First and last name of the student

Calculus problems

1. Calculating the arithmetic mean and the geometric mean of the numbers a and b, where

   $$a = \sqrt{\left(1-\sqrt{2016}\right)^2} \quad ; \quad b = \sqrt{\left(1+\sqrt{2016}\right)^2} \quad \text{we obtain the results:}$$

   $a)\, m_a = \sqrt{2015}, m_g = \sqrt{2016} \quad b)\, m_a = \sqrt{2016}, m_g = \sqrt{2015} \quad c)\, m_a = 1, m_g = 2016 \quad d)\, m_a = 2016, m_g = 2015$

2. Calculating $(n+1009)^2 - (n-1008)^2 - 2 \cdot 2017n$, the result is:

   $a)\, 2016 \quad b)\, 2017 \quad c)\, -4034n + 2016 \quad d)\, -4032n + 2016$

3. Given $a = \dfrac{1}{2} + \dfrac{3}{4} + \dfrac{5}{6} + ... + \dfrac{2015}{2016}$ $\quad and \quad b = \dfrac{1 + \dfrac{1}{2} + \dfrac{1}{3} + ... \dfrac{1}{1008}}{2}$, the result of a+b is:

   $a)\, 2016 \quad b)\, 1007 \quad c)\, 1008 \quad d)\, 504$

Logical problems

1. The football team of a school consists of 15 students. Their age distribution by number is illustrated in the table below:

Age (years)	14	15	16	17	18	19
Number of students	2	5	3	2	2	1

   One more student is selected into the team. How old should he be, so that the average age of the team remains the same?

   a) A=16   b) A=17   c) A=15   d) A=19

2. Given $a, b, c \in$ R, so that $\sqrt{(a-2017)^2} + \sqrt{(b+1009)^2} + \sqrt{(c-1)^4} \leq 0$, find the result of the calculus $a + 2b + c$.

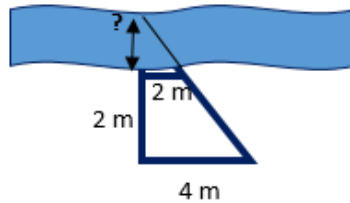   a)3027   b) 2150   c) 0   d) there is no solution

3. The convex polygon which has the same number of diagonals and the same number of sides is the:

   a)triangle   b) square   c)pentagon (5 sides)   d) hexagon (6 sides)

Practical applications

1. Which is the width of the river between the points indicated in the drawing below?

$a)$ 4m $b)$ 3m $c)$ 2m $d)$ 1m

2. A biker rides from Oradea to Deva at a speed of 24 km/h, and from Deva to Oradea, being more tired, at a speed of 21 km/h. Which is the biker's average speed?

   a)22.5km/h   b) 22.4km/h   c) 23km/h   d) 22km/h

3. A handball team has one last match to play in a tournament. If they score 11 points, then the average number of points per match will be 16. If they score 21 points, the average number of points per match will be 18. How many matches will the team have played in the tournament?

   $a)$ 10 $b)$ 17 $c)$ 5 $d)$ 16