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PROBLEMS OF IMPROVING THE METHODOLOGY OF CALCULATING SQUARE SIZES IN THE EGYPTIAN TRIANGLE

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ABSTRACT:

In This paper the relationship between the magnitudes of the squares drawn inside the Egyptian triangle and the magnitudes of these triangles, and the advantages of traditional Egyptian triangles over finding, calculating, and calculating the mathematical relationships of the magnitudes of these planimetric shapes are examined.

KEY WORDS: The Egyptian triangle, the ordinal number of the Egyptian triangle, δ - the constant size, the side of the square drawn inside the Egyptian triangle, the roof of the rectangle drawn inside the Egyptian triangle, y - x - the difference and its values.

INTRODUCTION:

Finding optimal ways to define the sizes of other planimetric shapes drawn inside and outside the Egyptian triangle and introducing them into the teaching process is one of the current issues facing the science of pedagogy.

Rectangles straight to the Egyptian triangle can be placed both internally and externally. I would like to share the following news from the results of our research. If a square is drawn inside an Egyptian triangle, the following work is done to express its magnitude through the dimensions of this triangle.

Маълумки, бунда ушбу фигураларнинг катталиклари ўзаро математик боғлиқликлар ҳосил қилади.Ушбу боғлиқликларни аниқлаш ва таҳлил қилишга киришамиз

In this case, we can easily write this rule.

Rule 3.1. The diagonal of the square drawn inside the Egyptian triangle is equal to the bisector of the right triangle.

$$L_{bs} = d_{kv}, \qquad (1)$$

(F. A. Mamadaliev. “The Egyptian Triangle” (third book), page 7. Tashkent - 2018. “Renaissance press”.)

The quantities in this formula are:

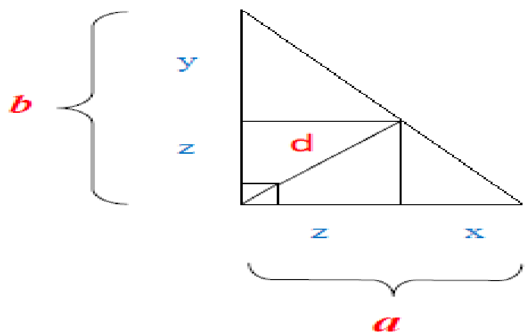

Figure-1

L $_{bs}$- the bisector of the right end of the Egyptian triangle;

d_{kv} – the diagonal of the square drawn inside the Egyptian triangle;

Our task is to determine the mathematical dependencies of manashu and this consists of formulating the formulas of the laws.

$$z = z, \quad (2)$$

$$b - y = a - x, \quad (3)$$

$$b - a = y - x, \quad (4)$$

$$1 = y - x, \quad (5)$$

From this we can conclude that:

$$b_n - a_n = y_n - x_n, \quad (6)$$

$$b_n - a_n = n, \quad (7)$$

$$y_n - x_n = n, \quad (8)$$

It is advisable to define it in the following order:

$$\mathbf{z_n = a_n - x_n}, \quad \textbf{(9)}$$
$$\mathbf{z_n = b_n - y_n}, \quad \textbf{(10)}$$

Creating a table for the values of $\mathbf{z_n}$ is extremely convenient.

If, as a result of our research, the side of the square (Figure 1) is denoted by **z**, then we can make the following considerations:

$$\mathbf{L_{bs} = d_{kv}}, \quad \textbf{(1)}$$
$$\mathbf{S_{kv.n} = z_n^2}, \quad \textbf{(2)}$$
$$\mathbf{P_{kv.n} = 4 \cdot z_n}, \quad \textbf{(2*)}$$

The quantities in this formula are:

$\mathbf{L_{bs}}$ – the bisector of the right end of the Egyptian triangle;

$\mathbf{d_{kv}}$– the diagonal of the square drawn inside the Egyptian triangle;

According to (1), we subtract the values for both parts of the equation and obtain:

$$\mathbf{L_{bs\,n} = \sqrt{2} \cdot n \cdot \delta}, \quad \textbf{(12)}$$
$$\mathbf{d_{kv\,n} = \sqrt{2} \cdot z_n}, \quad \textbf{(13)}$$

If we equate the values of the above equations (1), (12) and (13) according to rule 3.1, we get the following equation (14):

$$\mathbf{z_n = n \cdot \delta}, \quad \textbf{(14)}$$
$$\mathbf{\delta = z_1}, \quad \textbf{(15)}$$

$$\mathbf{n = \frac{z_n}{\delta}}, \quad \textbf{(16)}$$

$$\mathbf{\delta = 1,(7142857)... \approx 1,7143}$$

Where

δ– a constant size in the Egyptian triangle interior diagonal square diagonal and other used to find the magnitudes.

δ–It is important to use the constant magnitude in finding the magnitudes of the interior lines drawn in the Egyptian triangle.

δ –the concept of continuity and magnitude definition

Rule 6.1. The ratio of the perimeter of an Egyptian triangle of any order to the sum of its catheters is a constant. Its value **δ = 1,7(142857)...** consists of a periodic fraction equal to 1.7143.

The discovery of this constant created a number of ease in working with squares or other right rectangles drawn inside the Egyptian triangle. It is convenient to find solutions to simple and complex (mixed) problems in this area, to teach theories in this area. In particular, the discovery that **δ** is equal to $\mathbf{z_1}$ was an unexpected novelty.

δ – how the constant is found should be of interest to many. Here is the formula for finding this constant quantity:

$$\mathbf{\delta = \frac{P_{\Delta n}}{b_n + a_n}}, \quad \textbf{(17)}$$

In addition to formulas such as (1), (8), (9) and (12) -, (15) - formula is also used in compiling Table 1, which gives the magnitudes of the squares drawn inside the Egyptian triangle. Some of the dimensions of the Egyptian triangle are derived from the results of our previous studies. However, we use the following formulas for finding the values of $\mathbf{x_n}$, $\mathbf{y_n}$, $\mathbf{z_n}$ in compiling our Table 2. Table 2 shows the quantitative relationships between the sizes of the Egyptian triangle and the sizes of the squares drawn inside it. The limits of application of this table are also wider.

$$\mathbf{x_n = n \cdot x_1}$$

$$\mathbf{y_n = n \cdot y_1}$$

$$\mathbf{z_n = n \cdot z_1}$$

We construct the first Table 1, which represents the quantitative relationships between the legs, hypotenuse, perimeter, and **δ** -constant of the Egyptian triangle.

In compiling this Table 1, the main focus will be on the quantitative relationships between

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the magnitudes of the Egyptian triangle, the constant **δ**, and the ordinal number. Considering Figure 1, for both legs of an Egyptian triangle, the side of the inner drawn square $\mathbf{z_n}$ and $\mathbf{x_n}$ and $\mathbf{y_n}$ are the constituents. We use the above formula (17) to calculate the values of the constant d we have found. It will look like this:

$$\boldsymbol{\delta \approx 1{,}7143}$$

The most important thing is that we have accurately calculated the values of the constant **δ**.

Table showing the quantitative relationships between the Egyptian triangle catheters, hypotenuse, perimeter, and d - constant. Table 1

n	δ ва z_1	a_n	b_n	c_n	P_{Δ_n}
1	1,7143	3	4	5	12
2	1,7143	6	8	10	24
3	1,7143	9	12	15	36
4	1,7143	12	16	20	48
5	1,7143	15	20	25	60
6	1,7143	18	24	30	72
10	1,7143	30	40	50	120
15	1,7143	45	60	75	180
20	1,7143	60	80	100	240
25	1,7143	75	100	125	300
36	1,7143	108	144	180	432
52	1,7143	156	208	260	624
100	1,7143	300	400	500	1200
120	1,7143	360	480	600	1440
200	1,7143	600	800	1000	2400

In constructing this table, we used formula (17) to find the perimeter of a triangle.

δ – we are able to easily find the values of the constant.

To date, in science, we have tried in practice the easiest way to find the area of a square drawn inside an Egyptian triangle by means of the values of the constant – **δ** – to find the magnitudes of the squares drawn inside the Egyptian triangle by means of the values of the constants.

To do this, we calculate all the sizes of the squares drawn inside these Egyptian triangles of order n = 2 and n = 5.

1. **If n = 2** and **n = 5** we will have:

$$\boldsymbol{\delta = \frac{P_{\Delta_n}}{b_n + a_n} \approx 1{,}7143}$$

It suffices to calculate the five basic quantities for both tasks. They are $\mathbf{x_2}$, $\mathbf{y_2}$, $\mathbf{z_2}$, $\mathbf{S_{kv.2}}$ and $\mathbf{P_{kv.2}}$

Let's start the calculation:

$$x_2 = 2 \cdot x_1 = 2 \cdot 3 = 6,$$
$$y_2 = 2 \cdot y_1 = 2 \cdot 4 = 8,$$
$$z_2 = 2 \cdot z_1 = 2 \cdot 5 = 10,$$
$$S_{kv.2} = (2 \cdot \delta)^2 = (2 \cdot 1{,}7143)^2 = 11{,}75,$$
$$P_{kv.2} = 4 \cdot n \cdot \delta = 4 \cdot 1{,}7143 = 1{,}37143,$$

$$x_5 = 5 \cdot x_1 = 5 \cdot 3 = 15.$$
$$y_5 = 5 \cdot y_1 = 5 \cdot 4 = 20.$$
$$z_5 = 5 \cdot z_1 = 5 \cdot 5 = 25.$$
$$S_{kv.5} = (5 \cdot \delta)^2 = 73{,}47$$
$$P_{kv.5} = 20 \cdot \delta = 34{,}2857$$

A table representing the dependence of the sizes of the squares drawn inside the Egyptian triangle on the sizes of these triangles. Table 2

n	δ ва z_1	z_n	x_n	y_n	a_n	b_n	$l_{bs\,n}$ ва $d_{kv\,n}$	$S_{kv\,n}$	$P_{kv\,n}$
1	1,7143	1,7143	1,2857	2,2857	3	4	2,4244	2,94	6,8572
2	1,7143	3,4286	2,5714	4,5714	6	8	4,8487	11,75	13,7143
3	1,7143	5,1429	3,8571	6,8571	9	12	7,2731	26,45	20,5714
4	1,7143	6,8571	5,1429	9,1428	12	16	9,6975	47,02	27,4286
5	1,7143	8,5714	6,4286	11,4285	15	20	12,1218	73,47	34,2857
6	1,7143	10,2857	7,7143	13,7143	18	24	14,5462	105,8	41,1428
10	1,7143	17,1429	12,857	22,857	30	40	24,2436	293,9	68,571
20	1,7143	34,2857	25,714	45,714	60	80	48,4873	1175	137,14
30	1,7143	51,4286	38,571	68,571	90	120	72,7309	2645	205,71

40	1,7143	68,5714	51,429	91,429	120	160	96,9746	4702	274,28
50	1,7143	85,7143	64,286	114,29	150	200	12,1218	7347	342,86
70	1,7143	120	90	160	210	280	169,705	14400	480
90	1,7143	154,286	115,71	205,71	270	360	218,193	23804	617,14

CONSLUSION:

This article analyzes the relationship between the magnitudes of the Egyptian triangle and the square drawn inside it, in particular, the order of this triangle, as well as the interdependence of the dimensions of the interior drawn square.

It has been shown by precise calculation methods that it is possible to mathematically quantify all the sizes of the squares drawn inside it by means of the Egyptian triangle sequence number.

In addition, the importance of the concept of "Egyptian triangle chain" in the optimal calculation method has been analyzed and confirmed in specific issues.

A new approach to finding the sizes of squares drawn inside an Egyptian triangle has been promoted. The advantages of such an approach are outlined.

The solutions provide recommendations for the use of a new constant quantity and reveal the essence of this constant quantity.

REFERENCES:

1) T. Jo‘raev va boshqalar. Oliy matematika asoslari.
2) T. «O‘zbekiston», 1995 y. I qism.
3) Beklemishev D.V. Kurs analiticheskoy geometrii i lineynoy algebri. – M. Nauka,1984 g.
4) Ya. S. Bugrov, S. M. Nikolskiy. Elementi lineynoy algebri i analiticheskoy geometrii. M. «Nauka», 1990 g.
5) F.A.Mamadaliev, Egyptian triangle (books I, II, III)
6) T. «Renessans press», 2018 y.
7) https://uztest.ru/abstracts/?idabstract=75
8) http://ru.solverbook.com/primery-reshenij/primery-resheniya-
9) logarifmicheskix-uravnenij/