

114

A COMPARISON OF "TEACHERS"-MARKS"
AND STANDARDIZED TEST-SCORES

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DEDICATION

To the members of my Beloved Family;

My Wife, Mildred

My Son, Tommy

**For their Kindness, Devotion, Inspiration, Patience,
and Encouragement over the Years.**

H.T.G.

ACKNOWLEDGMENT

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H.T.G.

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CHAPTER I

INTRODUCTION

Rationale.--The writer's major field of interest is Science Education which includes a concentrated study in Psychology. From this particular field the writer has gained a tremendous interest in the Educational Psychological Curriculum movement. The writer has pursued a thesis problem in this area.

Beginning with the inception of the standardized testing movement at the turn of the twentieth century, educators, citizens, and parents have been increasingly aware of the need for, and have been placing emphasis upon, the problem and question: How can we measure more validly what goes on in the teaching-learning situation? In the wake of this increasing insistence upon finding an answer to the paramount question: How much and how well are children and youth learning the 3R's and developing the traits of social competence and preparing for adulthood? Test constructors have devised a vast (and perhaps an uncounted) repository of instruments to measure academic accomplishments, personality traits, interest, attitudes, special aptitudes, and socio-economic backgrounds.

Furthermore, it must be remembered that the measurement and appraisal of pupil progress is not a new emphasis and/or technique; for, since the beginning of formalized "teaching-learning situations," classroom teachers have graded and appraised the extent of pupil learning and expressed their evaluation as indices which have been called "teachers'-marks" as measures of pupil progress; from opinions, observations, and research, the unreliability of "teachers'-marks" which is inherent in subjectivity of the reaction--climate of the scorer--can easily be intensified.

There is an abundance of evidence pertinent to the unreliability of "teachers'-marks" as valid measures of pupil achievement and pupil progress. The objective and standardized testing technique and procedure were born and have been blessed with their greatest and most sustaining motivation. Hence, in the most recent decades, the development and refinement of objectives and standardized test-instruments have evolved and have become the most trusted means of appraising and evaluating pupil progress when used by well-trained persons.

All of this avalanche of refined instruments for measuring, appraising, evaluating, and assessing the quantity and quality of learning and individual development in the teacher-learning situation has moved in several directions, e. g., (a) merely to survey the extent of and establish norms of actual and expected levels of individuals' developments

and academic accomplishments, (b) specifically, to isolate and identify the points of weaknesses and strengths prevalent in the teaching-learning situation, (c) pointedly, to suggest the avenues for improving and making more effective the teaching-learning situation, and (d) philosophically, to provide an adequate education for all children and youth without regard to age within the frame-of-reference of their differences of innate ability, individual interest, prior experiences, and socio-economic status.

Consequently, our schools of today are committed to a philosophy and practice of a program of so-called "continuous evaluation or appraisal" of the total school program of facilities, activities, and personnel. In the nature of things, the emphasis on appraisal of the school program has been centered on what is happening to the child and youth; namely, measuring academic accomplishment and assessing individual growth and development, rather than on those aspects of the program which exist solely to promote pupil learning and development.

However, it is felt that, in all fairness to the system of "teachers'-marks" used to measure pupil achievement, which has been operative in the schools over the years, that it would be proper and fruitful to compare pupil progress, as measured by "teachers'-marks" and test-scores, as a frame-of-reference for any program of standardized testing to be inaugurated presently or in the future.

Skill in scholastic matters, whether important as an end in itself, or important as a means of attaining more complete self realization, is not only one of the school's responsibilities but it is a unique responsibility. If the schools falter in this responsibility, no other agency stands ready to step into the breach of responsibility. In this area of discipline in cultural facts, the school is largely responsible for any academic attainment the child may acquire.

School marks are an important, useful, and integral part of education. At almost every level of education, from the first grade through the university, marks reveal the evaluator's estimate of the achievement of students. These marks, which are reported to parents and children, are generally taken seriously. School records are thought to be incomplete, if they do not show a statement of a child's promotion from grade to grade and also the relative proficiency of his work as indicated by marks received from teachers in the various subjects.

"School marks" have much to do with the educational and vocational future of a child. These marks often form the basis for the child's own judgement of his ability to master the subjects he has studied, and can be used as a guide for his future educational opportunities by parents and teachers. Institutions of higher learning often set their standards of entrance by marks in high school or performance on

standardized achievement tests and sometime grant scholarships to those whose marks exemplify unusual achievement.¹

The purpose of the "school marks" may be roughly stated as (1) administrative, (2) educational, and (3) social promotion as well as in certification of the graduation of the pupils. The administrative work of the school is very much concerned with school marks as reported by the teachers. Administrative difficulties arise whenever teachers are uncertain as to the achievement ability of the individual pupils; and, further, most pupils and parents are not satisfied with marks that do not designate the deficiency.²

"School marks are used to motivate school work, since pupils work, to some extent, for marks. This practice is desirable if the marks are relatively consistent with achievement, not only concerning the accomplishments reached, but also concerning the needs and short comings revealed.³

In view of the fact that school marks are often taken seriously by both pupils and parents, and in the view of possibility of making these marks indicate particular difficulties and needs, marks may be utilized to promote

¹Henry Lester Smith and Wendell W. Wright, Test and Measurement (Chicago: Silver, Burdett and Company, 1938), p. 31.

²Smith and Wright, Ibid., p. 32.

³Harry N. Revlin, Teaching Adolescents in Secondary Schools (New York: Appleton-Century Crafts, Inc., 1948), p. 426.

learning. The competition of pupils, one against another, or that of a pupil against his own record, offers a worthy incentive to activity that will purposefully be valuable insofar as the marks are given a definite measure of specific achievement.¹

The greatest source of inaccuracy in marks is that teachers use widely different standards and bases which may include such factors as achievement in school, improvement in school work, efforts, attitudes, neatness, habits of work, conduct in class, results on examination, and others.²

Evolution of the problem.--This problem grew out of writer's working as chairman of the compilation committee of his school's records. This committee was to find the overall achievement of each ninth grade pupil at Southside Junior High School, Mobile, Alabama. The finding was of such a nature that it was felt that teachers were not giving students valid grades which they appraised periodically in their classes. The writer believes that the grades that were given cannot be justified completely by the teacher.

Contribution to educational research.--It is hoped that the information contained in this study will be valuable to extent that it will provide additional objective data relative

¹Smith and Wright, op. cit., p. 31.

²Henry B. McDaniel, Guidance in the Modern School (New York: Henry Holt and Company, Inc., 1956), p. 189.

to the reliability of "teachers'-marks" assigned to pupils in reporting their progress and achievement. Also this study might provide information that will be significant to other teachers in improving their assignment of grades.

Statement of the problem.--The problem involved in this study was to analyze critically the differences, if any, in the relationship of "teachers'-marks", standardized test-scores, and intelligence quotients of the ninth grade pupils enrolled in the Southside Junior High School, Mobile, Alabama, for the school term 1964-1965.

Statement of purpose.--The major purpose of the study was to get a comprehensive picture of significant differences in the overall school achievement:

1. To determine the measures of central tendency and variability of intelligence as measured by the California Test of Mental Maturity of the ninth grade pupils enrolled in the Southside Junior School, Mobile, Alabama, for the school term 1964-1965.
2. To determine the measures of central tendency and variability of "teachers'-marks" assigned to the ninth grade pupils enrolled at the Southside Junior High School, Mobile, Alabama, for the school term 1964-1965.
3. To determine the measures of central tendency and variability in achievement test-scores as measured by the California Achievement Test of the ninth grade pupils enrolled in Southside Junior High School, Mobile, Alabama, for the school term 1964-1965.
4. To determine the significant difference, if any, between the "teachers'-marks" and the achievement test-scores of the ninth grade pupils at the Southside Junior High School, Mobile, Alabama, for the school term 1964-1965.

5. To determine the significance of the correlation between the "teachers'-marks" and the achievement test-scores of the ninth grade pupils enrolled in the Southside Junior High School, Mobile, Alabama, for the school term 1964-1965.
6. To formulate comprehensive educational implications, if any, as may be derived from the analysis and interpretation of the data.

Null hypothesis.--There is no significant difference between "teachers'-marks" and standardized test-scores. Also there is no relationship between teachers'-marks and standardized test-scores nor intelligence quotients.

Definition of terms.--

1. Achievement--as used in this study refers to the level of efficiency in school subjects as measured by standardized test-scores and "teachers'-marks."
2. Intelligence--as used in this study refers to the level of efficiency of mental development of the pupils as measured by the California Short-Form Test of Mental Maturity.

Limitation of the study.--This study was limited in that no effort was made to ascertain the impact of the environmental factors and forces upon either the "teaching-learning situation" or the individual personality nor were any efforts made to appraise prior experience in performing in rigidly controlled competitive learning situations.

Locale and period of study.--The locale of this study was the setting of a very old city which is highly industrialized with factories and big shipping grain elevators. The city is Alabama's only port city, Mobile, Alabama. Southside Junior High School is located on the Southwest side of the city.

The task involved in collecting, assembling, treatment of the data and writing of the research was completed during the school year.

Description of the subjects.--The subjects involved in this study consisted of students enrolled in the Southside Junior High School, Mobile, Alabama. In this ninth grade class, there were twenty-eight boys ranging in chronological ages from thirteen to seventeen years with a mean of fifteen years. Whereas there were thirty-six girls ranging in chronological ages from twelve to fifteen years with a mean age of 13.5 years. The mean chronological age for the total group of sixty-four ninth-graders was 14.5.

The pupils in this community suffer from a lack of proper supervision and many are products of broken homes. Besides having no place to study, many pupils cannot receive help from their parents because the majority of them have less than a high school education--this causes the pupils to be limited in experimental background.

Description of materials.--Data for this research were gathered from the following selected sources:

1. The California Short-Form Test of Mental Maturity devised by Willis W. Clark and Ernest W. Tiegs.

This is a test of mental maturity which appraises the student's mental development and mental capacity. This test samples mental processes in four areas; namely, spatial relationship, logical reasoning, numerical reasoning, and verbal concepts.

2. The California Achievement Test Complete Battery

(advanced form) W. X. Y. Z. devised by Ernest W. Tieggs and Willis W. Clark.

This is an instrument designed for the measurement and diagnosis of school achievement. This series of tests is composed of highly reliable and valid tests of skills and understanding in reading, mathematics, and language.

3. Cumulative records of the pupils which cover attendance, scholarship, health, and personal data records of the pupils enrolled in the school.

The "variable" of "teachers'-marks" used in this study was formulated by computing the average of the numerical grades earned in the respective subject-matter areas by pupils as these grades were found recorded in the cumulative records of the pupils.

Method of research.--The Descriptive-Survey method of research was used.

Method of procedure.--The procedural steps used in conducting this study are as follows:

1. A more thorough survey of related literature pertinent to the problem was summarized and carefully studied to get a clear and deeper insight of the overall field of scientific knowledge in order to promote a greater understanding of the problem and to insure avoidance of unnecessary duplication, and to derive helpful suggestions made by others.
2. Data on each individual were taken from the cumulative folders. In doing so, the writer gained information of personal nature and of varying degrees of accuracy about the individual.
3. The subjects were given the California Short-Form Test of Mental Maturity to provide mental ability measurement of the individuals being studied. This test samples mental processes in four areas: spatial relationship, logical reasoning, numerical reasoning, and verbal concepts.
4. The California Achievement Test Complete Battery was administered. This is an instrument designed for the measurement, evaluation, diagnosis of school achievement. This series is composed of highly

reliable and valid tests of skill and understanding in reading, mathematics, and language.

5. The data derived from the "teachers'-marks" and standardized test-scores were treated statistically through the computation of such measures as: mean, median, standard deviation, standard error of the means, and Fisher's "t" score.
6. Findings, conclusions, implications, and recommendations derived from the analysis and interpretations of the data collected were formulated.

Related literature.--The literature pertinent to this study was reviewed by the writer with special attention on material dealing with theories and research pertinent to the nature of intelligence, achievement, and personality of "differences and correlations" on the variable differences according to sex, age, grade-placement, and socio-economic backgrounds. The literature on the unreliability of "teachers' marks" and the reliability of standardized test-scores revealed the fact that it was not as extensive as that on the associated problem of intelligence, school achievement, and personality. The review of the related literature is presented here under the following captions:

1. Theories and researches on school achievement
2. The unreliability of "teachers'-marks"
3. The reliability of standardized test-scores

The presentation to follow will be in the sequence indicated above.

Theories and researches on school achievement.--This section of the review of the related literature deals with the problem of the achievement of pupils in the teaching-

learning situation.

Merrill made a comparison of mentally retarded, normal, and superior children on the Stanford Achievement Reading Test and found approximately equal performance for the retarded, normal, and superior groups for the same age.¹ This points to the fact that the slow-learning child can make an appreciable amount of achievement, if provided with materials and instructions suited to his mental capacity.

Cook made a study of 312 failing and non-failing students in St. Paul School as reported by Bayer. A total of thirty-two comparisons of achievement tests means were made between the two groups. The final score was a tie. Sixteen differences in the achievement of these two groups.²

Myer reviewed a series of studies of the comparison of consolidated schools and one-teacher schools and noted that "the average year in the one-teacher schools studied was 6.8 days or .038 of a 180 day school year, shorter than the consolidated schools and concludes there was actually a difference of .28 of a year favorable to the one-teacher school."³

¹ Maud Merrill, "On the Relations of Intelligence to Achievement in cases of Mentally Retarded Children," Comparative Psychology Menographs (September, 1954), p. 68.

² Phillip A. Bayer, "Conditions that Make Guidance Possible," Review of Educational Research, XII (February, 1952), pp. 29-31.

³ C. E. Myer, "The One-Teacher School, Front and Center," Journal of Rural Education, Vol. III (1954), pp. 43-49.

Further, the Cooperation Committee made an investigation of the achievement of the consolidated schools and found that, "for each forward advancing year of age, the average pupil in the consolidated school goes forward .69 of a grade, in the small school .67 of a grade."¹

Kuhlen points out that achievement is the result of many factors:

It is the product of motivation of the amount of energy that is thrown into the task at hand, of health possessed, by the subject, of his general emotional and social adjustment, of the conditions of work, of his background skills both with respect to the particular task at hand and more general skills of how to work and think. All these factors and others, not easily identifiable,² combine to constitute functioning intelligence.

Epps made a Comparative Study of the Intelligence, School Achievement, and Personality Development Between Groups of Attendance and Non-Attendance Fifth and Sixth Grade Pupils. The data warranted the conclusion that the attendance group was experiencing a significantly higher level of mental development than the non-regular attenders. The attendance group achieved significantly higher levels of academic accomplishment than the group of non-attenders except in the areas of arithmetic computation and language. The attenders

¹J. M. Foote, (Chairman), "A Comparative Study of Investigation in Consolidated and One-Teacher Schools," Proceedings of N.E.A. (1963), pp. 812-26.

²Raymond G. Kuhlen, The Psychology of Adolescent Development (New York: Harper and Brothers, 1962), p. 129.

experienced a higher level of personality maturity than the non-attenders except in the area of personal adjustment. Epps concluded that the children who attend school regularly do achieve significantly higher levels of development, mentally, socially, emotionally, and academically than those children who attend irregularly.¹

Martin and Stendler argue:

American schools at the present time do not take into account individual growth rates. They still tend to compare an individual with his group average rather than with his own growth pattern. They also compare children school achievement norms. But growth and achievement are not uniform for all individuals nor do they proceed in a straight line.²

Wesley and Adams emphasize the need for successful school:

In order to secure recognition and praise, the children must have the self-confidence necessary to achieve something worthy of such records. Findings, projects, and activities for the purpose of enabling students to achieve is an important function of the teacher. Achievement must have integrity and be of such nature as to lead to the acquisition of permanent and transferable methods. Setting the stage for achievements is a fundamental obligation of the teacher, and can do something about the socio-economic background of the pupils, she can do a

¹ Alonza Epps, "A Study of Intelligence, School Achievement, and Personality Development Between Groups of Attendance and Non-Attendance Students in the Fifth and Sixth Grades of the Lumber City High School, Lumber City, Georgia, 1953-1954" (unpublished Master's Thesis, School of Education, Atlanta University, 1954).

² William H. Martin and Celia Stendler, Child Development (New York: McGraw-Hill Book Company, 1966), p. 53.

great deal to improve equal opportunities.¹

Unreliability of "teachers' marks".--The immediate excerpts to the following will deal with the problem of the unreliability of "teachers' marks". Many important studies of the accuracy of school marks made by Johnson and Owen² and Green and Jorgensen³ reveal the fact that school marks are highly subjective and hence inaccurate. This accumulation of evidence not only proved conclusively that such subjective measures as "teachers' marks" might be expected to vary widely from teacher to teacher, but also that some "teachers' marks" would vary from time to time and from subject to subject. It was shown that very often the difference between success and failure in a given subject was largely the pupil's fortune to be placed in one teacher's section of the class, rather than in that of another. This type of demonstration revealed the need for instruments which would yield more accurate measures of achievement.

In most school situations, achievements are measured in terms of the teacher's rating. School progress generally is

¹Edgar Bruce Wesley and Mary A. Adams, Teaching Social Studies in High School (Boston: C. C. Heath and Co., 1962), p. 84.

²William A. Owen and Wolmer C. Johnson, Some Measured Trail of Collegiate and Underchievers (Minnesota: University Press, 1949), pp. 45-46.

³H. A. Green and A. N. Jorgensen, The Use of Educational Test and Interpretation (New York: Logmans Green, Inc., 1964), pp. 4-5.

is based on the rating of the teacher. It seems imperative that "teachers' marks" should be investigated to determine whether the sex of the student, when compared to the sex of the teacher, justifies the "teachers' marks".

The primary significance of the problem is found in the almost universal use of marks in the public school systems in the United States. By use of one device or another, teachers express judgment on the level of achievement exhibited by various members of their classes.

These marks will influence the future of the school's career of the pupils who receive these marks. Therefore, a definite need for an objective evaluation of "teachers' marks", in terms of validity, is needed. Some of the factors responsible for unreliability of "teachers' marks" or grades of pupil achievement are:

1. The difference between standards of excellence, both among different teachers and on the part of single teachers, from one occasion to the next.
2. Psychological factors such as fatigue, etc., affecting ability to distinguish between closely allied degrees of merit. As a test, grades proceed through a large pile of papers. There are systematic changes, resulting from factors which vary from different grades, which grossly affected the test scores.

Reliability of standardized achievement test scores.--

Standardized Achievement tests are designed to measure the progress of pupils in various academic areas. The scores assigned to pupils' performance on these tests are reliable

because they are free from personal opinion, according to Risk.¹

Standardized tests are more reliable than "teachers' marks". They are free from personal opinion in scoring because answers are definitely agreed upon by authorities and experts in the specific areas. They enable a more extensive sampling in given time than can be obtained than any other test type. This means that standardized tests can be a very effective mean of teaching and testing because time can be saved and results will be more reliable, fair, and impartial.

Ruggard and Brooks² point out that standardized tests are constructed to measure specific responses. One of the important outcomes of this is that we know the typical or average performance of children under normal conditions with these averages, teachers can compare the work of their own pupils' specific test scores below or above average. This will give the teacher some indication of the pupil's need for guidance. The purpose of the standardized test is two-fold. First, to measure both aptitude and accomplishment, and second, to diagnosis the specific needs for help and guidance of individual pupils.

¹Thomas M. Risk, Principles and Practices of Teaching in Secondary Schools (New York: American Book Company, 1963), p. 631.

²Harold Ruggard and B. M. Brooks, The Principles of School and Society (New York: World Book Company, 1961), p. 651.

An increasing number of educators believe that the standardized test is another important factor in the school's program. In this connection, Lee and Lee¹ state that teachers can use the standardized test to:

1. Discover the difficulties and shortages of each child in the skills which are essential for success in pupil activities.
2. Obtain a measure of each child's skills in such fields as reading, vocabulary, reading comprehension, arithmetic, and language.
3. Provide a basis for planning an individual remedial program to meet the needs of the pupils.
4. Provide a basis for grouping pupils according to their needs for remedial instruction (this refers to the information of groups in reading or other specific fields and not practice of grouping classes homogeneously for the entire instructional program).
5. Show the pupils in which skill they are in need of special work.
6. Discover which pupils are not doing work which compares favorably with that done by the pupils of the same ability in other schools.
7. Evaluate strengths and weaknesses of instructions in various skills.
8. Provide a basis for studying the adjustment problem of the child.

Summary of related literature.--A review of the related literature pertinent to this research revealed that the various authorities who have investigated the problem of the unreliability of "teachers' marks" and the reliability of standardized test scores appear to agree that teachers should rely

¹Jim Lee and D. M. Lee, The Child and His Curriculum (New York: Appleton-Century Crafts Inc., 1960), p. 680.

on the results derived from standardized tests for a truer picture of pupil achievement or progress. The review of the literature related to the problem of this study has been condensed to certain generalized statements, which characterize the consensus of opinion and research, and are presented below under appropriate captions.

Theories of achievement.--The varied theories concerned with school achievement are in the characterizations below.

1. Kuhlen holds that achievement is the result of many factors, such as motivation, energy, health, emotional and social adjustment, condition of work, and the background of general and specific skills of work and thinking.¹
2. Martin and Stendler assert, "American schools at the present time do not take into account individual growth rates." The individual's growth pattern and school achievement are compared to his group-average rather than to his own development.²
3. Merrill experimentally found that on the Stanford Achievement Test that retarded, normal, and superior groups had approximately equal performance for those subjects of same mental age. This points to the fact that the slow learning child can make an appreciable amount of achievement, if provided with materials and instructions suited to his mental capacity.³
4. Cooperative Committee found that pupil progress through the grades was at a higher level in consolidated schools than in the smaller schools.⁴

¹ Kuhlen, op. cit., p. 13.

² Martin and Stendler, op. cit., p. 14.

³ Merrill, op. cit., p. 12.

⁴ Cooperative Committee, op. cit., p. 14.

The unreliability of "teachers' marks".--The research on the unreliability of "teachers' marks" is summarized below.

1. Gray, et. al., reveal the fact that the school marks are highly subjective and hence inaccurate.¹
2. Green and Jorgensen, reports that "teachers' marks" not only vary from teacher to teacher but also that the same teachers' marks would vary from time to time and from subject to subject.²
3. Thomas believes that marks should be valid, truly representative of quantities and qualities of pupil achievement. Reliability must be unquestioned.³
4. Carter states that marks assigned by teachers will influence the future school career of pupils who receive these marks. There is, therefore, a definite need for a lucid and objective evaluation of "teachers' marks" in terms of validity.⁴
5. Remmers and Cage state that psychological factors, such as fatigue, affecting the ability to distinguish between closely allied degrees of merit.⁵
6. Edmondson, Roemer and Bacon affirm that the lack of uniformity contributes largely to the variability of inaccuracy found in teachers' marks.⁶

The reliability of standardized test scores.--The research of the reliability of standardized test scores is epitomed in the statements to follow.

1. Risk states that standardized tests are more reliable than "teachers' marks", They are free from

¹ Gary, et. al., op. cit., p. 18.

² Green and Jorgensen, op. cit., p. 15.

³ Thomas, op. cit., p. 15.

⁴ Carter, op. cit., p. 13.

⁵ Remmers and Cage, op. cit., p. 12.

⁶ Edmondson, Roemer and Bacon, op. cit., p. 14.

personal judgment or opinion in scoring, because the answers are definitely agreed upon. It is an effective means of teaching and testing because time can be saved and results will be more favorable, fair, and impartial.¹

2. Rugg and Brooks state that standardized tests measure aptitudes and accomplishments and diagnoses the specific needs for help and guidance.²
3. Lee and Lee believe that teachers can use the standardized tests to evaluate strengths and weaknesses of instruction in the various skills.³

¹ Risk, op. cit., p. 17.

² Rugg and Brooks, op. cit., p. 17.

³ Lee and Lee, op. cit., p. 18.

CHAPTER II

PRESENTATION AND ANALYSIS OF DATA

The data derived from this study are presented in this chapter. The statistical technique used to analyze these data was the \bar{z} -ratio.

The criteria of reliability of the statistics for these data were: (a) Fisher's t-test of the significance of the difference between the means of two or more sets of data. The level of confidence used to interpret these findings was .05, with a "t" value of 1.96¹ or 3 times the standard error "r" and (b) the McCall T-Score Equivalent² for the raw-scores obtained.

The criteria used to determine the meaningfulness of the computed statistics of the data for the group were the established "Norms" of grade placements and percentile ranks for various distributions of the test-scores and "teacher's-marks" being analyzed and interpreted.

¹
Henry E. Garret, Statistics in Psychology and Education (New York: Longman, Green and Company, 1953), pp. 213-17.

²
Milton Smith, A Simplified Guide to Statistics (New York: Rinehart and Company, Inc., 1946), pp. 42-44.

Indices of Raw Scores and "Teachers'-Marks"

Introductory Statement.--This section of the report of the research presents the descriptive data of the raw scores and their respective T-scores of; (a) scores on the two tests and (b) scores referred to as "teachers'-marks" together with the measures of central tendency, variability, reliability, and "Norms" for the respective components on the tests and the various subject-matter areas appraised by the classroom teachers.

Results on the California Mental Maturity (Intelligent Quotient).--The data on the California Short-Form Mental Maturity Test (Intelligent Quotient), as obtained from the raw score and T-score equivalents for the ninth grade pupils, are presented in Tables 1 and 2, pages 24 and 25, respectively.

Raw Scores.--The raw scores on the mental maturity components ranged from a low of 70 to a high of 120, with a mean of 96.45, a median of 95.50, standard deviation of 11.8, and a standard error of the mean of 1.487. Further, the tables show that 22 of the subjects scored below the mean and 20 of the subjects scored within the mean class interval.

T-Score Equivalents.--The T-score equivalents on the mental maturity components ranged from a low of 17 to a high of 67, with a mean of 46.02, a median of 45.17, standard deviation of 10.00, and a standard error of the mean of 1.259. The tables also show that 24 of the subjects scored below the mean and 21 of the subjects scored within the mean class interval.

TABLE 1

DISTRIBUTION OF RAW SCORES ON THE CALIFORNIA SHORT-FORM MENTAL MATURITY TEST (TOTAL MENTAL FACTORS) (INTELLIGENT QUOTIENT) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
120-124	1	1.6
115-119	0	0.0
110-114	4	6.2
105-109	9	14.1
100-104	8	12.5
95-99	20	31.3
90-94	9	14.1
85-89	4	6.2
80-84	4	6.2
75-79	4	6.2
70-74	1	1.6
Total	64	100.0

S.D.	11.8
Mean	96.45
Median	95.50
S.E.M	1.487
G.P.	7.0

Summary.--The data on the mental maturity scores derived either from raw scores or T-score equivalents indicate that the ninth grade pupils are substantially below the norm of expectancy.

TABLE 2

DISTRIBUTION OF T-SCORE EQUIVALENTS ON THE CALIFORNIA SHORT-FORM MENTAL MATURITY TEST (TOTAL MENTAL FACTORS) (INTELLIGENT QUOTIENT) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
65-69	1	1.6
60-64	3	4.7
55-59	5	7.8
50-54	10	15.6
45-49	21	32.8
40-44	10	15.6
35-39	7	10.9
30-34	6	9.4
25-29	0	0.0
20-24	0	0.0
15-19	1	1.6
Total	64	100.0

S.D.	10.00
Mean	46.02
Median	45.17
S.E.M	1.259

Results on the California Test of Achievement (Mathematics).--The data on the California Test of Achievement Complete Battery (Advanced) (Mathematics), as obtained from the raw

TABLE 3

DISTRIBUTION OF RAW SCORES ON THE CALIFORNIA ACHIEVEMENT TEST (MATHEMATICS) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
120-124	1	1.6
115-119	0	0.0
110-114	2	3.1
105-109	0	0.0
100-104	2	3.1
95-99	2	3.1
90-94	5	7.8
85-89	4	6.3
80-84	6	9.4
75-79	6	9.4
70-74	10	15.6
65-69	6	9.4
60-64	6	9.4
55-59	4	6.3
50-54	2	3.1
45-49	2	3.1
40-44	2	3.1
35-39	4	6.3
Total	64	100.0
S.D.	18.5	
Mean	72.5	
Median	70.70	
S.E.M	2.329	
G.P.	7.3	

TABLE 4

DISTRIBUTION OF T-SCORE EQUIVALENTS ON THE CALIFORNIA
ACHIEVEMENT TEST (MATHEMATICS) AS OBTAINED BY THE
NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE
JUNIOR HIGH SCHOOL, MOBILE, ALABAMA,
1964-1965

Scores	Number	Per Cent
75-77	1	1.6
72-74	0	0.0
69-71	2	3.1
66-68	1	1.6
63-65	2	3.1
60-62	5	7.8
57-59	3	4.7
54-56	7	10.9
51-53	8	12.5
48-50	10	15.6
45-47	4	6.2
42-44	6	9.4
39-41	2	3.1
36-38	7	10.9
33-35-	3	4.7
30-32	3	4.7
Total	64	100.0

S.D.	10.2
Mean	48.89
Median	49.90
S.E.M	1.285

scores and T-score equivalents for the ninth grade pupils, are presented in Tables 3 and 4, pages 26 and 27, respectively.

Raw Scores.--The raw scores on the (Mathematics) components ranged from a low of 37 to a high of 121, with a mean of 72.5, a median of 70.7, standard deviation of 18.5, and a standard error of the mean of 2.329. Further, the tables show that 26 of the subjects scored below the mean and 10 of the subjects scored within the mean class interval.

T-Score Equivalents.--The T-score equivalents on the (Mathematics) components ranged from a low of 31 to a high of 76, with a mean of 48.89, a median of 49.90, a standard deviation of 10.2, and a standard error of the mean of 1.285. Further, the tables show that 25 of the subjects scored below the mean and 10 of the subjects scored within the mean class interval.

Summary.--The data on the Mathematics scores derived either from raw scores or T-score equivalents indicate that the ninth grade pupils scored substantially below the norm of expectancy.

Results on the California Test of Achievement (English).--The data on the California Test of Achievement Complete Battery (Advanced) (English), as obtained from the raw scores and T-score equivalents for the ninth grade pupils, are presented in Tables 5 and 6, pages 29 and 30, respectively.

Raw Scores.--The raw scores on the (English) components ranged from a low of 36 to a high of 122, with a mean of 72.5,

TABLE 5

DISTRIBUTION OF RAW SCORES ON THE CALIFORNIA ACHIEVEMENT TEST (ENGLISH) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
120-124	1	1.6
115-119	0	0.0
110-114	2	3.1
105-109	0	0.0
100-104	2	3.1
95-99	2	3.1
90-94	5	7.8
85-89	4	6.3
80-84	6	9.4
75-79	6	9.4
70-74	10	15.6
65-69	6	9.4
60-64	6	9.4
55-59	4	6.3
50-54	2	3.1
45-49	2	3.1
40-44	2	3.1
35-39	4	6.3
Total	64	100.0
S.D.	18.5	
Mean	72.5	
Median	70.70	
S.E.M	2.329	
G.P.	7.1	

TABLE 6

DISTRIBUTION OF T-SCORE EQUIVALENTS ON THE CALIFORNIA
ACHIEVEMENT TEST (ENGLISH) AS OBTAINED BY THE NINTH
GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR
HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
75-77	1	1.6
72-74	0	0.0
69-71	2	3.1
66-68	1	1.6
63-65	2	3.1
60-62	5	7.8
57-59	3	4.7
54-56	7	10.9
51-53	8	12.5
48-50	10	15.6
45-47	4	6.3
42-44	6	9.4
39-41	2	3.1
36-38	7	10.9
33-35	3	4.7
30-32	3	4.7
Total	64	100.0

S.D.	10.2
Mean	48.89
Median	49.90
S.E.M	1.285

a median of 70.70, standard deviation of 18.5, and a standard error of the mean of 2.329. Further, the tables show that 26 of the subjects scored below the mean and 10 of the subjects scored within the mean class interval.

T-Score Equivalents.--The T-score equivalents on the (English) components ranged from a low of 31 to a high of 76, with a mean of 48.89, a median of 49.90, a standard deviation of 10.2, and a standard error of the mean of 1.285. Further, the tables show that 25 of the subjects scored below the mean and 10 of the subjects scored within the mean class interval.

Summary.--The data on the English scores derived either from raw scores or T-score equivalents indicate that the ninth grade pupils are substantially below the norm of expectancy.

Results on "Teachers'-Marks" (Social Studies).--The data on "Teachers'-Marks" (Social Studies), as obtained from raw scores and T-score equivalents for the ninth grade pupils, are presented in Tables 7 and 8, pages 32 and 33, respectively.

Raw Scores.--The raw scores on the (Social Studies) components ranged from a low of 67 to a high of 94, with a mean of 82.77, a median of 81.33, a standard deviation of 8.17, and a standard error of the mean of 1.029. Further, the tables show that 27 of the subjects scored below the mean and 12 of the subjects scored within the mean class interval.

T-Score Equivalents.--The T-score equivalents on the "Teachers'-Marks" (Social Studies) components ranged from a low of 31 to a high of 67, with a mean of 48.27, a median of

TABLE 7

DISTRIBUTION OF RAW SCORES ON THE "TEACHERS' MARKS"
(SOCIAL STUDIES) AS OBTAINED BY THE NINTH GRADE
PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH
SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
93-95	7	10.9
90-92	10	15.6
87-89	2	3.1
84-86	6	9.4
81-83	12	18.8
78-80	6	9.4
75-77	3	4.7
72-74	10	15.6
69-71	5	7.8
66-68	3	4.7
Total	64	100.0

S.D.	8.17
Mean	82.77
Median	81.33
S.E.M	1.029

48.00, a standard deviation of 10.5, and a standard error of the mean of 1.323. The tables show that 29 of the subjects scored below the mean and 12 of the subjects scored within the mean class interval.

Summary.--The data on the "Teachers'-Marks" derived either

TABLE 8

DISTRIBUTION OF T-SCORE EQUIVALENTS ON THE "TEACHERS' MARKS"
 (SOCIAL STUDIES) AS OBTAINED BY THE NINTH GRADE PUPILS
 ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL,
 MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
66-68	1	1.6
63-65	7	10.9
60-62	9	14.1
57-59	2	3.1
54-56	3	4.7
51-53	5	7.8
48-50	12	18.8
45-47	5	7.8
42-44	3	4.7
39-41	3	4.7
36-38	7	10.9
33-35	4	6.3
30-32	3	4.7
Total	64	100.0
S.D.	10.5	
Mean	48.27	
Median	48.00	
S.E.M	1.323	

from raw scores or T-score equivalents indicate that the ninth grade pupils scored below the norm of expectancy.

Results on the "Teachers'-Marks" (Mathematics).--The data on "Teachers'-Marks" (Mathematics), as obtained from the raw scores and T-score equivalents for the ninth grade pupils, are presented in Tables 9 and 10, pages 35 and 36, respectively.

Raw Scores.--The raw scores on the "Teachers'-Marks" (Mathematics) components ranged from a low of 64 to a high of 94, with a mean of 77.12, standard deviation of 9.7, a median of 75.42, and a standard error of the mean of 1.222. Further, the table shows that 29 of the subjects scored below the mean and 13 of the subjects scored within the mean class interval.

T-Score Equivalents.--The T-score equivalents on the "Teachers'-Marks" (Mathematics) components ranged from a low of 37 to a high of 67, with a mean of 49.66, a median of 48.50, a standard deviation of 8.4, and a standard error of the mean of 1.058. Further, the table shows that 25 of the subjects scored below the mean and 12 of the subjects scored within the mean class interval.

Summary.--The data on the Mathematics scores derived either from raw scores or T-score equivalents indicate that the ninth grade pupils are substantially below the norm of expectancy.

Results on "Teachers'-Marks" (English).--The data on the "Teachers'-Marks" (English), as obtained from the raw scores and T-score equivalents for the ninth grade pupils, are presented in Tables 11 and 12, pages 37 and 38, respectively.

TABLE 9

DISTRIBUTION OF RAW SCORES ON THE "TEACHERS'-MARKS"
 (MATHEMATICS) AS OBTAINED BY THE NINTH GRADE
 PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR
 HIGH SCHOOL, MOBILE, ALABAMA,
 1964-1965

Scores	Number	Per Cent
93-95	3	4.7
90-92	2	3.1
87-89	4	6.3
84-86	3	4.7
81-83	2	3.1
78-80	10	15.6
75-77	13	20.3
72-74	3	4.7
69-71	8	12.5
66-68	4	6.3
63-65	12	18.8
Total	64	100.0

S.D.	9.7
Mean	77.12
Median	75.42
S.E. _M	1.222

TABLE 10

DISTRIBUTION OF T-SCORE EQUIVALENTS ON THE "TEACHERS' MARKS"
 (MATHEMATICS) AS OBTAINED BY THE NINTH GRADE PUPILS
 ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL,
 MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
66-68	2	3.1
63-65	2	3.1
60-62	5	7.8
57-59	3	4.7
54-56	4	6.3
51-53	11	17.2
48-50	12	18.8
45-47	1	1.6
42-44	7	10.9
39-41	6	9.4
36-38	11	17.2
Total	64	100.0

S.D.	8.4
Mean	49.66
Median	48.50
S.E.M	1.058

TABLE 11

DISTRIBUTION OF RAW SCORES ON THE "TEACHERS' MARKS"
(ENGLISH) AS OBTAINED BY THE NINTH GRADE PUPILS
ENROLLED IN THE SOUTHSIDE JUNIOR HIGH
SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
93-95	6	9.4
90-92	7	10.9
87-89	2	3.1
84-86	7	10.9
81-83	5	7.8
78-80	12	18.9
75-77	5	7.8
72-74	6	9.4
69-71	7	10.9
66-68	7	10.9
Total	64	100.0

S.D.	9.27
Mean	79.30
Median	78.00
S.E.M	1.168

Raw Scores.--The raw scores on the "Teachers'-Marks" (English) components ranged from a low of 67 to a high of 94, with a mean of 79.30, a median of 78.00, standard deviation of 9.27, and a standard error of the mean of 1.168. Further, the table shows that 25 of the subjects scored below the mean

TABLE 12

DISTRIBUTION OF T-SCORE EQUIVALENTS ON THE "TEACHERS' MARKS"
 (ENGLISH) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED
 IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE,
 ALABAMA, 1964-1965

Scores	Number	Per Cent
69-71	1	1.6
66-68	2	3.1
63-65	2	3.1
60-62	5	7.8
57-59	5	7.8
54-56	5	7.8
51-53	6	9.4
48-50	16	25.0
45-47	1	1.6
42-44	6	9.4
39-41	3	4.7
36-38	10	15.6
33-35	1	1.6
30-32	1	1.6
Total	64	100.0

S.D.	9.3
Mean	48.33
Median	48.60
S.E.M	1.172

and 12 of the subjects scored within the mean class interval.

T-Score Equivalents.--The T-score equivalents on the (English) components ranged from a low of 31 to a high of 70, with a mean of 48.33, a median of 48.60, a standard deviation of 9.3, and a standard error of the mean of 1.172. Further, the table shows that 23 of the subjects scored below the mean and 16 of the subjects scored within the mean class interval.

Summary.--The data on the English scores derived either from raw scores or T-score equivalents indicate that the ninth grade pupils are substantially below the norm of expectancy.

Results on "Teachers'-Marks" (Science).--The data on the "Teachers'-Marks" (Science), as obtained from the raw scores and T-score equivalents for the ninth grade pupils, are presented in Tables 13 and 14, pages 40 and 41, respectively.

Raw Scores.--The raw scores on the "Teachers'-Marks" (Science) components ranged from a low of 61 to a high of 94, with a mean of 78.67, a median of 78.23, a standard deviation of 8.4, and a standard error of the mean of 1.083. Further, the table shows that 28 of the subjects scored below the mean and 11 of the subjects scored within the mean class interval.

T-Score Equivalents.--The T-score equivalents on the "Teachers'-Marks" (Science) components ranged from a low of 31 to a high of 67, with a mean of 48.84, a median of 48.23, a standard deviation of 9.6, and a standard error of the mean of 1.209. Further, the table shows that 27 of the subjects scored below the mean and 11 of the subjects scored within the mean class interval.

TABLE 13

DISTRIBUTION OF RAW SCORES ON THE "TEACHERS' MARKS"
 (SCIENCE) AS OBTAINED BY THE NINTH GRADE PUPILS
 ENROLLED IN THE SOUTHSIDE JUNIOR HIGH
 SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Number	Per Cent
93-95	1	1.6
90-92	10	15.6
87-89	5	7.8
84-86	8	12.5
81-83	1	1.6
78-80	11	17.2
75-77	5	7.8
72-74	8	12.5
69-71	5	7.8
66-68	5	7.8
63-65	4	6.3
60-62	1	1.6
Total	64	100.0
S.D.	8.4	
Mean	78.67	
Median	78.23	
S.E.M	1.083	

TABLE 14

DISTRIBUTION OF T-SCORE EQUIVALENTS ON THE "TEACHERS' MARKS"
 (SCIENCE) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED
 IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE,
 ALABAMA, 1964-1965

Scores	Number	Per Cent
66-68	1	1.6
63-65	4	6.3
60-62	10	15.4
57-59	0	0.0
54-56	7	10.9
51-53	4	6.3
48-50	11	17.2
45-47	5	7.8
42-44	4	6.3
39-41	6	9.4
36-38	6	9.4
33-35	4	6.3
30-32	2	3.1
Total	64	100.0

S.D.	9.6
Mean	48.84
Median	48.23
S.E.M	1.209

Summary.--The data on the "Teachers'-Marks" (Science) scores derived either from the raw scores or T-score equivalents indicate that the ninth grade pupils are substantially below the norm of expectancy.

Significant Difference For Test

Scores and "Teachers'-Marks"

Introductory Statement.--This section of the research report presents data pertinent to the significance of statistical differences between T-score equivalents for test scores and "Teachers'-Marks" with specific reference to achievement in school subjects to the ninth graders who were subjects in this research.

Significant Difference between the California Achievement Test and "Teachers'-Marks" in English.--The "t" ratios for the significant differences were computed from the T-score equivalents for the data on English based on test-scores and "Teachers'-Marks" for the ninth grade pupils is presented in Table 15, page 43.

The mean T-score for the test score was 48.89, for the "Teachers'-Marks" it was 48.33, with a difference of .56 in favor of test scores. The median T-score for the test score was 48.90, for the "Teachers'-Marks" it was 48.60, with a difference of .30 in favor of the test score. The T-score standard deviation for the test score was 10.2, for the "Teachers'-Marks" it was 9.3, with a difference of .9 in favor of the test score. The T-score of standard error for

TABLE 15

SIGNIFICANT DIFFERENCE BETWEEN T-SCORES ON THE CALIFORNIA TEST OF ACHIEVEMENT (ENGLISH) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Mean	Median	S.D.	S.E.M	Sigma M ₁ -M ₂	Differ- ence Be- tween Means	"t"
California Test of Achieve- ment (English)	48.89	48.90	10.2	1.29	2.61	.56	.038
"Teachers'- Marks" (English)	48.33	48.60	9.3	1.17			

the test score was 1.29, for the "Teachers'-Marks" it was 1.17, with a difference of .12 in favor of the test scores. The standard error of difference between the two means was 2.61.

The "t" was found to be .038. This "t" was not significant for it was less than 2.58 at the one percent level of confidence. Therefore, the difference between the two sets of scores, test-scores and "Teachers'-Marks" on the components of English, was not statistically significant.

Significant Difference between the California Achievement Test and "Teachers'-Marks" in Mathematics.--The "t" ratios for the significant differences were computed from the T-score equivalents for the data on Mathematics based on test-scores and "Teachers'-Marks" for the ninth grade pupils are presented

in Table 16.

TABLE 16

SIGNIFICANT DIFFERENCE BETWEEN T-SCORES ON THE CALIFORNIA TEST OF ACHIEVEMENT (MATHEMATICS) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Mean	Median	S.D.	S.E.M	Sigma M ₁ -M ₂	Differ- ence Be- tween Means	"t"
California Test of Achieve- ment (Math- ematics)	48.67	48.70	10.2	1.29	2.69	.99	.37
"Teachers'- Marks" Mathematics	49.66	48.50	8.4	1.06			

The mean T-score for the test score was 48.67, for the "teachers'-marks" it was 49.66, with a difference of .99 in favor of the "teachers'-marks". The median T-score for the test was 48.70, for "Teachers'-Marks" it was 48.50, with a difference of .20 in favor of the test scores. The T-score standard deviation for the test score was 10.2, for the "Teachers'-Marks" it was 8.4, with a difference of 1.8, in favor of the test scores. The T-score standard error of the mean for the test score was 1.29, for the "Teachers'-Marks" it was 1.06, with a difference of .23 in favor of the test scores. The standard error of difference between the two means was 2.69.

The "t" was found to be .37. This "t" was not significant

for it was less than 2.58 at the one percent level of confidence. Therefore, the difference between the two sets of scores, test scores and "Teachers'-Marks" on the components of Mathematics, was not statistically significant.

Significant Difference between T-Scores on "Teachers'-Marks" in Social Studies and Science.--The "t" ratios for the significant differences were computed from the T-score equivalents for the data on Social Studies and Science based on test-scores and "Teachers'-Marks" for the ninth grade pupils are presented in Table 17.

TABLE 17

SIGNIFICANT DIFFERENCE BETWEEN T-SCORES ON "TEACHERS'-MARKS" (SOCIAL STUDIES AND SCIENCE) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Mean	Median	S.D.	S.E. _M	Sigma $M_1 - M_2$	Difference Be- tween Means	"t"
Social Studies "Teachers'- Marks"	48.27	48.00	10.5	1.32	1.50	.57	.38
Science "Teachers' Marks"	48.84	48.23	9.6	1.2.			

The mean T-score for the "Teachers'-Marks" (Social Studies) was 48.27, for the "Teachers'-Marks" (Science) was 48.84, with a difference of .57 in favor of "Teachers'-Marks" (Science).

The median T-score for "Teachers'-Marks" (Social Studies) was 48.00, for the "Teachers'-Marks" (Science) was 48.23, with a difference of .23 in favor of "Teachers'-Marks" (Science). The T-score standard deviation for the "Teachers'-Marks" (Social Studies) was 10.5, for the "Teachers'-Marks" (Science) was 9.6, with a difference of .9 in favor of "Teachers'-Marks" (Social Studies). The T-score standard error of the mean of "Teachers'-Marks" (Social Studies) was 1.32, for the "Teachers'-Marks" (Science) was 1.21, with a difference of .11 in favor of the "Teachers'-Marks" (Social Studies). The standard error of difference between the two means was 1.50.

The "t" was found to be .38. This "t" was not significant for it was less than 2.58 at the one percent level of confidence. Therefore, the difference between the two sets of scores, test-scores and "Teachers'-Marks" on the components of Social Studies and Science, was not statistically significant.

Significant Difference between T-Scores on "Teachers'-Marks" in English and Science.--The "t" ratios for the significant differences were computed from the T-score equivalents for the data on English and Science based on test-scores and "Teachers'-Marks" for the ninth grade pupils are presented in Table 18, page 47.

The mean T-score for the "Teachers'-Marks" (English) was 48.33, for the "Teachers'-Marks" (Science) was 48.84, with a difference of .51 in favor of Science. The median T-score

TABLE 18

SIGNIFICANT DIFFERENCE BETWEEN T-SCORES ON THE "TEACHERS'-MARKS" (SCIENCE AND ENGLISH) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Mean	Median	S.D.	S.E.M	Sigma M_1-M_2	Differ- ence Be- tween Means	"t"
"Teachers'- Marks" English	48.33	48.60	9.3	1.17	1.68	.51	.303
"Teachers'- Marks" Science	48.84	48.23	9.6	1.21			

for the "Teachers'-Marks" (English) was 48.60, for the "Teachers'-Marks" (Science) was 48.23, with a difference of .37 in favor of English. The T-score standard deviation for the "Teachers'-Marks" (English) was 9.3, for the "Teachers'-Marks" (Science) was 9.6, with a difference of .3 in favor of Science. The T-score standard error of the mean for the "Teachers'-Marks" (English) was 1.17, for the "Teachers'-Marks" (Science) was 1.21, with a difference of .04 in favor of Science. The standard error of difference between the two means was 1.68.

The "t" was found to be .303. This "t" was not significant for it was less than 2.58 at the one percent level of confidence. Therefore, the difference between the two sets of scores, test-scores and "Teachers'-Marks" on the components of the "Teachers'-Marks" (English) and (Science) was not

statistically significant.

Significant Difference between T-Scores on the "Teachers'-Marks" in Mathematics and Science.--The "t" ratios for the significant difference were computed from the T-score equivalents for the data on Mathematics and Science based on "Teachers'-Marks" for the ninth grade pupils are presented in Table 19.

TABLE 19

SIGNIFICANT DIFFERENCE BETWEEN T-SCORES ON THE "TEACHERS'-MARKS" (MATHEMATICS AND SCIENCE) AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Mean	Median	S.D.	S.E. _M	Sigma $M_1 - M_2$	Differ- ence Be- tween Means	"t"
"Teachers'- Marks" (Mathe- matics)	49.66	48.50	9.4	1.06	1.63	.82	.503
"Teachers'- Marks" Science	48.84	48.23	9.6	1.21			

The mean T-score for the "Teachers'-Marks" (Mathematics) was 49.66, for the "Teachers'-Marks" (Science) was 48.84, with a difference of .82 in favor of Mathematics. The median T-score for the "Teachers'-Marks" (Mathematics) was 48.50, for the "Teachers'-Marks" (Science) it was 48.23, with a difference of .27 in favor of Mathematics. The T-score standard deviation

of the "Teachers'-Marks" (Mathematics) was 9.4, for the "Teachers'-Marks" (Science) it was 9.6, with a difference of .2 in favor of Science. The T-score standard error of the mean for the "Teachers'-Marks" (Mathematics) was 1.06, for the "Teachers'-Marks" (Science) it was 1.21, with a difference of .15 in favor of Science. The standard error of difference between the two means was 1.63.

The "t" was found to be .503. This "t" was not significant for it was less than 2.58 at the one percent level of confidence. Therefore, the difference between the two sets of scores, test-scores and "Teachers'-Marks" on the components of the "Teachers'-Marks" (Mathematics) and (Science) was not statistically significant.

Correlations between the Test and between Achievement Indices

Introductory Statement.--There were two main objectives in the treatment of the data of this research: (a) to determine the significant differences, if any, between achievement on test scores and on "Teachers'-Marks" and (b) to determine the degrees of correlations, if any, among the paired arrays of scores obtained by the ninth grade pupils enrolled in the Southside Junior High School, Mobile, Alabama, 1964-1965, on two standardized tests and "Teachers'-Marks."

This section of the report of this research presents the data on the obtained correspondence between the paired variables for the test scores and "Teachers'-Marks."

The "r" between (English and Mathematics) on the California Test of Achievement.--Table 20 shows the data on the "r" and standard error of the "r" between scores obtained on the California Test of Achievement Complete Battery (Advanced) (English and Mathematics) by the ninth grade pupils.

TABLE 20

CORRELATIONS AND STANDARD ERRORS FOR SCORES OBTAINED ON THE CALIFORNIA TEST OF ACHIEVEMENT AND "TEACHERS'-MARKS" BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTH-SIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	"r"	S. E. "r"
Achievement Test (English and Mathematics)	.83	.08
"Teachers'-Marks" (English and Mathematics)	.86	.07
"Teachers'-Marks" (English and Science)	.78	.09
"Teachers'-Marks" (English and Social Studies)	.82	.08
"Teachers'-Marks" (Science and Social Studies)	.80	.09

Between the English and Mathematical factors on the achievement, the "r" was .83, with a standard error of the "r" of .08 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that

the indicated relationship was significant. Therefore, the data imply that there is a significant relationship between the English and Mathematical factors on the achievement test for this group.

The "r" between the "Teachers'-Marks" (English and Mathematics).--Table 20, page 50, shows that the data on the "r" and standard error of the "r" between scores obtained on the "Teachers'-Marks" (English and Mathematics) by the ninth grade pupils.

Between the English and Mathematical factors on the "Teachers'-Marks", the "r" was .86, with a standard error of .07 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there is a significant relationship between the English and Mathematical factors on the "Teachers'-Marks" for this group.

The "r" between the "Teachers'-Marks" (English and Science) .--Table 20, page 50, shows the data on the "r" and the standard error of the "r" between scores obtained on the "Teachers'-Marks" (English and Science) by the ninth grade pupils.

Between the English and Science factors on the "Teachers'-Marks", the "r" was .78, with a standard error of .09 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive

and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there is a significant relationship between English and Science factors on the "Teachers'-Marks" for the group.

The "r" between (English and Social Studies) on the "Teachers'-Marks".--Table 20, page 50, shows the data on the "r" and standard error of the "r" scores obtained on the "Teachers'-Marks" (English and Social Studies) by the ninth grade pupils.

Between the English and Social Studies factors on the "Teachers'-Marks", the "r" was .82, with a standard error of the "r" of .08 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the English and Social Studies factors on the "Teachers'-Marks" for this group.

The "r" between "Teachers'-Marks" (Science and Social Studies).--Table 20, page 50, shows that the data on the "r" and standard error of the "r" between scores obtained on the "Teachers'-Marks" (Science and Social Studies) by the ninth grade pupils.

Between the Science and Social Studies factors on the "Teachers'-Marks", the "r" was .80, with a standard error of the "r" of .09 which was statistically significant because it

was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the Science and Social Studies factors on the "Teachers'-Marks" for this group.

The "r" between the California Test of Mental Maturity (Total Mental Factors) and the California Test of Achievement (Total Scores) and "Teachers'-Marks"

The "r" between (IQ and Mathematics) on the California Test of Achievement and the California Mental Maturity Test.--

Table 21, page 54, shows the data on the "r" and standard error of the "r" between scores obtained on the California Test of Achievement Complete Battery (Advanced) and the California Short-Form Test of Mental Maturity (IQ and Mathematics) by the ninth grade pupils.

Between the IQ and the Mathematical factors on the achievement and mental maturity, the "r" was .56, with a standard error of the "r" of .10 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the IQ and Mathematical factors on the achievement and mental maturity tests for this group.

The "r" between (IQ and Mathematics) on the "Teachers'-

TABLE 21

CORRELATIONS AND STANDARD ERROR FOR SCORES OBTAINED ON THE CALIFORNIA TEST OF MENTAL MATURITY, ACHIEVEMENT, AND "TEACHERS'-MARKS" BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	"r"	S. E. "r"
Total Mental Factors (IQ), Achievement (Mathematics)	.56	.10
Total Mental Factors (IQ), "Teachers'-Marks" (Mathematics)	.55	.10
Total Mental Factors (IQ), "Teachers'-Marks" (English)	.59	.10
Total Mental Factors (IQ), Achievement (English)	.49	.11
Total Mental Factors (IQ), "Teachers'-Marks" (Social Studies)	.51	.11
Total Mental Factors (IQ), "Teachers'-Marks" (Science)	.54	.10

Marks" and the California Test of Mental Maturity.--Table 21, page 54, shows the data on the "r" and standard error of the "r" between the scores obtained on the "Teachers'-Marks" (Mathematics) and the California Short-Form Test of Mental Maturity (IQ) by the ninth grade pupils.

Between the IQ and Mathematical factors on the "Teachers'-Marks" (Mathematics) and the California Short-Form Test of

Mental Maturity (IQ), the "r" was .55 with a standard error of the "r" of .10 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the IQ and Mathematical factors on the achievement test for this group.

The "r" between IQ and English on the "Teachers'-Marks" and the California Test of Mental Maturity.--Table 21, page 54, shows the data on the "r" and the standard error of the "r" between scores obtained on the "Teachers'-Marks" (English) and the California Short-Form Test of Mental Maturity (IQ) by the ninth grade pupils.

Between the "Teachers'-Marks" (English) and the California Short-Form Test of Mental Maturity (IQ) factors, the "r" was .59, with a standard error of the "r" of .10 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the English and IQ (mental) factors on the achievement test for this group.

The "r" between (IQ and English) on the California Test of Mental Maturity and the California Achievement Test.--

Table 21, page 54, shows the data on the "r" and the standard

error of the "r" between scores obtained on the California Achievement Test Complete Battery (Advanced) (English) and the California Short-Form Test of Mental Maturity (IQ) by the ninth grade pupils.

Between the California Achievement Test Complete Battery (Advanced) (English) and the California Short-Form Test of Mental Maturity (IQ) factors, the "r" was .49 with a standard error of the "r" of .11 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the English and IQ factors on the achievement test for this group.

The "r" between (IQ and Social Studies) on the "Teachers'-Marks", California Test of Mental Maturity, and the California Test of Achievement.--Table 21, page 54, shows the data on the "r" and the standard error of the "r" between scores obtained on the "Teachers'-Marks" (Social Studies), the California Short-Form Test of Mental Maturity (IQ), and the California Test of Achievement Complete Battery (Advanced) (IQ) by the ninth grade pupils.

Between the "Teachers'-Marks" (Social Studies) and the California Short-Form Test of Mental Factors, the "r" was .51 with a standard error of the "r" of .11 which was statistically significant because it was more than three times its standard

error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the "Teachers'-Marks" (Social Studies) and the California Short-Form Tests of Mental Factors (IQ) on the achievement test for this group.

The "r" between (IQ and Science) on the "Teachers'-Marks" and the California Test of Mental Maturity.--Table 21, page 54, shows the data on the "r" and the standard error of the "r" between scores obtained on the "Teachers'-Marks" (Science) and the California Short-Form Test of Mental Maturity (IQ) by the ninth grade pupils.

Between the "Teachers'-Marks" (Science) and the California Short-Form Test of Mental Maturity (IQ), the "r" was .54 with a standard error of the "r" of .10 which was statistically significant because it was more than three times its standard error index. The "r" itself was positive and large enough to warrant the conclusion that the indicated relationship was significant. Therefore, the data imply that there was a significant relationship between the "Teachers'-Marks" (Science) and the California Short-Form Test of Mental Maturity (IQ) factors on the achievement for this group.

Resume Findings

Prefactory Statement.--As the quantitative measures, basic to the analysis and interpretation of the data pertinent to this research, tables have been presented throughout this

entire chapter. Summary tables, Tables 22, 23, and 24, pages 59, 60, and 61 respectively, summarize specific contents of each table as indicated below.

1. Raw-Score Data Tests--mental maturity, achievement test-scores, and "Teachers'-Marks"
2. The T-Score Data Tests--mental maturity, achievement test-scores, and "Teachers'-Marks"
3. The Significant Difference ("t" ratios) between achievement test-scores and "Teachers'-Marks" for the components of English, Mathematics, Science, and Social Studies
4. The Significance of Correlations ("r") between paired variables
5. The summary tables on basic statistics, tables 1-21 are consolidated in tables 22-26.

Interpretative Summaries and Conclusions

The interpretative summaries of the quantitative data in the consolidated tables, Tables 22-26, which-in-turn were derived from the 21 tables of the analysis, comparison, and correlation on the basic data are presented throughout this chapter.

Introductory Statement.--The interpretative summaries of the findings of this research are reported under four captions: (a) Interpretative Summary of Data from the California Short-Form Test of Mental Maturity, (b) Interpretative Summary of the Data from the California Test of Achievement Complete Battery (advanced) and "Teachers'-Marks", (c) Interpretative Summary for Significant Difference between Achievement Test-Scores and "Teachers'-Marks", and (d) Interpretative Summary

TABLE 22

SUMMARY OF RAW SCORE DATA AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED
IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Mean	Median	S. D.	S. E.M
California Test of Mental Maturity Total Mental Factors	96.45	95.50	11.8	1.49
California Test of Achievement English	72.5	70.70	18.5	2.33
Mathematics	72.5	70.70	18.5	2.33
"Teachers' -Marks" English	79.30	78.00	9.3	1.16
Mathematics	77.12	75.42	9.7	1.22
Science	78.67	78.23	8.4	1.08
Social Studies	82.77	81.77	8.2	1.03

TABLE 23

SUMMARY OF T-SCORE DATA AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED
IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	Mean	Median	S. D.	S. E.M
California Test of Mental Maturity Total Mental Factors	46.02	45.17	10.00	1.26
California Test of Achievement				
English	48.89	49.90	10.20	1.29
Mathematics	48.89	49.90	10.20	1.29
"Teachers' -Marks"				
English	48.33	48.60	9.3	1.17
Mathematics	49.66	48.50	8.4	1.06
Science	48.84	48.23	9.6	1.21
Social Studies	48.27	48.00	10.5	1.32

TABLE 24

SUMMARY OF DATA ON SIGNIFICANT DIFFERENCE BETWEEN THE CALIFORNIA TEST OF ACHIEVEMENT AND "TEACHERS' -MARKS" AS OBTAINED BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Components	Achievement Test				"Teachers' -Marks"				Different Data		
	Mean	Median	S.D.	S.E.M	Mean	Median	S.D.	S.E.M	M ₁ -M ₂	M ₁ -M ₂	"t"
English	48.89	49.90	10.2	1.29	48.33	48.60	9.3	1.17	.56	2.61	.038
Mathematics	48.67	48.70	10.2	1.29	49.66	48.50	8.4	1.06	.99	2.69	.370
	"Teachers' -Marks"				"Teachers' -Marks"						
Science and Social Studies	48.84	48.23	9.6	1.21	48.27	48.00	10.5	1.32	.57	1.50	.380
English and Science	48.33	48.60	9.3	1.17	48.84	48.23	9.6	1.21	.51	1.68	.303
Mathematics and Science	49.66	48.50	9.4	1.06	48.84	48.23	9.6	1.21	.82	1.63	.503

of Correlations.

Interpretative Summary on Data from the California Test of Mental Maturity.--The data for the raw scores and T-scores for the California Short-Form Test of Mental Maturity are summarized in Table 26, page 63. The finding of this test showed that the ninth grade pupils had a mean intelligence below the norm of expectancy on all components.

Interpretative Summary on Data from the California Achievement Test and "Teachers'-Marks".--The data from raw scores and T-scores for achievement test-scores and "Teachers'-Marks" are summarized in Table 25.

TABLE 25

SUMMARY OF THE CORRELATIONS AND STANDARD ERRORS FOR SCORES OBTAINED ON THE CALIFORNIA ACHIEVEMENT TEST AND "TEACHERS'-MARKS" BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	"r"	S. E. "r"
Achievement Test English and Mathematics	.83	.08
"Teachers'-Marks" English and Mathematics	.86	.07
"Teachers'-Marks" Social Studies and English	.78	.09
"Teachers'-Marks" English and Science	.82	.08
"Teachers'-Marks" Science and Social Studies	.80	.09

The finding of this test showed that the ninth grade pupils were achieving approximately two grades below the norm of expectancy in Mathematics and English.

Interpretative Summary of the Significant Difference between the California Achievement Test-Scores and "Teachers'-Marks".--The data for the significant difference between the California Test of Achievement Complete Battery (Advanced) and the "Teachers'-Marks" are summarized in Table 26.

TABLE 26

SUMMARY OF THE CORRELATIONS AND STANDARD ERROR OF SCORES OBTAINED ON THE CALIFORNIA ACHIEVEMENT TEST AND THE "TEACHERS'-MARKS" AND THE CALIFORNIA MENTAL MATURITY TEST BY THE NINTH GRADE PUPILS ENROLLED IN THE SOUTHSIDE JUNIOR HIGH SCHOOL, MOBILE, ALABAMA, 1964-1965

Scores	"r"	S. E. "r"
Total Mental Factors (IQ) Achievement (Mathematics)	.56	.10
Total Mental Factors (IQ) "Teachers'-Marks" (Mathematics)	.55	.10
Total Mental Factors (IQ) "Teachers'-Marks" (English)	.59	.10
Total Mental Factors (IQ) "Teachers'-Marks" (Science)	.54	.11
Total Mental Factors (IQ) Achievement (English)	.49	.11
Total Mental Factors (IQ) "Teachers'-Marks" (Social Studies)	.51	.11

These findings showed that no significant differences existed between the achievement test in English and Mathematics, and there were no significant differences between the "Teachers'-Marks" in English, Mathematics, Science, and Social Studies.

Interpretative Summary of Correlations.--The data for the correlations of scores obtained by sixty-four ninth grade pupils on the achievement test, mental maturity test, and the "Teachers'-Marks" are summarized as follows:

1. There was a statistically significant, positive relationship between the English, mathematical, and mental factors on the California Short-Form Test of Mental Maturity and the California Achievement Test Complete Battery (Advanced).
2. There was a statistically significant, positive relationship between the English, mathematical, and mental factors as measured by the California Short-Form Test of Mental Maturity and the "Teachers'-Marks."
3. There was a statistically significant, positive relationship between the English, Science, and mental factors as measured by the California Short-Form Test of Mental Maturity and the "Teachers'-Marks."
4. There was a statistically significant, positive relationship between English, Social Studies, and mental factors as measured by the California Short-Form Test of Mental Maturity and the "Teachers'-Marks."
5. There was a statistically significant, positive relationship between Science, Social Studies, and mental factors as measured by the California Short-Form Test of Mental Maturity and the "Teachers'-Marks."

CHAPTER III

SUMMARY AND CONCLUSIONS

Recapitulation of research-design.--Our schools of today are committed to a philosophy and practice of a program of so-called "continuous evaluation or appraisal" of the total school program of facilities, activities, and personnel. In the nature of things, the emphasis on appraisal of the school program has been centered on what is happening to the child and youth; namely, measuring academic accomplishment and assessing individual growth and development, rather than on those aspects of the program which exist solely to promote pupil learning and development.

However, it is felt that, in all fairness to the system of "teachers'-marks", used to measure pupil achievement, which has been operative in the public schools over the years, that it would be proper and fruitful to compare pupil progress, as measured by "teachers'-marks" and test-scores, as a frame-of-reference for any program or standardized testing to be inaugurated presently or in the future.

Skill in scholastic matters, whether important as an end in itself, or important as a means of attaining more complete self realization, is not only one of the school's

responsibilities but it is a unique responsibility. If the schools falter in this responsibility, no other agency stands ready to step into the breach. In this area of the discipline in cultural facts, the school and the school alone is responsible for any academic attainment the child may acquire.

School marks are an important, useful, and integral part of education. At almost every level of education, from the first grade through the university, marks reveal the achievement of students. These marks which are reported to parents and pupils are generally taken seriously. School records are thought to be incomplete, if they do not show a statement of a child's promotion from grade to grade and also the relative proficiency of his work as indicated by marks received from teachers in the various subjects.

"School marks" have much to do with the educational and vocational future of a child. These marks often form the bases for the child's own judgement of his ability to master the subjects he has studied, and they can be used as a guide by parents and teachers. Institutions of higher learning often determine the question of entrance by marks in high school and sometime grant scholarships to those whose marks exemplify unusual achievement.¹

¹Henry Lester Smith and Wendell W. Wright, Test and Measurement (Chicago: Silver, Burdett and Company, 1938), p. 31.

The purpose of the "school marks" may be roughly stated as (1) administrative and (2) educational; they may be used for social promotion, as well as in certifying the graduation of the pupils. The administrative work of the school is very much concerned with school marks as reported by the teachers. Administrative difficulties arise whenever teachers are very uncertain as to the achievement ability of the individual pupils; and, further, most pupils and parents are not satisfied with marks that do not designate the deficiency of students.¹

"School marks" are used to motivate school work, since pupils work to some extent for marks. This practice is desirable, if the marks are consistent with true achievement, not only concerning the accomplishments reached, but also concerning the needs and short comings revealed.²

In view of the fact that school marks are often taken seriously by both pupils and parents, and in view of possibility of making these marks indicate particular difficulties and needs, marks may be utilized to promote learning. The competition of pupils, one against another, or that of a pupil against his own record, offers a worthy incentive to activity that will purposefully be valuable insofar as the marks are

¹Smith and Wright, Ibid., p. 32

²Harry N. Revlin, Teaching Adolescents in Secondary Schools (New York: Appleton-Century Crafts, Inc., 1948), p. 426.

given a definite measure of specific achievement.¹

The greatest source of inaccuracy in marks is that teachers use widely different standards and bases for determining their grades. These bases may be achievement in school, improvement in school work, efforts, attitudes, neatness, habits of work, conduct in class, results on examination, and others.²

Evolution of the problem.--This problem grew out of the writer's working as chairman of the compilation committee of his school's records. This committee was to find the overall achievement of each ninth grade pupil at Southside Junior High School, Mobile, Alabama. The finding was of such nature that it was opinionated that teachers were not giving students valid grades, even though they appraised their performance periodically in their classes. The writer believes that the grades that were given cannot be justified completely by the teacher.

Contribution to educational research.--It is hoped that the information contained in this study will be valuable to the extent that its finding will provide additional objective substantiation or negation of the reliability of "teachers'-marks" assigned to pupils in reporting their progress and achievement. Also this study might provide information that

¹Smith and Wright, op. cit., p. 31

²Henry B. McDaniel, Guidance in the Modern School (New York: Henry Holt and Company, Inc., 1956), p. 189.

will be significant to other teachers in improving their assignment of grades.

Statement of the problem.--The problem involved in this study was to critically analyze the differences, if any, in the relationship of "teachers'-marks", standardized test-scores and intelligence quotients of the ninth grade pupils enrolled in the Southside Junior High School, Mobile, Alabama, for the school term 1964-1965.

Statement of purpose.--The major purpose of the study was to get a comprehensive picture of the significant differences in the overall school achievement:

1. To determine the measures of central tendency and variability of intelligence of the students as measured by the California Short-Form Test of Mental Maturity.
2. To determine the measures of central tendency and variability of "teachers'-marks" assigned to these pupils.
3. To determine the measures of central tendency and variability in achievement test-scores as measured by the California Achievement Test Complete Battery (Advanced).
4. To determine the significance of the difference, if any, between the "teachers'-marks" and the students' achievement test-scores.
5. To determine the significance of the difference, if any, in correlation between the students' "teachers'-marks" and their achievement test-scores.
6. To formulate comprehensive educational implications, if any, as may be derived from the analysis and interpretation of the data.

Null hypothesis.--There are no significant differences between the relationship of "teachers'-marks", standardized

test-scores, and intelligence quotients.

Definition of terms.--

1. Achievement--as used in this study refers to the level of efficiency in school subjects as measured by standardized test-scores and "teachers'-marks."
2. Intelligence--as used in this study refers to the level of efficiency of mental development of the pupils as measured by the California Short-Form Test of Mental Maturity.

Limitation of the study.--This study was limited in that no effort was made to ascertain the impact of the environmental factors and forces upon either the "teaching-learning situation" or the individual personality nor were any efforts made to appraise prior experiences of the students in performing in rigidly controlled and competitive situations.

Locale and period of study.--The locale of this study was Mobile, Alabama. Southside Junior High School is located on the Southwest side of the city.

The task, involved in collecting and organizing, treating of these data, and the writing of the thesis, was completed during the 1964-1965 school year.

Description of the subjects.--The subjects involved in this study consisted of students enrolled in the Southside Junior High School, Mobile, Alabama. In this ninth grade class, there were twenty-eight boys ranging in chronological ages from thirteen to seventeen years, with a mean of fifteen years. There were thirty-six girls ranging in chronological ages from twelve to fifteen years, with a mean age of 13.5 years. The mean chronological age for the total group of

sixty-four ninth-graders was 14.5.

The pupils in this community suffered from a lack of proper supervision and many were the products of broken homes. Besides having no place to study, many pupils could not receive help from their parents because the majority of them had less than a high school education--this caused the pupils to be severely limited in experiential backgrounds.

Description of materials.--Data for this study were gathered from the following selected sources:

1. California Short-Form Test of Mental Maturity, devised by Willis W. Clark and Ernest W. Tiegs.
This is a test of mental maturity which appraises the student's mental development and mental capacity. This test samples mental processes in four areas, namely: spatial relationship, logical reasoning, numerical reasoning, and verbal concepts.
2. The California Achievement Test Complete Battery (Advanced) W. X. Y. Z., devised by Willis W. Clark and Ernest W. Tiegs.
These are instruments designed for the measurement and diagnosis of school achievement. This series is composed of highly reliable and valid tests of skills and understanding in reading, mathematics, and language.
3. Cumulative records of the pupils which cover attendance, scholarship, health, and personal data records of the pupils enrolled in the school.
The "teachers'-marks" used in this study were formulated by computing the average of the numerical grades earned in the respective subject-matter areas by pupils as these grades were found recorded in the cumulative records of the pupils.

Method of research.--The Descriptive-Survey method of research, utilizing the techniques of test-scores, "teachers'-marks" and statistical treatment was used to gather the necessary data for this study.

Method of procedure.--The procedural steps used in conducting this study are as follows:

1. A more thorough survey was made of the related literature pertinent to the problem which was summarized and carefully studied to get a clear or deeper insight of the overall field of scientific knowledge in order to promote a greater understanding of the problem and to insure avoidance of unnecessary duplication, and to derive helpful suggestions made by others.
2. Data on the individuals were taken from the cumulative folders. In doing so, the writer gained information of personal nature and of varying degrees of accuracy about the individuals.
3. The subjects were given the California Short-Form Test of Mental Maturity to provide mental ability measurements of the individuals being studied. This test samples mental processes in four areas: spatial relationship, logical reasoning, numerical reasoning, and verbal concepts.
4. The California Achievement Test Complete Battery was administered. These are instruments designed for the measurement, evaluation, and diagnosis of school achievement. This series is composed of highly reliable and valid tests of skill and understanding in reading, mathematics, and language.
5. The data derived from the "teachers'-marks" and standardized test-scores were treated statistically through the computation of such measures as: mean, median, standard deviation, standard error of the mean, and Fisher's "t" score.
6. Findings, conclusions, implications, and recommendations, derived from the analysis and interpretations of the data collected, were formulated.

Summary of related literature.--A review of the related literature pertinent to this research revealed that the various authorities who have investigated the problem of the unreliability of "teachers'-marks" and the reliability of standardized test scores appear to agree that teachers should rely

on the results derived from standardized tests for a truer picture of pupil achievement or progress. The review of the literature related to the problem of this study has been condensed to certain generalized statements, which characterize the consensus of opinion and research, are presented below under appropriate captions.

Theories of achievement.--The varied theories concerned with school achievement are in the characterization below.

1. Kuhlen holds that achievement is the result of many factors, such as; motivation, energy, health, emotional and social adjustment, condition of work, and the background of general and specific skills of work thinking.¹
2. Martin and Stendler assert, "American schools at the present time do not take into account individual growth rates." The individual's growth pattern and school achievement are compared to his group--average rather than to his own development.²
3. Merrill experimentally found that on the Stanford Achievement Test that retarded, normal, and superior groups had approximately equal performance for those subjects of the same mental age. This points to the fact that the slow learning child can make an appreciable amount of achievement, if provided with materials and instructions suited to his mental capacity.³
4. Cooperative Committee found that pupil progress through the grades was at a higher level in consolidated schools than in the smaller schools.⁴

¹Kuhlen, op. cit., p. 129.

²Martin and Stendler, op. cit., p. 53.

³Merrill, op. cit., p. 68.

⁴Cooperative Committee, op. cit., pp. 812-26.

The unreliability of "teachers'-marks".--The research on the unreliability of "teachers'-marks" is summarized below.

1. Gray, et. al. reveal the fact that the school marks are highly subjective and hence inaccurate.¹
2. Green and Jorgensen report that "teachers'-marks" not only vary from teacher to teacher but also that the same teachers'-marks would vary from time to time and from subject to subject.²
3. Thomas believes that marks should be valid, truly representative of quantities and qualities of pupil achievement. Reliability must be unquestioned.³
4. Carter states that marks assigned by teachers will influence the future school career of pupils who receive these marks. There is, therefore, a definite need for a lucid and objective evaluation of "teachers'-marks" in terms of validity.⁴
5. Remmers and Cage state that psychological factors, such as fatigue, affecting the ability to distinguish between closely allied degrees of merit.⁵
6. Edmondson, Roemer and Bacon affirm that the lack of uniformity contributes largely to the variability of inaccuracy found in "teachers'-marks."⁶

The reliability of standardized test scores.--The research of the reliability of standardized test scores is epitomed in the statements to follow.

1. Risk states that standardized tests are more reliable than "teachers'-marks". They are free from

¹Gray, et. al., op. cit., p. 49.

²Green and Jorgensen, op. cit., p. 4-5.

³Thomas, op. cit., p. 26.

⁴Carter, op. cit., p. 1-2.

⁵Remmers and Cage, op. cit., p. 129.

⁶Edmondson, Roemer and Bacon, op. cit., p. 459.

personal judgment or opinion in scoring, because the answers are definitely agreed upon. It is an effective means of teaching and testing because time can be saved and results will be more favorable, fair, and impartial.¹

2. Rugg and Brooks state that standardized tests measure aptitudes and accomplishments, and diagnosis the specific needs for help and guidance.²
3. Lee and Lee believe that teachers can use the standardized tests to evaluate strengths and weaknesses of instruction in the various skills.³

Summary of findings.--The summary of the findings of this study are presented as follows:

Indices of Raw-Scores and "Teachers'-Marks"

Mental Maturity
(Total Mental Factors)

Tables 1 and 2

The mean score 96.45 indicated that these subjects performed at a grade-placement of 7.4.

California Achievement Test
(English)

Tables 3 and 4

The mean score 72.5 indicated that these subjects performed at a grade-placement of 7.6.

California Achievement Test
(Mathematics)

Tables 5 and 6

The mean score 72.5 indicated that these subjects performed at a grade-placement of 7.6.

¹Risk, op. cit., p. 631.

²Rugg and Brooks, op. cit., p. 445.

³Lee and Lee, op. cit., p. 680.

"Teachers'-Marks"
(Social Studies)

Tables 7 and 8

The mean score 82.77 indicated that these subjects performed at a grade-placement of 8.4.

"Teachers'-Marks"
(Mathematics)

Tables 9 and 10

The mean score 77.12 indicated that these subjects performed at a grade-placement of 7.6.

"Teachers'-Marks"
(English)

Tables 11 and 12

The mean score 79.30 indicated that these subjects performed at a grade-placement of 7.6.

"Teachers'-Marks"
(Science)

Tables 13 and 14

The mean score 78.67 indicated that these subjects performed at a grade-placement of 7.6.

Significant Differences for Test-Scores
and "Teachers'-Marks"

Test-Scores and "Teachers'-Marks"
(English)

Table 15

The mean T-scores for the "Teachers'-Marks" and test-scores indicated that there were no significant differences.

Test-Scores and "Teachers'-Marks"
(Mathematics)

Table 16

The mean T-scores for the "Teachers'-Marks" and test-scores indicated that there were no significant differences.

"Teachers'-Marks"
(Science and Social Studies)

Table 17

The mean T-scores for the "teachers'-marks" indicated that there were no significant differences.

"Teachers'-Marks"
(English and Science)

Table 18

The mean T-scores for the "teachers'-marks" indicated that there were no significant differences.

"Teachers'-Marks"
(Mathematics and Science)

Table 19

The mean T-scores for the "teachers'-marks" indicated that there were no significant differences.

Significance of Correlations on Paired
Variables of Indices

Table 20

The correlations derived from the achievement for the ninth grade pupils and performance on the tests were: (a) achievement test (English and Mathematics) was "r" .83 and S.E."r" of .05, (b) "Teachers'-Marks" (English and Mathematics) "r" was .86 and S.E."r" of .07, (c) "Teachers'-Marks" (English and Science) "r" was .78 and S.E."r" of .09, (d) "Teachers'-Marks" (English and Social Studies) "r" was .82 and S.E."r" of .08, and (e) "Teachers'-Marks" (Science and Social Studies) "r" was .80 and S.E."r" of .09. There was a positive relationship between the subject areas, but the resultant "r" was not statistically significant.

Table 21

The correlations derived from the achievement and mental factors were: (a) achievement test and mental factors (Mathematics and IQ) "r" was .56 and S.E."r" of .10, (b) "teachers'-marks" and mental factors (Mathematics and IQ) "r" was .55 and S.E."r" of .10, (c) "Teachers'-Marks" and total mental factors (English and IQ) "r" was .59 and S.E."r" of .10, (d) total mental factors and achievement test (English and IQ) "r" was .49 and S.E."r" of .11, (e) total mental factors and "Teachers'-Marks" (IQ and Social Studies) "r" was .51 and S.E."r" of .11, and (f) total mental factors and "Teachers'-Marks" (IQ and Science) "r" was .54 and S.E."r" of .10. There was a positive relationship between achievement and total mental factors, but the resultant "r" was not statistically significant.

Interpretative Summaries

Tables 22 and 23

The interpretative summary of data from the California Short-Form Test of Mental Maturity showed that the ninth grade pupils had an intelligence grade-placement of three grades below the norm of expectancy on all components.

The interpretative summary of data on the California Achievement Test Complete Battery (Advanced) and "Teachers'-Marks" showed that the pupils were achieving approximately two grades below the norm of expectancy in Mathematics and English.

Significance of the Difference Between
California Achievement Test-Scores
and "Teachers'-Marks"

Table 25

The data for the significance of the differences between the California Achievement Test Complete Battery (Advanced) and "Teachers'-Marks" showed no significant differences to exist between the performance on the achievement test in English and Mathematics, and that there were no significant differences between the "Teachers'-Marks" in English, Mathematics, Science, and Social Studies.

Interpretative Summary of Correlations

Table 26

The data for the correlations of scores obtained on the California Achievement Test Complete Battery (Advanced), the California Short-Form Test of Mental Maturity, and "Teachers'-Marks" revealed that: (a) there was a statistically significant, positive relationship between the English, Mathematics, and mental factors on the California Short-Form Test of Mental Maturity and the California Achievement Test Complete Battery, (b) there was a statistically significant, positive relationship between the English, Mathematics, and mental factors as measured by the California Short-Form Test of Mental Maturity and "Teachers'-Marks", (c) there was a statistically significant, positive relationship between the English, Science, and mental factors, as measured by the California Short-Form Test

of Mental Maturity and the "Teachers'-Marks," (d) there was a statistically significant, positive relationship between the English, Social Studies, and mental factors, as measured by the California Short-Form Test of Mental Maturity and the "Teachers'-Marks", and (e) there was a statistically significant, positive relationship between Science, Social Studies, and mental factors, as measured by the California Short-Form Test of Mental Maturity and the "Teachers'-Marks".

Summary of the findings.--This research indicated the following trends:

1. The ninth grade pupils enrolled in the Southside Junior High School, Mobile, Alabama, 1964-1965:
 - (a) obtained an intelligent quotient's grade placement of two grades below the norm of expectancy
 - (b) were achieving approximately two or three years below the norm of expectancy
2. There were no significant differences between achievement test-scores in English, Mathematics and "Teachers'-Marks" in English and Mathematics.
3. All of the relationship of the factors were positive but was not statistically significant.
4. There were no significant differences between the "r"'s of "Teachers'-Marks", intelligent quotients, and achievement test-scores. However, the subjects showed low levels of achievement on the standardized achievement test, which was established as a criterion of accomplishment; therefore, the teachers were too liberal with the grades that were assigned to the pupils.

Conclusions.--The conclusions warranted from the findings of this study are listed below:

1. The subjects were achieving at approximately the same levels, as measured by the test-scores on

"Teachers'-Marks." However, the subjects tend to show higher levels of achievement as measured by test-scores as indicated by the mean T-score, which was higher for the achievement test-scores.

2. The positive, statistically significant correlations between achievement, "Teachers'-Marks", and mental factors in English, Mathematics, Science, and Social Studies indicated that some factors were common to those subject-matter areas.
3. There were no significant differences in the relationships between the "Teachers'-Marks" (English and Mathematics) and test-scores (English and Mathematics), respectively.
4. There was a high degree of relationship, as measured by "Teachers'-Marks": English-Science, English-Social Studies, Science-Social Studies, and English-Mathematics. The "r"s in these subject-matter areas were .78, .82, .80, and .86 respectively.
5. There was a high degree of relationship, as measured by achievement test-scores on the English and Mathematics subject-matter areas. The "r" for the data on English and Mathematics was .86.
6. There was a high degree of relationship, as measured by the total mental factors and achievement test-scores on the total mental factors-Mathematics, and total mental factors-English. The "r"s were .56 and .59 respectively.
7. There was a high degree of relationship, as measured by the total mental factors and the "Teachers'-Marks":
 - (a) total mental factors--English, Mathematics, Social Studies, and Science.
 - (b) The "r"s were .55, .49, .51, and .54 respectively.

Implications.--The implications of the findings from this study are those listed below.

1. The data of this research indicates that the pupils enrolled in the Southside Junior High School, should be exposed to many more enriching experiences in order that the backgrounds of the present students can be improved.
2. The data of this research indicates that the grading systems should be revised in order to improve their methods of assigning grades to the pupils.

3. The data of this research indicates that the teachers of the Southside Junior High School, Mobile, Alabama, should improve the quality and/or quantity of their instructions; this will aid the students to perform closer to norms that they are expected to reach.

Recommendations.--The recommendations warranted by this research are:

1. The Southside Junior High School should inaugurate a comprehensive testing program in close accord with the major objectives (needed diagnosis and remediation) of the educational program for the pupils' progress.
2. The Southside Junior High School should inaugurate a program of educational diagnosis and remediation in order that the pupils may have the opportunity of improving their efficiency in basic skills of school subjects.
3. The Southside Junior High School's program should be studied and/or revised in order to meet the needs, interests, and abilities of its pupils.

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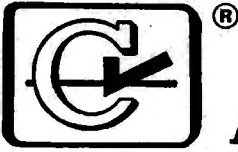
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APPENDIXES

APPENDIX A

SPECIMEN OF CALIFORNIA ACHIEVEMENT TESTS

COMPLETE BATTERY, ADVANCED, FORM-X



Advanced

GRADES
9 to 14

Form X

California Achievement Tests Complete Battery

READING — MATHEMATICS — LANGUAGE

W X Y Z SERIES

DEvised BY ERNEST W. TIEGS AND WILLIS W. CLARK.

INSTRUCTIONS TO STUDENTS:

This is a test of your achievement in reading, mathematics, and language. In taking the first part you will show how many words you know and how well you understand what you read. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

1957 EDITION

10th Printing

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A

X

DIRECTIONS: Mark as you have been told the number of the word that means the same or about the same as the first word.

SAMPLE: B. large ¹ little ² big
³ zero ⁴ angle

Correct Test
Booklet Mark

2 B

Correct Answer
Sheet Mark

B 1 2 3 4

TEST 1—SECTION C

31. verdict ¹ demand ² declaration
³ decision ⁴ decipher _____31
32. system ¹ segment ² scheme
³ secretion ⁴ sympathy _____32
33. immigrant ¹ buyer ² emigrant
³ imposter ⁴ incomer _____33
34. information ¹ industry ² data
³ infinity ⁴ inflow _____34
35. nullify ¹ pacify ² return
³ cancel ⁴ repeat _____35
36. illiterate ¹ unlearned ² reiterate
³ illegal ⁴ literary _____36
37. indemnity ¹ buy ² segment
³ parlance ⁴ reimbursement _____37
38. emancipation ¹ law ² liberation
³ federation ⁴ liegeman _____38
39. diplomacy ¹ tact ² grade
³ familiarity ⁴ ecstasy _____39
40. denomination ¹ member ² length
³ offering ⁴ category _____40
41. charity ¹ philology ² character
³ philanthropy ⁴ pheasant _____41
42. conciliation ¹ ration ² invitation
³ conference ⁴ appeasement _____42
43. annul ¹ invalidate ² yearly
³ serf ⁴ ague _____43
44. recompense ¹ charge ² payment
³ parlance ⁴ admission _____44
45. injunction ¹ injustice ² index
³ mandate ⁴ manner _____45

TEST 1—SECTION D

46. plot ¹ plan ² plenty
³ farce ⁴ episode _____46
47. tedious ¹ lonely ² tiresome
³ restricted ⁴ sad _____47
48. abounding ¹ wary ² nautical
³ athletic ⁴ plentiful _____48
49. verbal ¹ verbose ² tuneful
³ oral ⁴ speedy _____49
50. belated ¹ pounded ² revived
³ delayed ⁴ dictated _____50
51. zest ¹ enjoyment ² engraving
³ ensemble ⁴ enhancement _____51
52. survival ¹ replica ² reflection
³ retort ⁴ remnant _____52
53. modifier ¹ receiver ² mystifier
³ adjective ⁴ caterer _____53
54. grotesque ¹ grouchy ² distorted
³ desperate ⁴ guttural _____54
55. satire ¹ ridicule ² story
³ crib ⁴ reverence _____55
56. supple ¹ polite ² pliant
³ plump ⁴ pointed _____56
57. diction ¹ dictation ² platitude
³ dictum ⁴ phraseology _____57
58. terse ¹ revisory ² decelerated
³ concise ⁴ perforated _____58
59. euphonious ¹ rhythmic ² slow
³ fictitious ⁴ ritual _____59
60. garrulous ¹ luscious ² talkative
³ impervious ⁴ conciliatory _____60

GO

RIGHT ON TO THE
NEXT SECTION

Test 1 — Sec. C Score
(number right).....

STOP

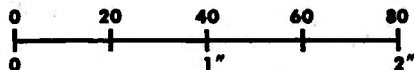
NOW WAIT FOR
FURTHER INSTRUCTIONS

Test 1 — Sec. D Score
(number right).....

TEST 2—SECTION E

DIRECTIONS: Read the following directions. Mark as you are told the number or letter of each correct answer.

61. On the following scale of miles, one inch (1") represents forty miles:



Mark the letter of the number which shows how many miles are represented by $1\frac{1}{4}$ inches.

- a 30
b 45
c 50
d 55
e 60
62. Several states have cities of the same name. For example, there is an Augusta in Georgia, Wisconsin, and Maine; Columbia is in Missouri, Tennessee, and South Carolina; Portland is in Oregon and Maine; and there is an Albany in New York, Georgia, and Texas. Mark the number that shows the cities found in Georgia.
- 1 Columbia, Portland
2 Augusta, Albany
3 Augusta, Portland
4 Albany, Columbia
63. The Greek letters λ , μ , π , and τ are the equivalents of \aleph , \beth , δ and η in Hebrew. They stand for our l , m , p , and t , respectively. Mark the number which shows the letters m , l , t first in Greek and then in Hebrew.
- 1 μ , λ , τ , δ , η , \beth
2 \beth , λ , \aleph , π
3 μ , λ , τ , \beth , \aleph , η
4 mem, lambda, tau, mu, lamed, tau

64. The chemical symbol for sodium is Na; for sulphur, S; for oxygen, O; for nitrogen, N; and for hydrogen, H. A formula expresses the proportion in which substances combine chemically. For example, if one part nitrogen takes three parts hydrogen, the formula is NH_3 . Suppose that on Mars our chemical substances did not exist but were paralleled by others which, when combined in the same proportion as ours, would yield the same results. Thus our sodium would be equal to Martian plat (P), our sulphur to zanit (Za), our oxygen to graal (Gr), and our hydrogen to milix (Mx). Mark the number of the Martian formula that would be equivalent to our combination of two parts sodium, one part sulphur, and four parts oxygen.

- 1 P_2ZaGr_4
2 $\text{P}_2\text{Mx}_4\text{S}$
3 Na_2SO_4
4 Za_2GrP_4

65. Two lines that are drawn so they cannot meet are said to be parallel lines. Two lines drawn so that they form right angles are said to be perpendicular to each other. Diagonal lines are lines drawn at any angle except right angles to each other. Mark the number which identifies the following lines:



- 1 diagonal, perpendicular, parallel
2 diagonal, diagonal, diagonal
3 diagonal, perpendicular, diagonal
4 parallel, perpendicular, parallel

TEST 2—SECTION E (Continued)

66. Latitude is the distance north and south from the equator. Mark the number of the following ship's reading which indicates the greatest distance of latitude from the equator.

a 8° 2' 20" W
b 2° 48' 10" N
c 10° 19' 30" E
d 16° 47' 13" S

66

67. In the transition from Latin, most Romance words followed definite patterns. For instance, the Latin word *novo* became the Italian *nuovo* by breaking the first *o* into *uo*; in Spanish the break of the *o* became *ue* rather than *uo* (*nuevo*); but in Portuguese the *o* came through unchanged from the Latin (*novo*). Mark the number which shows the Italian and Portuguese words derived from the Latin *ovo*.

1 **uovo, huevo**
2 **ovo, huevo**
3 **uovo, ovo**
4 **uovum, uvo**

67

68. The German word *Wissen* has the same meaning as the Danish *Viden*. The German suffix *schaft* is expressed in Danish by the suffix *skab*. The German word for science, *Wissenschaft*, is formed, as is the Danish, by adding the suffix to the word. Mark the number of the Danish word for science.

1 **Videnschaft**
2 **Videnskab**
3 **Skabviden**
4 **Scienshaft**

68

69. In an imaginary language, the stem of the verb *to speak* is *pali*. Instead of using pronouns (I, you, and he) to indicate first, second, and third person, the vowels *a*, *o*, or *u*, respectively, are added after the stem. Mark the number that is *you speak* in the imaginary language.

1 **palio**
2 **palia**
3 **opali**
4 **palo**

69

70. The first constructed language, invented by a German priest, formed the future tense by putting *o* before the verb. The first person plural, expressed in English by the pronoun *we*, was formed by adding *obs* after the verb. The verb meaning *to love* was *löf*. Mark the number which gives the English translation of *olöfobs*.

1 **we love**
2 **they will love**
3 **we loved**
4 **we shall love**

70

71. In an imaginary mathematical system, all numbers must end in the number by which they are multiplied. This is done by either increasing or decreasing the last digit of the result of the multiplication. The other digits are not changed. For example, $4 \times 3 = 13$; $17 \times 4 = 64$. All other mathematical operations are the same as in the usual system. Mark the letter that gives the result of $(9 \times 7) + (104 \times 2)$.

a **267**
b **269**
c **270**
d **279**

71

TEST 2—SECTION E (Continued)

72. The volume of a pyramid is found by multiplying $\frac{1}{3}$ of the area of the base by the altitude. In this problem, the pyramid has a square base, so the area is found by multiplying the length of one side by itself. Mark the letter which shows the number of cubic inches in the volume of a pyramid with a base 6 inches square and 5 inches high.

- a 60
- b 15
- c 65
- d 56
- e 20

_____72

73. In other languages, various letters are pronounced differently from the way we say them in English. In Spanish, for instance, *a* sounds similar to the way we pronounce it in the word *mark*; *e* as we pronounce it in *bet*; *i* as in our word *pick*; *o* as in our *fort*; and *u* as in our *rude*. Mark the number of the English word that has the same vowel sounds, in the same sequence, as the Spanish word *mentira*.

- ¹ revival
- ² renegade
- ³ reticent
- ⁴ enigma

_____73

74. The four words below are listed on one page of a dictionary. Mark the number that represents the pair of words which would be listed first and third.

portrait, portraitist,
portraiture, portray

- ¹ portray, portrait
- ² portrait, portraiture
- ³ portrait, portraitist
- ⁴ portraitist, portray

_____74

75. The standard time meridians of the United States are those whose longitudes west of Greenwich are 75°, 90°, 105°, and 120°. A difference of 15 degrees in longitude corresponds to a difference in time of one hour. The time of each of these standard meridians is 5, 6, 7, and 8 hours, respectively, slower than Greenwich Time. They are called Eastern, Central, Mountain, and Pacific Time, respectively. Mark the letter which shows what time it is at 120° West of Greenwich when it is 6:00 P.M. at Greenwich.

- a 10:00 A.M.
- b 2:00 P.M.
- c 9:00 A.M.
- d 7:00 A.M.
- e 2:00 A.M.

_____75

STOP NOW WAIT FOR
FURTHER INSTRUCTIONS

TEST 2—SECTION F

DIRECTIONS: Mark as you have been told the number or letter of each correct answer.

76. An index is found in what part of a book?
 1 beginning
 2 middle
 3 end _____76
77. A glossary usually contains only
 1 the index.
 2 definitions.
 3 pictures.
 4 footnotes. _____77
78. In which reference can all uses of a word be found?
 1 a grammar
 2 a book on the history of language
 3 a book of synonyms and antonyms
 4 an unabridged dictionary _____78
79. In which drawer in the card catalogue will information on the topic, North America, be found?
 1 AMER
 2 AMERA-BAB
 3 NOR-PAT
 4 GEOL-GEOM _____79
80. The Dewey Decimal System provides
 1 boxes for catalogue cards.
 2 simplified fractions.
 3 a system of mathematics.
 4 library code numbers. _____80
81. The abbreviation *loc. cit.* means
 1 in the place cited.
 2 later.
 3 succeeding title.
 4 no longer in print. _____81
82. The abbreviation *i.e.* means
 1 that is.
 2 the same as.
 3 index error.
 4 and so forth. _____82

- ✓ Decide which are the TWO best topics to look up in an encyclopedia or reference book for information on the following subjects. Mark the numbers of these two topics.

Sample C: Skating in Holland

- 1 Skating
 2 Wrestling
 3 Baseball
 4 Football
 5 Recreation in Holland

Answers to Sample C:

Correct Test Booklet Mark	Correct Answer Sheet Mark										
1-5 C	<table border="1"> <tr> <td>1-2</td> <td>1-3</td> <td>1-4</td> <td>1-5</td> <td>2-3</td> </tr> <tr> <td>2-4</td> <td>2-5</td> <td>3-4</td> <td>3-5</td> <td>4-5</td> </tr> </table>	1-2	1-3	1-4	1-5	2-3	2-4	2-5	3-4	3-5	4-5
1-2	1-3	1-4	1-5	2-3							
2-4	2-5	3-4	3-5	4-5							

83. Transoceanic Communication by Telephone
 1 Radio
 2 Oceans
 3 Inventors
 4 Cables
 5 Newspapers _____83
84. Harmful Insects in Wheat Raising
 1 Agriculture
 2 Industry
 3 Wheat
 4 Destruction
 5 Pests _____84
85. Golf in America
 1 Schools
 2 Courses
 3 Golf
 4 Sports
 5 America _____85
- ✓ In making a scientific investigation, the following alphabetical list of items may be used as an outline.
- A. Interpretation of Data
 B. Title
 C. Purpose
 D. Data of Investigation
 E. Method
 F. Conclusions

TEST 2—SECTION F (Continued)

If the items just presented were arranged in the proper order in a final report,

86. the letter that shows which item would be fourth is
B. C. D. E. F. _____86

87. the letter that shows which item would be second is
A. B. C. D. E. _____87

✓ Look at the graph below and answer questions 88 through 92.

88. By approximately how many dollars do Brazil's exports exceed her imports?
a 650 million
b 350 dollars
c 350 million
d 300 million _____88

89. The condition called "a favorable balance of trade" exists when a country's exports exceed imports. With which two nations did the United States *not* have a favorable balance of trade?
1 Iran and Italy
2 Great Britain and Brazil
3 Brazil and India
4 India and Iran _____89

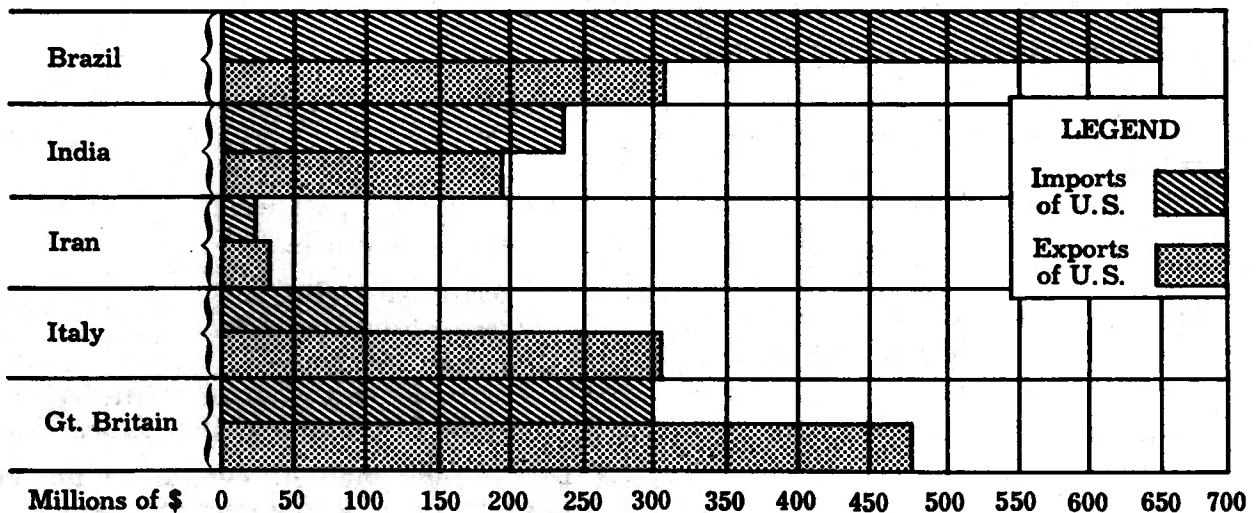
90. Which two nations buy approximately the same amount from the U. S.?
1 Great Britain and India
2 Brazil and Great Britain
3 India and Italy
4 Brazil and Italy _____90

91. With reference to trade with the United States, which nation imports three times as much as it exports?
1 Italy
2 Brazil
3 Great Britain
4 None _____91

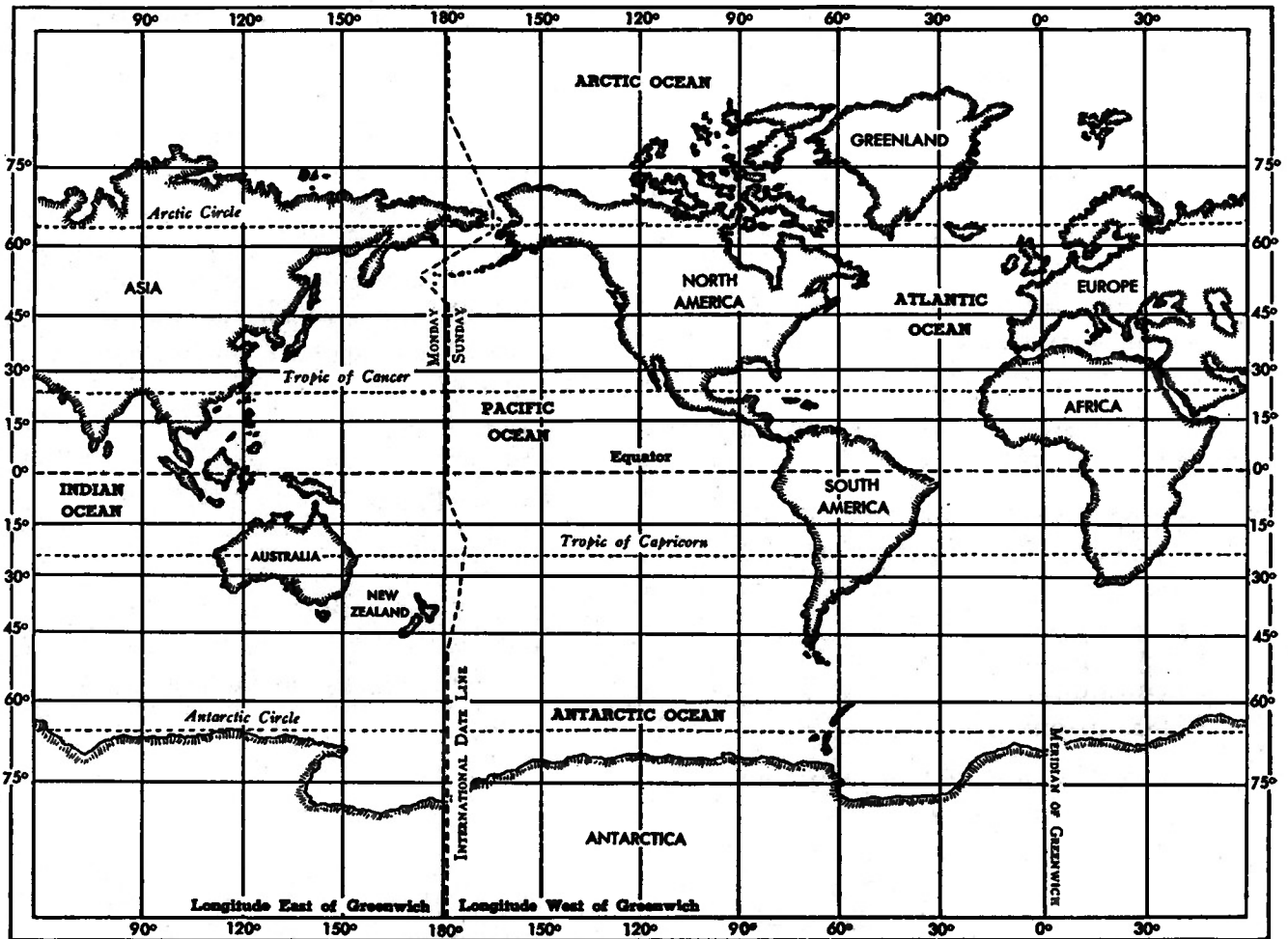
92. How many nations have a total trade with the United States exceeding 500 million dollars?
a one
b two
c three
d None _____92

93. The markings on a map are explained in
1 the title.
2 the legend.
3 the inscription.
4 the tradition. _____93

IMPORTS AND EXPORTS OF THE U.S. WITH SELECTED COUNTRIES



TEST 2—SECTION F (Continued)



THE WORLD

Cylindrical Projection

✓ Look at the world map above to find the answers to questions 94 through 97.

94. The arc of what great circle is used as the reference point to calculate longitude?

- 1 International Date Line
- 2 90°E
- 3 Meridian of Greenwich
- 4 60°E

_____ 94

95. This flat projection of the earth gives the most misleading impression of the actual size of

- 1 Australia.
- 2 Europe.
- 3 Asia.
- 4 Antarctica.

_____ 95

96. The farthestmost point west that the mainland of North America reaches is

- a 165°.
- b 165°W.
- c 165°E.
- d 130°W.

_____ 96

97. On the 30°S parallel, the greatest distance shown is

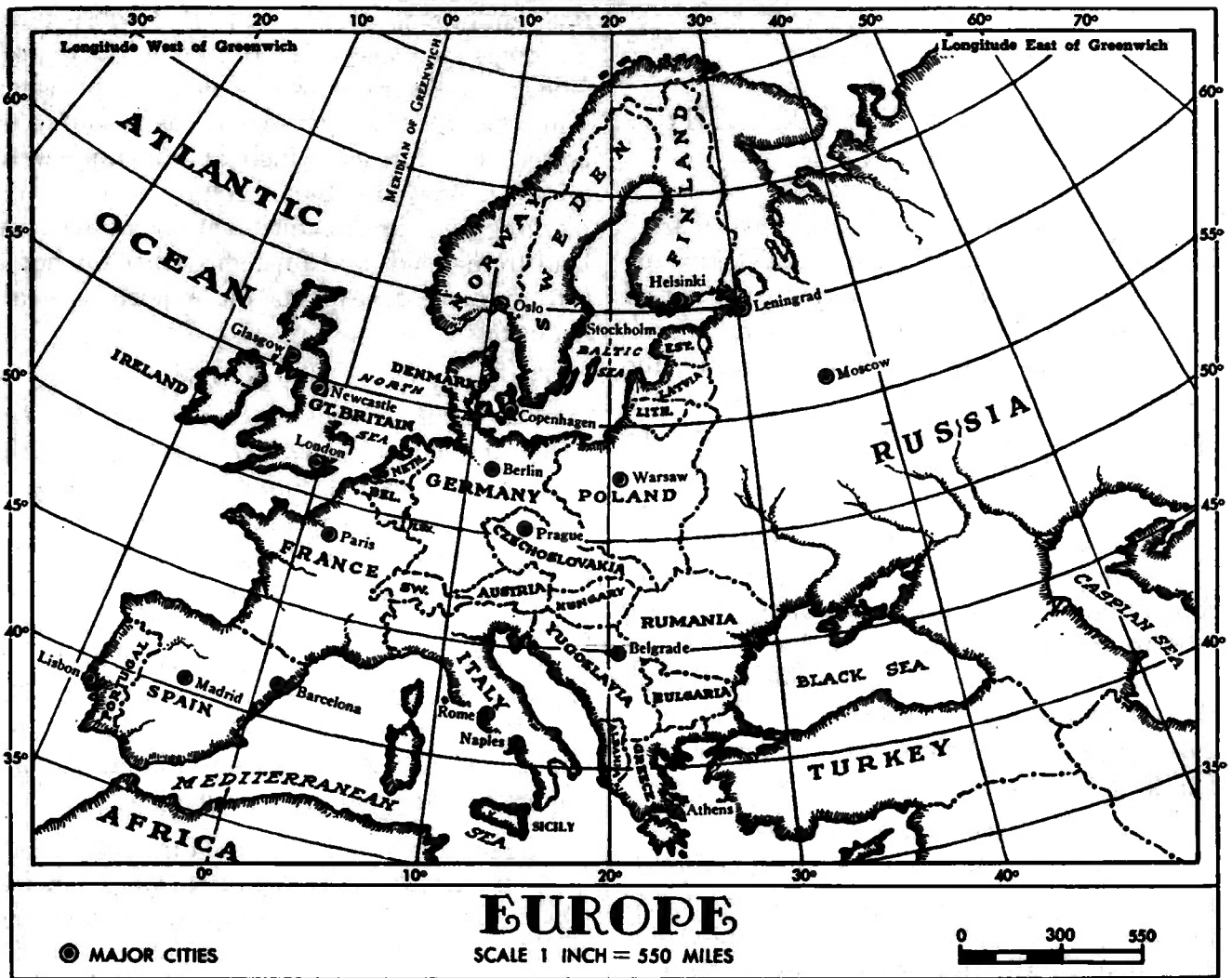
- 1 across Australia.
- 2 across South America.
- 3 across Africa.
- 4 from the east coast of Australia to the International Date Line.

_____ 97

✓ Look at the map of Europe on the next page to find the answers to questions 98 through 102.



TEST 2—SECTION F (Continued)



98. Which city listed below lies farthest south?

- 1 Moscow
- 2 Copenhagen
- 3 Glasgow
- 4 Newcastle

_____ 98

99. Which city is located at 12°26'E 41°55'N?

- 1 Naples
- 2 Berlin
- 3 Madrid
- 4 Rome

_____ 99

100. The nearest to the correct number of miles from Rome to Athens is

- a 420 miles.
- b 530 miles.
- c 650 miles.
- d 780 miles.

_____ 100

101. A degree of latitude is nearly 70 miles in length. How many miles farther north than Belgrade, Yugoslavia is Prague, Czechoslovakia?

- a 45
- b 180
- c 350
- d 750

_____ 101

102. Which one of the figures below indicates the extreme lines of longitude and latitude of Italy (including Sicily)?

6°37'E	18°32'E	9°15'W	3°20'E
	47°7'N		43°40'N
a		b	
	36°38'N		36°5'N
4°52'W	7°39'E	6°50'E	14°10'E
	51°5'N		54°2'N
c		d	
	42°20'N		47°30'N
			_____ 102



Test 2 — Sec. F Score
(number right).....

TEST 2—SECTION G

✓ Read this article:

THE INFLUENCE OF GEOGRAPHY ON FRANCE

The geographical features of France have been favorable to her development. Before the invention of the airplane, any enemy found invasion difficult because of her natural boundaries. On the east the mountain barriers, the Alps, the Jura, and the Vosges, protected against Germany and Italy; on the south the Pyrenees protected against Spain. Although over half of her frontier was open seacoast, potential enemies found most of her coastline to be dangerously rocky or shallow. This condition, however, limits the number of good harbors, most of which are on rivers. The seaports not located on rivers are Marseilles on the Mediterranean, La Rochelle in the west, Cherbourg on the Normandy peninsula, and Dunkirk and Calais in the extreme north.

France, the second largest country on the European continent, is in a most favorable position for commerce. She has easy access to the three most important sea lanes, the North Atlantic to Northern Europe and North America, the Mediterranean to the Far East, and the South Atlantic to South America. Furthermore, natural overland trade routes lead into both eastern and western European nations.

France has four important river systems: the Rhone, which empties into the Mediterranean; the Garonne and the Loire, which flow into the northern and southern extremities of the Bay of Biscay, respectively; and the Seine, which flows into the English Channel. All of these rivers are navigable. These and many lesser rivers, connected by numerous canals, form a valuable system of waterways on which raw materials and manufactured products can be transported.

The mountains make important contributions to the wealth of the nation. Sheep, cattle,

and goats graze on the high pastures. In addition, granite is so plentiful that most farm buildings are constructed of it. The rivers provide hydroelectric power which compensates somewhat for the lack of coal as a source of power. The forests, which at one time were nearly destroyed, now, through years of re-planting and careful conservation, protect the land from floods and furnish timber for home consumption, as well as for export in small quantities.

The many rivers indicate the abundance of rainfall in all sections of France. Located between the latitudes 42°20' and 51° North, France has a varied climate which results in diverse agricultural production. Among many grains, wheat is the most important. Sugar beets, flax, hemp, and potatoes are raised in great abundance. Farther south, semitropical fruits, particularly the olive, grow in the mild Mediterranean climate. The soil and the climate make France a leading nation in the production of grapes. This leads directly to the important wine-making industry.

The sea affords a livelihood for many fishermen. In the Mediterranean, sardines, anchovies, and tuna are caught. In western waters, oysters and sardines are abundant. In the North Sea, herring are caught. Large fleets fish for cod off the banks of Newfoundland. Thus all the geographical features, location, topography, and climate, have played an important part in determining French cultural and economic patterns.

✓ Mark as you have been told the number or letter of each correct answer. You may look back to find the answers.

103. The Seine River flows into the

- ¹ Bay of Biscay.
- ² Mediterranean Sea.
- ³ English Channel.
- ⁴ North Sea.

_____103

TEST 2—SECTION G (Continued)

104. How is rainfall related to transportation in France?
¹ It prevents the use of harbors at certain times of the year.
² The consistency of rainfall insures year round navigability of her rivers.
³ In the dry season, so little rain falls that the rivers are not navigable.
⁴ Rains wash out the railroad bridges. _____104
105. Most French farm buildings are made of
¹ wood.
² granite.
³ stucco.
⁴ brick. _____105
106. The number of good harbors in France is restricted because of
¹ the short seacoast.
² the rocky coastline.
³ extensive swamplands bordering the ocean.
⁴ inundation of harbors by silt. _____106
107. A good system of waterways is important to France because
¹ more people can travel.
² people can live in houseboats.
³ rivers create deltas which can be farmed.
⁴ of its effect on the nation's manufacturing. _____107
108. The most important grain crop in France is
¹ wheat.
² grapes.
³ flax.
⁴ barley. _____108
109. Three of the following items related to French commerce are in the same category. Which one does *not* belong?
¹ the North Atlantic trade route
² the Mediterranean trade route
³ the South Atlantic trade route
⁴ the Baltic trade route _____109
110. Which of the following important fishing areas is not mentioned in connection with the French fishing industry?
¹ Caribbean
² Newfoundland
³ North Sea
⁴ Mediterranean _____110
111. France is able to raise a large variety of agricultural products because of
^a the long seacoast.
^b the soil.
^c the climate.
^d the topography of the land. _____111
112. France's manufactured goods have been mostly the products of light industry rather than heavy because she lacks
¹ coal.
² raw materials.
³ inventive genius.
⁴ skilled laborers. _____112
113. Geography is a study that is limited to
^a the natural features of an area.
^b the natural features and mineral deposits of an area.
^c the natural features and the distribution of plant and animal life of an area and man's relationship to them.
^d the natural features, climate, and mineral deposits of an area. _____113

TEST 2—SECTION G (Continued)

✓ Read the following excerpt from a speech:

“Fear and worry based on unknown danger contribute to social unrest and economic demoralization. If, as our constitution tells us, our federal government was established among other things ‘to promote the general welfare,’ it is our plain duty to provide for that security upon which welfare depends.

“...we may well undertake the great task of furthering the security of the citizen and his family through social insurance. This is not an untried experiment. Lessons of experience are available from states, from industries, and from many nations of the civilized world. The various types of social insurance are inter-related, and I think it is difficult to attempt to solve them piecemeal. Hence, I am looking for a sound means which I can recommend to provide at once security against several of the disturbing factors in life—especially those which relate to unemployment and old age.

“I believe there should be a maximum of cooperation between the states and the federal government. I believe that the funds necessary to provide this insurance should be raised by contribution rather than by increase in general taxation. Above all, I am convinced that social insurance should be national in scope, although the several states should meet at least a large portion of the cost of management, leaving to the federal government the responsibility of investing, maintaining, and safeguarding the funds consisting of the necessary insurance reserves.

“This seeking for a greater measure of welfare and happiness does not indicate a change in values. It is rather a return to values lost in the course of our economic development and expansion.”

✓ Mark the number of each correct answer.
You may look back to find the answers.

114. General welfare, in the speech, means
- ¹ the good of all.
 - ² public charity.
 - ³ the care of the sick and aged.
 - ⁴ a guaranteed annual wage. _____114
115. Social insurance, in the speaker's opinion, should take care of
- ¹ serious disasters.
 - ² people out of work.
 - ³ criminals.
 - ⁴ hospital bills. _____115
116. Social insurance was said to be
- ¹ a suggestion.
 - ² a new idea.
 - ³ a federal matter entirely.
 - ⁴ a tried experiment. _____116
117. The administration of the funds for this program should be vested in
- ¹ each state.
 - ² private industry.
 - ³ federal banks.
 - ⁴ the United States government. _____117
118. The speaker believed the cost of social insurance should be met by
- ¹ state governments.
 - ² county taxes.
 - ³ individual contributions.
 - ⁴ the federal government. _____118

TEST 2—SECTION G (Continued)

119. The speaker thought social insurance would
- ¹ create new values.
 - ² reestablish lost ideals.
 - ³ overburden the government.
 - ⁴ socialize medical care. _____119
120. The central topic of the speech is
- ¹ social unrest.
 - ² federal responsibilities.
 - ³ economics.
 - ⁴ social insurance. _____120

✓ Read the following article:

Any discussion of the steam engine quite rightly gives credit to the work of James Watt. It might, however, be more nearly correct to say that he modified the steam engine into a form that has gone practically unchanged until today, rather than to say that Watt invented the steam engine. His major contributions consisted of the development of the separate condenser and of his use of double action. In the latter, he applied steam and a vacuum alternately to each side of the piston. These, with other lesser improvements, enabled him to produce an engine which he patented in 1782.

Seldom, however, is a major invention made by any one individual. The labors of Watt, after 1763, follow in natural sequence to those of Newcomen in 1705. Newcomen's work rested on that of Savery, of Papin, and of Desaguliers. Indeed, as early as the second century before the birth of Christ, Hero of Alexandria had invented the first steam engine. There is, however, no record of its having been put to useful work other than to demonstrate a law of motion, namely, that every action is accompanied by an equal and opposite reaction.

The earliest steam engine to be put to practical use in industry was that of Thomas Savery. It was unsatisfactory, however, in that

the engine was very wasteful in its use of fuel.

Savery's engine was improved by Desaguliers who applied a safety valve (invented by Papin). He also substituted condensation, by use of a jet of cold water within the vessel, for Savery's method. Papin, who had invented the safety valve, suggested that the condensation of steam should be used to make a vacuum under a piston which had been lifted by the expansion of the steam. His steam engine was the first cylinder and piston steam engine and his plan of using steam was put into practical form later by Newcomen.

Newcomen's engine came into general use about 1725. It continued to be used, with a few changes, until Watt's great new addition, the "separate condenser," made Newcomen's engine obsolescent. Watt made an empty vessel separate from the cylinder. Steam was allowed to escape into the vessel from the cylinder. The steam was condensed in the vessel by the application of cold water either outside or as a jet. Watt also added an air pump to extract condensed steam and water and found a way of keeping the cylinder hot. Later came the use of double action, the use of steam expansion which reduced fuel waste, and a throttle-valve for regulating the rate of admission of steam.

The development of the steam engine from a device used in 130 B.C. illustrates the interdependence of various factors in progress. The practical application of the steam engine had to wait for the discovery of the use of coal as fuel, for example, although the principle of the steam engine had been known many centuries before.

The newly-perfected steam engine revolutionized one industry after another. Steam brought about a revolution in textile manufacture and in rail and ocean transportation. The nineteenth century has been called, indeed, the "century of steam."

James Watt was the son of an impoverished Scottish merchant. At nineteen he had made his way to London to be apprenticed to an instrument maker. Hard work and frugal living forced him, after twelve months, to return

TEST 2—SECTION G (Continued)

home to recover his health. Because he had been unable to complete his apprenticeship, he was not allowed by the guild to work as an instrument maker in Edinburgh. He was, however, established there as mathematical instrument maker to the University of Edinburgh and the situation gave him enough freedom so that, in 1761, he began to experiment with improving Newcomen's steam engine. Four years later, his improved engine was working. His first patent was obtained in 1769.

He was a man of warm friendships. He had a dry humor and enjoyed telling anecdotes. He was familiar with modern languages and was a great talker. From a humble beginning, this man of varied interests made a memorable and significant contribution to the world's industrial progress.

✓ **Mark the number of each correct answer. You may look back to find the answers.**

121. The central topic of the preceding article is
- 1 inventors.
 - 2 machinery.
 - 3 the steam engine.
 - 4 the life of James Watt. _____121
122. The instrument invented by Hero illustrated the application of the law of
- 1 motion.
 - 2 velocity.
 - 3 force.
 - 4 gases. _____122
123. The first safety valve used on the engine was invented by
- 1 Watt.
 - 2 Papin.
 - 3 Savery.
 - 4 Desaguliers. _____123

124. The first steam engine put to practical use was unsatisfactory because
- 1 it lacked power.
 - 2 it worked too slowly.
 - 3 it was too expensive to operate.
 - 4 consumption of fuel was too great. _____124
125. Not being permitted by the guild to work as an instrument maker was fortunate for Watt because
- 1 he became interested in improving the lot of the little merchants like his father.
 - 2 the university excluded apprentices.
 - 3 he could work for changes in the regulations governing apprenticeships.
 - 4 his work in an institution gave him time to experiment. _____125
126. Until Watt's improved engine came on the market, whose engine was most successful?
- 1 Newcomen's
 - 2 Savery's
 - 3 Desagulier's
 - 4 Hero's _____126
127. The man to whom credit is given for making the most important improvements on the steam engine was
- 1 an Englishman.
 - 2 an American.
 - 3 a Scotsman.
 - 4 a Frenchman. _____127
128. The portion of the engine around which Watt made improvements is the
- 1 air chamber.
 - 2 feed pump.
 - 3 cylinder and piston.
 - 4 throttle. _____128

TEST 2—SECTION G (Continued)

129. The function of the air pump was
¹ to condense the steam.
² to regulate the admission of steam.
³ to withdraw water and steam.
⁴ to push the steam out of the boiler. _____129
130. It is historically correct to say
¹ that Watt originated the theory by which the steam engine works.
² that Watt invented the steam engine.
³ that Watt obtained the first patent.
⁴ that Watt added his ideas to those of other people. _____130
131. Watt is best remembered for
¹ his ability as a speaker and writer.
² his numerous unrelated inventions.
³ the part he played in the industrial revolution.
⁴ the instruments he made. _____131
132. One of Papin's most important contributions to making the engine function was
¹ to condense the steam by using a jet of cold water within the vessel.
² to use the condensation of the steam to create a vacuum to pull the piston down.
³ to prove that Savery's method of condensation was the best method.
⁴ to add an air pump to extract condensed steam and water. _____132
133. Which of these men who contributed to the making of the steam engine came first?
¹ Savery
² Papin
³ Watt
⁴ Newcomen _____133

134. The best meaning for the word *obsolescent* as used in this article is

- ¹ to be ancient.
² to fall into disuse.
³ to be rare.
⁴ to fall into disrepair. _____134

✓ Read the following statement:

Standardized and validated tests differ in several respects from the typical informal or traditional examinations which teachers commonly use. First, the questions or exercises which are used in educational tests are much more carefully selected to coincide with the purpose for which the test is designed than is usually true of the ordinary informal or traditional examination. The traditional informal examination is often casually prepared and may contain items which cannot be accurately evaluated.

Second, the questions and exercises in a standardized educational test are usually developed and arranged in accordance with certain principles of test construction in order to obtain an accurately measuring instrument. These principles of test construction are rather technical.

In the third place, the test or scale is standardized. Thus, after the relationship of the items to each other and to the purpose of the test are carefully investigated and improved as far as possible, the test is given to a carefully-selected standardization group. From the data thus gathered the norms, or standards, and other statistics are obtained. The individual test items are again studied in relation to these data and directions for interpreting and using test results are prepared.

A point of great importance, but only recently recognized and applied in connection with test development, is the fact that test scores, even from carefully-constructed standardized tests, are of limited value unless they indicate where specific remedial procedures

TEST 2—SECTION G (Continued)

are needed. This is nothing more than saying that a good standardized test, in addition to providing evidence of the general status of each student, must provide information for making a diagnosis so specific that the results may be interpreted in terms of the kind and approximate amount of educational activity which is needed.

Standardized diagnostic tests are not panaceas for all educational inadequacies, but they are essential in discovering obstacles to learning progress in such a manner that the teacher will know what to do. Standardized tests are objective and quite reliable. A standardized test score has useful meaning, and it permits definite comparisons, inferences, and conclusions.

✓ **Mark the number of each correct answer.**
You may look back to find the answers.

135. If a test yields a reliable and valid measurement of achievement, it is probably
- 1 standardized.
 - 2 traditional.
 - 3 informal.
 - 4 too easy.
- _____135
136. Teachers can obtain most accurate data if they use
- 1 informal tests.
 - 2 standardized diagnostic tests.
 - 3 traditional examinations.
 - 4 no tests whatsoever.
- _____136
137. The teacher who wishes to do good remedial work should base his corrective program on
- 1 informal examinations.
 - 2 intelligence tests.
 - 3 essay examinations.
 - 4 standardized diagnostic tests.
- _____137
138. This test you are taking is
- 1 an informal test of reading speed.
 - 2 a form of a diagnostic reading test.
 - 3 a test of ability to remember facts.
 - 4 an essay test in English grammar.
- _____138
139. In order to compare the achievement of individuals or classes most accurately, the teacher should use
- 1 personal judgment.
 - 2 marks.
 - 3 norms.
 - 4 opinions of classmates.
- _____139
140. A test which contains items which have been carefully studied in relation to each other and to other factors is apt to be
- 1 traditional.
 - 2 standardized.
 - 3 neither standardized nor traditional.
 - 4 too hard.
- _____140
141. The word *panaceas*, as used in the above article, means
- 1 causes of.
 - 2 contributors to.
 - 3 detractors from.
 - 4 remedies for.
- _____141
142. The function of a diagnostic test is primarily to help the teacher
- 1 guide teaching and learning.
 - 2 award marks.
 - 3 promote pupils.
 - 4 determine the native ability of his students.
- _____142

TEST 2—SECTION G (Continued)

✓ **Read the following statement:**

During the past few decades, much progress has been made in the application of scientific procedures to the study of human relationships, social organization, and social processes. The methods are analogous to those used in the physical and biological sciences. But social customs, traditions, and beliefs are apt to cause an unconscious bias on the part of the investigator and human beings cannot be as readily subjected to laboratory methods or controlled experimental conditions.

The more or less scientific procedures in current use in the study of social problems involve the use of the historical, the census, the case history, the laboratory, and statistical methods. The historical method is characterized by the examination and interpretation of documentary evidence. The census method requires classification, definition, and the counting of quantitative data. The case history method involves the analysis of hereditary, environmental, and adaptation factors of the individual subject. The laboratory method employs experimental and controlled units. The statistical method represents a procedure for analyzing the influences of some of the various factors that may be operating in given situations.

Students of human society must develop and maintain a scientific attitude. The word *scientific* is derived from the two Latin words, *scientia* (knowledge) and *facere* (to make). Psychologically speaking, a scientific attitude is a "tendency to act to make knowledge." Social science may be expected to attain the relative status of the physical sciences when it develops adequate techniques for the analysis and interpretation of social data.

✓ **Mark the number of each correct answer.**
You may look back to find the answers.

143. The census method is characterized by
- ¹ counting items.
 - ² statistical analysis.
 - ³ study of documents.
 - ⁴ revealing environmental influences. _____143
144. Researches in the social and physical sciences have many conditions which are
- ¹ retroactive.
 - ² indifferent.
 - ³ analogous.
 - ⁴ redundant. _____144
145. A truly scientific thinker is one who
- ¹ never reaches a final conclusion.
 - ² avoids social problems and issues for study.
 - ³ makes some practical use of that which he learns.
 - ⁴ frees himself of his personal biases. _____145
146. In social investigations it is difficult to secure
- ¹ statistical data.
 - ² controlled conditions.
 - ³ sufficient evidence.
 - ⁴ subject cooperation. _____146
147. The central idea of the preceding article is that
- ¹ social sciences have now achieved equal status with the physical sciences.
 - ² entirely different methodologies are required in the social sciences.
 - ³ there is only one usable scientific technique in studying the social processes.
 - ⁴ a scientific attitude is more difficult to maintain in social fields. _____147

STOP NOW WAIT FOR
FURTHER INSTRUCTIONS

Mathematics

INSTRUCTIONS TO STUDENTS:

This is a mathematics test. In taking it you will show how well you can think and work problems. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

TEST 3—SECTION A

Do not write, mark, or figure on this test booklet unless told to do so by the examiner.

DIRECTIONS: Decide how each of the amounts below should be written as a number. Then mark as you are told the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, mark the letter, e. In taking this test you should finish the first column before going on to the second. Look at the samples to the right and see how they are marked.

Sample A: Twelve

- a 10
- b 12
- c 11
- d 2
- e None

Correct Answer Sheet Mark				
A	a	b	c	d
Correct Test Booklet Mark				
b A				

Sample B: Twenty

- a 22
- b 200
- c 2
- d 21
- e None

Correct Answer Sheet Mark				
B	a	b	c	d
Correct Test Booklet Mark				
e B				

- | | | |
|---|---|-----|
| 1. Seven thousand eleven | a 711,000
b 7110
c 7011
d 700,011
e None | (1) |
| 2. Eighteen thousand four | a 18,040
b 180,040
c 1804
d 18,000,4
e None | (2) |
| 3. Three million four hundred four | a 3,404,000
b 3,400,004
c 3404
d 3,000,404
e None | (3) |
| 4. Ninety-five dollars and eight cents | a \$95.8¢
b \$95.08
c \$95.80
d 95.08
e None | (4) |
| 5. Seventeen and three-fifths | a $17\frac{3}{5}$
b $\frac{17}{5}$
c $7\frac{3}{5}$
d $\frac{73}{5}$
e None | (5) |
| 6. Four hundredths (written as a decimal) | a .400
b 4.00
c .04
d .004
e None | (6) |
| 7. Forty-two ten-thousandths (written as a decimal) | a 42,010,000
b .042
c .0042
d .00042
e None | (7) |

✓ Read these Roman numerals. Then mark as you have been told the letter of each correct answer.

8. XL means

- a 20 b 40 c 60 d 80 e None
- (8)

9. DCC means

- a 300 b 250 c 700 d 800 e None
- (9)

10. MCCCXI means

- a 411 b 611 c 811 d 1311 e None
- (10)

✓ Find the largest number or quantity, marked a, b, c, or d, in each of the following rows. Then mark its letter.

11. a $\frac{3}{4}$ b $\frac{5}{8}$ c $\frac{5}{6}$ d $\frac{5}{9}$ _____11

12. a .049 b .47 c .192 d .0864 _____12

13. a 2 b 50% c .42 d 1.19 _____13

14. a 4^2 b 2^3 c 7 d 1^{10} _____14

15. a $(\frac{3}{4})^2$ b $\frac{3}{4}$ c $(\frac{2}{3})^2$ d $(\frac{4}{5})^3$ _____15

16. a $\sqrt{.36}$ b .76 c $\sqrt{.81}$ d .768 _____16

17. a $.7^3$ b $.7^2$ c .4 d $.6^4$ _____17

(Consider all algebraic quantities to be positive and that $b + c$ is greater than 1.)

18. a b^2 b $b^2 - 1$ c $\frac{b^3 - b}{b}$ d $b \times b - 2$ _____18

19. a $\frac{4b^2 - c}{b}$ b $3b - c$ c $4b$ d $\frac{6b^2 - 2c^2}{2b}$ _____19

20. a $(b + c)^2$ b $(b - c)^2$ c $(b + c)(b - c)$ d b^2 _____20

STOP

Test 3 - Sec. A Score
(number right).....

TEST 3—SECTION B

DIRECTIONS: Mark the letter or number of each correct answer. If you do not know an answer, or if you think that none of the answers given is correct, you should mark the letter, e, or the number, 5, whichever appears before the word, None. Finish the first column before going on to the second. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

<p>21. What is the greatest common divisor of 5, 15, and 35?</p> <p>a 15 b 3 c 5 d 55 e None</p> <p style="text-align: right;">(21)</p>	<p>26. What is the greatest common divisor of $2y^2 - 2yz$, $4yz$, and $4y^2z^2$?</p> <p>a $2y^2$ b $4y$ c $2yz$ d $2y$ e None</p> <p style="text-align: right;">(26)</p>
<p>22. Which 2 numbers are both factors of 15?</p> <p>a 15, 0 b 5, 10 c 3, 5 d 7, 8 e None</p> <p style="text-align: right;">(22)</p>	<p>27. Which 2 quantities are both factors of $x^2 + 2xy + y^2$?</p> <p>1 $(x + y)(x + y)$ 2 $(x + y)(x - y)$ 3 $(x^2y^2)(2xy)$ 4 $(2x + y)(x + y)$ 5 None</p> <p style="text-align: right;">(27)</p>
<p>23. $\sqrt{49}$ is</p> <p>a 149 b 1 c 49 d 9 e None</p> <p style="text-align: right;">(23)</p>	<p>28. \parallel means</p> <p>1 equal to 2 lines 3 parallel 4 therefore 5 None</p> <p style="text-align: right;">(28)</p>
<p>24. 6% of $50 =$</p> <p>a $8\frac{1}{3}$ b 25 c 56 d 3 e None</p> <p style="text-align: right;">(24)</p>	<p>29. \cong means</p> <p>1 to prove 2 similar 3 equal 4 congruent 5 None</p> <p style="text-align: right;">(29)</p>
<p>25. Reduce to simplest terms:</p> $\frac{\frac{24}{3}}{\frac{12}{6}}$ <p>a 4 b $\frac{1}{8}$ c $\frac{1}{16}$ d 16 e None</p> <p style="text-align: right;">(25)</p>	<p>30. \therefore means</p> <p>1 triangle 2 therefore 3 to prove 4 equivalent 5 None</p> <p style="text-align: right;">(30)</p>

DIRECTIONS: Some rules used in measurement, numbered 1, 2, 3, 4, 5, and 6, are given to the right below. Some problems that can be worked with these rules are given on the left, numbered 31, 32, 33, 34, and 35. Mark the number of the rule on the right which is used to find the answer to each problem on the left.

Problems	Rule	Rules Used in Measurement
31. Area of a circle	____ 31	$\left. \begin{array}{l} 1. \text{ Multiply altitude by the square of the radius by } 3.1416 \text{ or } 3\frac{1}{7}. \\ 2. \text{ Multiply } 3.1416 \text{ or } 3\frac{1}{7} \text{ by the square of the radius.} \\ 3. \text{ Multiply width by length.} \\ 4. \text{ Divide the sum of the upper and lower sides by two.} \\ 5. \text{ Divide area by width.} \\ 6. \text{ Multiply } \frac{1}{3} \text{ area of base by altitude.} \end{array} \right\}$
32. Length of a rectangle	____ 32	
33. Volume of a cylinder	____ 33	
34. Volume of a pyramid	____ 34	
35. Width of a trapezoid	____ 35	

TEST 3—SECTION B (Continued)

DIRECTIONS: Work these problems. Then mark as you have been told the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish the first column before going on to the second. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

<p>36. Subtract: $\begin{array}{r} 57x \\ -14x \\ \hline \end{array}$</p> <p>a $71x^2$ b $71x$ c $43x$ d $798x^2$ e None</p> <p style="text-align: right;">(36)</p>	<p>41. $x + 3 = 9$ $x =$</p> <p>a 12 b 3 c 9 d 27 e None</p> <p style="text-align: right;">(41)</p>
<p>37. Multiply: $6(-5)$</p> <p>a 1 b 11 c 30 d -30 e None</p> <p style="text-align: right;">(37)</p>	<p>42. $\frac{x}{3} = 4$ $x =$</p> <p>a 12 b 7 c $\frac{4}{3}$ d $\frac{3}{4}$ e None</p> <p style="text-align: right;">(42)</p>
<p>38. Simplify: $\frac{-24}{6}$</p> <p>a -4 b $-\frac{2}{3}$ c 4 d -144 e None</p> <p style="text-align: right;">(38)</p>	<p>43. $x^2 = 25$ $x =$</p> <p>a 125 b $25x$ c $125x$ d 5 e None</p> <p style="text-align: right;">(43)</p>
<p>39. Add: $\begin{array}{r} 42 \\ -34 \\ \hline 56 \end{array}$</p> <p>a 98 b 64 c 132 d -64 e None</p> <p style="text-align: right;">(39)</p>	<p>44. If $a = 4$, $b = 6$, and $c = 5$, find the value of x in the following equation: $x = a - b + c$ $x =$</p> <p>a 15 b -1 c -7 d 3 e None</p> <p style="text-align: right;">(44)</p>
<p>✓ Find the value of x in each of the following equations. Then mark its letter.</p>	
<p>40. $4x = 32$ $x =$</p> <p>a 128 b 28 c 8 d 36 e None</p> <p style="text-align: right;">(40)</p>	<p>45. If $m = 2$, $p = 4$, and $r = 3$, find the value of x in the following equation: $\frac{x}{m} = pr - m$ $x =$</p> <p>a $\frac{1}{2}$ b 10 c 20 d 24 e None</p> <p style="text-align: right;">(45)</p>

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

TEST 3—SECTION C

DIRECTIONS: Work these problems. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

- | | |
|---|--|
| <p>46. How much money will be required to buy 2 cakes of soap at 10¢ a cake and 1 dozen eggs at 65¢ a dozen?</p> | <p>a 45¢
b 55¢
c 75¢
d 85¢
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(46)</p> |
| <p>47. How much money will be required to buy $\frac{3}{4}$ pound of butter at 60¢ a pound, 4 pounds of sugar at 7¢ a pound, and 3 eggs at 64¢ a dozen?</p> | <p>a 44¢
b 69¢
c 61¢
d 99¢
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(47)</p> |
| <p>48. For a candy sale, 4 girls brought the following amounts of candy to school: Mary, 2 pounds of fudge; Dorothy, 3 pounds of peanut brittle; Jean, 2 pounds of chocolates; and Elsie, 1 pound of divinity. What was the average number of pounds brought?</p> | <p>a 8
b $2\frac{1}{2}$
c 2
d 3
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(48)</p> |
| <p>49. When the scale on a map is "$\frac{1}{4}$ in. = 30 mi.," how many miles apart are 2 cities that are represented on a map as 2 inches apart?</p> | <p>a 120
b 60
c 240
d 15
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(49)</p> |
| <p>50. A man received 7 per cent interest on a loan of \$1,000 for 1 year. How much interest did he receive?</p> | <p>a \$70.00
b \$7.00
c \$1070.00
d \$7000.00
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(50)</p> |
| <p>51. A garden is 120 yards wide and 300 yards long. How many square yards are there in the garden?</p> | <p>a 180
b 36,000
c 3600
d 420
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(51)</p> |
| <p>52. A swimming pool is 15 feet wide, 50 feet long, and has an average depth of 5 feet. How many cubic feet of water will it hold?</p> | <p>a 70
b 750
c 250
d 3750
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(52)</p> |
| <p>53. Frank, Henry, and Roy together received \$40.00. Frank received \$8.00, Henry received \$12.00, and Roy received \$20.00. What per cent of the \$40.00 did Henry receive?</p> | <p>a 30
b 20
c 50
d 10
e None</p> <hr style="width: 100%;"/> <p style="text-align: right;">(53)</p> |

TEST 3—SECTION C (Continued)

54. Some families spend their monthly incomes according to budget plans, two of which are given to the right. Using these plans as a basis, about how much would a family with a monthly income of \$275 spend for food?		\$225	\$275	
		Monthly	Monthly	
		Income	Income	
	Shelter	20%	17%	
	Food	26	25	
	Clothing	15	15	a \$68.75
	Operation	6	7	b \$112.50
	Savings	13	16	c \$60.00
Other Expenses ...	20	20	d \$32.00	
	<u>100%</u>	<u>100%</u>	e None	
			(54)	

55. Our basketball team won 60 per cent of the games played, but lost 8 games. How many games did they play altogether?

a 10
b 16
c 12
d 20
e None

(55)

56. Ruth earned \$24.00 and saved \$6.00 of it. What per cent did she save?

a 20
b 400
c 25
d $\frac{1}{4}$
e None

(56)

57. What was the average wage per month of factory workers who were paid as follows:

}	10 received \$180 per month
	15 received \$200 per month
	5 received \$220 per month
	1 received \$300 per month

a \$200
b \$225
c \$180
d \$220
e None

(57)

58. A house, valued at \$8000, was insured for 80% of its value. The rate of insurance was 24 cents per \$100. What was the amount of the premium?

a \$6400.00
b \$15.36
c \$1536.00
d \$256.00
e None

(58)

59. A merchant sold shoes for \$5.00 which cost him \$3.75 a pair. Thus he received a gross profit of \$1.25, or 25% on the selling price. By what per cent was the cost price increased to provide for this 25% profit on the selling price?

a 125
b $\frac{1}{3}$
c 25
d $33\frac{1}{3}$
e None

(59)

60. Helen's father owns a hardware store. He wished to purchase a dining room set at a list price of \$100.00. One wholesale dealer offered a discount of 30%, and another offered discounts of 25% and 10%. How much more will Helen's father save by taking the better discount?

a \$30.00
b \$7.50
c \$67.50
d \$2.50
e None

(60)



TEST 4—SECTION D

DIRECTIONS: Do these problems in addition. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms. Remember to do your figuring on scratch paper if you are marking your answers on an answer sheet.

<p>(61)</p> $\begin{array}{r} 205 \\ + 340 \\ \hline \end{array}$ <p>a 565 b -165 c 69700 d 545 e None</p> <p style="text-align: right;">(61)</p>	<p>(68)</p> $\begin{array}{r} \frac{1}{3} \\ + \frac{1}{6} \\ \hline \end{array}$ <p>a $\frac{4}{6}$ b $\frac{1}{2}$ c $\frac{1}{9}$ d $\frac{1}{18}$ e None</p> <p style="text-align: right;">(68)</p>	<p>(75)</p> $16\frac{5}{8} + 13.05 =$ <p>a 29.675 d 3.455 b 3.575 e None c 29.555</p> <p style="text-align: right;">(75)</p>
<p>(62)</p> $\begin{array}{r} 31 \\ + 15 \\ \hline \end{array}$ <p>a 26 b 16 c 56 d 465 e None</p> <p style="text-align: right;">(62)</p>	<p>(69)</p> $\begin{array}{r} 21 \\ + 4\frac{2}{3} \\ \hline \end{array}$ <p>a $16\frac{1}{3}$ b 98 c $25\frac{2}{3}$ d $17\frac{2}{3}$ e None</p> <p style="text-align: right;">(69)</p>	<p>(76)</p> $.06 + .148 + .2166 =$ <p>a 23.20 d .4246 b .2320 e None c .3146</p> <p style="text-align: right;">(76)</p>
<p>(63)</p> $\begin{array}{r} 4272 \\ 5468 \\ 1845 \\ + 1402 \\ \hline \end{array}$ <p>a 11877 b 12887 c 12987 d 11887 e None</p> <p style="text-align: right;">(63)</p>	<p>(70)</p> $\begin{array}{r} \frac{1}{4} \\ + 3\frac{3}{8} \\ \hline \end{array}$ <p>a $3\frac{5}{8}$ b $3\frac{1}{8}$ c $3\frac{4}{32}$ d $1\frac{5}{8}$ e None</p> <p style="text-align: right;">(70)</p>	<p>(77)</p> $42.3 + 6.23 + .0429 + 4 =$ <p>a 1.4889 d 48.9729 b 52.5729 e None c 5.0889</p> <p style="text-align: right;">(77)</p>
<p>(64)</p> $\begin{array}{r} \$65.35 \\ 3.69 \\ 42.74 \\ + 8.16 \\ \hline \end{array}$ <p>a \$108.94 b \$118.75 c \$108.74 d \$119.94 e None</p> <p style="text-align: right;">(64)</p>	<p>(71)</p> $\begin{array}{r} 21\frac{1}{4} \\ + 3\frac{2}{5} \\ \hline \end{array}$ <p>a $17\frac{17}{20}$ b $18\frac{3}{9}$ c $24\frac{18}{20}$ d $63\frac{3}{4}$ e None</p> <p style="text-align: right;">(71)</p>	<p>(78)</p> $20\% \text{ of } 30 + 10\% \text{ of } 70 =$ <p>a -1 d 13 b $8\frac{1}{2}$ e None c 1</p> <p style="text-align: right;">(78)</p>
<p>(65)</p> $\begin{array}{r} 4 \text{ yd. } 2 \text{ ft. } 7 \text{ in.} \\ + 2 \text{ yd. } 1 \text{ ft. } 6 \text{ in.} \\ \hline \end{array}$ <p>a 2 yd. 1 ft. 1 in. b 6 yd. 3 ft. 13 in. c 7 yd. 1 ft. 1 in. d 7 yd. 11 in. e None</p> <p style="text-align: right;">(65)</p>	<p>(72)</p> $\begin{array}{r} 8\frac{1}{4} \\ + 3\frac{5}{6} \\ \hline \end{array}$ <p>a $11\frac{6}{10}$ b $11\frac{12}{13}$ c $5\frac{7}{12}$ d $12\frac{1}{12}$ e None</p> <p style="text-align: right;">(72)</p>	<p>(79)</p> $4a + 2a + 3a =$ <p>a $9a^2$ d $24a$ b $9a^3$ e None c $9a$</p> <p style="text-align: right;">(79)</p>
<p>(66)</p> $\$30.00 + \$0.25 + \$5 + \$1.25 =$ <p>a \$61.25 d \$36.50 b \$56.75 e None c \$36.40</p> <p style="text-align: right;">(66)</p>	<p>(73)</p> $\begin{array}{r} 73\frac{1}{2} \\ 22\frac{2}{3} \\ + 34\frac{3}{4} \\ \hline \end{array}$ <p>a $96\frac{1}{6}$ b $129\frac{11}{12}$ c $130\frac{11}{12}$ d $62\frac{9}{12}$ e None</p> <p style="text-align: right;">(73)</p>	<p>(80)</p> $3(2x^2 - x) + x^2 + 5x =$ <p>a $6x^2 - x + 5x^3$ b $7x^2 + 2x$ c $7x^2 - 15x$ d $6x^2 - 3x + 3x^2 + 5x$ e None</p> <p style="text-align: right;">(80)</p>
<p>(67)</p> $\begin{array}{r} \frac{1}{3} \\ + \frac{1}{3} \\ \hline \end{array}$ <p>a $\frac{1}{6}$ b $\frac{1}{9}$ c $\frac{2}{3}$ d $\frac{2}{6}$ e None</p> <p style="text-align: right;">(67)</p>	<p>(74)</p> $7\frac{1}{2} + 8.5 =$ <p>a $15\frac{1}{2}$ d 15.55 b 16 e None c $92\frac{1}{2}$</p> <p style="text-align: right;">(74)</p>	

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

TEST 4—SECTION E

DIRECTIONS: Do these problems in subtraction. Then mark the letter of each correct answer. For some of the problems none of the answers given may be correct. If you cannot work a problem, or if you think that none of the answers given is correct, you should mark the letter, e. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms. Remember that these are problems in subtraction.

<p>(81)</p> $\begin{array}{r} 584 \\ -322 \\ \hline \end{array}$ <p>a 162 b 906 c 188048 d -906 e None</p> <p style="text-align: right;">(81)</p>	<p>(88)</p> $\frac{2}{3} - \frac{1}{3}$ <p>a 1 b -1 c $\frac{1}{3}$ d $-\frac{1}{3}$ e None</p> <p style="text-align: right;">(88)</p>	<p>(95)</p> $85\frac{2}{5} - 24.23 =$ <p>a $60\frac{11}{12}$ b 62.17 c 109.63</p> <p>d 61.17 e None</p> <p style="text-align: right;">(95)</p>
<p>(82)</p> $\begin{array}{r} 72 \\ -19 \\ \hline \end{array}$ <p>a 91 b 63 c 53 d 67 e None</p> <p style="text-align: right;">(82)</p>	<p>(89)</p> $\frac{1}{4} - \frac{1}{8}$ <p>a $\frac{3}{8}$ b $\frac{2}{32}$ c $\frac{1}{16}$ d $\frac{1}{8}$ e None</p> <p style="text-align: right;">(89)</p>	<p>(96)</p> $74.260 - 21.16 =$ <p>a 53.1 b .72044 c 95.42</p> <p>d 1571.2416 e None</p> <p style="text-align: right;">(96)</p>
<p>(83)</p> $\begin{array}{r} 8607 \\ -3938 \\ \hline \end{array}$ <p>a 12545 b 4669 c 5779 d 33894366 e None</p> <p style="text-align: right;">(83)</p>	<p>(90)</p> $\frac{3}{4} - \frac{1}{3}$ <p>a $\frac{4}{12}$ b $\frac{4}{7}$ c $\frac{5}{12}$ d $\frac{1}{6}$ e None</p> <p style="text-align: right;">(90)</p>	<p>(97)</p> $78.65 - 3.4279 =$ <p>a 82.0799 b 26.404 c 74.1222</p> <p>d 75.2221 e None</p> <p style="text-align: right;">(97)</p>
<p>(84)</p> $\begin{array}{r} \$16.25 \\ -2.45 \\ \hline \end{array}$ <p>a \$18.60 b \$14.80 c \$18.70 d \$13.80 e None</p> <p style="text-align: right;">(84)</p>	<p>(91)</p> $9\frac{4}{7} - 5$ <p>a $4\frac{4}{7}$ b $14\frac{4}{7}$ c $47\frac{6}{7}$ d $3\frac{3}{7}$ e None</p> <p style="text-align: right;">(91)</p>	<p>(98)</p> $\frac{1}{6} \text{ of } 30 - \frac{1}{3} \text{ of } 9 =$ <p>a 15 b 8 c 2</p> <p>d $\frac{12}{9}$ e None</p> <p style="text-align: right;">(98)</p>
<p>(85)</p> $\begin{array}{r} \$200.00 \\ -14.25 \\ \hline \end{array}$ <p>a \$185.75 b \$196.85 c \$186.75 d \$214.25 e None</p> <p style="text-align: right;">(85)</p>	<p>(92)</p> $6 - 3\frac{2}{3}$ <p>a 22 b $3\frac{1}{3}$ c $9\frac{2}{3}$ d $2\frac{1}{3}$ e None</p> <p style="text-align: right;">(92)</p>	<p>(99)</p> $4a - a - 2a =$ <p>a $4a^2 - 2a$ b a c 7a</p> <p>d $7a^3$ e None</p> <p style="text-align: right;">(99)</p>
<p>(86)</p> <p>7 da. 8 hr. 20 min. 4 da. 10 hr. 30 min.</p> <p>a 6 da. 31 hr. 80 min. d 2 da. 21 hr. 50 min. b 11 da. 8 hr. 50 min. e None c 3 da. 2 hr. 10 min.</p> <p style="text-align: right;">(86)</p>	<p>(93)</p> $67\frac{1}{9} - 24\frac{4}{9}$ <p>a $91\frac{5}{9}$ b $41\frac{2}{3}$ c $42\frac{2}{3}$ d $43\frac{2}{3}$ e None</p> <p style="text-align: right;">(93)</p>	<p>(100)</p> $4x^3 - 3x - (x^3 + 2x) =$ <p>a $3x^3 - 5x$ b $4x^3 - 3x - x^3 - 2x$ c $x^3 - x$ d $5x^3 - x$ e None</p> <p style="text-align: right;">(100)</p>
<p>(87)</p> $\frac{1}{6} - \frac{1}{6}$ <p>a $\frac{1}{36}$ b 0 c $\frac{1}{12}$ d $\frac{2}{6}$ e None</p> <p style="text-align: right;">(87)</p>	<p>(94)</p> $34.75 - 8\frac{1}{4} =$ <p>a 26.5 b 43 c $26.25\frac{1}{4}$</p> <p>d -286.6875 e None</p> <p style="text-align: right;">(94)</p>	

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Test 4 — Sec. E Score
(number right).....

TEST 4—SECTION F

DIRECTIONS: Do these problems in multiplication. Then mark the letter of each correct answer. Finish each column before going on to the next. Be sure to reduce fractions to lowest terms.

<p>(101)</p> $\begin{array}{r} 423 \\ \times 7 \\ \hline \end{array}$ <p>a 416 b 430 c 2961 d $60\frac{3}{7}$ e None</p> <p style="text-align: right;">(101)</p>	<p>(108)</p> $\frac{1}{5} \times \frac{1}{5} =$ <p>a $\frac{1}{25}$ b $\frac{1}{5}$ c $\frac{2}{10}$</p> <p>d $\frac{2}{5}$ e None</p> <p style="text-align: right;">(108)</p>	<p>(115)</p> $\begin{array}{r} 32.95 \\ \times 3\frac{1}{5} \\ \hline \end{array}$ <p>a $32.98\frac{1}{5}$ b $32.91\frac{4}{5}$ c 995.09 d 105.44 e None</p> <p style="text-align: right;">(115)</p>
<p>(102)</p> $\begin{array}{r} 803 \\ \times 6 \\ \hline \end{array}$ <p>a 797 b 4818 c 809 d $133\frac{5}{6}$ e None</p> <p style="text-align: right;">(102)</p>	<p>(109)</p> $\frac{1}{6} \times \frac{6}{7} =$ <p>a 7 b $\frac{7}{13}$ c $\frac{7}{42}$</p> <p>d $\frac{1}{7}$ e None</p> <p style="text-align: right;">(109)</p>	<p>(116)</p> $\begin{array}{r} 683.7 \\ \times 4 \\ \hline \end{array}$ <p>a 2734.8 b 684.1 c 273.48 d 683.3 e None</p> <p style="text-align: right;">(116)</p>
<p>(103)</p> $\begin{array}{r} 481 \\ \times 27 \\ \hline \end{array}$ <p>a 454 b 4329 c 12987 d 3367 e None</p> <p style="text-align: right;">(103)</p>	<p>(110)</p> $\frac{2}{3} \times \frac{6}{8} =$ <p>a $\frac{9}{24}$ b $\frac{1}{2}$ c $\frac{8}{11}$</p> <p>d 5 e None</p> <p style="text-align: right;">(110)</p>	<p>(117)</p> $\begin{array}{r} 47.35 \\ \times .068 \\ \hline \end{array}$ <p>a 46.67 b 3.2198 c 48.03 d 6.96340 e None</p> <p style="text-align: right;">(117)</p>
<p>(104)</p> $\begin{array}{r} 867 \\ \times 30 \\ \hline \end{array}$ <p>a 897 b 837 c $28\frac{27}{30}$ d 26010 e None</p> <p style="text-align: right;">(104)</p>	<p>(111)</p> $8 \times 3\frac{3}{4} =$ <p>a $11\frac{3}{4}$ b $4\frac{1}{4}$ c 30</p> <p>d $.02\frac{2}{15}$ e None</p> <p style="text-align: right;">(111)</p>	<p>(118)</p> $5 \times 30\% \text{ of } 20 =$ <p>a $1\frac{1}{2}$ b 3 c 30</p> <p>d 11 e None</p> <p style="text-align: right;">(118)</p>
<p>(105)</p> $\begin{array}{r} 3048 \\ \times 306 \\ \hline \end{array}$ <p>a 932688 b 3354 c 2742 d $9\frac{147}{153}$ e None</p> <p style="text-align: right;">(105)</p>	<p>(112)</p> $9\frac{1}{4} \times \frac{3}{5} =$ <p>a $9\frac{4}{9}$ b $9\frac{9}{20}$ c $9\frac{1}{20}$</p> <p>d $5\frac{11}{20}$ e None</p> <p style="text-align: right;">(112)</p>	<p>(119)</p> $3x \times 4x =$ <p>a 12x b -x c 7x</p> <p>d $12x^2$ e None</p> <p style="text-align: right;">(119)</p>
<p>(106)</p> $\begin{array}{r} 3 \text{ yd. } 5 \text{ ft. } 6 \text{ in.} \\ \times 7 \\ \hline \end{array}$ <p>a 20 yd. 35 ft. 42 in. b 33 yd. 2 ft. 6 in. c 33 yd. 5 ft. 6 in. d 33 yd. 2 ft. $2\frac{1}{3}$ in. e None</p> <p style="text-align: right;">(106)</p>	<p>(113)</p> $8\frac{2}{5} \times 4\frac{1}{7} =$ <p>a $34\frac{4}{5}$ b $34\frac{28}{35}$ c $4\frac{9}{35}$</p> <p>d $12\frac{1}{4}$ e None</p> <p style="text-align: right;">(113)</p>	<p>(120)</p> $(r-s)(r-s^2) =$ <p>a $r^2 - rs - rs^2 + s^3$ b $r^2 - s^3$ c $2r - s^3$ d $r^2 - 2s^3$ e None</p> <p style="text-align: right;">(120)</p>
<p>(107)</p> $4 \times \frac{1}{4} =$ <p>a $\frac{1}{16}$ b $4\frac{1}{4}$ c 1 d $3\frac{3}{4}$ e None</p> <p style="text-align: right;">(107)</p>	<p>(114)</p> $\begin{array}{r} 46\frac{2}{3} \\ \times 15 \\ \hline \end{array}$ <p>a $61\frac{2}{3}$ b $31\frac{2}{3}$ c 700 d $51\frac{2}{3}$ e None</p> <p style="text-align: right;">(114)</p>	

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

TEST 4—SECTION G

DIRECTIONS: Do these problems in division. Then mark the letter of each correct answer. Finish each column before going on to the next. Be sure to express remainders as fractions and reduce fractions to lowest terms.

<p>(121)</p> $7 \overline{)70}$ <p>a 63 b 77 c 10 d 490 e None</p> <p style="text-align: right;">(121)</p>	<p>(128)</p> $6 \div \frac{2}{3} =$ <p>a 9 b $5\frac{1}{3}$ c $6\frac{2}{3}$</p> <p>d $\frac{1}{9}$ e None</p> <p style="text-align: right;">(128)</p>	<p>(135)</p> $.02 \overline{)6}$ <p>a 3.00 b 300 c .30 d $\frac{2}{3}$ e None</p> <p style="text-align: right;">(135)</p>
<p>(122)</p> $6 \overline{)626}$ <p>a 632 b $104\frac{1}{3}$ c 620 d 3756 e None</p> <p style="text-align: right;">(122)</p>	<p>(129)</p> $\frac{1}{2} \div \frac{1}{2} =$ <p>a $\frac{1}{4}$ b 0 c 2</p> <p>d 1 e None</p> <p style="text-align: right;">(129)</p>	<p>(136)</p> $2 \overline{)7.12}$ <p>a 5.12 b 35.6 c 3.56 d 14.24 e None</p> <p style="text-align: right;">(136)</p>
<p>(123)</p> $44 \overline{)17864}$ <p>a 17820 b 46 c 406 d 416 e None</p> <p style="text-align: right;">(123)</p>	<p>(130)</p> $\frac{5}{8} \div \frac{1}{4} =$ <p>a $2\frac{1}{2}$ b $\frac{3}{8}$ c $\frac{5}{32}$</p> <p>d $\frac{7}{8}$ e None</p> <p style="text-align: right;">(130)</p>	<p>(137)</p> $.02 \overline{).712}$ <p>a 1.424 b 3.56 c .692 d 35.6 e None</p> <p style="text-align: right;">(137)</p>
<p>(124)</p> $200 \overline{)6000}$ <p>a 300 b 3.0 c 1200000 d 30 e None</p> <p style="text-align: right;">(124)</p>	<p>(131)</p> $5\frac{1}{3} \div \frac{3}{4} =$ <p>a 4 b $7\frac{1}{9}$ c $4\frac{1}{4}$</p> <p>d $6\frac{1}{12}$ e None</p> <p style="text-align: right;">(131)</p>	<p>(138)</p> $\frac{1}{3} \text{ of } 27 \div \frac{1}{6} \text{ of } 18 =$ <p>a 3 b $\frac{1}{3}$ c .75</p> <p>d 27 e None</p> <p style="text-align: right;">(138)</p>
<p>(125)</p> $72 \overline{)5694}$ <p>a $79\frac{1}{12}$ b 5766 c 5622 d 409968 e None</p> <p style="text-align: right;">(125)</p>	<p>(132)</p> $4\frac{2}{3} \div 2\frac{1}{2} =$ <p>a $6\frac{1}{2}$ b $8\frac{1}{3}$ c $1\frac{13}{15}$</p> <p>d $2\frac{1}{6}$ e None</p> <p style="text-align: right;">(132)</p>	<p>(139)</p> $\frac{a^2 - a}{a} =$ <p>a $a^3 - a^2$ b $a - 1$ c 1</p> <p>d $1a$ e None</p> <p style="text-align: right;">(139)</p>
<p>(126)</p> $1 \div \frac{1}{3} =$ <p>a 3 b $\frac{1}{9}$ c $\frac{1}{3}$</p> <p>d $1\frac{1}{3}$ e None</p> <p style="text-align: right;">(126)</p>	<p>(133)</p> $150 \div 1\frac{1}{2} =$ <p>a $151\frac{1}{2}$ b 1000 c 10</p> <p>d 100 e None</p> <p style="text-align: right;">(133)</p>	<p>(140)</p> $\frac{3r^3 - 3r^2s + rs - s^2}{r - s} =$ <p>a $rs - s^2$ b $3r^3 - 3rs + rs - s$ c $3r^2 + s$ d $3r^4 - 3r^2s + rs - s^3$ e None</p> <p style="text-align: right;">(140)</p>
<p>(127)</p> $\frac{1}{3} \div 3 =$ <p>a 1 b $\frac{1}{9}$ c $3\frac{1}{3}$</p> <p>d $\frac{1}{6}$ e None</p> <p style="text-align: right;">(127)</p>	<p>(134)</p> $4 \overline{)123\frac{2}{3}}$ <p>a $30\frac{11}{12}$ b $3\frac{11}{12}$ c $30\frac{2}{3}$ d $127\frac{2}{3}$ e None</p> <p style="text-align: right;">(134)</p>	

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Language

INSTRUCTIONS TO STUDENTS:

This is a language test. In taking it you will show what you know about capitalization, punctuation, and words and sentences, and how well you can spell. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.

TEST 5—SECTION A

DIRECTIONS: In most lines of the story and sentences below, four words have a number above the first letter. If **ONE** of the letters should be a capital, mark its number. If none of the four letters should be a capital, mark **N**, which stands for None. Not more than one letter with a number over it should be a capital on any one line.

	Correct Test Booklet Mark	Correct Answer Sheet Mark										
SAMPLE: A. ¹ The winner of the race was ² tom. ³ ⁴	<u>4</u> A	A <table style="display: inline-table; border: none;"><tr><td style="text-align: center;">1</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td><td style="text-align: center;">4</td><td style="text-align: center;">N</td></tr><tr><td style="text-align: center;">⋮</td><td style="text-align: center;">⋮</td><td style="text-align: center;">⋮</td><td style="text-align: center;"> </td><td style="text-align: center;">⋮</td></tr></table>	1	2	3	4	N	⋮	⋮	⋮		⋮
1	2	3	4	N								
⋮	⋮	⋮		⋮								
SAMPLE: B. ¹ He is one of my best ² friends. ³ ⁴	<u>N</u> B	B <table style="display: inline-table; border: none;"><tr><td style="text-align: center;">1</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td><td style="text-align: center;">4</td><td style="text-align: center;">N</td></tr><tr><td style="text-align: center;">⋮</td><td style="text-align: center;">⋮</td><td style="text-align: center;">⋮</td><td style="text-align: center;">⋮</td><td style="text-align: center;"> </td></tr></table>	1	2	3	4	N	⋮	⋮	⋮	⋮	
1	2	3	4	N								
⋮	⋮	⋮	⋮									

In Sample A, the “t” in “tom,” which has a 4 above it, should be a capital. Notice how the 4 has been marked. In Sample B, none of the letters with numbers above them should be capitals, so the N has been marked.

STORY

- | | | |
|-----|---|---------|
| 1. | Last week, while looking through the magazines | _____ 1 |
| 2. | at the carnegie Library, I came across some beautiful
color pictures of Italy. They had been taken | _____ 2 |
| 3. | by a reverend Swanson on his vacation and were in a | _____ 3 |
| 4. | magazine called <i>holiday</i> . They certainly made my mind | _____ 4 |
| 5. | wander. with all of the wonderful places in the world | _____ 5 |
| 6. | to see, my sister, diane, and I had never been outside | _____ 6 |
| 7. | of springfield! I began to feel sorry for myself. | _____ 7 |
| 8. | When Father arrived home from work early | _____ 8 |
| 9. | last monday night, I asked him if we could afford | _____ 9 |
| 10. | to spend our vacation in rome this summer. | _____10 |
| 11. | After thinking it over, he said, “would you | _____11 |



TEST 5—SECTION A (Continued)

12. ¹ rather ² go ³ abroad ⁴ for a month or go to college next _____12
13. ¹ year? Which ² will it be—the ³ university or ⁴ europe?" _____13
14. ¹ He reminded me of ² Father in ³ *life With Father*, by ⁴ _____14
- the famous author, Clarence Day, the way he spoke.
15. ¹ he had put me on the ² spot, and I didn't know how ³ _____15
16. ¹ ² to answer him. He knew that in ³ september I would ⁴ _____16
17. ¹ want ² desperately to go to ³ college. ⁴ _____17
18. "Perhaps," I said, "mr. Nichols at the bank can ¹ _____18
19. ¹ lend us some ² money. Then I can see the ³ vatican and ⁴ _____19
20. ¹ the famous ² coliseum as well as go to ³ college." ⁴ _____20
21. Then Mother laughed, "one can hardly blame your ¹ _____21
- father for getting his Irish temper up, young lady.
22. John ¹ d. Rockefeller is no ² relative of ours, nor ³ _____22
23. ¹ does your ² father belong to the ³ millionaire's ⁴ Club." _____23
24. Father added, "Your aunt Kit, who is an actress ¹ _____24
25. ¹ in the east, has been to many ² foreign ³ countries. ⁴ _____25
26. She says one needs a thick ¹ pocketbook to ² travel. ³ _____26
27. You had better settle for ¹ Colford ² college ³ this fall!" ⁴ _____27

TEST 5—SECTION A (Continued)

SENTENCES

28. ¹ John ² fired ³ once. ⁴ the hawk dropped. _____28
- Emma said that she and Jane spent
29. ¹ an ² interesting ³ summer ⁴ near a lake. _____29
30. ¹ Easter ² usually ³ falls ⁴ on a Sunday in April. _____30
31. ¹ Ted ² speaks ³ french ⁴ like a native. _____31
32. ¹ *The Children's hour* ² is ³ a well-known ⁴ poem. _____32
33. ¹ Henry ² asked, "where ³ do ⁴ you study _____33
34. ¹ your ² Spanish ³ and ⁴ mathematics on weekdays?" _____34
35. ¹ *The marriage of Figaro* ² is ³ an ⁴ opera by Mozart. _____35
36. ¹ The famous ² admiral ³ Dewey, ⁴ one of our national _____36
37. ¹ heroes, ² destroyed ³ the Spanish ⁴ fleet at manila. _____37
38. ¹ He ² attends ³ Yale ⁴ university, which is in New _____38
- Haven.
39. ¹ The ² House ³ and ⁴ the senate were in session. _____39
40. ¹ His ² mother ³ said, "look ⁴ where you step." _____40

TEST 5—SECTION B

DIRECTIONS: In the letter and story below, most lines have a number, such as 41, 42, or 43. If a punctuation mark is needed where the number is, make a black mark within the pair of dotted lines under the punctuation mark needed. If no punctuation is needed, make a black mark under the N, which stands for None. Show either apostrophes or single quotation marks in the fourth column. Only one answer should be given for each line.

Correct Test Booklet
and Answer Sheet Mark

SAMPLE: C. Mary₁ will you come with us?

	,	:	"	'	N
1	⋮	⋮	⋮	⋮	⋮

SAMPLE: D. The bus₂ is leaving at ten o'clock.

	,	:	"	'	N
2	⋮	⋮	⋮	⋮	⋮

In Sample C, a comma is needed at 1 after the word "Mary," so a mark has been made under the comma in answer row 1. In sample D, no punctuation mark is needed at 2, so the N has been marked in answer row 2. If you are using an answer sheet, do not mark on this page.

221 East Fifth Street

Omaha, Nebraska

June 8, 1956

Mr. James P. Holt

The Stars Magazine

6018 Sunset Boulevard

Hollywood 28₄₁ California

	,	:	"	'	N
41	⋮	⋮	⋮	⋮	⋮

Dear Mr. Holt₄₂

	,	:	"	'	N
42	⋮	⋮	⋮	⋮	⋮

This morning₄₃s letter from you was a wonderful surprise to both Mother₄₄ and me. To know that

	,	:	"	'	N
43	⋮	⋮	⋮	⋮	⋮

of all the contestants from the United States, Canada, and Hawaii, I was the winner, is thrilling. Yes₄₅

	,	:	"	'	N
44	⋮	⋮	⋮	⋮	⋮

Mother will be happy to come along for the two week₄₆s

	,	:	"	'	N
45	⋮	⋮	⋮	⋮	⋮

in a chaperone₄₇s capacity. A few days ago at our house,

	,	:	"	'	N
46	⋮	⋮	⋮	⋮	⋮

	,	:	"	'	N
47	⋮	⋮	⋮	⋮	⋮

TEST 5—SECTION B (Continued)

while a group of us were talking about the contest,⁴⁸
 as usual⁴⁹ she said, “I’ve always wanted to see
 Hollywood and California.⁵⁰

As to your question of how we’d like to travel⁵¹
 any of the following will do⁵² plane, train, auto,
 bus, boat, or oxcart! Seriously, though, the trip
 is one that we⁵³ve wanted to take for a long time.
 So, when Mother asked me which I preferred, I said⁵⁴
 “Plane would be the best, but as the saying goes, ⁵⁵Beggars
 can’t be choosers.’ Whatever you decide will be fine.⁵⁶

Mr. Holt⁵⁷ you wrote that the winning essay
 would be published⁵⁸ and I wondered in which issue.
 Actually, though, it really doesn⁵⁹t matter as long as I
 have won. The moment I am anxiously awaiting⁶⁰ and
 for which I am preparing myself is Monday, June 25, at
 8⁶¹00 A. M. I hope that my part in the movie “Two
 Tickets to Courage⁶² is one to which I can do justice.
 However⁶³ rest assured I will do my best.

The picture that the studio wants is enclosed.⁶⁴

Sincerely yours⁶⁵

Gloria West⁶⁶

48 , : " ' N
 49 , : " ' N
 50 , : " ' N
 51 , : " ' N
 52 , : " ' N
 53 , : " ' N
 54 , : " ' N
 55 , : " ' N
 56 , : " ' N
 57 , : " ' N
 58 , : " ' N
 59 , : " ' N
 60 , : " ' N
 61 , : " ' N
 62 , : " ' N
 63 , : " ' N
 64 , : " ' N
 65 , : " ' N
 66 , : " ' N



TEST 5—SECTION B (Continued)

STORY

Yesterday, upon Alice's return₆₇ from Europe₆₈ she visited Marie, Helen, and Dorothy.

Dorothy said, "Did you enjoy₆₉ Europe?"

Alice quickly answered, ₇₀I had a good time, but I spent too much money." Continuing₇₁

Alice said,₇₂ "I saw a large number of extremely poor people.₇₃ They followed us

through the streets and kept saying₇₄ 'Please buy!₇₅ and, since I could not resist

them,₇₆ I bought too much."

Helen said,₇₇ "When I was in Europe, I also heard them plead, ₇₈Please buy,' but I

sometimes refused. One₇₉s money lasts just so long, so don₈₀t you think I'm right?"

67	:	:	:	:	N
68	:	:	:	:	N
69	:	:	:	:	N
70	:	:	:	:	N
71	:	:	:	:	N
72	:	:	:	:	N
73	:	:	:	:	N
74	:	:	:	:	N
75	:	:	:	:	N
76	:	:	:	:	N
77	:	:	:	:	N
78	:	:	:	:	N
79	:	:	:	:	N
80	:	:	:	:	N

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

TEST 5—SECTION C

DIRECTIONS: Mark the number of the correct or better word in each sentence below.

SAMPLE: E. She (¹ ain't ² isn't) as tall as Betty.

Correct Test
Booklet Mark

Correct Answer
Sheet Mark

2 E

E 1 2

In Sample E, the word in parentheses with the 2 by it, "isn't," is the better word. Notice how the 2 has been marked.

- | | |
|---|--|
| <p>81. The editor has (¹ wrote ² written) a strong editorial. _____81</p> <p>82. In the sentence below, "spirit" and "flesh" are both (¹ nouns ² adjectives): _____82</p> <p style="padding-left: 20px;">The spirit is willing, but the flesh is weak.</p> <p>83. You (¹ was ² were) very convincing in the debate, Ray. _____83</p> <p>84. I (¹ had ² hadn't) hardly finished when the doorbell rang. _____84</p> <p>85. There are (¹ eight ² six) different parts of speech. _____85</p> <p>86. Has the captain (¹ saw ² seen) the weather report yet? _____86</p> <p>87. (¹ Sitting ² Setting) the basket down, she went back. _____87</p> <p>88. An infinitive is a form of a (¹ conjunction ² verb). _____88</p> | <p>89. In "the house which once belonged to his mother," there are (¹ two ² three) nouns. _____89</p> <p>90. Just then, the principal walked (¹ into ² in) the room. _____90</p> <p>91. Tense is related to (¹ adjectives ² verbs). _____91</p> <p>92. If (¹ us ² we) neighbors all sign it, we have a chance. _____92</p> <p>93. "Help" is classified as (¹ an interjection ² a verb) in the sentence below: _____93</p> <p style="padding-left: 20px;">Help! I'm falling.</p> <p>94. What (¹ became ² become) of your brother's textbooks? _____94</p> <p>95. In the phrase "sad but true," the word "but" is a (¹ conjunction ² preposition). _____95</p> |
|---|--|

TEST 5—SECTION C (Continued)

96. In "When are we leaving?" the word "When" is (¹ a preposition ² an adverb). _____ 96
97. "Purchased" is (¹ the simple predicate ² the subject) of the sentence below: _____ 97
 The committee purchased new classroom equipment with the benefit funds.
98. (¹ On account of ² Because of) his popularity, the vote was unanimous. _____ 98
99. In the verb phrase "will leave," the auxiliary verb is (¹ will ² leave). _____ 99
100. The concert had (¹ begun ² began) when we arrived. _____ 100
101. The objective case of the pronoun "he" is (¹ his ² him). _____ 101
102. In "The Last Rose of Summer," the word "Last" is an (¹ adjective ² adverb). _____ 102
103. A sentence which expresses a command is called an (¹ imperative ² interrogative) sentence. _____ 103
104. A swarm of bees like that (¹ scare ² scares) me. _____ 104
105. The nominative case of the pronoun "them" is (¹ their or theirs ² they). _____ 105
106. The sentence below is a (¹ complex ² compound) sentence: _____ 106
 James ran to first base, and Henry walked up to the plate.
107. In "I will go if you do," the word "if" is (¹ an interjection ² a conjunction). _____ 107
108. The possessive case of the pronoun "me" is (¹ my or mine ² I). _____ 108
109. The sentence below is (¹ compound ² simple): _____ 109
 Each person took his accustomed position in an endeavor to make the best of a difficult situation.
110. A given word (¹ may ² may not) function as more than one part of speech. _____ 110
111. If he (¹ lies ² lays) down, it'll be difficult for him to get up. _____ 111
112. The subject of the sentence you are now reading is the word (¹ "sentence" ² "subject"). _____ 112
113. Everyone who is going has bought (¹ his ² their) ticket. _____ 113
114. The superlative degree of the adverb "much" is (¹ more ² most). _____ 114
115. (¹ Who ² Whom) did you visit? _____ 115
116. A gerund is the form of a verb ending in (¹ ed ² ing) when used as a noun. _____ 116

TEST 5—SECTION C (Continued)

117. The word “to” plus the simple form of a verb is called (¹an infinitive ²a prepositional phrase). _____117
118. One of those three boys (¹are ²is) guilty. _____118
119. The past participle of “swim” is (¹swum ²swam). _____119
120. The best grades in algebra went to George and (¹I ²me). _____120
121. A participle that has no noun or pronoun which it can modify is called a (¹dangling ²past) participle. _____121
122. My father is much taller than (¹him ²he). _____122
123. My chum (¹has run ²has ran) for the car every morning this week. _____123
124. The word “immediately,” used to tell when something happened, is an (¹adjective ²adverb). _____124
125. In “The sun shines,” the verb “shines” is (¹transitive ²intransitive). _____125
126. I wish I had (¹lain ²laid) down when I first felt sick. _____126
127. The sentence below is (¹compound ²simple): _____127
They consider him to be a capable person and an asset to the company.
128. The two main clauses in a compound sentence (¹need not ²must) be joined by a conjunction. _____128

✓ For each statement given below that is a complete sentence, mark YES; for each that is not, mark NO.

129. Having won the match and beaten a foe who had long been his most bitter rival. YES NO 129
130. According to one of the country’s leading physicians, the ability to relax when the mind and the body need it most is an art which, alas, too few of us learn to master in our lifetime. YES NO 130
131. While the natives watched the ships sailing past the harbor. YES NO 131
132. The books lay in confused piles on the cluttered shelves. YES NO 132
133. Having served his country exceedingly well, both in times of war and peace, without any type of reward. YES NO 133
134. In the auto shop, with the mechanic as unkempt and greasy as the car on which he worked. YES NO 134
135. The old saying “A fool and his money are soon parted” should not be applied to a man of his stature. YES NO 135
136. Waiting in the chill evening air for the signal of the scientists to flash before us. YES NO 136

TEST 5—SECTION C (Continued)

137. Eighteen holes of golf on a day as hot as this being almost too much for one as inexperienced as he. **YES NO 137**
138. The giant boulders rolled like mighty balls into the river bed, creating a loud rumbling. **YES NO 138**
139. When new forms of exercise which everyone can and should take are engaged in indiscriminately and serve to keep the individual tired so that he receives no real relaxation or freeing of energies for the time he could otherwise use more effectively. **YES NO 139**

140. After the initial reactions to the senator's speech had died down and the ordinary citizen, after thinking over what was said in the historic debate which followed, began to make his feelings known to his representatives in Washington, D. C. **YES NO 140**

STOP NOW WAIT FOR
FURTHER INSTRUCTIONS

TEST 6

DIRECTIONS: Each line in this test contains four spelling words and the word, None. These words are numbered 1, 2, 3, 4, and the None is numbered 5. In some of the lines, one word is misspelled. In others, no word is misspelled. If there is a misspelled word, mark its number. If no word is misspelled, mark the 5.

					Correct Test Booklet Mark	Correct Answer Sheet Mark					
SAMPLE:	F.	¹ now	² just	³ come	⁴ ron	⁵ None					
							4				
SAMPLE:	G.	¹ go	² see	³ do	⁴ may	⁵ None	5				

141.	¹ readily	² fatigue	³ mast	⁴ largely	⁵ None	___141
142.	¹ bookcase	² voyage	³ exception	⁴ ministers	⁵ None	___142
143.	¹ asociate	² kindle	³ applicant	⁴ hasten	⁵ None	___143
144.	¹ summary	² accredited	³ successfully	⁴ virtue	⁵ None	___144
145.	¹ honeymoon	² proceedings	³ exceedingly	⁴ expendichure	⁵ None	___145
146.	¹ probably	² noisy	³ vulgar	⁴ feiry	⁵ None	___146
147.	¹ prohibition	² imagined	³ resignasion	⁴ fragrant	⁵ None	___147
148.	¹ estamate	² biscuit	³ revised	⁴ mince	⁵ None	___148
149.	¹ wiring	² trustees	³ campaign	⁴ postpone	⁵ None	___149
150.	¹ heavily	² assistant	³ duplicate	⁴ peculier	⁵ None	___150
151.	¹ trimmed	² interfear	³ regretting	⁴ salaries	⁵ None	___151
152.	¹ finally	² whiskers	³ eligent	⁴ hurried	⁵ None	___152
153.	¹ procession	² raisin	³ omission	⁴ lepoard	⁵ None	___153
154.	¹ greivance	² arrangements	³ committee	⁴ crisis	⁵ None	___154
155.	¹ delinquent	² initiate	³ faculties	⁴ allumni	⁵ None	___155
156.	¹ competent	² extrordinary	³ cafeteria	⁴ applicable	⁵ None	___156
157.	¹ heartily	² forfeit	³ labratory	⁴ dependent	⁵ None	___157
158.	¹ adjourned	² mischievous	³ thoroughly	⁴ controversy	⁵ None	___158
159.	¹ ultimate	² transformed	³ chauffeur	⁴ receipted	⁵ None	___159
160.	¹ forcibly	² dissention	³ negotiations	⁴ requisition	⁵ None	___160
161.	¹ counsel	² livlihood	³ bouquet	⁴ charlatan	⁵ None	___161
162.	¹ anticipated	² amendement	³ traffic	⁴ routine	⁵ None	___162
163.	¹ developement	² grocer	³ apartments	⁴ ferry	⁵ None	___163
164.	¹ festival	² efficiency	³ originally	⁴ dimensions	⁵ None	___164
165.	¹ fraternity	² reckon	³ kindergarden	⁴ acutely	⁵ None	___165
166.	¹ duely	² vouchers	³ undoubtedly	⁴ transferred	⁵ None	___166
167.	¹ attorneys	² politician	³ efficient	⁴ parliment	⁵ None	___167
168.	¹ affiliated	² unanimous	³ tonage	⁴ aggravate	⁵ None	___168
169.	¹ expedite	² greatful	³ abandon	⁴ communities	⁵ None	___169
170.	¹ amiable	² sorority	³ rheumatism	⁴ tyrannous	⁵ None	___170

(The quick brown fox just came over to greet the lazy poodle.)

STOP NOW WAIT FOR FURTHER INSTRUCTIONS

Grade Placement.....

Diagnostic Analysis of Learning Difficulties*

California Achievement Tests—Advanced Battery

1. Reading Vocabulary

A. MATHEMATICS

_____ t-15 Basic vocabulary

B. SCIENCE

_____ t6-30 Basic vocabulary

C. SOCIAL SCIENCE

_____ 3t-45 Basic vocabulary

D. GENERAL

_____ 46-60 Basic vocabulary

2. Reading Comprehension

E. FOLLOWING DIRECTIONS

_____ 61, 65, 71, 72, 75 Directions in mathematical situations
 _____ 63, 67, 68, 69, 70, 73, 74 Directions in language situations
 _____ 62, 64, 66 Directions in science situations

F. REFERENCE SKILLS

_____ 76, 77, 81, 82 Vocabulary
 _____ 78, 79, 80 Dictionary and library skills
 _____ 83, 84, 85 Selecting references
 _____ 86, 87 Report outline
 _____ 88-92 Reading a graph
 _____ 93-102 Reading a map

G. INTERPRETATION OF MATERIAL

_____ 120, 121, 147 Topic or central idea
 _____ 103, 105, 108, 118, 117, 118, t23, 140, t43, 146 Directly stated facts
 _____ 104, 106, 107, 109, 110, 111, 112, 113, t14, t15, 119, t22, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 141, 142, 144, 145 Inferences

3. Mathematics Reasoning

A. MEANINGS

_____ t, 2, 3 Writing integers
 _____ 4 Writing money
 _____ 5, 6, 7 Writing fractions and decimals
 _____ 8, 9, 10 Roman numerals
 _____ 11, 12, 13 Fractions and decimals
 _____ t4, 15, 16, 17 Exponents and roots
 _____ 18, 19, 20 Abstract numbers

B. SYMBOLS, RULES, & EQUATIONS

_____ 21, 22, 26, 27 Vocabulary
 _____ 23, 24, 25, 28, 29, 30 Symbols
 _____ 31, 32, 33, 34, 35 Rules
 _____ 36, 37, 38, 39 Negative numbers
 _____ 40, 41, 42, 43, 44, 45 Solving equations

C. PROBLEMS

_____ 46, 47 Simple problems
 _____ 48, 57 Averaging
 _____ 51, 52 Square and cubic measure
 _____ 49, 50, 53, 55, 56, 59 Ratio and percentage
 _____ 54 Budgeting
 _____ 58, 60 Insurance and discount

4. Mathematics Fundamentals

D. ADDITION

_____ 61, 62 Simple combinations
 _____ 63, 64 Carrying
 _____ 61, 63 Zeros
 _____ 63, 64 Column addition
 _____ 64, 66 Adding money
 _____ 64, 65, 66 Denominate numbers
 _____ 67 Adding numerators
 _____ 68, 70, 71, 72, 73 Fract. to common denominators
 _____ 69, 70, 71, 72, 73 Adding mixed numbers
 _____ 74, 75 Adding fractions & decimals
 _____ 76, 77 Writing decimals in column
 _____ 78 Adding percentages
 _____ 79, 80 Adding abstract numbers

E. SUBTRACTION

_____ 8t Simple combinations
 _____ 82, 83, 84, 85 Borrowing
 _____ 83, 85 Zeros
 _____ 84, 85 Subtracting money
 _____ 84, 85, 86 Denominate numbers
 _____ 87, 88 Subtracting numerators
 _____ 89, 90 Fractions to common denom.
 _____ 91, 92, 93 Borrowing, mixed numbers
 _____ 94, 95 Subtracting fractions and decimals
 _____ 96, 97 Writing decimals in column
 _____ 98 Subtracting fractional parts
 _____ 99, 100 Subtracting abstract numbers

F. MULTIPLICATION

_____ 101, 102, 103, t04, 105 Tables
 _____ 102, 105 Zeros in multiplicand
 _____ 104, 105 Zeros in multiplier
 _____ 103, 104, 105 Two- and 3-place multipliers
 _____ 108 Denominate numbers
 _____ t07, t09, t10, t11 Cancellation of fractions
 _____ 108 Multiplying numerators and denominators
 _____ 112, 113, t14 Fractions and mixed numbers
 _____ 115 Fractions and decimals
 _____ t16, t17 Pointing off decimals
 _____ t18 Multiplying per cent
 _____ t19, t20 Multiplying abstract numbers

G. DIVISION

_____ 121, 122, 123, 124, 125 Tables
 _____ 121, 122, 123, 124 Zeros in quotient
 _____ 125 Remainders
 _____ 126, 127, 128, 129, 130, 131, 132, 133 Inverting divisors
 _____ 131, 132, 133 Mixed numbers
 _____ 134 Fractions in remainder
 _____ 135, 136, 137 Pointing off decimals
 _____ 138 Division, fractional parts
 _____ 139, 140 Division, abstract numbers

5. Mechanics of English

A. CAPITALIZATION

_____ 2, 27, 38, 39 Names of institutions
 _____ 3, 18, 24 Titles of persons
 _____ 4, 14, 32, 35 Titles of literature and drama
 _____ 5, 15, 28 First words of sentences
 _____ 6, 22, 36 Names of persons
 _____ 7, 10, 13, 19, 20, 25, 37 Names of places
 _____ 9, 16, 30 Days and months
 _____ 11, 21, 33, 40 First words of quotations
 _____ 23 Name of club
 _____ 31 Name of language
 _____ 1, 8, 12, 17, 26, 29, 34 Over-capitalization

B. PUNCTUATION

_____ 41, 45, 49, 51, 54, 57, 58, 63, 65, 68, 71, 74, 76, 77 Commas
 _____ 42, 52, 61 Colons
 _____ 43, 47, 53, 59, 79, 80 Apostrophes
 _____ 50, 56, 62, 70 Quotation marks
 _____ 55, 75, 78 Quotations within quotations
 _____ 44, 46, 48, 60, 64, 66, 67, 69, 72, 73 Over-punctuation

C. WORD USAGE

_____ 81, 86, 94, 100, 119, 123 Tense
 _____ 82, 85, 89, 93, 95, 96, 102, 107, 110, 124 Parts of speech
 _____ 83, t04, 113, t18 Number
 _____ 84, 87, 90, 98, 111, 128 Good usage
 _____ 88, 91, 97, 99, 103, t06, 109, 112, 114, 116, 117 Syntax
 _____ 121, 125, 127, t28 Case
 _____ 92, 101, 105, t08, 115, 120, 122 Case
 _____ 129-140 Recognizing sentences

6. Spelling (141-170) See profile

HANDWRITING See profile

* Consult Part 2 of the manual for uses.

Sex
M-F

Grade or
Occupation

Name

First

Last

School or
Organization

City

Month

Day

Year

California Achievement Tests

Advanced • GRADES 9 to 14 • Form X

DEvised BY ERNEST W. TIEGS AND WILLIS W. CLARK

Date of Test

Teacher or
Examiner

Month

Day

Year

Student's Age

Teacher or
Examiner

Month

Day

Year

See MANUAL for instructions.

TEST SECTION	POSSIBLE SCORE	STUDENT'S SCORE
1. READING VOCABULARY		
A. Mathematics	15	5
B. Science	15	8
C. Social Science	15	8
D. General	15	7
TOTAL (A+B+C+D)	60	28
2. READING COMPREHENSION		
E. Following Directions	15	7
F. Reference Skills	27	12
G. Interpretations	45	24
TOTAL (E+F+G)	87	43
3. MATHEMATICS REASONING		
A. Meanings	20	9
B. Symbols, Rules, and Equations	25	12
C. Problems	15	7
TOTAL (A+B+C)	60	28
4. MATHEMATICS FUNDAMENTALS		
D. Addition	20	16
E. Subtraction	20	14
F. Multiplication	20	14
G. Division	20	10
TOTAL (D+E+F+G)	80	54
5. MECHANICS OF ENGLISH		
A. Capitalization	40	33
B. Punctuation	40	38
C. Word Usage	60	40
TOTAL (A+B+C)	140	98
6. SPELLING		
TOTAL SPELLING	30	15
7. HANDWRITING		
Handwriting	100	100
8. BATTERY GRADE PLACEMENT		
BATTERY GRADE PLACEMENT		10.2
9. CHRONOLOGICAL AGE GR. PL.		
CHRONOLOGICAL AGE GR. PL.		10.3
10. ACTUAL GRADE PLACEMENT		
ACTUAL GRADE PLACEMENT		10.4
11. INTELL. (M.A.) GRADE PLACE.		
INTELL. (M.A.) GRADE PLACE.		10.6

READING GRADE PLACEMENT 10.4 50

MATHEMATICS GRADE PLACEMENT 9.4 46

LANGUAGE GRADE PLACEMENT 10.3 58

BATTERY GRADE PLACEMENT 10.2 50

CHRONOLOGICAL AGE GR. PL. 10.3

ACTUAL GRADE PLACEMENT 10.4

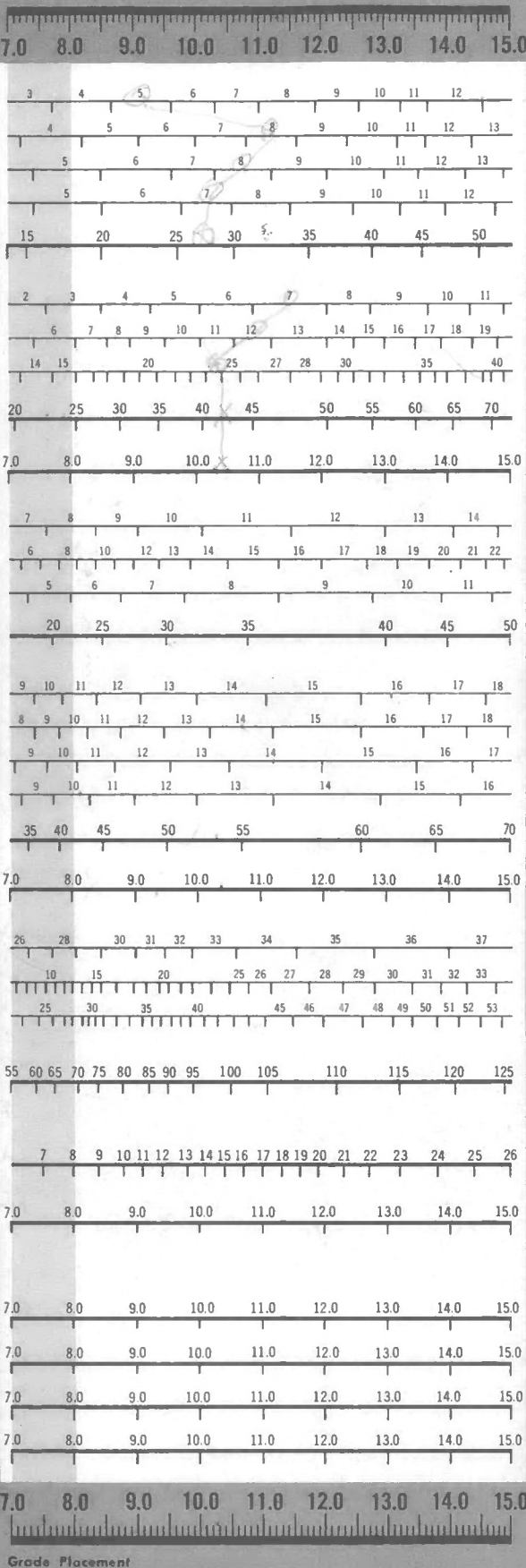
INTELL. (M.A.) GRADE PLACE 10.6

Grade Placement

Percentile Rank

DIAGNOSTIC PROFILE* (Chart Student's Scores Here)

Grade Placement



*For an interpretation of green area within Profile, see discussion on Articulation in Part 4 of Manual.

†Column designed for recording Expected Grade Placements, Anticipated Grade Placements, School or Class Averages, etc. See Part 2 of Manual.

APPENDIX B

**SPECIMEN OF CALIFORNIA SHORT-FORM TEST OF
MENTAL MATURITY, SECONDARY, FORM-S**

9-12th Grades



CALIFORNIA SHORT-FORM TEST OF MENTAL MATURITY

DEvised BY WILLIS W. CLARK AND ERNEST W. TIEGS
















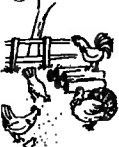
























➤ INSTRUCTIONS TO EXAMINEES:










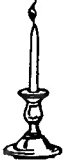










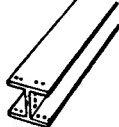



















In taking this test you will show how well you think and what you do when you face new problems. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

Do not write or mark on this test booklet unless told to do so by the examiner.

TEST 1

➤ **DIRECTIONS:** In each row there is one picture that shows something which is the opposite of the first picture. Find it and mark its number.

A						A
1						1
2						2
3						3
4						4
5						5
6						6
7						7

8						8
9						9
10						10
11						11
12						12
13						13
14						14
15						15

TEST 1 SCORE
(number right)

STOP

TEST 2

➤ **DIRECTIONS:** The first three pictures in each row are of things which are alike in some way. Decide how they are alike and then find the picture to the right of the dotted line that is most like them and mark its number.

B

1 2 3 4

16

1 2 3 4

17

1 2 3 4

18

B D R P H K L

1 2 3 4

19

1 2 3 4

20

1 2 3 4

21

1 2 3 4

22

1 2 3 4

23

1 2 3 4

24

1 2 3 4

25

1 2 3 4

26

1 2 3 4

27

1 2 3 4

28

1 2 3 4

29

1 2 3 4

30

1 2 3 4

➔➔➔➔➔ **DIRECTIONS:** Work these problems. Use scratch paper if necessary. Mark the letter of each correct answer.

E. If you earned \$5.00 and spent \$3.00, how many dollars would you have left? ^a \$1.00 ^c \$3.00 ^b \$2.00 ^d \$4.00	E
---	---

61. What number, if multiplied by 3, is equal to 2 times 9?

- ^a 3 ^c 9
^b 6 ^d 18

62. How much will your mother have to pay for the cleaning of a rug 9 feet wide and 12 feet long at the rate of 20¢ a square foot?

- ^a \$1.08 ^c \$8.40
^b \$4.20 ^d \$21.60

63. If a telephone book of 65 pages contains 4550 names, with the same number of names on each page, how many names are on the first 9 pages?

- ^a 505 ^c 630
^b 585 ^d 700

64. Richard saw an air rifle advertised for \$21.00 at one-third off for cash. How much money will he need to buy it?

- ^a \$18.00 ^c \$9.00
^b \$14.00 ^d \$7.00

65. An airplane is capable of carrying 30,000 pounds. Eighty passengers, whose average weight is 160 pounds, board the plane and each has 44 pounds of luggage. If 3680 pounds of air freight are loaded besides, how many 50-pound sacks of mail can also be placed on the plane?

- ^a 200 ^c 326
^b 256 ^d 600

66. A swimming pool is 60 feet long and 30 feet wide. The water in the pool is 4 feet deep on the average. How long will it take to fill the pool if the water runs in at the rate of 90 cubic feet a minute?

- ^a 5 min. ^c 45 min.
^b 26 min. ^d 80 min.

67. A clock on the tower of a building has a dial 7 feet in diameter. If marks representing the hours are placed on the edge of the dial, how far apart will the centers of these marks be? (Circumference of a circle is about $3\frac{1}{7}$ times the diameter.)

- ^a 22 in. ^c 8 in.
^b 14 in. ^d 7 in.

68. A portion of the bleachers on an athletic field consists of 20 rows of seats, each of which is 50 feet long. There are also 10 rows of seats, each 30 feet long. If each spectator is allowed 30 inches of seating space, how many can be seated when the bleachers are full?

- ^a 280 ^c 400
^b 312 ^d 520

69. In a field meet, 20 events were listed for the day. Pupils from your school won 60 per cent of the events. How many events did you lose?

- ^a 4 ^c 8
^b 3 ^d 12

70. How many $1\frac{1}{2}$ ¢ stamps would you give in even exchange for thirty $\frac{1}{2}$ ¢ stamps?

- ^a 10 ^c 20
^b 15 ^d 45

TEST 7

➤➤➤➤➤ **DIRECTIONS:** Read the following items. Mark the number or letter of each correct answer according to the story.

<p>G. The story read to you a while ago concerned people who</p> <p>¹ lived on an island.</p> <p>² lived on a peninsula.</p> <p>³ never achieved a high civilization.</p> <p>⁴ eventually brought about the Ming Dynasty.</p>	G
---	---

96. On the Aegean Islands, one can see and photograph ruined palaces, and admire ancient

¹ statuary.

² ships.

³ volcanoes.

⁴ myths.

96

97. The center of the Aegean civilization was located at a point where

¹ it was easy to make war on the mainland.

² it was easy to conquer three continents.

³ Europe, Africa, and Asia joined.

⁴ Europe, Africa, and Asia are closest together.

97

98. In the summer, the Cretan men wore

¹ togas.

² long robes.

³ modern-appearing clothes.

⁴ loincloths.

98

99. The Cretans averaged

¹ nearly six feet in height.

² a few inches under five feet in height.

³ a few inches over five feet in height.

⁴ a few inches over six feet in height.

99

100. The Cretan women were light-complexioned and apparently

¹ were of a different ethnic group than the men.

² did little housework.

³ spent considerable time indoors.

⁴ helped the men with their work.

100

101. The clothing of the Cretan women

¹ was rather primitive.

² was quite modern.

³ lacked lace and embroidery.

⁴ was usually a simple toga.

101

102. Two metals the Cretans especially needed were

¹ iron and steel.

² tin and copper.

³ lead and zinc.

⁴ copper and steel.

102

103. The Cretans first developed

¹ great fleets of warships.

² great land armies.

³ great fleets of merchant vessels.

⁴ pirate fleets.

103

104. The Cretan fleet ruled out the need for

¹ a large land army.

² ships with sails and oars.

³ land defenses.

⁴ peaceful trade with other areas.

104

TEST 7 (Continued)

105. The Cretans finally developed the
- ¹ galley.
 - ² merchant vessel.
 - ³ warship.
 - ⁴ packet ship.

105

110. The Cretan ships brought home gold, amber, ivory, and
- ¹ jewels from the Orient.
 - ² slaves from Africa.
 - ³ perfumes from Levant.
 - ⁴ samples of fine craftsmanship.

110

106. The greatest wealth the Cretans ever possessed was
- ¹ gold and ivory from North Africa.
 - ² amber and jade from Asia.
 - ³ their great fleet of warships.
 - ⁴ the skill of their craftsmen and designers.

106

111. As their civilization developed and the fleet became greater, the knowledge and skills of the Cretan craftsmen
- ¹ decreased.
 - ² remained the same.
 - ³ increased.
 - ⁴ centered around building warships.

111

107. The Cretans lived in comfortable homes while Europe was still
- ¹ unsettled.
 - ² the center of civilization and culture.
 - ³ in a primitive state.
 - ⁴ a completely unknown area.

107

112. We know of the expansion of the Aegean civilization from
- ¹ Asiatic writers.
 - ² records left by the Egyptians.
 - ³ legends of the Arabic peoples.
 - ⁴ cities like Mycenae and Argos.

112

108. The Cretan palaces were provided with
- ¹ central heat.
 - ² running water.
 - ³ Persian carpets.
 - ⁴ brick floors.

108

113. The early mainland cities, following Cretan expansion, contained palaces like those at
- ¹ Knossos.
 - ² Alexandria.
 - ³ Rome.
 - ⁴ Cyprus.

113

109. The largest Cretan buildings were usually constructed of either
- ¹ limestone or gypsum.
 - ² marble or sandstone.
 - ³ granite or concrete.
 - ⁴ wood or gypsum.

109

114. The early mainland palaces were decorated in the
- ¹ Cretan style.
 - ² Greek style.
 - ³ Egyptian style.
 - ⁴ European style.

114

TEST 7 (Continued)

115. One thing which identified the Cretan homes as being reasonably modern was
- ¹ central heat.
 - ² hot and cold running water.
 - ³ windows.
 - ⁴ an evaporative cooling system.

115

116. The Aegean civilization came to an end following
- ¹ two successive invasions.
 - ² three successive invasions.
 - ³ four successive invasions.
 - ⁴ five successive invasions.

116

117. The first invaders of the Aegean area were the
- ¹ Persians.
 - ² Egyptians.
 - ³ Romans.
 - ⁴ Achaeans.

117

118. The Aegean civilization ended in approximately
- ^a 900 B.C.
 - ^b 1100 B.C.
 - ^c 1500 B.C.
 - ^d 1800 B.C.

118

119. The last invaders of the Aegean area were the
- ¹ Huns.
 - ² Spartans.
 - ³ Dorians.
 - ⁴ Turks.

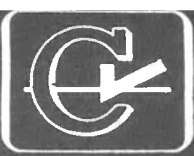
119

120. For many people today, the Aegean islands are merely
- ¹ barren lands.
 - ² dots on a map.
 - ³ tourist curiosities.
 - ⁴ uninteresting.

120

TEST 7 SCORE
(number right)

STOP



CALIFORNIA SHORT-FORM TEST OF MENTAL MATURITY

1963 S-FORM/LEVEL 4

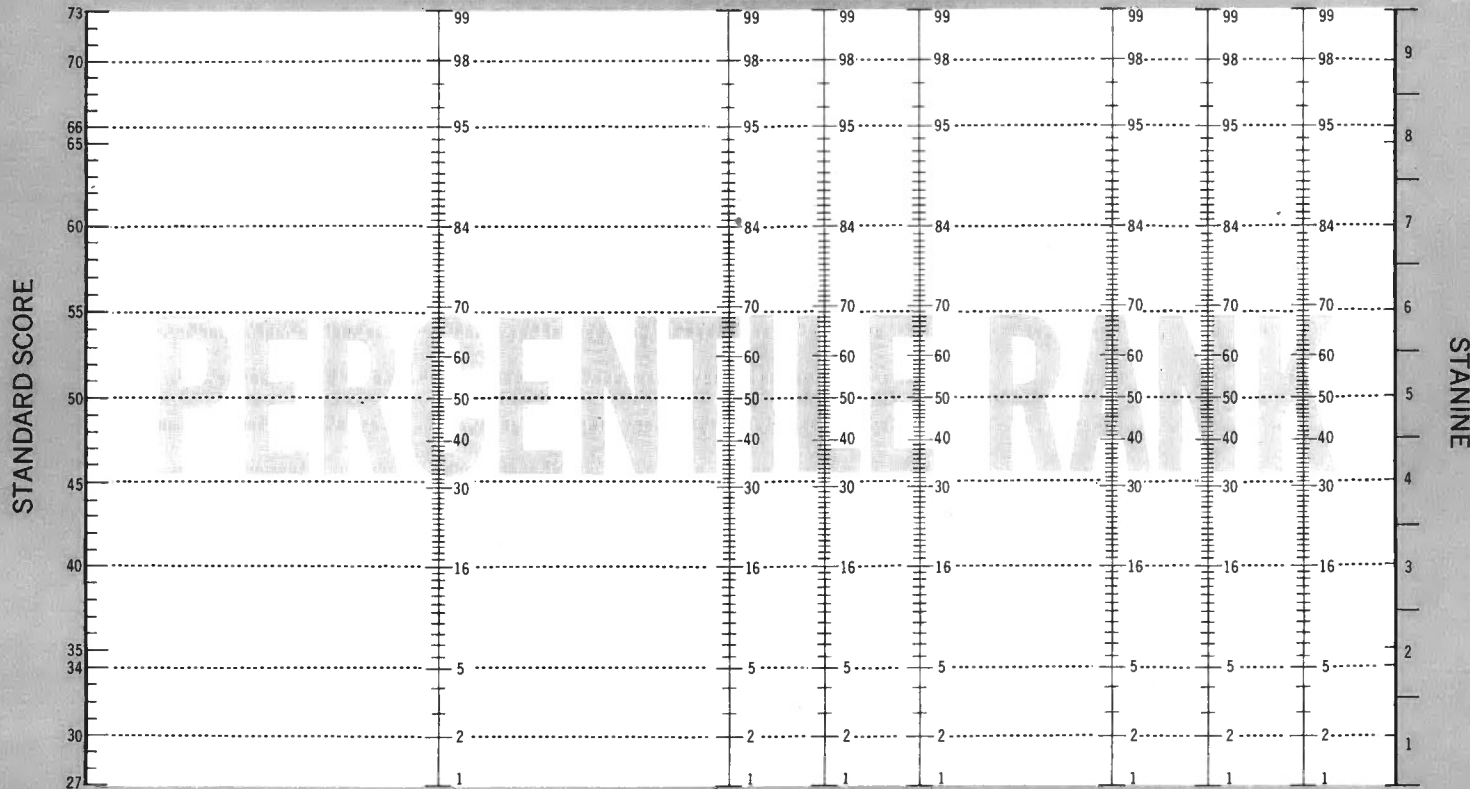
DEvised BY WILLIS W. CLARK AND ERNEST W. TIEGS

Name..... Last First Middle
 School or Organization..... City.....
 Grade or Occupation..... Examiner.....
 (Circle one)

Date of Test..... Year Month Day
 Date of Birth..... Year Month Day
 C.A. ()
 Years Months Total Mos.

TEST/FACTOR	1. OPPOSITES	2. SIMILARITIES	3. ANALOGIES	I. LOGICAL REASONING	4. NUMERICAL VALUES	5. NUMBER PROBLEMS	II. NUMERICAL REASONING	III. VERBAL CONCEPTS (6. VERBAL COMPREHENSION)	IV. MEMORY (7. DELAYED RECALL)	LANGUAGE (Tests 5, 6, 7)	NON-LANGUAGE (Tests 1, 2, 3, 4)	TOTAL	I.S.I.*
POSSIBLE SCORE	15	15	15	45	15	10	25	25	25	60	60	120	
RAW SCORE													ACTUAL G.P.
PERCENTILE*													GRADE C.A.

LANGUAGE	NON-LANGUAGE	TOTAL	M.A.†	RAW SCO	I.Q.‡



STANINE

*Unless otherwise indicated, national norms appropriate for examinee's chronological age are used.

†Intellectual Status Index; see Manual.

‡Must be obtained from table in Manual.

INTELLIGENCE QUOTIENT