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CORRECT POLYGONS

Construction of the correct polygon (n-sides polygon) remained a problem for mathematicians until the 19th century. Most famous mathematicians such as Karl Friedrich Gauss, Euclid, Per Laurent Vanzel, Johannes Erchinger, Friedrich Julius Richelio, Johann Gustav Hermes and others paid much attention to this problem.

A polygon is called correct if all its sides and corners are equal, for example, an equilateral triangle is a correct triangle, a square is a correct quadrilateral.

The correct polygon is a convex polygon.

Every corner of the correct n-sides polygon is equal $\frac{180°(n-2)}{n}$.

Indeed, since the sum of the angles of a convex n- sides polygon is $180°(n-2)$ and they are all equal, each of them is equal $\frac{180°(n-2)}{n}$.

Any correct polygon is simultaneously inscribed and described, and the centers of the described and inscribed circles coincide.

The point, which is the center of the described and inscribed circle of the correct polygon, is called the center of the correct polygon.

Formulas for finding the radii of the described and inscribed circles for the correct triangle, quadrilateral, and hexagon are the following:

The number of sides of the correct n- sides polygon	n = 3	n = 4	n = 6
The radius of the circle is described	$R_3 = \frac{a\sqrt{3}}{3}$	$R_4 = \frac{a\sqrt{2}}{2}$	$R_6 = a$

The radius of the circle is inscribed	$r_3 = \dfrac{a\sqrt{3}}{6}$	$r_4 = \dfrac{a}{2}$	$R_6 = \dfrac{a\sqrt{3}}{2}$

The ancient Greek mathematicians (Antiphon, Brison, Archimedes, etc.) used correct polygons to calculate the number π. They calculated the area of the polygons inscribed in the circle and the polygons around it, gradually increasing the number of their sides and thus obtaining the correct square of the circle.

In computer graphics, a polygon is a primitive used in modeling and rendering. They are defined in a database, containing arrays of vertices (the coordinates of the geometrical vertices, as well as other attributes of the polygon, such as color, shading and texture).

So, this topic is very important in the study of mathematics and computer grafhics.

References

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