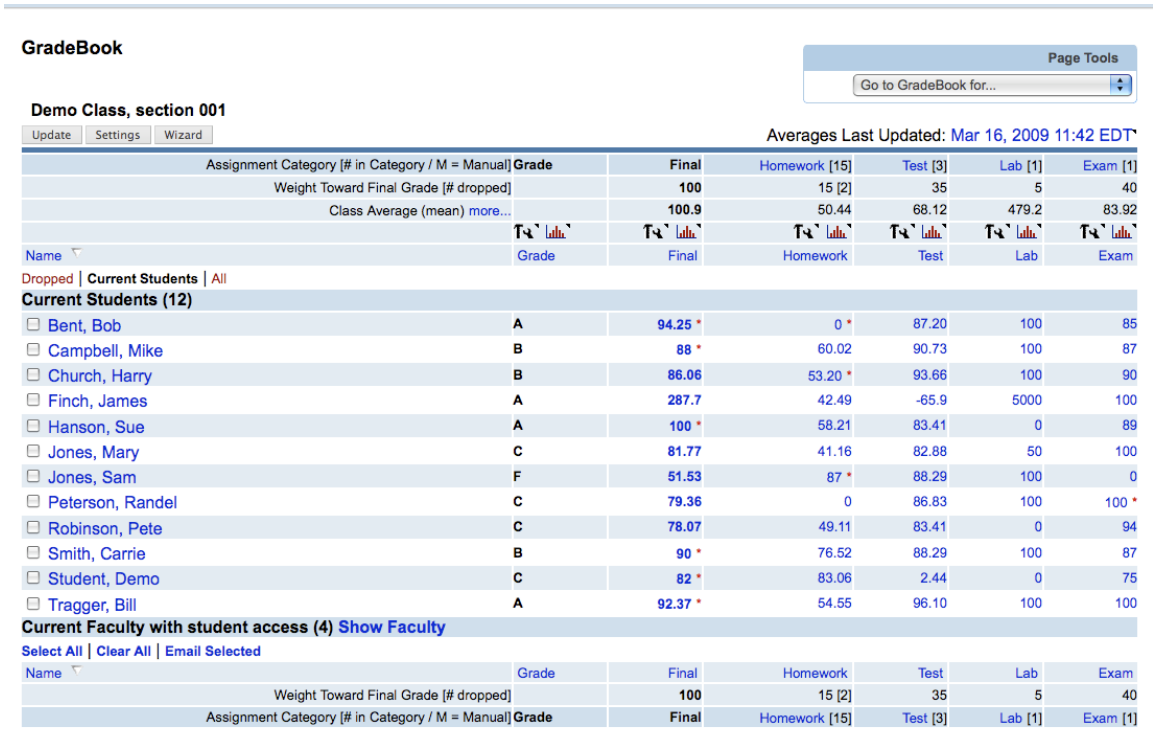
Web Assign supports a variety of problem types such as fill in, multiple choice and essays. Even though it does not utilize a fancy interface to enter complex math symbols, it provides a simple symbolic table that contains the written equivalent.

Available operators	Example
+ for addition	x + 1
- for subtraction or the negative sign	x - 1, or -x
* or nothing for multiplication	4*x or 4x
/ for division	x/4
** or ^ for exponential	x**3 or x^3
( ) where necessary to group terms	4/(x + 1), or 3(x + 1)
abs() to take the absolute value of a variable or expression	abs(-5) = 5
sqrt() for square root of an expression	sqrt(x/5)
! for factorial of a number or expression	5! = 120 or (x - 1)!

Available operators	Example
sin, cos, tan, sec, csc, cot, asin, acos, atan functions (as well as hyperbolics) (angle x expressed in radians)	sin(2x) or coth(x/3)
x^(1/n) or rootn(x) for the n^{th} root of a number	x^(1/3) or root5(x - 3)
pi for 3.14159....	2 pi x
e for scientific notation	1e3 = 1000
ln() for natural log	ln(x)
exp() for "e to the power of"	exp(x) = e^x
log_b(x) for log with base b	log_2(x + 5)

Figure 21

Web Assign also provides great support for teachers. Teachers have the ability to manage students in their class and assign them work. They are able to track grades easily and much like Assistment, they can also build their own problems. The grade book section, which is only available to the teachers, allows access to all this information.



GradeBook

Page Tools

Go to GradeBook for...

Demo Class, section 001

Update | Settings | Wizard

Averages Last Updated: Mar 16, 2009 11:42 EDT

Assignment Category [# in Category / M = Manual]	Grade	Final	Homework [15]	Test [3]	Lab [1]	Exam [1]
Weight Toward Final Grade [# dropped]		100	15 [2]	35	5	40
Class Average (mean) more...		100.9	50.44	68.12	479.2	83.92
Name	Grade	Final	Homework	Test	Lab	Exam
Dropped | **Current Students** | All						
Current Students (12)						
Bent, Bob	A	94.25 *	0 *	87.20	100	85
Campbell, Mike	B	88 *	60.02	90.73	100	87
Church, Harry	B	86.06	53.20 *	93.66	100	90
Finch, James	A	287.7	42.49	-65.9	5000	100
Hanson, Sue	A	100 *	58.21	83.41	0	89
Jones, Mary	C	81.77	41.16	82.88	50	100
Jones, Sam	F	51.53	87 *	88.29	100	0
Peterson, Randel	C	79.36	0	86.83	100	100 *
Robinson, Pete	C	78.07	49.11	83.41	0	94
Smith, Carrie	B	90 *	76.52	88.29	100	87
Student, Demo	C	82 *	83.06	2.44	0	75
Tragger, Bill	A	92.37 *	54.55	96.10	100	100
Current Faculty with student access (4) Show Faculty						
Select All | Clear All | Email Selected						
Name	Grade	Final	Homework	Test	Lab	Exam
Weight Toward Final Grade [# dropped]		100	15 [2]	35	5	40
Assignment Category [# in Category / M = Manual]	Grade	Final	Homework [15]	Test [3]	Lab [1]	Exam [1]

Figure 22

Web Assign's system is clearly very powerful. Having the capability to handle many different subjects, it can easily simplify a students' learning experience and a teachers' teaching experience.

Comparison between Assistment and Other Systems

System	Hints / Tutoring	Multi-Subject Support	Textbook Support	Problem Builder	Teacher Analysis
Assistment	X			X	X
Mastering Series	X	X	X		X
Web Assign	X	X	X	X	X

Table 11

BIBLIOGRAPHY

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Source: http://www.assistment.org

Date: 05/01/2009

MasteringPhysics

Source: http://www.masteringphysics.com

Date: 05/01/2009

WebAssign

Source: http://www.webassign.net

Date: 05/01/2009

Effectiveness of Mastery Learning Programs: A Meta-Analysis

Author(s): Chen-Lin C. Kulik, James A. Kulik, Robert L. Bangert-Drowns

Source: Review of Educational Research, Vol. 60, No. 2 (Summer, 1990), pp. 265-299

Published by: American Educational Research Association

Stable URL: http://www.jstor.org/stable/1170612

Cognitive Tutors: Lessons Learned

Author(s): John R. Anderson, Albert T. Corbett, Kenneth R. Koedinger, Ray Pelletier

Source: The Journal of the Learning Sciences, Vol. 4. No. 2 (1995), pp. 167-207

Published by: Lawrence Erlbaum Associates (Taylor and Francis Group)

Stable URL: http://www.jstor.org/stable/1466690

Press, Oxford University

Oxford English Dictionary

http://dictionary.oed.com/cgi/entry/00307098?single=1&query_type=word&queryword=meta-analysis

Date: 05/05/2009

Which Works Better: Worked Examples or Hint Messages?

Author(s): Denis Vadimovich Golovnya, Mihai Tiberiu Luca, Antoniya Toneva Statelova

Published by: Worcester Polytechnic Institute

Publish Date: 04/22/2008

Source: http://www.wpi.edu/Pubs/E-project/Available/E-project-042408-134714/unrestricted/report_final.pdf

The ASSISTment Project

Author(s): Jeslin J. Wu, Boris Svirchuk

Published by: Worcester Polytechnic Institute

Publish Date: 05/14/2008

Source: http://www.wpi.edu/Pubs/E-project/Available/E-project-051508-062025/unrestricted/IQP.pdf

Applied Statistics for Engineering and Scientists

Author(s): Joseph D. Petruccelli, Balgobin Nandram, Minghui Chen

Published by: Worcester Polytechnic Institute

Is There Better Evidence on Mastery Learning? A Response to Slavin

Author(s): James A. Kulik, Chen-Lin C. Kulik, Robert L. Bangert-Drowns

Source: Review of Educational Research, Vol. 60, No. 2 (Summer, 1990), pp. 303-307

Published by: American Educational Research Association

Stable URL: http://www.jstor.org/stable/1170614

Accessed: 29/04/2009 19:36

APPENDIX

Sampler Source Code

```
package com.iqp;

import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.awt.event.WindowAdapter;
import java.awt.event.WindowEvent;
import java.io.File;

import javax.swing.JFileChooser;
import javax.swing.JOptionPane;

import com.iqp.ui.UI;
import com.iqp.util.DataImporter;
import com.iqp.util.Evaluator;
import com.iqp.util.GenericFileFilter;

/**
 * <code>Sampler</code> defines the implementation of a utility
 * software program that computes the mean and median of a data
 * set read in from file with bootstrapping resampling.
 *
 * @author Yi Wang (Neakor)
 * @version Creation date: 04-22-2009 12:19:23 AM EST
 * @version Modified date: 04-22-2009 12:19:23 AM EST
 */
public class Sampler extends WindowAdapter implements ActionListener {
	/**
	 * The <code>Boolean</code> finished flag.
	 */
	private volatile boolean finished;

	/**
	 * Start the program.
	 */
	private void start() {
		final File file = this.selectFile();
		if(file == null) System.exit(0);
		final DataImporter importer = new DataImporter();
		double[] values = importer.readDoubles(file);
		if(values.length <= 0) JOptionPane.showMessageDialog(null, "No
values in file.");
		else {
			UI ui = new UI(this);
			ui.activate();
			this.updateLoop(new Evaluator(values, ui));
		}
```

```
            System.exit(0);
      }

      /**
       * Propmt the user to select a file to read data from.
       * @return The <code>File</code> selected.
       */
      private File selectFile() {
            JFileChooser chooser = new JFileChooser();
            chooser.setFileFilter(new GenericFileFilter("Text file",
".txt"));
            chooser.showOpenDialog(null);
            return chooser.getSelectedFile();
      }

      /**
       * The sampler update loop.
       * @param evaluator The <code>Evaluator</code> for computation.
       */
      private void updateLoop(final Evaluator evaluator) {
            while(!this.finished) {
                  evaluator.update();
                  synchronized(this) {
                        try {
                              this.wait();
                        } catch (InterruptedException e) {
                              e.printStackTrace();
                        }
                  }
            }
      }

      @Override
      public void actionPerformed(ActionEvent e) {
            synchronized(this){
                  this.notifyAll();
            }
      }

      @Override
      public void windowClosed(WindowEvent e) {
            this.finished = true;
      }

      /**
       * Main method.
       */
      public static void main(String[] args) {
            new Sampler().start();
      }
}
```

```
package com.iqp.enumn;

/**
 * <code>EType</code> defines the enumerations of all types of
 * statistical standards to use.
 *
 * @author Yi Wang (Neakor)
 * @version Creation date: 04-22-2009 12:21:47 AM EST
 * @version Modified date: 04-22-2009 12:21:47 AM EST
 */
public enum EType {
	/**
	 * The average value.
	 */
	Average,
	/**
	 * The median value.
	 */
	Median,
}
```

```
package com.iqp.ui;

import java.awt.Dimension;
import java.awt.EventQueue;
import java.awt.event.ActionListener;
import java.text.DecimalFormat;

import javax.swing.GroupLayout;
import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JSeparator;
import javax.swing.JSpinner;
import javax.swing.LayoutStyle;
import javax.swing.SpinnerNumberModel;
import javax.swing.WindowConstants;

import com.iqp.enumn.EType;

/**
 * <code>UI</code> defines the implementation of the user interface
 * of the sampler program.
 *
 * @author Yi Wang (Neakor)
 * @version Creation date: 04-22-2009 12:22:18 AM EST
 * @version Modified date: 04-22-2009 12:22:18 AM EST
 */
public class UI extends JFrame implements Runnable {
	/**
	 * The serial version.
	 */
	private static final long serialVersionUID = 628324465572600916L;
	/**
	 * The data formatter.
	 */
	private final DecimalFormat formatter;
	/**
	 * The sample <code>JButton</code>.
	 */
	private JButton bntSample;
	/**
	 * The average text <code>JLabel</code>.
	 */
	private JLabel lblAverage;
	/**
	 * The average value <code>JLabel</code>.
	 */
	private JLabel lblResultAverage;
	/**
	 * The median text <code>JLabel</code>.
	 */
	private JLabel lblMedian;
```

```
	/**
	 * The median value <code>JLabel</code>.
	 */
	private JLabel lblResultMedian;
	/**
	 * The sample size <code>JLabel</code>.
	 */
	private JLabel lblSample;
	/**
	 * The <code>JSeparator</code>.
	 */
	private JSeparator separator;
	/**
	 * The sample size <code>JSpinner</code>.
	 */
	private JSpinner spnSample;

	/**
	 * Constructor of <code>UI</code>.
	 * @param handler The <code>ActionListener</code>.
	 */
	public UI(ActionListener handler) {
		this.formatter = new DecimalFormat("###.##");
		this.setDefaultCloseOperation(WindowConstants.EXIT_ON_CLOSE);
		this.setMinimumSize(new Dimension(208, 175));
		this.initComponents(handler);
		this.initLayout();
	}

	/**
	 * Initialize components.
	 * @param handler The <code>Actionlistener</code>.
	 */
	private void initComponents(ActionListener handler) {
		this.bntSample = new JButton("Resample");
		this.lblAverage = new JLabel("Average: ");
		this.spnSample = new JSpinner();
		this.spnSample.setModel(new SpinnerNumberModel(30, 1,
Double.MAX_VALUE, 5));
		this.lblResultAverage = new JLabel("result");
		this.lblMedian = new JLabel("Median:");
		this.lblResultMedian = new JLabel("result");
		this.lblSample = new JLabel("Sample size:");
		this.separator = new JSeparator();
		this.bntSample.setActionCommand("resample");
		this.bntSample.addActionListener(handler);
	}

	/**
	 * Initialize UI layout.
	 */
	private void initLayout() {
		GroupLayout layout = new GroupLayout(getContentPane());
		getContentPane().setLayout(layout);
```

```
            layout.setHorizontalGroup(

      layout.createParallelGroup(GroupLayout.Alignment.LEADING)
                        .addComponent(this.separator,
GroupLayout.DEFAULT_SIZE, 208, Short.MAX_VALUE)
                        .addGroup(layout.createSequentialGroup()
                                  .addContainerGap()

      .addGroup(layout.createParallelGroup(GroupLayout.Alignment.LEADING)

      .addGroup(layout.createSequentialGroup()

      .addComponent(this.lblAverage)

      .addPreferredGap(LayoutStyle.ComponentPlacement.RELATED)

      .addComponent(this.lblResultAverage))

      .addGroup(layout.createSequentialGroup()

      .addComponent(this.lblMedian)

      .addPreferredGap(LayoutStyle.ComponentPlacement.UNRELATED)

      .addComponent(this.lblResultMedian)))

      .addContainerGap(86, Short.MAX_VALUE))

      .addGroup(layout.createSequentialGroup()

      .addContainerGap()

      .addComponent(this.lblSample)

      .addPreferredGap(LayoutStyle.ComponentPlacement.RELATED)

      .addComponent(this.spnSample, GroupLayout.PREFERRED_SIZE, 74,
GroupLayout.PREFERRED_SIZE)

      .addContainerGap(26, Short.MAX_VALUE))

      .addGroup(layout.createSequentialGroup()

                  .addGap(9, 9, 9)

                  .addComponent(this.bntSample, GroupLayout.PREFERRED_SIZE,
182, GroupLayout.PREFERRED_SIZE)

                  .addContainerGap(GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
            );
            layout.setVerticalGroup(

      layout.createParallelGroup(GroupLayout.Alignment.LEADING)
```

```
                        .addGroup(layout.createSequentialGroup()
                                .addContainerGap()

      .addGroup(layout.createParallelGroup(GroupLayout.Alignment.BASELINE)

      .addComponent(this.lblSample)

      .addComponent(this.spnSample, GroupLayout.PREFERRED_SIZE,
GroupLayout.DEFAULT_SIZE, GroupLayout.PREFERRED_SIZE))

      .addPreferredGap(LayoutStyle.ComponentPlacement.RELATED)

      .addComponent(this.bntSample)

      .addPreferredGap(LayoutStyle.ComponentPlacement.RELATED)

      .addComponent(this.separator, GroupLayout.PREFERRED_SIZE, 10,
GroupLayout.PREFERRED_SIZE)

      .addPreferredGap(LayoutStyle.ComponentPlacement.RELATED)

      .addGroup(layout.createParallelGroup()

      .addComponent(this.lblAverage)

      .addComponent(this.lblResultAverage))

      .addPreferredGap(LayoutStyle.ComponentPlacement.RELATED)

      .addGroup(layout.createParallelGroup(GroupLayout.Alignment.BASELINE)

      .addComponent(this.lblMedian)

      .addComponent(this.lblResultMedian))

      .addContainerGap(GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
            );
            pack();
      }

      /**
       * Activate the UI.
       */
      public void activate() {
            EventQueue.invokeLater(this);
      }

      @Override
      public void run() {
            this.setVisible(true);
      }

      /**
       * Set the value of given statistical type.
```

```
	 * @param type The <code>EType</code> enumeration.
	 * @param value The <code>Double</code> value to be set.
	 */
	public void setValue(EType type, double value) {
		final String str = this.formatter.format(value);
		switch(type) {
		case Average: this.lblResultAverage.setText(str); break;
		case Median: this.lblResultMedian.setText(str); break;
		}
	}

	/**
	 * Retrieve the current set sample size.
	 * @return The <code>Integer</code> sample size.
	 */
	public int getSampleSize() {
		double size = (Double)this.spnSample.getValue();
		return (int)size;
	}
}
```

```
package com.iqp.util;

import java.io.File;
import java.io.FileReader;
import java.io.IOException;
import java.io.StreamTokenizer;
import java.util.ArrayList;
import java.util.List;

/**
 * <code>DataImporter</code> defines the implementation of the
 * utility unit that reads in initial data set from given file.
 *
 * @author Yi Wang (Neakor)
 * @version Creation date: 04-22-2009 12:26:24 AM EST
 * @version Modified date: 04-22-2009 12:26:24 AM EST
 */
public class DataImporter {

	/**
	 * Read in double values.
	 * @param file The <code>File</code> to read.
	 * @return The array of <code>Double</code>.
	 */
	public double[] readDoubles(File file) {
		try {
			final StreamTokenizer parser = new StreamTokenizer(new
FileReader(file));
			final List<Double> list = new ArrayList<Double>();
			while(parser.ttype != StreamTokenizer.TT_EOF) {
				Double value = this.nextDouble(parser);
				if(value != null) list.add(value);
			}
			double[] values = new double[list.size()];
			int index = 0;
			for(Double value : list) {
				values[index] = value;
				index++;
			}
			return values;
		} catch (IOException e) {
			e.printStackTrace();
		}
		return null;
	}

	/**
	 * Read in the next double value.
	 * @param parser The <code>StreamTokenizer</code>.
	 * @return The <code>Double</code> value.
	 * @throws IOException If reading is interrupted.
	 */
```

```
	private Double nextDouble(StreamTokenizer parser) throws IOException
{
		while(parser.nextToken() != StreamTokenizer.TT_NUMBER) {
			if(parser.ttype == StreamTokenizer.TT_EOF) return null;
		}
		return parser.nval;
	}
}
```

```
package com.iqp.util;

import java.util.Arrays;
import java.util.Random;

import com.iqp.enumn.EType;
import com.iqp.ui.UI;

/**
 * <code>Evaluator</code> defines the implementation of the unit
 * that is responsible for computing the resampled data.
 *
 * @author Yi Wang (Neakor)
 * @version Creation date: 04-22-2009 12:27:44 AM EST
 * @version Modified date: 04-22-2009 12:27:44 AM EST
 */
public class Evaluator {
	/**
	 * The <code>Random</code> used to draw index.
	 */
	private final Random random;
	/**
	 * The initial array of <code>Double</code> values.
	 */
	private final double[] values;
	/**
	 * The <code>UI</code> instance.
	 */
	private final UI ui;

	/**
	 * Constructor of <code>Evaluator</code>.
	 * @param values The initial array of <code>Double</code> values.
	 * @param ui The <code>UI</code> instance.
	 */
	public Evaluator(double[] values, UI ui) {
		this.random = new Random();
		this.values = values;
		this.ui = ui;
	}

	/**
	 * Update the UI with computed values.
	 */
	public void update() {
		final int size = this.ui.getSampleSize();
		this.ui.setValue(EType.Average, this.average(size));
		this.ui.setValue(EType.Median, this.median(size));
	}

	/**
	 * Compute the average with resampling.
```

```
	 * @param size The <code>Integer</code> sample size.
	 * @return The average <code>Double</code> value.
	 */
	private double average(final int size) {
		double total = 0;
		for(int i = 0; i < size; i++) {
			total += this.values[this.nextIndex(this.values.length)];
		}
		return total/size;
	}

	/**
	 * Compute the median with resampling.
	 * @param size The <code>Integer</code> sample size.
	 * @return The median <code>Double</code> value.
	 */
	private double median(final int size) {
		final double[] temp = new double[size];
		for(int i = 0; i < size; i++) {
			temp[i] =
this.values[this.nextIndex(this.values.length)];
		}
		Arrays.sort(temp);
		final double middle = (double)temp.length/2.0;
		final int truncated = (int)middle;
		if(middle == truncated) return temp[truncated];
		double total = temp[truncated] + temp[truncated+1];
		return total/2.0;
	}

	/**
	 * Retrieve a randomly selected index value.
	 * @param range The <code>Integer</code> range to select.
	 * @return The <code>Integer</code> index.
	 */
	private int nextIndex(int range) {
		final double value = this.random.nextDouble();
		if(value >= 1.0) return range;
		return (int)(range*value);
	}
}
```

```
/*
 * This source code is directly taken from Project Essence with
 * usage permission granted to project IQP re-sampling by the
 * chief architect Yi Wang (Neakor).
 */
package com.iqp.util;

import java.io.File;

import javax.swing.filechooser.FileFilter;

/**
 * <code>GenericFileFilter</code> defines the concrete implementation of
 * a file filter that excludes files without the required extensions.
 * <p>
 * <code>GenericFileFilter</code> requires the given extension strings
 * to include the character <code>'.'</code>.
 *
 * @author Yi Wang (Neakor)
 * @version Creation date: 09-06-2008 19:28 EST
 * @version Modified date: 01-25-2009 14:23 EST
 */
public class GenericFileFilter extends FileFilter {
	/**
	 * The description of the files allowed
	 */
	private final String description;
	/**
	 * The extensions this filter will allow
	 */
	private final String[] extensions;

	/**
	 * Constructor of <code>GenericFileFilter</code>.
	 * @param description The <code>String</code> description of the
file types allowed.
	 * @param extensions The code>String</code> variable argument
extensions allowed.
	 */
	public GenericFileFilter(String description, String...extensions) {
		this.description = description;
		this.extensions = extensions;
	}

	@Override
	public boolean accept(File f) {
		if(f == null) return false;
		String name = f.getName();
		int index = name.lastIndexOf(".");
```

```
            if(index < 0) return true;
            String extension = name.substring(name.lastIndexOf("."));
            for(String ext : this.extensions) {
                  if(ext.equalsIgnoreCase(extension))     return true;
            }
            return false;
      }

      @Override
      public String getDescription() {
            return this.description;
      }
}
```

Group Number	Pre-test Date	Pre-test Result	Post-test Date	Post-test Result	Result Difference
4	2/27/2009	16%	3/9/2009	16%	0%
4	2/27/2009	66%	3/9/2009	16%	-50%
4	2/27/2009	58%	3/9/2009	16%	-42%
4	3/3/2009	83%	3/9/2009	91%	8%
4	2/27/2009	50%	3/9/2009	75%	25%
4	2/27/2009	25%	3/9/2009	50%	25%
4	2/27/2009	16%	3/10/2009	66%	50%
4	2/27/2009	41%	3/10/2009	66%	25%
4	2/27/2009	75%	3/10/2009	66%	-9%
4	3/4/2009	66%	3/10/2009	83%	17%
4	2/27/2009	41%	3/9/2009	66%	25%
4	2/27/2009	58%	3/10/2009	75%	17%
4	2/27/2009	83%	3/9/2009	100%	17%
4	2/27/2009	66%	3/9/2009	83%	17%
4	2/27/2009	33%	3/10/2009	25%	-8%
4	2/27/2009	0%	3/10/2009	16%	16%
4	2/27/2009	100%	3/9/2009	83%	-17%
5	2/27/2009	75%	3/10/2009	75%	0%
5	2/27/2009	41%	3/11/2009	41%	0%
5	2/27/2009	50%	3/9/2009	66%	16%
5	2/27/2009	25%	3/10/2009	50%	25%
5	2/27/2009	50%	3/9/2009	91%	41%
5	2/27/2009	83%	3/9/2009	100%	17%
5	2/27/2009	33%	3/10/2009	100%	67%

5	2/27/2009	33%	3/10/2009	58%	25%
5	2/27/2009	50%	3/13/2009	83%	33%
5	2/27/2009	50%	3/10/2009	91%	41%
5	2/27/2009	58%	3/13/2009	80%	22%
5	2/27/2009	50%	3/9/2009	50%	0%
5	2/27/2009	83%	3/9/2009	75%	-8%
5	2/27/2009	75%	3/10/2009	75%	0%
5	2/27/2009	91%	3/9/2009	91%	0%
5	2/27/2009	50%	3/10/2009	83%	33%
7	2/27/2009	91%	3/12/2009	100%	9%
7	2/27/2009	66%	3/10/2009	83%	17%
7	2/27/2009	91%	3/13/2009	83%	-8%
7	2/27/2009	91%	3/10/2009	91%	0%
7	2/27/2009	58%	3/9/2009	50%	-8%
7	2/27/2009	75%	3/9/2009	100%	25%
7	2/27/2009	91%	3/9/2009	100%	9%
7	2/27/2009	33%	3/13/2009	25%	-8%
7	2/27/2009	83%	3/10/2009	25%	-58%
7	2/27/2009	58%	3/9/2009	58%	0%
7	2/27/2009	75%	3/10/2009	16%	-59%
7	2/27/2009	66%	3/10/2009	100%	34%
7	3/3/2009	58%	3/10/2009	28%	-30%
7	3/3/2009	75%	3/9/2009	66%	-9%
7	2/27/2009	66%	3/9/2009	83%	17%
7	2/27/2009	100%	3/9/2009	100%	0%
7	2/27/2009	41%	3/10/2009	75%	34%
7	2/27/2009	66%	3/9/2009	100%	34%

7	2/27/2009	91%	3/10/2009	75%	-16%
7	2/27/2009	100%	3/9/2009	100%	0%
7	2/27/2009	83%	3/10/2009	83%	0%
7	2/27/2009	91%	3/9/2009	100%	9%
7	2/27/2009	66%	3/9/2009	91%	25%
7	2/27/2009	83%	3/10/2009	91%	8%
6	2/27/2009	16%	3/10/2009	33%	17%
6	2/27/2009	75%	3/10/2009	83%	8%
6	2/27/2009	66%	3/10/2009	100%	34%
6	2/27/2009	33%	3/10/2009	66%	33%
6	2/27/2009	58%	3/10/2009	91%	33%
6	3/3/2009	41%	3/10/2009	83%	42%
6	2/27/2009	91%	3/9/2009	100%	9%
6	2/27/2009	50%	3/10/2009	100%	50%
6	3/3/2009	75%	3/10/2009	83%	8%
6	2/27/2009	16%	3/10/2009	25%	9%
6	3/3/2009	41%	3/9/2009	50%	9%
6	2/27/2009	16%	3/10/2009	91%	75%
6	2/27/2009	83%	3/9/2009	66%	-17%
6	2/27/2009	66%	3/9/2009	83%	17%
6	2/27/2009	75%	3/9/2009	100%	25%
6	2/27/2009	100%	3/9/2009	100%	0%
6	2/27/2009	75%	3/9/2009	91%	16%
6	2/27/2009	75%	3/9/2009	83%	8%
6	2/27/2009	50%	3/9/2009	83%	33%
6	2/27/2009	41%	3/10/2009	100%	59%

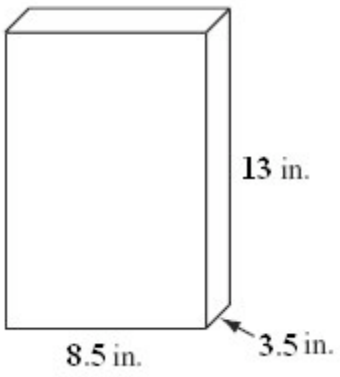
Table 12 - Data Table

Assistment – Yi Wang

Problem Set "8th Grade - Geometry Review Set(5 Items)" id:[5310]

1) Assistment #27959 "27959 - 8th Grade - Geometry Review - Morph 2007 grade 8 #22"

A) Mora bought a box of cereal that was a rectangular prism with a length of 8.5 inches, a width of 3.5 inches, and a height of 13 inches, as shown below.



What is the total number of vertices of Mora's cereal box?

Fill in:

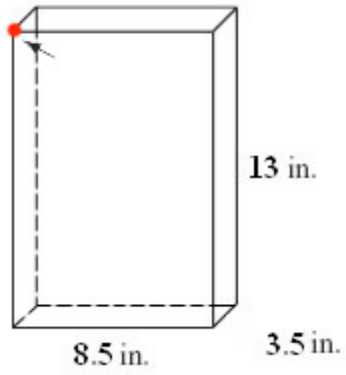
✓ 8

Hints:

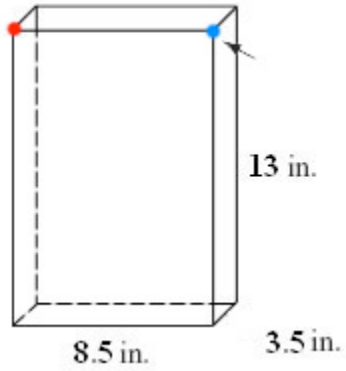
- First we should know what vertices are. The word "vertices" is the plural of "vertex". A vertex is an intersection point between faces.

- Now we know what vertices are, let's start counting.

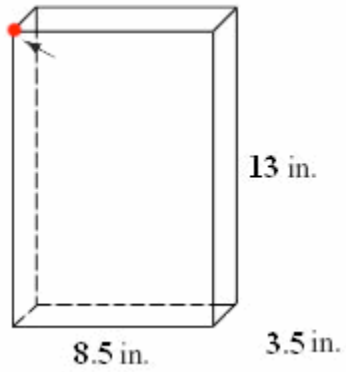
Let's start with the **1st** one on the top left corner on the front face.



- The **2nd** one on the top right corner on the front face.

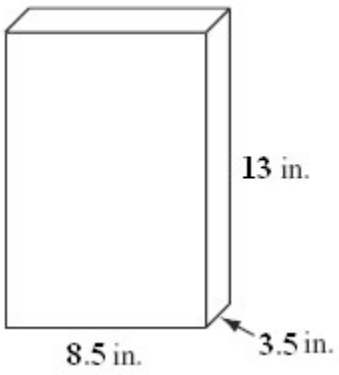


- As we can see from the image below, there are 8 vertices in total.



Therefore, the total number of vertices of Mora's cereal box is 8. Type in 8.

B) What is the total number of faces of Mora's cereal box?



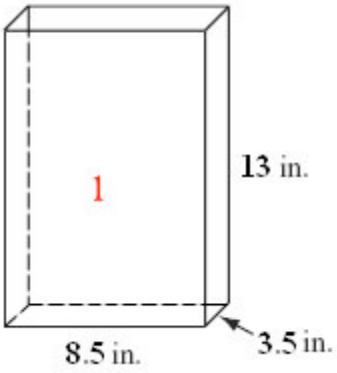
Fill in:

✓ 6

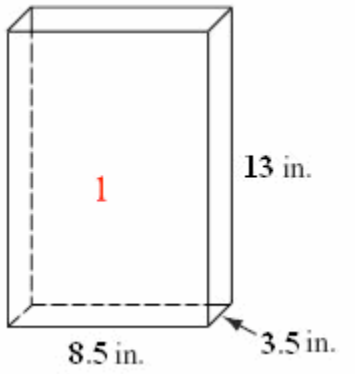
Hints:

- In order to count the number of faces, we first need to understand what is a face of a geometry. "Face" is the bounding surface of a geometric shape, such as the face of a table.
- Let us count the faces of the box starting from the front face.

1st face on front side of the box.

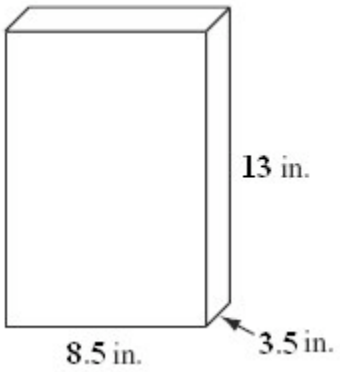


- Let us keep counting the number of faces.



- There are 6 faces. The front and back, the left and right sides and the top and bottom. Type in 6

C) Draw a net (flat pattern) that can be folded to form a box with the same dimensions as Mora's cereal box. Be sure to label your drawing of the net with the lengths, in inches, of the line segments.



Multiple choice:

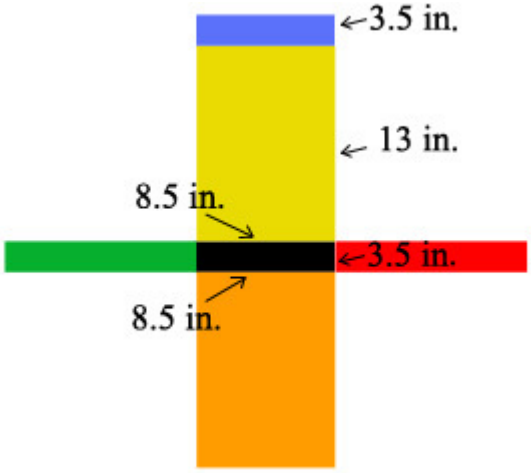
✓ I have finished the problem on the work sheet.

Hints:

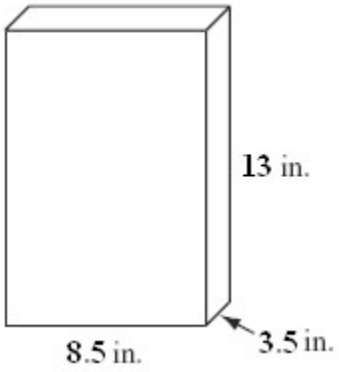
- The next hint is a correct answer. If you click "show next hint" again, your teacher will be

informed and you will NOT receive any credit.

- Here is an image showing one possible way to unfold the box.



D) Find the surface area of the rectangular prism.

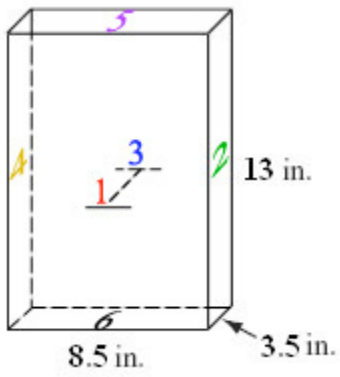


Algebra:

✓ 371.5

Hints:

- The total surface area of a rectangular prism is the sum of the areas of all 6 faces.



- We also notice that the 6 faces are in fact 3 sets of 2 equal sized faces.

The front and the back faces, the left and the right faces and the top and the bottom faces.

- So in order to find the surface area of the rectangular prism, we can follow the formula:

Surface area = Area of front face + Area of back face + Area of left face + Area of right face + Area of top face + Area of bottom face

= (Area of front face + Area of back face) + (Area of left face + Area of right face) + (Area of top face + Area of bottom face)

Surface area = (2 * Area of front face) + (2 * Area of left face) + (2 * Area of top face)

- As we can see in the diagram, each face on the rectangular prism is in fact a retangle. This means we can use the formula:

Area of face = Base * Height

- Area of front face = 8.5 * 13 = 110.5

Area of left face = 13 * 3.5 = 45.5

Area of top face = 8.5 * 3.5 = 29.75

- Then by substituting the values we found for each face into the simplified formula:

Surface area = (2 * Area of front face) + (2 * Area of left face) + (2 * Area of top face)

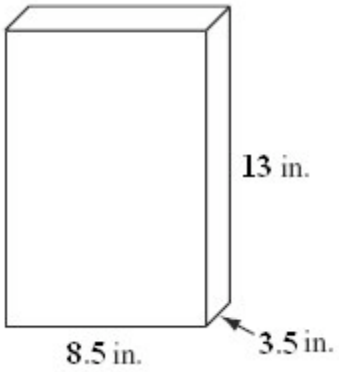
= (2* 110.5) + (2 * 45.5) + (2 * 29.75)

= 221 + 91 + 59.5

= 371.5

- Therefore, the surface area of the rectangular prism is 371.5. Type in 371.5.

E) Find the volume of the rectangular prism.

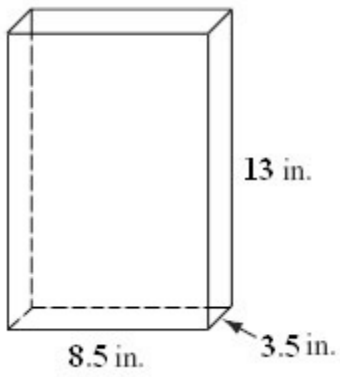


Fill in:

✓ 386.75

Hints:

- In order to find the volume of the rectangular prism, we first need to know what is the formula for calculating the volume of a rectangular prism.



- The formula for calculating the volume of a rectangular prism is:

Volume = Width * Height * Depth.

- As the diagram shows, the width of the box is 8.5 inch, the height is 13 inch and the depth is 3.5 inch.

- Now we have the formula and the values, we can simply substitute the values into the fomula then we have:

Volume = Width * Height * Depth

= 8.5 * 3.5 * 13

= 386.75.

- Therefore, the volume of the rectangular prism is 386.75. Type in 386.75.

---

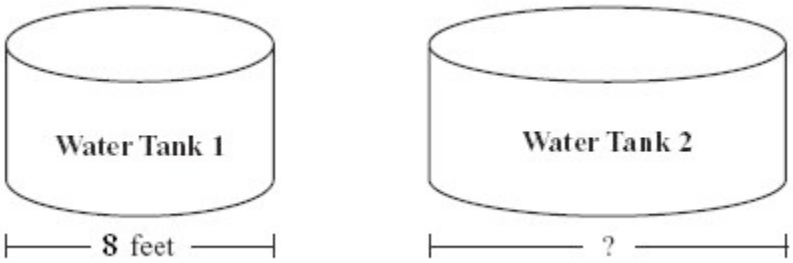
2) Assistment #27960 "27960 - Morph 2007 grade 8 #29"

A) A rancher has two water tanks.

* Each water tank is in the shape of a cylinder.

* The base of each water tank is in the shape of a circle.

Diagrams of the two water tanks are shown below.



What is the circumference, in feet, of the base of Water Tank 1?

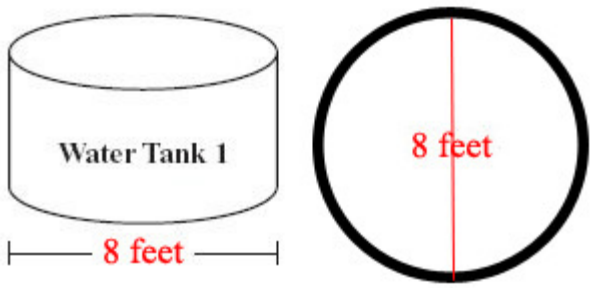
(Use 3.14 for π.)

Fill in:

✓ 25.12

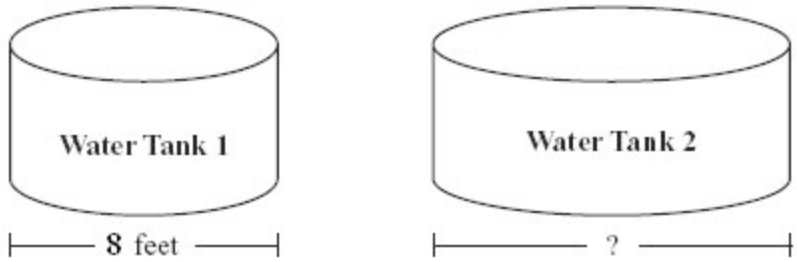
Hints:

- As the problem stated, the base of each water tank is in the shape of a circle. In order to find the circumference of the base of Water Tank 1, we simply need to find the circumference of a circle with diameter 8 feet as shown in the diagram.



- The formula for calculating the circumference of a circle is C = π * D, where D is the diameter of the circle.
- Now by substituting the diameter and π value into the circumference formula we get 3.14 * 8 = 25.12.
- Therefore, the circumference of the base of Water Tank 1 is 25.12. Type in 25.12.

B) The circumference of the base of Water Tank 2 is 6.28 feet longer than that of Water Tank 1. What is the diameter, in feet, of the base of Water Tank 2? (Use 3.14 for π.)



Fill in:

✓ 10

Hints:

- In order to find the diameter of the base of Water Tank 2, we need to know the circumference of the base of Water Tank 2.
- We found the circumference of the base of Water Tank 1 is 25.12 in the previous problem.

This problem states that the circumference of the base of Water Tank 2 is 6.28 longer than

that of Water Tank 1.

This means the circumference of the base of Water Tank 2 is 25.12 + 6.28 = 31.4.

• The relationship between the circumference of a circle and its diameter is given by the circumference formula we used in Problem 1.

C = π * D where D is the diameter of the circle. By dividing π from both sides of the formula, we have

C / π = D.

• In order to find the diameter of the base of Water Tank 2, we simply substitue its circumference value which we just found into the modified formula. This gives us

D = 31.4 / π

• Solve the equation

D = 31.4 / π for D. We have

D = 31.4 / 3.14 = 10. Therefore, the diameter of the base of Water Tank 2 is 10. Type in 10.

C) How many more square feet does the base of Water Tank 2 cover than the base of Water Tank 1?

(Use 3.14 for π. and round to the tenths place)

Fill in:

✓ 28.3

Scaffold:

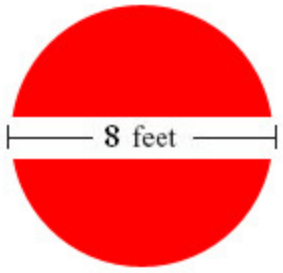
Let's first find out the area of the base of Water Tank 1. What is the area covered by the base of Water Tank1? (Use 3.14 as the value of π)

Algebra:

✓ 50.24

Hints:

- The base of each Water Tank is a circle, so we simply need to find the area of the circle with diameter 8.



- The formula for calculating the area of a circle is $\pi * r^2$, where r is the radius of the circle.
- Fortunately, we know the radius is half the diameter . So the radius of the base of

Water Tank 1 is 8 / 2 = 4.

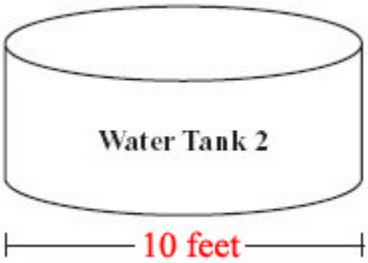
- Now we substitue the radius and π value into the area formula we just found.

We have area = $\pi * r^2 = 3.14 * 4^2 = 50.24$.

Therefore, the area of the base of Water Tank 1 is 50.24. Type in 50.24.

Scaffold:

Now we can use the same strategy to find the area of the base of Water Tank 2. What is the area of the base of Water Tank 2?



Algebra:

✓ 78.5

Hints:

- The base of each Water Tank is a circle, so we simply need to find the area of the circle with diameter 10.
- The formula for calculating the area of a circle is $\pi * r^2$, where r is the radius of the circle.

- Fortunately, we know the radius is half the diameter. So the radius of the base of Water Tank 2 is 10 / 2 = 5.
- Now we substitue the radius and π value into the area formula we just found.

We have area = $\pi * r^2 = 3.14 * 5^2 = 78.5$.

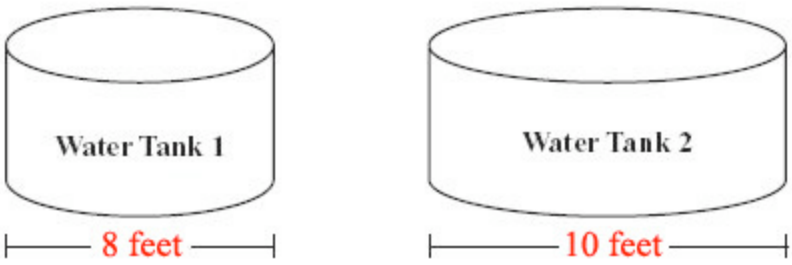
Therefore, the area of the base of Water Tank 2 is 78.5. Type in 78.5.

Scaffold:

Now let's try the original problem again.

How many more square feet does the base of Water Tank 2 cover than the base of Water Tank 1?

(Use 3.14 for π. and round to the tenths place)



Fill in:

✓ 28.3

Hints:

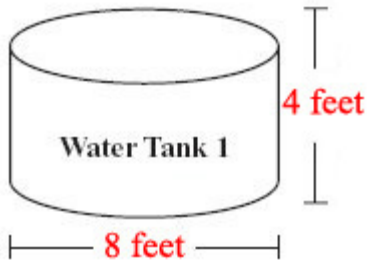
- We found that the area of the base of Water Tank 1 is 50.24 and that of Water Tank 2 is 78.5.
- The extra area that the base of Water Tank 2 covers than the base of Water Tank 1 is simply the difference between the two areas.
- The difference between two areas is 78.5 - 50.24 = 28.26.

Round this value to the tenths gives us 28.3.

Therefore, the base of Water Tank 2 convers 28.3 square feet more than the base of Water Tank 1. Type in 28.3.

D) If the height of water tank 1 is 4 feet, what is its volume?

(round to the nearest tenths place)



Algebra:

✓ 201.0

Hints:

- Water Tank 1 is in a shape of cylinder. In order to find its volume, we need to find the

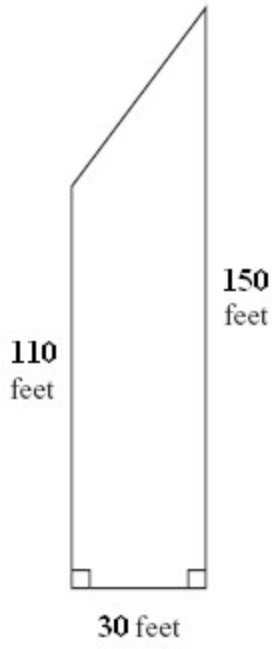
volume of a cylinder with base diameter 8 and height 4.

- The formula for calculating the volume of a cylinder is given by Base Area * Height.
- We already found that the base area of Water Tank 1 is 50.24. And the problem tells us the height is 4.
- So by substituting the values into the formula we get 50.24 * 4 = 200.96. Round this value to the nearest tenths gives us 201.0.
- Therefore, the volume of Water Tank 1 is 201.0. Type in 201.0.

---

3) Assistment #27961 "27961 - Morph 2007 grade 7 #37"

A new house was built on a lot in the shape of a trapezoid, as shown below.



What is the area of the trapezoid?

Algebra:

✓ 3900

Scaffold:

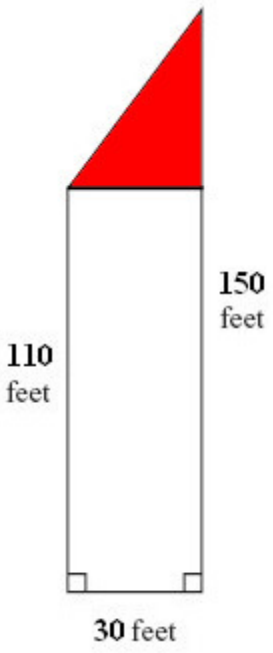
We can break this complex problem into two smaller problems by separating the trapezoid into 2 separate shapes. One on the top, one on the bottom. So what are the 2 primitive shapes?

Multiple choice:

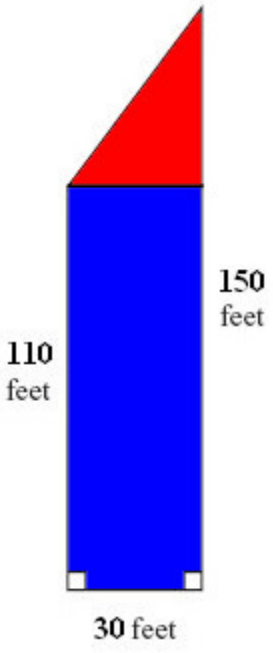
✓ A. Triangle on top, rectangle on the bottom. ✗B. Trapezoid on top, sqaure on the bottom. ✗C. Square on top, rectangle on the bottom. ✗D. Rectangle on top, triangle on the bottom.

Hints:

- There is a triangle on the top part of the trapezoid.



- If we extract the triangle we found, there is a rectangle left on the bottom.



- Therefore, the 2 primitive shapes are the triangle on the top and the rectangle on the bottom. Choose A.

Scaffold:

Now since we know the trapezoid is in fact composed of two primitive shapes, we can then find out the area of the trapezoid by calculating the sum of the areas of the two primitive shapes.

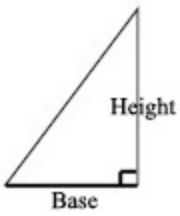
So first, let's find out the area of the top triangle. In order to do that, we need to know the formula used for calculating the area of a triangle. What is the formula used for calculating the top triangle?

Multiple choice:

✘A. Base * Height ✘B. Base * Height * 2 ✓ C. Base * Height / 2 ✘D. Base * Base

Hints:

- The triangle we found here is evidently a right triangle. It has a base and a height.



- The formula for calculating the area of a right triangle is "Base * Height / 2".

Therefore, C is the correct answer. Choose C.

Scaffold:

Now we know the formula for calculating the area of the top triangle. We just need to

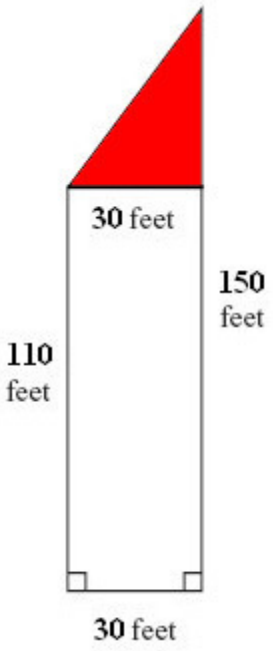
the top triangle?

Multiple choice:

✓ A. Base is 30 feet, height is 40 feet. ✗B. Base is 40 feet, height is 30 feet. ✗C. Base is 110 feet, height is 30 feet. ✗D. Base is 150 feet, height is 110 feet.

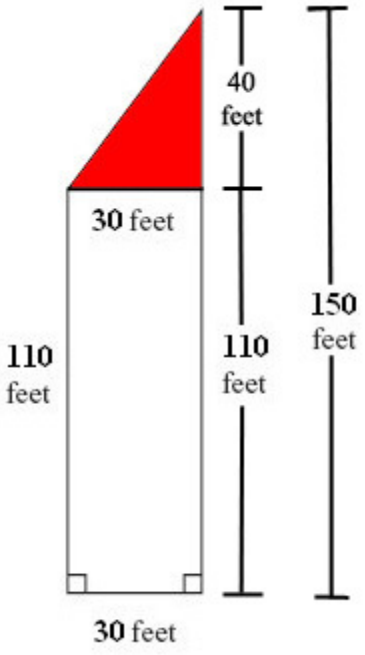
Hints:

- As we can see from this image, the base of the top triangle is also the top edge of the bottom rectangle. And since it is a rectangle, the top and bottom edge should be equal in length. Therefore, the base of the triangle is 30 feet.



- Now apply the same idea to the height. We can see that the right edge of the bottom rectangle has the same length as the left edge which is 110 feet. And the problem tells us that the length of the right edge of the whole trapizoid is 150 feet. And the difference between these two lengths is exactly the height of the triangle. Therefore, the height of

the top triangle is 150 feet - 110 feet = 40 feet.



- Therefore, the base of the top triangle is 30 feet and the height is 40 feet. Choose A.

Scaffold:

Now we have all the information we need to calculate the area of the top triangle. What is the area of the top triangle?

Algebra:

✓ 600

Hints:

- Since we know the base of the triangle is 30 feet and the height is 40 feet. We substitute these values into the formula Base * Height / 2.
- After subsitition we have 30 feet * 40 feet / 2 = 1200 / 2 = 600 Square feet. Therefore, the correct answer is 600

Scaffold:

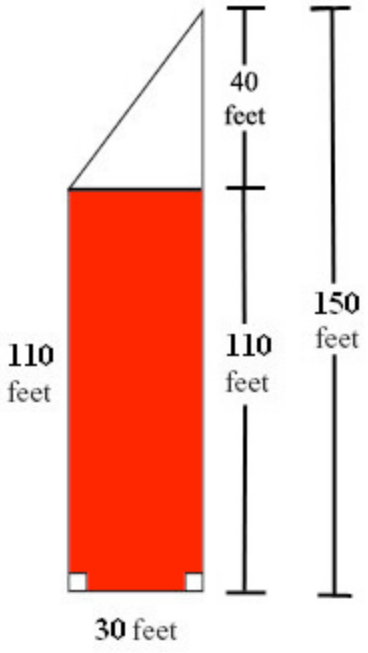
In order to calculate the area of the bottom rectangle. Let's find out what the values of its base and height. What are the values of the base and height of the bottom rectangle?

Multiple choice:

✘A. Base is 30 feet, height is 150 feet. ✘B. Base is 110 feet, height is 150 feet. ✘ C. Base is 110 feet, height is 110 feet. ✓ D. Base is 30 feet, height is 110 feet.

Hints:

- As the image shows, the base of bottom rectangle is 30 feet and the height is 110 feet.



- Therefore, the base is 30 feet and the height is 110 feet. Choose D.

Scaffold:

Now let's use the formula and the base and height values we found to calculate the area of the bottom rectangle. What is the area of the bottom rectangle?

Algebra:

✓ 3300

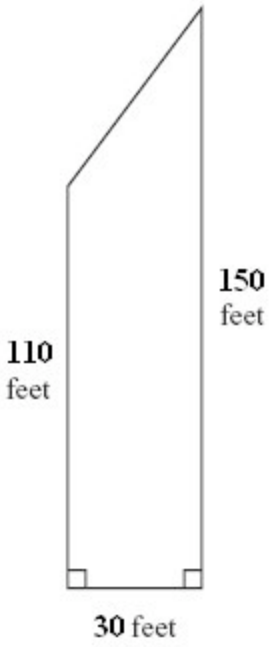
Hints:

- In order to find the area of the bottom rectangle, we simply substitute the base and height values into the formula.
- We have 30 feet * 110 feet = 3300 square feet. Therefore, the area of the bottom rectangle is 3300.

Scaffold:

Now try the original question again.

A new house was built on a lot in the shape of a trapezoid, as shown below.



What is the area of the trapezoid?

Algebra:

✓ 3900

Hints:

- As stated before, the total area of the trapezoid is simply the sum of the area of the top triangle and the area of the bottom rectangle.

- Since we know the area of the top triangle is 600 square feet and the area of the bottom rectangle is 3300 square feet. We can find the area of the trapezoid by using this information.

- The sum of the areas of the triangle and rectangle is 600 square feet + 3300 square feet = 3900 square feet. Therefore, the answer is 3900.

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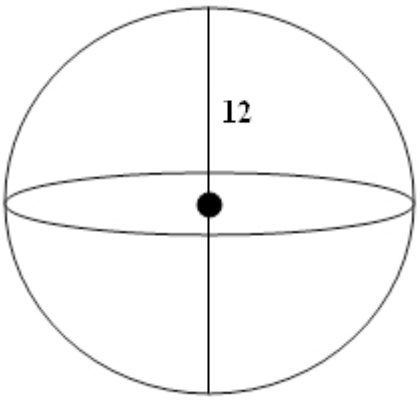
4) Assistment #27962 "27962 - 8th Grade - Geometry Review - picture of a spere with diameter 12 Find the volume of this sphere."

The sphere below has a diameter of 12.



What is the volume of this sphere? (round to the nearest tenths)

Algebra:

✓ 904.3

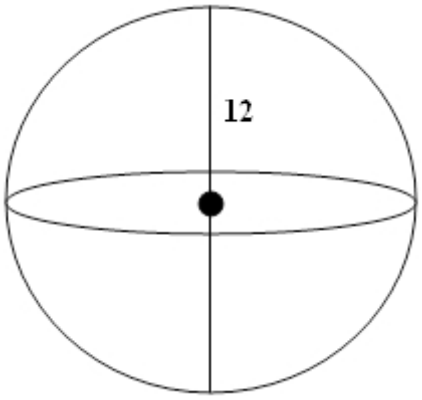
Scaffold:

Let us first find out the formula for calculating the volume of a sphere. What is the formula for calculating the volume of a sphere?

Multiple choice:

✓ A. 4/3 * π * r^3 ✗B. 3/4 * π * r^3 ✗C. π * r^2 ✗D. π * r^3

Hints:

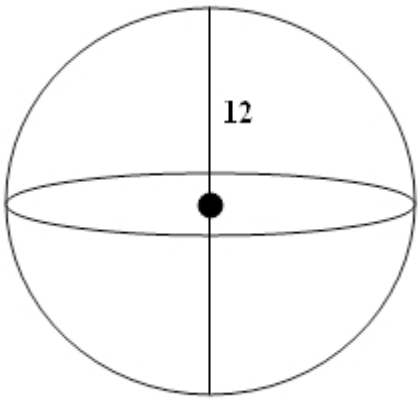


A sphere is a three dimensional shape. Therefore, the part of the volume formula is its radius raised to its third power.

- Along with its radius raised to its third power, the other part of the formula is related to π.
- The formula for calculating the volume of a sphere is $4/3 * \pi * r^3$. Choose A.

Scaffold:

Now we know the formula for calculating the volume of the sphere, we simply need to substitute the radius value into the formula. However, we are given the diameter of the sphere. What is the radius of the sphere?



Algebra:

✓ 6

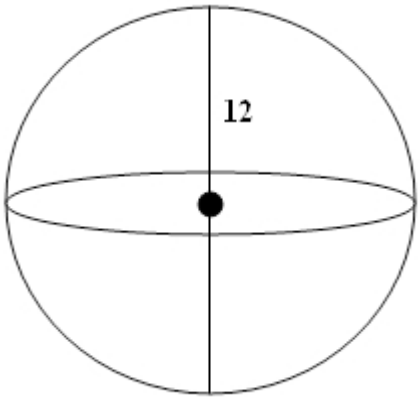
Hints:

- The radius of a sphere is half of the diameter of that sphere. r = 1/2 * dimeter.
- Therefore, the radius of the sphere is r = 1/2 * 12 = 6. Type in 6.

Scaffold:

Now let us solve the original problem.

The sphere below has a diameter of 12.



What is the volume of this sphere? (round to the nearest tenths)

Algebra:

✓ 904.3

Hints:

- The radius of the sphere is 6. The formula for calculating the volume of the sphere is

$4/3 * \pi * r^3$.

- By substituting the radius value we have

$4/3 * \pi * 6^3$

$1.33 * 3.14 * 216$

904.32.

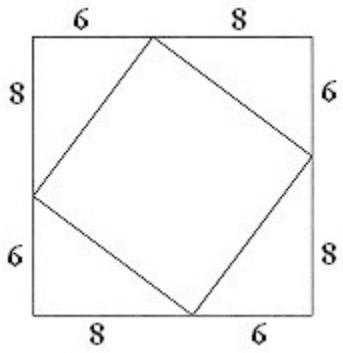
- Round the value 904.32 to the nearest tenths we have 904.3. Therefore, volume is

904.3 type in 904.3

---

5) Assistment #27963 "27963 - 8th Grade - Geometry Review - Morph 2003 grade 8 #38"

The figure below shows a square inscribed in a larger square.



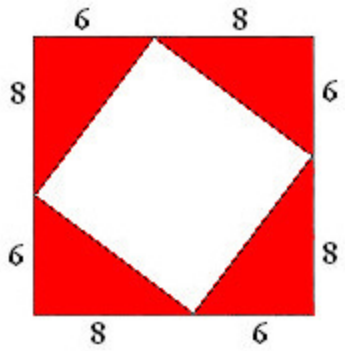
What is the area of the smaller square?

Fill in:

✓ 100 ✓ 100 square units. ✓ 100 sq. units ✓ 100 square units

Scaffold:

In order to find the area of the smaller square, we need to first find the area of the larger square then subtract the four triangles from it.



What is the area of the larger square?

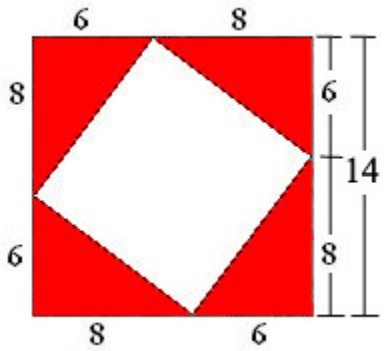
Algebra:

✓ 196

Hints:

- The formula for calculating the area of a square is Side * Side.

In our case, the side is 8 + 6 = 14.



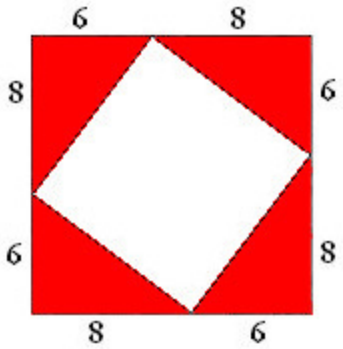
- Hence, the area of the square is 14 * 14 = ?
- 14 * 14 = 196.

Therefore, the area of the larger square is 196.

Type in 196.

Scaffold:

Now let's find the total area of the four triangles.



What is the total area of these four triangles?

Algebra:

✓ 96

Hints:

- As we can see, all four triangles are right triangles.

Area = Base * Height / 2.

- We also notice that all four triangles have the same area. In order to find the total area of all four triangles, we have:

Total area = $area_1 + area_2 + area_3 + area_4$

= (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2)

= (Base * Height / 2) * 4

Total area = Base * Height / 2 * 4

- Now we substitute the values into the simplified formula:

Total area = Base * Height / 2 * 4

= 8 * 6 / 2 * 4

=24 *4

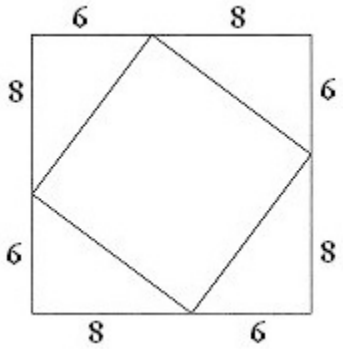
= 96

- Therefore, the total area of all four triangles is 96. Type in 96.

Scaffold:

Now we know the area of the larger square and the total area of the four triangles, let's try solve the original problem.

The figure below shows a square inscribed in a larger square.



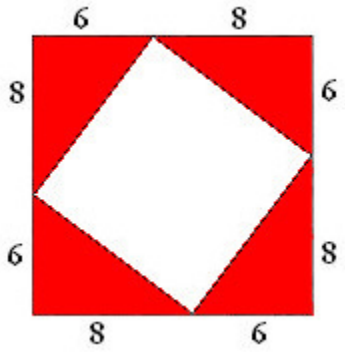
What is the area of the smaller square?

Algebra:

✓ 100 ✓ 100 square units. ✓ 100 sq. units ✓ 100 square units

Hints:

- Recall that the larger square has an area of 196 and the total area of all four triangles we identified is 96.



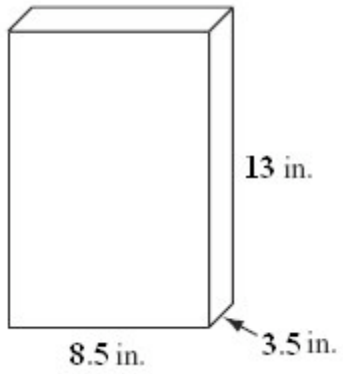
- Just like we planned before, we subtract the total area of the four triangles from the area of the larger square to find the area of the smaller square.
- Therefore, the area of the smaller sqaure is 196 - 96 = 100. Type in 100.

test	false	false	false	false	false
false	false				

Problem Set "8th Grade Geometry Review Test v1.0 With Tutoring (12 Items)" id:[5546]

1) Assistment #27959 "27959 - 8th Grade - Geometry Review - Morph 2007 grade 8 #22"

A) Mora bought a box of cereal that was a rectangular prism with a length of 8.5 inches, a width of 3.5 inches, and a height of 13 inches, as shown below.



What is the total number of vertices of Mora's cereal box?

Fill in:

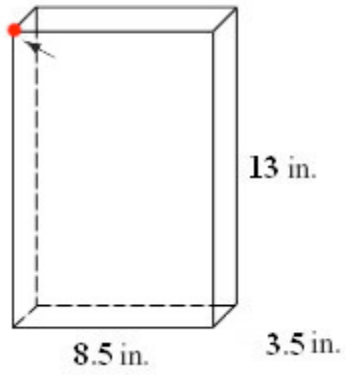
✓ 8

Hints:

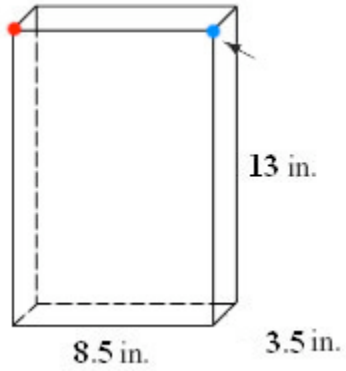
- First we should know what vertices are. The word "vertices" is the plural of "vertex". A vertex is an intersection point between faces.

- Now we know what vertices are, let's start counting.

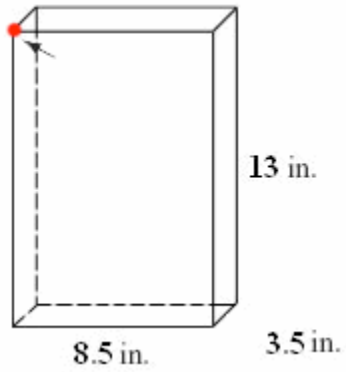
Let's start with the **1st** one on the top left corner on the front face.



- The **2nd** one on the top right corner on the front face.

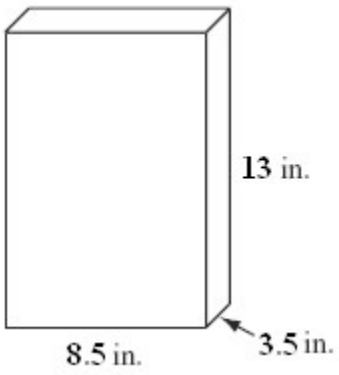


- As we can see from the image below, there are 8 vertices in total.



Therefore, the total number of vertices of Mora's cereal box is 8. Type in 8.

B) What is the total number of faces of Mora's cereal box?



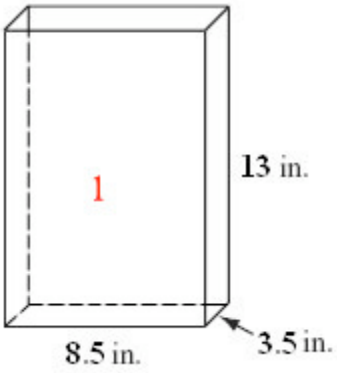
Fill in:

✓ 6

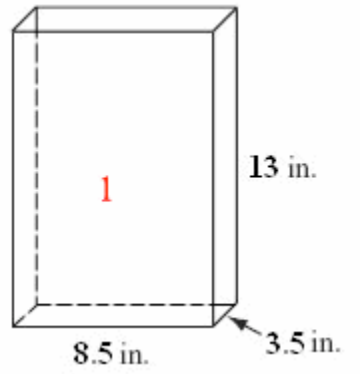
Hints:

- In order to count the number of faces, we first need to understand what is a face of a geometry. "Face" is the bounding surface of a geometric shape, such as the face of a table.
- Let us count the faces of the box starting from the front face.

1st face on front side of the box.

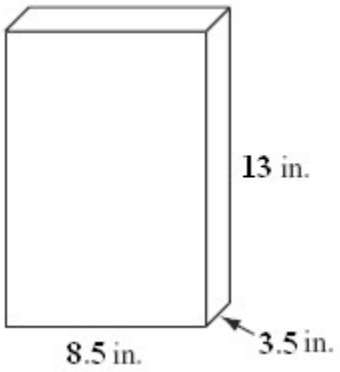


- Let us keep counting the number of faces.



- There are 6 faces. The front and back, the left and right sides and the top and bottom. Type in 6

C) Draw a net (flat pattern) that can be folded to form a box with the same dimensions as Mora's cereal box. Be sure to label your drawing of the net with the lengths, in inches, of the line segments.



Multiple choice:

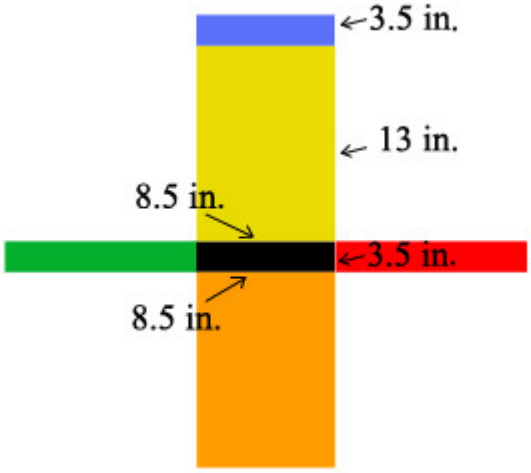
✓ I have finished the problem on the work sheet.

Hints:

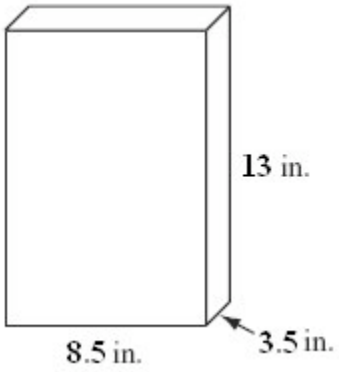
- The next hint is a correct answer. If you click "show next hint" again, your teacher will be

informed and you will NOT receive any credit.

- Here is an image showing one possible way to unfold the box.



D) Find the surface area of the rectangular prism.

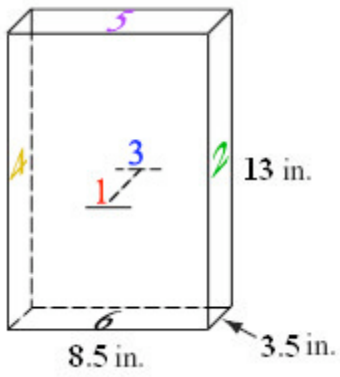


Algebra:

✓ 371.5

Hints:

- The total surface area of a rectangular prism is the sum of the areas of all 6 faces.



- We also notice that the 6 faces are in fact 3 sets of 2 equal sized faces.

The front and the back faces, the left and the right faces and the top and the bottom faces.

- So in order to find the surface area of the rectangular prism, we can follow the formula:

Surface area = Area of front face + Area of back face + Area of left face + Area of right face + Area of top face + Area of bottom face

= (Area of front face + Area of back face) + (Area of left face + Area of right face) + (Area of top face + Area of bottom face)

Surface area = (2 * Area of front face) + (2 * Area of left face) + (2 * Area of top face)

- As we can see in the diagram, each face on the rectangular prism is in fact a retangle. This means we can use the formula:

Area of face = Base * Height

- Area of front face = 8.5 * 13 = 110.5

Area of left face = 13 * 3.5 = 45.5

Area of top face = 8.5 * 3.5 = 29.75

- Then by substituting the values we found for each face into the simplified formula:

Surface area = (2 * Area of front face) + (2 * Area of left face) + (2 * Area of top face)

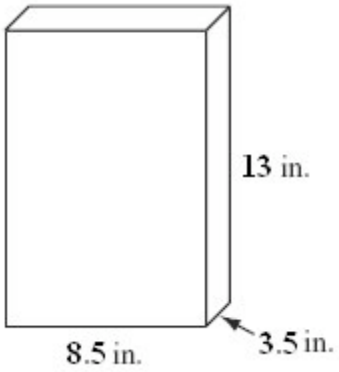
= (2* 110.5) + (2 * 45.5) + (2 * 29.75)

= 221 + 91 + 59.5

= 371.5

- Therefore, the surface area of the rectangular prism is 371.5. Type in 371.5.

E) Find the volume of the rectangular prism.

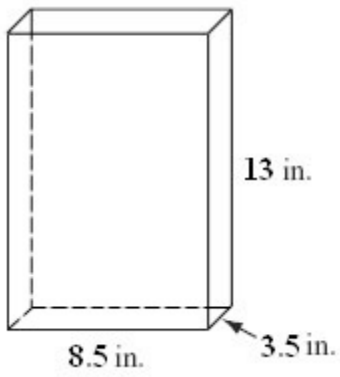


Fill in:

✓ 386.75

Hints:

- In order to find the volume of the rectangular prism, we first need to know what is the formula for calculating the volume of a rectangular prism.



- The formula for calculating the volume of a rectangular prism is:

Volume = Width * Height * Depth.

- As the diagram shows, the width of the box is 8.5 inch, the height is 13 inch and the depth is 3.5 inch.

- Now we have the formula and the values, we can simply substitute the values into the fomula then we have:

Volume = Width * Height * Depth

= 8.5 * 3.5 * 13

= 386.75.

- Therefore, the volume of the rectangular prism is 386.75. Type in 386.75.

---

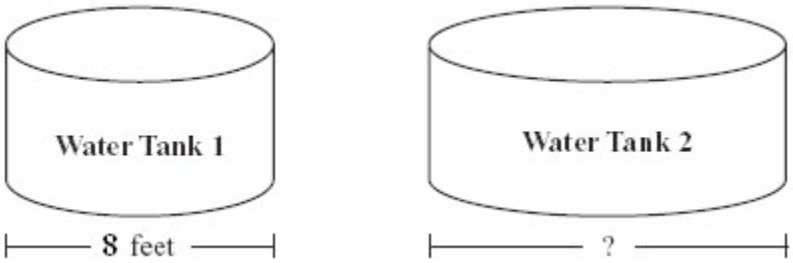
2) Assistment #27960 "27960 - Morph 2007 grade 8 #29"

A) A rancher has two water tanks.

* Each water tank is in the shape of a cylinder.

* The base of each water tank is in the shape of a circle.

Diagrams of the two water tanks are shown below.



What is the circumference, in feet, of the base of Water Tank 1?

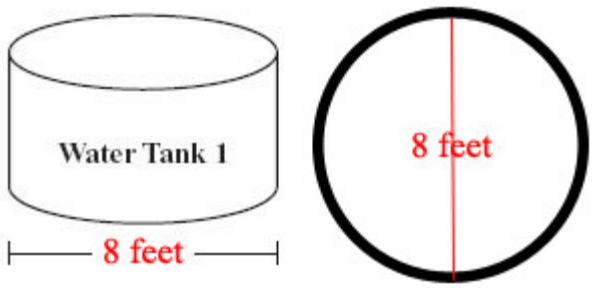
(Use 3.14 for π.)

Fill in:

✓ 25.12

Hints:

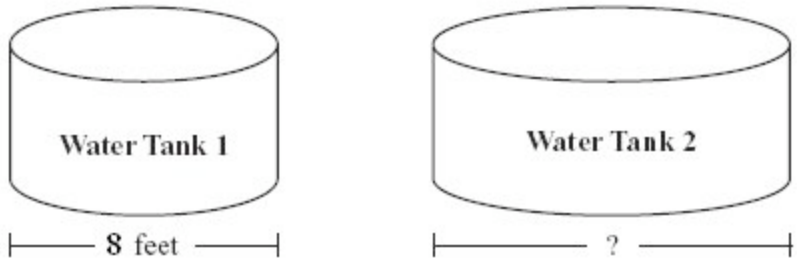
- As the problem stated, the base of each water tank is in the shape of a circle. In order to find the circumference of the base of Water Tank 1, we simply need to find the circumference of a circle with diameter 8 feet as shown in the diagram.



- The formula for calculating the circumference of a circle is C = π * D, where D is the diameter of the circle.
- Now by substituting the diameter and π value into the circumference formula we get 3.14 * 8 = 25.12.
- Therefore, the circumference of the base of Water Tank 1 is 25.12. Type in 25.12.

B) The circumference of the base of Water Tank 2 is 6.28 feet longer than that of Water Tank 1. What is the diameter, in feet, of the base of Water Tank 2?

(Use 3.14 for π.)



Fill in:

✓ 10

Hints:

- In order to find the diameter of the base of Water Tank 2, we need to know the circumference of the base of Water Tank 2.
- We found the circumference of the base of Water Tank 1 is 25.12 in the previous problem.

This problem states that the circumference of the base of Water Tank 2 is 6.28 longer than

that of Water Tank 1.

This means the circumference of the base of Water Tank 2 is 25.12 + 6.28 = 31.4.

• The relationship between the circumference of a circle and its diameter is given by the circumference formula we used in Problem 1.

C = π * D where D is the diameter of the circle. By dividing π from both sides of the formula, we have

C / π = D.

• In order to find the diameter of the base of Water Tank 2, we simply substitue its circumference value which we just found into the modified formula. This gives us

D = 31.4 / π

• Solve the equation

D = 31.4 / π for D. We have

D = 31.4 / 3.14 = 10. Therefore, the diameter of the base of Water Tank 2 is 10. Type in 10.

C) How many more square feet does the base of Water Tank 2 cover than the base of Water Tank 1?

(Use 3.14 for π. and round to the tenths place)

Fill in:

✓ 28.3

Scaffold:

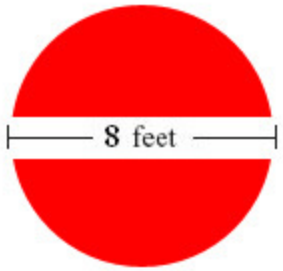
Let's first find out the area of the base of Water Tank 1. What is the area covered by the base of Water Tank1? (Use 3.14 as the value of π)

Algebra:

✓ 50.24

Hints:

- The base of each Water Tank is a circle, so we simply need to find the area of the circle with diameter 8.



- The formula for calculating the area of a circle is $\pi * r^2$, where r is the radius of the circle.
- Fortunately, we know the radius is half the diameter . So the radius of the base of

Water Tank 1 is 8 / 2 = 4.

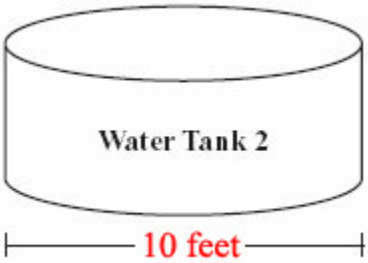
- Now we substitue the radius and π value into the area formula we just found.

We have area = $\pi * r^2 = 3.14 * 4^2 = 50.24$.

Therefore, the area of the base of Water Tank 1 is 50.24. Type in 50.24.

Scaffold:

Now we can use the same strategy to find the area of the base of Water Tank 2. What is the area of the base of Water Tank 2?



Algebra:

✓ 78.5

Hints:

- The base of each Water Tank is a circle, so we simply need to find the area of the circle with diameter 10.
- The formula for calculating the area of a circle is $\pi * r^2$, where r is the radius of the circle.

- Fortunately, we know the radius is half the diameter. So the radius of the base of Water Tank 2 is 10 / 2 = 5.
- Now we substitue the radius and π value into the area formula we just found.

We have area = $\pi * r^2 = 3.14 * 5^2 = 78.5$.

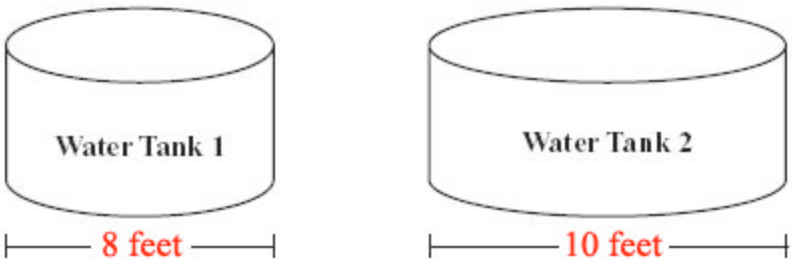
Therefore, the area of the base of Water Tank 2 is 78.5. Type in 78.5.

Scaffold:

Now let's try the original problem again.

How many more square feet does the base of Water Tank 2 cover than the base of Water Tank 1?

(Use 3.14 for π. and round to the tenths place)



Fill in:

✓ 28.3

Hints:

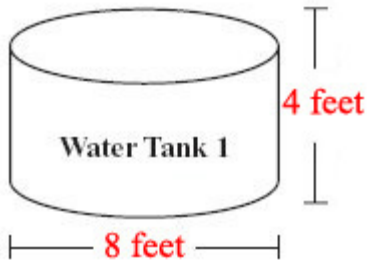
- We found that the area of the base of Water Tank 1 is 50.24 and that of Water Tank 2 is 78.5.
- The extra area that the base of Water Tank 2 covers than the base of Water Tank 1 is simply the difference between the two areas.
- The difference between two areas is 78.5 - 50.24 = 28.26.

Round this value to the tenths gives us 28.3.

Therefore, the base of Water Tank 2 convers 28.3 square feet more than the base of Water Tank 1. Type in 28.3.

D) If the height of water tank 1 is 4 feet, what is its volume?

(round to the nearest tenths place)



Algebra:

✓ 201.0

Hints:

- Water Tank 1 is in a shape of cylinder. In order to find its volume, we need to find the

volume of a cylinder with base diameter 8 and height 4.

- The formula for calculating the volume of a cylinder is given by Base Area * Height.
- We already found that the base area of Water Tank 1 is 50.24. And the problem tells us the height is 4.
- So by substituting the values into the formula we get 50.24 * 4 = 200.96. Round this value to the nearest tenths gives us 201.0.
- Therefore, the volume of Water Tank 1 is 201.0. Type in 201.0.

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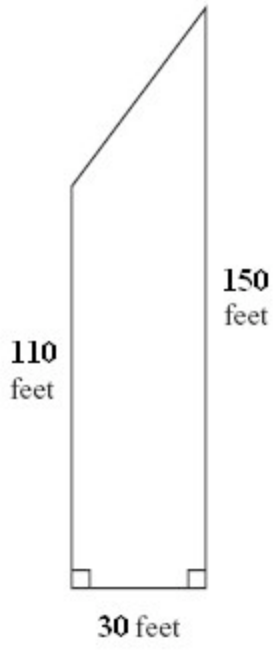
3) Assistment #27961 "27961 - Morph 2007 grade 7 #37"

A new house was built on a lot in the shape of a trapezoid, as shown below.



What is the area of the trapezoid?

Algebra:

✓ 3900

Scaffold:

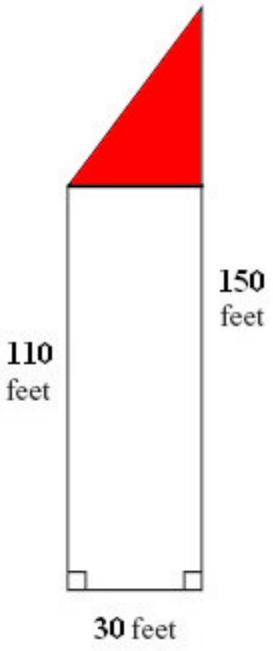
We can break this complex problem into two smaller problems by separating the trapezoid into 2 separate shapes. One on the top, one on the bottom. So what are the 2 primitive shapes?

Multiple choice:

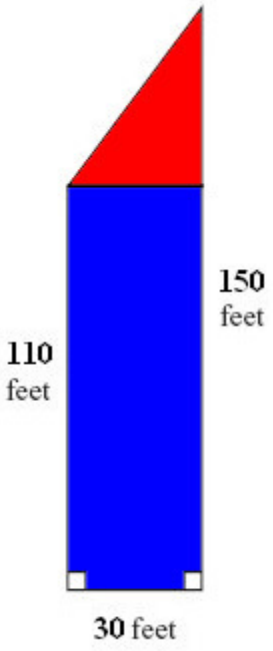
✓ A. Triangle on top, rectangle on the bottom. ✗B. Trapezoid on top, sqaure on the bottom. ✗C. Square on top, rectangle on the bottom. ✗D. Rectangle on top, triangle on the bottom.

Hints:

- There is a triangle on the top part of the trapezoid.



- If we extract the triangle we found, there is a rectangle left on the bottom.



- Therefore, the 2 primitive shapes are the triangle on the top and the rectangle on the bottom. Choose A.

Scaffold:

Now since we know the trapezoid is in fact composed of two primitive shapes, we can then find out the area of the trapezoid by calculating the sum of the areas of the two primitive shapes.

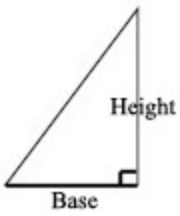
So first, let's find out the area of the top triangle. In order to do that, we need to know the formula used for calculating the area of a triangle. What is the formula used for calculating the top triangle?

Multiple choice:

✘A. Base * Height ✘B. Base * Height * 2 ✓ C. Base * Height / 2 ✘D. Base * Base

Hints:

- The triangle we found here is evidently a right triangle. It has a base and a height.



- The formula for calculating the area of a right triangle is "Base * Height / 2".

Therefore, C is the correct answer. Choose C.

Scaffold:

Now we know the formula for calculating the area of the top triangle. We just need to

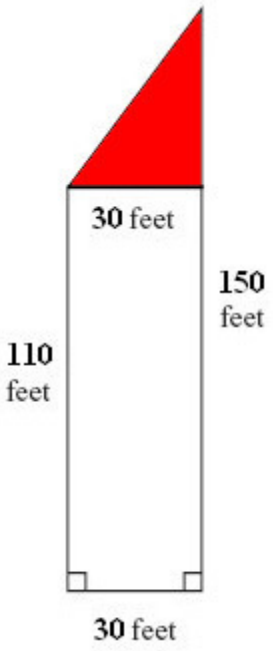
the top triangle?

Multiple choice:

✓ A. Base is 30 feet, height is 40 feet. ✗B. Base is 40 feet, height is 30 feet. ✗C. Base is 110 feet, height is 30 feet. ✗D. Base is 150 feet, height is 110 feet.

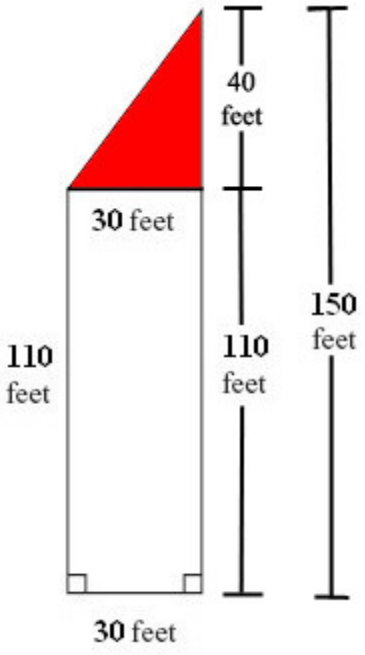
Hints:

- As we can see from this image, the base of the top triangle is also the top edge of the bottom rectangle. And since it is a rectangle, the top and bottom edge should be equal in length. Therefore, the base of the triangle is 30 feet.



- Now apply the same idea to the height. We can see that the right edge of the bottom rectangle has the same length as the left edge which is 110 feet. And the problem tells us that the length of the right edge of the whole trapizoid is 150 feet. And the difference between these two lengths is exactly the height of the triangle. Therefore, the height of

the top triangle is 150 feet - 110 feet = 40 feet.



- Therefore, the base of the top triangle is 30 feet and the height is 40 feet. Choose A.

Scaffold:

Now we have all the information we need to calculate the area of the top triangle. What is the area of the top triangle?

Algebra:

✓ 600

Hints:

- Since we know the base of the triangle is 30 feet and the height is 40 feet. We substitute these values into the formula Base * Height / 2.
- After subsitition we have 30 feet * 40 feet / 2 = 1200 / 2 = 600 Square feet. Therefore, the correct answer is 600

Scaffold:

In order to calculate the area of the bottom rectangle. Let's find out what the values of its base and height. What are the values of the base and height of the bottom rectangle?

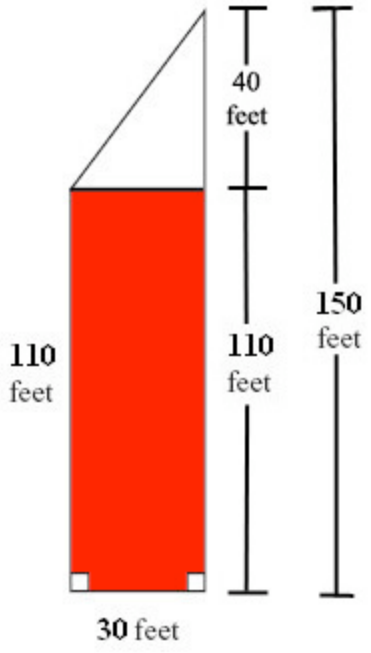
Multiple choice:

✘A. Base is 30 feet, height is 150 feet. ✘B. Base is 110 feet, height is 150 feet. ✘

C. Base is 110 feet, height is 110 feet. ✓ D. Base is 30 feet, height is 110 feet.

Hints:

- As the image shows, the base of bottom rectangle is 30 feet and the height is 110 feet.



- Therefore, the base is 30 feet and the height is 110 feet. Choose D.

Scaffold:

Now let's use the formula and the base and height values we found to calculate the area of the bottom rectangle. What is the area of the bottom rectangle?

Algebra:

✓ 3300

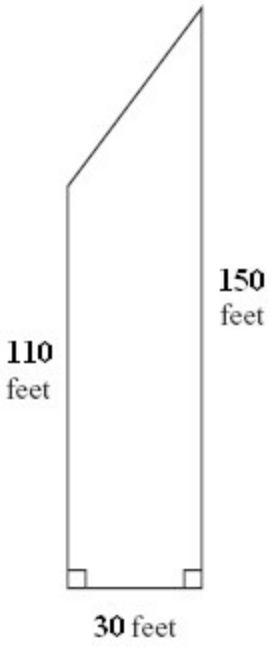
Hints:

- In order to find the area of the bottom rectangle, we simply substitute the base and height values into the formula.
- We have 30 feet * 110 feet = 3300 square feet. Therefore, the area of the bottom rectangle is 3300.

Scaffold:

Now try the original question again.

A new house was built on a lot in the shape of a trapezoid, as shown below.



What is the area of the trapezoid?

Algebra:

✓ 3900

Hints:

- As stated before, the total area of the trapezoid is simply the sum of the area of the top triangle and the area of the bottom rectangle.

- Since we know the area of the top triangle is 600 square feet and the area of the bottom rectangle is 3300 square feet. We can find the area of the trapezoid by using this information.

- The sum of the areas of the triangle and rectangle is 600 square feet + 3300 square feet = 3900 square feet. Therefore, the answer is 3900.

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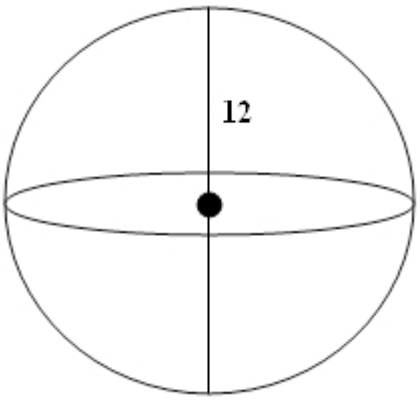
4) Assistment #27962 "27962 - 8th Grade - Geometry Review - picture of a spere with diameter 12 Find the volume of this sphere."

The sphere below has a diameter of 12.



What is the volume of this sphere? (round to the nearest tenths)

Algebra:

✓ 904.3

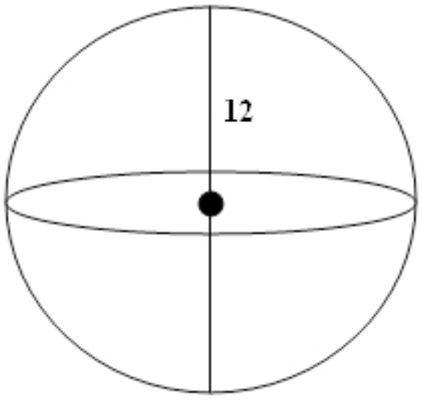
Scaffold:

Let us first find out the formula for calculating the volume of a sphere. What is the formula for calculating the volume of a sphere?

Multiple choice:

✓ A. 4/3 * π * r^3 ✗B. 3/4 * π * r^3 ✗C. π * r^2 ✗D. π * r^3

Hints:

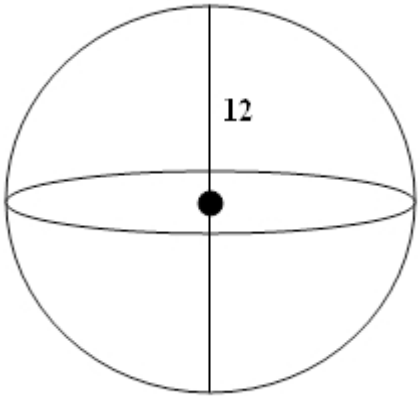


A sphere is a three dimensional shape. Therefore, the part of the volume formula is its radius raised to its third power.

- Along with its radius raised to its third power, the other part of the formula is related to π.
- The formula for calculating the volume of a sphere is $4/3 * \pi * r^3$. Choose A.

Scaffold:

Now we know the formula for calculating the volume of the sphere, we simply need to substitute the radius value into the formula. However, we are given the diameter of the sphere. What is the radius of the sphere?



Algebra:

✓ 6

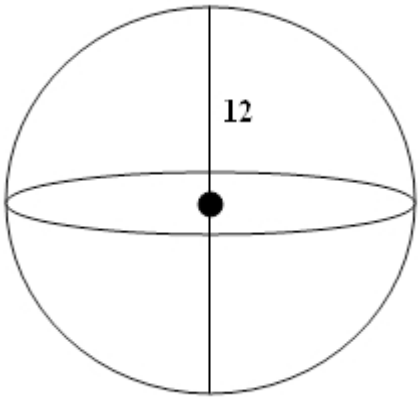
Hints:

- The radius of a sphere is half of the diameter of that sphere. r = 1/2 * dimeter.
- Therefore, the radius of the sphere is r = 1/2 * 12 = 6. Type in 6.

Scaffold:

Now let us solve the original problem.

The sphere below has a diameter of 12.



What is the volume of this sphere? (round to the nearest tenths)

Algebra:

✓ 904.3

Hints:

- The radius of the sphere is 6. The formula for calculating the volume of the sphere is

$4/3 * \pi * r^3$.

- By substituting the radius value we have

$4/3 * \pi * 6^3$

$1.33 * 3.14 * 216$

904.32.

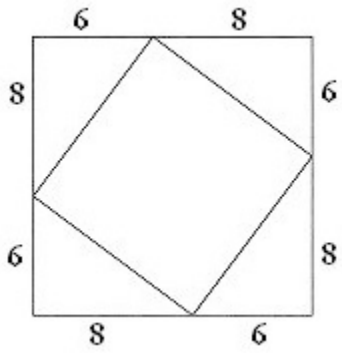
- Round the value 904.32 to the nearest tenths we have 904.3. Therefore, volume is

904.3 type in 904.3

---

5) Assistment #27963 "27963 - 8th Grade - Geometry Review - Morph 2003 grade 8 #38"

The figure below shows a square inscribed in a larger square.



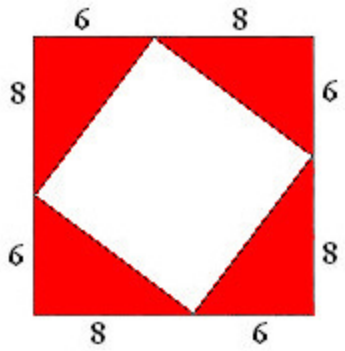
What is the area of the smaller square?

Fill in:

✓ 100 ✓ 100 square units. ✓ 100 sq. units ✓ 100 square units

Scaffold:

In order to find the area of the smaller square, we need to first find the area of the larger square then subtract the four triangles from it.



What is the area of the larger square?

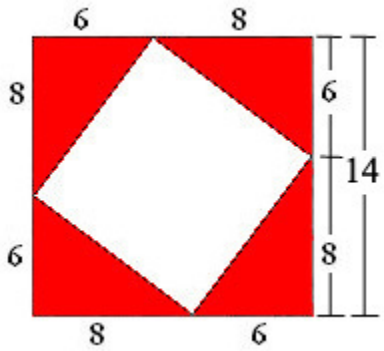
Algebra:

✓ 196

Hints:

- The formula for calculating the area of a square is Side * Side.

In our case, the side is 8 + 6 = 14.



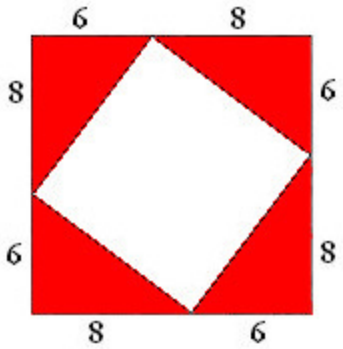
- Hence, the area of the square is 14 * 14 = ?
- 14 * 14 = 196.

Therefore, the area of the larger square is 196.

Type in 196.

Scaffold:

Now let's find the total area of the four triangles.



What is the total area of these four triangles?

Algebra:

✓ 96

Hints:

- As we can see, all four triangles are right triangles.

Area = Base * Height / 2.

- We also notice that all four triangles have the same area. In order to find the total area of all four triangles, we have:

Total area = $area_1 + area_2 + area_3 + area_4$

= (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2)

= (Base * Height / 2) * 4

Total area = Base * Height / 2 * 4

- Now we substitute the values into the simplified formula:

Total area = Base * Height / 2 * 4

= 8 * 6 / 2 * 4

=24 *4

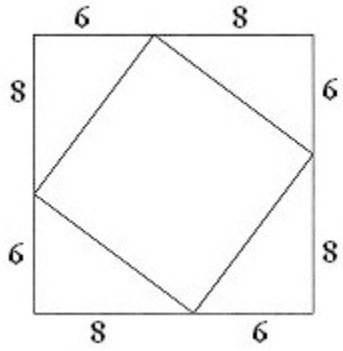
= 96

- Therefore, the total area of all four triangles is 96. Type in 96.

Scaffold:

Now we know the area of the larger square and the total area of the four triangles, let's try solve the original problem.

The figure below shows a square inscribed in a larger square.

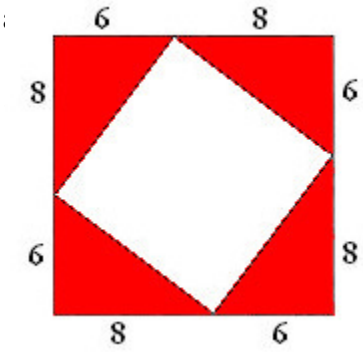


s. 100 sq. units 100 square units

re has an area of 196 and the total area of all four triangles

✓ ✓ ✓ ✓

- Just like we planned before, we subtract the total area of the four triangles from the

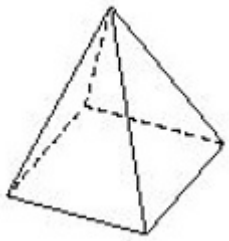


d the area of the smaller square.

naller sqaure is 196 - 96 = 100. Type in 100.

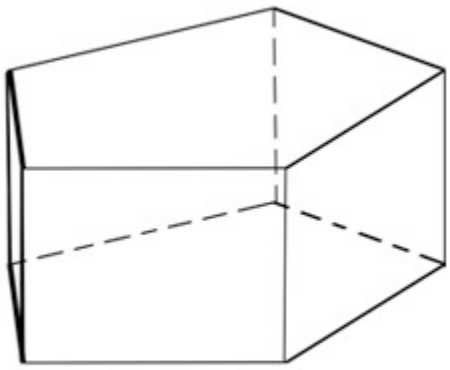
Assistment #42296 "42296 - 30509 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many vertices are there in a Pyramid



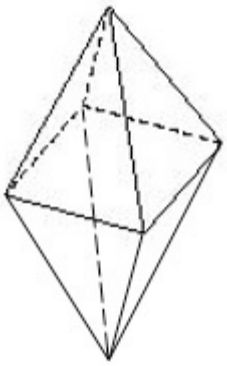
Assistment #42299 "42299 - 30509 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many vertices are there in a Pentagon



Assistment #42301 "42301 - 30509 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many vertices are there in a Diamond



Assistment #42302 "42302 - 30509 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many vertices are there in a

Triangular Prism

Assistment #42296 "42296 - 30509 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many vertices are there in a Pyramid

Fill in:

5

Hints:

- First we should know what vertices are.

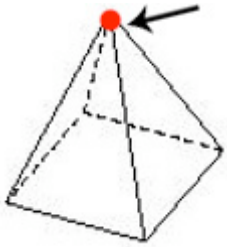
The word "vertices" is actually the plural of "vertex".

A vertex is an intersection point between faces.

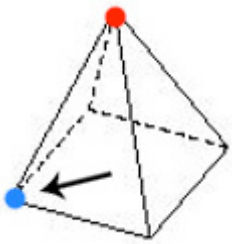
So in order to find the number of vertices on a figure, we just count each individual vertex of the figure.

- Now we know what vertices are, let's start counting.

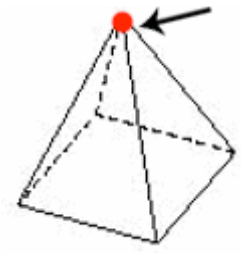
Let's start with the **1st** one pointed by the arrow.



- The **2nd** one.



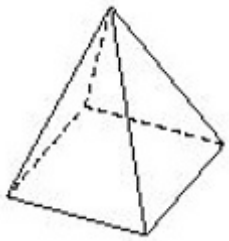
- As we can see from the image below, there are 5 vertices in total.



Therefore, the total number of vertices of the figure is 5. Type in 5.

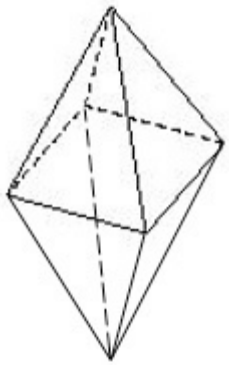
Assistment #42326 "42326 - 31692 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many faces are there in a Pyramid



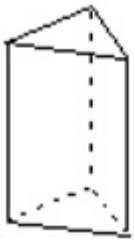
Assistment #42327 "42327 - 31692 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many faces are there in a Diamond



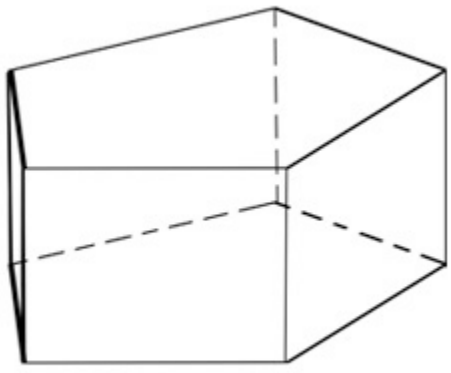
Assistment #42328 "42328 - 31692 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many faces are there in a Triangular Prism



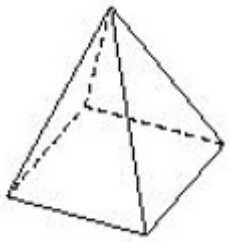
Assistment #42329 "42329 - 31692 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many faces are there in a Pentagon



Assistment #42326 "42326 - 31692 - 8th Grade - Geometry Review - Properties of Geometric Figures "

How many faces are there in a Pyramid



Algebra:

✓ 5

Hints:

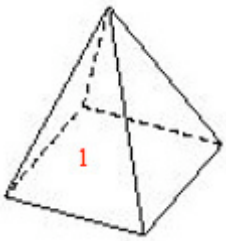
- First we should know what faces are.

A face is a boundary surface of a geometric figure.

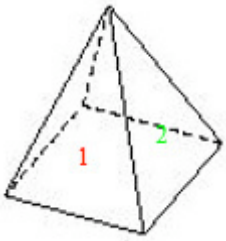
So in order to find the number of faces on a figure, we just count each individual boundary face of the figure.

- Now we know what faces are, let's start counting.

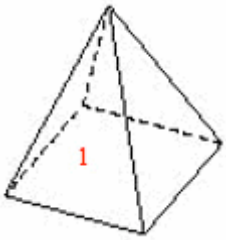
Let's start with the **1st** one.



- The **2nd** one.



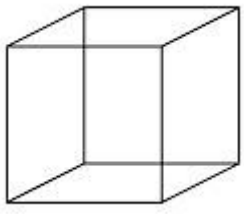
- As we can see from the image below, there are 5 faces in total.



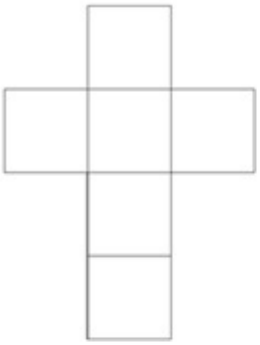
Therefore, the total number of faces of the figure is 5. Type in 5.

Assistment #42356 "42356 - 30857 - 30509 - 8th Grade - Geometry Review - Nets of 3D figures"

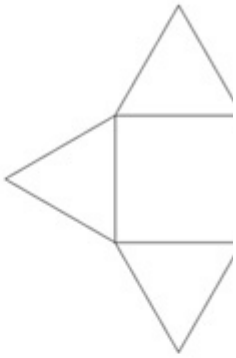
Which one of the flat nets represent the given Cube figure?



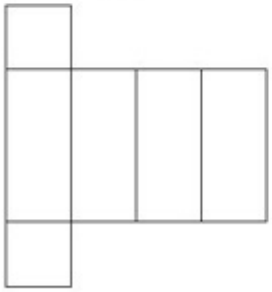
A.



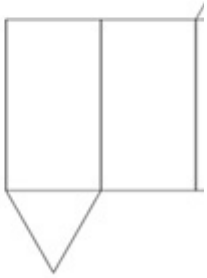
B.



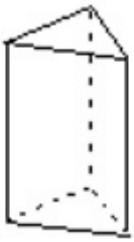
C.



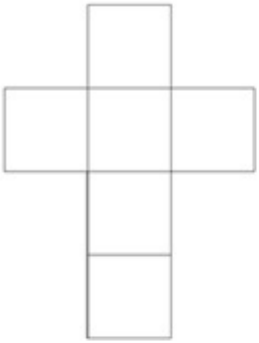
D.



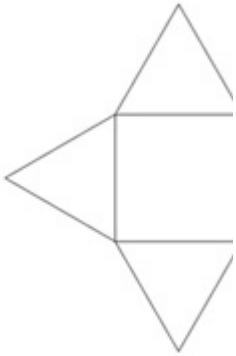
Which one of the flat nets represent the given Triangular Prism figure?



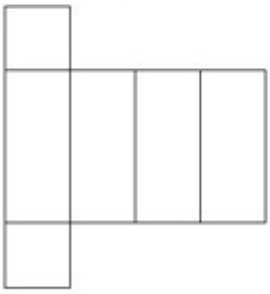
A.



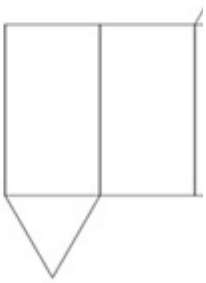
B.



C.



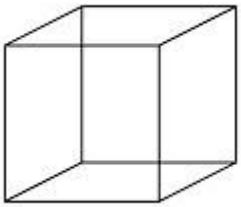
D.



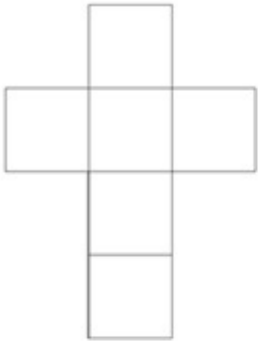
Assistment #42357 "42357 - 30857 - 30509 - 8th Grade - Geometry Review - Nets of 3D figures"

Assistment #42356 "42356 - 30857 - 30509 - 8th Grade - Geometry Review - Nets of 3D figures"

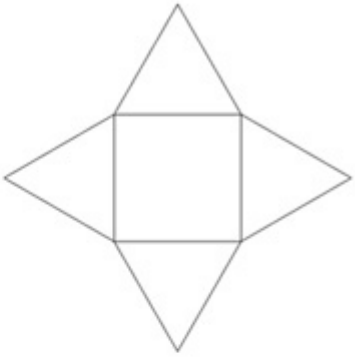
Which one of the flat nets represent the given Cube figure?



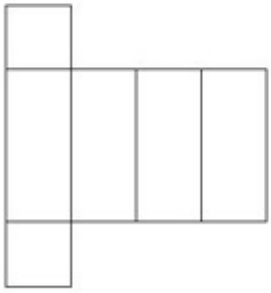
A.



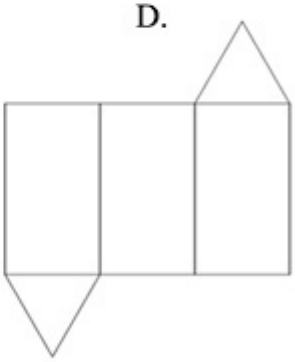
B.



C.



D.

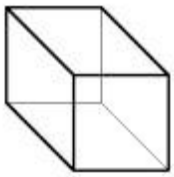


Algebra:

✓ a

Assistment #42386 "42386 - 31684 - 8th Grade - Geometry Review - Area of Polygons."

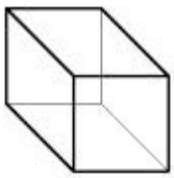
The rectangular prism below has a width of 2, a length of 5, and a depth of 4.



What is the surface area of this rectangular prism?

Assistment #42388 "42388 - 31684 - 8th Grade - Geometry Review - Area of Polygons."

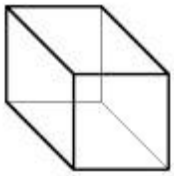
The rectangular prism below has a width of 1, a length of 4, and a depth of 3.



What is the surface area of this rectangular prism?

Assistment #42389 "42389 - 31684 - 8th Grade - Geometry Review - Area of Polygons."

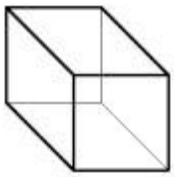
The rectangular prism below has a width of 3, a length of 3, and a depth of 5.



What is the surface area of this rectangular prism?

Assistment #42390 "42390 - 31684 - 8th Grade - Geometry Review - Area of Polygons."

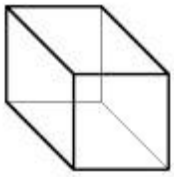
The rectangular prism below has a width of 5, a length of 6, and a depth of 6.



What is the surface area of this rectangular prism?

Assistment #42386 "42386 - 31684 - 8th Grade - Geometry Review - Area of Polygons."

The rectangular prism below has a width of 2, a length of 5, and a depth of 4.



What is the surface area of this rectangular prism?

Algebra:

✓ 76

Hints:

- The total surface area of a rectangular prism is the sum of the areas of all 6 faces.

-

We also notice that the 6 faces are in fact 3 sets of 2 equal sized faces.

The front and the back faces, the left and the right faces and the top and the bottom faces.

- So in order to find the surface area of the rectangular prism, we can follow the formula:

Surface area = Area of front face + Area of back face + Area of left face + Area of right

face + Area of top face + Area of bottom face

= (Area of front face + Area of back face) + (Area of left face + Area of right face) + (Area of top face + Area of bottom face)

Surface area = (2 * Area of front face) + (2 * Area of left face) + (2 * Area of top face)

•

As we can see in the diagram, each face on the rectangular prism is in fact a retangle. This means we can use the formula:

Area of face = Base * Height

• Area of front face = 2 * 5 = 10

Area of left face = 5 * 4 = 20

Area of top face = 2 * 4 = 8

• Then by substituting the values we found for each face into the simplified formula:

Surface area = (2 * Area of front face) + (2 * Area of left face) + (2 * Area of top face)

= (2* 10) + (2 * 20) + (2 * 8)

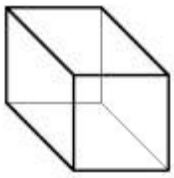
= 20 + 40 + 16

= 76

• Therefore, the surface area of the rectangular prism is 76. Type in 76.

Assistment #42484 "42484 - 31688 - 8th Grade - Geometry Review - Volume."

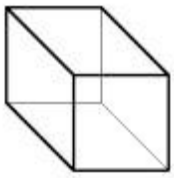
The rectangular prism below has a width of 4, a length of 5, and a depth of 3.



What is the volume of this rectangular prism?

Assistment #42485 "42485 - 31688 - 8th Grade - Geometry Review - Volume."

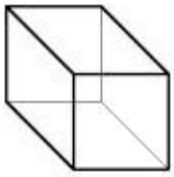
The rectangular prism below has a width of 5, a length of 5, and a depth of 2.



What is the volume of this rectangular prism?

Assistment #42490 "42490 - 31688 - 8th Grade - Geometry Review - Volume."

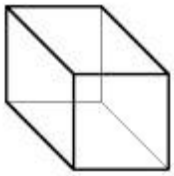
The rectangular prism below has a width of 2, a length of 1, and a depth of 6.



What is the volume of this rectangular prism?

Assistment #42491 "42491 - 31688 - 8th Grade - Geometry Review - Volume."

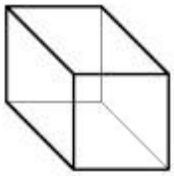
The rectangular prism below has a width of 2, a length of 4, and a depth of 3.



What is the volume of this rectangular prism?

Assistment #42492 "42492 - 31688 - 8th Grade - Geometry Review - Volume."

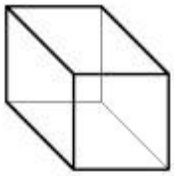
The rectangular prism below has a width of 4, a length of 3, and a depth of 7.



What is the volume of this rectangular prism?

Assistment #42484 "42484 - 31688 - 8th Grade - Geometry Review - Volume."

The rectangular prism below has a width of 4, a length of 5, and a depth of 3.



What is the volume of this rectangular prism?

Algebra:

✓ 60

Hints:

-

The formula for calculating the volume of a rectangular prism is:

Volume = Width * Length * Depth.

-

As the problem describes, the width of the box is 4, the length is 5 and the depth is 3.

-

Now we have the formula and the values, we can simply substitute the values into the fomula then we have:

Volume = Width * Length * Depth

= 4 * 5 * 3

= 60

Therefore, the volume of the rectangular prism is 60. Type in 60.

Assistment #42514 "42514 - Circumference Of Circle : using radius with real context"

John wants to construct a fence around his farm.

The farm is circular in shape with a radius of 10 ft.

What is the **length of fencing material** he will need to fence one complete circle around his farm?

(Use 3.14 for the value of Π (pi))

Assistment #42517 "42517 - Circumference Of Circle : using radius with real context"

Shawn wants to construct a fence around his playground.

The playground is circular in shape with a radius of 13 ft.

What is the **length of fencing material** he will need to fence one complete circle around his playground?

(Use 3.14 for the value of Π (pi))

Assistment #42520 "42520 - Circumference Of Circle : using radius with real context"

John wants to construct a fence around his farm.

The farm is circular in shape with a radius of 2 ft.

What is the **length of fencing material** he will need to fence one complete circle around his farm?

(Use 3.14 for the value of Π (pi))

Assistment #42520 "42520 - Circumference Of Circle : using radius with real context"

John wants to construct a fence around his farm.

The farm is circular in shape with a radius of 2 ft.

What is the **length of fencing material** he will need to fence one complete circle around his farm?

(Use 3.14 for the value of Π (pi))

Assistment #42514 "42514 - Circumference Of Circle : using radius with real context"

John wants to construct a fence around his farm.

The farm is circular in shape with a radius of 10 ft.

What is the **length of fencing material** he will need to fence one complete circle around his farm?

(Use 3.14 for the value of Π (pi))

Algebra:

✓ 62.8 ✓ 2

Hints:

- John's farm is circular in shape.
- The length of fencing material required **for one complete circle** is given by the **circumference** of his farm.

The **circumference** of a circle is the distance around the edge of the circle.

- Remember the formula that gives the **circumference** of a circle when its radius is given,

circumference = 2 * Π * radius

Use the formula above to find the **length of the fencing material**.

(Round your answer to the 100th decimal place.)

- **Circumference** = 2 * Π * radius

  = 2 * 3.14 * 10 ft

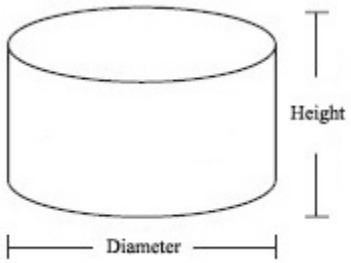
  = **62.8** ft

Thus **62.8 ft** is the required **length of the fencing material**.

Type in **62.8**

Assistment #42644 "42644 - 31689 - 8th Grade Geometry Review - Circumference"

If the circumference of the base of the cylinder is 12

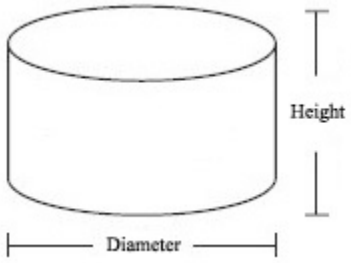


What is the diameter of the base of the cylinder?

(Round to the nearest integer)

Assistment #42647 "42647 - 31689 - 8th Grade Geometry Review - Circumference"

If the circumference of the base of the cylinder is 1

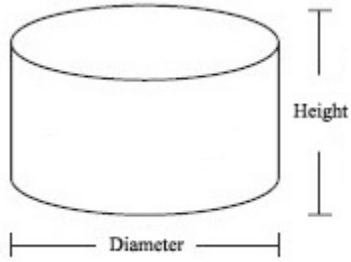


What is the diameter of the base of the cylinder?

(Round to the nearest integer)

Assistment #42650 "42650 - 31689 - 8th Grade Geometry Review - Circumference"

If the circumference of the base of the cylinder is 4

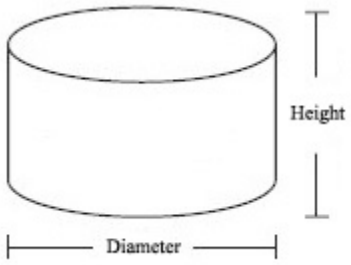


What is the diameter of the base of the cylinder?

(Round to the nearest integer)

Assistment #42660 "42660 - 31689 - 8th Grade Geometry Review - Circumference"

If the circumference of the base of the cylinder is 17

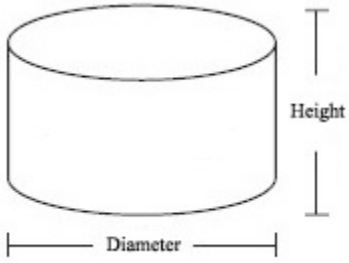


What is the diameter of the base of the cylinder?

(Round to the nearest integer)

Assistment #42644 "42644 - 31689 - 8th Grade Geometry Review - Circumference"

If the circumference of the base of the cylinder is 12



What is the diameter of the base of the cylinder?

(Round to the nearest integer)

Algebra:

✓ 4

Hints:

- First, we realize that the base of a cylinder is a circle.

Then we need to find the relationship between the circumference of a circle and its diameter.

•

The relationship between the circumference of a circle and its diameter is given by the circumference formula:

$C = \pi * D$

where C is the circumference of the circle and D is the diameter of the circle.

Now, by dividing π from both sides of the formula, we have

$C / \pi = D$.

Or

$D = C / \pi$

- In order to find the diameter of the base of the cylinder, we substitue the given circumference value into the modified formula.

$D = 12 / \pi$

$= 3.82165605095541$

- Round the answer to the nearest integer, we have 4.

Therefore, the diameter of the base of the cylinder is 4. Type in 4.

Assistment #42674 "42674 - Area of circle using radius with real context"

Danny wants to carpet his office.

The office is circular in shape with a radius of 11ft.

What area of carpet will he need to cover the office?

(Use 3.14 for the value of Π (pi))

Assistment #42677 "42677 - Area of circle using radius with real context"

Danny wants to carpet his office.

The office is circular in shape with a radius of 16ft.

What area of carpet will he need to cover the office?

(Use 3.14 for the value of Π (pi))

Assistment #42680 "42680 - Area of circle using radius with real context"

Danny wants to carpet his room.

The room is circular in shape with a radius of 14ft.

What area of carpet will he need to cover the room?

(Use 3.14 for the value of Π (pi))

Assistment #42691 "42691 - Area of circle using radius with real context"

Jane wants to carpet her office.

The office is circular in shape with a radius of 18ft.

What area of carpet will she need to cover

the office?

(Use 3.14 for the value of Π (pi))

Assistment #42674 "42674 - Area of circle using radius with real context"

Danny wants to carpet his office.

The office is circular in shape with a radius of 11ft.

What area of carpet will he need to cover the office?

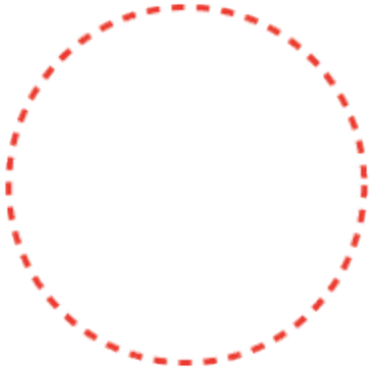
(Use 3.14 for the value of Π (pi))

Algebra:

✓ 379.94

Hints:

- Danny's office is circular in shape so the carpet needed should also be circular.
- The area of a circle is the region covered by the circle.



- We know that the radius of the office is 11ft.

- The formula for the **area** of a circle when its radius is given is,

area = Π * $(\text{radius})^2$

Therefore,

area = 3.14 * $(11\text{ft})^2$

We can use this expression to find the area of the carpet.

(Do not forget to round your answer to the 100th decimal place.)

- Area = **3.14** * 11ft * 11ft

  = 379.94ft^2

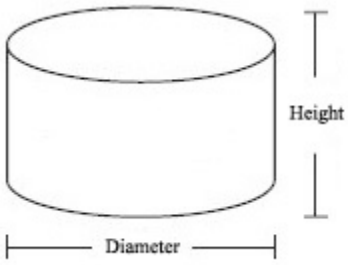
Thus the area of carpet required is **379.94ft^2**.

Type in **379.94**.

Assistment #42764 "42764 - 31687 - 8th Grade - Geometry Review - Volume."

If the diameter of the base of the cylinder is 4 and the height of the cylinder is 3, what is its volume?

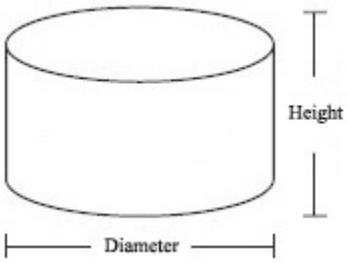
(Round to the nearest integer)



Assistment #42767 "42767 - 31687 - 8th Grade - Geometry Review - Volume."

If the diameter of the base of the cylinder is 4 and the height of the cylinder is 5, what is its volume?

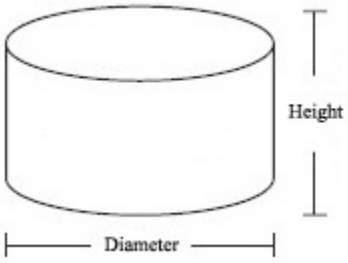
(Round to the nearest integer)



Assistment #42770 "42770 - 31687 - 8th Grade - Geometry Review - Volume."

If the diameter of the base of the cylinder is 5 and the height of the cylinder is 3, what is its volume?

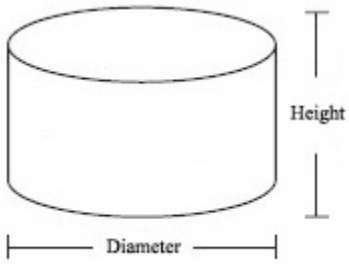
(Round to the nearest integer)



Assistment #42775 "42775 - 31687 - 8th Grade - Geometry Review - Volume."

If the diameter of the base of the cylinder is 7 and the height of the cylinder is 1, what is its volume?

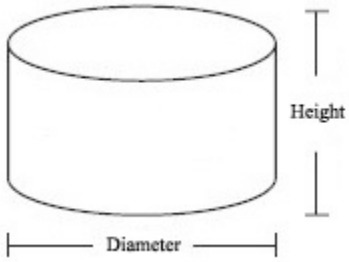
(Round to the nearest integer)



Assistment #42764 "42764 - 31687 - 8th Grade - Geometry Review - Volume."

If the diameter of the base of the cylinder is 4 and the height of the cylinder is 3, what is its volume?

(Round to the nearest integer)



Algebra:

✓ 38

Hints:

- The formula for calculating the volume of a cylinder is given by Base Area * Height.
-

The Base Area of of a cylinder is a circle. Therefore, the Base Area is just the area of a circle with a diameter of 4.

-

Base Area = π * radius^2

$= \pi * (\text{diameter}/2)^2$

$= 3.14 * (4/2)^2$

$= 3.14 * 2^2$

$= 12.56$

-

Now by substituting the Base Area value we just found and the given Height value into the formula we get

Volume = Base Area * Height

$= 12.56 * 3$

$= 37.68$

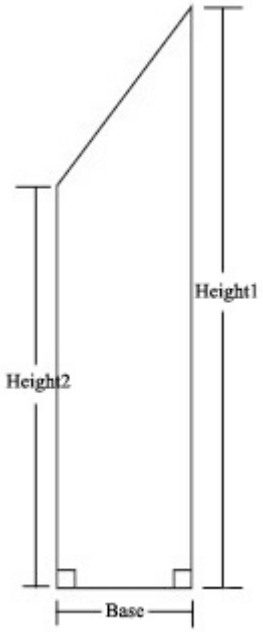
-

Round the volume value to the nearest integer gives us 38.

Therefore, the volume of the cylinder is 38. Type in 38.

Assistment #42876 "42876 - 31690 - 8th Grade Geometry Review - Area of Polygons"

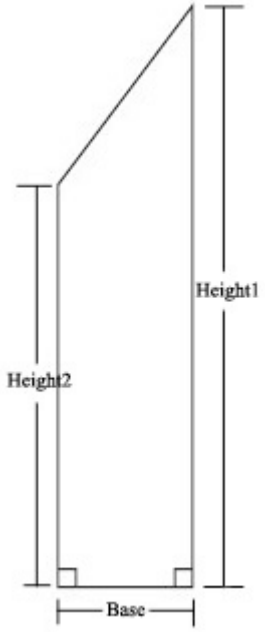
The height1 has a value of 12, height2 has a value of 1 and the base has a value of 4



What is the area of this trapezoid?

Assistment #42880 "42880 - 31690 - 8th Grade Geometry Review - Area of Polygons"

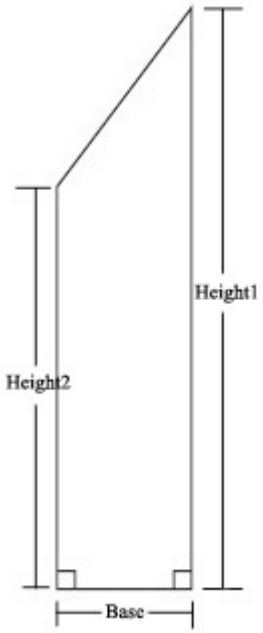
The height1 has a value of 11, height2 has a value of 5 and the base has a value of 3



What is the area of this trapezoid?

Assistment #42876 "42876 - 31690 - 8th Grade Geometry Review - Area of Polygons"

The height1 has a value of 12, height2 has a value of 1 and the base has a value of 4



What is the area of this trapezoid?

Algebra:

✓ 26

Scaffold:

We can break this complex problem into two smaller problems by separating the trapezoid into 2 separate shapes. One on the top, one on the bottom. So what are the 2 primitive shapes?

Multiple choice:

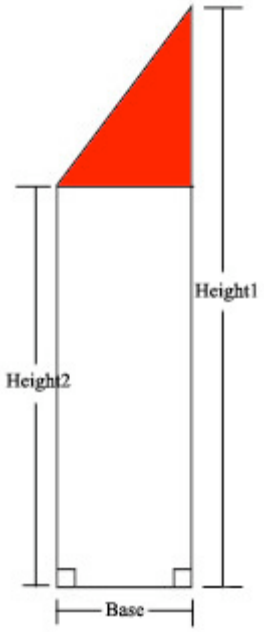
✓ Triangle on top, rectangle on the bottom. ✘ Trapezoid on top, sqaure

✘

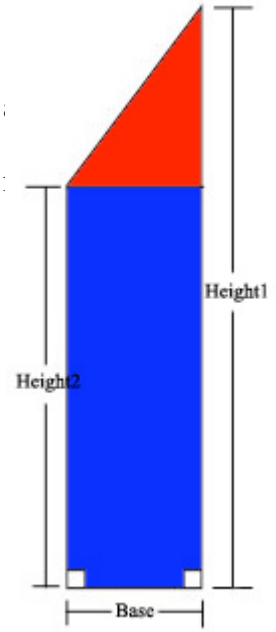
✘

Hints:

- There is a triangle on the top part of the trapezoid.



- If we extract the triangle we found, there is a rectangle left on the bottom.



imitive shapes

top and the

m.

Scaffold:

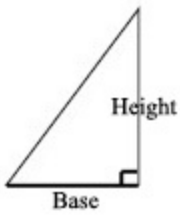
Now since we know the trapezoid is in fact composed of two primitive shapes, we can then find out the area of the trapezoid by calculating the sum of the

Multiple choice:

✘Base * Height ✘Base * Height * 2 ✓ Base * Height / 2 ✘Base * Base

Hints:

- The triangle we found here is evidently a right triangle. It has a base and a height.



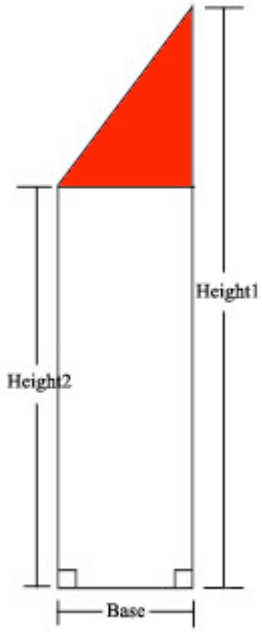
- The formula for calculating the area of a right triangle is "Base * Height / 2".

Scaffold:

Now we know the formula for

Multiple choice:

Base is 4, height is 11. Base is 40 feet, height is 30 feet. Base is feet. Base is) feet.



)m this image, the gle is also the top

✓

✘

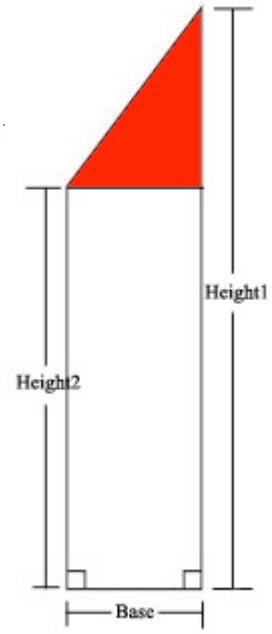
✘

✘

Multiple choice:

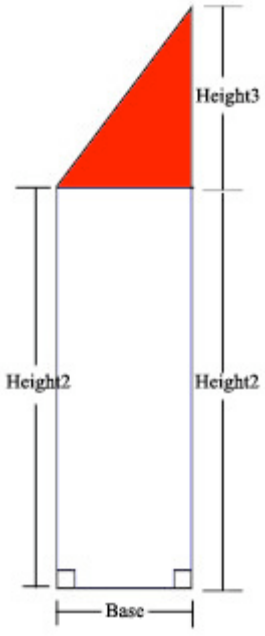
Base is 4, height is 11. Base is 40 feet, height is 30 feet. Base is 110 feet, height is 30 feet. Base is 150 feet, height is 110 feet.

Hints:



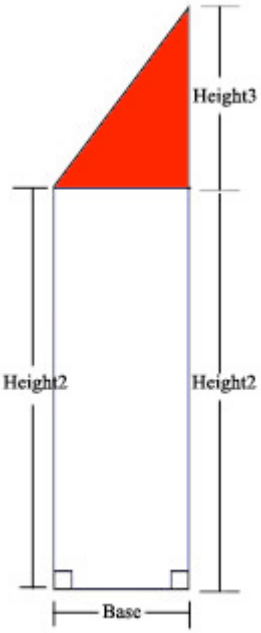
ı this image, the le is also the top

- Therefore, the base of the top triangle is 4 and the height is 11.



Scaffold:

Now we have all the information we need to calculate the area of the top triangle. What is the area of the top triangle?



Algebra:

✓ 22

Hints:

- Since we know the base of the triangle is 4 and the height is 11.

We substitute these values into the formula Base * Height / 2.

- After subsitition we have

Area = Base * Height / 2

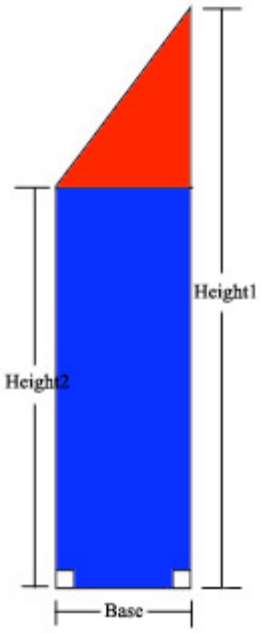
= 4 * 11 / 2

= 22

Therefore, the correct answer is 22.

Scaffold:

In order to calculate the area of the bottom rectangle, let's find out what the values of its base and height.



Multiple choice:

✘Base is 30 feet, height is 150 feet.

✘Base is 110 feet, height is 150 feet.

✘Base is 110 feet, height is 110 feet.

✓ Base is 4, height is 1.

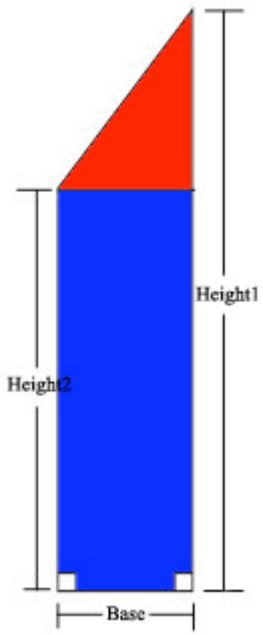
Hints:

- As the image shows, the base of bottom rectangle is base 4 and the height is height2 1.

- Therefore, the base is 4 and the height is 1.

Scaffold:

Now let's use the formula and the base and height values we found to calculate the area of the bottom rectangle.



ıe area of the

'e simply

ınd height values

Area = Base * Height

= 4 * 1.

= 4

Therefore, the area of the bottom rectangle is 4.

Algebra:

4

Hints:

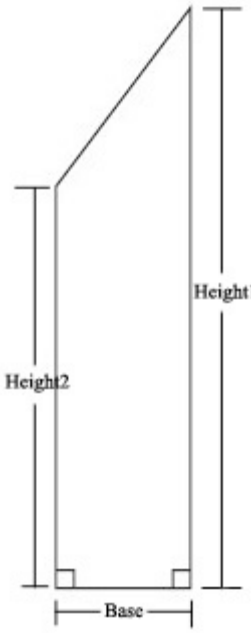
- In order to find the area of the bottom rectangle, we simply substitute the base and height values into the formula.

Scaffold:

Now try the original question again.

Algebra:

26



the total area of

ply the sum of the

gle and the area of

e.

Algebra:

26

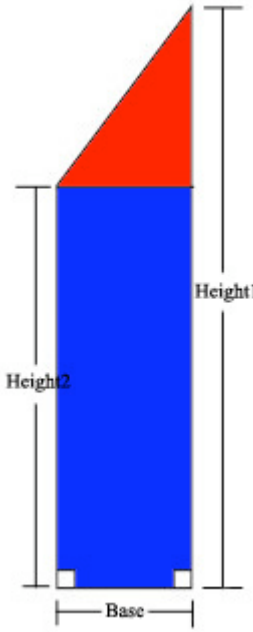
Hints:

- As stated before, the total area of the trapezoid is simply the sum of the area of the top triangle and the area of the bottom rectangle.

Since we know the area of the top triangle is 22 and the area of the bottom rectangle is 4.

A

H



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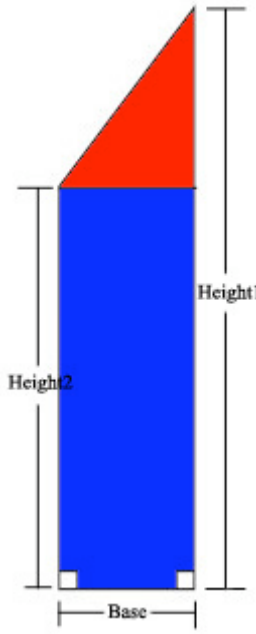


The sum of the areas of the triangle

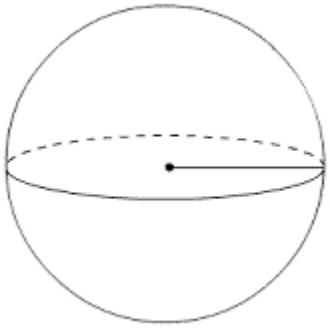
and rectangle is

$22 + 4 = 26$

Therefore, the answer is 26.

Assistment #43092 "43092 - 31680 - 8th Grade - Geometry Review - Volume."

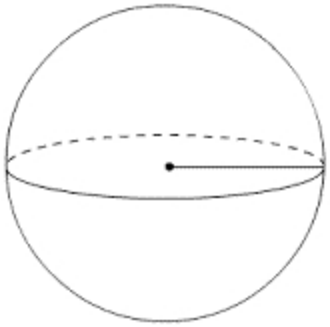
The sphere below has a diameter of 1.



What is the volume of this sphere? (round to the nearest integer)

Assistment #43095 "43095 - 31680 - 8th Grade - Geometry Review - Volume."

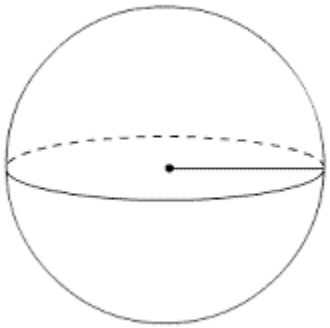
The sphere below has a diameter of 9.



What is the volume of this sphere? (round to the nearest integer)

Assistment #43100 "43100 - 31680 - 8th Grade - Geometry Review - Volume."

The sphere below has a diameter of 7.

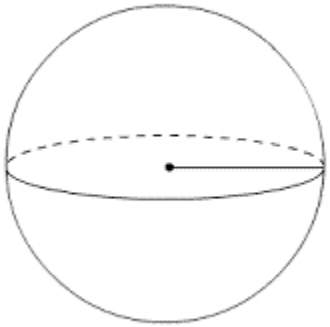


What is the volume of this sphere? (round

to the nearest integer)

Assistment #43092 "43092 - 31680 - 8th Grade - Geometry Review - Volume."

The sphere below has a diameter of 1.



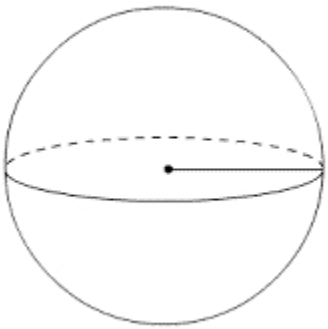
What is the volume of this sphere? (round to the nearest integer)

Algebra:

✓ 1

Scaffold:

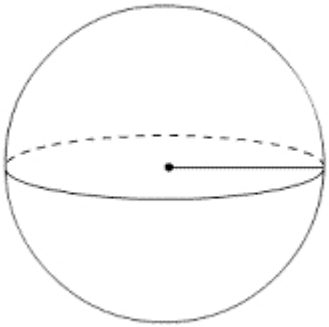
Let us first find out the formula for calculating the volume of a sphere. What is the formula for calculating the volume of a sphere?



Multiple choice:

✓ A. 4/3 * π * r^3 ✗B. 3/4 * π * r^3 ✗C. π * r^2 ✗D. π * r^3

Hints:

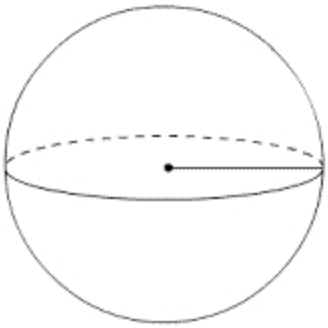


- A sphere is a three dimensional shape. Therefore, the part of the volume formula is its radius raised to its third power.
- Along with its radius raised to its third power, the other part of the formula is related to π.
- The formula for calculating the volume of a sphere is $4/3 * \pi * r^3$. Choose A.

Scaffold:

Now we know the formula for calculating the volume of the sphere, we simply need to substitute the radius value into the formula.

However, we are given the diameter of the sphere. What is the radius of the sphere?



Algebra:

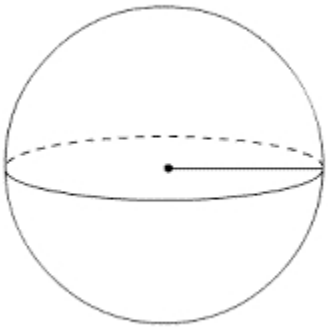
✓ 0.5

Hints:

- The radius of a sphere is half of the diameter of that sphere. r = 1/2 * dimeter.
- Therefore, the radius of the sphere is r = 1/2 * 1 = 0.5. Type in 0.5.

Scaffold:

Now let us solve the original problem.



Algebra:

1

Hints:

- The radius of the sphere is 0.5. The formula for calculating the volume of the sphere is $4/3 * \pi * r^3$.

- By substituting the radius value we have

$4/3 * \pi * 0.53$

$1.33 * 3.14 * 0.5*0.5*0.5$

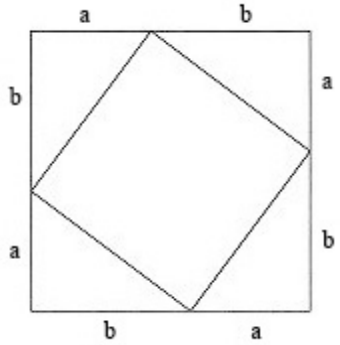
0.523333333333333

- Round the value 0.523333333333333 to the nearest integer we have 1. Therefore, volume is 1.

Type in 1.

Assistment #43122 "43122 - 31691 - 8th Grade - Geometry Review - Area of Polygons"

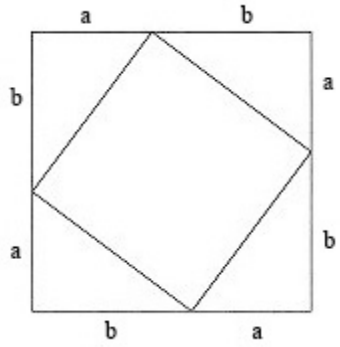
The figure below shows a square inscribed in a larger square, with a is 2 and b is 1.



What is the area of the smaller square?

Assistment #43125 "43125 - 31691 - 8th Grade - Geometry Review - Area of Polygons"

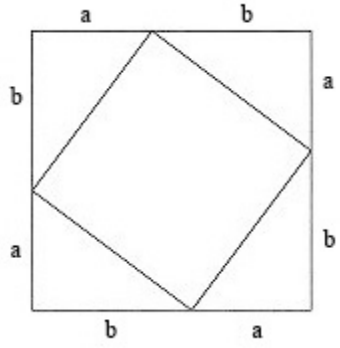
The figure below shows a square inscribed in a larger square, with a is 3 and b is 1.



What is the area of the smaller square?

Assistment #43127 "43127 - 31691 - 8th Grade - Geometry Review - Area of Polygons"

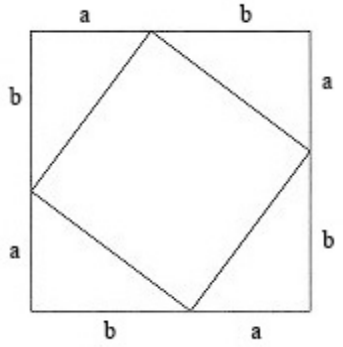
The figure below shows a square inscribed in a larger square, with a is 3 and b is 3.



What is the area of the smaller square?

Assistment #43130 "43130 - 31691 - 8th Grade - Geometry Review - Area of Polygons"

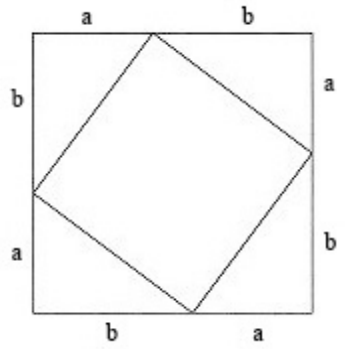
The figure below shows a square inscribed in a larger square, with a is 6 and b is 2.



What is the area of the smaller square?

Assistment #43122 "43122 - 31691 - 8th Grade - Geometry Review - Area of Polygons"

The figure below shows a square inscribed in a larger square, with a is 2 and b is 1.



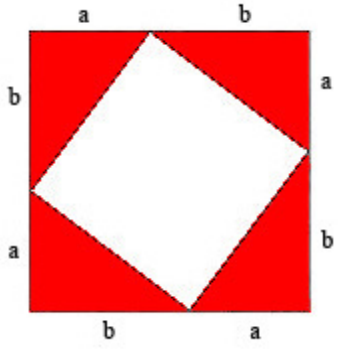
What is the area of the smaller square?

Algebra:

✓ 5

Scaffold:

In order to find the area of the smaller square, we need to first find the area of the larger square then subtract the four triangles from it.



What is the area of the larger square?

Algebra:

✓ 9

Hints:

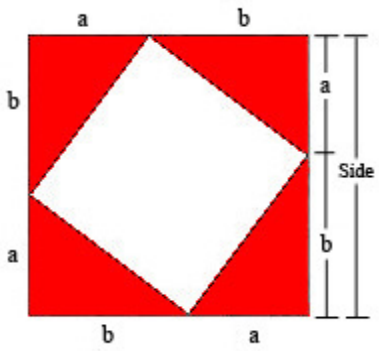
- The formula for calculating the area of a square is Side * Side.

In our case, the side is

Side = a + b

= 2 + 1

= 3.



- Hence, the area of the square is 3 * 3 = ?
- Area = size * side

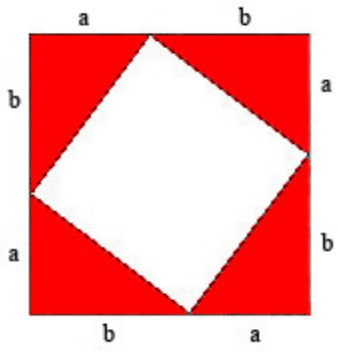
= 3 * 3

Therefore, the area of the larger square is 9.

Type in 9.

Scaffold:

Now let's find the total area of the four triangles.



What is the total area of these four triangles?

Algebra:

✓ 4

Hints:

- As we can see, all four triangles are right triangles.

Therefore, we can find the area of each of them by using the formula

Area = Base * Height / 2.

- We also notice that all four triangles have the same area. In order to find the total area of all four triangles, we have:

Total area = $area_1 + area_2 + area_3 + area_4$

= (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2) + (Base * Height / 2)

= (Base * Height / 2) * 4

Total area = Base * Height / 2 * 4

- Now we substitute the values into the simplified formula:

Total area = Base * Height / 2 * 4

= 2 * 1 / 2 * 4

= 1 * 4

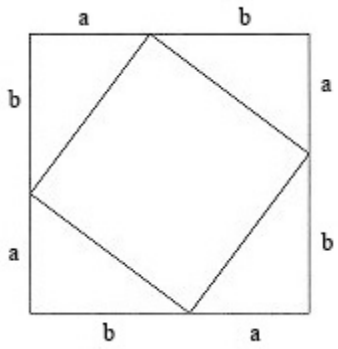
= 4

- Therefore, the total area of all four triangles is 4. Type in 4.

Scaffold:

Now we know the area of the larger square and the total area of the four triangles, let's try solve the original problem.

The figure below shows a square inscribed in a larger square, with a is 2 and b is 1.



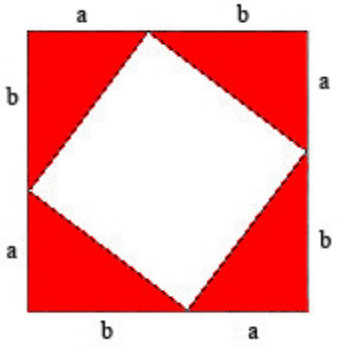
What is the area of the smaller square?

Algebra:

✓ 5

Hints:

- Recall that the larger square has an area of 9 and the total area of all four triangles we identified is 4.



- Just like we planned before, we subtract the total area of the four triangles from the area of the larger square to find the area of the smaller square.
- Therefore, the area of the smaller sqaure is 9 - 4 = 5. Type in 5.

Assistment – Yuan Shi

Assistment #30998 "30998 - Looking for Pythagoras Investigation 2 #5"

which of the answer choice shows the following numbers arranged from least to greatest?

3, √10, -√24, -5, -9, -7.2

Multiple choice:

✗

A. -9, -√24, -5, √10, 3, 7.2

✓

B. -9, -5, -√24, 3, √10, 7.2

✗

C. 7.2, √10, 3, -√24, -5, -9

✗

D. -√24, -5, -9, 3, √10, 7.2

Hints

:

let's start by looking the table of square and perfect square roots. Notice the interger number the perfect square roots represent.

$\sqrt{1} = \sqrt{1x1} = 1$ $1^2 = 1x1 = 1$

$\sqrt{4} = \sqrt{2x2} = 2$ $2^2 = 2x2 = 4$

$\sqrt{9} = \sqrt{3x3} = 3$ $3^2 = 3x3 = 9$

$\sqrt{16} = \sqrt{4x4} = 4$ $4^2 = 4x4 = 16$

$\sqrt{25} = \sqrt{5x5} = 5$ $5^2 = 5x5 = 25$

$\sqrt{36} = \sqrt{6x6} = 6$ $6^2 = 6x6 = 36$

$\sqrt{49} = \sqrt{7x7} = 7$ $7^2 = 7x7 = 49$

Lets estimate all the square roots

first: $\sqrt{10}$ is larger than 3 since $3^2 = 9$ -

$\sqrt{24}$ is a little more than -5 since $5^2 = 25$

First let us find the smallest value. Since negtive number is smaller than positive number. Lets find the smallest negtive value. You can clearly see that -9 is the smallest negtive number.

Then, lets compare -5 and $-\sqrt{24}$. $-\sqrt{24}$ is a little more than -5. That means -5 is smaller than $-\sqrt{24}$ and larger than -9.

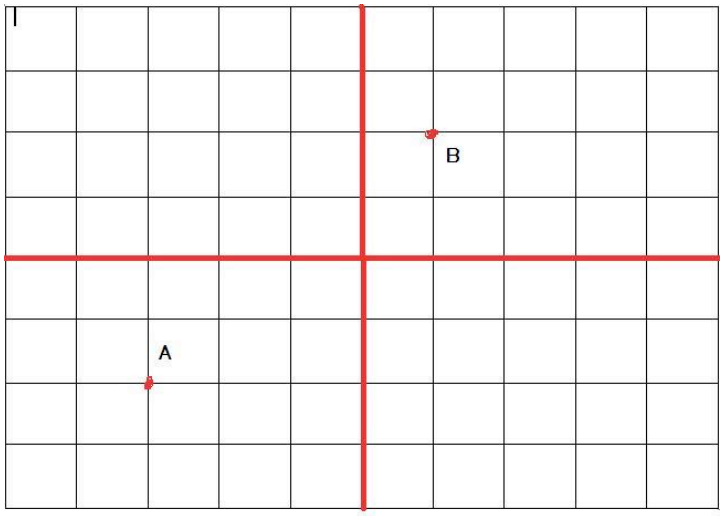
$-\sqrt{24}$ is the only other negative number besides -5 and -9, that means it is the third smallest number.

Of the positive values remaining, let's first compare 3 and $\sqrt{10}$. 3 is equal to $\sqrt{(3^2)}$ so that we can represent 3 as $\sqrt{9}$ and then compare it with $\sqrt{10}$. $\sqrt{10}$ is larger than 3. so 3 is the smallest positive number.

and finally, 7.2 is much larger than $\sqrt{10}$ because $7^2 = 49$ which is larger than 10. thus, the largest number is 7.2

The only answer choice with the first three values correctly in order from smallest to largest is choice B. Select B.

Assistment #30172 "30172 - Looking for Pythagoras Investigation 1 #1"



What is the point half way from A to B if you "fly by helicopter"? In other words, if you drew a straight line from A to B, what would be the midpoint?

Multiple choice:

✗

(1, 0)

✗

(0, 1)

✗

(0, -1)

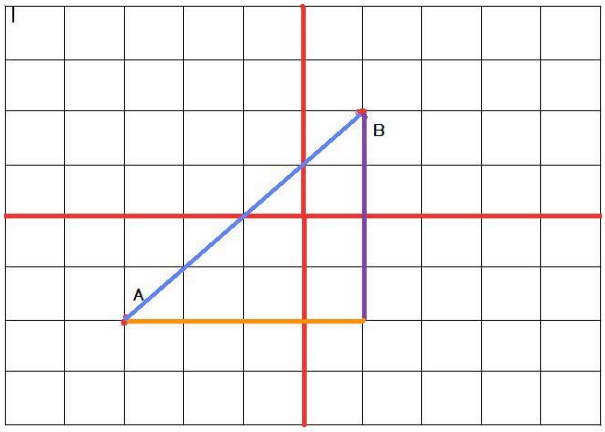
✓

(-1, 0)

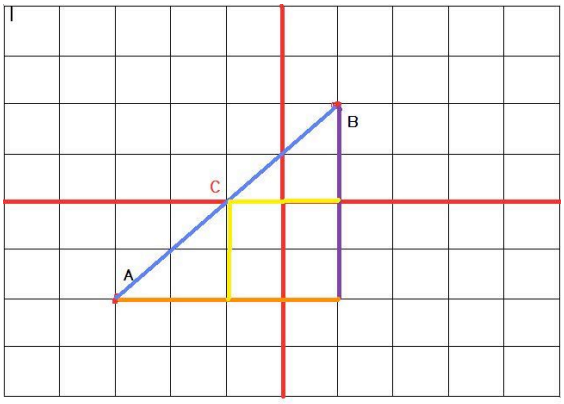
Hints

:

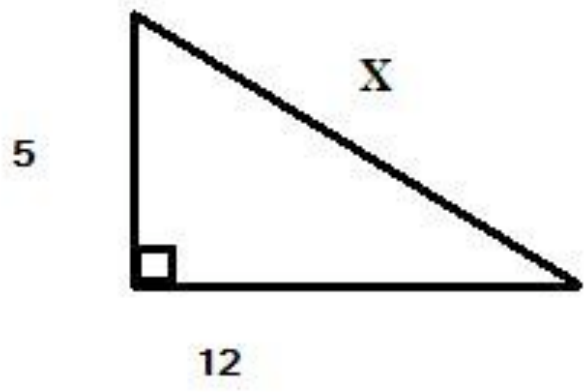
Start by drawing the legs of the triangle formed by the line from A to B. The midpoint of AB is at the middle of both the red and blue legs. Find the midpoints of the orange and purple leg by counting.



Once you have the triangle drawn, and the midpoints of the two legs found, you can find the midpoint as shown in the image below. Now you need to



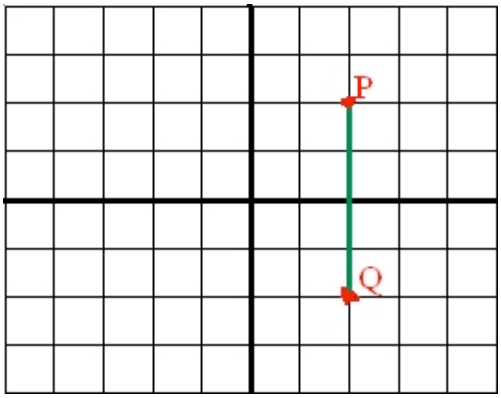
find the coordinate of the midpoint.



The coordinates of the midpoint is C which is(-1, 0). Choose the (-1, 0) answer choice.

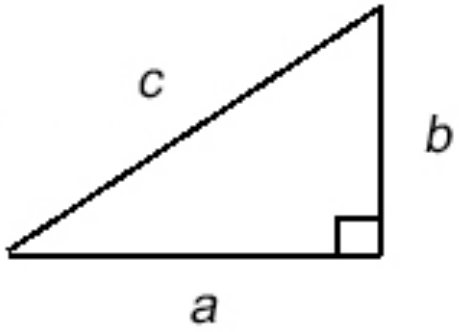
Assistment #30215 "30215 - Looking for Pythagoras Investigation 1 #3"

Suppose you want to place two points Y and T on the graph such that PYTQ is a non-rectangular parallelogram. Which of these possibilities would work for T and Y?

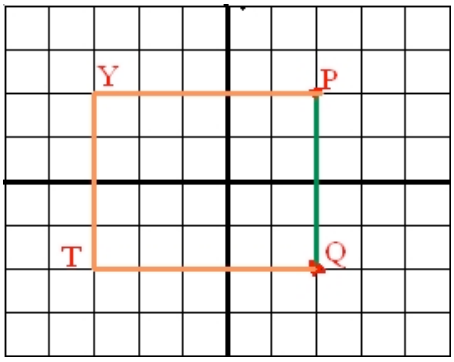


Multiple choice:

✗ A) T = (-3, -2) Y = (-3, 2) ✗ B) T = (-2,-4) Y = (-1,3) ✓ C) T = (-2, -1) Y = (-2, 3)



$$a^2 + b^2 = c^2$$



Hints

:

This is a drawing of option A. Notice that there are 4 right angles. That makes this version of PYTH a rectangle. We are looking for a **non rectangular** parallellogram.

Assistment #30174 "30174 - Looking for Pythagoras Investigation 3 #1"

What is the length of the hypotenuse of the right triangle shown below?

Fill in:

✓ 13

Hints

:

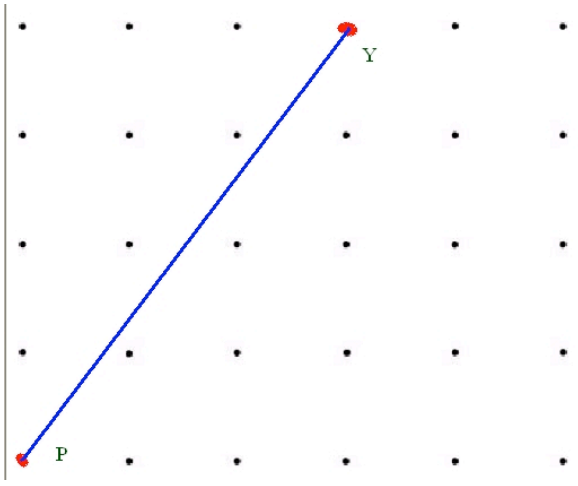
The Pythagorean Theorem is shown below. The values of a and b are given as 5 and 12 respectively. Plus in the values of a and b into the Pythagorean Theorem and solve for c.

After plugging in the values of a and b, you get the equation: $c^2 = 5^2 + 12^2$ Simplify the equation by finding the squares of 6 and 8 and adding them.

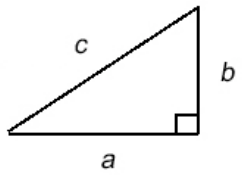
After simplifying the right hand side of the equation, you get the equation: $c^2 = 144+ 25$ or $c^2 = 169$ Take the square root of both sides to find the value of c.

$c = \sqrt{169}$

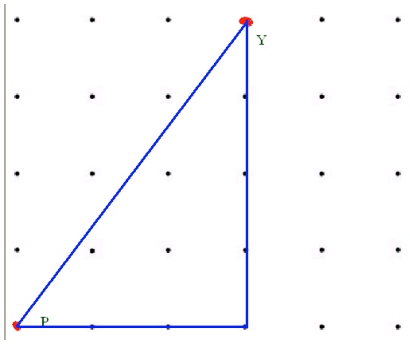
The value of c is the $\sqrt{169}$. The square root of 169 is 13. Type in 13.



Assistment #30175 "30175 - Looking for Pythagoras Investigation 3 #4"



$a^2 + b^2 = c^2$



Use the pythagorean theorem to find the distance from point P to point Y.

What is the distance from point P to point Y?

Fill in:

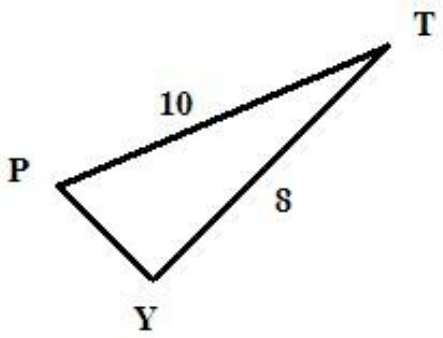
✓ 5

Hints

:

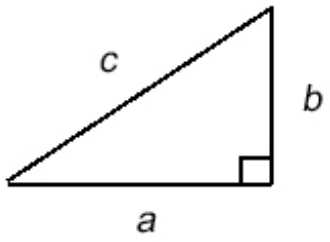
Start by drawing the line PY and the right triangle it forms.

Your picture should look like this. Now use the Pythagorean Theorem to find the distance between the two points.



The Pythagorean Theorem is shown below. You need to find the length of the legs in order to use it.

The length of the legs are 3 and 4. Plug the leg lengths into the Pythagorean



$a^2 + b^2 = c^2$

Theorem and find the length of **c**, the hypotenuse.

Plugging in the length of the legs gives you the equation: $c^2 =$

$3^2 + 4^2$ Solve for the value of **c**.

$c^2 = 3^2 + 4^2$ $c^2 = 9 + 16$ $c^2 = 25$

Find **c** by taking the square root of both sides of the equation.

Taking the square root of both sides of the equation gives you the value of c:

$c = \sqrt{25}$ so that $c = 5$.

type the answer 5.

Assistment #30176 "30176 - Looking for Pythagoras Investigation 4 #3"

How long is side PY in the right triangle if angle PYT is right angle?

Fill in:

✓ 6

Hints

:

The length of the hypotenuse and one leg has been given to you. Using the Pythagorean Theorem, you can solve for the last leg!

The Pythagorean Theorem is shown above. Plug in the length of the hypotenuse and one leg into the equation, and solve for the unknown variable!

What is x in the

equation: $10^2 = x^2 + 8^2$

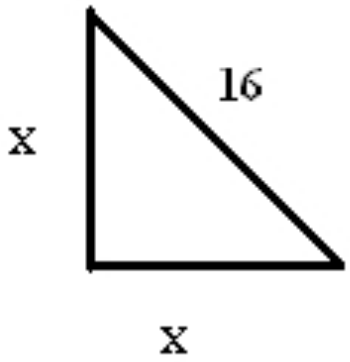
Simpifying the equation gives

you: $100 = x^2 + 64$

By subtracting both sides of the equation by 64, you get the equation: $x^2 = 36$

Taking the square root of both sides of the equation gives you the value of x.

The square root of 36 is 6. Therefore, $x = 6$. Type in 6.



Assistment #30177 "30177 - Looking for Pythagoras Investigation 4 #1"

The hypotenuse of a right isoceles triangle is 16 feet. How long is one leg of this triangle?

Multiple choice:

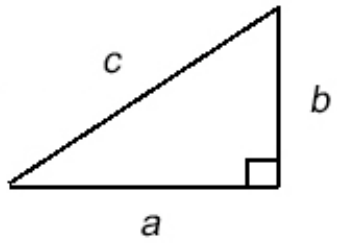
✓ √128 ✗ √64 ✗ 4 ✗ 128

Hints

:

Start by drawing a picture of this triangle.

The triangle you drew should look like this since it is both a right triangle and a isoceles triangle. An isoceles triangle has two equal sides.



$a^2 + b^2 = c^2$

Using the pythagorean theorem, find the length of one leg.

Solve for x in this

equation: $16^2 = x^2 + x^2$

Simplifying the equation gives

you: $256 = 2 * x^2$

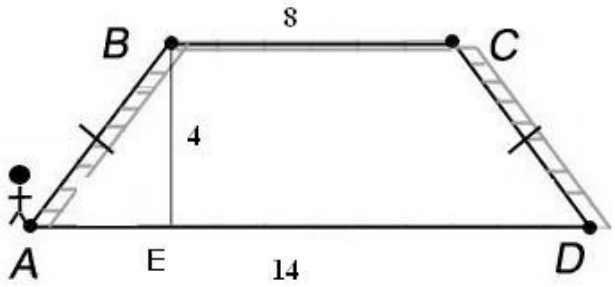
Further simplifying the equation gives you: $x^2 = 256 / 2 = 128$

Taking the square root of both sides gives you: x =

√128. Choose the answer choice √128.

Assistment #41937 "41937 - Looking for Pythagoras Investigation 4 #2"

A climber at a park looks like the picture below.



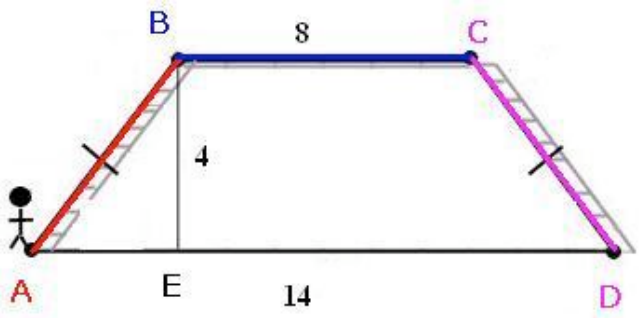
If a kid climbs from A to B to C to D, how far has she climbed?

Fill in:

✓ 18

Scaffold:

To find the distance from A to B to C to D, you need to find the length of AB, BC, and CD.



The length of BC is given to be 8.

You can find the length of AB and CD using the Pythagorean Theorem.

First, you must find the length of the unknown leg. What is the length of the unknown leg AE?

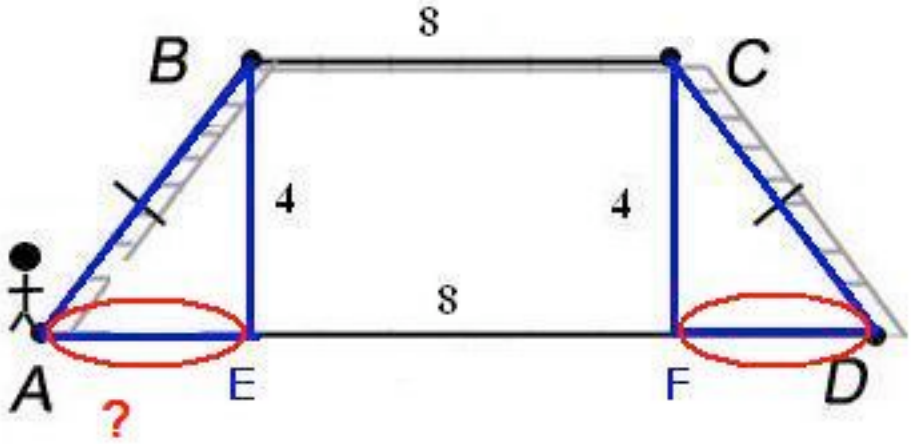
Algebra:

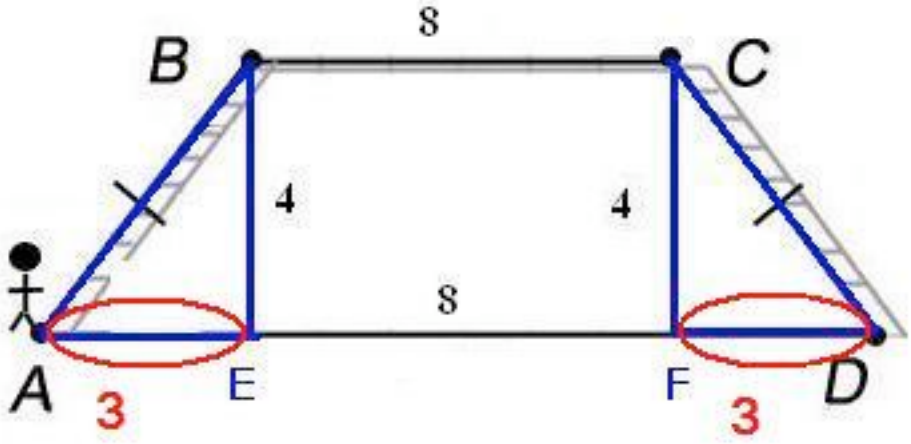
✓ 3

Hints

:

You will notice that ΔABE and ΔDCF are congruent triangles. Thus, we know that AE = FD.



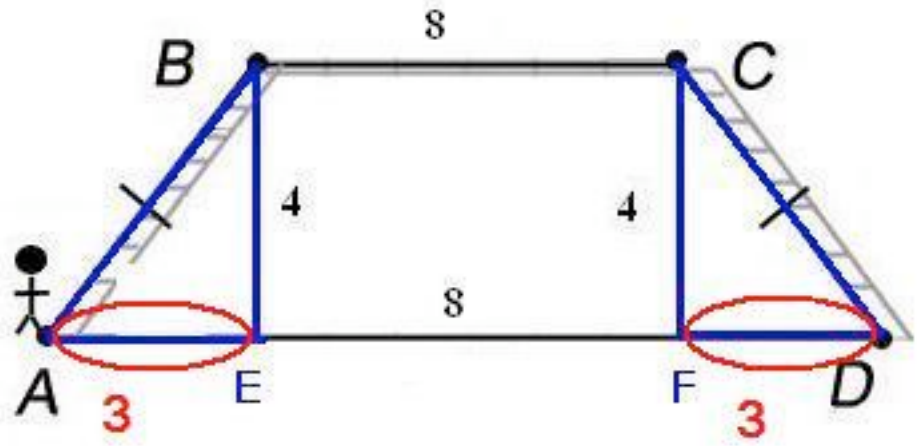


You can see that AE + EF + FD = 14 and EF =8 and AE = FD. what is AE equal to?

Since we already know that AE + EF + FD =14 and EF =8 and AE = FD. We can rewrite the equation as 2xAE +8 =14.

Thus, we solve for AE = FD = 3. type in 3

Scaffold:



Now, you already know the length of the leg is 3 and you can use pythagoras theorem to find the length of AB and CD which are labeled in blue.

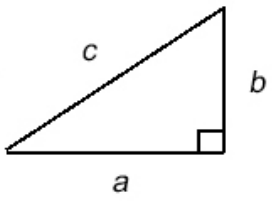
What is the length of AB? (this will also be the lenght of CD since this is an Isosceles Trapezoid.)

Algebra:

✓ 5

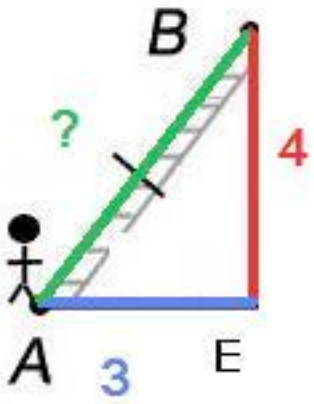
Hints

:



$a^2 + b^2 = c^2$

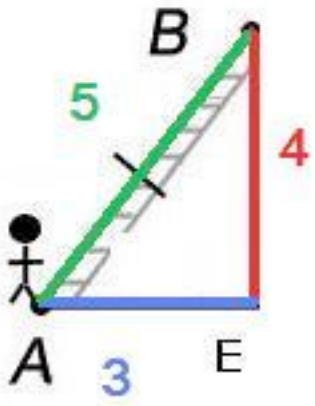
Use the Pythagorean Theorem



In our triangle AE= 3, BE = 4, Now find AB

$AB^2 = AE^2 + BE^2$.

$AB^2 = 3^2 + 4^2$



$AB^2 = 9 + 16$

$AB^2 = 25$.

$AB = 5$

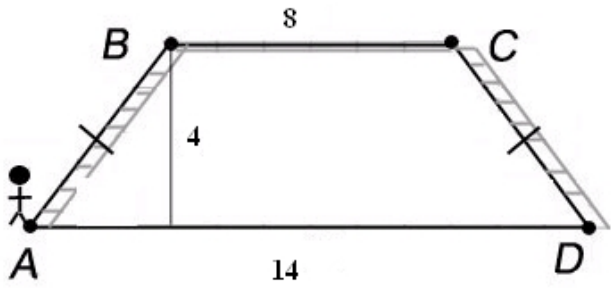
So AB = 5 . Type in 5

Scaffold:

Let's now, go back to the original problem.

A climber at a park looks like the picture below.

If a kid climbs from A to B to C to D, how far has she climbed?



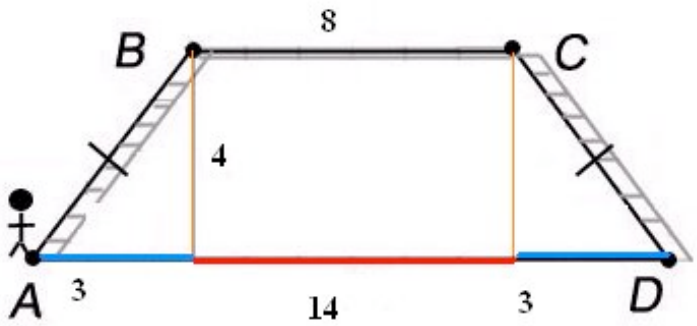
Algebra:

✓ 18

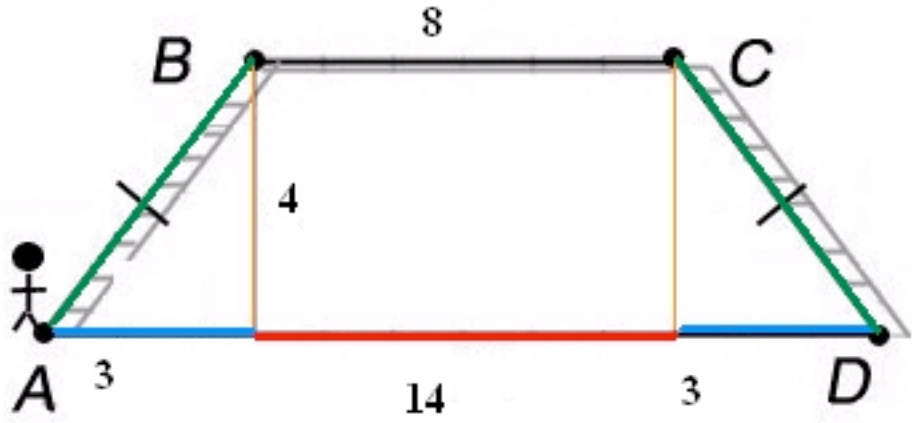
Hints

:

Let's review what we have done so far. Fist we solved the leg of this trapzoid which is 3



second we solved the length of AB and CD which is 5 for each of them.



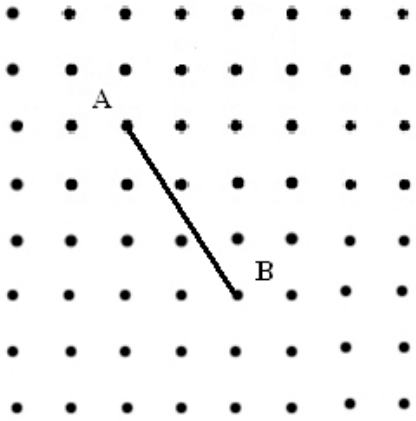
Now, in order to find the distance from A to D, we just need to add all the distance up.

AB + BC + CD = 5 + 8 + 5 = 18. The distance from A to B to C to D is 18.

Type in 18.

Assistment #30179 "30179 - Looking for Pythagoras Investigation 2 #4"

How long is the line segment AB?



Multiple choice:

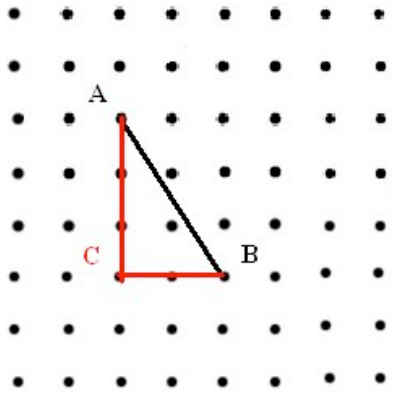
✓ √13 ✗ 5 ✗ 2 ✗ √5

Hints

:

Start by drawing a right triangle with AB as the hypotenus. Then you can use the Pythagorean Theorem to find AB.

Here is the picture. Use the pythagorean theorem to find AB.



The pythagoean theorem says that :

$AB^2 = AC^2 + BC^2$

Also AC =3 and BC = 2

$AC^2 + CB^2 = AB^2\ 3^2$

$+\ 2^2 = AB^2\ 9\ +$

$4\ =\ AB^2$

$13\ =\ AB^2$

$AB^2=13\ \ \sqrt{AB^2}=\sqrt{13}$ AB $=\sqrt{13}$ the length of the side AB must be the $\sqrt{13}$. Choose $\sqrt{13}$.

Assistment #41781 "41781 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10"

A) What is the first whole number greater than $\sqrt{10}$?

Algebra:

✓ 4

Scaffold:

Let's start by finding some square roots of the perfect square then we can go back to solve the original problem.

what is the $\sqrt{9}$?

Fill in:

✓ 3

Hints:

Here is the table for some perfect square roots

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$

$\sqrt{36} = \sqrt{6x6} = 6$ $\quad\quad$ $6^2 = 6x6 = 36$

$\sqrt{49} = \sqrt{7x7} = 7$ $\quad\quad$ $7^2 = 7x7 = 49$

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

can you find $\sqrt{9}$ from the table?

you can see that $\sqrt{9} = 3$ so type in 3

Scaffold:

let's explore one more square root before going back to the original problem.

what is √16?

Fill in:

✓ 4

Hints:

Let's start by looking at the table of perfect square root and perfect squares.

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

can you find √16 from the table?

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

from the table above you are able to find $\sqrt{16} = 4$ type in 4

Scaffold:

Only perfect square root can be whole number.

are there any perfect square roots between √9 and √16?

Multiple choice:

✗ Yes ✓ No

Hints:

Look at the table below. It has already listed all the perfect square roots from1 to 36. Can you see any perfect square root between √9 and √16?

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

There is no perfect square root between $\sqrt{9}$ and $\sqrt{16}$. Thus, choose "No".

Scaffold:

Is $\sqrt{9} < \sqrt{10} < \sqrt{16}$ true?

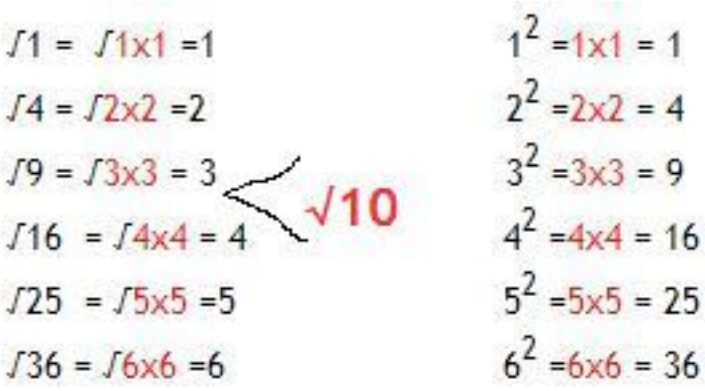
Multiple choice:

✓ Yes ✗ No

Hints:

based on what we have done so far. compare $\sqrt{10}$ with $\sqrt{9}$ and $\sqrt{16}$ from the table of perfect square roots.

You can find that $\sqrt{10}$ is between $\sqrt{9}$ and $\sqrt{16}$



so, $\sqrt{9}<\sqrt{10}<\sqrt{16}$ is true. select Yes

Scaffold:

Now let's go back to the original problem.

what is the first whole number greater than $\sqrt{10}$?

Fill in:

✓ 4

Hints:

Let's review what we have done so far. first, we have found the table of perfect square roots and perfect squares.

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

Second, we have found $\sqrt{9} = 3$ third, we have found $\sqrt{16} = 4$

Then, we find out that there is no perfect square root between $\sqrt{9}$ and $\sqrt{16}$. the table below $\sqrt{10}$ is between $\sqrt{9}$ and $\sqrt{16}$.

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$ $\sqrt{10}$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

also, only perfect square root can be whole number.

so the first whole number greater than √10 is √16 **which is**

4. type in 4

B) What is the value of the expression below?

$$\sqrt{49} + 3 * 5$$

Fill in:

✓ 22

Scaffold:

We can use order of operations to find the value of the expression

$$\sqrt{49} + 3 * 5$$

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

So first we do the "Exponents (powers, roots, etc)"

What is the value of $\sqrt{49}$?

Fill in:

7

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

based on table can you solve √49?

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$
$\sqrt{49} = \sqrt{7x7} = 7$	$7^2 = 7x7 = 49$

you can see from the table that $\sqrt{49}$ is a perfect square root and its value is 7.

Type in 7.

Scaffold:

This is what we have done so far

$\sqrt{49} + 3 * 5$

$7+3*5$

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

Now, we need to do multiplication.

what is 3*5 ?

Fill in:

15

Hints:

Scaffold:

Now Let's return to the Original Problem

what is √49 +3*5?

Fill in:

22

Hints:

Let's review what we have done so far.

So far we have follow the order of operation done this much of the problem.

√49 + 3*5

7 + 3*5

7 + 15

all we left to do is just addition.

Looking for Pythagoras - Compare rational numbers

1) Assistment #43562 "43562 - 30998 - Looking for Pythagoras Investigation 2 #5"

which of the answer choice shows the following numbers arranged from least to greatest?

$-9.3 \quad -\sqrt{67} \quad -1.6 \quad \sqrt{34} \quad 3.2 \quad \sqrt{56}$

A) $-9.3 < -\sqrt{67} < -1.6 < 3.2 < \sqrt{34} < \sqrt{56}$

B) $-\sqrt{67} < -9.3 < -1.6 < \sqrt{56} < 3.2 < \sqrt{34}$

C) $-9.3 < -1.6 < -\sqrt{67} < 3.2 < \sqrt{56} < \sqrt{34}$

D) $-1.6 < -\sqrt{67} < -9.3 < 3.2 < \sqrt{34} < \sqrt{56}$

2) Assistment #43572 "43572 - 30998 - Looking for Pythagoras Investigation 2 #5"

which of the answer choice shows the following numbers arranged from least to greatest?

$-9 \quad -\sqrt{76} \quad -2.9 \quad \sqrt{31} \quad 2.8 \quad \sqrt{49}$

A) $-9 < -\sqrt{76} < -2.9 < 2.8 < \sqrt{31} < \sqrt{49}$

B) $-\sqrt{76} < -9 < -2.9 < \sqrt{49} < 2.8 < \sqrt{31}$

C) $-9 < -2.9 < -\sqrt{76} < 2.8 < \sqrt{49} < \sqrt{31}$

D) $-2.9 < -\sqrt{76} < -9 < 2.8 < \sqrt{31} < \sqrt{49}$

3) Assistment #43604 "43604 - 30998 - Looking for Pythagoras Investigation 2 #5"

which of the answer choice shows the following numbers arranged from least to greatest? $\sqrt{58} \quad \sqrt{34} \quad -\sqrt{78} \quad 2.3 \quad -2.2 \quad -9.2$

Assistment #43562 "43562 - 30998 - Looking for Pythagoras Investigation 2 #5"

which of the answer choice shows the following numbers arranged from least to greatest?

$-9.3 \quad -\sqrt{67} \quad -1.6 \quad \sqrt{34} \quad 3.2 \quad \sqrt{56}$

Multiple choice:

✓

$-9.3 < -\sqrt{67} < -1.6 < 3.2 < \sqrt{34} < \sqrt{56}$

✗

$-\sqrt{67} < -9.3 < -1.6 < \sqrt{56} < 3.2 < \sqrt{34}$

✗

$-9.3 < -1.6 < -\sqrt{67} < 3.2 < \sqrt{56} < \sqrt{34}$

✗

$-1.6 < -\sqrt{67} < -9.3 < 3.2 < \sqrt{34} < \sqrt{56}$

Hints

:

Lets estimate all the square roots first: $\sqrt{1}$ =

$\sqrt{1x1}$ =1 1^2 =1x1 = 1 $\sqrt{4}$ =

$\sqrt{2x2}$ =2 2^2 =2x2 = 4 $\sqrt{9}$ =

$\sqrt{3x3}$ = 3 3^2 =3x3 = 9 $\sqrt{16}$ =

$\sqrt{4x4}$ = 4 4^2 =4x4 = 16 $\sqrt{25}$ =

$\sqrt{5x5}$ =5 5^2 =5x5 = 25 $\sqrt{36}$ =

$\sqrt{6x6}$ =6 6^2 =6x6 = 36 $\sqrt{49}$ =

$\sqrt{7x7}$ =7 7^2 =7x7 = 49 $\sqrt{64}$ =

$\sqrt{8x8}$ = 8 8^2= 8x8 = 64 $\sqrt{81}$ =

$\sqrt{9x9}$ = 9 9^2= 9x9 =81 for

example: $-9<-\sqrt{67}<-8$ because $-\sqrt{81} = -9$ and $-\sqrt{64} = -8$

$5<\sqrt{34}<6$ ibecause $\sqrt{25} = 5$ and $\sqrt{36}$ =6 $7<\sqrt{56}$ because $\sqrt{49} = 7$

Then, lets compare -1.6 and $-\sqrt{67}$. We have $-\sqrt{67} < -8 < -1.6$

The number -8 helps us compare.

Now you can **WRITE DOWN** the order of the all the negtive number which is $-9.3 < -\sqrt{67} < -1.6$. Next let us use the same method to sort positive numbers.

Of the positive values remaining, let's first compare $\sqrt{34}$ and $\sqrt{56}$. $\sqrt{34}$ is less than $7 = \sqrt{49}$ and $\sqrt{56}$ is larger than $7 = \sqrt{49}$. Thus $\sqrt{34}$ is less than $\sqrt{56}$

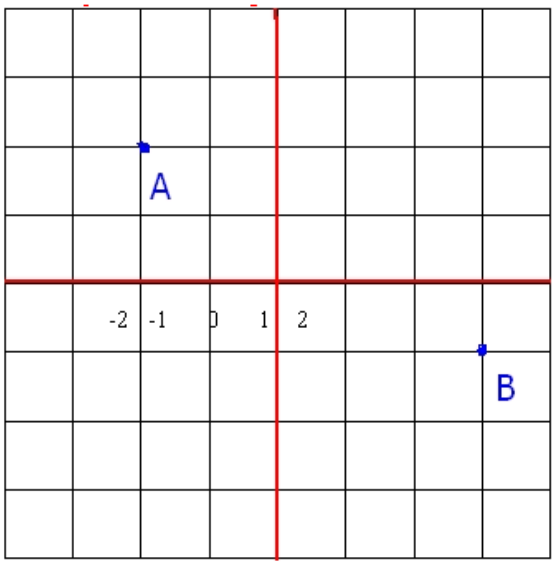
and finally,3.2 is smaller than 5 and $\sqrt{34}$ is larger than $\sqrt{25} = 5$. we can sort the positive from small to large in the following order $3.2 < \sqrt{34} < \sqrt{56}$

let's arrage all the numbers from small to larger. $-9.3 < -\sqrt{67} < -1.6 < 3.2 < \sqrt{34} < \sqrt{56}$ so choose the corresponding choice

Problem Set "Looking for Pythagoras - Finding Middle Point"

1) Assistment #43784 "43784 - Looking for Pythagoras Investigation 1 #1"

What is the point half way from A to B if you "fly by helicopter"? In other words, if you drew a straight line from A to B, what would be the midpoint? Each square has unit length and width of 1



A) (-0.5, -0.5)

B) (0.5, -0.5)

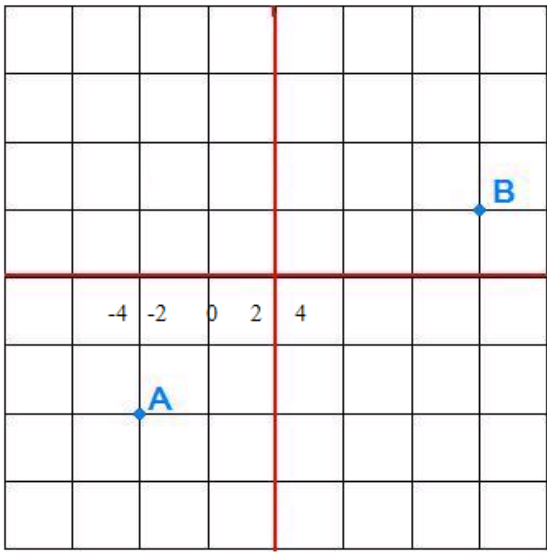
C) (0.5, 0.5)

D) (-0.5, 0.5)

2) Assistment #43815 "43815 - Looking for Pythagoras Investigation 1 #1"

What is the point half way from A to B if you " drive a car"? In other words, if you drew a straight line from A to B, what would be the midpoint?

Each square has unit length and width of 2



A) (-1, -1)

B) (1, -1)

C) (1, 1)

D) (-1, 1)

E) (2, -2)

F) (4, -2)

G) (4, 1)

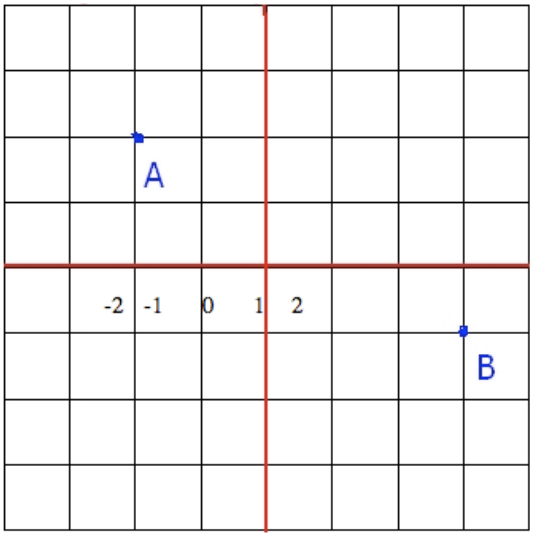
H) (-1, 4)

J) (4, 1)

Assistment #43784 "43784 - Looking for Pythagoras Investigation 1 #1"

What is the point half way from A to B if you "fly by helicopter"? In other words, if you drew a straight line from A to B, what would be the midpoint?

Each square has unit length and width of 1



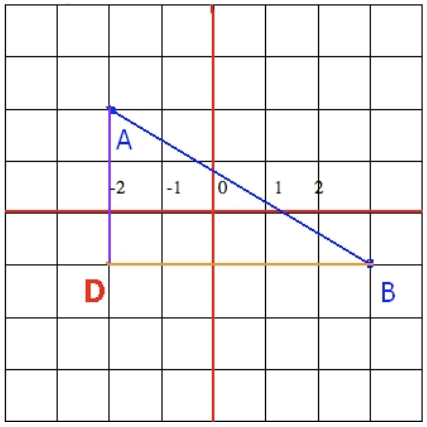
Multiple choice:

✗ (-0.5, -0.5) ✗ (0.5, -0.5) ✓ (0.5, 0.5) ✗ (-0.5, 0.5)

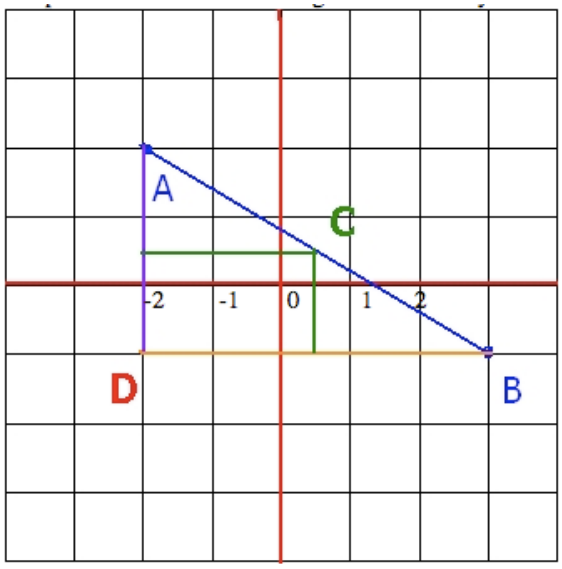
Hints

:

Start by drawing the legs of the triangle formed by the line from A to B. The midpoint of AB is at the middle of both the red and blue legs. Find the midpoints of the orange and purple leg by counting.



Once you have the triangle drawn, and the midpoints of the two legs found, you can find the midpoint as shown in the image below. Now you need to find the coordinate of the midpoint.



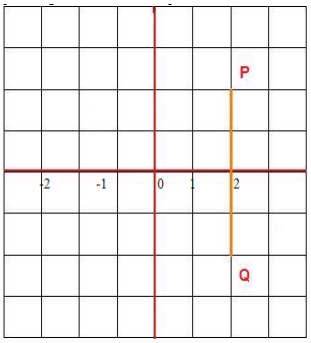
since that point **C** is in the middle of the first square. the horizontal coordinate of **c** is half the length of 1 which is 0.5 the vertical coordinate of **C** is half the length of 1 which is 0.5

The coordinates of the midpoint is C which is(0.5, 0.5). Choose the (0.5, 0.5) answer choice.

Problem Set "Looking for Pythagoras - Parallelogram"

1) Assistment #43904 "43904 - Looking for Pythagoras Investigation 1 #3"

Suppose you want to place two points Y and T on the graph such that PYTQ is a non-rectangular parallelogram. Which of these possibilities would work for T and Y?



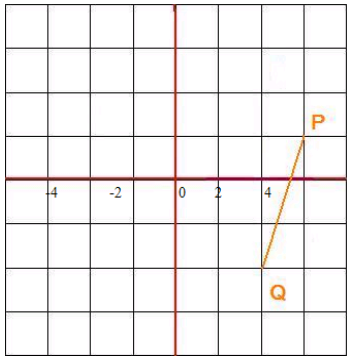
A) T = (-3, -2) Y = (-3, 2)

B) T = (-2,-4) Y = (-1,3)

C) T = (-2, -1) Y = (-2, 3)

2) Assistment #43945 "43945 - Looking for Pythagoras Investigation 1 #3"

Suppose you want to place two points Y and T on the graph such that PYTQ is a **rectangular** parallelogram. Which of these possibilities would work for T and Y?



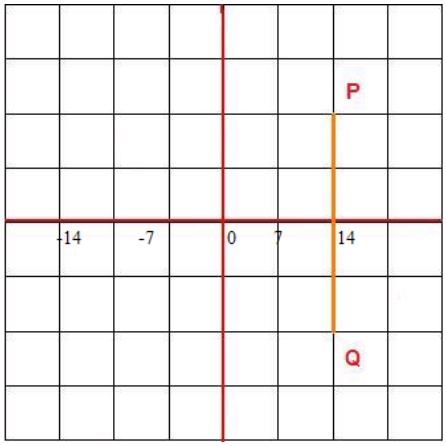
A) Y = (0, 4) T = (-2, -2)

B) Y = (-2,6) T = (-4,-8)

C) Y = (-4, 2) T = (-6, -4)

3) Assistment #43940 "43940 - Looking for Pythagoras Investigation 1 #3"

Suppose you want to place two points Y and T on the graph such that PYTQ is a **rectangular** parallelogram. Which of these possibilities would work for T and Y?



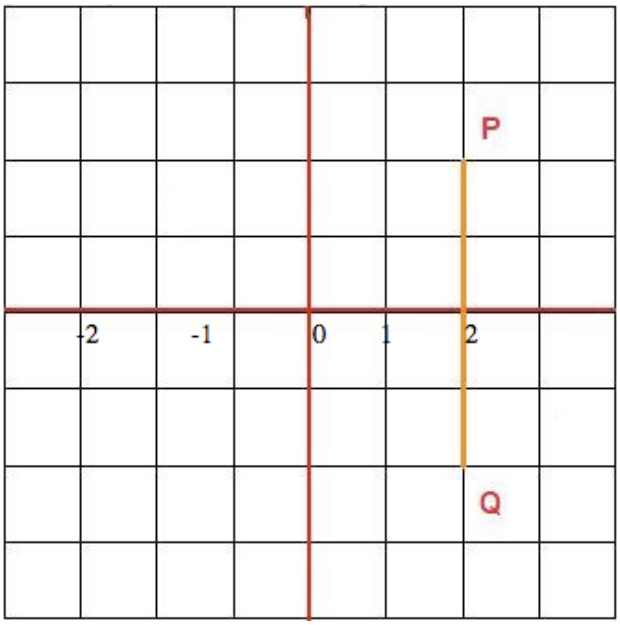
A) T = (-21, -14) Y = (-21, 14)

B) T = (-14,-28) Y = (-7,21)

C) T = (-14, -7) Y = (-14, 21)

Assistment #43904 "43904 - Looking for Pythagoras Investigation 1 #3"

Suppose you want to place two points Y and T on the graph such that PYTQ is a non-rectangular parallelogram. Which of these possibilities would work for T and Y?



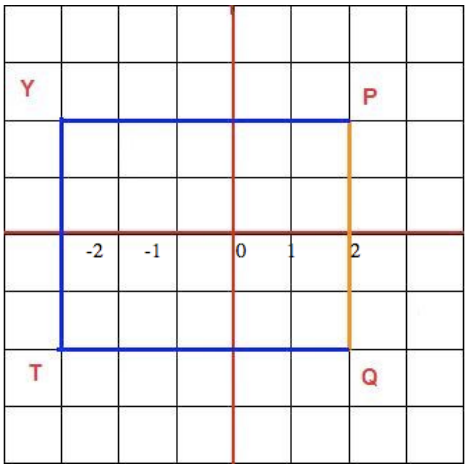
Multiple choice:

✗ T = (-3, -2) Y = (-3, 2) ✗ T = (-2,-4) Y = (-1,3) ✓ T = (-2, -1) Y = (-2, 3)

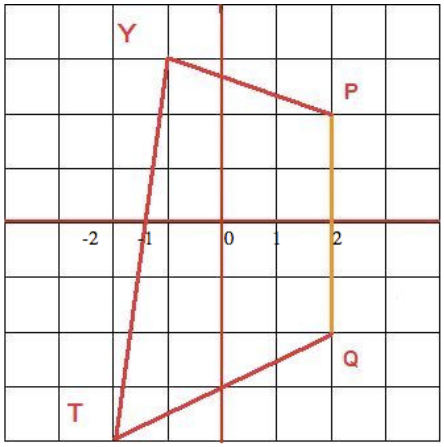
Hints

:

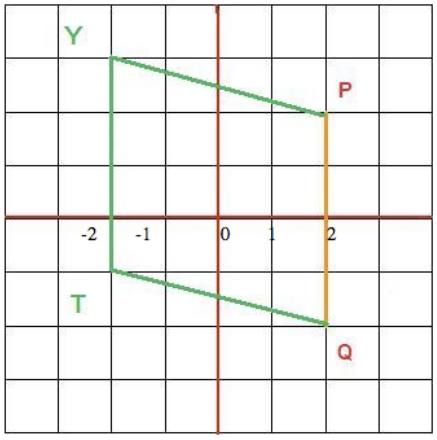
This is a drawing of coordinate T = (-3,-2) Y = (-3,2). Notice that there are 4 right angles. That makes this version of PYTH a rectangle. We are looking for a **non rectangular** parallellogram.



This is a drawing of option T = (-2,-4) Y =(-1,3) . The lengths of TH and YP are not equal. This is not a parallelogram.



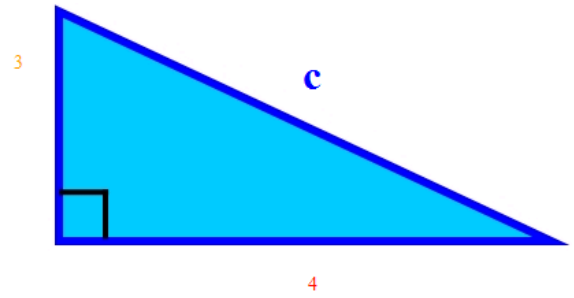
This is a drawing of option T = (-2, -1) Y = (-2,3) . This is the correct answer since the opposite sides are congruent and it does not have right angles.



so T = (-2, -1) Y = (-2,3) is the two points that satisfy the question. Choose the corresponding coordinat

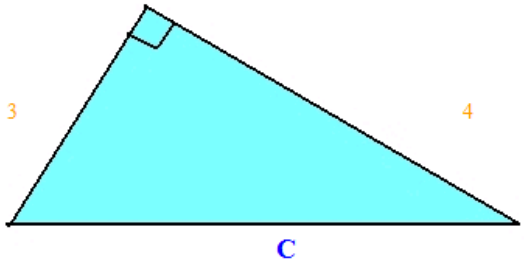
Problem Set "Pythagorean Theorem - Find Hypotenuse Side"

1) Assistment #44052 "44052 - 27600 - Pythagorean Theorem - Find Hypotenuse Side"



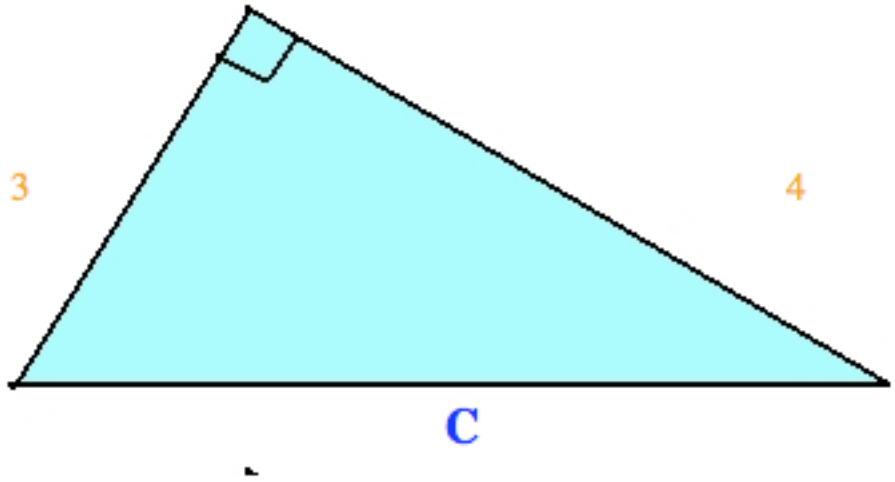
What is the length of side **c** in the above right triangle?

2) Assistment #44122 "44122 - 27600 - Pythagorean Theorem - Find Hypotenuse Side"



What is the length of side **c** in the above right triangle?

Assistment #44122 "44122 - 27600 - Pythagorean Theorem - Find Hypotenuse Side"



What is the length of side **c** in the above **right triangle**?

Algebra:

✓

5

Scaffold:

Since this is a **right triangle**, let's use the **Pythagorean Theorem** to find the length of side **c**.

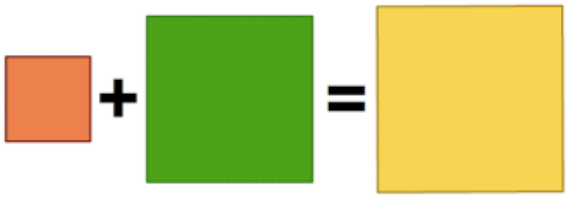
And the **Pythagorean Theorem** says, that the square of the hypotenuse of a **right triangle** is equal to.....

Multiple choice:

the sum of the two other sides

Wrong, there is something else that we have to do before we add the two sides.

the sum of the squares of the two other sides.



In the image, *the area of the square of the hypotenuse is equal to the area of the square of the two other sides*.

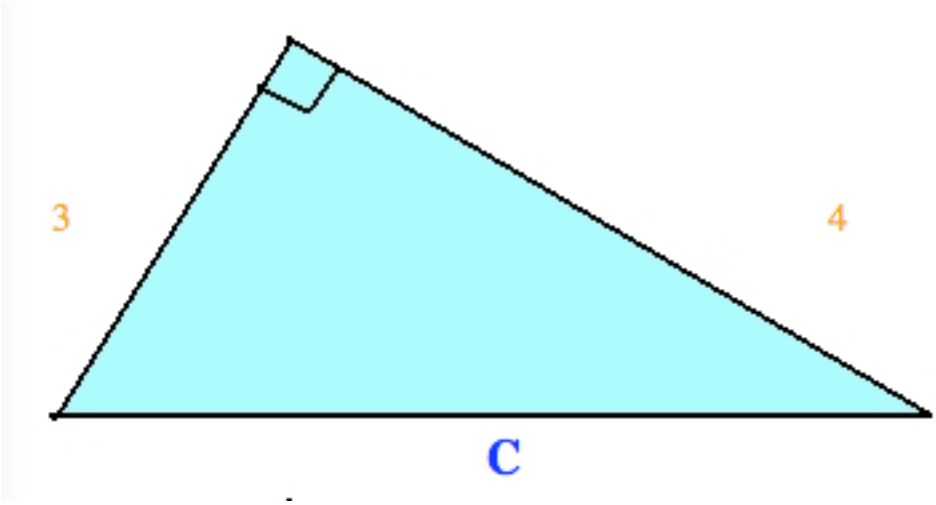
This means that the **Pythagorean Theorem** says *the square of the hypotenuse of a right triangle is equal to* ***the sum of the squares of the two other sides*****.** So, choose the part in blue above.

Scaffold:

Now, we know that the **Pythagorean Theorem** says *the square of the hypotenuse*

of a right triangle is equal to the sum of the squares of the two other sides.

Let's try the original problem again.



What is the length of side **c** in the above **right triangle**?

Algebra:

✓

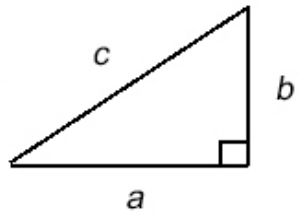
5

Hints

:

Remember, the **Pythagorean Theorem** says that *the square of the hypotenuse of a right triangle is equal to the sum of the squares of the two other sides*.

We also know that side **c** is the hypotenuse because it is to the opposite of the **right angle**.



$a^2 + b^2 = c^2$

So according to the **Pythagorean Theorem**, $3^2 + 4^2 = c^2$

$3^2 + 4^2 = c^2$ **9**

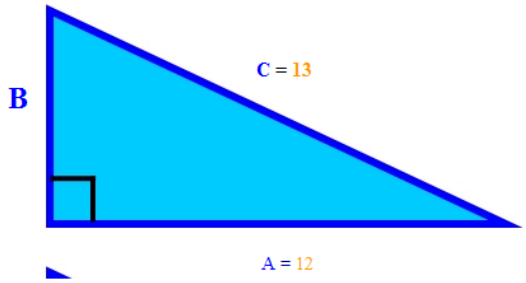
+ 16 $= c^2$ **25**

$= c^2$

Since $\mathbf{c}^2 = \mathbf{25}$, **c** must be equal to 5. Type in 5.

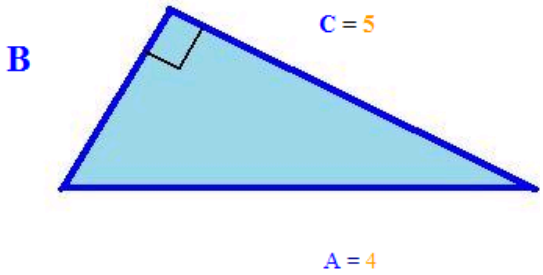
Problem Set "Pythagorean Theorem - Find leg Side"

1) Assistment #44672 "44672 - 42055 - 27600 - Pythagorean Theorem - Find Leg Side"



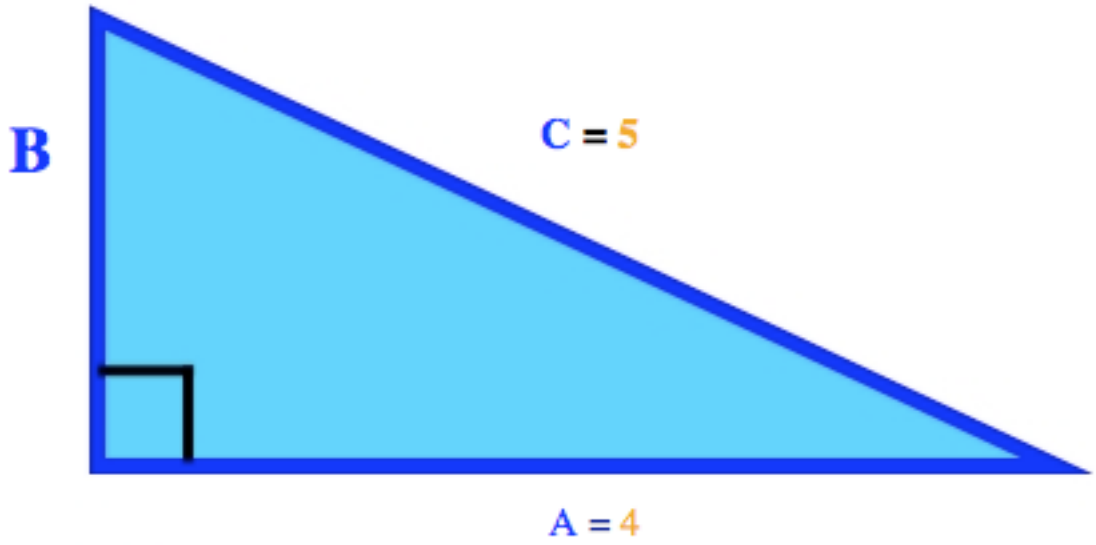
What is the length of side **B** in the above **right triangle**?

2) Assistment #44672 "44672 - 42055 - 27600 - Pythagorean Theorem - Find Leg Side"



What is the length of side **B** in the above **right triangle**?

Assistment #44672 "44672 - 42055 - 27600 - Pythagorean Theorem - Find Leg Side"



What is the length of side **B** in the above **right triangle**?

Algebra:

✓

3

Scaffold:

Since this is a **right triangle**, let's use the **Pythagorean Theorem** to find the length of side **B**.

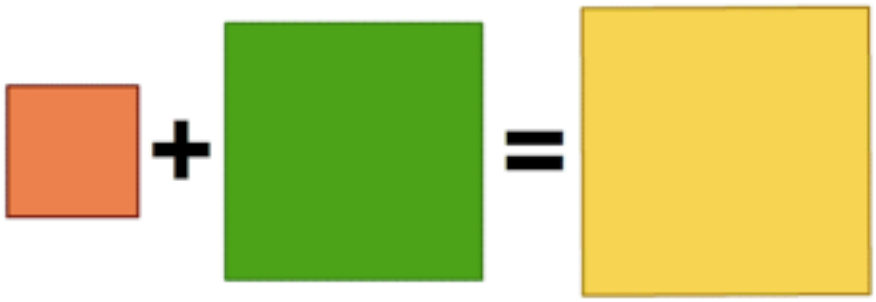
And the **Pythagorean Theorem** says, that the square of the hypotenuse of a **right triangle** is equal to.....

Multiple choice:

the sum of the two other sides

Wrong, there is something else that we have to do before we add the two sides.

the sum of the squares of the two other sides.



In the image, *the area of the square of the hypotenuse is equal to the area of the square of the two other sides*.

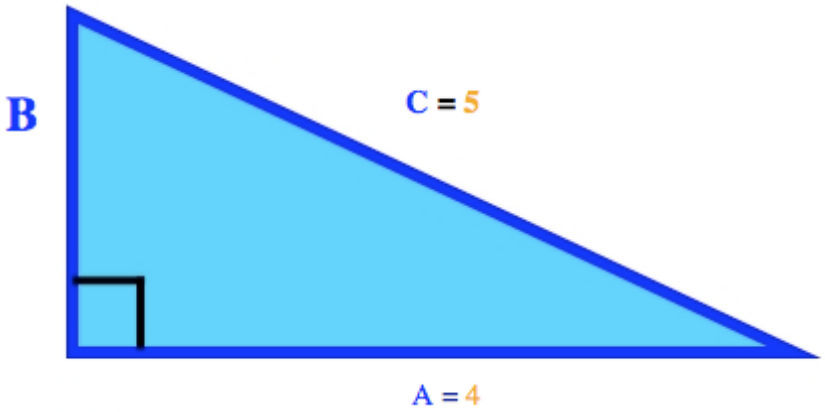
This means that the **Pythagorean Theorem** says *the square of the hypotenuse of a right triangle is equal to the sum of the squares of the two other sides*. So, choose the corresponding answer.

Scaffold:

Now, we know that the **Pythagorean Theorem** says *the square of the hypotenuse*

of a right triangle is equal to the sum of the squares of the two other sides.

Let's try the original problem again.



What is the length of side **B** in the above **right triangle**?

Algebra:

✓

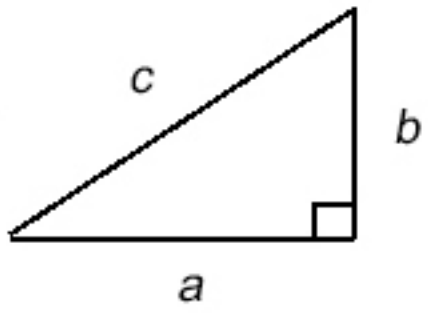
3

Hints

:

Remember, the **Pythagorean Theorem** says that *the square of the hypotenuse of a right triangle is equal to the sum of the squares of the two other sides*.

We also know that side **C** is the hypotenuse because it is to the opposite of the **right angle**.



$$a^2 + b^2 = c^2$$

So according to the **Pythagorean**

Theorem, $a^2 + b^2 = c^2$ $B^2 + 4^2 =$

$\mathbf{5}^2$

$B^2 + 4^2 =$

$\mathbf{5}^2$ $\mathbf{B}^2$ $= \mathbf{25}$ -

16 So, $B^2 = \mathbf{9}$

Since $\mathbf{B}^2 = \mathbf{9}$, **B** must

be equal to

3. Type in 3.

Problem Set "Looking for Pythagoras - Isosceles-Trianle "

1) Assistment #44272 "44272 - Looking for Pythagoras Investigation 4 #1"

The hypotenuse of a right isosceles triangle is √2 feet. How long is one leg of this triangle?

2) Assistment #44273 "44273 - Looking for Pythagoras Investigation 4 #1"

The hypotenuse of a right isosceles triangle is √8 feet. How long is one leg of this triangle?

3) Assistment #44274 "44274 - Looking for Pythagoras Investigation 4 #1"

The hypotenuse of a right isosceles triangle is √18 feet. How long is one leg of this triangle?

4) Assistment #44275 "44275 - Looking for Pythagoras Investigation 4 #1"

The hypotenuse of a right isosceles triangle is √32 feet. How long is one leg of this triangle?

5) Assistment #44311 "44311 - Looking for Pythagoras Investigation 4 #1"

Assistment #44272 "44272 - Looking for Pythagoras Investigation 4 #1"

The hypotenuse of a right isosceles triangle is $\sqrt{2}$ feet. How long is one leg of this triangle?

Fill in:

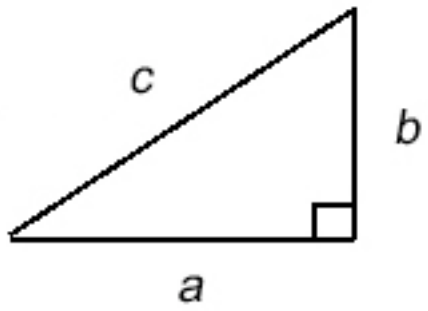
1

Hints:

Start by drawing a picture of this triangle.

The triangle you drew should look like this since it is both a right triangle and a isoceles triangle. An isoceles triangle has two equal sides.

Using the pythagorean theorem, find the length of one leg.



$a^2 + b^2 = c^2$

We notice that $\sqrt{2}$ is hypotenus in this triangle! solve for X!

Solve for x in this

equation: $(\sqrt{2})^2 = x^2 + x^2 \quad 2 = 2$

* $x^2 \quad 2 / 2 = x^2 \; 1 \quad = \; x^2$

Taking the square root according to the table of perfect square and square roots

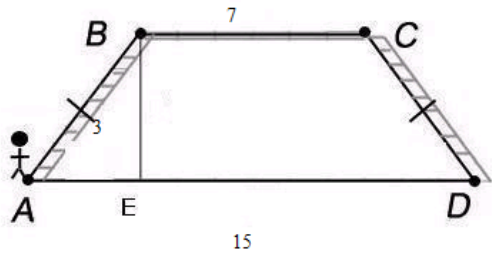
$\sqrt{1} = \sqrt{1 \times 1} = 1$	$1^2 = 1 \times 1 = 1$
$\sqrt{4} = \sqrt{2 \times 2} = 2$	$2^2 = 2 \times 2 = 4$
$\sqrt{9} = \sqrt{3 \times 3} = 3$	$3^2 = 3 \times 3 = 9$
$\sqrt{16} = \sqrt{4 \times 4} = 4$	$4^2 = 4 \times 4 = 16$
$\sqrt{25} = \sqrt{5 \times 5} = 5$	$5^2 = 5 \times 5 = 25$
$\sqrt{36} = \sqrt{6 \times 6} = 6$	$6^2 = 6 \times 6 = 36$
$\sqrt{49} = \sqrt{7 \times 7} = 7$	$7^2 = 7 \times 7 = 49$
$\sqrt{64} = \sqrt{8 \times 8} = 8$	$8^2 = 8 \times 8 = 64$
$\sqrt{81} = \sqrt{9 \times 9} = 9$	$9^2 = 9 \times 9 = 81$

x = 1.

Type in 1.

Problem Set "Looking for Pythagoras - Tricky Shape"

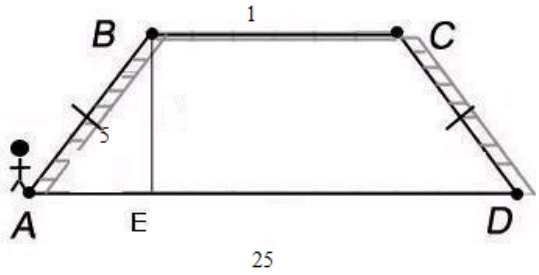
1) Assistment #44362 "44362 - Looking for Pythagoras Investigation 4 #2"



A climber at a park looks like the picture below.

If a kid climbs from A to B to C to D, how far has she climbed?

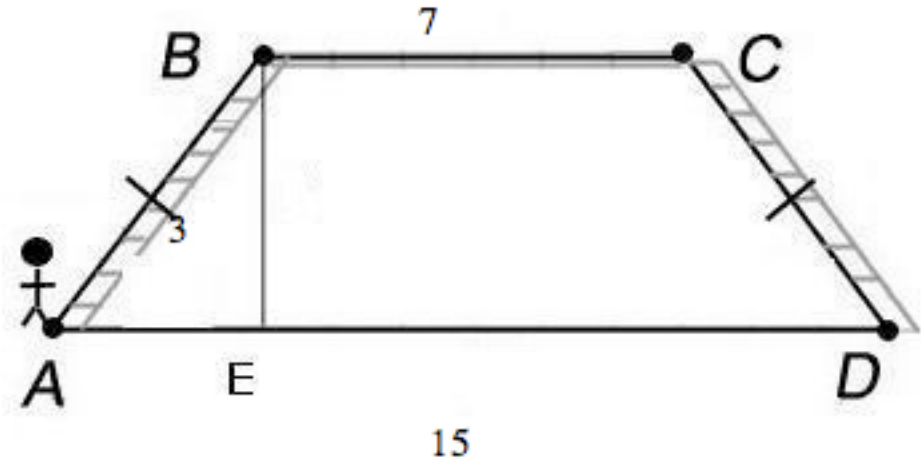
2) Assistment #44362 "44362 - Looking for Pythagoras Investigation 4 #2"



A climber at a park looks like the picture below.

If a kid climbs from A to B to C to D, how far has she climbed?

Assistment #44362 "44362 - Looking for Pythagoras Investigation 4 #2"



A climber at a park looks like the picture below.

If a kid climbs from A to B to C to D, how far has she climbed?

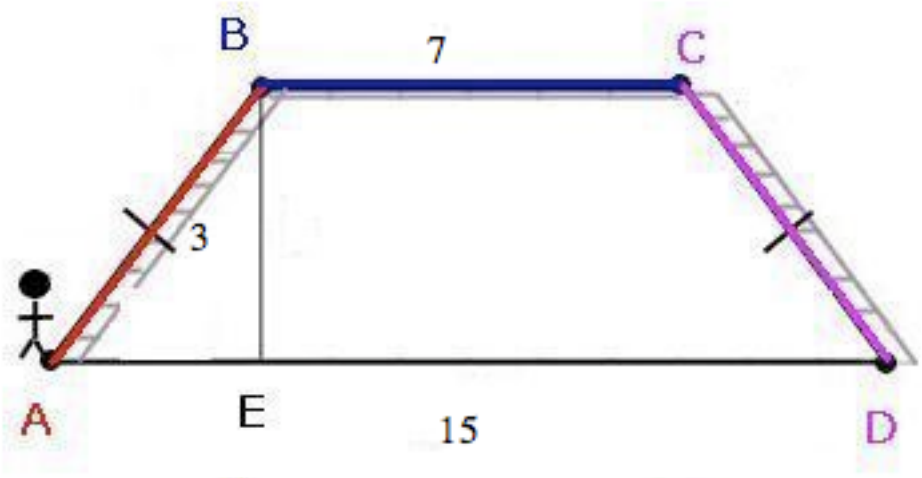
Fill in:

✓

17

Scaffold:

To find the distance from A to B to C to D, you need to find the length of AB, BC, and CD.



The length of BC is given to be 7.

You can find the length of AB and CD using the Pythagorean Theorem.

First, you must find the length of the unknown leg. What is the length of the unknown leg AE?

Algebra:

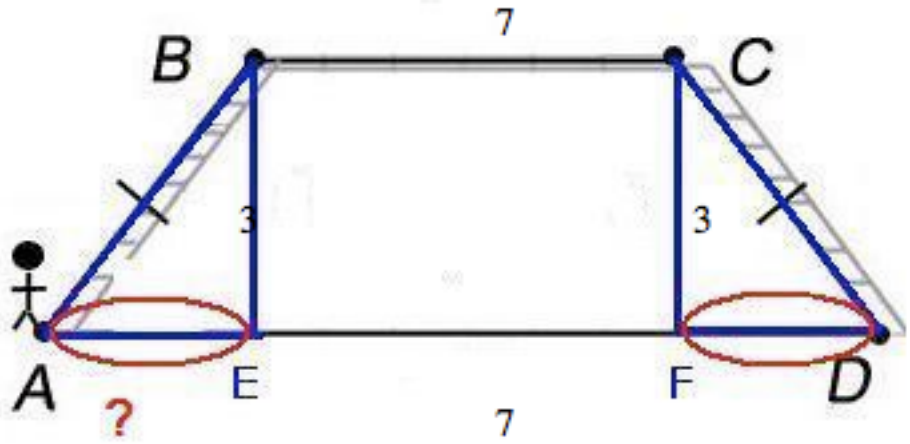
✓

4

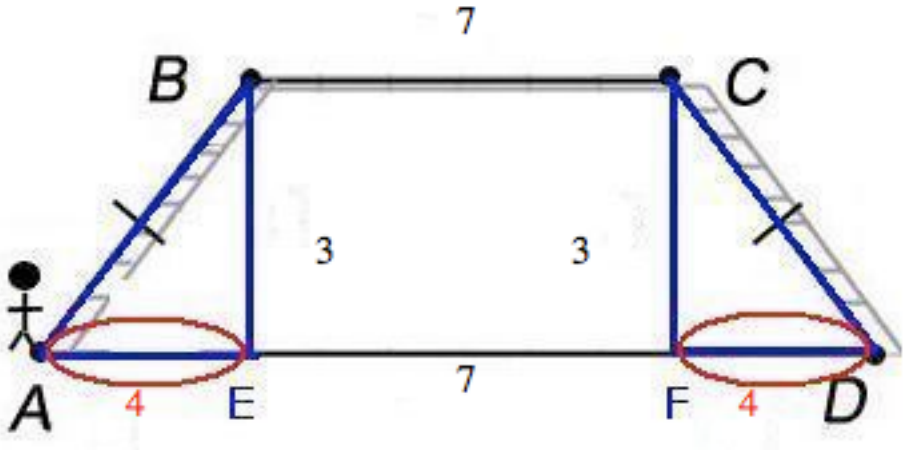
Hints

:

You will notice that ΔABE and ΔDCF are congruent triangles. Thus, we know that AE = FD.



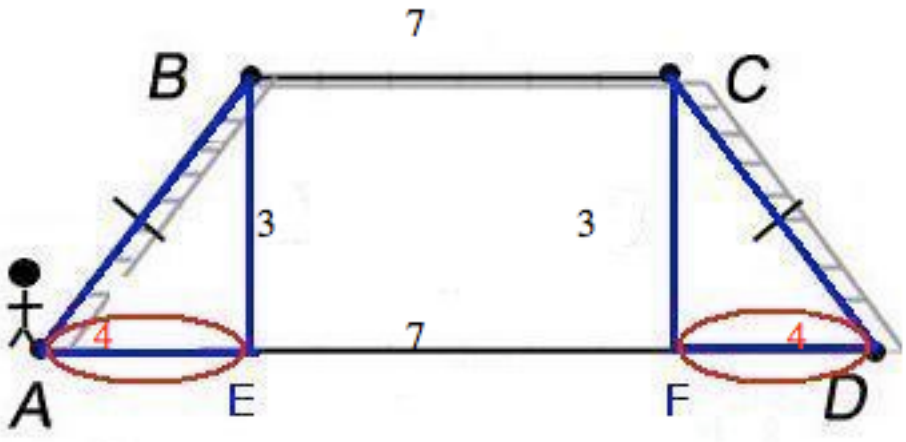
You can see that AE + EF + FD = 15 and EF = 7 and AE = FD. what is AE equal to?



Since we already know that AE + EF + FD =15 and EF = 7 and AE = FD. We can rewrite the equation as 2xAE +7 =15. Thus, we solve for AE = FD = 4. type in 4

Scaffold:

Now, you already know the length of the leg is 4 and you can use pythagoras theorem to find the length of AB and CD which are labeled in blue.



What is the length of AB? (this will also be the lenght of CD since this is an Isosceles Trapezoid.)

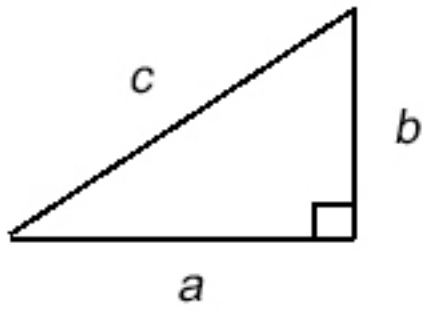
Algebra:

✓

5

Hints

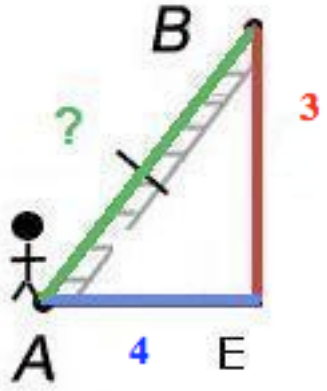
:



$a^2 + b^2 = c^2$

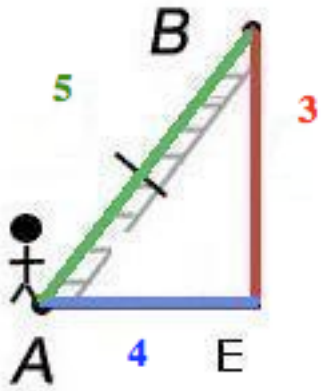
Use the Pythagorean Theorem

In our triangle AE= 4, BE = 3, Now find AB



$AB^2 = AE^2 + BE^2$.

$AB^2 = 4^2 + 3^2$



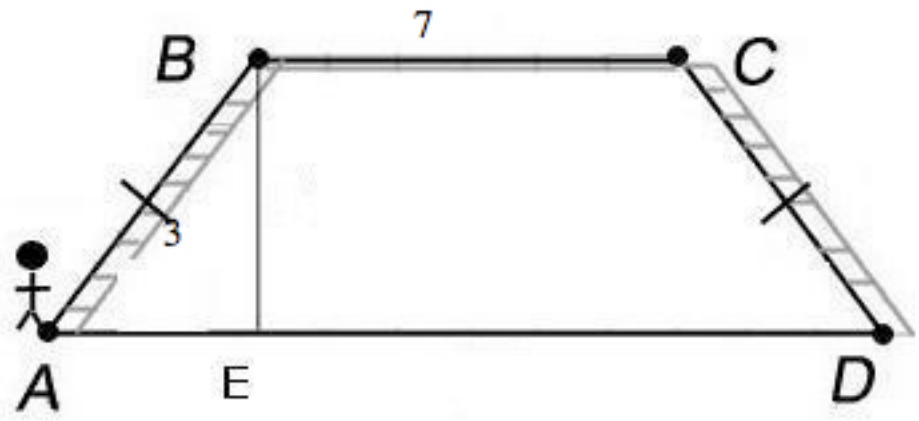
$AB^2 = 16 + 9$ $AB^2=25$. AB =5 So AB = 5 . Type in 5

Scaffold:

Let's now, go back to the origianl problem.

A climber at a park looks like the picture below.

If a kid climbs from A to B to C to D, how far has she climbed?



Algebra:

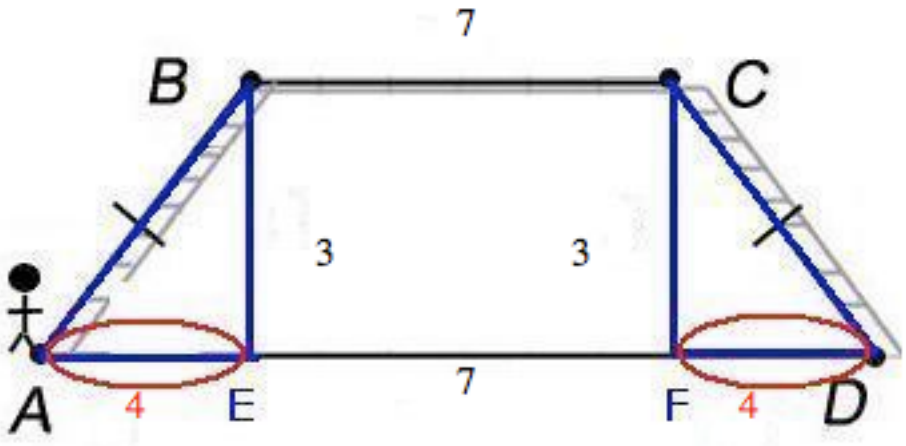
✓

17

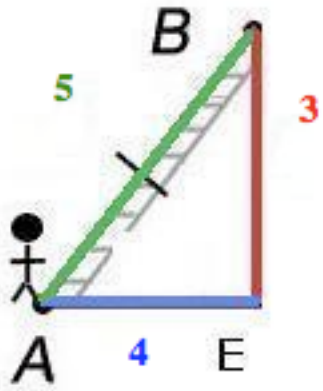
Hints

:

Let's review what we have done so far. Fist we solved the leg of this trapzoid which is 4



second we solved the length of AB and CD which is 5 for each of them.



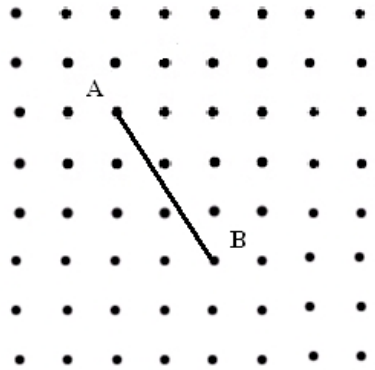
Now, in order to find the distance from A to D, we just need to add all the distance up.

AB + BC + CD = 5 + 7 + 5 = 17. The distance from A to B to C to D is 17. Type in 17.

Problem Set "Looking for Pythagoras - Distance on Grid"

1) Assistment #30179 "30179 - Looking for Pythagoras Investigation 2 #4"

How long is the line segment AB?



A) $\sqrt{13}$

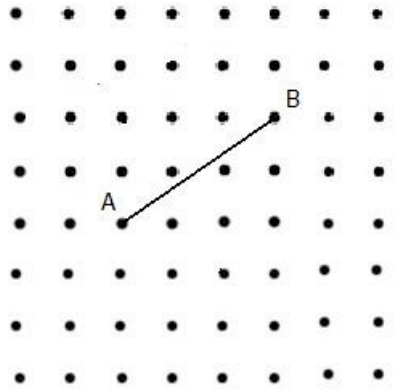
B) 5

C) 2

D) $\sqrt{5}$

2) Assistment #42209 "42209 - Looking for Pythagoras Investigation 2 #4"

How long is the line segment AB?



A) $\sqrt{13}$

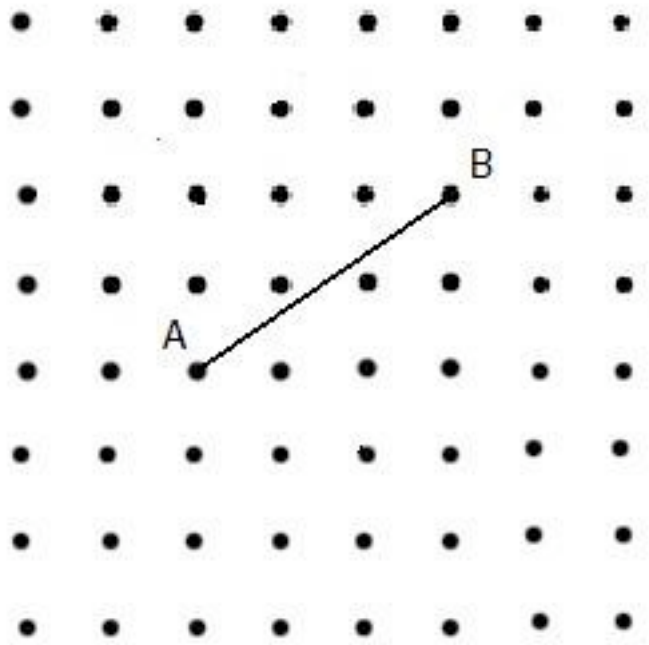
B) 5

C) 2

D) $\sqrt{5}$

Assistment #42209 "42209 - Looking for Pythagoras Investigation 2 #4"

How long is the line segment AB?



Multiple choice:

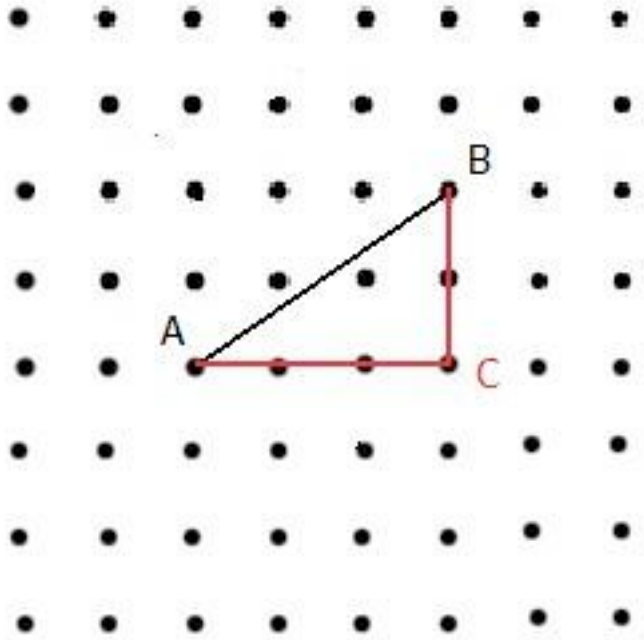
✓ √13 ✗ 5 ✗ 2 ✗ √5

Hints

:

Start by drawing a right triangle with AB as the hypotenus. Then you can use the Pythagorean Theorem to find AB.

Here is the picture. Use the pythagorean theorem to find AB.



The pythagoean theorem says that

: $AB^2 = AC^2 + BC^2$ Also AC =3 and

BC = 2

$AC^2 + CB^2 = AB^2$ 3^2

$+ \ 2^2 = AB^2 \ 9 \ +$

$4 \ = \ AB^2$

$13 \ = \ AB^2$

$AB^2=13$ $\sqrt{AB^2}=\sqrt{13}$ $AB=\sqrt{13}$ the length of the side AB must be the $\sqrt{13}$. Choose $\sqrt{13}$.

Problem Set "Looking for Pythagoras - Estimate Square Root"

1) Assistment #44422 "44422 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10"

What is the first whole number greater than √2?

2) Assistment #44423 "44423 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10"

What is the first whole number greater than √7?

3) Assistment #44425 "44425 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10"

What is the first whole number greater than √20?

4) Assistment #44465 "44465 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10"

What is the first whole number less than √29?

Assistment #44465 "44465 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10"

What is the first whole number less than $\sqrt{29}$?

Algebra:

5

Scaffold:

Let's start by finding some square roots of the perfect square then we can go back to solve the original problem.

what is the $\sqrt{25}$?

Fill in:

5

Hints:

Here is the table for some perfect square roots

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

you can see that $\sqrt{25} = 5$ so type in 5

Scaffold:

let's explore one more square root before going back to the original problem.

what is √36?

Fill in:

6

Hints:

Let's start by looking at the table of perfect square root and perfect squares.

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

can you find √36 from the table?

from the table above you are able to find $\sqrt{36} = 6$ type in 6

Scaffold:

only perfect square root can be whole number.

are there any perfect square roots between √25 and √36?

Multiple choice:

Yes

No

Hints:

Look at the table below. It has already listed all the perfect square roots from1 to 36. Can you see any perfect square root between √25 and √36?

$\sqrt{1} = \sqrt{1x1} = 1$	$1^2 = 1x1 = 1$
$\sqrt{4} = \sqrt{2x2} = 2$	$2^2 = 2x2 = 4$
$\sqrt{9} = \sqrt{3x3} = 3$	$3^2 = 3x3 = 9$
$\sqrt{16} = \sqrt{4x4} = 4$	$4^2 = 4x4 = 16$
$\sqrt{25} = \sqrt{5x5} = 5$	$5^2 = 5x5 = 25$
$\sqrt{36} = \sqrt{6x6} = 6$	$6^2 = 6x6 = 36$

There is no perfect square root between √25 and √36. Thus, choose "No".

Scaffold:

Is $\sqrt{25} < \sqrt{29} < \sqrt{36}$ true?

Multiple choice:

Yes

No

Hints:

based on what we have done so far. compare $\sqrt{29}$ with $\sqrt{25}$ and $\sqrt{36}$ from the table of perfect square roots.

you know that $\sqrt{25} < \sqrt{29} < \sqrt{36}$ is true. select Yes

Scaffold:

Now let's go back to the original problem.

what is the first whole number smaller than √29?

Fill in:

5

Hints:

Let's review what we have done so far. first, we have found the table of perfect square roots and perfect squares.

Second, we have found √25 =5 third, we have found √36 =6

Then, we find out that there is no perfect square root between √25 and √36. also, only perfect square root can be whole number.

so the first whole number smaller than $\sqrt{29}$ is $\sqrt{25}$ **which is**

5. type in 5

Problem Set "Looking for Pythagoras - Ordering of operation with square root"

1) Assistment #44482 "44482 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{1} + 1 * 2$$

2) Assistment #44483 "44483 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{4} + 2 * 3$$

3) Assistment #44484 "44484 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{9} + 10 * 8$$

4) Assistment #44485 "44485 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{16} + 5 * 1$$

5) Assistment #44486 "44486 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{25} + 1 * 3$$

6) Assistment #44487 "44487 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{36} + 9 * 3$$

7) Assistment #44488 "44488 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{49} + 2 * 6$$

8) Assistment #44489 "44489 - 42206 - 42082 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{64} + 7 * 8$$

9) Assistment #44514 "44514 - 42083 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{(22 + 3)} * 6$$

Notice: only $(22 + 3)$ is under the square root!

10) Assistment #44516 "44516 - 42083 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{(42 + 7)} * 5$$

Notice: only (42 + 7) is under the square root!

11) Assistment #44519 "44519 - 42083 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{(3 + 6)} * 9$$

Notice: only (3 + 6) is under the square root!

Assistment #44519 "44519 - 42083 - 42080 - 27964 - 8th Grade - Looking for Pythagoras - Problem 10(b)"

What is the value of the expression below?

$$\sqrt{(3 + 6)} * 9$$

Notice: only $(3 + 6)$ is under the square root!

Fill in:

27

Scaffold:

We can use order operation to findout the value of the expression

√(3+6)*9

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

Let's first evaluate what is inside the "Paranthesis"

What is (3 +6) equal to ?

Fill in:

9

Hints:

3 + 6 is equal to 9 type in 9

Scaffold:

We can use order of operations to find the value of the expression

$\sqrt{(6 + 3)} * 9$

$\sqrt{9} * 9$

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

So next let we solve the "Exponents (powers, roots, etc)"

What is the value of $\sqrt{9}$?

Fill in:

You can see from the table that $\sqrt{9}$ is a perfect square root and its value is 3.

Type in 3.

Scaffold:

Now Let's return to the Original Problem

what is √(3 +6)*9?

Fill in:

27

Hints:

Let's review what we have done so far.

So far we have follow the order of operation done this much of the problem.

√(3 + 6)*9

√9 * 9

3 * 9

all we left to do is just multiplication.

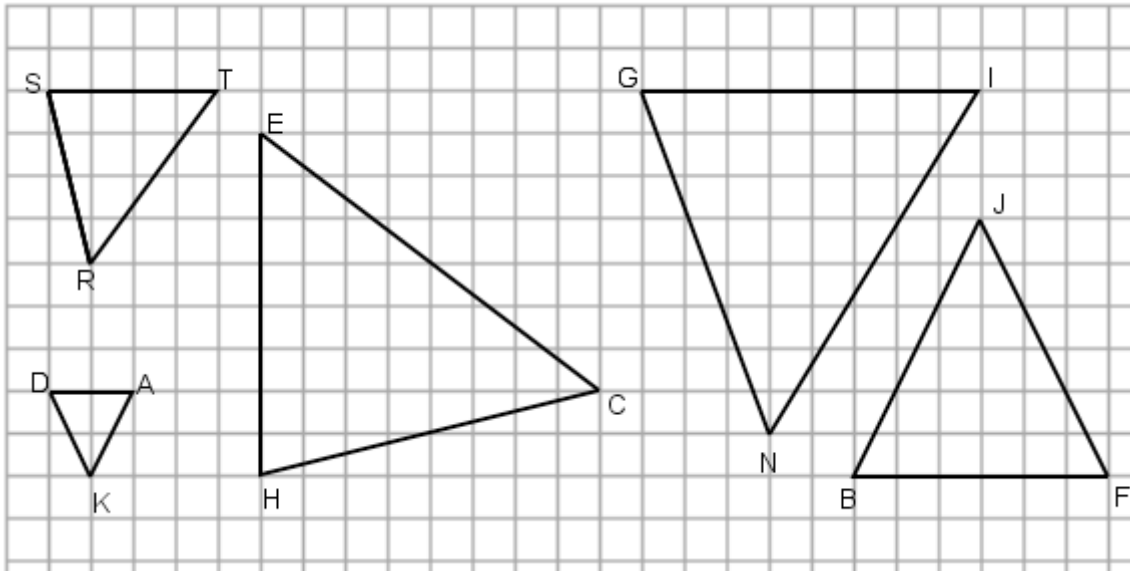
Assistment – Mihajlo Zeljkovic

Problem Set "Stretching and Shrinking Pre-Test (14 items) V1.0 With Tutoring"

id:[5545]

1) Assistment #27946 "27946 - 14140 - Stretching and Shrinking - Inv 2.5.a"

A) Which triangle above is similar to STR?

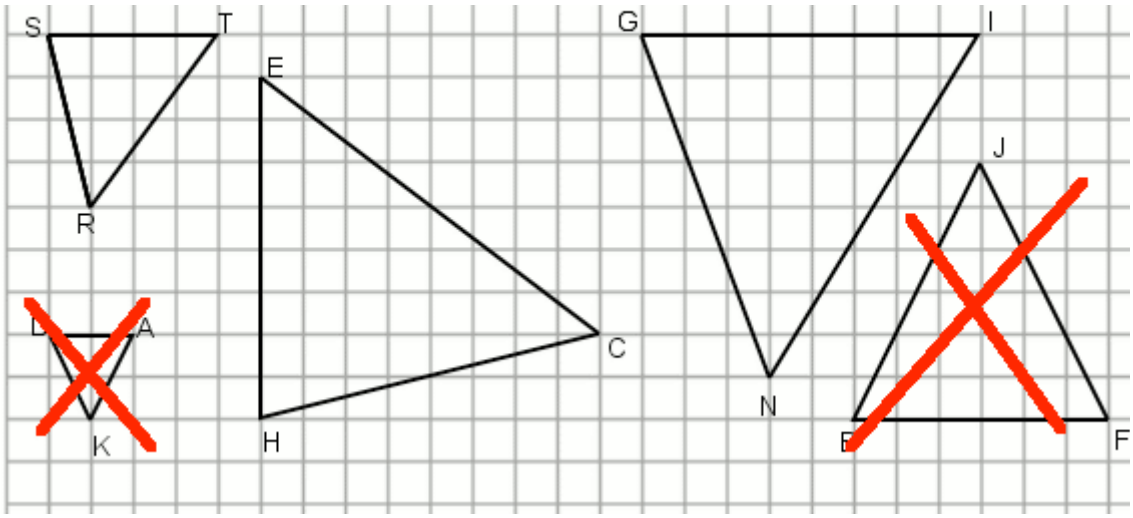


Multiple choice:

✘A. DAK ✓ B. HEC ✘C. GIN ✘D. BFJ

Hints:

- Note DAK and JBF are both isoceles, but STR is not. So they cannot be similar.



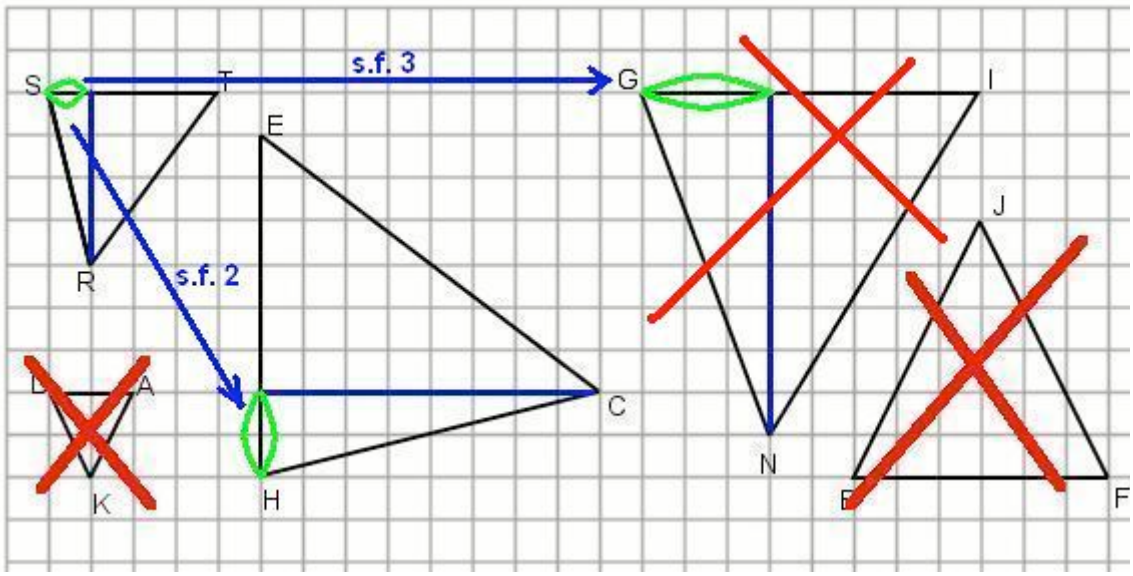
- This leaves HEC and GIN. Use the grid to compare STR to both HEC and GIN.

Find the smallest sides of each triangle and draw heights to those sides. Look if you can find two triangles with the same ratio.

- In both triangles HEC and GIN, we have heights that are twice as long as the height in STR.

For two triangles to be similar, all parts should have the same scale factor. Look if you can determine which of the two triangles is similar to STR.

- As you can see on the picture below, the smaller part of the side GI of triangle GIN is 3 times as long as the corresponding part in triangle STR, and since the scale factor is 2 it cannot be the answer.

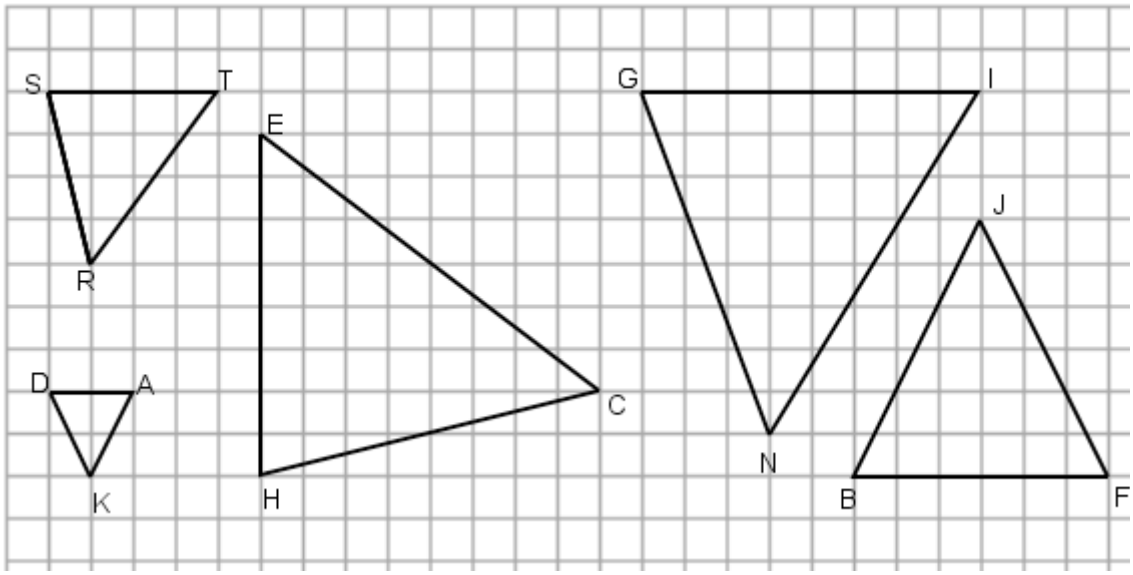


The triangle similar to STR is HEC. Select B) HEC.

B) Explain your answer on the box below.

Ungraded open response:

C)



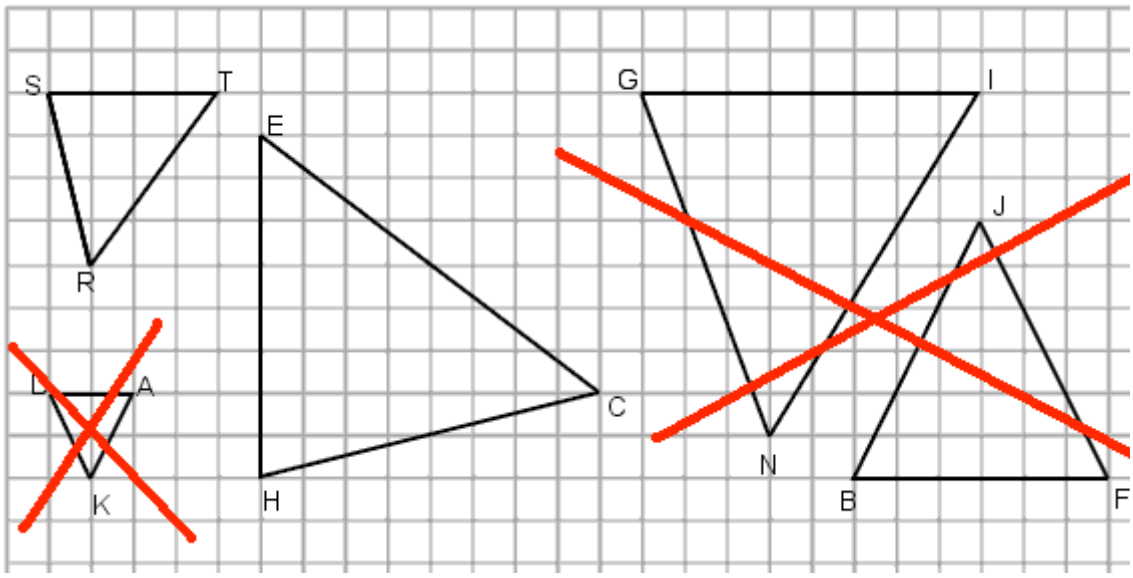
Which side corresponds to SR in the similar triangle?

Multiple choice:

✘EC ✓HC ✘HE

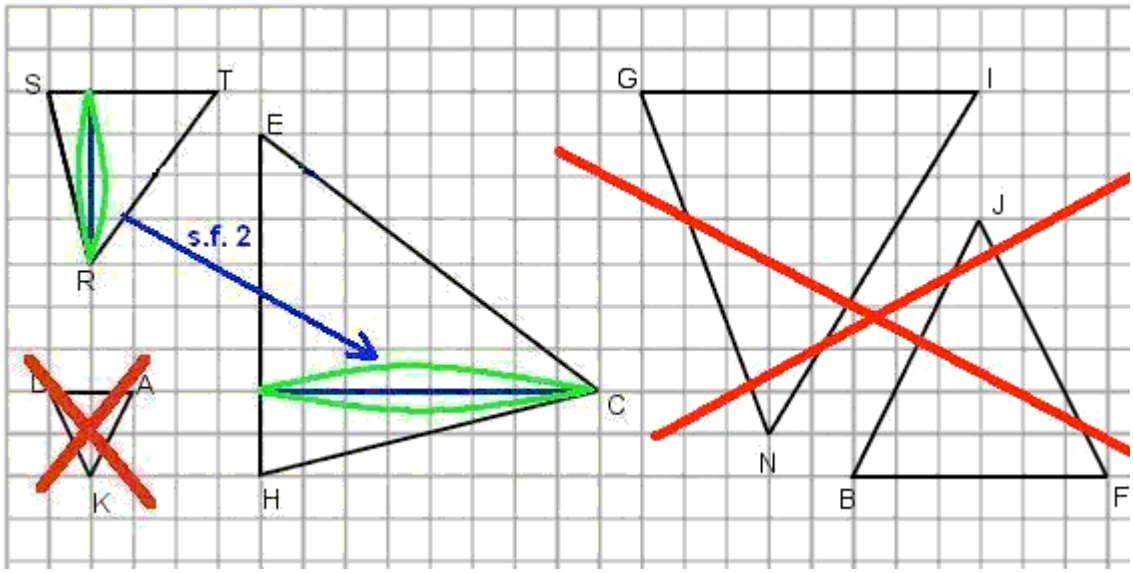
Hints:

•



Remember, triangles STR and HEC are similar.

•

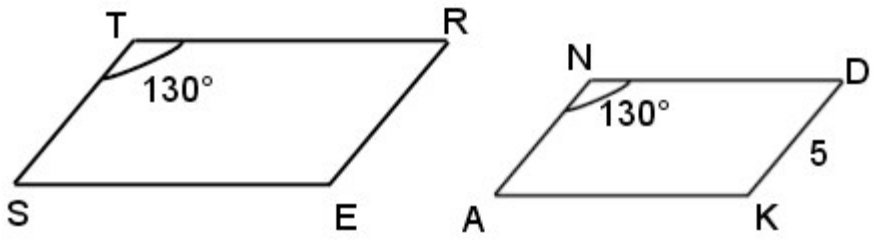


Point S is closer to the height of SRT than the point T, and point H is closer to the height of the triangle HEC than the point E.

- HC corresponds to SR in the similar triangle. Select HC.

2) Assistment #28853 "28853 - 14157 - Stretching And Shrinking - Morph - Inv 3.4.a"

If we know the area of parallelogram STRE is 9 times that of paralellogram ANDK and the two parallelograms are **similar**, what is the measure of ER? (Picture is not drawn to scale)



Algebra:

✓ 15

Hints:

- The two parallelograms are similar since they are both parallelograms and have a common angle of 130 degrees.
- 

When the area of a figure is 9 times as large the scale factor is 3.

- If the scale factor from the smaller parallelogram to the larger is 3, what is the

measure of ER?

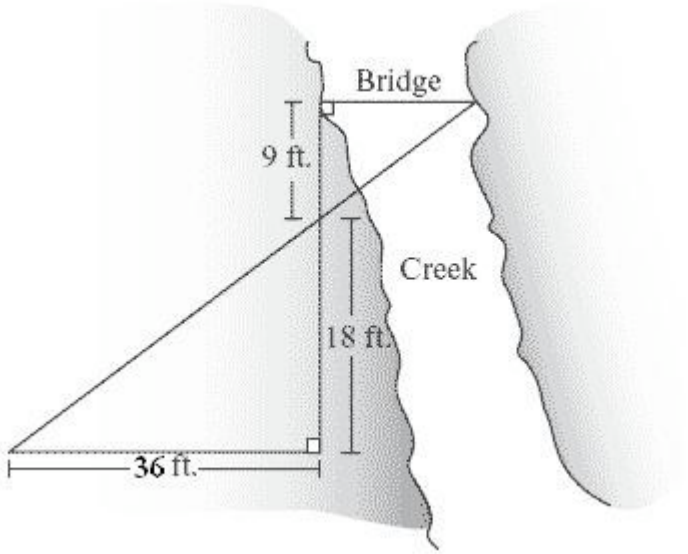
- Since the scale factor is 3 from the small parallelogram to the large parallelogram we can multiply the side of the small parallelogram by 3 to get the measure of the side of the large parallelogram.

3 * 5 = 15. Type in 15.

3) Assistment #28839 "28839 - Stretching and Shrinking - 2006 #32"

Mr. Lui wants to build a bridge across the creek that runs through his property.

He made measurements and drew the map shown below.

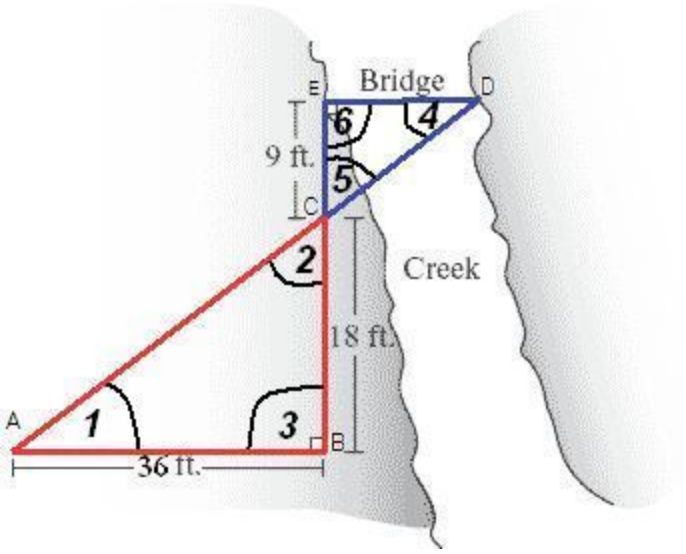


Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge?

Algebra:

✓ 18

Scaffold:



The red and blue triangles are similar. We are going to use the known lengths to find the length of the bridge.

First to show that two triangles are similar you need to show that they have 2 congruent (same measure) angles.

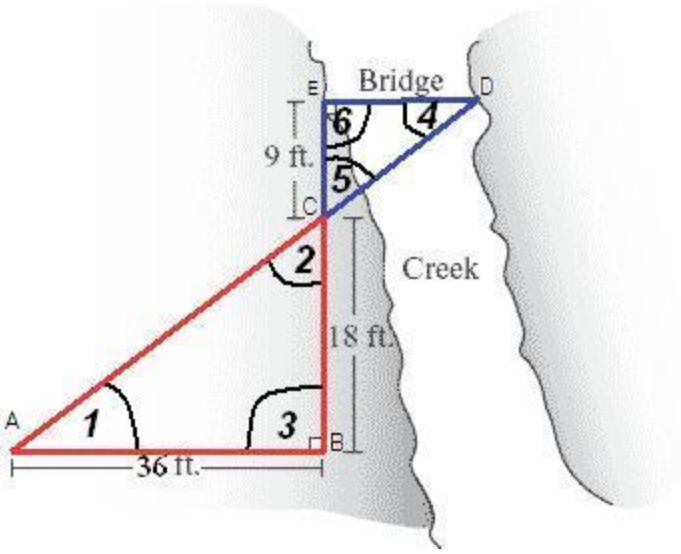
Angle 2 is congruent to which angle ?

Multiple choice:

✘A) 1 ✘B) 3 ✘C) 4 ✓ D) 5 ✘E) 6

Hints:

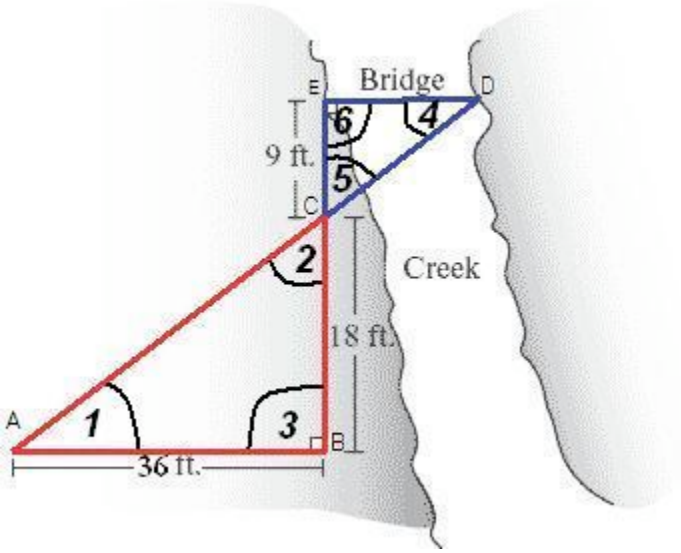
-



Angles 2 and 5 are called vertical angles.

- Vertical angles are congruent.
- Angle 2 is congruent to angle 5. Select D) 5

Scaffold:



Angle 3 is congruent to which angle?

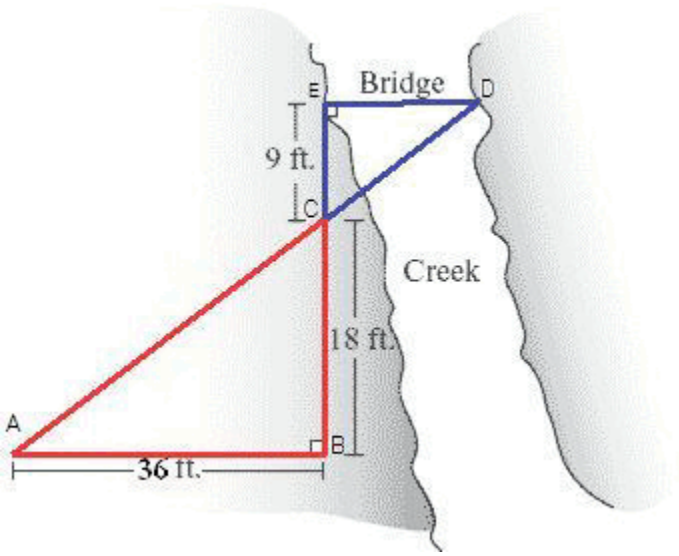
Multiple choice:

✘A) 1 ✘B) 2 ✘C) 4 ✘D) 5 ✓ E) 6

Hints:

- Angle 3 and angle 6 are both right angles.
- Angle 3 is congruent to angle 6. Select E) 6

Scaffold:

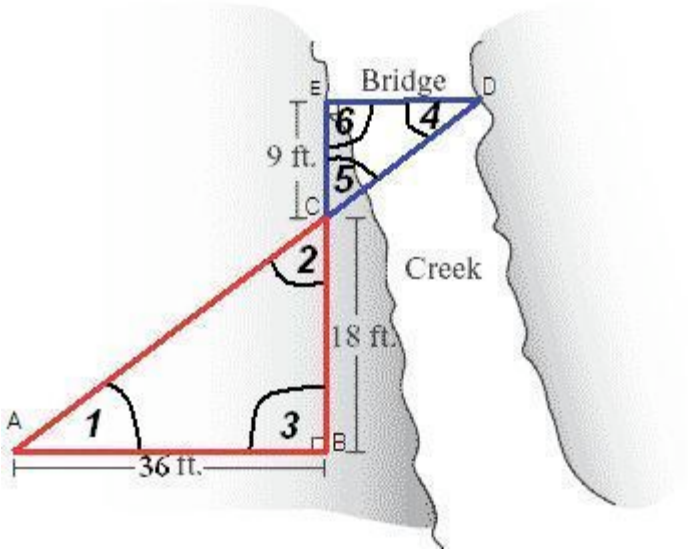


Since the two triangles are similar which side in CED corresponds to BC in ABC?

Multiple choice:

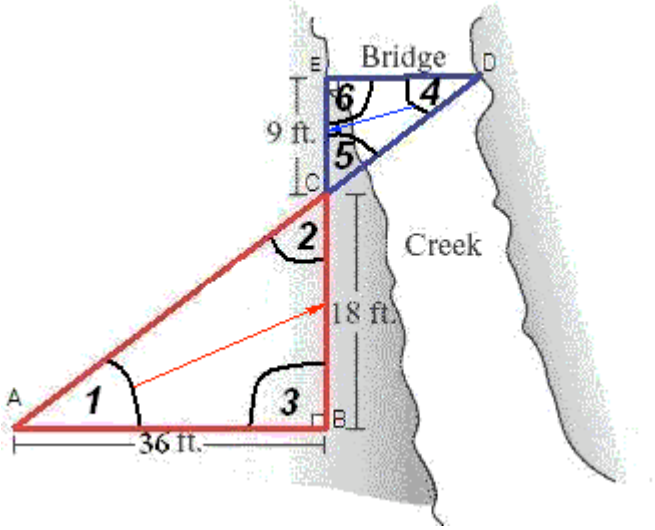
✘A) AB ✓ B) CE ✘C) CD ✘D) DE ✘E) AC

Hints:



-

Angles 1 and 4 are congruent.

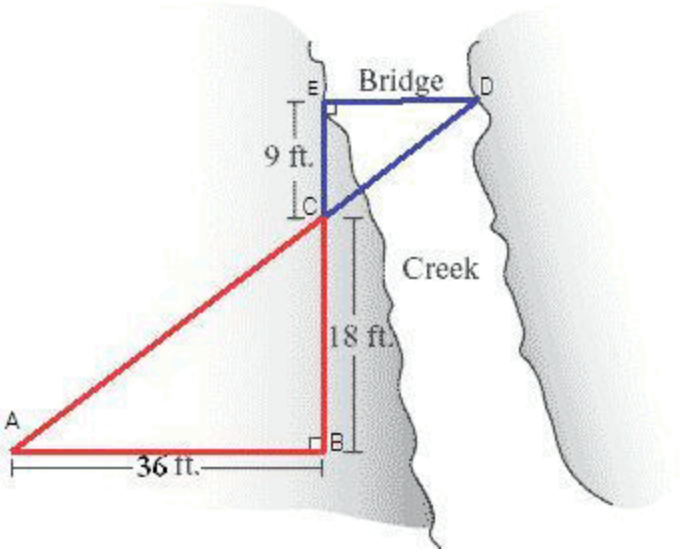


-

CE and BC are across the congruent angles.

- CE in CED corresponds to BC in ABC. Select B) CE

Scaffold:

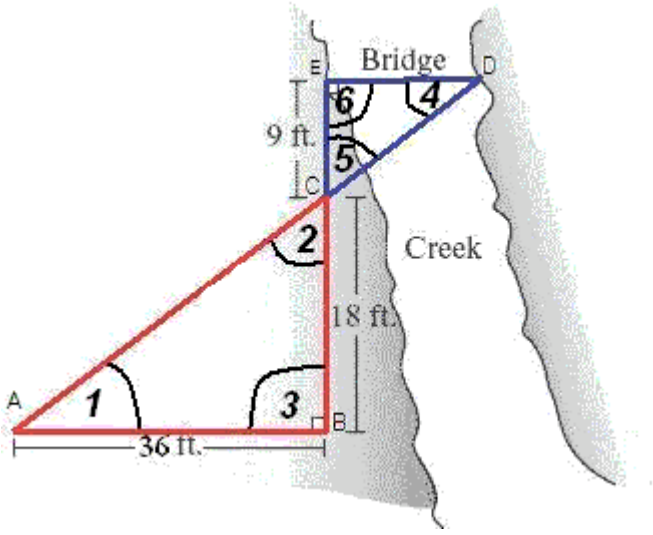


Which side in ABC corresponds to ED (bridge) in CED?

Multiple choice:

✘A) BC ✘B) AC ✘C) CE ✓ D) AB ✘E) CD

Hints:



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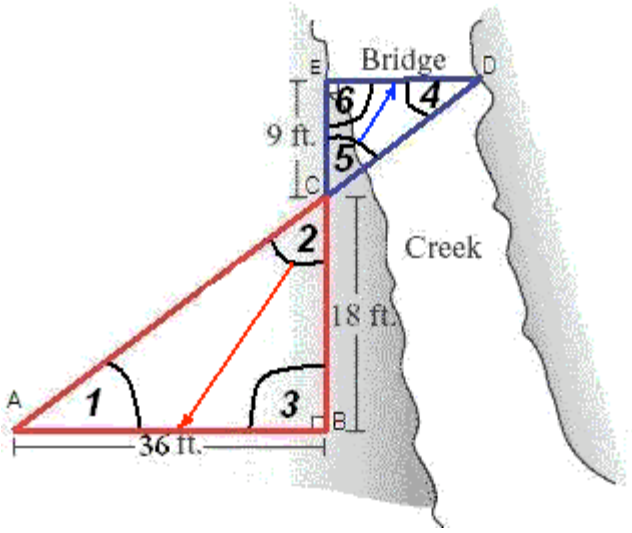
Angles 2 and 5 are congruent.

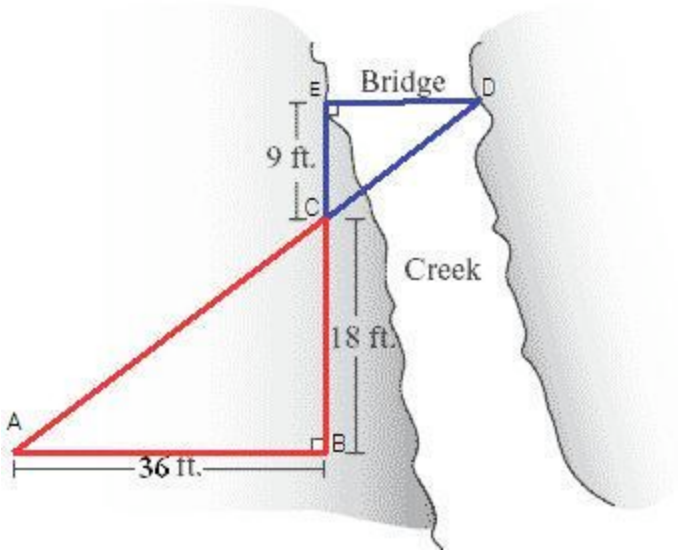


-

AB and ED are across the same angles.

- AB corresponds to ED. Select D) AB.

Scaffold:



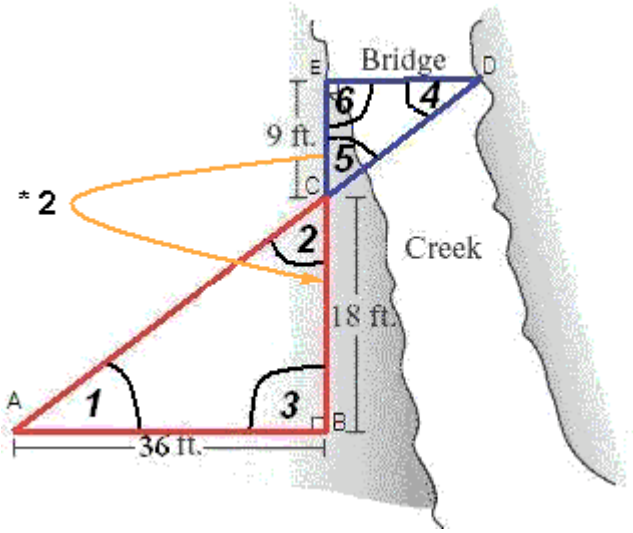
What is the scale factor from CED to ABC?

Fill in:

✓ 2

Hints:

- BC and CE are corresponding sides in two similar triangles. CE = 9 and BC = 18



18 = 2 * 9

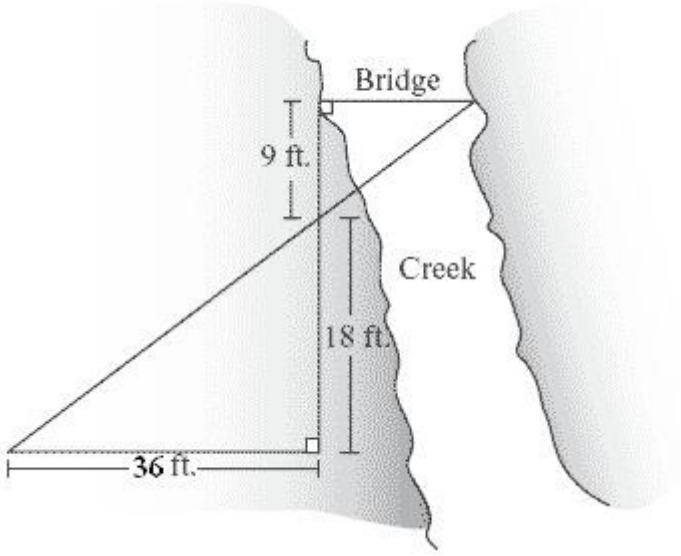
- Scale factor is 2. Type in 2.

Scaffold:

Now back to the original problem.

Mr. Lui wants to build a bridge across the creek that runs through his property.

He made measurements and drew the map shown below.

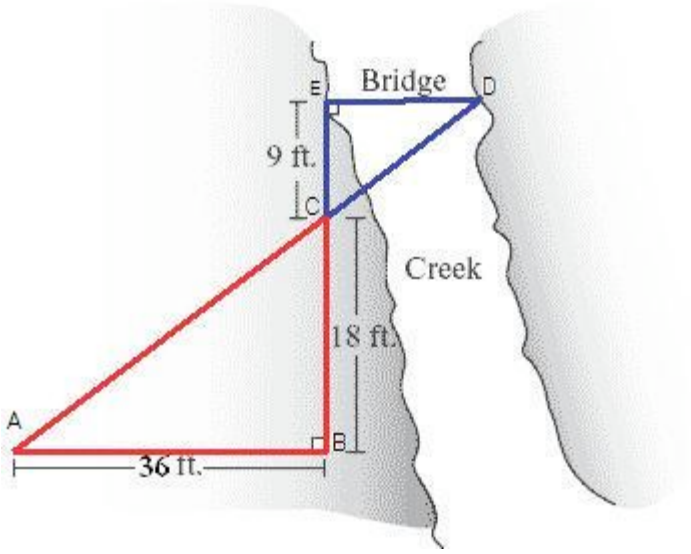


Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge.

Algebra:

✓ 18

Hints:



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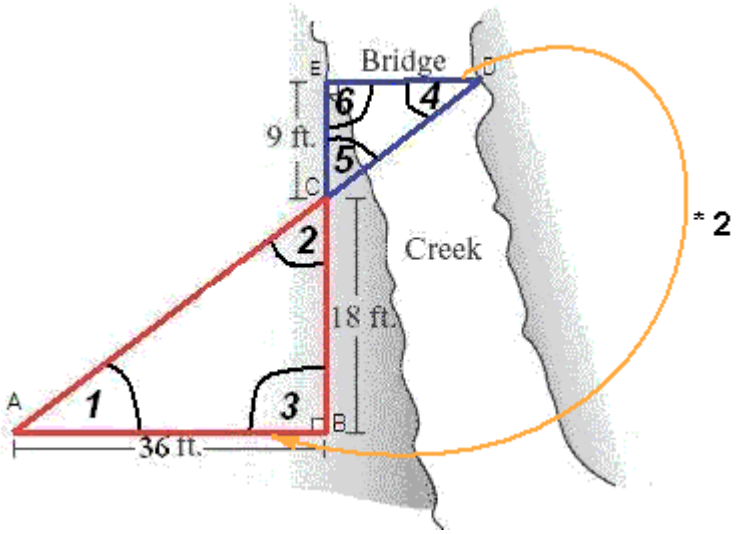
Remember ED(bridge) in CED corresponds to AB in ABC and scale factor is 2.



-

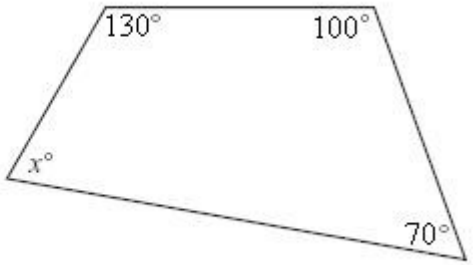
AB = 2 * ED

- 36 = 2 * ED (bridge).

So, Distance across the creek is 18 feet. Type in 18.

4) Assistment #28850 "28850 - Stretching and Shrinking - Morph - 2007 #7" "

The figure below is a quadrilateral.



What is the value of x in the quadrilateral?

Algebra:

✓ 60

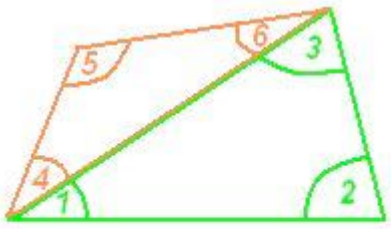
Scaffold:

What is the sum of all angles in quadrilateral figure?

Algebra:

✓ 360

Hints:

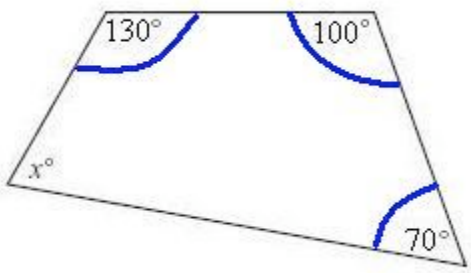


-

Divide the figure into two triangles.

- Sum of all angles in a triangle is 180.
- Sum of all angles in quadrilateral figure is 180 + 180 = 360. Type in 360.

Scaffold:



What is the sum of three known angles in this problem?

Fill in:

✓ 300

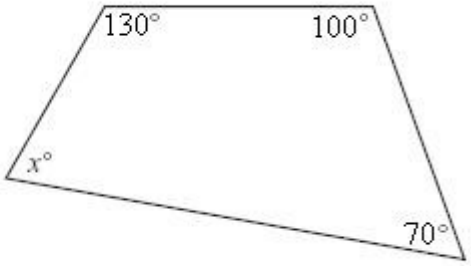
Hints:

- 70 + 130 + 100 = ?
- Sum of angles is 300. Type in 300.

Scaffold:

Now, back to the original problem:

The figure below is a quadrilateral.



What is the value of x in the quadrilateral?

Fill in:

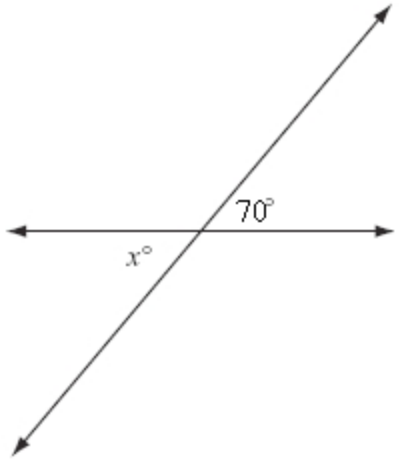
✓ 60

Hints:

- Remember the sum of all angles in this figure is 360 and the value of all besides x is 300.
- 360 - 300 = ?
- Value of x is 60. Type in 60.

5) Assistment #28851 "28851 - Stretching and Shrinking - Morph - 2007 #21"

The figure below shows two intersecting lines.



Based on the given angle measure, what is the value of x?

Algebra:

✓ 70

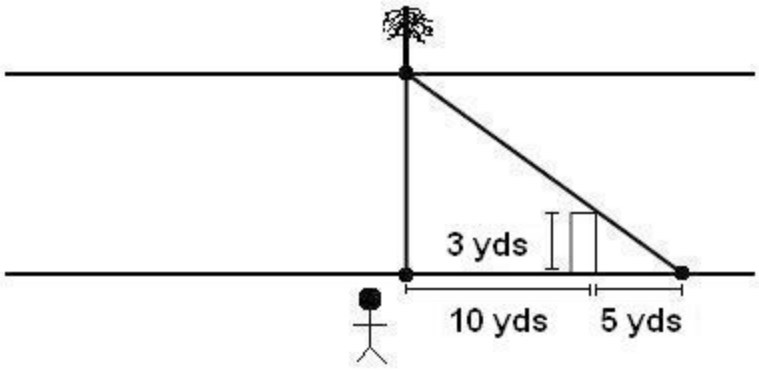
Hints:

- Imagine folding the picture so one angle is on top of the other.
- The two angles are called vertical angles.
- Vertical angles are always equal, so if one of them is 70^o, the other one must be 70^o too.

Value of x is 70^o. Type in 70.

6) Assistment #14162 "14162 - Stretching and Shrinking - Morph - Inv 5.1.a"

Ben was able to make the measurements given in the picture. He is straight across from the tree, and 10 yards from the dock. The dock is 3 yards long. The line that goes from the tree to the end of the dock hits the side of the river 5 yards down from the dock. How far is it across the river?

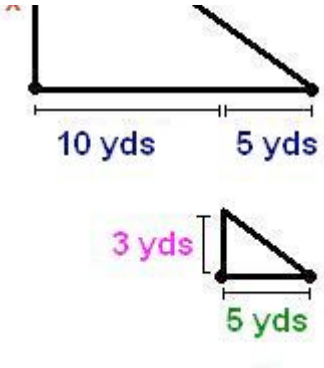


Algebra:

✓ 9

Hints:

- There are two similar triangles in the diagram, one inside the other. They are shown seperated in this image.



- Set up a proportion to find the value of x, the distance across the river. The example bellow shows the ratio of the short side to the long side of the triangle. We use **15** because **10** + **5** = **15**

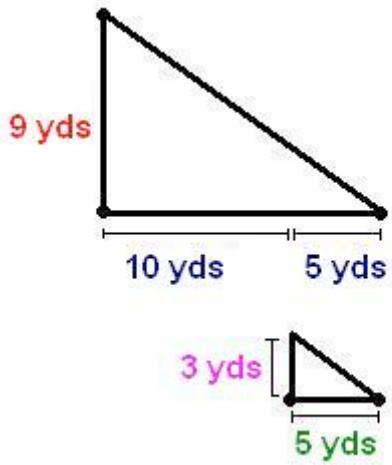
$$\frac{3}{5} = \frac{x}{15}$$

- Since 5 * 3 = 15, the scale factor from the small triangle to the large triangle is

3. Use this to find the value of x.

$$\frac{3 * 3}{5 * 3} = \frac{x}{15}$$

$$\frac{9}{15} = \frac{x}{15}$$



•

The distance across the river is 9 yards, please type in 9.

7) Assistment #28936 "28936 - 14163 - Stretching and Shrinking - Morph - Inv 5.2.a"

Find the value of **x** that makes the fraction equivalent.

$$\frac{x}{50} = \frac{11}{10}$$

Algebra:

✓ 55

Hints:

- One way to solve this problem is to find the scale factor that you multiply by 10 to get 50. Then if you multiply the denominator by this factor you also need to multiply the numerator.

- The scale factor is **5** because 5 * 10 = 50

$$\frac{x}{} \quad \frac{11}{}$$

$$\frac{x}{50} = \frac{11}{10}$$

$$\frac{x}{50} = \frac{11 * 5}{10 * 5}$$

- $$\frac{x}{50} = \frac{11}{10}$$

$$\frac{x}{50} = \frac{11 * 5}{10 * 5}$$

$$\frac{\mathbf{x}}{\mathbf{50}} = \frac{\mathbf{55}}{\mathbf{50}}$$

X = 55

50 = 50

- The value of x is 55. Please enter 55.

8) Assistment #28912 "28912 - Stretching and Shrinking - Morph - Inv 1.3.a"

What is 140% of 55?

Fill in:

✓ 77 ✓ 77.0

Hints:

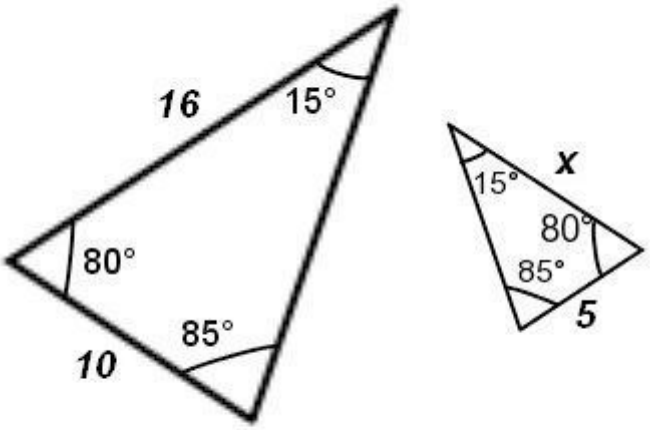
- To find 140% of 55, convert the percentage to decimal.
- To write 140% as a decimal remove the percentage sign and move the decimal two spaces to the left, between the 1 and 4.
- 140% as a decimal is 1.4.

Multiply the decimal by 55 to get your answer. 1.4 * 55 = ?

- 1.4 * 55 = 77
- 140% of 55 is 77. Type in 77.

9) Assistment #28937 "28937 - 14161 - Stretching and Shrinking - Morph - Inv 4.4.a"

The two triangles are similar. Find the length of the missing side, x.



Algebra:

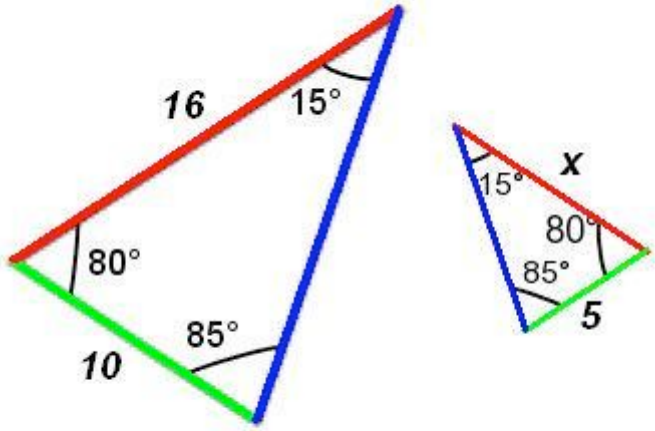
✓ 8

Hints:

- We need to find the scale factor from the large triangle to the small one. Since the triangle gets smaller we know the scale factor will be less than 1.
- Check which sides of the triangles correspond by using the equal angles.

For example, the sides, which are across from the 80 degree angle are

c ee angles.



- Now we can use the two green corresponding sides (the ones opposite 15 degrees) to find the scale factor since we know their lenghts.

In the smaller triangle the side is 5 units and in the bigger one it's 10 units.

So the scale factor is 5/10 = 1/2.

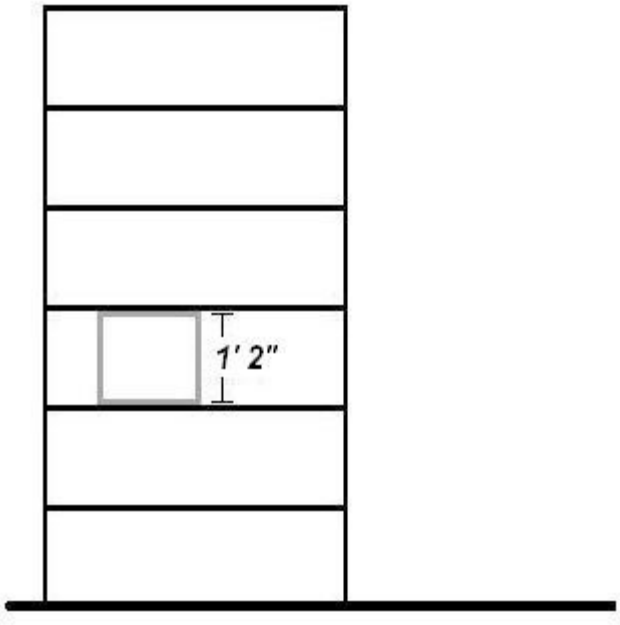
- Now we can use the scale factor of 1/2 to find the missing side lengths.

- 16 units * 1/2 = 8 unit

So x = 8 units. Type in 8.

10) Assistment #29103 "29103 - 14140 - Stretching and Shrinking - Morph - Inv 1.1.a"

A box was on a shelf in a big warehouse as shown below. The box was 1 foot 2 inches tall. The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall in feet is the whole shelf (round to the nearest whole foot)?



Algebra:

✓ 7

Scaffold:

One way to solve this problem is to multiply the feet portion by 6 and then multiple the inches portion by 6.

Start by multiplying just the foot portion by 6.

1 foot * 6 = ? (How many feet)

Algebra:

✓ 6

Hints:

- Just multiply 1 * 6
- 1 * 6 = 6. There are 6 feet when you count just the whole feet in the measure of the box. Type in 6.

Scaffold:

So, part of the height is 6. Now we need to multiply 2 by 6.

2 inches * 6 = ? (How many inches)

Algebra:

✓ 12

Hints:

- Just multiply 2 * 6
- 2 * 6 = 12. There are 12 inches when you count just the whole inches in the measure of the box. Type in 12.

Scaffold:

So, now we have 12 inches, but we need our answer to be in feet. How many feet is 12 inches?

Algebra:

✓ 1

Hints:

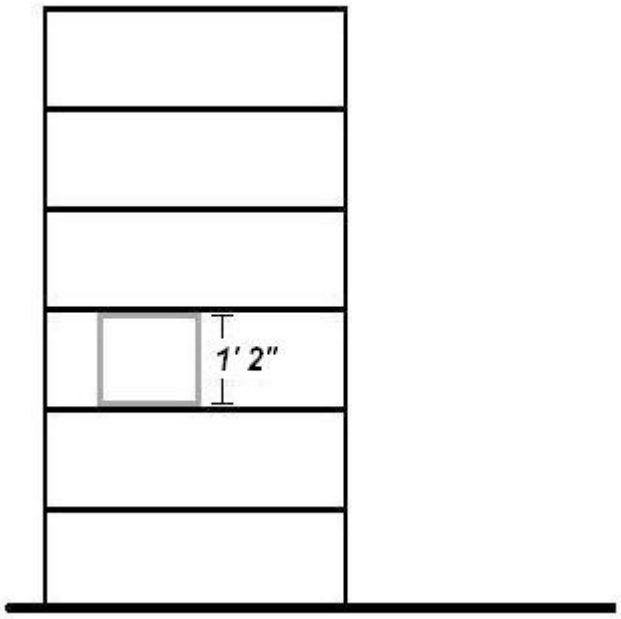
- 1 foot is 12 inches.
- In 1 foot there is 12 inches. Type in 1.

Scaffold:

Now back to the original problem.

A box was on a shelf in a big warehouse as shown below. The box was 1 foot 2 inches tall.

The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall in feet is the whole shelf (round to the nearest whole foot)?



Algebra:

✓ 7

Hints:

- Remember, when you multiply the feet portion by 6 you get:

1 foot * 6 = 6 feet

- When you multiply the inches portion by 6 you get:

2 inches * 6 = 12 inches

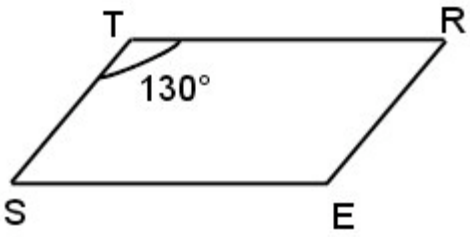
- 12 inches is 1 foot.

- Height of the whole shelf is: 1 foot + 6 feet = 7 feet.

Type in 7.

11) Assistment #14156 "14156 - Stretching_and_Shrinking_Inv_3_3_a_Hints"

What is the measure of angle R in the parallelogram TRES?

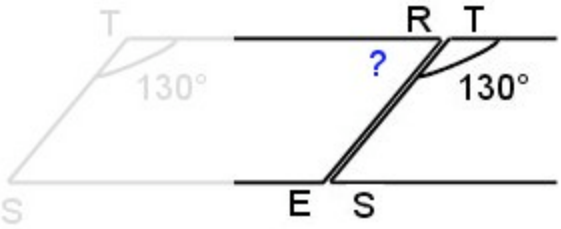


Algebra:

✓ 50

Hints:

- By cutting the parallelogram in half and rearranging it, we see that the angle R and the angle T make an angle of 180?.



- So, 130 + R = 180

Now find R.

- If 130 + R = 180 then

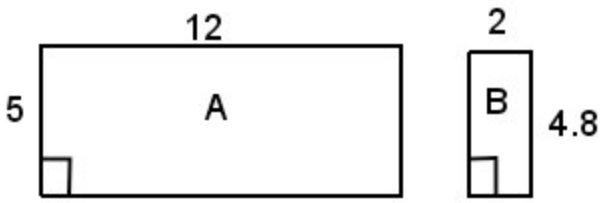
180- 130 = R

50 = R

Type in 50.

12) Assistment #14159 "14159 - Stretching_and_Shrinking_Inv_4_2_a_Hints"

Parallelogram A and B are similar. What is the scale factor from rectangle A to B?



Algebra:

✓.4 ✗2.5

Hints:

- Notice that the side of value 5 corresponds to the side of value 2. Also, the side of value 12 corresponds to the side of value 4.8.
- Another way to see scale factor here is asking how much would you multiply a side of A by to get the corresponding side of B?
- The side of length 2 of B corresponds to the side of length 5 of A. What do we multiply 5 by to get 2? Let x be the scale factor from rectangle A to B, then 5 * x = 2. Since 2 is less than 5, the value of x should be less than 1.
- Because of fact families, if 5 * x = 2 then x = 2/5 = 0.4 We can check this and yes 5 * 0.4 = 2 Therefore the scale factor is .4

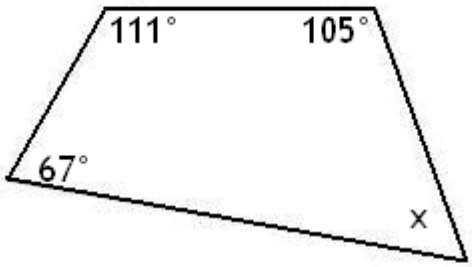
Please enter .4

Problem Set "Stretching and Shrinking Post Test (14 Items) Without Tutoring"

id:[6270]

1) Assistment #31696 "31696 - 30200 - Sum Of Interior Angles Quadrilateral"

The figure below is a quadrilateral.



What is the value of x in the quadrilateral?

Algebra:

✓ 77

Scaffold:

What is the sum of all angles in quadrilateral figure?

Algebra:

✓ 360

Hints:

-

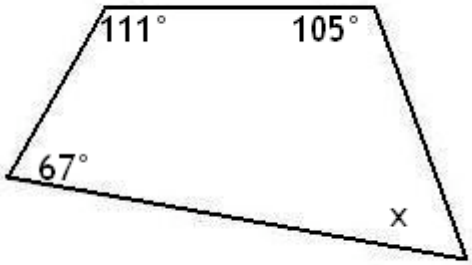
Divide the figure into two triangles.

- Sum of all angles in a triangle is 180.

- Sum of all angles in quadrilateral figure is 180 + 180 = 360. Type in 360.

Scaffold:

The figure below is a quadrilateral.



What is the sum of the three known angles?

Fill in:

✓ 283

Hints:

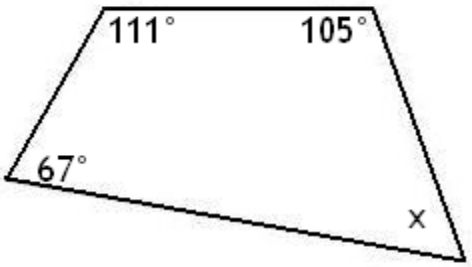
- 111 + 105 + 67 = ?

- Sum of angles is 283. Type in 283.

Scaffold:

Now, back to the original problem:

The figure below is a quadrilateral.



What is the value of x in the quadrilateral?

Fill in:

✓ 77

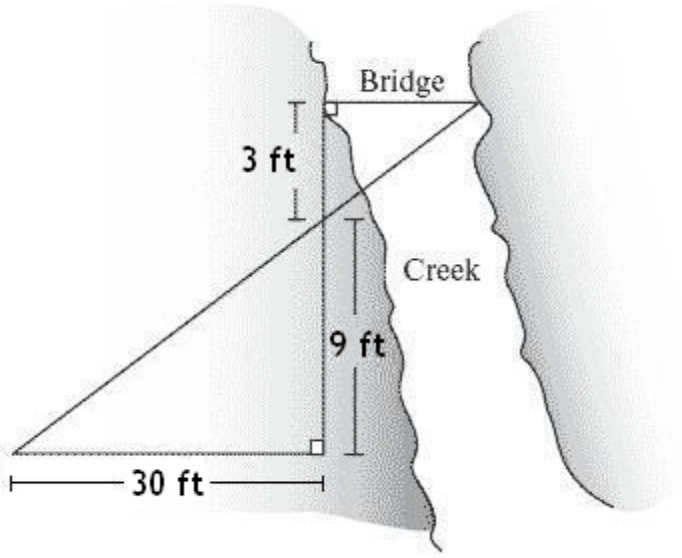
Hints:

- Remember the sum of all angles in this figure is 360 and the value of all besides x is 283.
- 360 - 283 = ?
- Value of x is 77. Type in 77.

2) Assistment #31707 "31707 - 28839 - Stretching and Shrinking - 2006 #32"

Mr. Lui wants to build a bridge across the creek that runs through his property.

He made measurements and drew the map shown below.

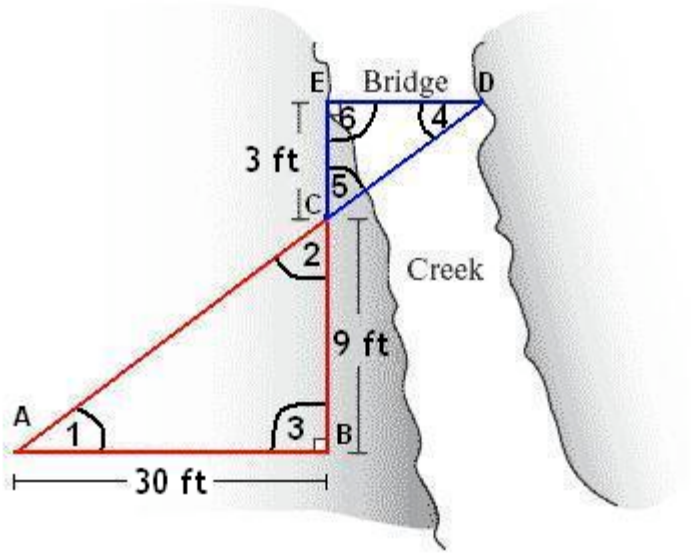


Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge?

Algebra:

✓ 10ft. ✓ 10 ft. ✓ 10ft ✓ 10feet ✓ 10 feet ✓ 10

Scaffold:



The red and blue triangles are similar. We are going to use the known lengths to find the length of the bridge.

First to show that two triangles are similar you need to show that they have 2 congruent (same measure) angles.

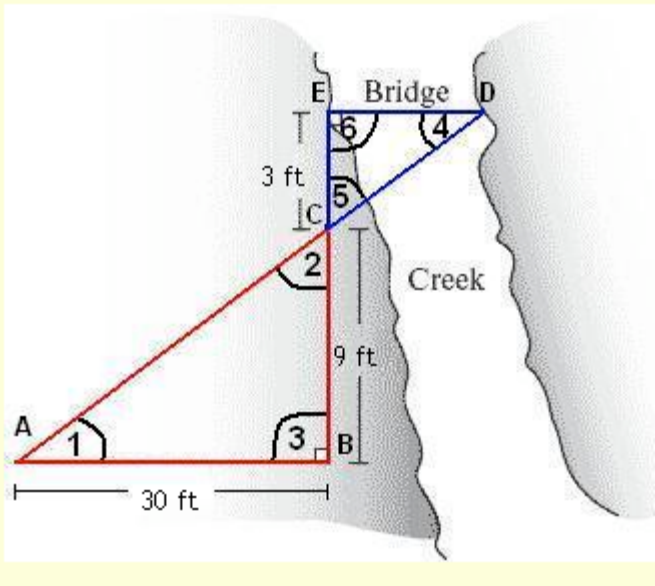
Angle 2 is congruent to which angle ?

Multiple choice:

✘1 ✘3 ✘4 ✓5 ✘6

Hints:

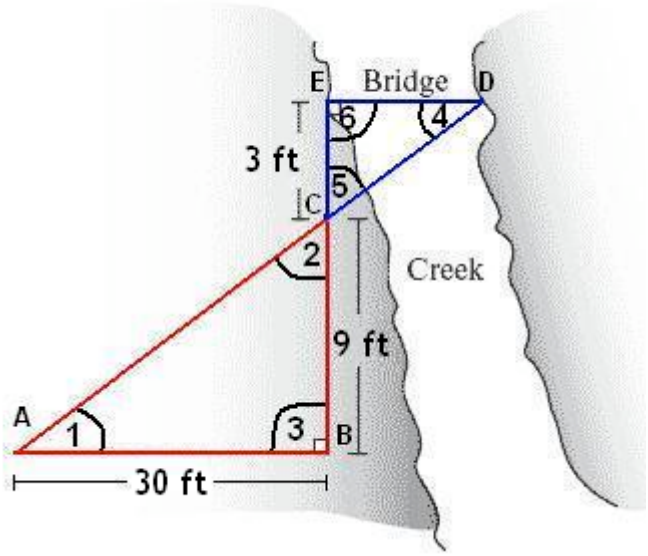
•



Angles 2 and 5 are called vertical angles.

- Vertical angles are congruent.
- Angle 2 is congruent to angle 5. Select 5

Scaffold:



Angle 3 is congruent to which angle?

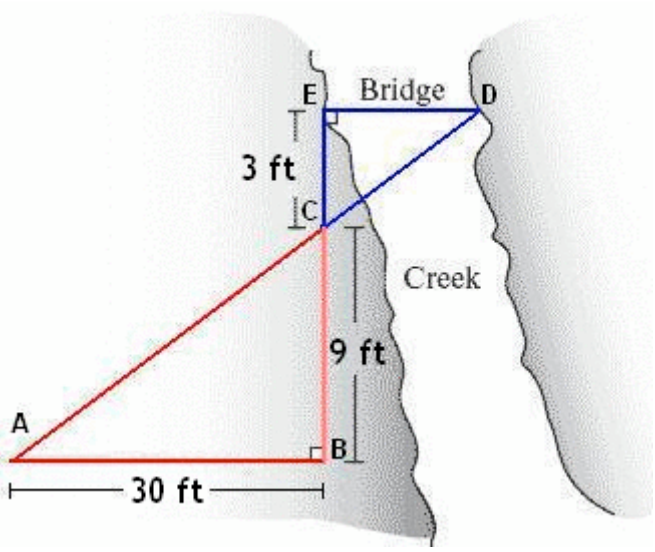
Multiple choice:

✘1 ✘2 ✘4 ✘5 ✓ 6

Hints:

- Angle 3 and angle 6 are both right angles.
- Angle 3 is congruent to angle 6. Select 6

Scaffold:



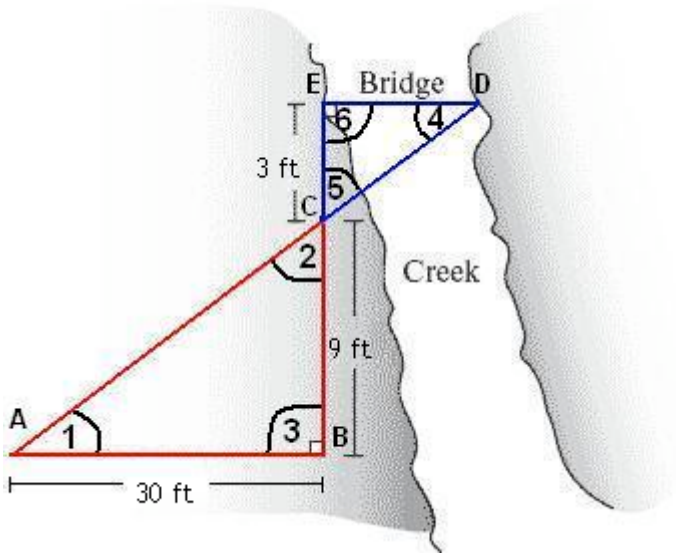
Since the two triangles are similar which side in CED corresponds to BC in ABC?

Multiple choice:

✘AB ✓ CE ✘CD ✘DE ✘AC

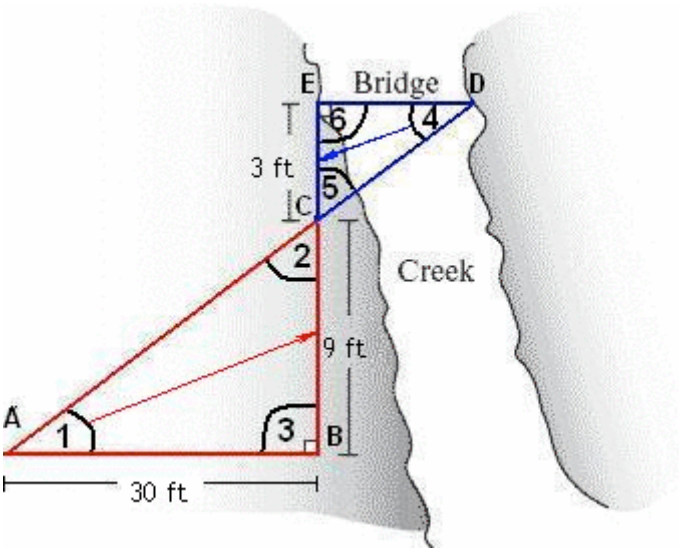
Hints:

-



Angles 1 and 4 are congruent.

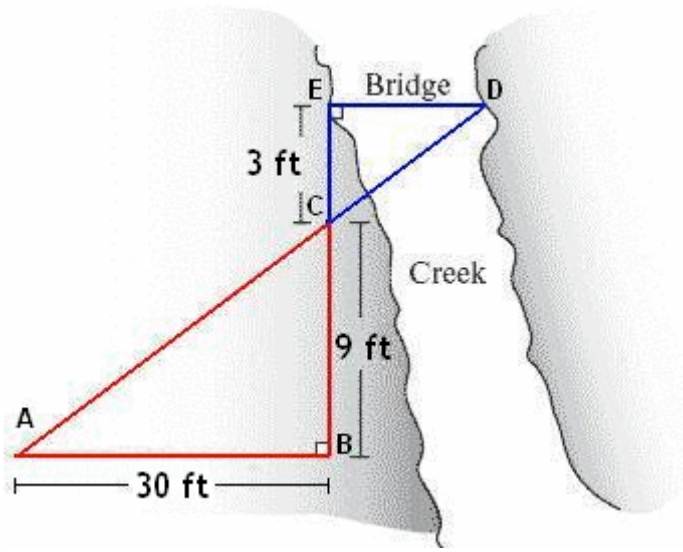
•



CE and BC are across the congruent angles.

- CE in CED corresponds to BC in ABC. Select CE

Scaffold:



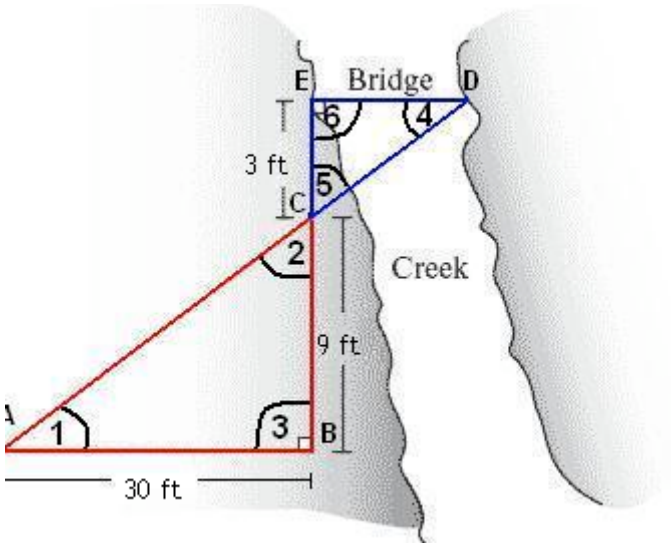
Which side in ABC corresponds to ED (bridge) in CED?

Multiple choice:

✘BC ✘AC ✘CE ✓ AB ✘CD

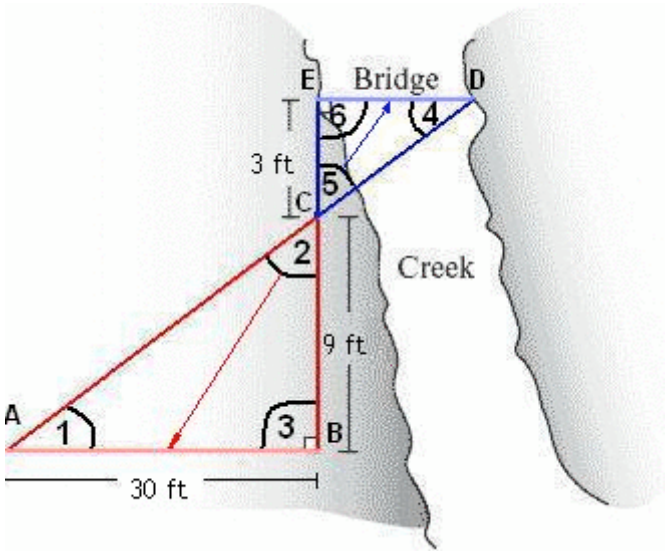
Hints:

-



Angles 2 and 5 are congruent.

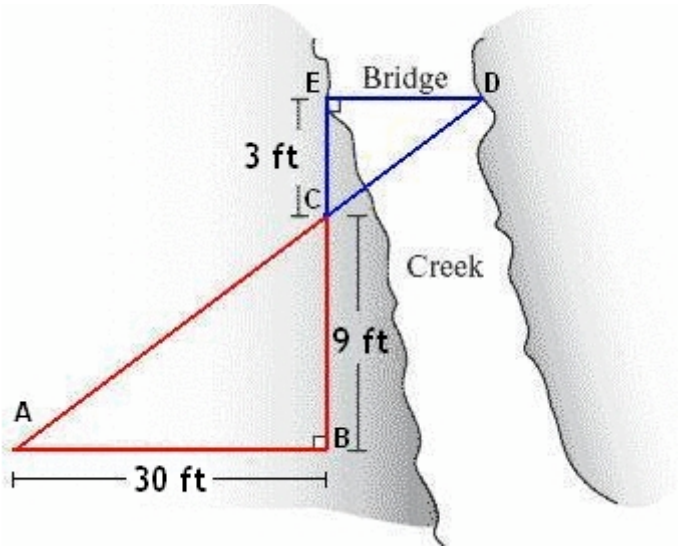
•



AB and ED are across the congruent angles.

- AB corresponds to ED. Select AB.

Scaffold:



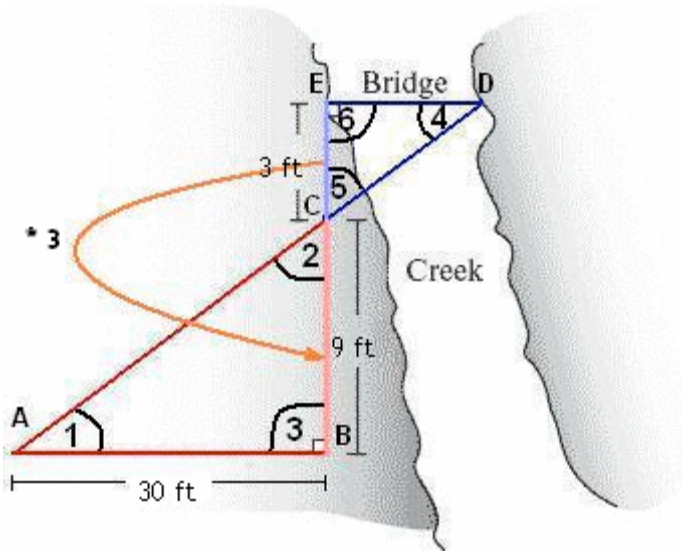
What is the scale factor from CED to ABC?

Fill in:

✓ 3

Hints:

- BC and CE are corresponding sides in two similar triangles. CE = 3 and BC = 9
-



9 = 3 * 3

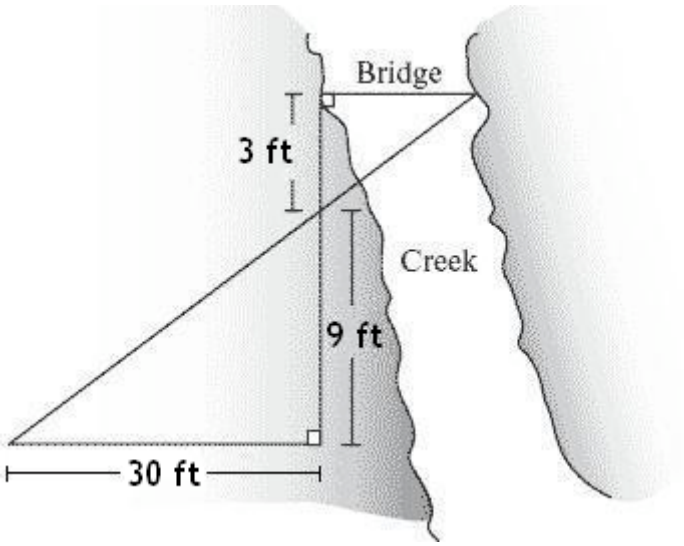
- Scale factor is 3. Type in 3.

Scaffold:

Now back to the original problem.

Mr. Lui wants to build a bridge across the creek that runs through his property.

He made measurements and drew the map shown below.



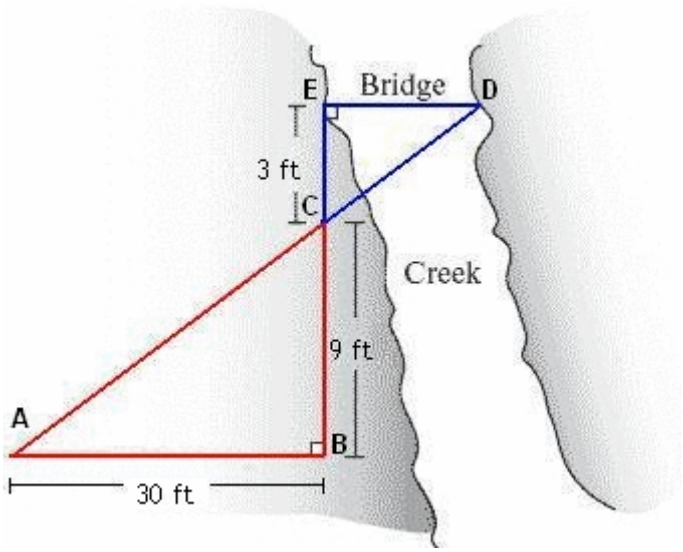
Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge.

Algebra:

✓ 10 ✓ 10 ft ✓ 10 feet ✓ 10feet ✓ 10ft ✓ 10ft. ✓ 10 ft.

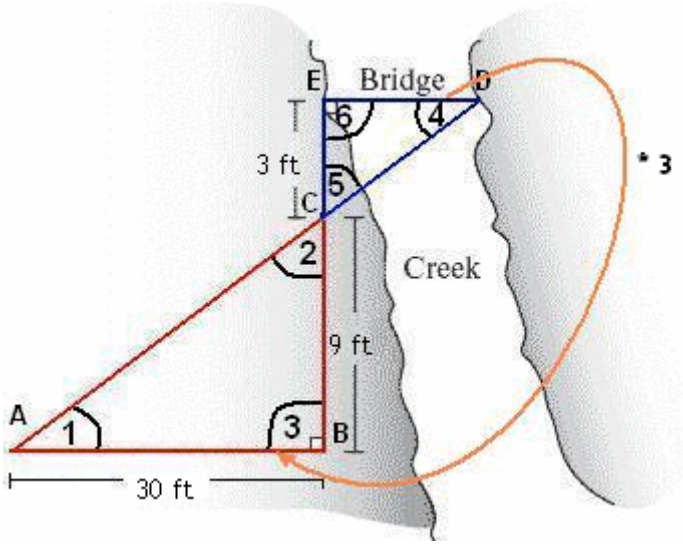
Hints:

-



Remember ED(bridge) in CED corresponds to AB in ABC and scale factor is 3.

•



AB = 3 * ED

- 30 = 3 * 10 (bridge).

So, Distance across the creek is 10 feet. Type in 10.

3) Assistment #31708 "31708 - Stretching and Shrinking - Morph - Inv 1.3.a"

What is 120% of 75?

Fill in:

✓ 90

Hints:

- To find 120% of 75, convert the percentage to decimal.
- To write 120% as a decimal remove the percentage sign and move the decimal two spaces to the left, between the 1 and 2.
- 120% as a decimal is 1.2.

Multiply the decimal by 55 to get your answer. 1.2 * 75 = ?

- 1.2 * 75 =90
- 120% of 75 is 90. Type in 90.

4) Assistment #31709 "31709 - 28936 - 14163 - Stretching and Shrinking - Morph - Inv 5.2.a"

Find the value of **x** that makes the fraction equivalent.

$$\frac{x}{36} = \frac{13}{9}$$

Algebra:

✓ 52

Hints:

- One way to solve this problem is to find the scale factor that you multiply by 9 to get 36. Then if you multiply the denominator by this factor you also need to multiply the numerator.

- The scale factor is **4** because 4 * 9 =36

$$\frac{x}{36} = \frac{13}{9}$$

$$\frac{x}{36} = \frac{13 * 4}{9 * 4}$$

-

$$\frac{x}{36} = \frac{13}{9}$$

$$\frac{x}{36} = \frac{13 * 4}{9 * 4}$$

$$\frac{x}{36} = \frac{52}{36}$$

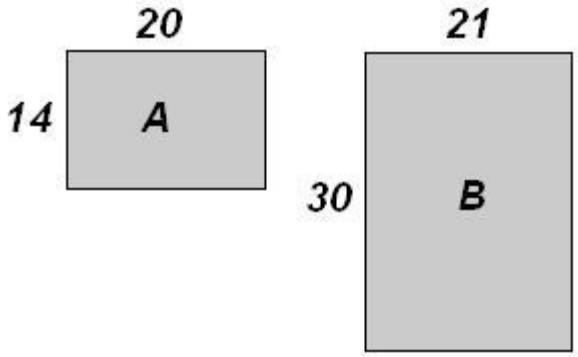
X = 52

36 = 36

- The value of x is 52. Please enter 52.

5) Assistment #28911 "28911 - 14159 - Stretching and Shrinking - Morph"

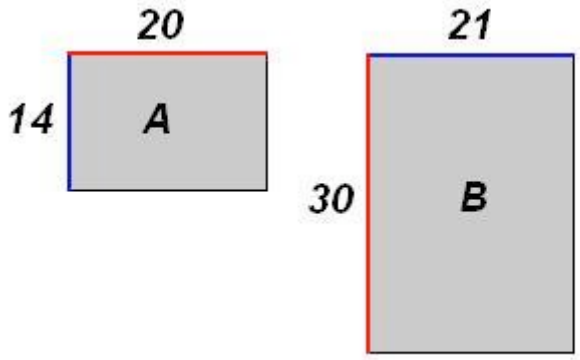
Parallelogram A and B are similar. What is the scale factor from rectangle A to B?



Algebra:

✓1.5 ✘0.66 ✘0.67

Hints:



-

Notice that the side of value 20 corresponds to the side of value 30. Also, the side of value 14 corresponds to the side of value 21.

- Another way to see scale factor here is asking how much would you multiply a side of A by to get the corresponding side of B?
- The side of length 30 of B corresponds to the side of length 20 of A.

What do we multiply 20 by to get 30?

Let x be the scale factor from rectangle A to B, then 20 * x = 30.

Since 20 is less than 30, the value of x should be more than 1.

- Because of fact families, if 20 * x = 30 then x = 30 / 20 = 1.5

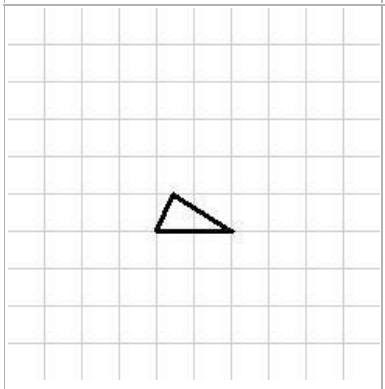
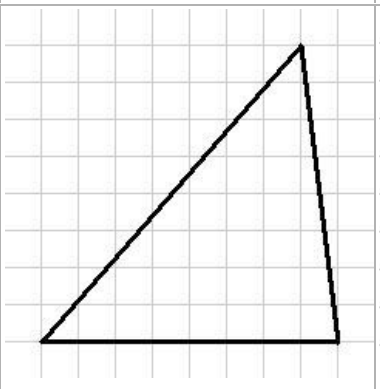
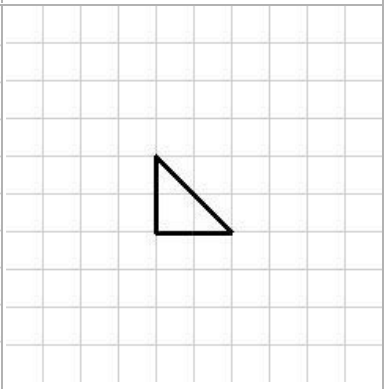
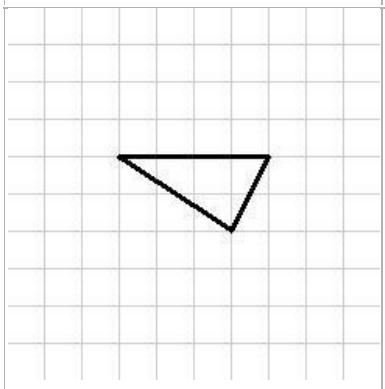
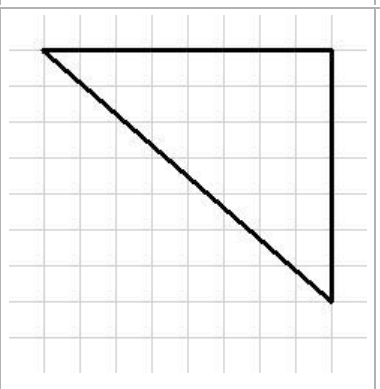
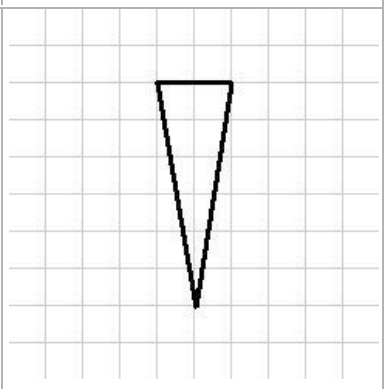
We can check this and yes 20 * 1.5 = 30

Therefore the scalefactor is 1.5

Please enter 1.5

6) Assistment #31710 "31710 - 27946 - 14140 - Stretching and Shrinking - Inv 2.5.a"

Which triangle below is similar to the triangle 1? (Note: All triangle points are either on the grid lines or in the middle of them)

1	2	3
		
		
4	5	6

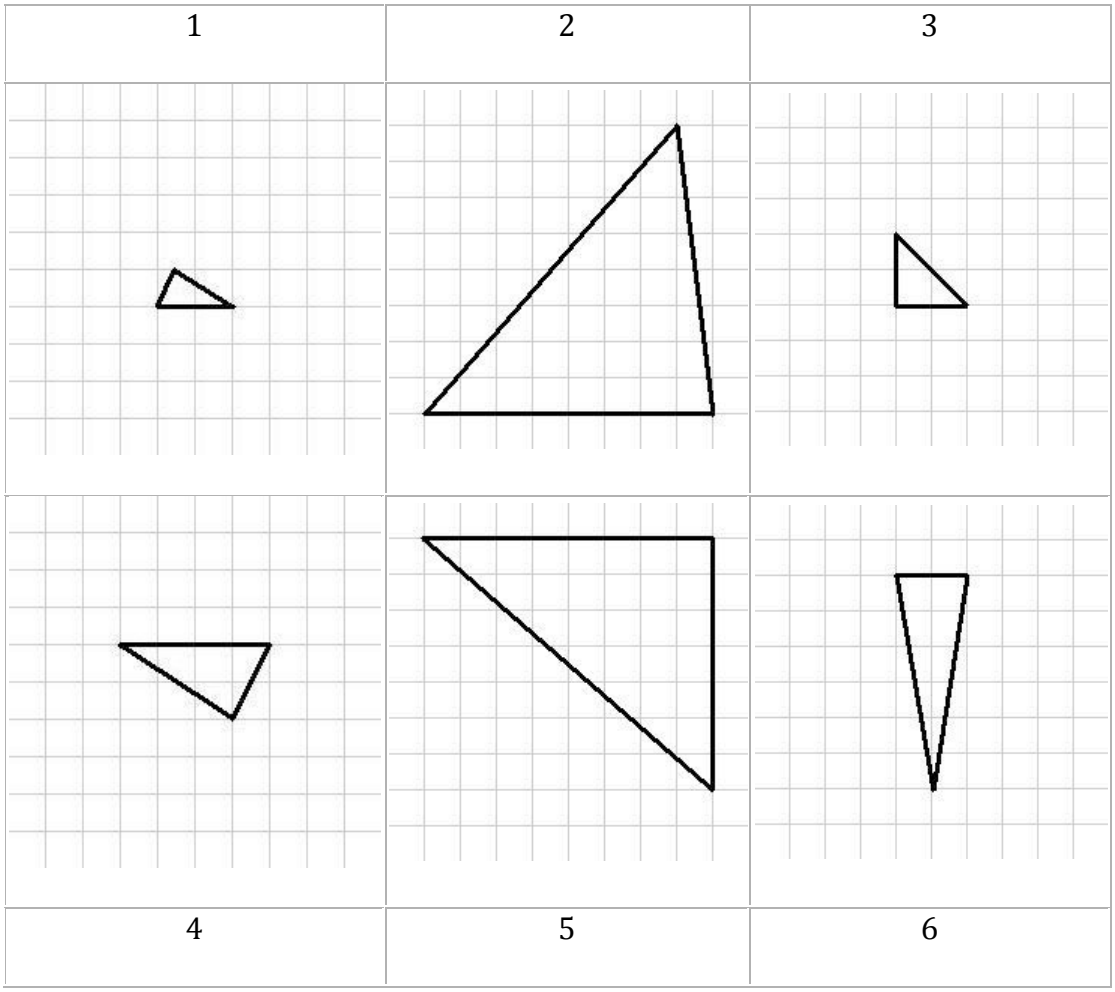
Multiple choice:

2 3 4 5 6

Hints:

- Note triangles 3, 5 and 6 are all isosceles or right-angled, but triangle 1 is not.

So they cannot be similar.



- This leaves triangles 2 and 4. Use the grid to compare triangle 1 to both

triangles 2 and 4.

Draw heights of triangles that are parallel to the grid lines and look at ratios

between heights and correspondent sides.

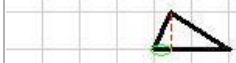
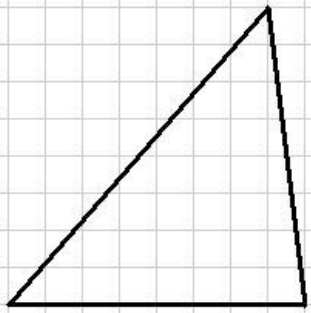
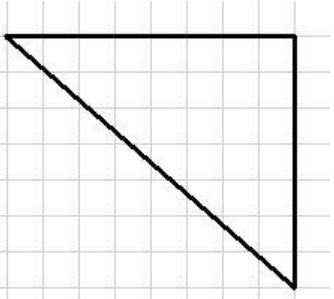
Also look at the ratio of the two parts height divided each side.

- Ratio of triangle 4 and 1 heights is 2 : 1 = 2

Ratio of triangle 4 and 1 sides 4 : 2 = 2

Ratio of triangle 4 and 1 smaller part of sides is 1 : 0.5 = 2

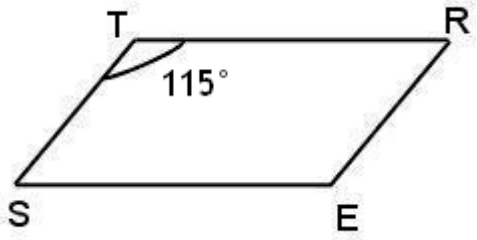
This means that triangles 1 and 4 are similar. Select 4.

1	2	3
		
		

4	5	6

7) Assistment #31711 "31711 - 28866 - 14156 - Stretching and Shrinking - Morph - Inv 3.3"

What is the measure of angle R in the parallelogram TRES?

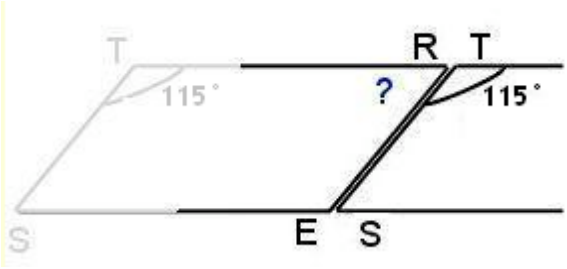


Algebra:

✓ 65

Hints:

- By cutting the parallelogram in half and rearranging it, we see that the angle R and the angle T make an angle of 180.



- So, 115 + R = 180

Now find R.

- If 115 + R = 180 then

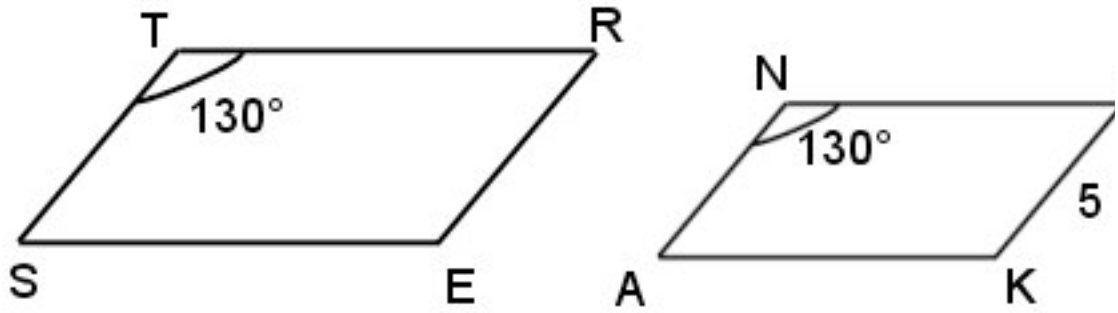
180 - 115 = R

65 = R

Type in 65.

8) Assistment #31712 "31712 - 28853 - 14157 - Stretching And Shrinking - Morph - Inv 3.4.a"

If we know the area of parallelogram STRE is 4 times that of paralellogram ANDK and the two parallelograms are **similar**, what is the measure of ER? (Picture is not drawn to scale)



Algebra:

✓ 10

Hints:

- The two parallelograms are similar since they are both parallelograms and have a common angle of 130 degrees.

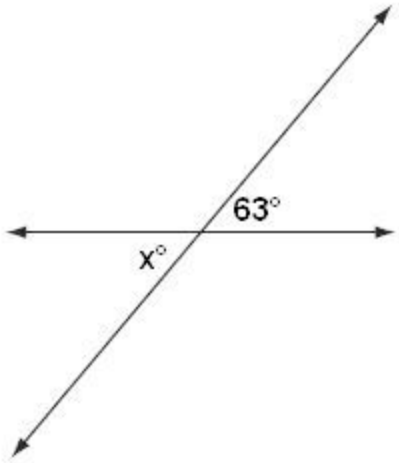
When the area of a figure is 4 times as large the scale factor is 2.

- If the scale factor from the smaller parallelogram to the larger is 2, what is the measure of ER?
- Since the scale factor is 2 from the small parallelogram to the large parallelogram we can multiply the side of the small parallelogram by 2 to get the measure of the side of the large parallelogram.

2* 5 = 10. Type in 10.

9) Assistment #31713 "31713 - 28851 - Stretching and Shrinking - Morph - 2007 #21"

The figure below shows two intersecting lines.



Based on the given angle measure, what is the value of x?

Algebra:

✓ 63

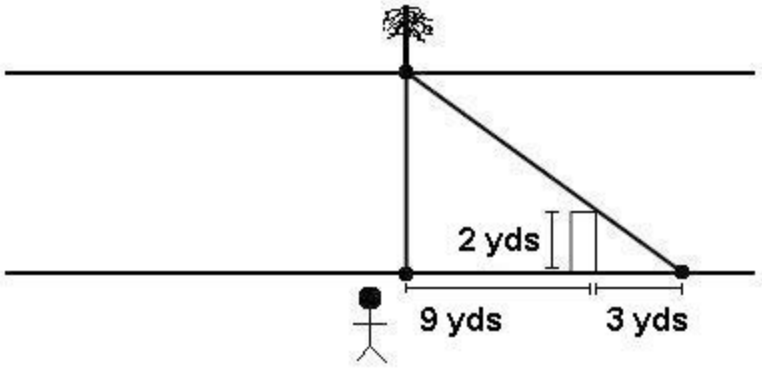
Hints:

- Imagine folding the picture so one angle is on top of the other.
- The two angles are called vertical angles.
- Vertical angles are always equal, so if one of them is 63^o, the other one must be 63^o too.

Value of x is 63^o. Type in 63.

10) Assistment #31714 "31714 - 14162 - Stretching and Shrinking - Morph - Inv 5.1.a"

Ben was able to make the measurements given in the picture. He is straight across from the tree, and 9 yards from the dock. The dock is 2 yards long. The line that goes from the tree to the end of the dock hits the side of the river 3 yards down from the dock. How far is it across the river?

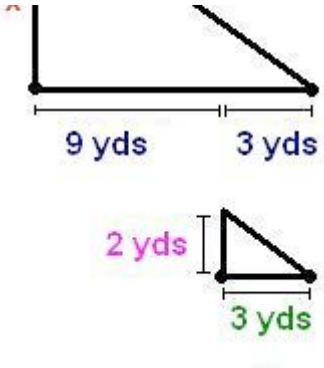


Algebra:

✓ 8

Hints:

- There are two similar triangles in the diagram, one inside the other. They are shown seperated in this image.



- Set up a proportion to find the value of x, the distance across the river. The example bellow shows the ratio of the short side to the long side of the triangle. We use **12** because **9** + 3 = **12**

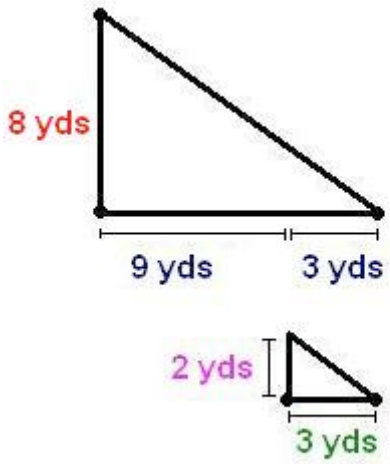
$$\frac{2}{3} = \frac{x}{12}$$

- Since 3 * 4 = 12, the scale factor from the small triangle to the large triangle is

4. Use this to find the value of x.

$$\frac{2 * 4}{3 * 4} = \frac{x}{12}$$

$$\frac{8}{12} = \frac{x}{12}$$

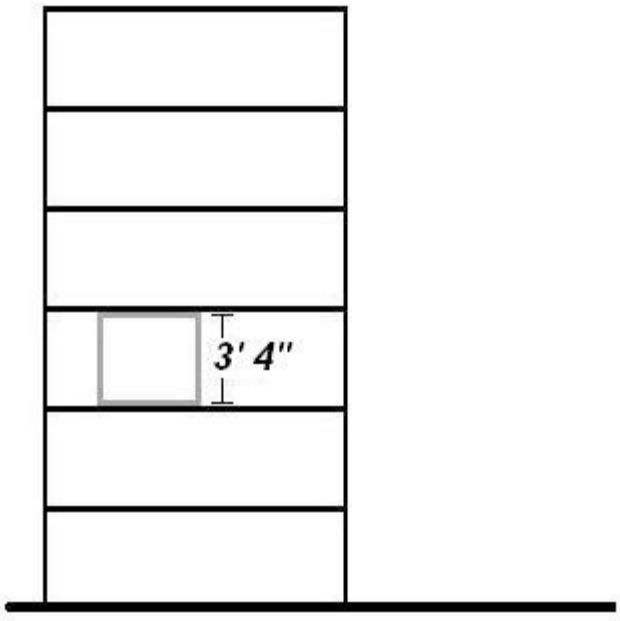


•

The distance across the river is 8 yards, please type in 8.

11) Assistment #14140 "14140 - Stretching and Shrinking - Morph - Inv 1.1.a"

A box was on a shelf in a big warehouse as shown below. The box was 3 feet 4 inches tall. The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall in feet is the whole shelf (round to the nearest whole foot) ?



Algebra:

✓ 20

Scaffold:

One way to solve this problem is to multiply the feet portion by 6 and then multiple the inches portion by 6.

Start by multiplying just the foot portion by 6.

3 feet * 6 = ? (How many feet)

Algebra:

✓ 18

Hints:

- Just multiply 3 * 6
- 3 * 6 = 18. There are 18 feet when you count just the whole feet in the measure of the box. Type in 18.

Scaffold:

So, part of the height is 6. Now we need to multiply 4 by 6.

4 inches * 6 = ? (How many inches)

Algebra:

✓ 24

Hints:

- Just multiply 4 * 6
- 4 * 6 = 24. There are 24 inches when you count just the whole inches in the measure of the box. Type in 24.

Scaffold:

So, now we have 24 inches, but we need our answer to be in feet. How many feet is 24 inches?

Algebra:

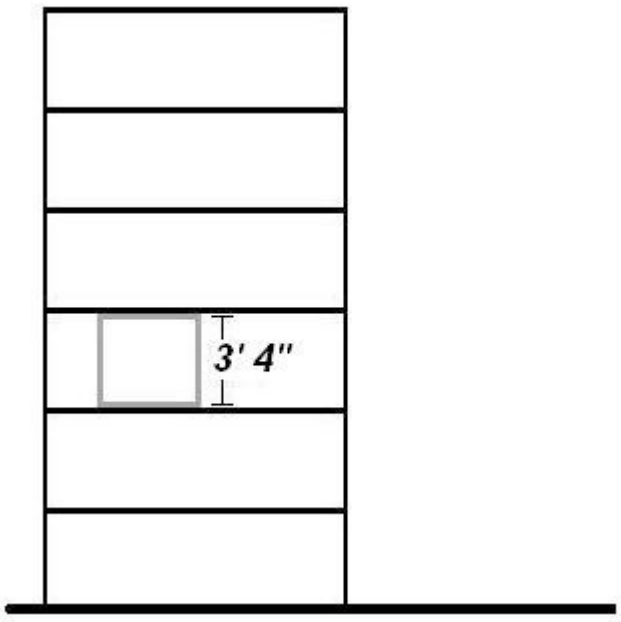
✓ 2

Hints:

- 1 foot is 12 inches.
- 2 feet is 24 inches. Type in 2

Scaffold:

Now back to the original problem.



Algebra:

✓ 20

Hints:

- Remember, when you multiply the feet portion by 6 you get:

3 foot * 6 = 18 feet

- When you multiply the inches portion by 6 you get:

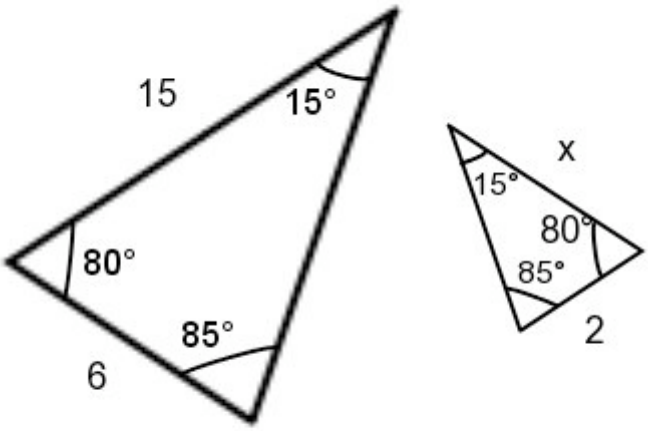
4 inches * 6 = 24 inches

- 24 inches is 2 feet.
- Height of the whole shelf is: 2 feet + 18 feet = 20 feet.

Type in 20.

12) Assistment #14161 "14161 - Stretching_and_Shrinking_Inv_4_4_a_hints"

The two triangles are similar. Find the length of the missing side, x.



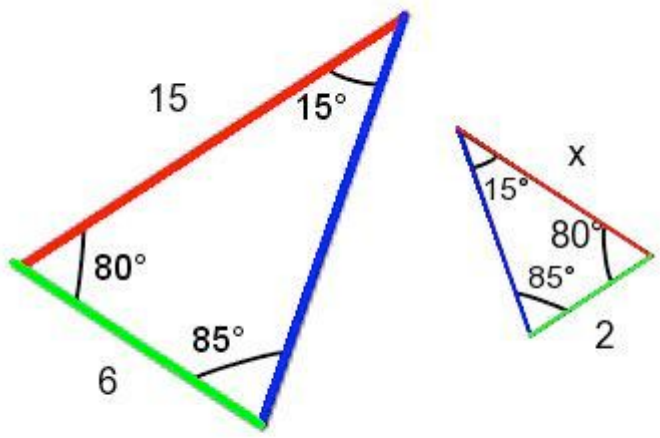
Algebra:

✓ 5

Hints:

- We need to find the scale factor from the large triangle to the small one. Since the triangle gets smaller we know the scale factor will be less than 1.
- Check which sides of the triangles correspond by using the equal angles.

For example, the sides, which are across from the 80 degree angle are corresponding, so are the ones opposite the 85 degree angles.



- Now we can use the two green corresponding sides (the ones opposit 15 degrees) to find the scale factor since we know their lenghts.

In the smaller triangle the side is 2 units and in the bigger one it's 6 units.

So the scale factor is 2/6 = 1/3.

- Now we can use the scale factor of 1/3 to find the missing side lengths.

- 15 units * 1/3 = 5 units

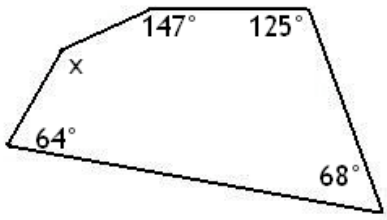
So x=5 units. Type in 5.

Mastery learning 27892

Stretching and Shrinking Sum of interior Angles more than 3 angles

Assistment #40219 - 30406 - Sum Of Interior Angles Pentagon

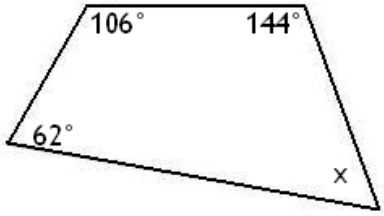
The figure below is a pentagon.



What is the value of x in the pentagon?

Assistment #40279 - 30200 - Sum Of Interior Angles Quadrilateral

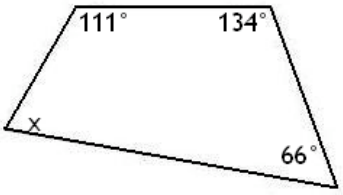
The figure below is a quadrilateral.



What is the value of x in the quadrilateral?

Assistment #40309 - 30411 - Sum Of Interior Angles Quadrilateral

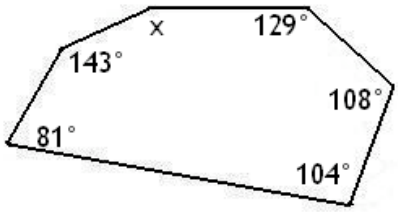
The figure below is a quadrilateral.



What is the value of x in the quadrilateral?

Assistment #40341 - 30429 - Sum Of Interior Angles Hexagon

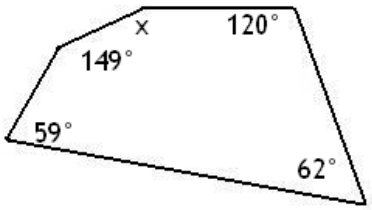
The figure below is a hexagon



What is the value of x in the hexagon?

Angles Pentagon

The figure below is a pentagon.

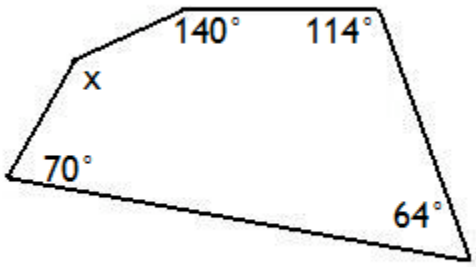


What is the value of x in the pentagon?

Assistment #42105 - 30409 - Sum Of Interior

Assistment #40220 "40220 - 30406 - Sum Of Interior Angles Pentagon"

The figure below is a pentagon.



What is the value of x in the pentagon?

Algebra:

✓ 152

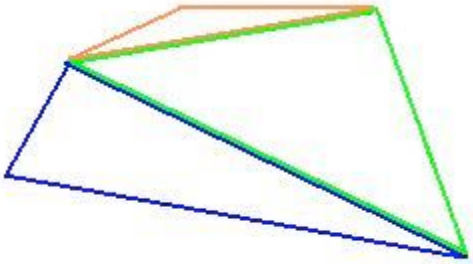
Scaffold:

What is the sum of all angles in a pentagon?

Algebra:

✓ 540

Hints:



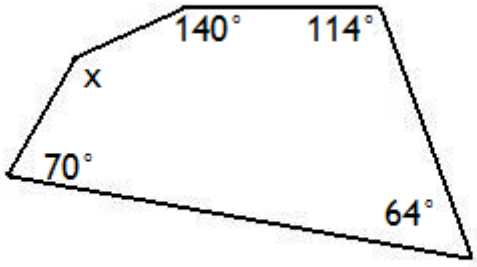
-

Divide the figure into three triangles.

- Sum of all angles in a triangle is 180.
- Sum of all angles in pentagon is 180 + 180 + 180 = 540. Type in 540.

Scaffold:

The figure below is a pentagon.



What is the value of x in the pentagon?

Fill in:

✓ 388

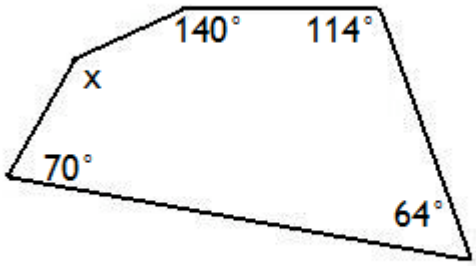
Hints:

- 140 + 114 + 70 + 64 = ?
- Sum of angles is 388. Type in 388.

Scaffold:

Now, back to the original problem:

The figure below is a pentagon.



What is the value of x in the pentagon?

Fill in:

✓ 152

Hints:

- Remember the sum of all angles in this figure is 540 and the value of all besides x is 388.

- 540 - 388 = ?
- Value of x is 152. Type in 152.

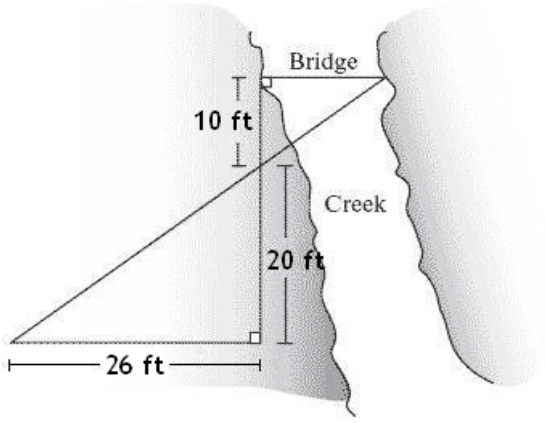
Mastery learning problem set

28839 Stretching and Shrinking - Similar Figures

Assistment #40667 - 28839 - Stretching and Shrinking - 2006 #32

Mr. Lui wants to build a bridge across the creek that runs through his property.

He made measurements and drew the map shown below.

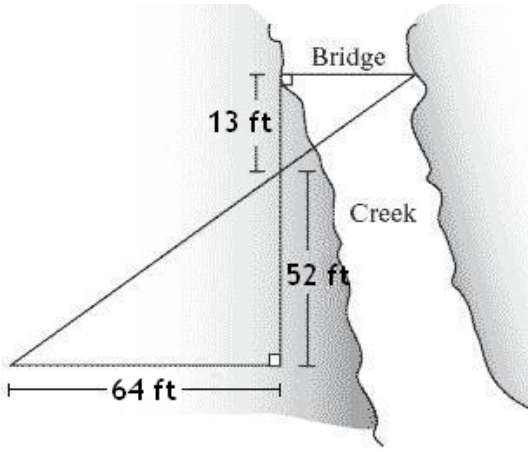


Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge?

Assistment # 40677 - 28839 - Stretching and Shrinking - 2006 #32

Mr. Lui wants to build a bridge across the creek that runs through his property.

He made measurements and drew the map shown below.

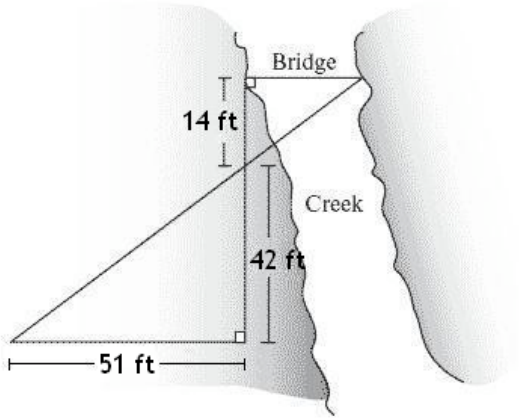


Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge?

Assistment # 40668 - 28839 - Stretching and Shrinking - 2006 #32"

Mr. Lui wants to build a bridge across the creek that runs through his property.

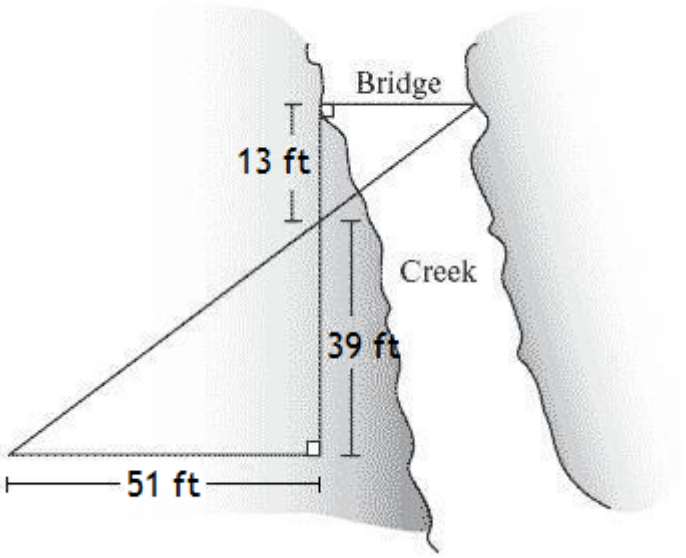
He made measurements and drew the map shown below.



Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge?

Assistment #40669 "40669 - 28839 - 7th Grade Stretching and Shrinking - 2006 Grade 7 #32"

Mr. Lui wants to build a bridge across the creek that runs through his property. He made measurements and drew the map shown below.

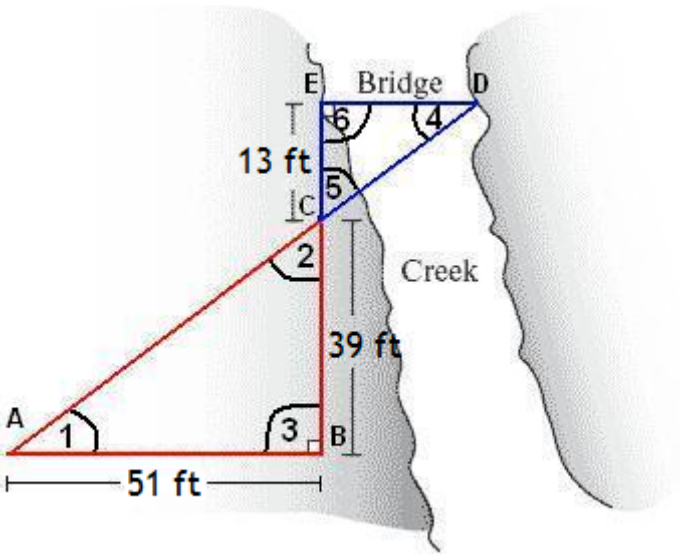


Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge?

Algebra:

✓ 17ft. ✓ 17 ft. ✓ 17ft ✓ 17feet ✓ 17 feet ✓ 17

Scaffold:



The red and blue triangles are similar. We are going to use the known lengths to find the length of the bridge.

First to show that two triangles are similar you need to show that they have 2 congruent (same measure) angles.

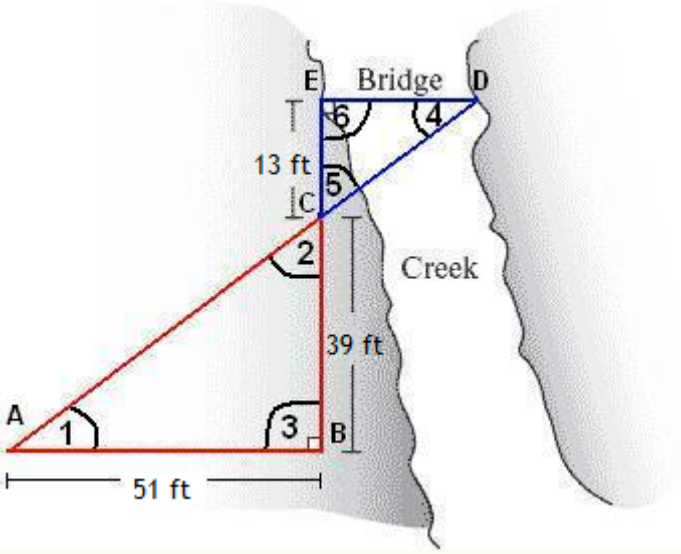
Angle 2 is congruent to which angle ?

Multiple choice:

✘1 ✘3 ✘4 ✓5 ✘6

Hints:

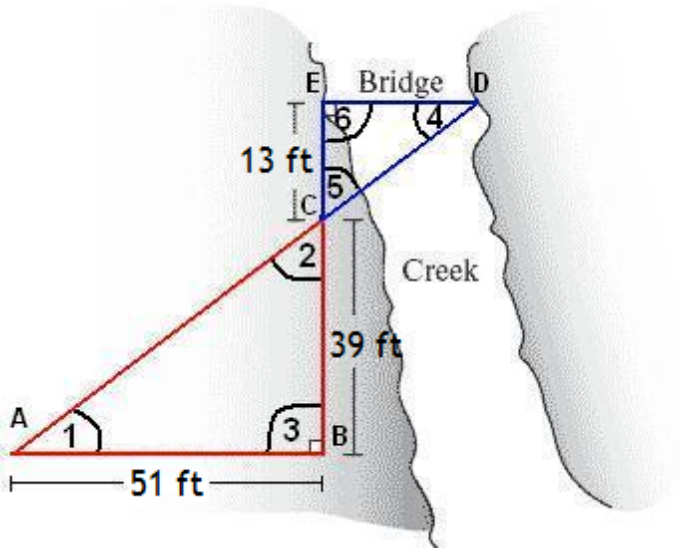
•



Angles 2 and 5 are called vertical angles.

- Vertical angles are congruent.
- Angle 2 is congruent to angle 5. Select 5

Scaffold:



Angle 3 is congruent to which angle?

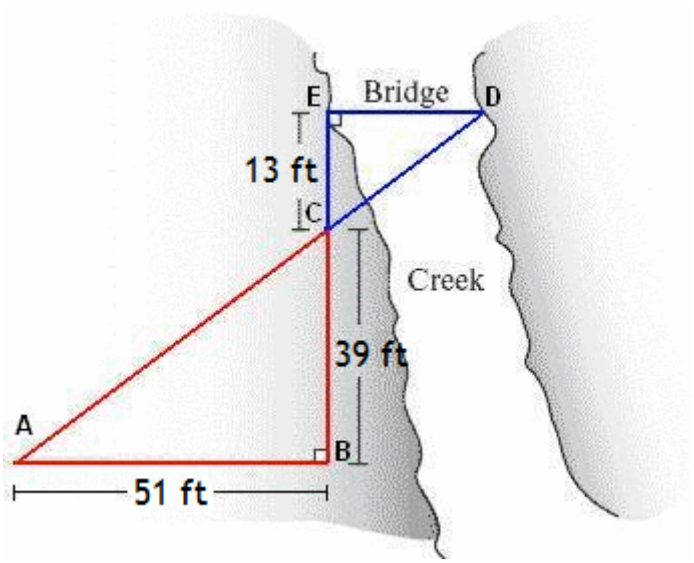
Multiple choice:

✘1 ✘2 ✘4 ✘5 ✓ 6

Hints:

- Angle 3 and angle 6 are both right angles.
- Angle 3 is congruent to angle 6. Select 6

Scaffold:



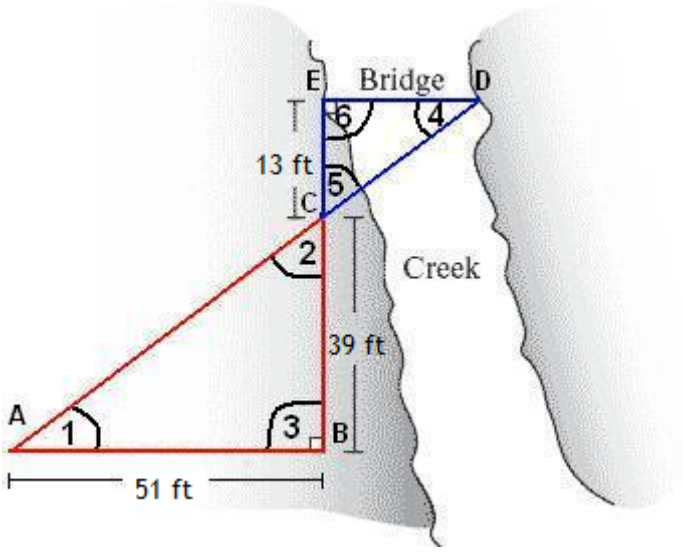
Since the two triangles are similar which side in CED corresponds to BC in ABC?

Multiple choice:

✘AB ✓CE ✘CD ✘DE ✘AC

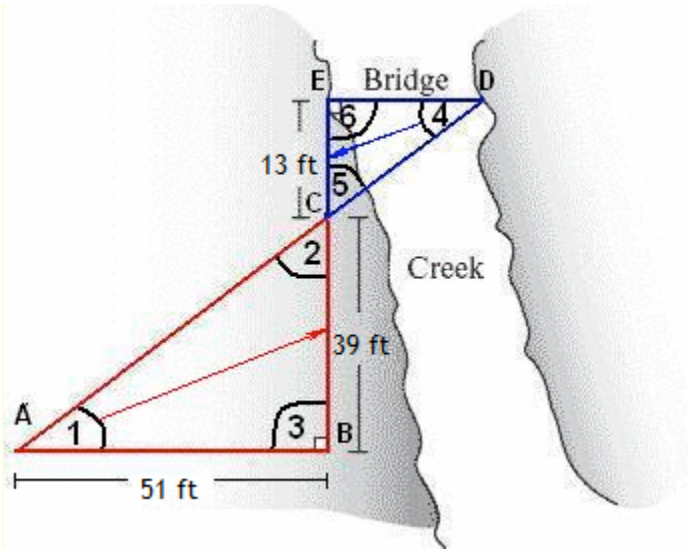
Hints:

•



Angles 1 and 4 are congruent.

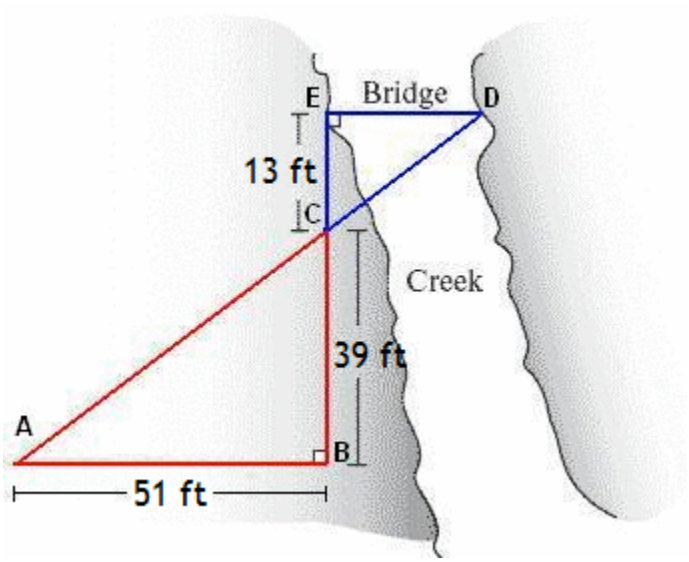
•



CE and BC are across the congruent angles.

• CE in CED corresponds to BC in ABC. Select CE

Scaffold:



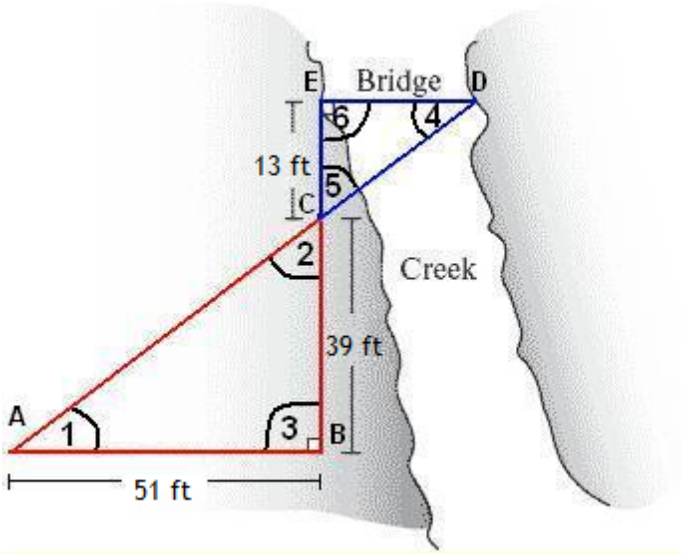
Which side in ABC corresponds to ED (bridge) in CED?

Multiple choice:

✘BC ✘AC ✘CE ✓ AB ✘CD

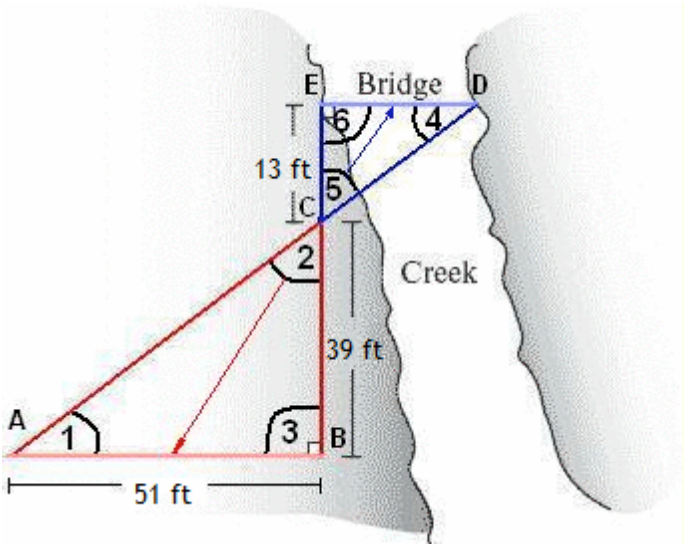
Hints:

-



Angles 2 and 5 are congruent.

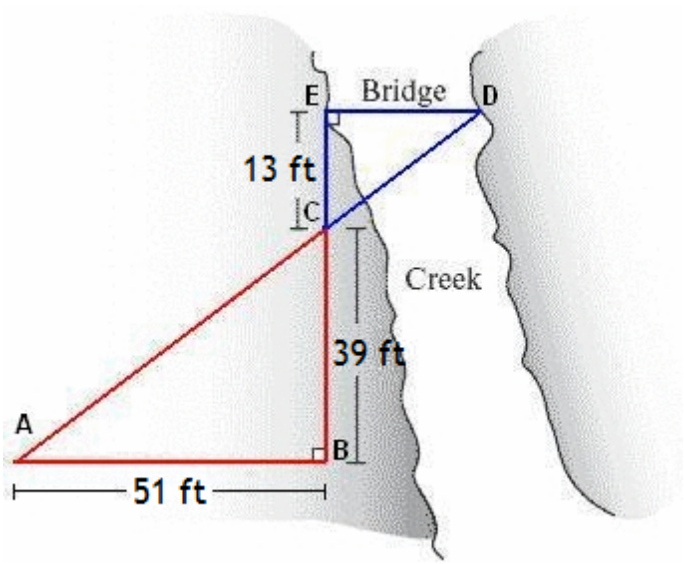
•



AB and ED are across the congruent angles.

• AB corresponds to ED. Select AB.

Scaffold:



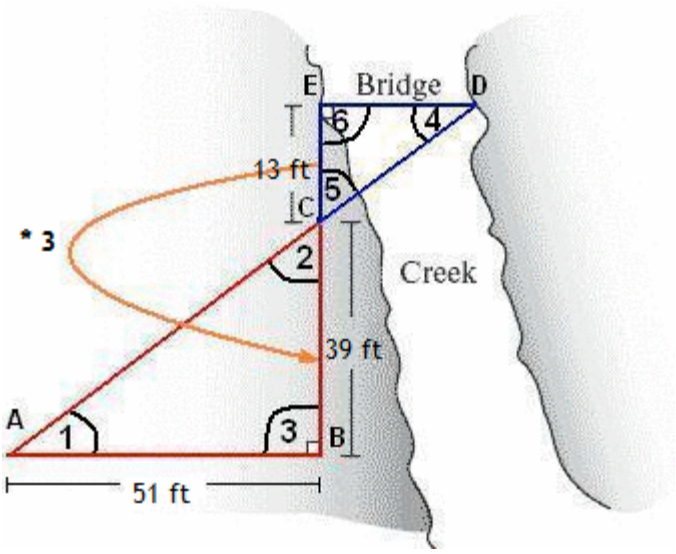
What is the scale factor from CED to ABC?

Fill in:

✓ 3

Hints:

- BC and CE are corresponding sides in two similar triangles. CE = 13 and BC =39
-



39 = 3 * 13

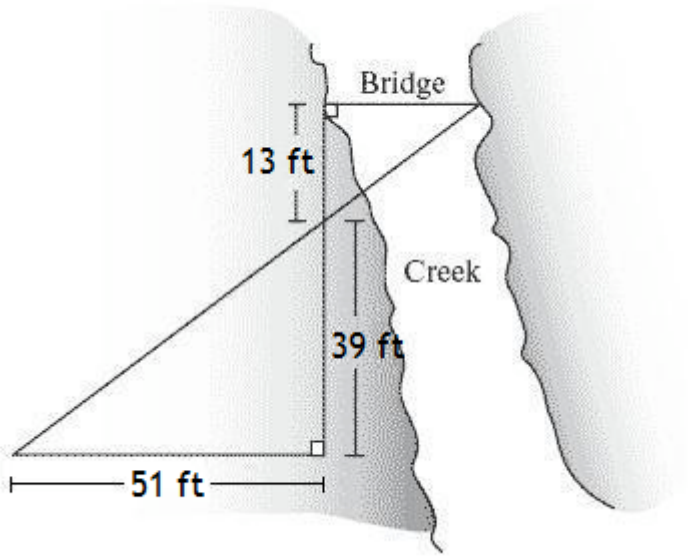
- Scale factor is 3. Type in 3.

Scaffold:

Now back to the original problem.

Mr. Lui wants to build a bridge across the creek that runs through his property.

He made measurements and drew the map shown below.



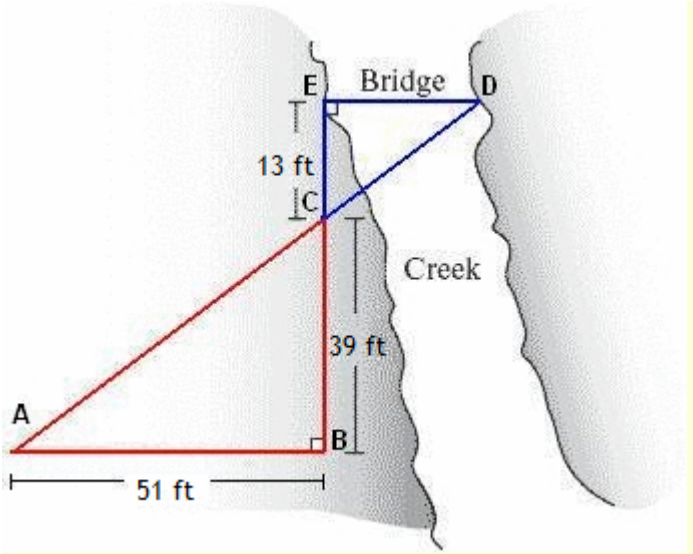
Based on this map, what is the distance across the creek at the place where Mr. Lui wants to put the bridge.

Algebra:

✓ 17 ✓ 17 ft ✓ 17 feet ✓ 17feet ✓ 17ft ✓ 17ft. ✓ 17 ft.

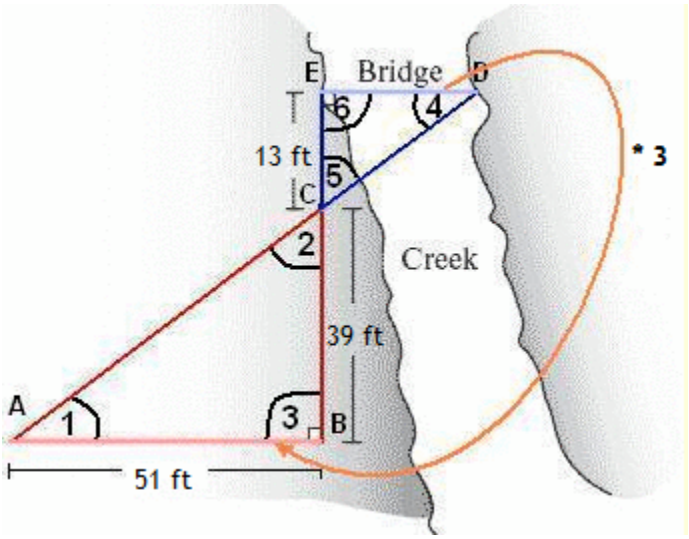
Hints:

-



Remember ED(bridge) in CED corresponds to AB in ABC and scale factor is 3.

•



AB = 3 * ED

• 51 = 2 * ED (bridge).

So, Distance across the creek is 17 feet. Type in 17.

Mastery learning 28912

Stretching and Shrinking - Percent of

Assistment #40700 - 30907 - Stretching and Shrinking - Morph - Inv 1.3.a

What is 110% of 80?

Assistment #40721 - 30907 - Stretching and Shrinking - Morph - Inv 1.3.a

What is 120% of 90?

Assistment #40718 - 30907 - Stretching and Shrinking - Morph - Inv 1.3.a

What is 140% of 80?

Assistment #40704 - 30907 - Stretching and Shrinking - Morph - Inv 1.3.a

What is 120% of 60?

Assistment #40701 - 30907 - Stretching and Shrinking - Morph - Inv 1.3.a

What is 140% of 50?

What is 130% of 70?

Assistment #40698 - 30907 - Stretching

and Shrinking - Morph - Inv 1.3.a

Assistment #40703 "40703 - 30907 - 7th Grade Stretching and Shrinking - Morph - Inv 1.3.a"

What is 180% of 90?

Fill in:

✓ 162

Hints:

- To find 180% of 90, convert the percentage to decimal.
- To write 180% as a decimal remove the percentage sign and move the decimal two spaces to the left, between the 1 and 8.
- 180% as a decimal is 1.8.

Multiply the decimal by 90 to get your answer. 1.8 * 90 = ?

- 1.8 * 90 = 162
- 180% of 90 is 162. Type in 162.

Mastery learning 28936

Stretching and Shrinking - Proportion

Assistment #40728 - 28936 - 14163 - Stretching and Shrinking - Morph - Inv 5.2.a

Find the value of **x** that makes the fraction equivalent.

$$\frac{x}{32} = \frac{18}{8}$$

Assistment #40731 - 28936 - 14163 - Stretching and Shrinking - Morph - Inv 5.2.a

Find the value of **x** that makes the fraction equivalent.

$$\frac{x}{27} = \frac{12}{9}$$

Assistment #40735 - 28936 - 14163 - Stretching and Shrinking - Morph - Inv 5.2.a

Find the value of **x** that makes the fraction equivalent.

$$\frac{x}{40} = \frac{10}{8}$$

Find the value of **x** that makes the fraction equivalent.

$$\frac{x}{24} = \frac{12}{6}$$

Assistment #40729 - 28936 - 14163 - Stretching and Shrinking - Morph - Inv 5.2.a

Assistment #40730 "40730 - 28936 - 14163 - 7th Grade Stretching and Shrinking - Morph - Inv 5.2.a"

Find the value of **x** that makes the fraction equivalent.

$$\frac{x}{27} = \frac{17}{9}$$

Algebra:

✓ 51

Hints:

- One way to solve this problem is to find the scale factor that you multiply by 9 to get 27. Then if you multiply the denominator by this factor you also need to multiply the numerator.

- The scale factor is **3** because 3 * 9 =27

$$\frac{x}{} \quad \frac{17}{}$$

$$\frac{x}{27} = \frac{17}{9}$$

$$\frac{x}{27} = \frac{17 * 3}{9 * 3}$$

- $$\frac{x}{27} = \frac{17}{9}$$

$$\frac{x}{27} = \frac{17 * 3}{9 * 3}$$

$$\frac{x}{27} = \frac{51}{27}$$

X = 51

27 = 27

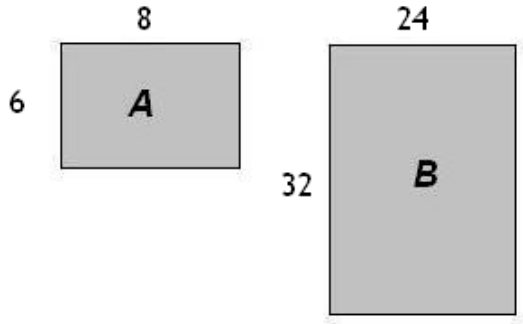
- The value of x is 51. Please enter 51.

Mastery learning 14159

Stretching and Shrinking - Identify Similar Figures

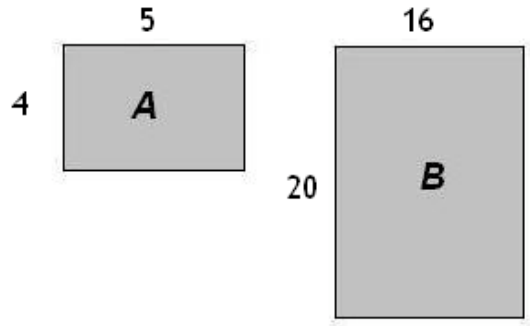
Assistment #40781 - 28911 - 14159 - Stretching and Shrinking – Morph

Parallelogram A and B are similar. What is the scale factor from rectangle A to B?



Assistment #40773 - 28911 - 14159 - Stretching and Shrinking - Morph

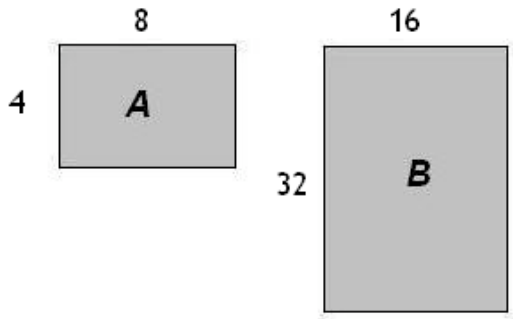
Parallelogram A and B are similar. What is the scale factor from rectangle A to B?



Assistment #40782 - 28911 - 14159 - Stretching and Shrinking – Morph

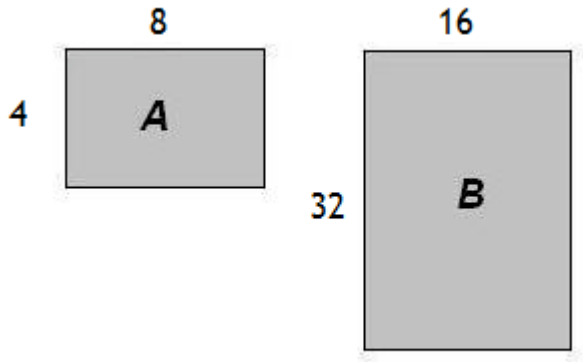
Parallelogram A and B are similar. What is the scale factor from rectangle

A to B?



Assistment #40783 "40783 - 28911 - 14159 - 7th Grade Stretching and Shrinking - Morph"

Parallelogram A and B are similar. What is the scale factor from rectangle A to B?

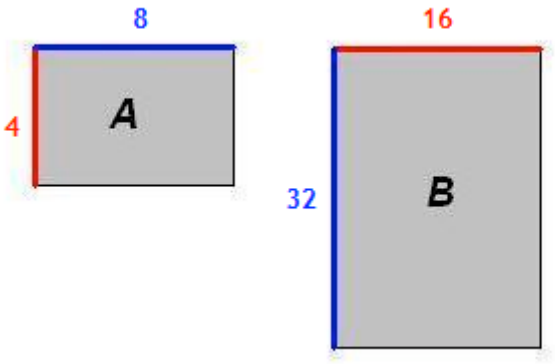


Algebra:

✓ 4 ✘0.25

Hints:

•



Notice that the side of value 4 corresponds to the side of value 16. Also, the side of value 8 corresponds to the side of value 32.

- Another way to see scale factor here is asking how much would you multiply a side of A by to get the corresponding side of B?

- The side of length 16 of B corresponds to the side of length 4 of A.

What do we multiply 4 by to get 16?

Let x be the scale factor from rectangle A to B, then 4 * x = 16.

Since 4 is less than 16, the value of x should be more than 1.

- Because of fact families, if 4 * x = 16 then x = 16 / 4 = 4

We can check this and yes 4 * 4 =16

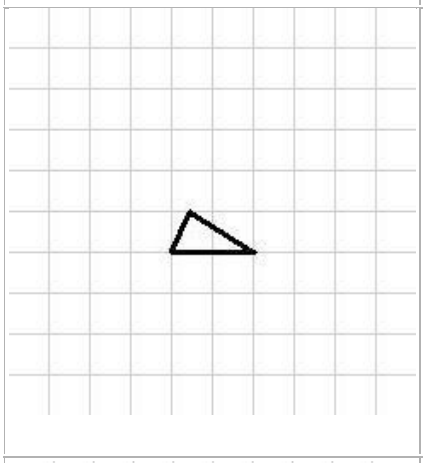
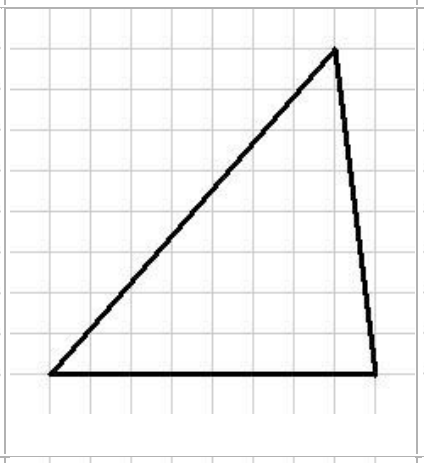
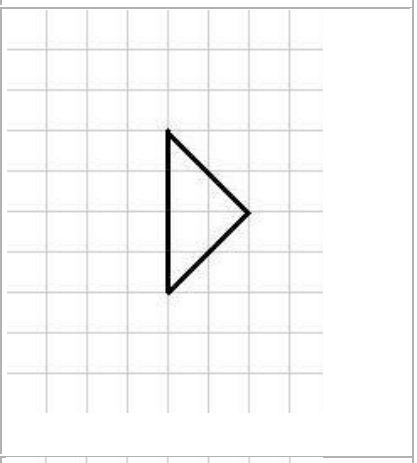
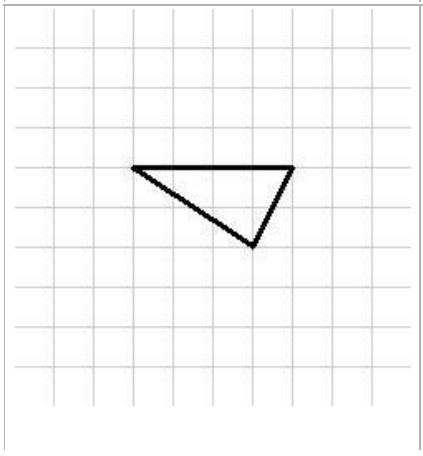
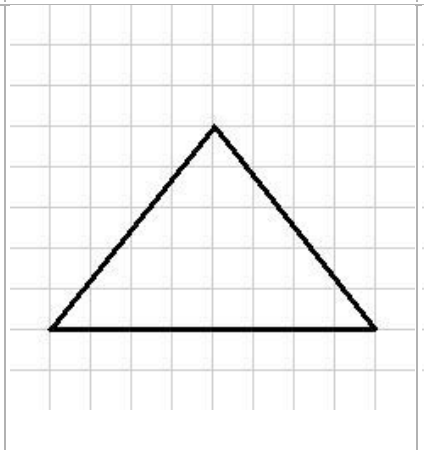
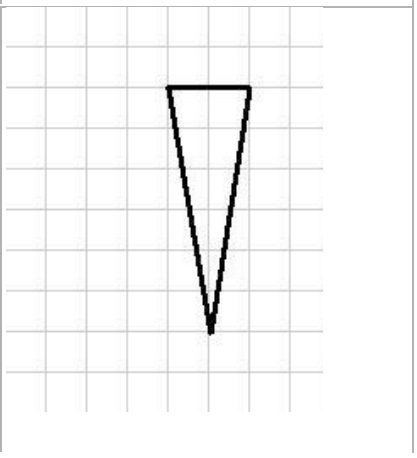
Therefore the scale factor is 4.

Please enter 4.

Mastery learning 27946 Stretching and Shrinking - Similar figures - Scale factor

Assistment #40788 - 27946 - 14140 - Stretching and Shrinking - Inv 2.5.a

Which triangle below is similar to the triangle 1? (Note: All triangle points are either on the grid lines or in the middle of them)

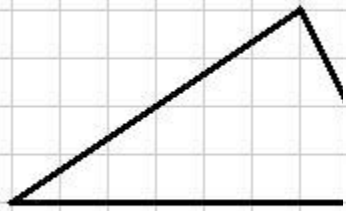
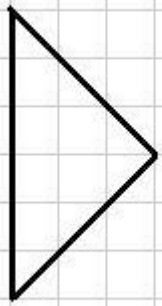
1	2	3
		
		

4	5	6

2 3 4 5 6

Assistment #40789 "40789 - 27946 - 14140 - 7th Grade Stretching and Shrinking - Inv 2.5.a"

Which triangle below is similar to the triangle 1? (Note: All triangle points are either on the grid lines or in the middle of them)

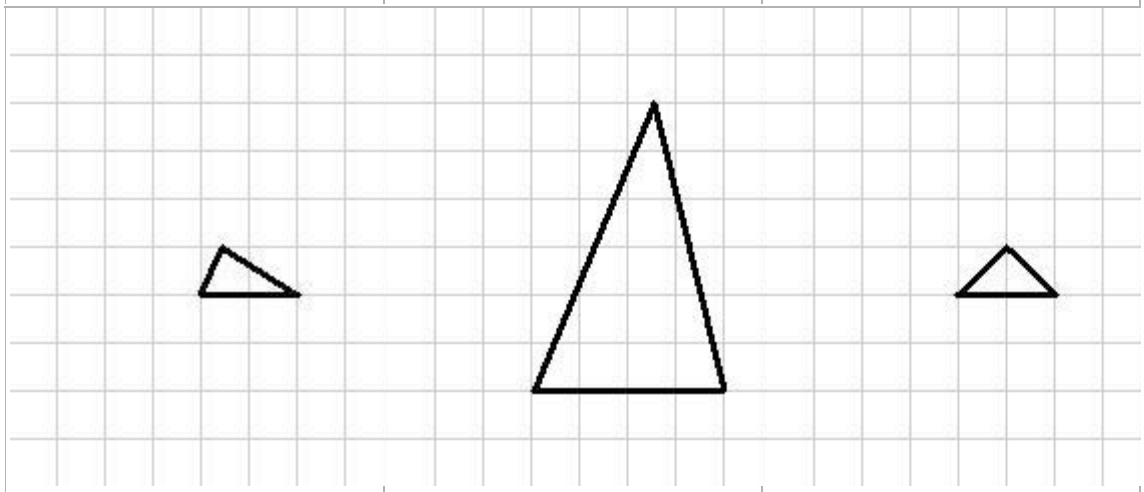
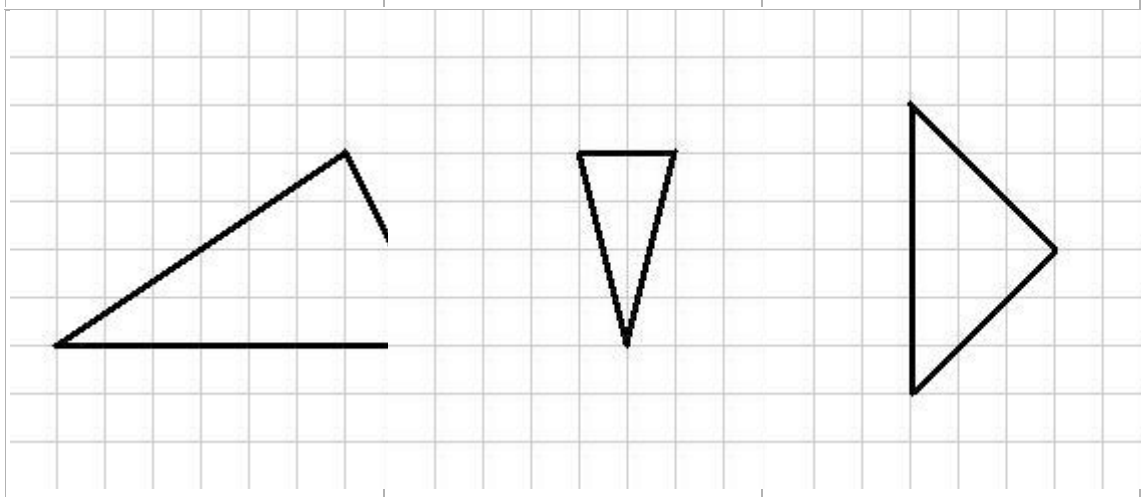
1	2	3
		
		
4	5	6

Multiple choice:

✘2 ✘3 ✓4 ✘5 ✘6

Hints:

- Note triangles 3, 5 and 6 are all isoceles or right-angled, but triangle 1 is not. So they cannot be similar.

1	2	3
		
		
4	5	6

- This leaves triangles 2 and 4. Use the grid to compare triangle 1 to both triangles 2 and 4.

  Draw heights of triangles that are parallel to the grid lines and look at ratios between heights and correspondent sides.

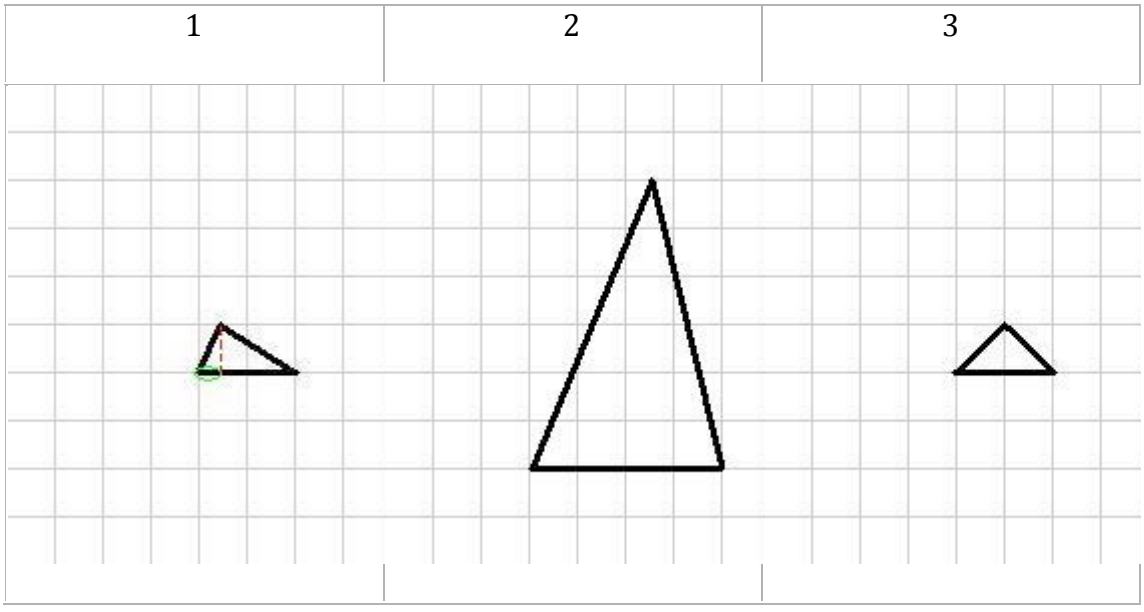
  Also look at the ratio of the two parts height divided each side.

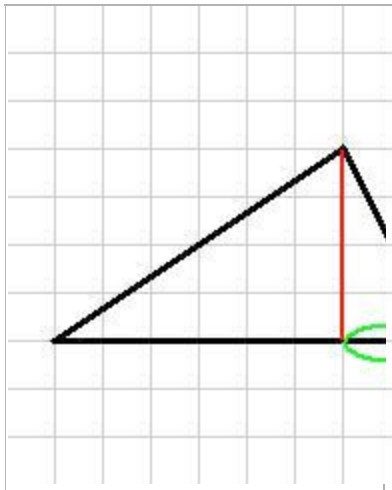
- Ratio of triangle 4 and 1 heights is 4 : 1 = 4

Ratio of triangle 4 and 1 sides 8 : 2 = 4

Ratio of triangle 4 and 1 smaller part of sides is 2 : 0.5 = 4

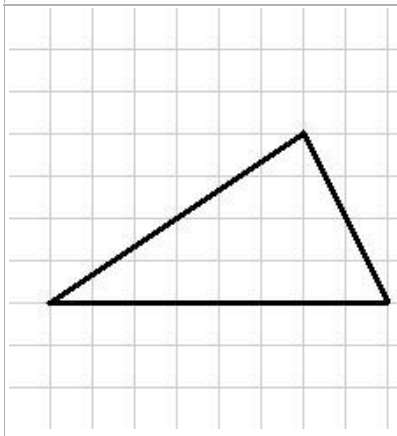
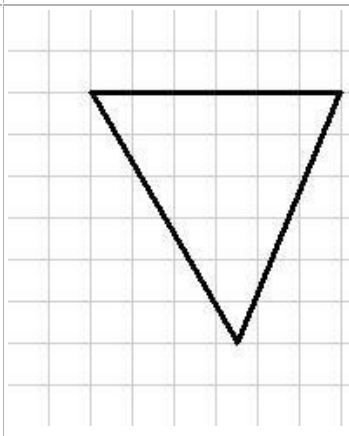
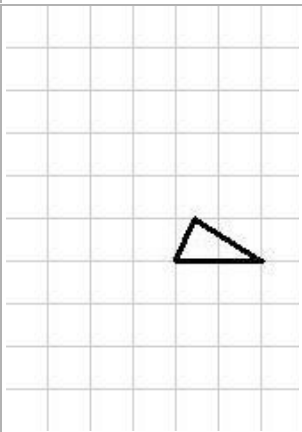
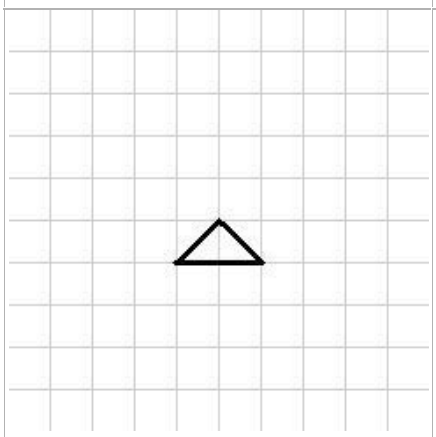
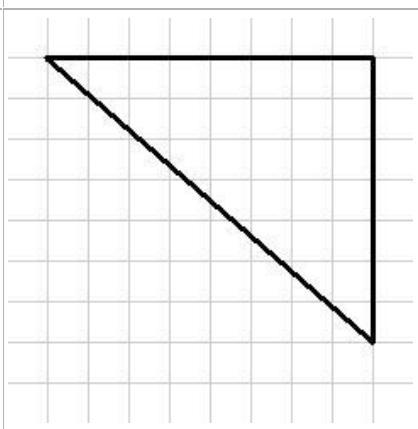
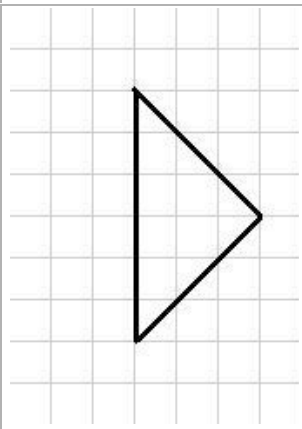
This means that triangles 1 and 4 are similar. Select 4.



		
4	5	6

Assistment #40822 - 31040 - 27946 - 14140 - Stretching and Shrinking - Inv 2.5.a

Which triangle below is similar to the triangle 1? (Note: All triangle points are either on the grid lines or in the middle of them)

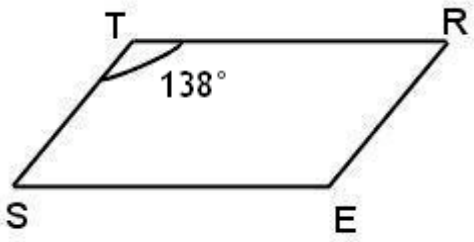
1	2	3
		
		
4	5	6

○ 2 ○ 3 ○ 4 ○ 5 ○ 6

Mastery learning 14156 Stretching and Shrinking - understanding line intersection angle formation

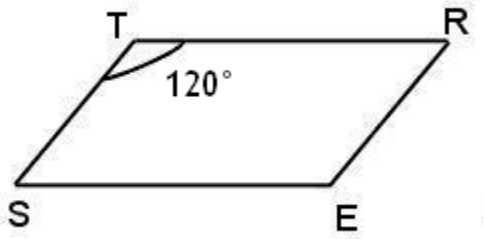
Assistment #41024 - 32881 - 28866 - 14156 - Stretching and Shrinking - Morph - Inv 3.3

What is the measure of angle E in the parallelogram TRES?



Assistment #40964 - 28866 - 14156 Stretching and Shrinking - Morph - Inv 3.3

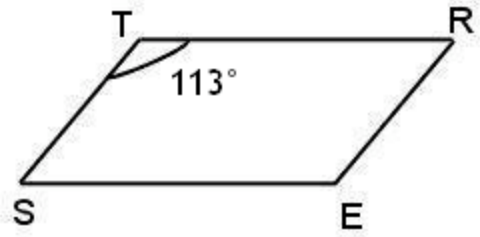
What is the measure of angle R in the parallelogram TRES?



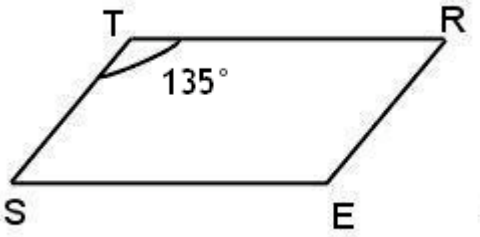
Assistment #40994 - 28866 - 14156 - Stretching and Shrinking - Morph - Inv 3.3

What is the measure of angle S in the

parallelogram TRES?



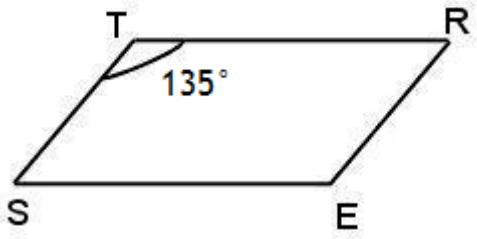
What is the measure of angle S in the parallelogram TRES?



Assistment #40995 - 28866 - 14156 - Stretching and Shrinking - Morph - Inv 3.3"

Assistment #41025 "41025 - 32881 - 28866 - 14156 - 7th Grade Stretching and Shrinking - Morph - Inv 3.3"

What is the measure of angle E in the parallelogram TRES?

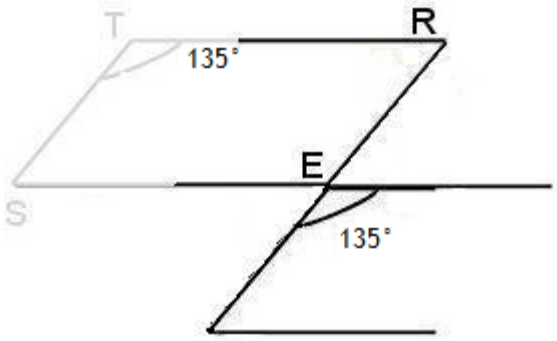


Algebra:

✓ 135

Hints:

- By cutting the parallelogram in half and rearranging it, we see that the angle E and the angle T are congruent.



- So, angle E = angle T = 135

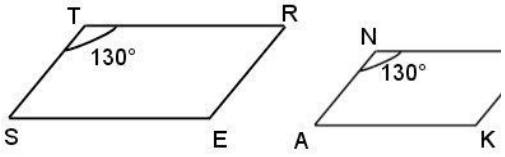
Type in 135.

Mastery learning 28853

Stretching and Shrinking - Similar Figures – Area

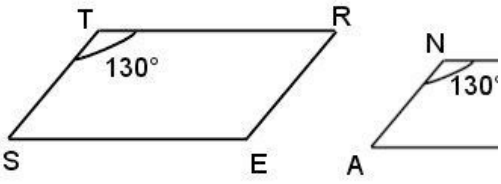
Assistment #41055 - 28853 - 14157 - Stretching And Shrinking - Morph - Inv 3.4.a

If we know the area of parallelogram STRE is **36** times that of parallelogram ANDK, the two parallelograms are **similar** and **KD = 6** what is the measure of ER? (Picture is not drawn to scale)

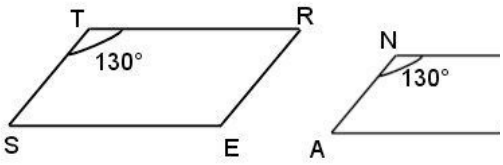


Assistment #41076 - 28853 - 14157 - Stretching And Shrinking - Morph - Inv 3.4.a

If we know the area of parallelogram STRE is **25** times that of parallelogram ANDK, the two parallelograms are **similar** and **KD = 6** what is the measure of ER? (Picture is not drawn to scale)



Assistment #41077 - 28853 - 14157 - Stretching And Shrinking - Morph - Inv 3.4.a

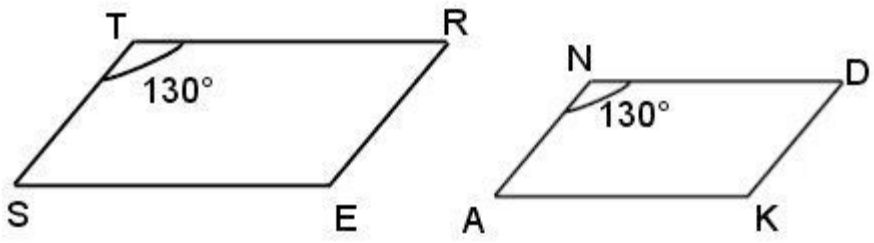


If we know the area of parallelogram STRE is **16** times that of paralellogram ANDK, the two parallelograms are **similar** and **KD = 7** what is the measure of ER? (Picture is not drawn to scale)

Assistment #41056 "41056 - 28853 - 14157 - 7th Grade Stretching And Shrinking - Morph - Inv 3.4.a"

If we know the area of parallelogram STRE is **4** times that of paralellogram ANDK, the two parallelograms are **similar** and **KD = 10** what is the measure of ER?

(Picture is not drawn to scale)



Algebra:

✓ 20

Hints:

- The two parallelograms are similar since they are both parallelograms and have a common angle of 130 degrees.
- When the area of a figure is 4 times as large the scale factor is 2.

Example when scale factor is 3:

- If the scale factor from the smaller parallelogram to the larger is 2, what is the

measure of ER?

- Since the scale factor is 2 from the small parallelogram to the large parallelogram we can multiply the side of the small parallelogram by 2 to get the measure of the side of the large parallelogram.

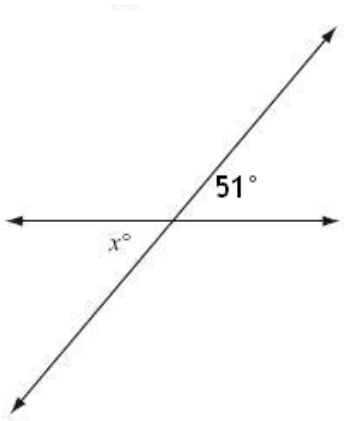
2 * 10 = 20. Type in 20.

Mastery learning 28851

Stretching and Shrinking - vertical angles

Assistment #41085 - 28851 - Stretching and Shrinking - Morph - 2007 #21

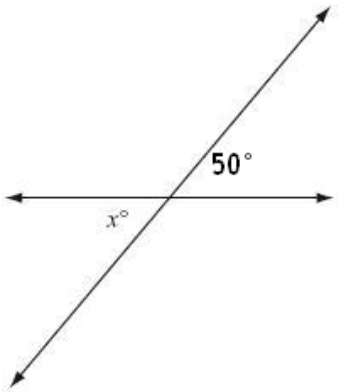
The figure below shows two intersecting lines.



What is the value of x?

Assistment #41097 - 28851 - Stretching and Shrinking - Morph - 2007 #21

The figure below shows two intersecting lines.

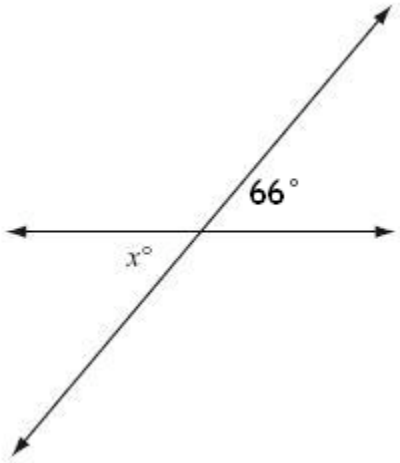


What is the value of x?

Assistment #41095 - 28851 - Stretching and Shrinking - Morph - 2007 #21

The figure below shows two

intersecting lines.



What is the value of x?

Assistment #41086 "41086 - 28851 - 7th Grade Stretching and Shrinking - Morph - 2007 grade 7 #21"

The figure below shows two intersecting

What is the value of x?

Algebra:

✓ 53

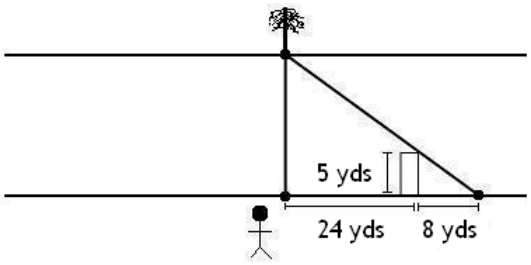
Hints:

- Imagine folding the picture so one angle is on top of the other.
- The two angles are called vertical angles.
- Vertical angles are always equal, so if one of them is 53^o, the other one must be 53^o too.

Value of x is 53^o. Type in 53.

Mastery learning 14162

Stretching and Shrinking - Similar Figures - Similar Triangles Application



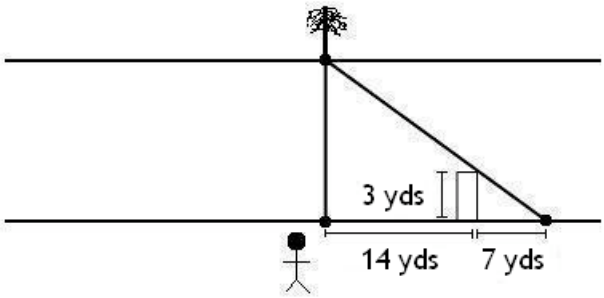
Assistment # 41115 - 14162 - Stretching and Shrinking - Morph - Inv 5.1.a

Ben was able to make the measurements given in the picture. He is straight across from the tree, and 24 yards from the dock. The dock is 5 yards long. The line that goes from the tree to the end of the dock hits the side of the river 8 yards down from the dock. How far is it across the river?

Assistment # 41130 - 14162 - Stretching and Shrinking - Morph - Inv 5.1.a

Ben was able to make the measurements given in the picture. He is straight across from the tree, and 14 yards from the dock. The dock is 3 yards long. The line that goes from the tree to the end of the dock hits the side of the river 7 yards down from the dock. How far is it

across the river?



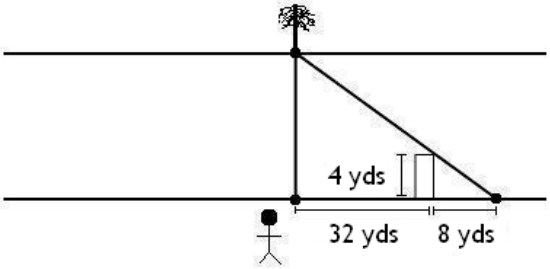
is 4 yards

long. The line that goes from the tree to the end

of the dock hits the side of the river 8 yards down

from the dock. How far is it across the river?

Assistment #41131 - 14162 - Stretching and Shrinking - Morph - Inv 5.1.a

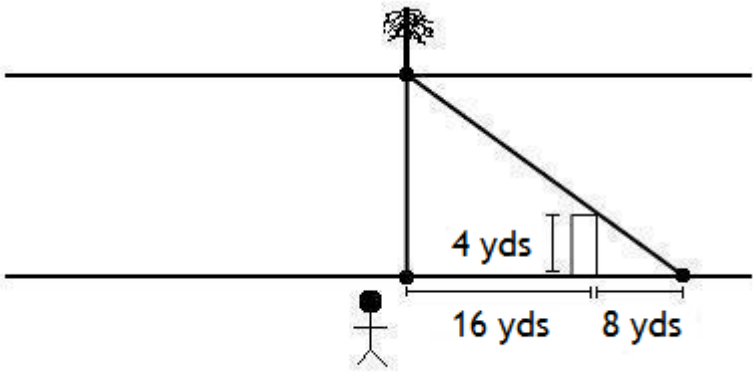


Ben was able to make the measurements given in the picture. He is straight across from the tree, and 32 yards from the dock. The dock

Assistment #41116 "41116 - 14162 - 7th Grade Stretching and Shrinking - Morph - Inv 5.1.a"

Ben was able to make the measurements given in the picture. He is straight across from the tree, and 16 yards from the dock. The dock is 4 yards long. The line that goes from the tree to the end of the dock hits the side of the river 8 yards down

from the dock. How far is it across the river?

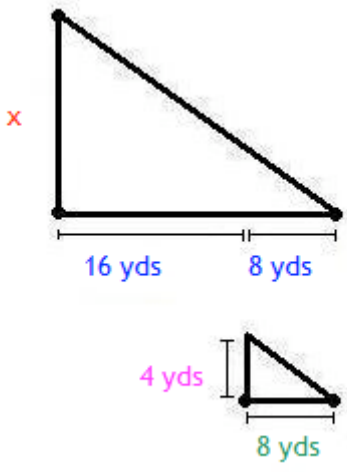


Algebra:

✓ 12

Hints:

- There are two similar triangles in the diagram, one inside the other. They are shown seperated in this image.



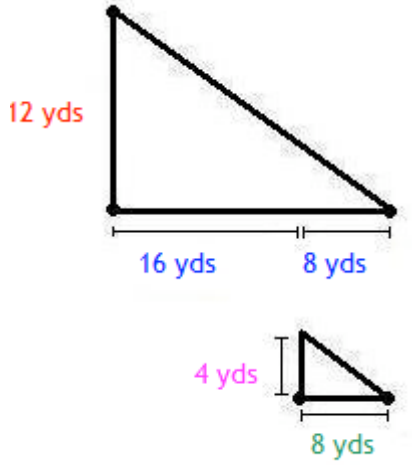
- Set up a proportion to find the value of x, the distance across the river. The example bellow shows the ratio of the short side to the long side of the triangle. We use **24** because **16** + **8** = **24**

$$\frac{4}{8} = \frac{x}{24}$$

- Since 8 * 3 = 24, the scale factor from the small triangle to the large triangle is 3. Use this to find the value of x.

$$\frac{4 * 3}{8 * 3} = \frac{x}{24}$$

$$\frac{12}{24} = \frac{x}{24}$$

- 

The distance across the river is 12 yards, please type in 12.

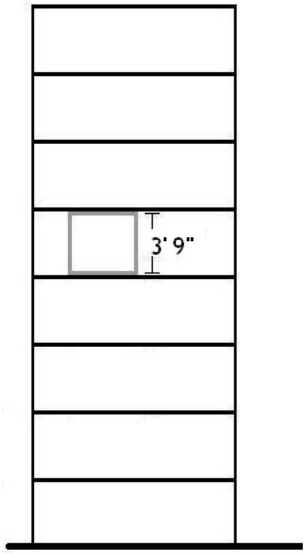
Mastery learning 14140

Stretching and Shrinking -

Converting from one measure to another

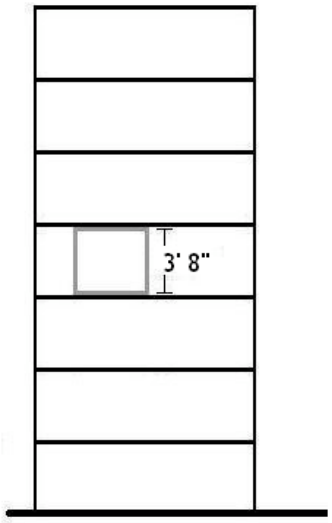
Assistment # 41616 - 32880 - 32876 - 14140 - Stretching and Shrinking - Morph - Inv 1.1.a

A box was on a shelf in a big warehouse as shown below. The box was 3 feet 9 inches tall. The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall **in feet** is the whole shelf?



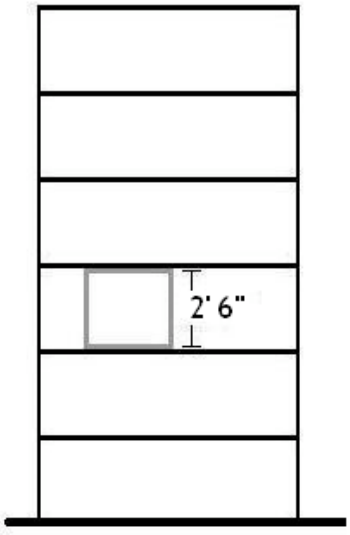
Assistment # 41614 - 32876 - 14140 - Stretching and Shrinking - Morph - Inv 1.1.a

A box was on a shelf in a big warehouse as shown below. The box was 3 feet 8 inches tall. The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall **in inches** is the whole shelf?



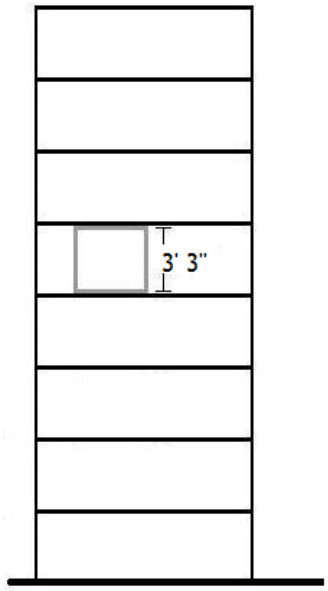
Assistment #41555 - 32876 - 14140 - Stretching and Shrinking - Morph - Inv 1.1.a

A box was on a shelf in a big warehouse as shown below. The box was 2 feet 6 inches tall. The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall **in inches** is the whole shelf?



Assistment #41617 "41617 - 32880 - 32876 - 14140 - 7th Grade Stretching and Shrinking - Morph - Inv 1.1.a"

A box was on a shelf in a big warehouse as shown below. The box was 3 feet 3 inches tall. The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall **in feet** is the whole shelf?



Algebra:

✓ 26

Scaffold:

Since the shelf has 8 rows, one way to solve this problem is to multiply the feet portion by 8 rows and then multiply the inches portion by 8 rows.

Start by multiplying just the foot portion by 8.

3 feet * 8 = ? (How many feet)

Algebra:

✓ 24

Hints:

- Just multiply 3 * 8
- 3 * 8 = 24. There are 24 feet when you count just the whole feet in the measure of the box. Type in 24.

Scaffold:

So, part of the height is 24 feet. Now we need to multiply 3 inches by 8 rows.

3 inches * 8 = ? (How many inches)

Algebra:

✓ 24

Hints:

- Just multiply 3 * 8
- 3 * 8 = 24. There are 24 inches when you count just the whole inches in the measure of the box. Type in 24.

Scaffold:

So, now we have 24 inches, but we need our answer to be in feet. How many feet is 24 inches?

Algebra:

✓ 2

Hints:

- 1 foot is 12 inches.
- 24 ÷ 12 = 2

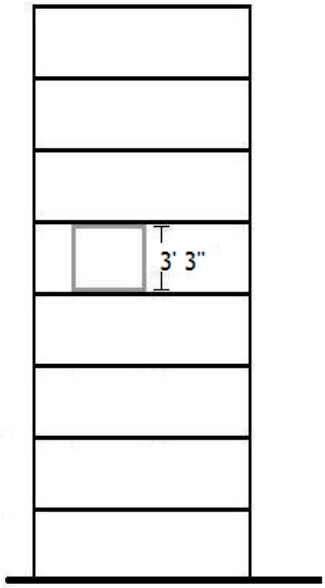
2 feet is 24 inches. Type in 2

Scaffold:

Now back to the original problem.

A box was on a shelf in a big warehouse as shown below. The box was 3 feet 3 inches tall.

The box fits perfectly height-wise on one of the shelves and each shelf has the same width and height. How tall **in feet** is the whole shelf?



Algebra:

✓ 26

Hints:

- Remember, when you multiply the feet portion by 8 you get:

3 feet * 8 = 24 feet

- When you multiply the inches portion by 8 you get:

3 inches * 8 = 24 inches

And 24 inches is 2 feet

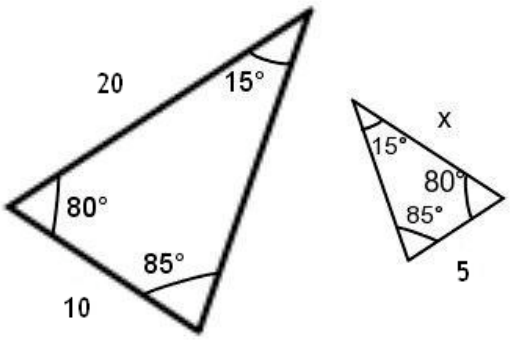
- Height of the whole shelf is: 24 feet + 2 feet = 26 feet.

Type in 26.

Mastery learning 14161 Stretching and Shrinking - Similar Figures - Find Unknown Length

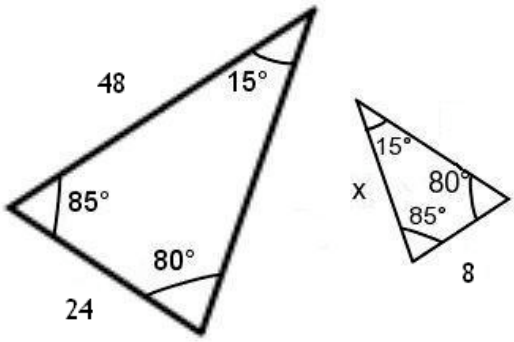
Assistment # 41346 - 32877 - 14161 - Stretching_and_Shrinking_Inv_4_4_a_hints

The two triangles are similar. Find the length of the missing side, x.



Assistment # 41376 - 32878 - 32877 - 14161 - Stretching_and_Shrinking_Inv_4_4_a_hints

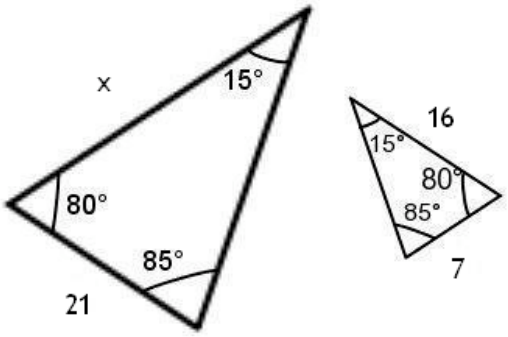
The two triangles are similar. Find the length of the missing side, x.



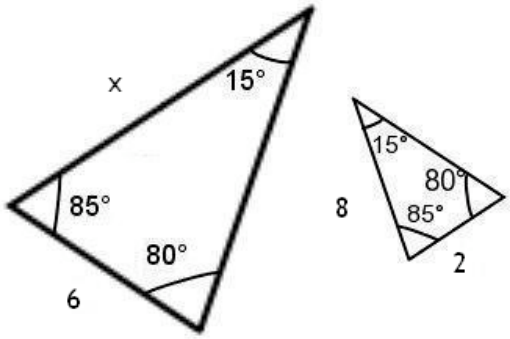
Assistment # 41406 - 32877 - 14161 - Stretching_and_Shrinking_Inv_4_4_a_hints

Assistment # 41436 - 32877 - 14161 - Stretching_and_Shrinking_Inv_4_4_a_hints

The two triangles are similar. Find the length of the missing side, x.



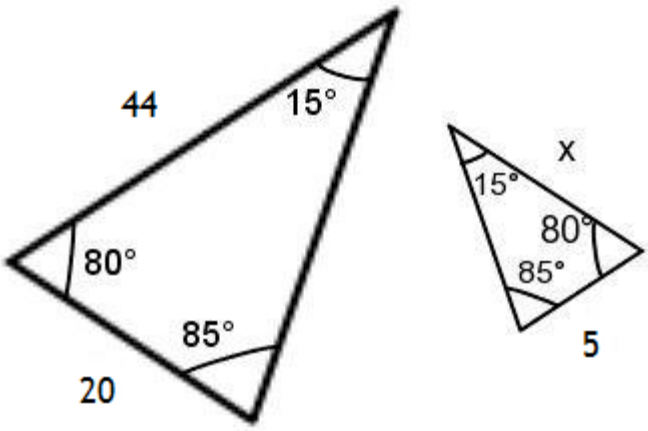
The two triangles are similar. Find the length of the missing side, x.



Assistment #41347 "41347 - 32877 - 14161 -

Stretching_and_Shrinking_Inv_4_4_a_hints"

The two triangles are similar. Find the length of the missing side, x.



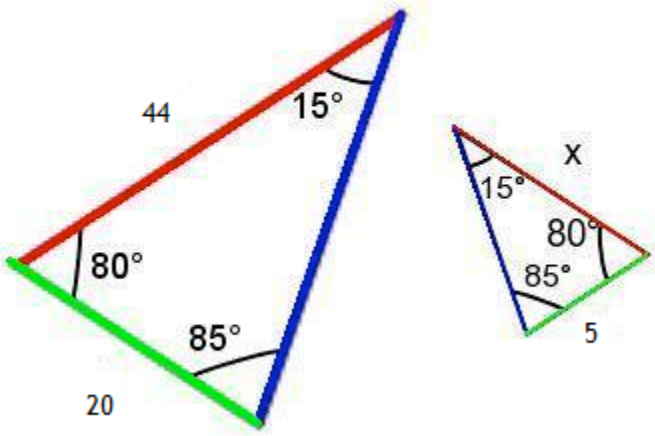
Algebra:

✓ 11

Hints:

- We need to find the scale factor from the large triangle to the small one. Since the triangle gets smaller we know the scale factor will be less than 1.
- Check which sides of the triangles correspond by using the equal angles.

For example, the sides, which are across from the 80 degree angle are corresponding, so are the ones opposite the 85 degree angles.



- Now we can use the two green corresponding sides (the ones opposit 15 degrees) to find the scale factor since we know their lenghts.

In the smaller triangle the side is 5 units and in the bigger one it's 20 units.

So the scale factor is 5/20 = 1/4.

- Now we can use the scale factor of 1/4 to find the missing side lengths.

- 44 units * 1/4 = 11 units

So x = 11 units. Type in 11.

Assistment – Ricardo Madera

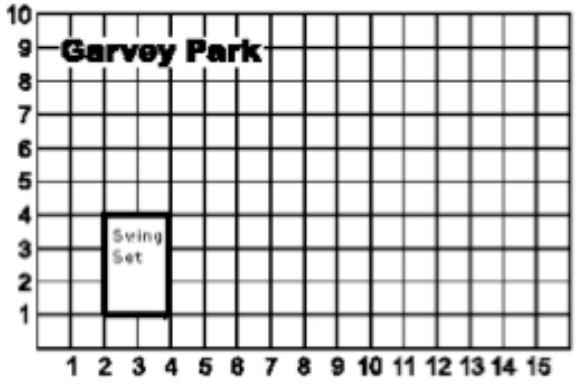
Assistment – Printing Content

Problem Set "7th Grade Kaleidoscopes, Hubcaps and Mirrors V1.0 With Tutoring (4 items)"
id:[5553]

1) Assistment #28820 "28820 - Morph-1998 #18 "

The swing set in Garvey Park is going to be moved from the place shown on the map to a new location.
One corner of the set will be at (8,5) and another corner will be at (11,7).

Where will the **two** other corners be?

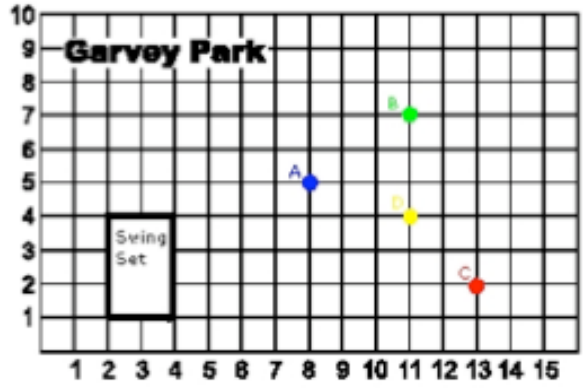


Multiple choice:

✗ (8, 5) and (8, 7) ✗ (8,7) and (11, 7) ✗ (8,5) and (11,5) ✓ (8, 7) and (11, 5)

Scaffold:

Let's locate the points identified as the new corners, (8,5) and (11,7).
Which letters correspond to these two points?

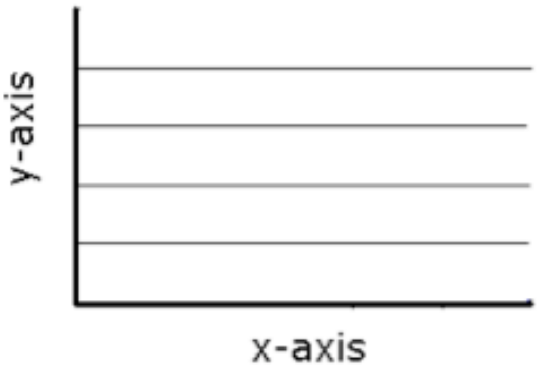


Multiple choice:

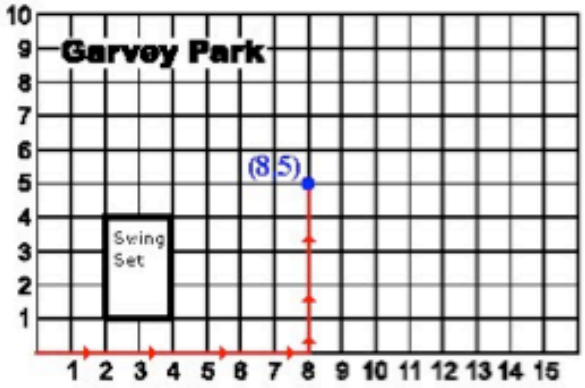
✓ A and B ✗ A and C ✗ B and C ✗ A and D ✗ B and D

Hints:

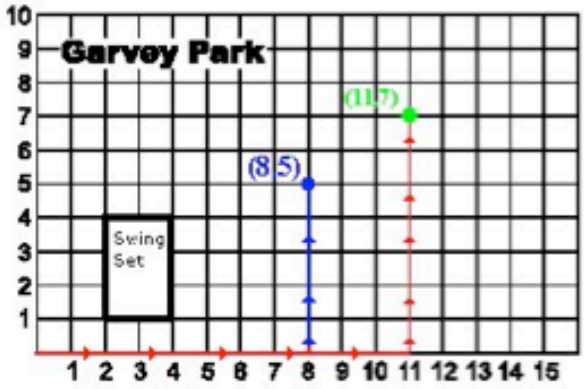
- Points are read as (x,y). X-values are on the horizontal or x-axis, while y-values are on the vertical or y-axis.



- So, we can read the point (8,5) as 8 over, 5 up.



- Point (11,7) can be read as 11 over, 7 up.

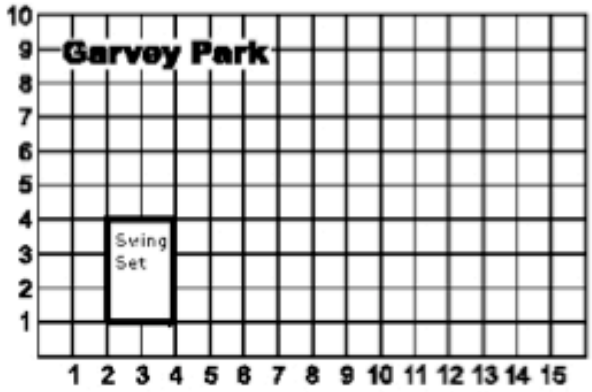


- Points A and B are correct.

Scaffold:

Now, lets return to the original question.

The swing set in Garvey Park is going to be moved from the place shown on the map to a new location.
One corner of the swing set will be at (8,5) and another corner will be at (11,7).
Where will the other **two** corners be?

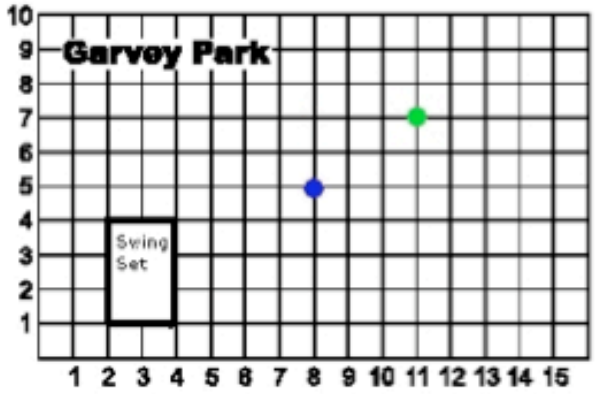


Multiple choice:

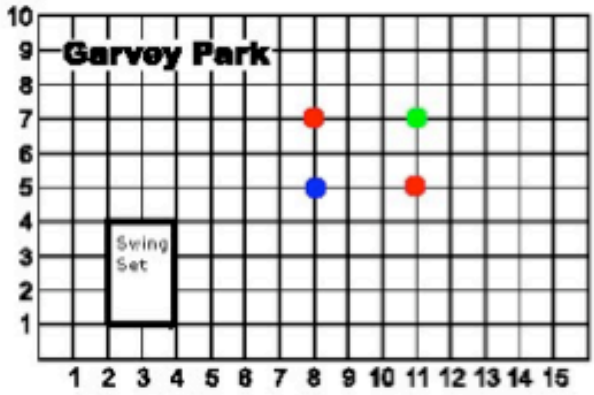
✗ (8,5) and (8, 7) ✓ (11, 5) and (8, 7) ✗ (3, 2) and (6, 2) ✗ (8, 7) and (11, 4)

Hints:

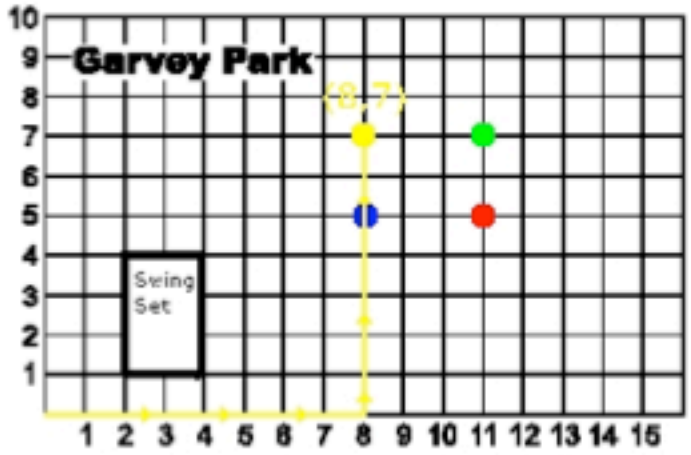
- The corners (8,5) and (11,7) are given by the problem.



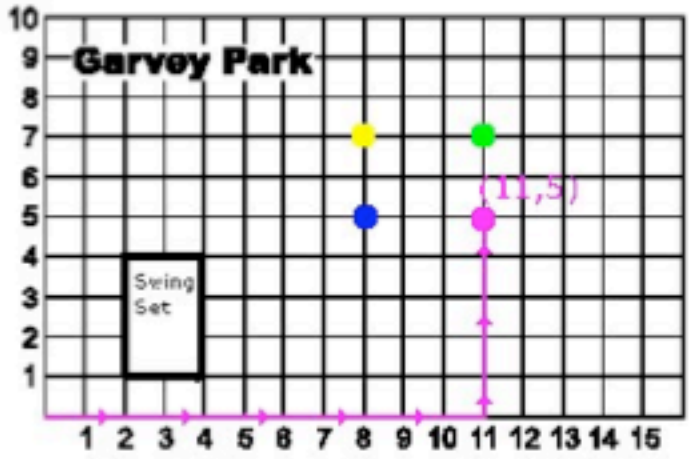
- The other two corners are marked in red.



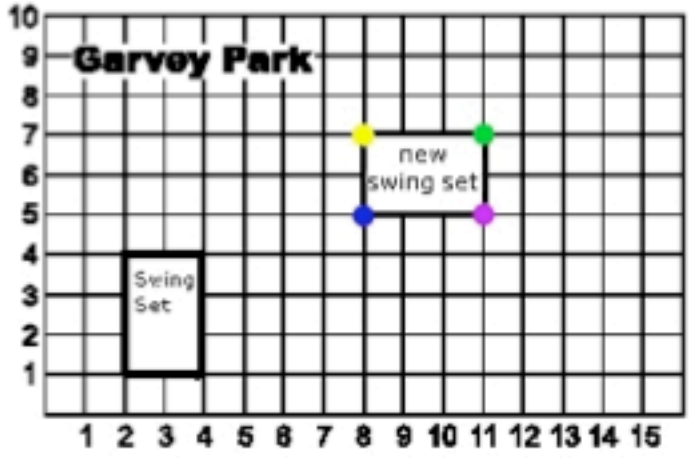
- To find their location, count how many right, then how many up the points are from (0,0)
- The upper left corner is located at (8, 7).



- The lower right corner is located at (11, 5).

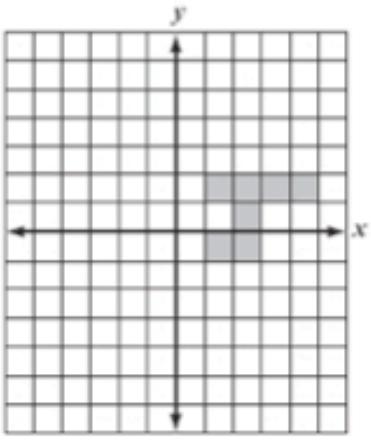


- So, the other two corners of the swing set would be at (8,7) and (11,5).



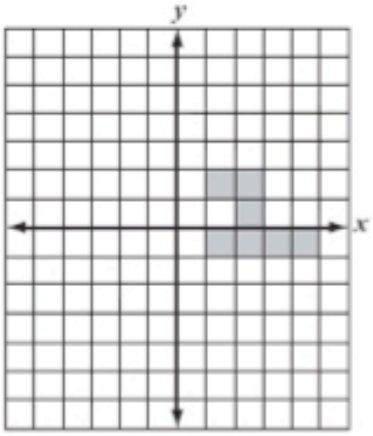
2) Assistment #28821 "28821 - Morph-2007 #4"

Angelie shaded a figure on a coordinate plane, as shown below.

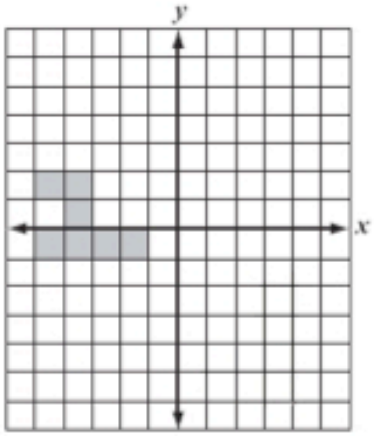


Which of the following best represents the reflection of Angelie's figure across the y-axis?

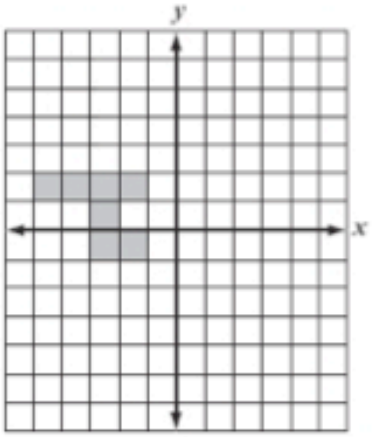
A.



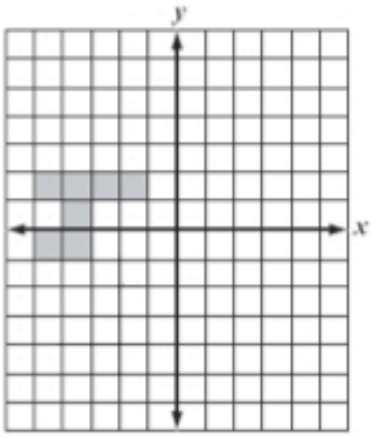
B.



C.



D.

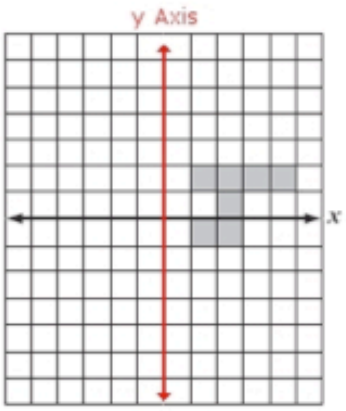


Multiple choice:

✘ A. ✘ B. ✓ C. ✘ D.

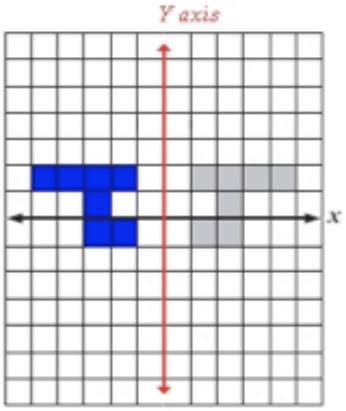
Hints:

- In this problem you are asked to reflect a figure across the y-axis. So, we need to find the y-axis and reflect Angelie's figure.



The y-axis is shaded in red.

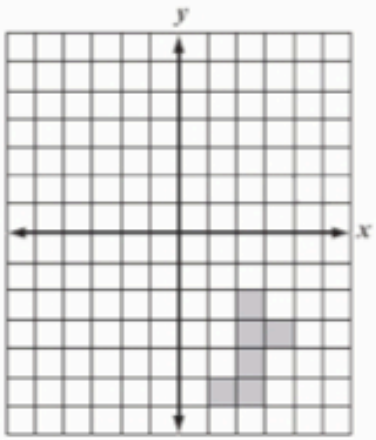
- The reflection of Angelie's figure across the y-axis is shown below:



The blue figure is the reflection of **Angelie's figure** across the y-axis.
Select C.

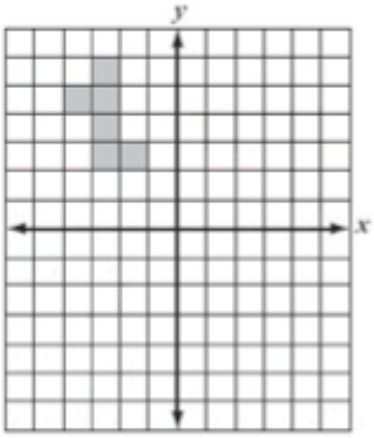
3) Assistment #28822 "28822 - Morph 2005 #5 "

Look at the figure shaded below.

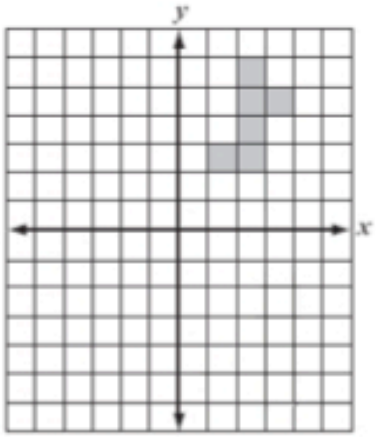


Which of the following graphs show's a translation over the X-axis and then the Y-axis?

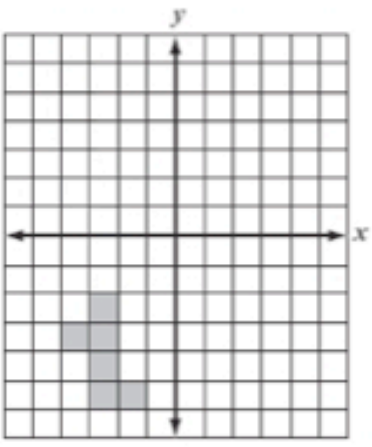
A.



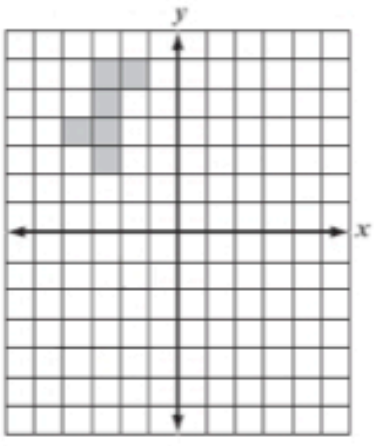
B.



C.



D.



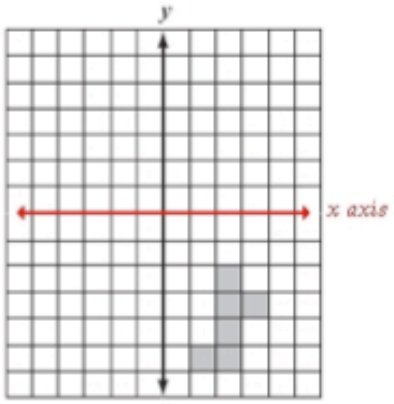
Multiple choice:

✗ A. ✗ B. ✗ C. ✓ D.

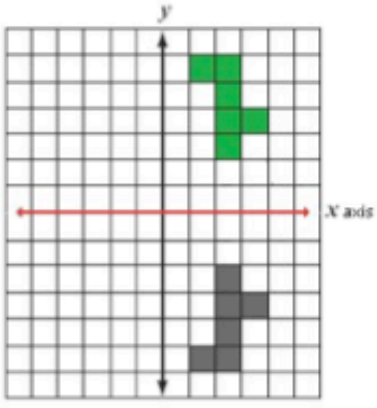
Hints:

- In this problem you are asked to reflect a figure across the x-axis and then the y-axis.

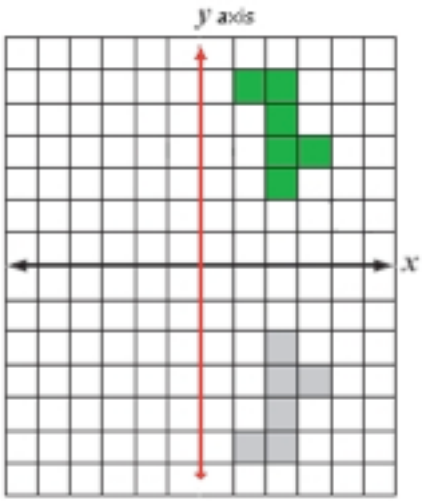
The first reflection is across the x-axis. So we need to mirror the figure across the x-axis shown in red.



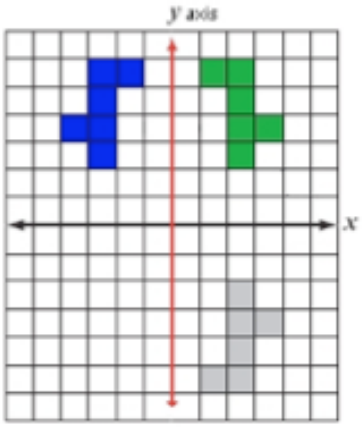
- The green figure is the reflection of the **original figure** across the x axis.



- The next step is to reflect the green figure across the y-axis.

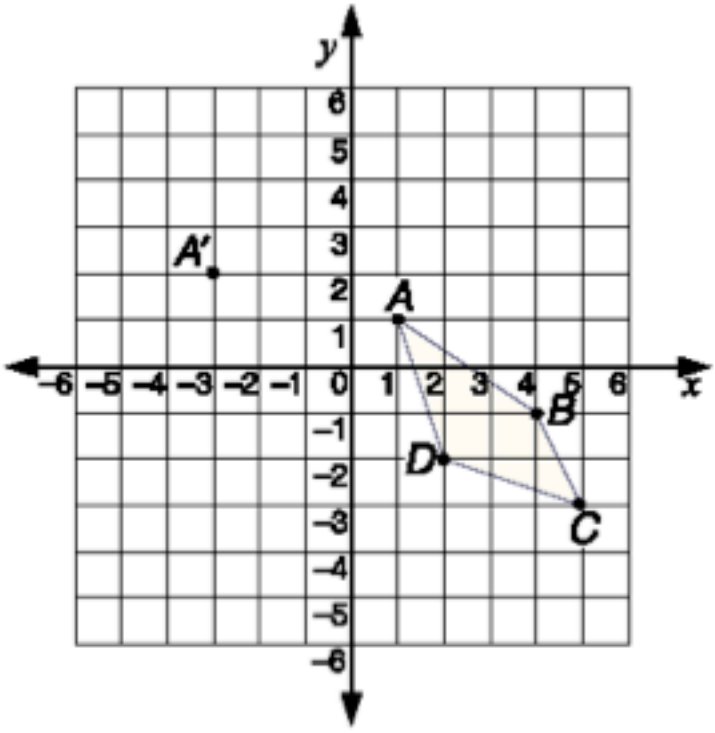


- Now, lets reflect the green figure across the y-axis.



The blue figure is the reflection of the green figure across the y-axis.

Therefor the blue figure is the reflectio of the gray figure across the x-axis and then the y-axis.
Select D.



Multiple choice:

✓ (1, -2) ✗ (0, 1) ✗ (-1, 1) ✗ (1, 0)

Scaffold:

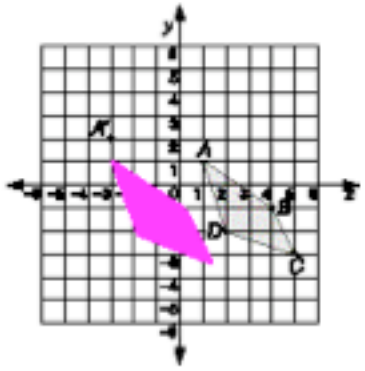
First let's find how point *A* is related to point ***A'*** .
How far to the left is ***A'*** from ***A*** *?*

Fill in:

✓ 4 ✗ 1

Hints:

- Count along the x-axis. The x-axis is the line going across.
-



- Count the squares between A and A', along the x-axis to the left.
- A' is 4 squares to the left from A. Type in 4.

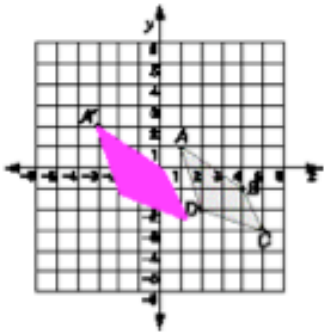
Scaffold:

How far up is *A'* from *A*?

Fill in:

✓ 1 ✗ 4

Hints:

- Count along the y-axis. The y-axis is the line that goes up and down.
- 

- Count the squares going up between A and A'.
- There is 1 square between A and A' along the y-axis. Type in 1.

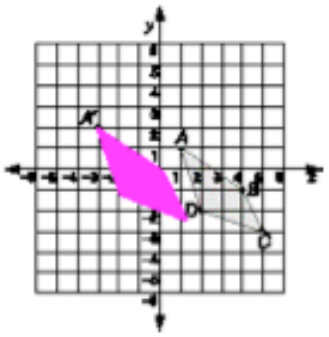
Scaffold:

Point C is related to the image of point C the same way that point A is related to A' . What is the x-coordinate of the image of C'?

Fill in:

✓ 1

Hints:

- Point C is related to the image of C in the same way that point A is related to A'.
- Count 4 spaces to the left from point C to find the x-coordinate of the image of C.
- 

- The x-coordinate of the image of C is 1. Type in 1.

Scaffold:

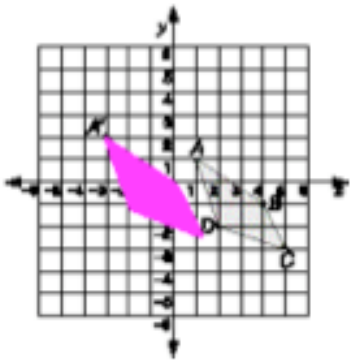
What is the y-coordinate of the image of C'?

Fill in:

✓ -2

Hints:

- Point C is related to the image of C in the same way that point A is related to A'.

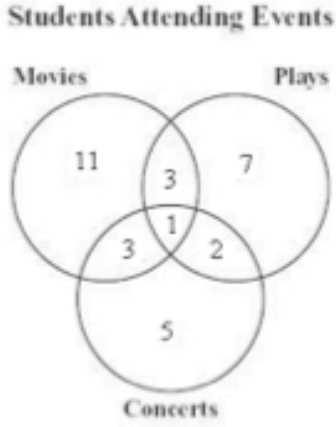
- 

- Count 1 space up from point C to find the y-coordinate of the image of C.
- The y-coordinate of the image of C is -2. Type in -2.

Problem Set "7th Grade - Data Analysis PreTest (8 items) V1.0 With Tutoring (Morph)" id:[5294]

1) Assistment #27843 "27843 - 27817 - Grade 7 - Year 2007 - Q 11 - Venn Diagram"

Heather asked her classmates if they went to a movie, a play, a concert, or any combination of those events during the last month.
The Venn diagram below represents her data.



Based on the diagram,
what is the total number of Heather's classmates who went to a concert during the last month?

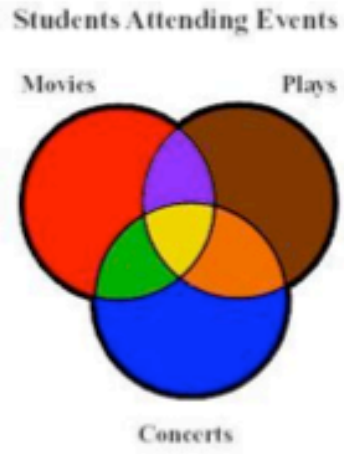
Algebra:

✓ 11

Scaffold:

Lets try to understand a venn diagram before we answer the question.

A Venn diagram shows a relationship by visually grouping things into sets.
Which of the following colored sections represent total number of Heather's classmates who went to a concert?



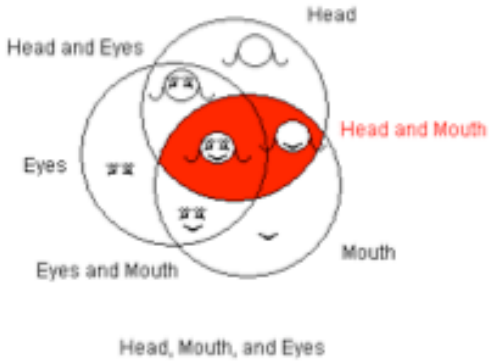
Multiple choice:

✗ A. Yellow ✗ B. Red, Brown and Blue ✓ C. Green, Yellow, Orange and Blue ✗ D. Green, Yellow, Purple and Orange

Hints:

- Use the diagram below to get an idea. It shows three different groups (head, mouth, and

eyes) and their intersections.



- We need all the sections that fall under the circle of classmates who went to see concerts.
- Classmates under green, yellow, orange and blue section went to see concerts.

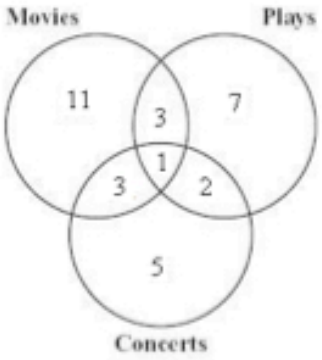
So, select option C.

Scaffold:

We know the sections we have to look at in order to find
the total number of Heather's classmates who went to a concert during the last month.
Now try to solve the original question.

Heather asked her classmates if they went to a movie, a play, a concert, or any combination of those events during the last month.
The Venn diagram below represents her data.

Students Attending Events



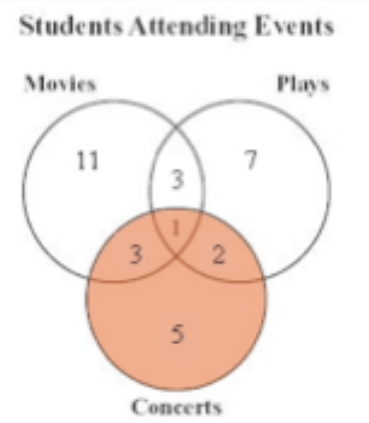
Based on the diagram,
what is the total number of Heather's classmates who went to a concert during the last month?

Algebra:

✓ 11

Hints:

- The highlighted area in the figure below represents the total number of Heather's classmates who went to a concert during the last month.

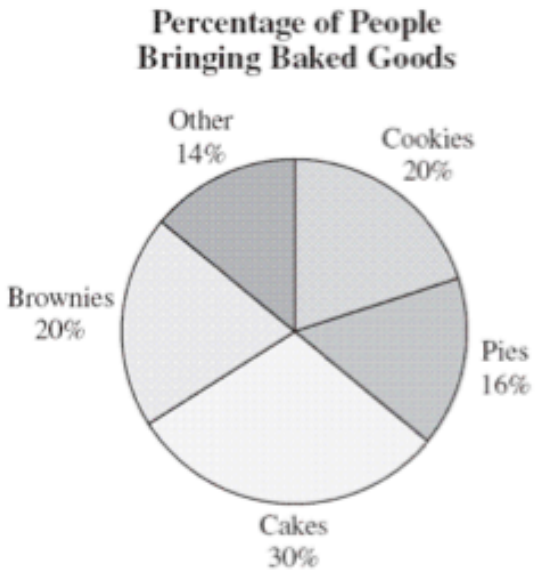


- To find the total number, you need to add the numbers in the highlighted sections.
- 1 + 2 + 3 + 3 = 11

Thus, 11 classmates of Heather went to a concert during the last month.
So type in 11.

2) Assistment #27844 "27844 - 2004MCASNum24"

The circle graph below shows the percentages of people who brought each type of baked good to sell at a recent bake sale. If 27 people brought cakes to sell, what is the total number of people who brought baked goods to sell?



Algebra:

✗ 45 ✓ 90 ✗ 70 ✗ 75

Scaffold:

Lets start by looking at the graph and finding out what we know.

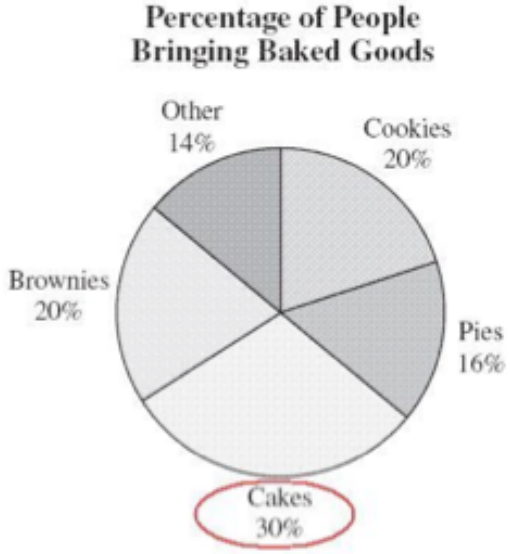
The graph says that 30% of the total number of people brought cakes. What is the number of cakes that corresponds with 30%?

Algebra:

✓ 27

Hints:

- From the circle graph, we can see that 30% brought cakes to sell.



- The text says:

The circle graph below shows the percentages of people who brought each type of baked good to sell at a recent bake sale. If **27 people brought cakes to sell**, what is the total number of people who brought baked goods to sell?

The part in read says that 27 people brought cakes to sell.

- Therefore, 30% of the total number of people is 27.

Type in 27.

Scaffold:

What is the 10% of the total number of people?

Algebra:

✓ 9

Hints:

- We just found that 30% of total number of people is 27.
- 10% is 3 times less than 30%.

That is to say:

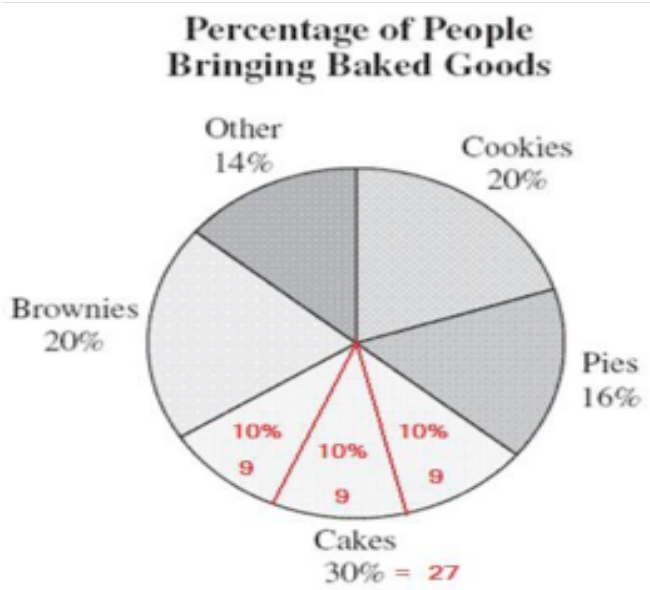
10% = 30% / 3
= 10%

- Similarly,

10% of people should be 3 times less than the 30% of people

10% of total people = 30% of total people / 3
= 27 / 3
= 9

- This can be visualized in the graph as following.

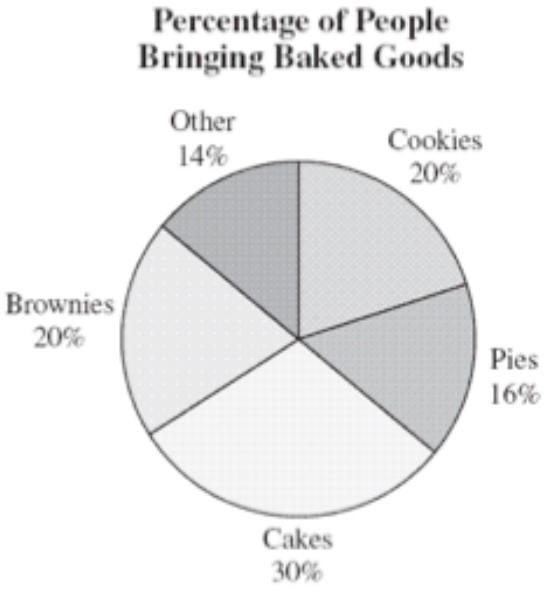


- Therefore, 10% of the total number of people is 9. Type in 9.

Scaffold:

Now, let's get back to our original question again.

The circle graph below shows the percentages of people who brought each type of baked good to sell at a recent bake sale. If 27 people brought cakes to sell, what is the total number of people who brought baked goods to sell?



Algebra:

✓ 90

Hints:

- We just found that 10% of the total number of people is 9.
- The total number of people is equivalent to 100% of total number of people.
- 100% is 10 times larger than 10%.

That is to say:

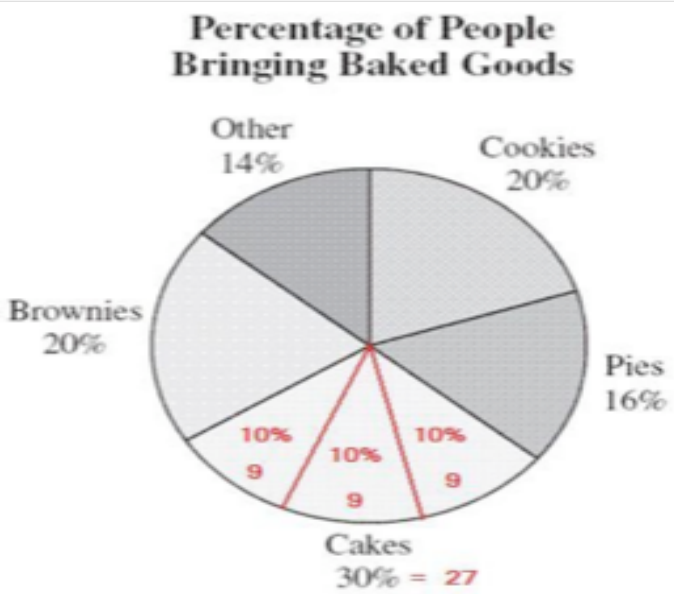
100% = 10% * 10
= 100%

- Similarly,

100% of total people must be 10 times larger than the 10% of the total people.

100% of total people = 10% of total people * 10
= 9 * 10
= 90

- This can be visualized in the graph as following.



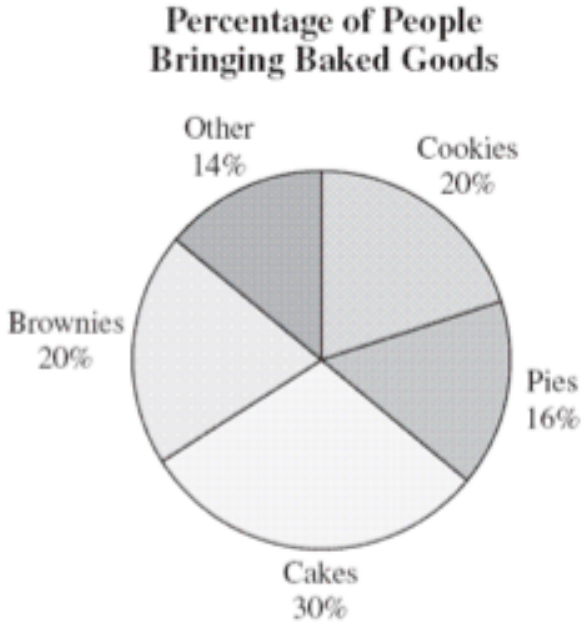
- Therefore, 10% of the total number of people is 9.

Type in 9.

Scaffold:

Now, let's get back to our original question again.

The circle graph below shows the percentages of people who brought each type of baked good to sell at a recent bake sale. If 27 people brought cakes to sell, what is the total number of people who brought baked goods to sell?



Algebra:

✓ 90

Hints:

- We just found that 10% of the total number of people is 9.
- The total number of people is equivalent to 100% of total number of people.
- 100% is 10 times larger than 10%.

That is to say:

100% = 10% * 10

= 100%

- Similarly,

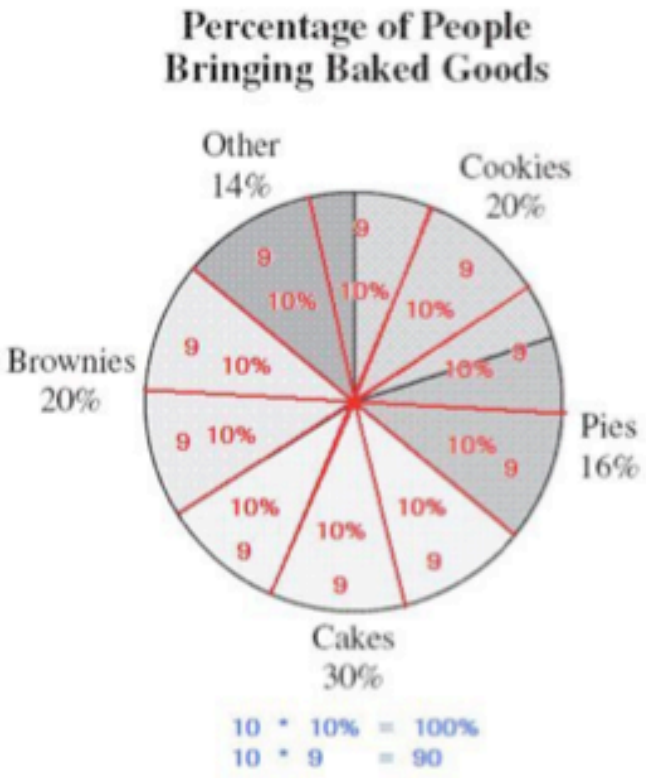
100% of total people must be 10 times larger than the 10% of the total people.

100% of total people = 10% of total people * 10

= 9 * 10

= 90

- This can be visualized in the graph as following.



- Therefore, total number of people who brought baked goods to sell is 90.

Type in 90.

3) Assistment #27845 "27845 - 2201 - Problem 8 - 2003"

The stem-and-leaf plot below shows the ages of the people who bought skateboards at a store during a sale. What is the median age of the people who bought skateboards during the sale?

Ages of People

Stem	Leaf
1	234566789
2	3568
3	5
4	45
6	77
7	2

Key
6|2 = 62

Fill in:

✓ 23 ✗ 21 ✗ 24

Scaffold:

In stem-and-leaf plots, each data number is separated into a "stem" and "leaf", where the "stem" is the tens digit and the "leaf" is the ones digit. Which of the following numbers does the stem-and-leaf plot above represents?

Stem	Leaf
4	36

Multiple choice:

✗ 4 and 36 ✗ 4, 3 and 6 ✓ 43 and 46 ✗ 436

Hints:

- Use the stem as the tens digit. Use the leaf as the ones digit.

20

Stem	Leaf
1	13

- The stem is 4. The leaves are 3 and 6.
- The two numbers are 43 and 46.

Scaffold:

Good, now we know what the stem-and-leaf plot means. The next step is to understand what the median means. Which of the following is the right definition of median?

Multiple choice:

✗ An average of the numbers. ✓ The middle value of the numbers. ✗ The most frequent value.

Hints:

- "An average of the numbers" is the **Mean**.
- "The most frequent value" is the **Mode**.
- The Median is "the middle value of the numbers".

Select "the middle value of the numbers"

Scaffold:

Now we know that the median is the measure of central tendency.
Median is the middle value of a data set.
Out of 19 data numbers in an ordered list, which one (the order) is the middle one?

Multiple choice:

✓ 10^{th} ✗ 11^{st} ✗ 7^{th} ✗ 9^{th}

Hints:

- Start counting from the beginning and from the end at the same time and find which count is in the middle.
- The correct answer is 10^{th}.

There are 9 numbers in front of it and 9 numbers behind it.
Select 10th.

Scaffold:

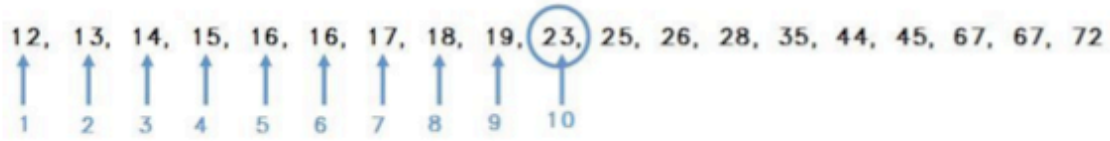
Now, find the value of the 10^{th} data number to get the median. What is the median age going to be?

Fill in:

✓ 23

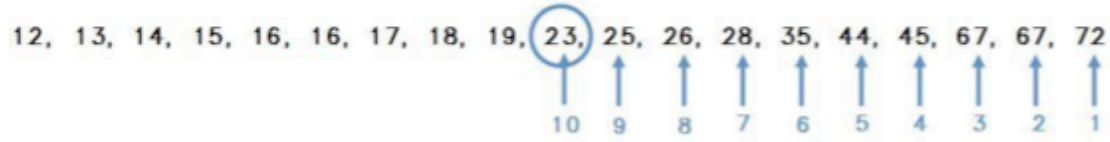
Hints:

- Let's start counting from the left to locate the 10^{th} number.



So, 23 is the 10^{th} number.

- To confirm this, let's start counting from the right as well and circle the 10^{th} number.



So this confirms 23 is in fact the 10^{th} number in the group.

- Therefore, the median age is 23.

Type in 23.

4) Assistment #27829 "27829 - 2005-26"

Three friends played a video game. Naomi scored the greatest number of points.
The chart below shows the results of the game.

Results of Video Game

Player	Number of Points
Naomi	5,000
Darla	2,000
Isaac	3,000

Type in the fraction that represents Naomi's score out of the total points.

Algebra:

✓ 1/2 ✗ $^{9}/_{11}$ ✗ $^{4}/_{5}$ ✗ $^{11}/_{20}$

Scaffold:

In order to find the fraction of the total pints scored by Naomi we need to find the total points scored and the number of points Naomi scored.
Lets start by finding the number of points Naomi scored.

How many points did Naomi score?

Algebra:

✓ 5000 ✓ 5,000 ✗ 2000 ✗ 2,000 ✗ 3000 ✗ 3,000

Hints:

- Look at the table for the row that has Naomi's name in it
- How many points are listed in Naomi's row?

Results of Video Game

Player	Number of Points
Naomi	5,000
Darla	2,000
Isaac	3,000

- Naomi scored 5,000 points.

Scaffold:

Now lets find the total points scored.

How many points were scored by all three players?

Algebra:

✓ 10000 ✓ 10,000

Hints:

- What is the sum of all of the points listed in the table?
-

Results of Video Game

Player	Number of Points
Naomi	5,000
Darla	+ 2,000
Isaac	+ 3,000
	?

What is 5,000 + 2,000 + 3,000?

- 5,000 + 2,000 + 3,000 = **10,000**.

Scaffold:

Now try to solve the original question again.

Three friends played a video game. Naomi scored the greatest number of points. The chart below shows the results of the game.

Results of Video Game

Player	Number of Points
Naomi	5,000
Darla	2,000
Isaac	3,000

Type in the fraction that represents Naomi's score out of the total points.

Algebra:

✓ 1/2 ✗ $^{9}/_{11}$ ✗ $^{4}/_{5}$ ✗ $^{11}/_{20}$

Hints:

- The numerator of the fraction is how many points Naomi scored, the denominator is the sum of all the points.
- Here is the fraction (ratio of Naomi's points to total number of points).

Now, let's reduce $^{5,000}/_{10,000}$.

- To start reducing the fraction, remove the last two zeros in each number. This is the same as dividing both by 100.

Now, you have $^{50}/_{100}$

This can still be reduced.

- 50 and 100 are both divisible by 50.

50 divided by 50 is 1
100 divided by 50 is 2

- The fraction is $^{1}/_{2}$

5) Assistment #27831 "27831 - Problem 30a - 1998"

The coach of the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	15, 24, 32, 15, 22, 19, 26, 29, 11, 17
Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

What is the **mean** number of points scored by Geltz?

Algebra:

✓ 21 ✗ 20 ✗ 22 ✗ 20.5

Scaffold:

Let's start with the definition. Which of the following is the right definition for the mean?

Multiple choice:

✗ the most frequent value ✓ an average of the numbers ✗ the middle number

Hints:

- "The most frequent value" is called Mode.
- "The middle number" is called Median.
- The **Mean** is "An average of the numbers".

Select "An average of the numbers".

Scaffold:

So the mean is the average of the numbers.

To find the average, **you sum the numbers** and divide by **how many numbers make up the sum.**

So first, let's find **the total number of points scored by Geltz.** (Later we will ask you for the mean)

Name of Player	Number of points scored in last ten games
Geltz	15, 24, 32, 15, 22, 19, 26, 29, 11, 17
Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

Fill in:

✓ 210 ✗ 21

Hints:

- To find the mean, divide **the sum of the numbers** by **how many numbers make up the sum.**

These are the numbers you have to add up:

15 + 24 + 32 + 15 + 22 + 19 + 26 + 29 + 11 + 17

- The sum of the points equals to 15 + 24 + 32 + 15 + 22 + 19 + 26 + 29 + 11 + 17 = 210
- **Gentz scored a total of 210 points in the past 10 games.**

Type in 210.

Scaffold:

Good. Let's try the original problem again.

The coach of the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Gentz	15, 24, 32, 15, 22, 19, 26, 29, 11, 17
Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

What is the mean number of points scored by Geltz?

Algebra:

✓ 21

Hints:

- To find the mean, **we first find the sum of all the points scored by Gentz.**
- 210 is the total number of points. Now find the mean.
- **There are 10 items in the list. To find the mean, you divide the sum by the number of the items.** What is 210/10?
- 210/10 = 21

The mean number of points scored by Gentz is 21. Enter 21.

6) Assistment #27840 "27840 - Problem 30b - 1998 Morph"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	15, 24, 32, 15, 22, 19, 26, 29, 11, 17
Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

What is the **median** number of points scored by Geltz?

Algebra:

✓ 20.5

Scaffold:

Let's start with the definition. Which of the following is the right definition of the median?

Multiple choice:

✓ the middle number ✗ an average of the numbers ✗ the most frequent value

Hints:

- It is **not** "the most frequent value" that is the **Mode**.
- It is **not** "An average of the numbers" that is the **mean**.
- The Median is "the middle number". Select "the middle number"

Scaffold:

Good. But, how do we find the median? First step you have to do is to sort the numbers in increasing order. Which of the following sequences represents points scored by Geltz in increasing order?

Multiple choice:

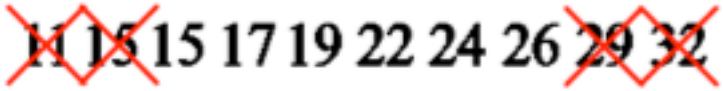
✗ 24, 26, 11, 15, 19, 15, 17, 15, 32, 29 ✗ 32, 29, 26, 24, 22, 19, 17, 15, 15, 11 ✓ 11, 15, 15, 17, 19, 22, 24, 26, 29, 32 ✗ 15, 15, 19, 11, 17, 29, 22, 24, 26, 32

Hints:

- Increasing order means from the smallest to the largest.
- The correct answer is 11, 15, 15, 17, 19, 22, 24, 26, 29, 32.

Scaffold:

Next, start crossing one number at a time from both ends until you are left with one single number (or two if you started with an even amount of numbers) in the middle.
This will give you the middle value or the median.
If you are left with 2 numbers in the middle, you have to find the average of them.
What is the average (mean) of the two numbers that are left?



Fill in:

✓ 20.5

Hints:

- To find the mean, divide the sum of the numbers by how many numbers make up the sum.
- The sum of the points equals 19 + 22 = 41.
- The mean equals 41 / 2 = 20.5.

The correct answer is 20.5.

7) Assistment #27841 "27841 - Problem 30b - 1998 - Range - Morph"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	28, 42, 18, 18, 24, 28, 20, 16, 26, 20
Luna	21, 18, 32, 5, 41, 24, 31, 15, 22, 31

What is the **range** number of points scored by Luna?

Fill in:

✓ 36

Scaffold:

Let's start with the definition. Which of the following is the right definition for the range?

Multiple choice:

✗ Most frequent value ✗ An average of all values ✗ The middle value ✓ The difference between the highest and the lowest value

Hints:

- "The most frequent value" is called the Mode.
- "An average of all values" is called the Mean.
- "The middle value" is called the Median.
- Range is "the difference between the highest and the lowest values".

Scaffold:

Good. Now, let's move on to find the range.

What is the **range** number of points scored by Luna?

Algebra:

✓ 36

Hints:

- We know that the range is the difference between the highest and the lowest number. So, at first we have to find the highest and the lowest number in the list.
- Note we are looking only on Luna's list which is:
21, 18, 32, 5, 41, 24, 31, 15, 22, 31
- The highest number in the list is 41.
The lowest number in the list is 5.
-

Range = Highest Number - Lowest Number
= 42 - 5
= 36

Therefore, the range number of points scored by Luna is 36.
Type in 36.

8) Assistment #27842 "27842 - Problem 30b - 1998 - Mode - Morph"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	28, 12, 38, 58, 24, 38, 20, 46, 6, 10
Luna	15, 20, 35, 8, 21, 21, 35, 11, 25, 35

What is the **mode** number of points scored by Luna?

Fill in:

✓ 35

Hints:

- The **mode** is the number that appears the most.
- Remember, we are only looking at the numbers on Luna's list which is:

15, 20, 35, 8, 21, 21, 35, 11, 25, 35

- From this list:

15, 20, 35, 8, 21, 21, 35, 11, 25, 35

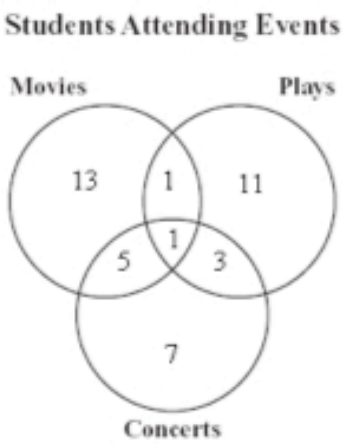
The number that appeared the most in this list is 35, so the **mode** is 35.

Type in 35.

Problem Set "7th Grade - Data Set (8 Items)" id:[5305]

1) Assistment #27902 "27902 - 8th Data - Post Post Test - Venn Diagram"

Heather asked her classmates if they went to a movie, a play, a concert, or any combination of those events during the last month. The Venn diagram below represents her data.



Based on the diagram, what is the total number of Heather's classmates who went to a concert during the last month?

Algebra:

✓ 16

Hints:

- To find the total number of classmates who went to a concert during the last month you need to look at the whole circle for concerts.
- This circle has 4 numbers:

7 students only went to concerts.
1 student went to concerts but also wen to Movies and Plays
5 students only went to movies nad concerts (did not go to Plays)
3 stdents only went to plays and concerts (did not go to movies)

- To find the total number of students who went to Concerts you have to add those numbers together.

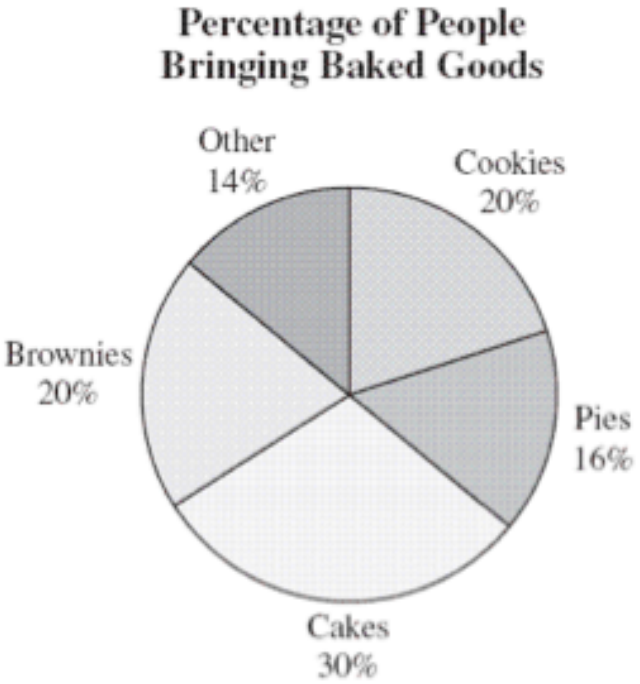
7 + 1 + 5 + 3

- 7 + 1 + 5 + 3 = 16. The total number of students who went to concerts during the last month was 16. Type in 16.

2) Assistment #27903 "27903 - 8th Data - Post Post Test - Circle Graph"

The circle graph below shows the percentages of people who brought each type of baked good to sell

at a recent bake sale. If 60 people brought cakes to sell, what is the total number of people who brought baked goods to sell?



Algebra:

✗ 180 ✓ 200 ✗ 280 ✗ 300

Scaffold:

You can solve this question by setting up a proportion. Choose the correct proportion for this problem.

Multiple choice:

✓ 60/x = 30/100 ✗ 60/30 = x/100 ✗ x/60 = 30/100 ✗ 30/x = 60/100

Hints:

- The percentage of people who brought cakes is 30%. 30/100 is another way of saying 30%
- We are looking for the total number of people who brought baked goods. Call that **x**
- 60 people out of **x** brought cakes.
- The answer is 60/x = 30/100. Please choose 60/x = 30/100

Scaffold:

Okay, 60/x = 30/100.
Now solve for x to find the total number of people who brought baked goods.

Fill in:

✓ 200

Hints:

- Since 60 is twice as much as 30, x should be twice as much as 100
- What is twice as much as 100?
- The answer is 200. Please enter 200.

3) Assistment #27904 "27904 - 8th Data - Post Post Test - Stem and Leaf"

The stem-and-leaf plot below shows the ages of the people who bought skateboards at a store during a sale. What is the median age of the people who bought skateboards during the sale?

Ages of People

Stem	Leaf
1	1 3 4 5 5 6 6 7 7
2	2 3 4 7
3	4
4	1 5
6	5 8
7	3

Key
6|2 = 62

Algebra:

✓ 22

Scaffold:

In stem-and-leaf plots, each data number is separated into a "stem" and "leaf", where the "stem" is the tens digit and the "leaf" is the ones digit. Which of the following numbers does the stem-and-leaf plot above represents?

Stem	Leaf
4	3 6

Multiple choice:

✗ 4 and 36 ✗ 4, 3 and 6 ✓ 43 and 46 ✗ 436

Hints:

- Use the stem as the tens digit. Use the leaf as the ones digit.

11

Stem	Leaf

- The stem is 4. The leaves are 3 and 6.
- The two numbers are 43 and 46.

Scaffold:

Good, now we know what the stem-and-leaf plot means. The next step is to understand what the median means. Which of the following is the right definition of median?

Multiple choice:

✗ An average of the numbers. ✓ The middle value of the numbers. ✗ The most frequent value.

Hints:

- Median is the same as the middle.
- The "middle value" of the list is the correct answer.

Scaffold:

Now we know that the median is the measure of central tendency. Median is the middle value of

a data set. Out of 19 data numbers in an ordered list, which one (the order) is the middle one?

Multiple choice:

✓ 10^{th} ✗ 11^{st} ✗ 7^{th} ✗ 9^{th}

Hints:

- The correct answer is 10^{th}. There are 9 numbers in front of it and 9 numbers behind it.

Scaffold:

Now, find the value of the 10^{th} data number to get the median. What is the median age going to be?

Fill in:

✓ 22

Hints:

- Locate the 10^{th} number in numerical order.
- The correct answer is 22.

4) Assistment #27905 "27905 - 8th Data - Post Post Test - Chart"

Three friends played a video game. Naomi scored the greatest number of points. The chart below shows the results of the game.

Results of Video Game

Player	Number of Points
Naomi	6,000
Darla	2,000
Isaac	2,000

Type in the fraction that represents Naomi's score out of the total points.

Algebra:

✓ 3/5 ✗ 10/6 ✗ 4/5 ✗ 7/10

Scaffold:

How many points did Naomi score?

Results of Video Game

Player	Number of Points
Naomi	6,000
Darla	2,000
Isaac	2,000

Fill in:

✓ 6000 ✓ 6,000

Hints:

- Look at the table for the row that has Naomi's name in it
- How many points are listed in Naomi's row?

Results of Video Game

Player	Number of Points
Naomi	6,000

Darla	2,000
Isaac	2,000

- Naomi scored 6,000 points. Type in 6000.

Scaffold:

How many points were scored by all three players?

Results of Video Game

Player	Number of Points
Naomi	6,000
Darla	2,000
Isaac	2,000

Fill in:

✓ 10000 ✓ 10,000

Hints:

- What is the sum of all of the points listed in the table?
-

Results of Video Game

Player	Number of Points
Naomi	6,00
Darla	+ 2,000
Isaac	+ 2,000
	?

What is 6,000 + 2,000 + 2,000?

- 6,000 + 2,000 + 2,000 = **10,000**. Type in 10000

Scaffold:

Now let's return to the original question.

Three friends played a video game. Naomi scored the greatest number of points. The chart below shows the results of the game.

Results of Video Game

Player	Number of Points
Naomi	6,000
Darla	2,000
Isaac	2,000

Type in the fraction that represents Naomi's score out of the total points.

Algebra:

✓ 3/5 ✗ 10/6 ✗ 4/5 ✗ 7/10

Hints:

- The numerator of the fraction is how many points Naomi scored, the denominator is the sum of all the points.

- Here is the fraction (ratio of Naomi's points to total number of points).

Now, let's reduce $^{6000}/_{10000}$.

- To start reducing the fraction, remove the last three zeros in each number. This is the same as dividing both by 1000.

Now, you have $^{6}/_{10}$

This can still be reduced.

- 6 and 10 are both divisible by 2.

6 divided by 2 is 3
10 divided by 2 is 5

- The fraction is $^{3}/_{5}$

5) Assistment #27906 "27906 - 8th Data - Post Post Test - Mean"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	14, 18, 15, 23, 8, 18, 31, 15, 11, 37
Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

What is the **mean** (average) number of points scored by Geltz?

Fill in:

✓ 19

Scaffold:

Let's start with the definition. Which of the following is the right definition for the mean?

Multiple choice:

✗ the most frequent value ✓ an average of the numbers ✗ the middle number

Hints:

- Mean is the same as an average.
- An average of the numbers is the correct answer.

Scaffold:

Good. Now, how do we find the mean?

To find the mean, you sum the numbers and divide by how many numbers make up the sum.

Now, let's find the mean number of points scored by Geltz.

Fill in:

✓ 19

Hints:

- To find the mean, divide the sum of the numbers by how many numbers make up the sum.
- The sum of the points equals to 14 + 18 + 15 + 23 + 8 + 18 + 31 + 15 + 11 + 37 = 190
- The mean equals to 190 / 10 = 19. The correct answer is 19.

6) Assistment #27907 "27907 - 8th Data - Post Post Test - Median"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	14, 18, 16, 23, 8, 18, 31, 15, 11, 37
Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

What is the **median** number of points scored by Geltz?

Fill in:

✓ 17 ✗ 16 ✗ 18

Scaffold:

Let's start with the definition. Which of the following is the right definition of the median?

Multiple choice:

✓ the middle number ✗ an average of the numbers ✗ the most frequent value

Hints:

- Median is the same as the middle.
- The middle number is the correct answer.

Scaffold:

Good. But, how do we find the median? First step you have to do is to sort the numbers in increasing order. Which of the following sequences represents points scored by Geltz in increasing order?

Multiple choice:

✗ 37, 18, 18, 16, 11, 14, 8, 23, 31, 15 ✗ 37, 31, 23, 18, 18, 16, 15, 14, 11, 8 ✓ 8, 11, 14, 15, 16, 18, 18, 23, 31, 37 ✗ 8, 11, 15, 14, 18, 16, 18, 23, 31, 37

Hints:

- Increasing order means from the smallest to the largest.
- The correct answer is 8, 11, 14, 15, 16, 18, 18, 23, 31, 37.

Scaffold:

Next, start crossing one number at a time from both ends until you are left with one single number (or two if you started with an even amount of numbers) in the middle.
This will give you the middle value or the median.
If you are left with 2 numbers in the middle, you have to find the average of them.
What is the average (mean) of the two numbers that are left?

8 11 14 15 16 18 18 23 31 37

Fill in:

✓ 17

Hints:

- To find the mean, divide the sum of the numbers by how many numbers make up the sum.
- The sum of the points equals 16 + 18 = 17.
- The mean equals 34 / 2 = 17.

The correct answer is 17.

Scaffold:

So, what is the median number of points scored by Geltz?

Fill in:

✓ 17

Hints:

- The median number of points will be equal to the average of the two middle numbers from the sorted list of points scored in the last ten games.
- The correct answer is 17.

7) Assistment #27908 "27908 - 8th Data - Post Post Test - Range"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	28, 42, 18, 18, 24, 28, 20, 16, 26, 20
Luna	17, 18, 22, 15, 6, 26, 24, 12, 16, 33

What is the **range** number of points scored by Luna?

Fill in:

✓ 27

Hints:

- The **range** is the difference between the highest number and the lowest number.
- Remember, we are only looking at the numbers on Luna's list which is:

17, 18, 22, 15, 6, 26, 24, 12, 16, 33

- From this list:

17, 18, 22, 15, 6, 26, 24, 12, 16, 33

The highest number is 33 and the lowest number is 6.
Now we have to subtract the lowest number from the highest number.

- 33 - 6 =27

So, the **range** of Luna's points scored is 27.
Type in 27.

8) Assistment #27909 "27909 - 8th Data - Post Post Test - Mode"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	28, 12, 38, 58, 24, 38, 20, 46, 6, 10
Luna	31, 15, 15, 12, 16, 18, 18, 19, 15, 16

What is the **mode** number of points scored by Luna?

Fill in:

✓ 15

Hints:

- The **mode** is the number that appears the most.
- Remember, we are only looking at the numbers on Luna's list which is:

31, 15, 15, 12, 16, 18, 18, 19, 15, 16

- From this list:

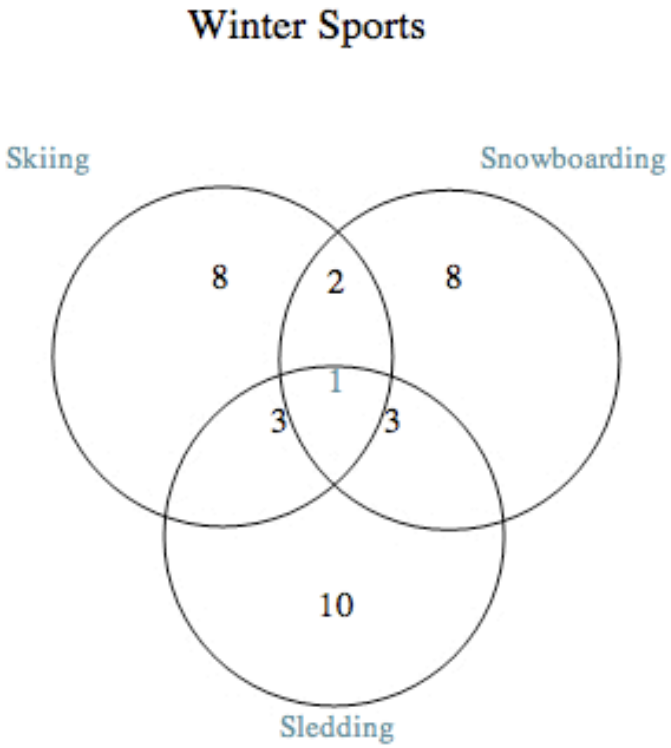
31, 15, 15, 12, 16, 18, 18, 19, 15, 16

The number that appeared the most in this list is 15, so the **mode** is 15.

Type in 15.

Assistment #36760 "36760 - 30041 - Venn Diagram - Using Eyeballs"

The Venn diagram below shows the winter sports that students generally participated in. Using the diagram, how many students participated in both **Skiing** and **Sledding**?

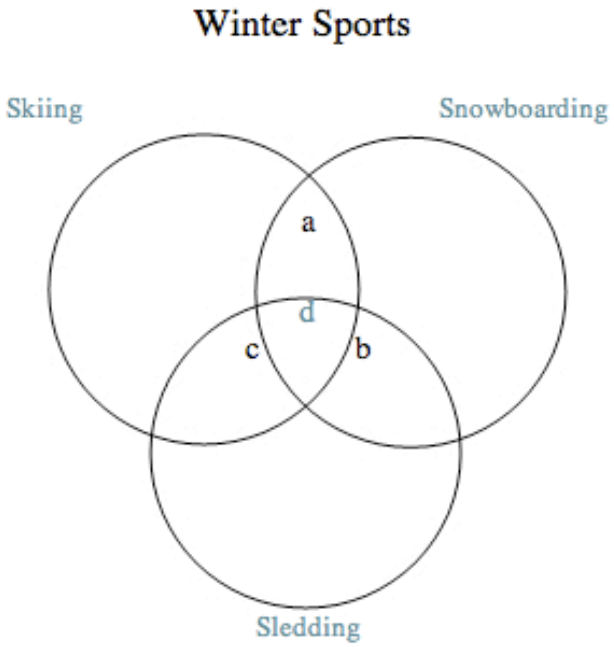


Algebra:

✓ 4

Scaffold:

A Venn diagram shows a relationship by visually grouping things into sets. Which of the following sections represents students who participated in both **Skiing** and **Sledding**?

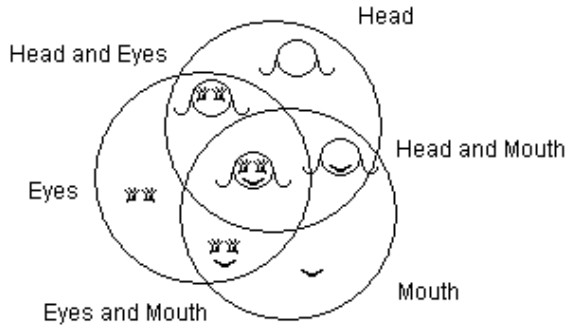


Multiple choice:

✘ a, b, c, and d ✘ b, c, and d ✓ c, and d ✘ a, c, and d

Hints:

- Use the diagram below to get an idea. It shows three different groups (head, mouth, and eyes) and their intersections.



- The sections we are looking for is included by both the **Skiing** circle and the **Sledding** circle.
- Only c, and d is included by both the **Skiing** circle and the **Sledding** circle.

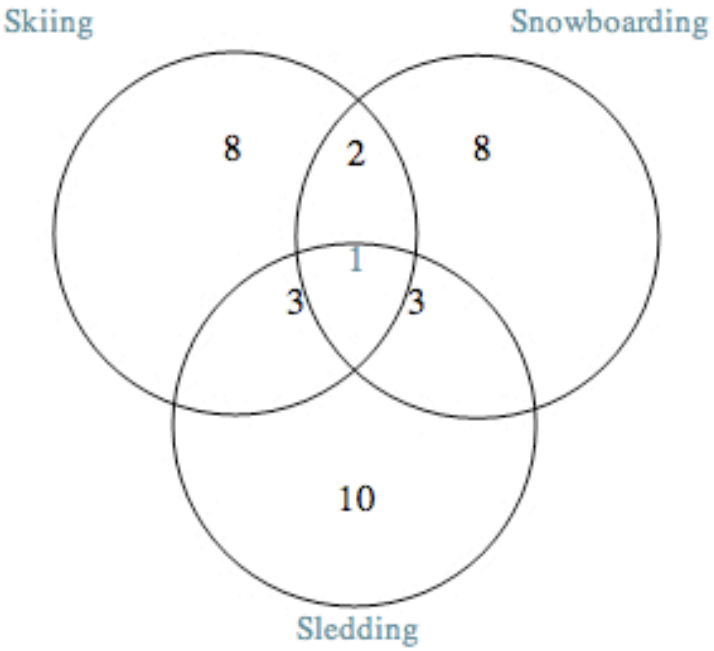
Choose the option with only c, and d.

Scaffold:

Now, we just have to add the two sections together to answer the question,

"how many students participated in both **Skiing** and **Sledding**?"

Winter Sports



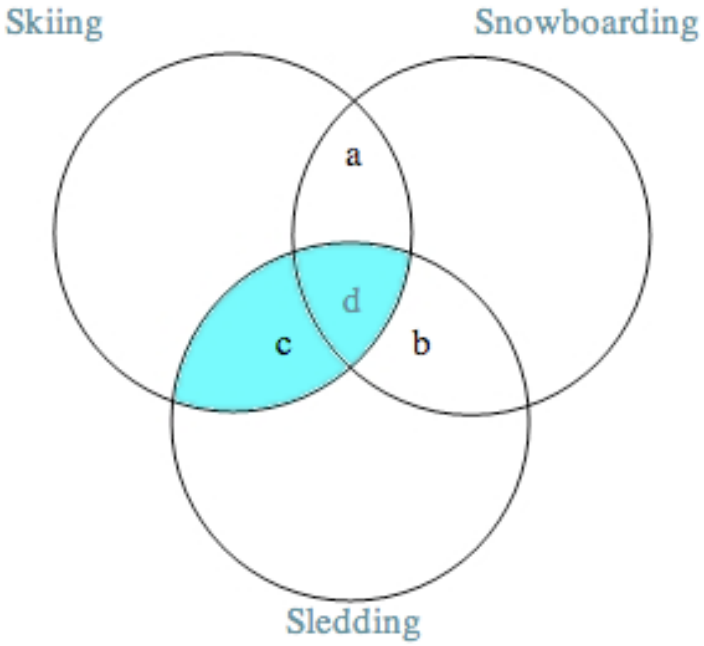
Algebra:

✓ 4

Hints:

- Remember we are only looking at the sections that includes both the **Skiing** circle and the **Sledding** circle.

- # Winter Sports



The highlighted regions shows the two numbers that we have to add.

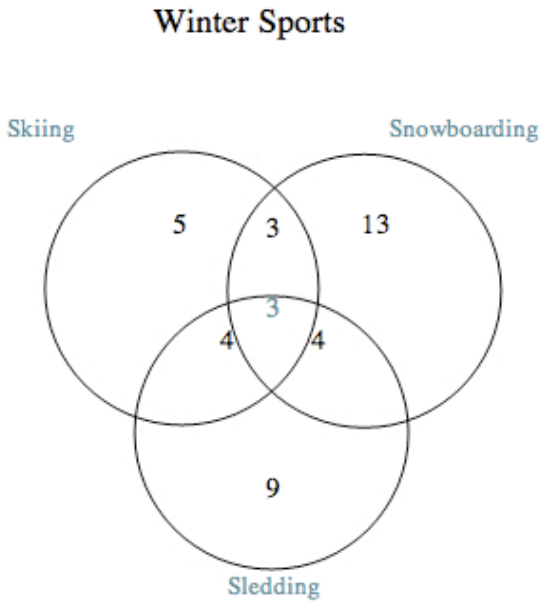
- 3 + 1 = 4

A total of 4 students participated in both Skiing and Sledding.

Type in 4.

Assistment #36790 "36790 - 30046 - Venn Diagram - Using Circles"

The Venn diagram below shows the winter sports that students generally participated in. Using the diagram, how many students participated in Skiing?

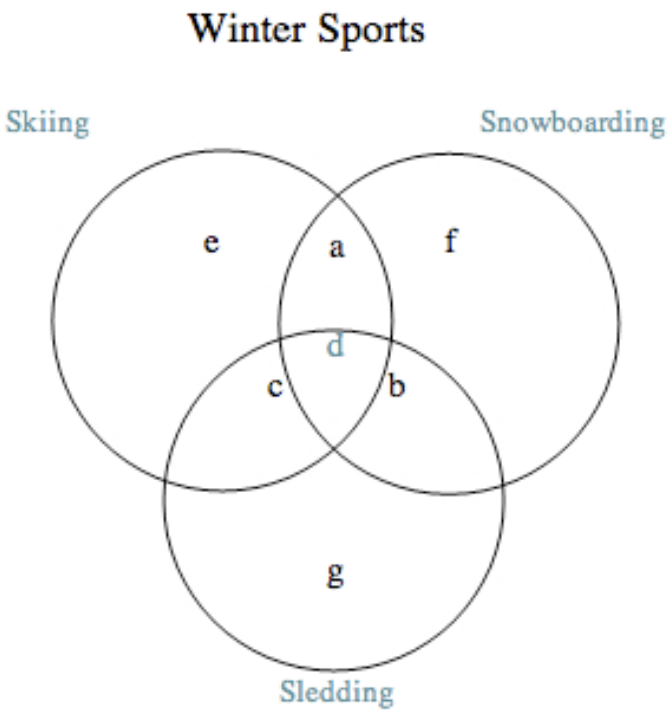


Algebra:

✓ 15

Scaffold:

A Venn diagram shows a relationship by visually grouping things into sets. Which of the following sections represents students who participated in Skiing?

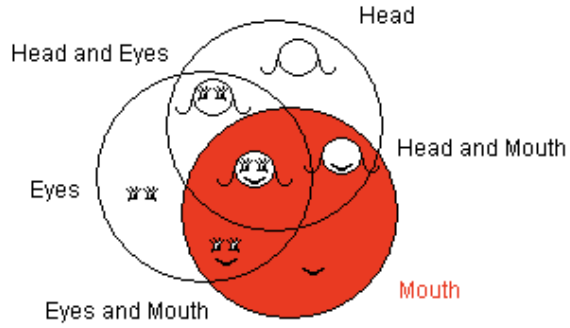


Multiple choice:

✘ a, b, c, and d ✘ b, c, and d ✓ a, c, d, and e ✘ a, c, d, and g

Hints:

- Use the diagram below to get an idea. It shows three different groups (head, mouth, and eyes) and their intersections.



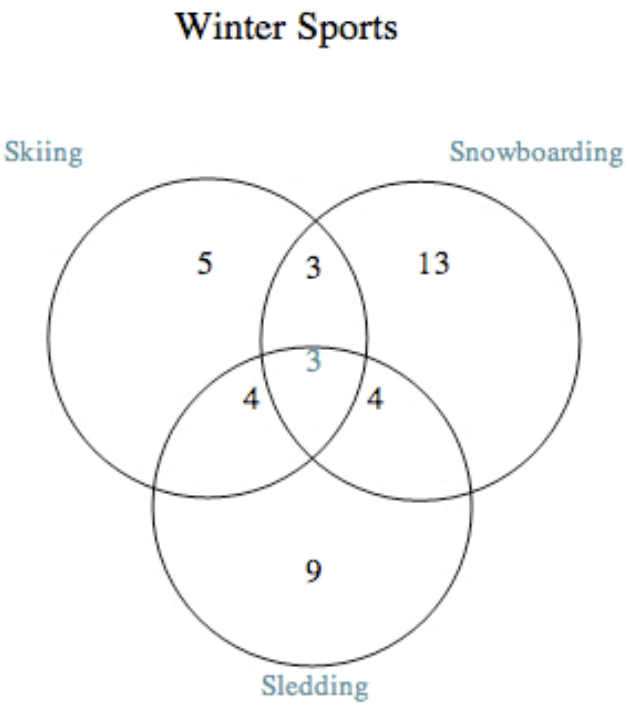
- The sections we are looking for is included by the Skiing circle.
- Only sections a, c, d, and e is included by the Skiing circle.

Choose the option with a, c, d, and e.

Scaffold:

Now, we just have to add those four sections together to answer the question,

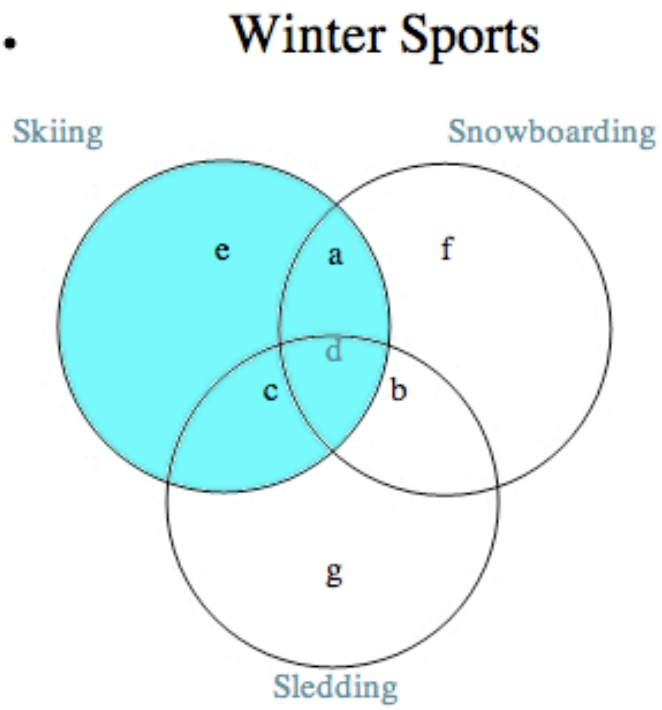
"how many students participated in Skiing?"



Algebra:

✓ 15

Hints:

- Remember we are only looking at the sections that are included by the Skiing circle.
- 

The highlighted regions shows the four numbers that we have to add.

- 4 + 3 + 5 + 3 = 15

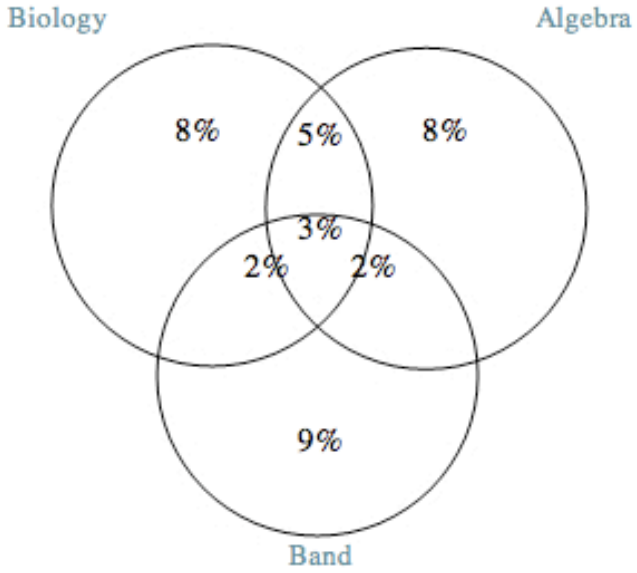
A total of 15 students participated in Skiing.

Type in 15.

Assistment #31306 "31306 - Venn Diagram - Eyeballs w/Percents"

The Venn diagram below shows the percent of students who chose to take Biology, Algebra, or Band. If 600 students signed up to take courses, how many students will be taking Biology and Algebra.

Student Registration



Algebra:

✓ 48

Scaffold:

First, let's find the total **percent** of student who will be taking Biology and Algebra.

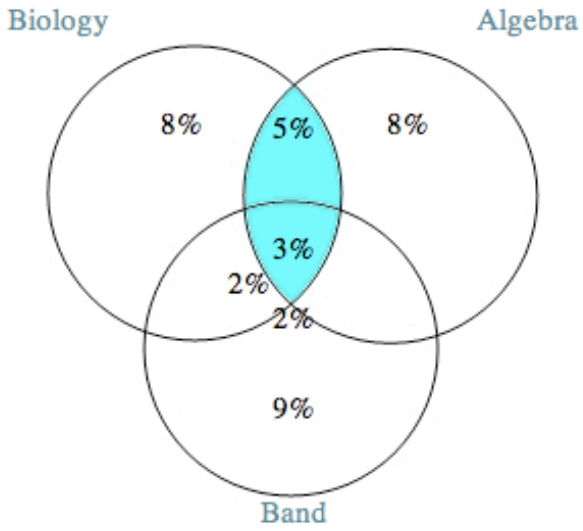
So, what is the percent of students taking Biology and Algebra?

Algebra:

✓ 8 ✓ 8% ✓ 8 %

Hints:

-



The highlighted region shows the percent of students who will be taking Biology and Algebra.

- So now, we have to *sum up all the percents*.
- 5% + 3% = **8%**

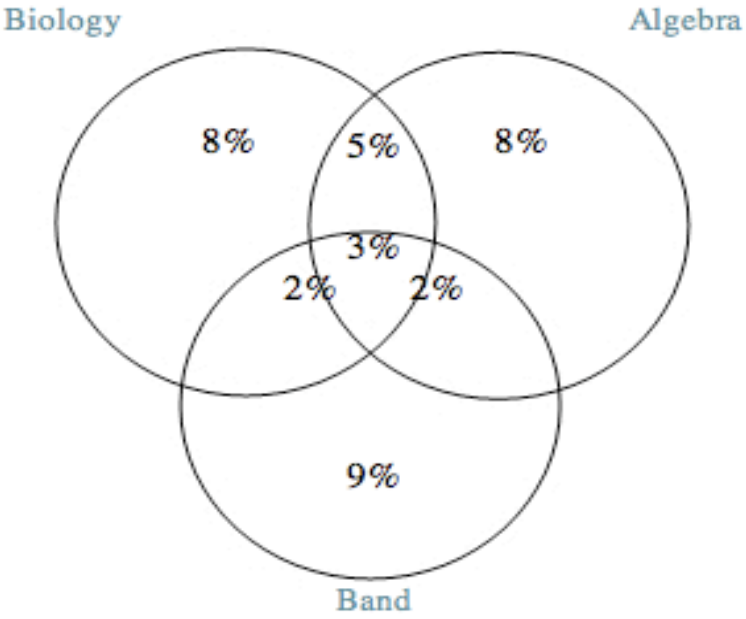
The total percent of students who will be taking Biology and Algebra is **8%**.
Type in 8.

Scaffold:

Now that we know the percent of students who will be taking Biology and Algebra is **8%**, try the original problem again.

The Venn diagram below shows the percent of students who chose to take Biology, Algebra, or Band. If 600 students signed up to take courses, how many students will be taking Biology and Algebra.

Student Registration



Algebra:

✓ 48

Hints:

- We need to find **8%** of **600**.
- First, convert **8%** into a **decimal**, and then multiply it to **600**.

- In order to convert **8%** into a **decimal**, we have to divide it by 100.

8% ÷ 100 = **0.08**

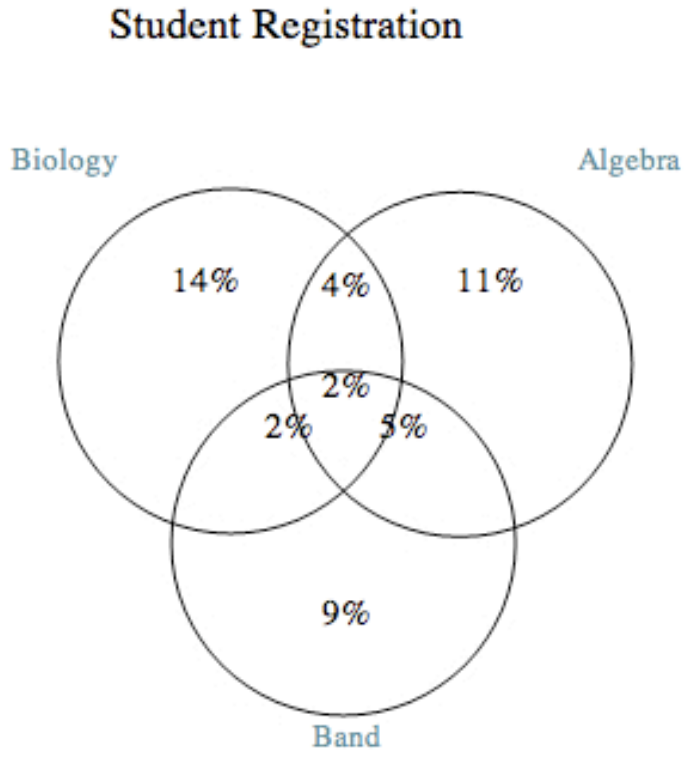
- Now we have to multiply **0.08** with **600**.

0.08 x **600** = 48

The number of students who will be taking Biology and Algebra is 48.
Type in 48.

Assistment #31336 "31336 - Venn Diagram - Using Circles w/Percents"

The Venn diagram below shows the **percent** of students who chose to take Biology, Algebra, or Band. If **400** students signed up to take courses, how many students will be taking Biology.



Algebra:

✓ 88

Scaffold:

First, let's find the total **percent** of student who will be taking Biology.

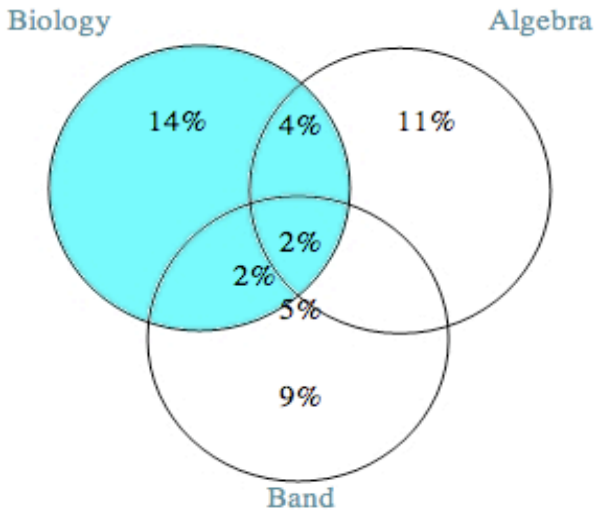
So, what is the **percent** of students taking Biology?

Algebra:

✓ 22 ✓ 22 % ✓ 22%

Hints:

•



The highlighted region shows the **percent** of students who will be taking Biology.

- So now, we have to *sum up all the percents*.
- 14% + 4% + 2% + 2% = **22%**

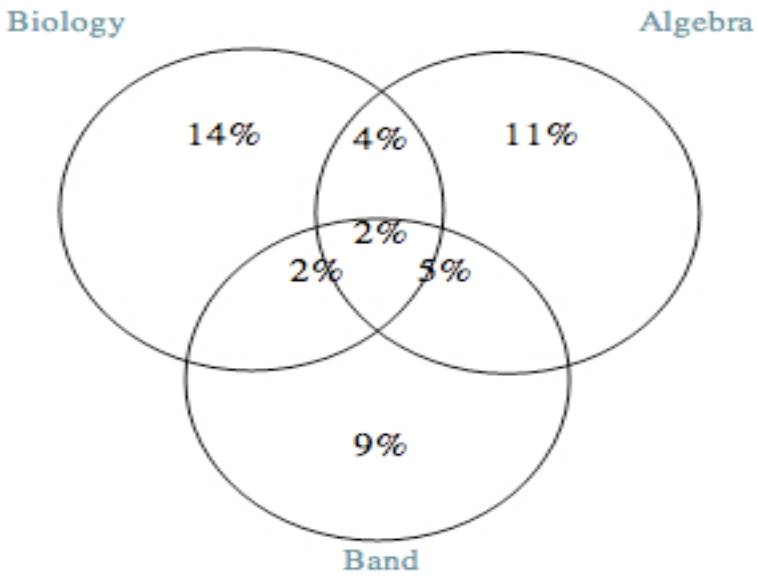
The total **percent** of students who will be taking Biology is **22%**.
Type in 22.

Scaffold:

Now that we know the percent of students who will be taking Biology is **22%**, try the original problem again.

The Venn diagram below shows the **percent** of students who chose to take Biology, Algebra, or Band. If **400** students signed up to take courses, how many students will be taking Biology.

Student Registration



Algebra:

✓ 88

Hints:

- We need to find **22%** of **400**.
- First, convert **22%** into a **decimal**, and then multiply it to **400**.

- In order to convert **22%** into a **decimal**, we have to divide it by 100.

22% ÷ 100 = **0.22**

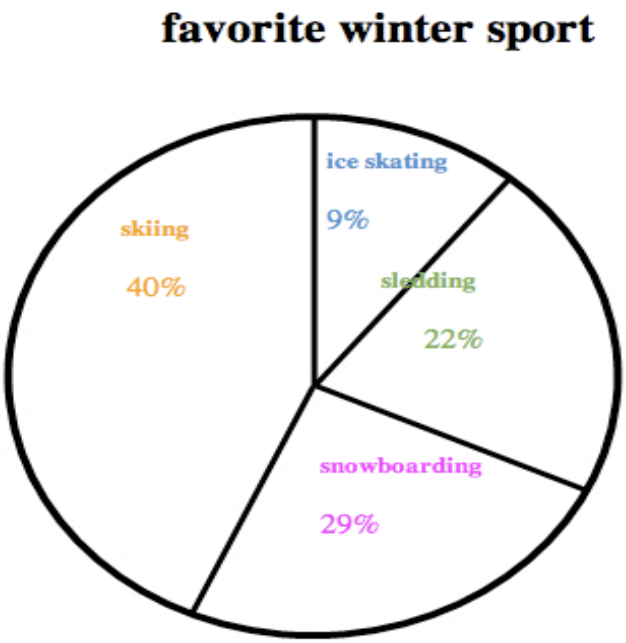
- Now we have to multiply **0.22** with **400**.

0.22 x **400** = 88

The number of students who will be taking Biology is 88.
Type in 88.

Assistment #31369 "31369 - 27705 - Circle Graph - Favorites - Medium"

Billy took a survey of **206** students in his school to find each student's favorite winter sport. He recorded the results and made the circle graph below to show the results.



According to this graph, about how many students have **skiing** as their favorite winter sport?

(round to the nearest whole number)

Algebra:

✓ 82

Hints:

- According to the graph **40%** of **206** students have **skiing** as their favorite winter sport.
- To find **40%** of **206**, convert **40%** to a decimal, and remember that "of" means times.
- So, we have

40% of **206**
40% x **206**
0.40 x **206** = **82.4** Now, round to the nearest whole number.

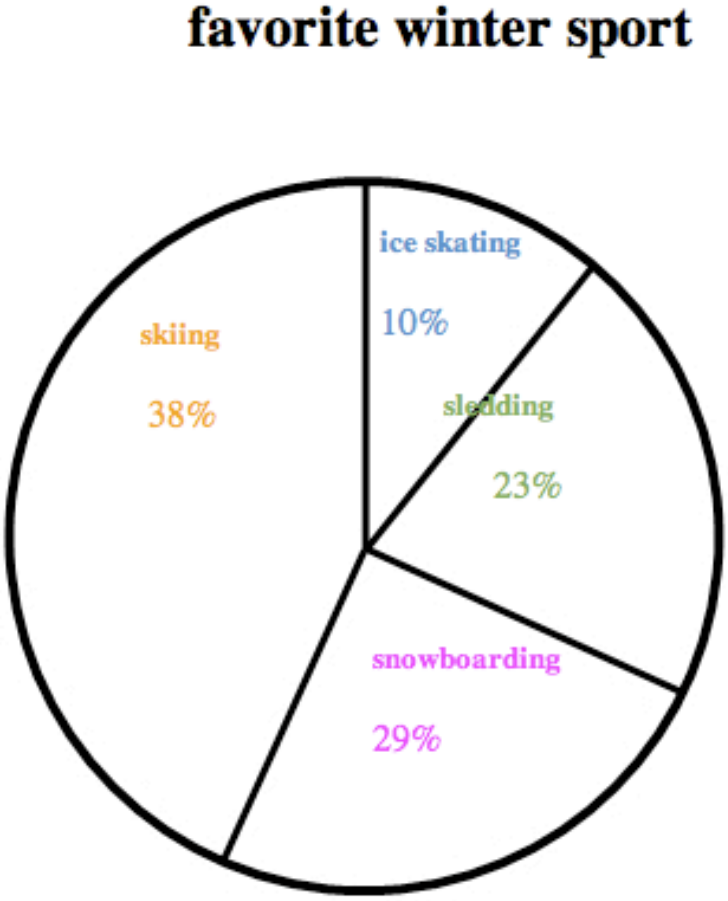
- **82.4** rounded to the nearest whole number is **82**.

So according to this circle graph, **82** students had **skiing** as their favorite winter sport.

Type in 82.

Assistment #31399 "31399 - Circle Graph - Favorites - Hard"

Billy took a survey of **201** students in his school to find each student's favorite winter sport. He recorded the results and made the circle graph below to show the results.



According to this graph, about how many students have either skiing or sledding as their favorite winter sport?

(round to the nearest whole number)

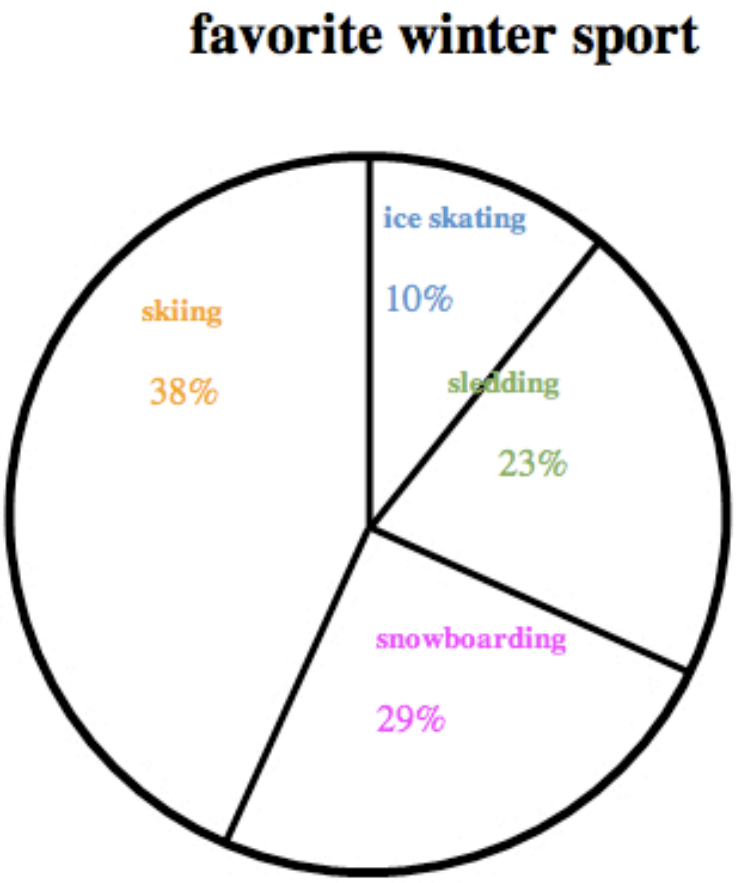
Algebra:

✓ 123

Scaffold:

The easiest way to find the number of students that has either skiing or sledding as their favorite winter sport is to first find the percent.

So according to this graph, what is the percentage of students that have either skiing or sledding as their favorite winter sport?



Algebra:

✓ 61

Hints:

- We know from the graph that 38% of students have skiing as their favorite winter sport, and that 23% of students have sledding as their favorite winter sport.
- So, in order to find the percentage of students that have either skiing or sledding as their favorite winter sport, we have to add the two percents together.
- 38% + 23%

38% + 23% = 61%

The percentage of students that have either skiing or sledding as their favorite winter sport is 61%.

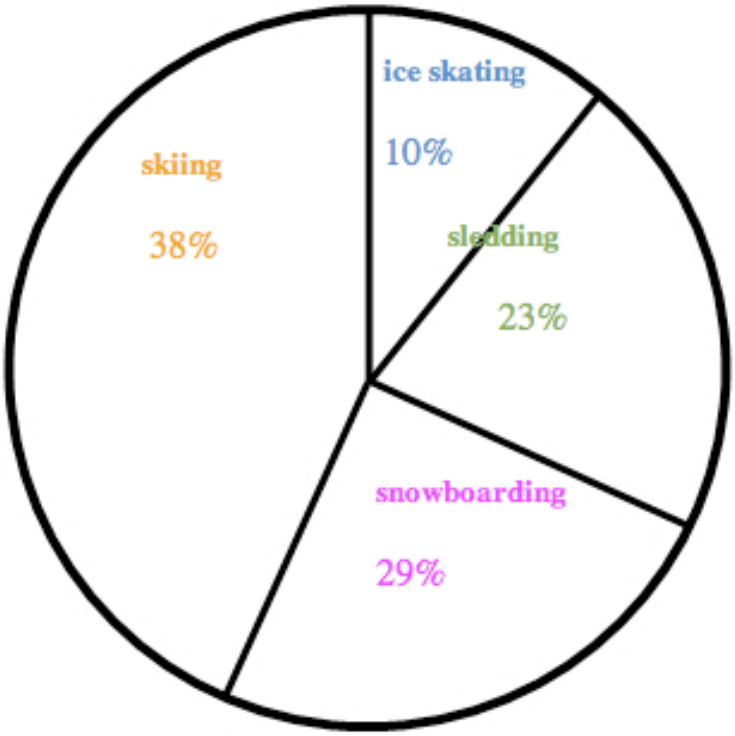
Type in 61.

Scaffold:

Now that we know the percentage of students that have either skiing or sledding as their favorite winter sport is 61%, try the original problem again.

Billy took a survey of **201** students in his school to find each student's favorite winter sport. He recorded the results and made the circle graph below to show the results.

favorite winter sport



According to this graph, about how many students have either skiing or sledding as their favorite winter sport?

(round to the nearest whole number)

Algebra:

✓ 123

Hints:

- Remember, 61% of students have either skiing or sledding as their favorite winter sport.
- To find 61% of **201**, convert 61% to a decimal, and remember that "of" means times.
- So, we have

61% of **201**
61% x **201**
0.61 x **201** = **122.61** Now, round to the nearest whole number.

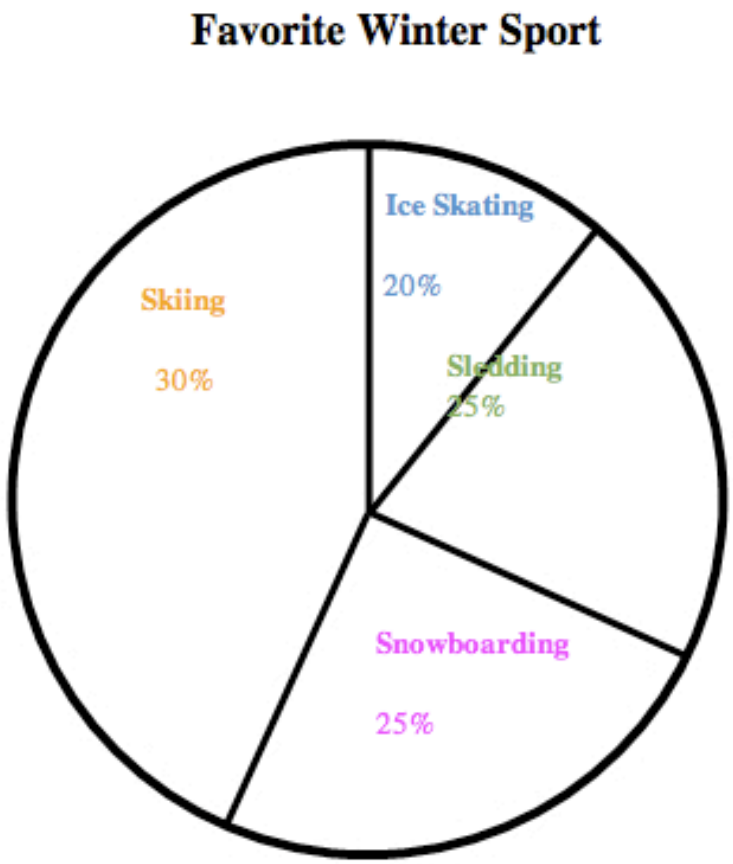
- **122.61** rounded to the nearest whole number is **123**.

So according to this circle graph, **123** students have either skiing or sledding as their favorite winter sport.

Type in 123.

Assistment #36820 "36820 - Circle Graph - Hard - Proportions"

Billy took a survey of the students in his school to find each student's favorite winter sport. He recorded the results in order to make the circle graph below.



According to this graph, if 180 students have Skiing as their favorite winter sport, then how many students in total did Billy survey?

Algebra:

✓ 600

Scaffold:

You can solve this problem by setting up a **proportion**.

Choose the correct proportion for this problem.

Multiple choice:

✓ 180/X = 30/100 ✗ 180/30 = X/100 ✗ X/180 = 30/100 ✗ 30/X = 180/100

Hints:

- Remember, the percentage of students who had Skiing as their favorite winter sport is 30%.

$\frac{30}{100}$ is another way of saying 30%.

- We are looking for the total number of students that Billy surveyed.

Call the total, **X**.

- This means that 180 out of **X** had Skiing as their favorite winter sport.
- So, $\frac{180}{\mathbf{X}} = \frac{30}{100}$

Choose the option that shows 180/x = 30/100.

Scaffold:

Okay, so $\frac{30}{100}$ is equal to $\frac{180}{\mathbf{X}}$

Now solve for **X** to find the total number of students that Billy surveyed.

Algebra:

✓ 600

Hints:

- Since 180 is 6 times as much as 30, **X** should be 6 times as much as 100.
- So now we have to solve,

$6 \times 100 = \mathbf{X}$

- **X** is equal to 600.

Billy surveyed a total of 600 students.

Type in 600.

Assistment #36850 "36850 - Stem and Leaf - Median"

The following **stem** and **leaf** plot shows the number of clothes sold each week at a store. According to this plot, what is the **median** number of clothes sold each week?

Clothes Sold Each Week

Stem	Leaf
3	1, 1, 2, 4, 5, 5, 5, 8
4	2, 3, 5, 8
5	6, 8
6	2, 2, 3, 3, 3

Key
1 | 8 represents 18

Algebra:

✓ 43

Scaffold:

In a **stem** and **leaf** plots, each data number is separated into a "**stem**" and a "**leaf**", where the "**stem**" is the **tens** digit and the "**leaf**" is the **ones** digit.

Which of the following numbers does the **stem** and **leaf** plot below represents?

Stem	Leaf
6	1, 5

Multiple choice:

✗ 6, and 15 ✗ 6, 1, and 5 ✓ 61 and 65 ✗ 615

Hints:

- Use the **stem** as the tens digit. Use the **leaf** as the ones digit.

- The **stem** is 6 and the **leafs** are 1, and 5
- So, the two numbers are **61** and **65**.

Choose the option with only 61 and 65.

Scaffold:

Now that we know the definition of a **stem** and **leaf** plot, we have to figure out what the **median** is.

So, what is the **median**?

Multiple choice:

✗ The number seen most often in a set of numbers. ✓ The middle number in a set of ordered numbers. ✗ The sum of the numbers divided by the number of numbers. ✗ The difference between the largest value and the smallest value of the set of numbers.

Hints:

- Give the definition of the **median**.
- The **median** is the middle number in a set of ordered numbers.

So, choose the option that says the middle number in a set of ordered numbers.

Scaffold:

Now that we know the definition of a **stem** and **leaf** plot and the **median**, lets try the original problem again.

The following **stem** and **leaf** plot shows the number of clothes sold each week at a store. According to this plot, what is the **median** number of clothes sold each week?

Clothes Sold Each Week

Stem	Leaf
3	1, 1, 2, 4, 5, 5, 5, 8
4	2, 3, 5, 8
5	6, 8
6	2, 2, 3, 3, 3

Key
1 | 8 represents 18

Algebra:

✓ 43

Hints:

- Stem and leaf plots are already ordered from smallest to largest.

Take a look at the following animation on how stem and leaf plots are ordered and how we get the median.

Remember, the median is the middle number in a set of numbers

1	1 1 6 6 7
2	1 3

- In the plot that we were given, there are a total of **19** numbers.

So, the *middle number is the 10th number*.

- The 10th number is 43.

Thus, the **median** number of clothes sold each week is 43.

Type in 43.

Assistment #36880 "36880 - Stem and Leaf - Range"

The following **stem** and **leaf** plot shows the number of sweaters sold each week at a store. According to this plot, what is the **range** of sweaters sold each week?

Sweaters Sold Each Week

Stem	Leaf
3	1, 1, 2, 3, 4, 6, 6, 8
4	2, 3, 6, 8
5	7, 8
6	2, 2, 3, 3, 3

Key
1 | 8 represents 18

Algebra:

✓ 32

Scaffold:
In a **stem** and **leaf** plots, each data number is separated into a "**stem**" and a "**leaf**", where the "**stem**" is the **tens** digit and the "**leaf**" is the **ones** digit.

Which of the following numbers does the **stem** and **leaf** plot below represents?

Stem	Leaf
6	1, 4

Multiple choice:
✗ 6, and 14 ✗ 6, 1, and 4 ✓ 61 and 64 ✗ 614

Hints:

- Use the **stem** as the tens digit. Use the **leaf** as the ones digit.

Stem	Leaf
1	1 3
2	0 7

- The **stem** is 6 and the **leafs** are 1, and 4
- So, the two numbers are **61** and **64**.

Choose the option with only 61 and 64.

Scaffold:
Now that we know the definition of a **stem** and **leaf** plot, we have to figure out what the **range** is.

So, what is the **range**?

Multiple choice:
✗ The number seen most often in a set of numbers. ✗ The middle number in a set of ordered numbers. ✗ The sum of the numbers divided by the number of numbers. ✓ The difference between the largest value and the smallest value in a set of numbers.

Hints:

- Give the definition of the **range**.
- The **range** is the difference between the largest value and the smallest value in a set of numbers.

So, choose the option that says the difference between the largest value and the smallest value in a set of numbers.

Scaffold:
Now that we know the definition of a **stem** and **leaf** plot and the **range**, lets try the original problem again.

The following **stem** and **leaf** plot shows the number of sweaters sold each week at a store. According to this plot, what is the **range** of sweaters sold each week?

Sweaters Sold Each Week

Stem	Leaf
3	1, 1, 2, 3, 4, 6, 6, 8
4	2, 3, 6, 8
5	7, 8
6	2, 2, 3, 3, 3

Key
1 | 8 represents 18

Algebra:

✓ 32

Hints:

- The largest number in the list is 63, and the smallest number is 31.
- So, all we have to do is *subtract the largest number, 63 from the smallest number, 31*.
- 63 - 31 = 32.

Thus, the **range** of sweaters sold each week is 32.

Type in 32.

Assistment #36911 "36911 - Stem and Leaf - Mode"

The following **stem** and **leaf** plot shows the number of glasses sold each week at a store. According to this plot, what is the **mode** of glasses sold each week?

Glasses Sold Each Week

Stem	Leaf
3	1, 1, 2, 3, 4, 6, 6, 8
4	1, 2, 5, 7
5	6, 7
6	2, 2, 3, 3, 3, 3

Key
1 | 8 represents 18

Algebra:

✓ 63

Scaffold:

In a **stem** and **leaf** plots, each data number is separated into a "**stem**" and a "**leaf**", where the "**stem**" is the **tens** digit and the "**leaf**" is the **ones** digit.

Which of the following numbers does the **stem** and **leaf** plot below represents?

Stem	Leaf
6	1, 4

Multiple choice:

✘ 6, and 14 ✘ 6, 1, and 4 ✓ 61 and 64 ✘ 614

Hints:

- Use the **stem** as the tens digit. Use the **leaf** as the ones digit.

20

Stem	Leaf
1	1 3

- The **stem** is 6 and the **leafs** are 1, and 4
- So, the two numbers are **61** and **64**.

Choose the option with only 61 and 64.

Scaffold:

Now that we know the definition of a **stem** and **leaf** plot, we have to figure out what the **mode** is.

So, what is the **mode**?

Multiple choice:

✓ The number seen most often in a set of numbers. ✘ The middle number in a set of ordered numbers. ✘ The sum of the numbers divided by the number of numbers. ✘ The difference between the largest value and the smallest value in a set of numbers.

Hints:

- Give the definition of the **mode**.
- The **mode** is the number seen most often in a set of numbers

So, choose the option that says the number seen most often in a set of numbers

Scaffold:

Now that we know the definition of a **stem** and **leaf** plot and the **mode**, lets try the original problem again.

The following **stem** and **leaf** plot shows the number of glasses sold each week at a store. According to this plot, what is the **mode** of glasses sold each week?

Glasses Sold Each Week

Stem	Leaf
3	1, 1, 2, 3, 4, 6, 6, 8
4	1, 2, 5, 7
5	6, 7
6	2, 2, 3, 3, 3, 3

Key
1 | 8 represents 18

Algebra:

✓ 63

Hints:

- Remember, the **mode** is the number that occurs the most.
- From the list, we can see that 63 occurred four times, which is the most.
- Thus, the **mode** of glasses sold each week is 63.

Type in 63.

Assistment #36942 "36942 - Stem and Leaf - Mean"
The following **stem** and **leaf** plot shows the number of clothes sold each week at a store. According to this plot, what is the **mean** of clothes sold each week?

Clothes Sold Each Week

Stem	Leaf
1	2, 2, 3, 4, 5, 6, 6, 8
2	2, 3, 6, 7
3	7, 7
4	1, 1, 2, 2, 2

Key
1 | 8 represents 18

(Round to the nearest hundredths place)

Algebra:
✓ 26.11
Scaffold:
In a **stem** and **leaf** plots, each data number is separated into a "**stem**" and a "**leaf**", where the "**stem**" is the **tens** digit and the "**leaf**" is the **ones** digit.

Which of the following numbers does the **stem** and **leaf** plot below represents?

Stem	Leaf
4	2, 5

Multiple choice:
✗ 4, and 25 ✗ 4, 2, and 5 ✓ 42 and 45 ✗ 425
Hints:

- Use the **stem** as the tens digit. Use the **leaf** as the ones digit.

Stem	Leaf
1	1 3
2	0 7 7

- The **stem** is 4 and the **leafs** are 2, and 5
- So, the two numbers are **42** and **45**.

Choose the option with only 42 and 45.

Scaffold:

Now that we know the definition of a **stem** and **leaf** plot, we have to figure out what the **mean** is.

So, what is the **mean**?

Multiple choice:

✘ The number seen most often in a set of numbers. ✘ The middle number in a set of ordered numbers. ✓ The sum of the numbers divided by the number of numbers. ✘ The difference between the largest value and the smallest value in a set of numbers.

Hints:

- Give the definition of the **mean**.
- The **mean** is the sum of the numbers divided by the number of numbers.

So, choose the option that says the sum of the numbers divided by the number of numbers.

Scaffold:

Since part of finding the **mean** is finding the sum of all of the numbers what is the sum of all the numbers in the **stem** and **leaf** plot?

Stem	Leaf
1	2, 2, 3, 4, 5, 6, 6, 8
2	2, 3, 6, 7
3	7, 7
4	1, 1, 2, 2, 2

Key
1 | 8 represents 18

Algebra:

✓ 496

Hints:

- First, write out all of the numbers in this plot on a piece of paper.
- Your list of numbers should look something like this:

12, 12, 13, 14, 15, 16, 16, 18, 22, 23, 26, 27, 37, 37, 41, 41, 42, 42, 42

Now we have to add all the numbers in this list up.

- 12
  12
  13
  14
  15
  16
  16
  18
  22
  23
  26
  27
  37
  37
  41
  41
  42
  42
  + 42
  496

The sum of the numbers is 496. Type in 496.

Scaffold:

Now that we know the definition of a **stem** and **leaf** plot and the **mean**, lets try the original problem again.

The following stem and leaf plot shows the number of clothes sold each week at a store. According to this plot, what is the mean of clothes sold each week?

Clothes Sold Each Week

Stem	Leaf
1	2, 2, 3, 4, 5, 6, 6, 8
2	2, 3, 6, 7
3	7, 7
4	1, 1, 2, 2, 2

Key
1 | 8 represents 18

(Round to the nearest hundredths place)

Algebra:

✓ 26.11

Hints:

- Remember, the sum of all the numbers is 496.

Now find the number of numbers and divide.

- There are 19 numbers in the stem and leaf plot.

The mean is 496 ÷ 19 = 26.105263 Now round to the nearest hundredths.

- 26.105263 rounded to the nearest hundredths place is 26.11.

Thus, the mean of clothes sold each week is 26.11.

Type in 26.11.

Assistment #31585 "31585 - Table - Selling Things to Meet a Total"

Some eighth-grade students want to raise at least **$640** for a field trip by selling popcorn and fruit bars. The table below shows the amount of profit they will make on each sale.

If they sell exactly **400** fruit bars, how many boxes of popcorn will they need to sell to make a total of **$640**?

Profit from Sales

Box of popcorn	80 ¢
Fruit bar	40 ¢

Algebra:

✓ 600

Scaffold:

Let's figure out how much money the students raised from selling fruit bars.

How much money did the students raise from the fruit bars?

Profit from Sales

Box of popcorn	80 ¢
Fruit bar	40 ¢

Algebra:

✓ 160 ✓ $160 ✓ $ 160

Hints:

- In order to get the amount of money that the students raised from fruit bars, we have to multiply the profit from each fruit bar by the quantity sold.
- The students earn $0.40 for each fruit bar and **400** fruit bars were sold.
- $0.40/fruit bars **x 400** fruit bars = $160

The students raised $160 from selling fruit bars.

Scaffold:

Now we need to find out how much money the students need to raise from popcorns alone, then we can find out how many boxes of popcorns they need to sell.

How much money do the students to need make from popcorns alone?

Algebra:

✓ 480 ✓ $480 ✓ $ 480

Hints:

- Remember, the students made $160 from selling fruit bars, and they are aiming to raise a total of **$640**.
- So we have to subtract $160 from **$640** to get the amount of money the students need to make from selling popcorns.
- **$640** - $160 = $480

The students need to make $480 from selling popcorns alone.

Type in 480.

Scaffold:

Good. If the students sell exactly **400** fruit bars, they will raise **$160**.
So, they need to raise **$480** from selling boxes of popcorn.
Now try the original problem again.

Some eighth-grade students want to raise at least **$640** for a field trip by selling popcorn and fruit bars. The table below shows the amount of profit they will make on each sale.

If they sell exactly 400 fruit bars, how many boxes of popcorn will they need to sell to make a total of **$640**?

Profit from Sales

Box of popcorn	80 ¢
Fruit bar	40 ¢

Algebra:

✓ 600

Hints:

- Remember, the students need to raise $480 from selling popcorns alone, and each box of popcorn is $0.80.
-

So, we have to divide $480 by $0.80.

- $480 ÷ $0.80/box = **600 boxes**

The students need to sell a total of **600** boxes of popcorn to get a total of **$640**.

Type in 600.

Assistment #32057 "32057 - 30369 - median table"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team.

The table below shows the number of points each of the players scored in their last 11 games.

Name of player	Number of points scored on the last ten games
John	37,66,27,102,14,93,60,7,74,23,50
Cristina	19,27,3,9,50,6,3,18,24,14,8

What is the median number of points scored by John ?

Algebra:

✓ 50 ✗

Scaffold:

Let's start with the definition. Which of the following is the right definition of the median?

Multiple choice:

✗ The number seen most often in a set of numbers. ✓ The middle number in a

set of ordered numbers. ✘The sum of the numbers divided by the number of numbers. ✘The difference between the largest value and the smallest value in a set of numbers.

Hints:

- Median is the same as the middle.
- The middle number is the correct answer.

Scaffold:

Now that we know what the median is,

Let's try the original problem again.

The coach for the All-Star Basketball Game needs to pick one of the two players for the team.

The table below shows the number of points each of the players scored in their last 11 games.

Name of player	Number of points scored on the last ten games
John	37,66,27,102,14,93,60,7,74,23,50
Cristina	19,27,3,9,50,6,3,18,24,14,8

What is the median number of points scored by John ?

Algebra:

✓ 50

Hints:

- First we need to order the list from least to greatest.

It should look like this,

7, 14, 23, 27, 37, 50, 60, 66, 74, 93, 102

- Now we need to find the middle number in this list.
- The median(middle) number in the list is 50
- Type in 50

Assistment #32087 "32087 - 30370 - range-table-female"

The coach for the volleyball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in their last 10 games.

Name of player	Number of points scored on the last ten games
John	11, 7, 13, 21, 24, 22, 11, 6, 23, 11
Cristina	24, 20, 12, 8, 8, 2, 23, 23, 15, 16

What is the **range** number of points scored by Cristina?

Algebra:

✓ 22 ✗

Scaffold:

To understand this problem, you must understand what **range** is.

Which of the following defines **range** the best?

Multiple choice:

✓ The diffrence between the highest value and the lowest value. ✗ The highest

value in the set. ✘The lowest value in the set. ✘The sum of all values in the set.

Hints:

- The **range** is the difference between the highest number and the lowest number.

Scaffold:

Now that we know the definition of **range**, Let's try the main problem again.

The coach for the All-Star Basketball Game needs to pick one of the two players for the team.

The table below shows the number of points each of the players scored in their last 10 games.

Name of player	Number of points scored on the last ten games
John	11, 7, 13, 21, 24, 22, 11, 6, 23, 11
Cristina	24, 20, 12, 8, 8, 2, 23, 23, 15, 16

What is the **range** number of points scored by Cristina?

Algebra:

✓ 22

Hints:

- Remember, we are only looking at the numbers on Cristina's list which is:

24,20,12,8,8,2,23,23,15,16

- From this list:

24,20,12,8,8,2,23,23,15,16

The highest number is 24 and the lowest number is 2.

Now we have to subtract the lowest number from the highest number.

- 24 - 2 = 22

So, the **range** of Luna's points scored is 22.

Type in 22.

Hints:

- The **range** is the difference between the highest number and the lowest number.
- Remember, we are only looking at the numbers on Luna's list which is:

24,20,12,8,8,2,23,23,15,16

- From this list:

24,20,12,8,8,2,23,23,15,16

The highest number is 23 and the lowest number is 2.

Now we have to subtract the lowest number from the highest number.

- 23 - 2 = 21

So, the **range** of Luna's points scored is 21.

Type in 21.

Assistment #32816 "32816 - 30375 - mode-table-fem"

The coach for the volleyball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in their last 10 games.

Name of player	Number of points scored on the last ten games
John	16, 11, 20, 13, 24, 15, 13, 6, 25, 13
Cristina	23, 7, 15, 14, 17, 7, 20, 23, 7, 19

What is the **mode** number of points scored by Cristina?

Algebra:

✓ 7 ✗

Scaffold:

To solve this problem, you need to know what **mode** means.

Which one of the following definitions describes **mode** the best?

Multiple choice:

✗ The highest number in the set. ✗ The middle number in the set. ✓ The

number with the most occurrences. ✘The number with the least occurrences.

Scaffold:

Now that we know what the definition of **mode** is,

Let's try the original problem again.

The coach for the volleyball Game needs to pick one of the two players for the team. The table below shows the number of points each of the players scored in their last 10 games.

Name of player	Number of points scored on the last ten games
John	16, 11, 20, 13, 24, 15, 13, 6, 25, 13
Cristina	23, 7, 15, 14, 17, 7, 20, 23, 7, 19

What is the **mode** number of points scored by Cristina?

Algebra:

✓ 7

Hints:

- Remember the **mode** is the number that appears most often in a set of numbers.
- We are only looking at the numbers on Cristina's list which is:

23,7,15,14,17,7,20,23,7,19

- From this list:

23,7,15,14,17,7,20,23,7,19

The number that appeared the most in this list is 7, so the **mode** is 7.

Type in 7.

Hints:

- The **mode** is the number that appears the most.
- Remember, we are only looking at the numbers on Luna's list which is:

23,7,15,14,17,7,20,23,7,19

- From this list:

23,7,15,14,17,7,20,23,7,19

The number that appeared the most in this list is 7, so the **mode** is 7.

Type in 7.

Assistment #32017 "32017 - mean table"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team.

The table below shows the number of points each of the players scored in their last 10 games.

Name of player	Number of points scored on the last ten games
Ricky	15,10,16,16,20,15,14,2,24,13
Carol	21,20,8,11,12,5,15,26,17,11

What is the **mean** (average)number of points scored by Ricky ?

Algebra:

✓ 14.5 ✗

Scaffold:

Let's start with the definition. Which of the following is the right definition for the **mean**?

Multiple choice:

✘The number seen most often in a set of numbers. ✘The middle number in a set of ordered numbers. ✓ The sum of the numbers divided by the number of numbers. ✘The difference between the largest value and the smallest value in a set of numbers.

Hints:

- Mean is the same as an average.
- An average of the numbers is the correct answer.

Scaffold:

Since part of finding the **mean** is finding the sum of all of the numbers

what is the sum of scores that Ricky scored?

Ricky 15,10,16,16,20,15,14,2,24,13

Algebra:

✓ 145

Hints:

- First, write out all of the numbers in this plot on a piece of paper.
- Your list of numbers should look something like this:

15,10,16,16,20,15,14,2,24,13

- Now we have to add all the numbers in this list up.

15

10

16

16

20

15

14

2

24

+ 13

145

Scaffold:

Now that we know the definition of the **mean**, lets try

What is the **mean** (average)number of points scored by Ricky ?

Algebra:

✓ 14.5

Hints:

- Remember, the sum of all the numbers is 145.

Now find the number of numbers and divide.

- There are 10 different scores on the chart.

The mean is 145 ÷ 10 = 14.5

Type in 14.5.

- The mean equals to 145/ 10 = 14.5 . The correct answer is 14.5.

Assistment #32846 "32846 - 30873 - mean table female"

The coach for the All-Star Basketball Game needs to pick one of the two players for the team.

The table below shows the number of points each of the players scored in their last 10 games.

Name of player	Number of points scored on the last ten games
Ricky	13,10,15,15,26,21,10,7,30,7
Carol	16,23,7,10,11,7,23,30,13,14

What is the **mean** (average)number of points scored by Carol ?

Algebra:

✓ 15.4 ✗

Scaffold:

Let's start with the definition. Which of the following is the right definition for the **mean**?

Multiple choice:

✘The number seen most often in a set of numbers. ✘The middle number in a set of ordered numbers. ✓ The sum of the numbers divided by the number of numbers. ✘The difference between the largest value and the smallest value in a set of numbers.

Hints:

- Mean is the same as an average.
- An average of the numbers is the correct answer.

Scaffold:

Since part of finding the **mean** is finding the sum of all of the numbers

what is the sum of scores that Carol scored?

Carol 16,23,7,10,11,7,23,30,13,14

Algebra:

✓ 154

Hints:

- First, write out all of the numbers in this plot on a piece of paper.
- Your list of numbers should look something like this:

16,23,7,10,11,7,23,30,13,14

- Now we have to add all the numbers in this list up.

16

23

7

10

11

7

23

30

13

+ 14

154

Scaffold:

Now that we know the definition of the **mean**, lets try the original problem again.

What is the **mean** (average)number of points scored by Carol ?

Algebra:

✓ 15.4

Hints:

- Remember, the sum of all the numbers is 154.

Now find the number of numbers and divide.

- There are 10 different scores on the chart.

The mean is 154 ÷ 10 = 15.4

Type in 15.4.

- The mean equals to 154/ 10 = 15.4 . The correct answer is 15.4.

Polynomial – Yi Wang

Assistment #43290 "43290 - Factor the follo..."

Factor the following polynomial:

$x^2 - 10x + 25$

Algebra:

✓ (x-5)(x-5)

Hints:

· Factoring means you want to get the polynomial in this form

(___x + ___)(____x + ____)

Since $x^2 - 10x + 25$ has no coefficient to x^2 you only have to find the values of the two blanks.

(x + ___)(x + ____)

· We have: $x^2 - 10x + 25$

Since the product of the last terms must be 25

The last terms could be:

5 and 5 , because 5*5=25

-5 and -5, because -5*-5=25

25 and 1, because 25*1 = 25 OR

-25 and -1, because -25*-1 = 25

So you either have:

(x + 5)(x + 5)

(x - 5)(x - 5)

(x + 25)(x + 1)

(x - 25)(x - 1)

· When you multiply you get:

$(x + 5)(x + 5) = x^2 + 5x + 5x + 25 = x^2 + 10x + 25$

$(x - 5)(x - 5) = x^2 - 5x - 5x + 25 = x^2 - 10x + 25$

$(x + 25)(x + 1) = x^2 + 25x + x + 25 = x^2 + 26x + 25$

$(x - 25)(x - 1) = x^2 - 25x - x + 25 = x^2 - 26x + 25$

· This one is correct:

$(x - 5)(x - 5) = x^2 - 5x - 5x + 25 = x^2 - 10x + 25$

Type (x-5)(x-5) or (x-5)^2 without spaces.

Assistment #44726 "44726 - Assistment #43162 - Polynomials Competency"

Factor the following polynomial

$x^2 + 38x + 361$

Algebra:

✓ (x+19)2 ✓ (x+19)(x+19)

Hints:

- Factoring means you want to get the polynomial in this form

(___x + ___)(____x + ____)

Since $x^2 + 38x + 361$ has no coefficient to x^2 you only have to find the values of the two blanks.

(x + ___)(x + ____)

•

We have: $x^2 + 38x + 361$

Since the product of the last terms must be 361

The last terms could be:

19 and 19 , because 19*19=361

-19 and -19, because -19*-19=361

361 and 1, because 361*1 = 361 OR

-361 and -1, because -361*-1 = 361

So you either have:

(x + 19)(x + 19)

(x - 19)(x - 19)

(x + 361)(x + 1)

(x - 361)(x - 1)

•

When you multiply you get:

$(x + 19)(x + 19) = x^2 + 19x + 19x + 361 = x^2 + 38x + 361$

$(x - 19)(x - 19) = x^2 - 19x - 19x + 361 = x^2 - 38x + 361$

$(x + 361)(x + 1) = x^2 + 361x + x + 361 = x^2 + 362x + 361$

$(x - 361)(x - 1) = x^2 - 361x - x + 361 = x^2 - 362x + 361$

•

This one is correct:

$(x + 19)(x + 19) = x^2 + 19x + 19x + 361 = x^2 + 38x + 361$

Type (x+19)(x+19) or (x+19)2 without spaces.

Polynomial – Yuan Shi

Assistment #43021 "43021 - Polynomial Competency Number 5"

Multiply and simplify: (2x - y)(4x - 2y)

Use x^2 for x^2 and

Use y^2 for y^2

Algebra:

✓

8x^2 - 8xy +2y^2

✗

$8x^2 + 2y^2$

✗

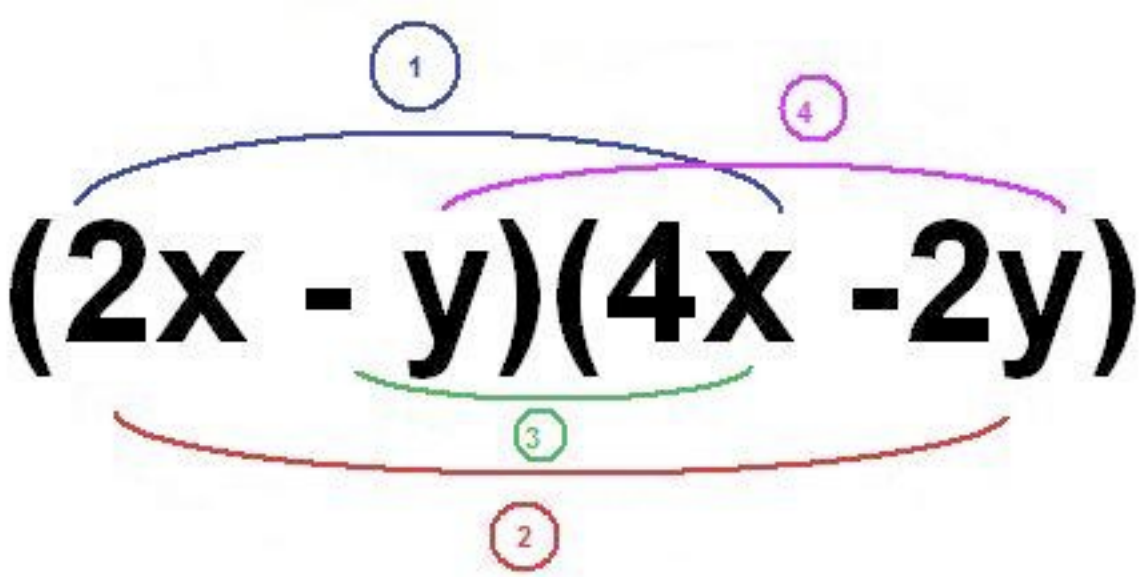
$8x^2 + 8xy + 2y^2$

✗

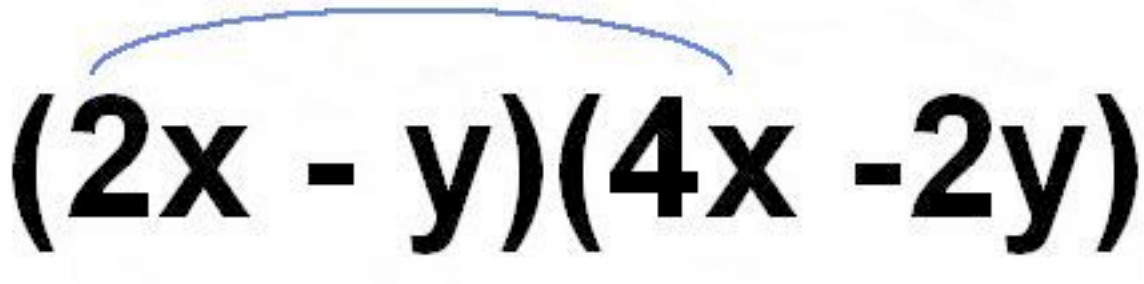
$8x^2 - 2y^2$

Scaffold:

Let's use FOIL to multiply the terms inside the paranthesis in a specific order: First, Outside, Inside, Last.



what is the first term you will get?



Multiple choice:

✓

$8x^2$

✗

8x

✗

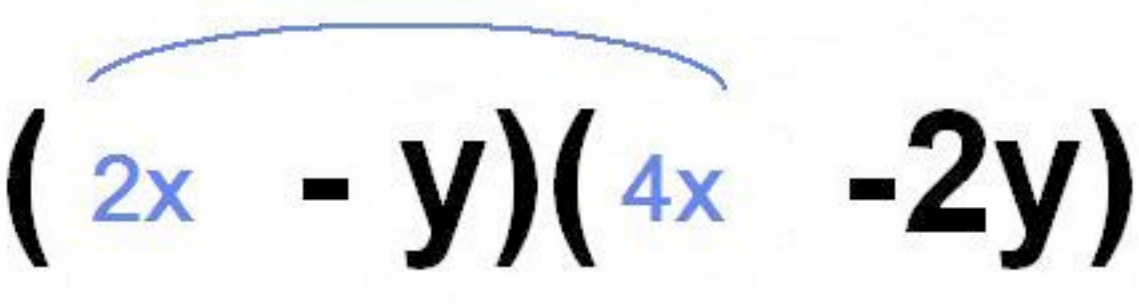
$6x^2$

✗

6x

Hints:

Remeber First means multiply the first term in each set!

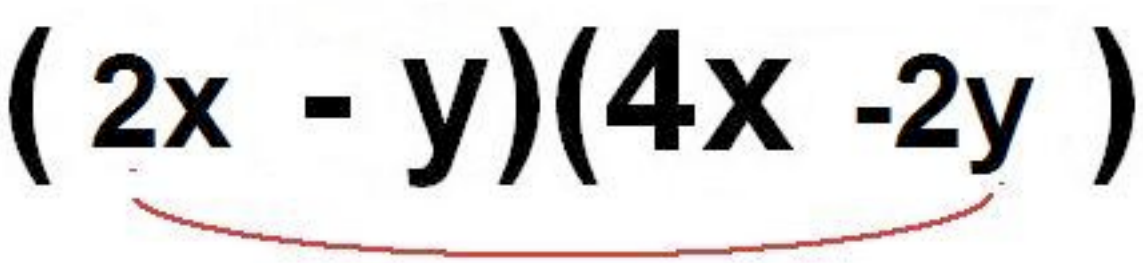


what is 2x * 4x =?

Multiply the first first termx of (2x-y)(4x -2y) you will get 2x * 4x = $8x^2$ Choose $8x^2$

Scaffold:

What is the next term? $8x^2 + \_\_\_\_\_$



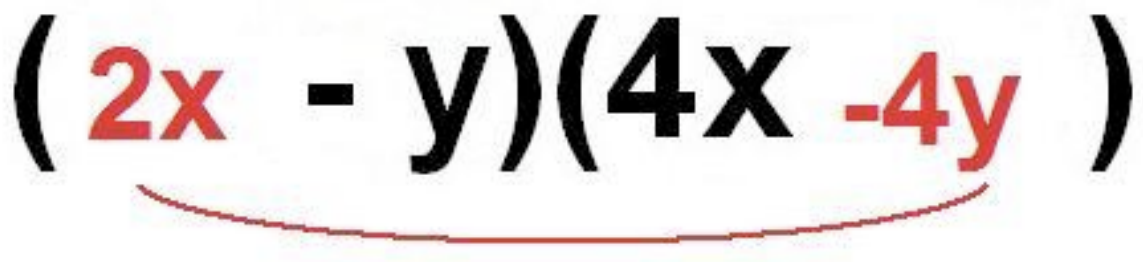
Algebra:

✓

-4xy

Hints:

Remember Outside means multiply the outside term in each set of the parenthesis of (2x-y)(4x-2y)

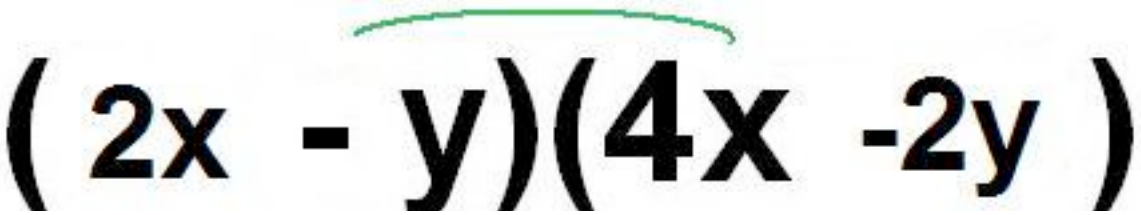


what is (2x)*(-4y) =?

2x * (-2y) = -4xy Now you will get the expression $8x^2 + (-4xy)$ type in -4xy

Scaffold:

what is next term? $8x^2 + (-4xy) +$ ____



Algebra:

✓

-4xy

✗

4xy

✗

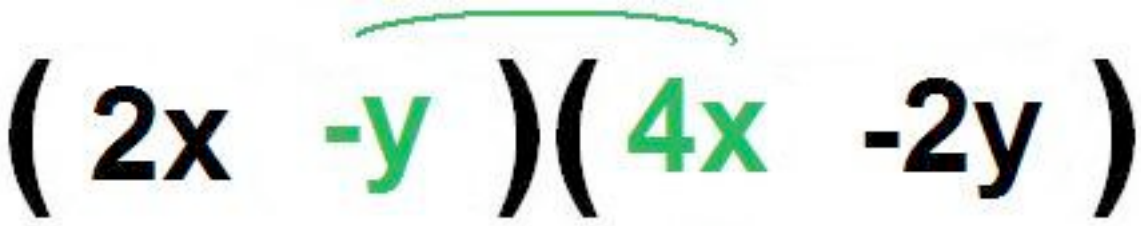
$4x^2$

✗

$4y^2$

Hints:

Rember Inside means multiply the inside terms of (2x -y)(4x -2y)



what is (-y)*(4x) =?

-y * (4x) = -4xy so type in -4xy Now, you have $8x^2$ + (-4xy) + (-4xy)

Scaffold:

what is the last term? $8x^2 + (-4xy) + (-4xy) +$____

Multiple choice:

$2y^2$

$4y^2$

$4x^2$

$4xy$

Hints:

Remember Last means multiply the last terms of (2x-y)(4x -2y)

Scaffold:

Let's get back to the original problem

Multiply and Simplify (2x-y)(4x-2y)

Use x^2 for x^2 and

Use y^2 for y^2

Multiple choice:

8x^2 - 8xy +2y^2

$8x^2 + 2y^2$

$8x^2 + 8xy + 2y^2$

$8x^2 - 2y^2$

Hints:

Let's see what we have done so far:

We use FOIL multiply the terms inside the paranthesis in a specific order:

First $2x * 4x = 8x^2$

Polynomial – Mihajlo Zeljkovic

Assistment #43056 "43056 - 43056"

Factor the following polynomial:

$x^2 + 4x + 4$

Algebra:

✓ $(x+2)(x+2)$

Hints:

- Factoring means you want to get the polynomial in this form

(__x + __)(___x + ___)

Since $x^2 + 4x + 4$ has no coefficient to x^2 you only have to find the values of the two blanks.

(x + __)(x + ___)

- We have: $x^2 + 4x + 4$

Since the produce of the last terms must be 4

The last terms could be:

2 and 2 , because 2*2=4

-2 and -2, because -2*-2=4

4 and 1, because 4*1 = 4 OR

-4 and -1, because -4*-1 = 4

So you either have:

(x + 2)(x + 2)

(x - 2)(x - 2)

(x + 4)(x + 1)

(x - 4)(x - 1)

- When you multiply you get:

$(x + 2)(x + 2) = x^2 + 2x + 2x + 4 = x^2 + 4x + 4$

$(x - 2)(x - 2) = x^2 - 2x - 2x + 4 = x^2 - 4x + 4$

$(x + 4)(x + 1) = x^2 + 4x + x + 4 = x^2 + 5x + 4$

$(x - 4)(x - 1) = x^2 - 4x - x + 4 = x^2 - 5x + 4$

- This one is correct:

$(x + 2)(x + 2) = x^2 + 2x + 2x + 4 = x^2 + 4x + 4$

Type (x + 2)(x + 2)

Assistment #44736 "44736 - 43056"

Factor the following polynomial:

$x^2 + 38x + 361$

Assistment #44746 "44746 - 43056"

Factor the following polynomial:

$x^2 + 12x + 11$

Assistment #44756 "44756 - 43056"

Factor the following polynomial:

$x^2 + 5x + 4$

Assistment #44766 "44766 - 43056"

Factor the following polynomial:

$x^2 - 26x + 25$

Assistment #44776 "44776 - 43056"

Factor the following polynomial:

$x^2 - 10x + 25$

Assistment #44777 "44777 - 43056"

Factor the following polynomial:

$x^2 - 4x + 4$

Algebra:

✓ (x-2)(x-2)

Hints:

- Factoring means you want to get the polynomial in this form

(___x + ___)(___x + ____)

Since $x^2 - 4x + 4$ has no coefficient to x^2 you only have to find the values of the two blanks.

(x + ___)(x + ____)

- We have: $x^2 - 4x + 4$

Since the produce of the last terms must be 4

The last terms could be:

2 and 2 , because 2*2=4

-2 and -2, because -2*-2=4

4 and 1, because 4*1 = 4 OR

-4 and -1, because -4*-1 = 4

So you either have:

(x + 2)(x + 2)

(x - 2)(x - 2)

(x + 4)(x + 1)

(x - 4)(x - 1)

- When you multiply you get:

$(x + 2)(x + 2) = x^2 + 2x + 2x + 4 = x^2 + 4x + 4$

$(x - 2)(x - 2) = x^2 - 2x - 2x + 4 = x^2 - 4x + 4$

$(x + 4)(x + 1) = x^2 + 4x + x + 4 = x^2 + 5x + 4$

$(x - 4)(x - 1) = x^2 - 4x - x + 4 = x^2 - 5x + 4$

- This one is correct:

$(x - 2)(x - 2) = x^2 - 2x - 2x + 4 = x^2 - 4x + 4$

Type (x - 2)(x - 2)

Polynomial – Ricardo Madera

Assistment #44578 "44578 - Factor the follow..."

Factor the following equation into 2 binomials by grouping:

$3wy + xy – xm – 3wm$

Algebra:

✓ (3w+x)(y-m)

Hints:

- In order to solve this problem you need to group the terms with similar values.

The equation:

3wy+xy -xm-3wm

Can be written as:

3wy-3wm+xy -xm

- The next step is to split the equation into two parts and factor each one.

3wy - 3wm = 3w(y-m)

xy -xm = x(y-m)

Now we put the two equations back together.

3w(y-m) + x(y-m)

- Now we need to factor the equation into two binomials.

The equation:

3w(y-m) + x(y-m)

Can be factored to give:

(3w+x)(y-m)

Assistment #44796 "44796 - Factor the follow..."

Factor the following equation into 2 binomials by grouping:

33ay+4xy -4xm-33am

Algebra:

✓ (33a+4x)(y-m) ✗(33a+4x)(y+m) ✗(4m+33x)(y-m) ✗(m+33x)(4y+m)

Hints:

- In order to solve this problem you need to group the terms with similar values.

The equation:

33ay+4xy -4xm-33am

Can be written as:

33ay - 33am + 4xy - 4xm

- The next step is to split the equation into two parts and factor each one.

33ay - 33am = 33a(y-m)

4xy - 4xm = 4x(y-m)

Now we put the two equations back together.

33a(y-m) + 4x(y-m)

- Now we need to factor the equation into two binomials.

The equation:

33a(y-m) + 4x(y-m)

Can be factored to give:

(33a+4x)(y-m)

Assistment #43231 "43231 - Factoring polynomials"

Factor the following polynomial:

$4x^2-36$

Algebra:

✓ (2x+6)(2x-6) ✓ (2x-6)(2x+6)

Hints:

- To factor this polynomial, you must use the difference of squares equation.

$$(a^2-b^2)= (a-b)(a+b)$$

- The reason we use this equation is because both terms are squares.

What does that mean?

The equation $4x^2-36$ has two terms and each one has a square root.

Term a = $4x^2$ Term b: 36

So now we take the square root of each term.

Term a: $\sqrt{4x^2} = 2x$

Term b: $\sqrt{36} = 6$

- Now, you can just plug those answers into the **difference of squares** equation.

$a = 2x$ $b= 6$

$(a^2-b^2) = (a-b)(a+b)$

$(2x^2-6^2) = (2x-6)(2x+6)$

- Enter $(2x-6)(2x+6)$ without any spaces.

Assistment #44817 "44817 - Factoring polynomials "

Factor the following polynomial:

$4x^2-25$

Fill in:

✓ $(2x+5)(2x-5)$ ✓ $(2x-5)(2x+5)$

Hints:

- To factor this polynomial, you must use the difference of squares equation.

$a^2-b^2 = (a-b)(a+b)$

- The reason we use this equation is because both terms are squares.

What does that mean?

The equation $4x^2-25$ has two terms and each one has a square root.

Term a = $4x^2$ Term b: 25

So now we take the square root of each term.

Term a: $\sqrt{4x^2} = 2x$

Term b: $\sqrt{25} = 5$

- Now, you can just plug those answers into the **difference of squares** equation.

a = 2x b= 5

$(a^2-b^2)= (a-b)(a+b)$

$(2x^2-5^2) = (2x-5)(2x+5)$

- Enter (2x-5)(2x+5) without any spaces.

Assistment #43232 "43232 - Factoring polynomials (Quadratic Formula)"

A) Solve for the two roots of the following equation,

(round to the nearest thousandths)

This problem is divided into two parts, you will first be asked for the larger root then the smaller root:

$x^2+8x+3 = 0$

What is the **larger** root of this equation?

Algebra:

✓ -0.395 ✗x=.395 x=-7.606 ✗x=-0.395 x=-7.606 ✗x=-7.606 x=-0.395

Hints:

- The polynomial does not factor easily so to find the roots of this equation, you can use the **quadratic** formula.

$\frac{-b\pm\sqrt{(b^2-4ac)}}{}$

$2a$

- a, b, and c can be found here:

$ax^2 + bx + c = 0$

$(1*x^2)+8x+3$

$a = 1$

$b = 8$

$c = 3$

- Now, you can just plug those terms into the **quadratic** formula.

Term A = 1 Term B = 8 Term C = 3

$$\frac{-8 \pm \sqrt{(8^2-4(1*3))}}{2*1}$$

•

Now lets simplify the expression for the larger root.

$$\frac{-8\pm\sqrt{(8^2-4(1*3))}}{2*1}$$

$$\frac{-8\pm\sqrt{(64-4(1*3))}}{2}$$

$$\frac{-8\pm\sqrt{(64-12)}}{2}$$

$$-8\pm\sqrt{(52)}$$

2

$$\frac{-8 \pm 7.21110}{2}$$

Good! Now that the equation is simplified, You need to solve for the larger root using addition.

$$\frac{(-8+7.21110)}{2}$$

-.7889

2

root1= -0.39445

- Now round to the nearest thousandth.

x=-0.395

Type in -0.395

B) $x^2+8x+3 = 0$

What is the value of the **smaller** root: (round to the nearest thousandths:)

Algebra:

✓ -7.606

Hints:

- To factor this polynomial, you must use the **quadratic** formula.

$$\frac{-b\pm\sqrt{(b^2-4ac)}}{2a}$$

- a, b, and c can be found here:

$$ax^2+bx+c=0$$

$$(1*x^2)+8x+3$$

$a = 1$

$b = 8$

$c = 3$

- Now, you can just plug those terms into the **quadratic** formula.

Term A = 1 Term B = 8 Term C = 3

$$\frac{-8\pm\sqrt{(8^2-4(1*3))}}{2*1}$$

- Now lets solve **quadratic** formula for the two roots.

Let's start by simplifying.

$$\frac{-8 \pm \sqrt{(8^2 - 4(1*3))}}{2*1}$$

$$\frac{-8 \pm \sqrt{(64 - 4(1*3))}}{2}$$

$$\frac{-8 \pm \sqrt{(64 - 12)}}{2}$$

$$\frac{-8 \pm \sqrt{(52)}}{2}$$

$$\frac{-8 \pm 7.21110}{2}$$

- Now we will use subtraction to get the lesser root.

$$\frac{(-8-7.21110)}{2}$$

$$\frac{-15.2111}{2}$$

root 2=-7.60555

- Now round to the nearest thousandth.

x=-7.606

Assistment #43233 "43233 - Polynomials Competency #9A "

Given a rectangle with length = 2x + 3 and width = x + 2,

Determine the perimeter.

Algebra:

✓ 6x+10

Hints:

•

The perimiter of a rectangle is the distance around the rectangle. Add up all the sides.

- Perimeter = Length + width + length + width
- Perimeter = 2x+3 + x+2 + 2x+3 + x+2
-

Perimeter = 4x+6 + 2x+4

Perimiter = 6x+10

Type in 6x + 10

Assistment #44786 "44786 - Polynomials Competency #9A Var"

Given a rectangle with length = 2x+3 and width =16x+7,

Determine the perimeter.

Algebra:

✓ 36x+20

Hints:

-

The perimiter of a rectangle is the distance around the rectangle. Add up all the sides.

- Perimeter = Length + width + length + width
- Perimeter = 2x+3 + 16x+7 + 2x+3 + 16x+7
-

Perimeter = 4x+6 + 32x+14

Perimiter = 36x+20

Type in 36x + 20

Assistment #43235 "43235 - Polynomials Competency #9B(Area)"

Given a rectangle with length = 2x+3 and width = x+2

Determine the Area.

Please write x^2 in the form x^2.

Algebra:

✓ 2x^2+7x+6 ✗2x^1+6x+7 ✗$2x^2$-6x+7 ✗$2x^2$-7x+6

Scaffold:

To Find the AREA of a rectangle, you need to multiply the length by the width.

AREA = LENGTH X WIDTH ----> AREA = (2x+3)(x+2)

Let's use the FOIL method to multiply the terms inside the paranthesis in a specific order: First, Outside, Inside, Last.

What expression you will get when you multiply the first term in each set of the parenthesis of (2x+3)(x+2)

Multiple choice:

✓ $2x^2$ ✗2x ✗$6x^2$ ✗6x

Hints:

- the first term of (2x +3)(x +2) is 2x and x

Multiply the first terms

-

$2x * x = 2x^2$

Choose $2x^2$

Scaffold:

What expression will you get if you multiply the Outside term in each set of the parenthesis of (2x+3)(x+2)

What is the next term? $2x^2 +$ _____

Multiple choice:

✓ 4x ✗ -4x ✗ $4x^2$ ✗ x^2

Hints:

- the outside term of (2x +3)(x +2) is 2x and 2

Multiply the outside terms

- 2x * (2) = 4x so choose 4x

Scaffold:

What expression will you get if you multiply the Inside term in each set of the parenthesis of (2x+3)(x+2)

Multiple choice:

✓ 3x ✗ -3x ✗ $3x^2$ ✗ $-3x^2$

Hints:

- the inside terms of (2x + 3)(x+2) is 3 and x

Multiply the inside terms

- 3 * (x) = 3x so choose 3x

Scaffold:

What expression will you get if you multiply the Last term in each set of the parenthesis of (2x+3)(x+2)

Multiple choice:

✓ 6 ✗3x ✗6x ✗-3x

Hints:

- the inside terms of (2x + 3)(x+2) is 3 and 2

Multiply the last terms

- (3) * (2) = 6 choose 6

Scaffold:

Let's get back to the original problem

Algebra:

✓ 2x^2+7x+6

Hints:

- Let's see what we have done so far:

We use FOIL multiply the terms inside the paranthesis in a specific order:

First, $2x * x = 2x^2$

Outside, $2x * (2) = 4x$

Inside, $3 * (x) = 3x$

Last, $(3) * (2) = 6$

- Let's add the result together

$2x^2 + (4x) + (3x) + 6 = 2x^2 + 7x + 6$

type in 2x^2 + 7x + 6

Assistment #44806 "44806 - Polynomials Competency #9B(Area)"

Given a rectangle with length = 8x+5 and width = 11x+8

Determine the Area.

Please write x^2 in the form x^2.

Algebra:

✓ 88x^2+119x+40 ✗88x^1+119x+40 ✗88x²-119x+40 ✗88x²-55x+40

Scaffold:

To Find the AREA of a rectangle, you need to multiply the length by the width.

AREA = LENGTH X WIDTH ----> AREA = (8x+5)(11x+8)

Let's use the FOIL method to multiply the terms inside the paranthesis in a specific order: First, Outside, Inside, Last.

What expression you will get when you multiply the first term in each set of the parenthesis of (8x+5)(11x+8)

Multiple choice:

✓ 88x^2 ✗55x^2 ✗64x² ✗40x^2

Hints:

- the first term of (8x +5)(11x +8) is 8x and 11x

Multiply the first terms

-

$8x * 11x = 88x^2$

Choose $88x^2$

Scaffold:

What expression will you get if you multiply the Outside term in each set of the parenthesis of (8x+5)(11x+%v{widthy)

What is the next term? $88x^2 +$ _____

Multiple choice:

✓ 64x ✗ -64x ✗ 55x ✗ 40x

Hints:

- the outside term of (8x +5)(11x +8) is 8x and 8

Multiply the outside terms

- 8x * (8) = 64x so choose 64x

Scaffold:

What expression will you get if you multiply the Inside term in each set of the parenthesis of (8x+5)(11x+8)

Multiple choice:

✓ 55x ✗ -55x ✗ $64x^2$ ✗ $-64x^2$

Hints:

- the inside terms of (8x + 5)(11x+8) is 5 and 11x

Multiply the inside terms

- 5 * (11x) = 55x so choose 55x

Scaffold:

What expression will you get if you multiply the Last term in each set of the parenthesis of (8x+5)(11x+8)

Multiple choice:

✓ 40 ✗ 40x ✗ 55x ✗ -64x

Hints:

- the inside terms of (8x + 5)(11x+8) is 5 and 8

Multiply the last terms

- (5) * (8) = 40 choose 40

Scaffold:

Let's get back to the original problem

Given a rectangle with length = 8x + 5 and width = 11x + 8,

Determine the perimeter

Algebra:

✓ 88x^2+119x+40

Hints:

- Let's see what we have done so far:

We use FOIL multiply the terms inside the paranthesis in a specific order:

First, $8x * 11x = 88x^2$

Outside, $8x * (8) = 64x$

Inside, $5 * (11x) = 55x$

Last, $(5) * (8) = 40$

- Let's add the result together

$88x^2 + (64x) + (55x) + 40 = 88x^2 + 119x + 40$

type in 88x^2 + 119x + 40