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THE NEWEST AND MOST OPTIMAL FORMULAS FOR CALCULATING THE PERIMETER AND AREA OF THE EGYPTIAN TRIANGLE ARE ALL METHODS

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Abstract:
This article is devoted to the creation of the most optimal methods of teaching standard geometric shapes, which are considered relevant today, and to the development and improvement of modern methods of calculating the dimensions of this triangle.

Keywords: Egyptian triangle, legs, hypotenuse, ordinal number, calculation formula, Egyptian triangle constant

When calculating the perimeter, we take the sum of all sides and half of the product of the sides when calculating the surface.In this method it is written as follows:

$$P_{\Delta} = a + b + c \quad , \quad (5)$$

$$s_{\Delta n} = \frac{ab}{2} \quad , \quad (6)$$

These formulas are general formulas for calculating the area and perimeter of a triangle, and also allow for the calculation of the area and perimeter of the Egyptian triangle. Here *PΔ* is the perimeter of the triangle, *sΔ* is the surface of the triangle.

Calculating the perimeter and surface of the Egyptian (Pythagorean) triangle can be done using the general formula for triangles. When calculating the perimeter and surface area of the Egyptian (Pythagorean) triangle, it will be possible to find the perimeter and surface area of the first-order Egyptian triangle. Formulas created to perform these calculations are expressed as follows:

$$P_{\Delta n} = n \cdot P_{\Delta 1} \quad (7)$$

$$s_{\Delta n} = n^2 \cdot s_{\Delta 1} \quad (8)$$

1. Methods of calculating the sides, hypotenuse, perimeter and surface of the Egyptian (Pythagorean) triangle using ordinal numbers.

All the dimensions of the Egyptian triangle can be calculated by means of an ordinal number, that is, a number that is a multiple of it. The legs and hypotenuse of an Egyptian triangle of any order can be calculated using the following formulas:

$$a_n = n \cdot a_1 \quad (9)$$

$$b_n = n \cdot b_1 \quad (10)$$

$$c_n = n \cdot c_1 \quad (11)$$

The perimeter of the Egyptian triangle is calculated using the ordinal number using this formula:

$$P_{\Delta n} = 12 \cdot n \quad (12)$$

The surface area of the Egyptian triangle is calculated using the ordinal number using the following formula:

$$s_{\Delta n} = 6 \cdot n^2 \quad (13)$$

2. Methods of calculating the surface through the perimeter and calculating the perimeter through the surface.

We will try to determine the relationship between the perimeter and the surface of the Egyptian triangle by taking the reciprocal ratio of formulas (7) and (8).
In this case, we get a ratio like (8) / (7):

$$\frac{S_{\Delta_n}}{P_{\Delta_n}} = \frac{6n^2}{12n} = \frac{n}{2} \quad , \quad (14)$$

This equality (14), that is, the proportion, allows us to find the formula for the relationship between PΔ n and sΔn, which is required for the calculation:

$$P_{\Delta_n} = \frac{n}{2} \cdot S_{\Delta_n} \quad (15)$$

$$S_{\Delta_n} = \frac{2}{n} \cdot P_{\Delta_n} \qquad (16)$$

If we consider equations (2) and (3), then we can write formulas (10) and (11) in terms of PΔ1 and σΔ1 as follows: Learning this method is easily done by remembering the sizes of triangles in the first order (3,4,5,6,12).

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