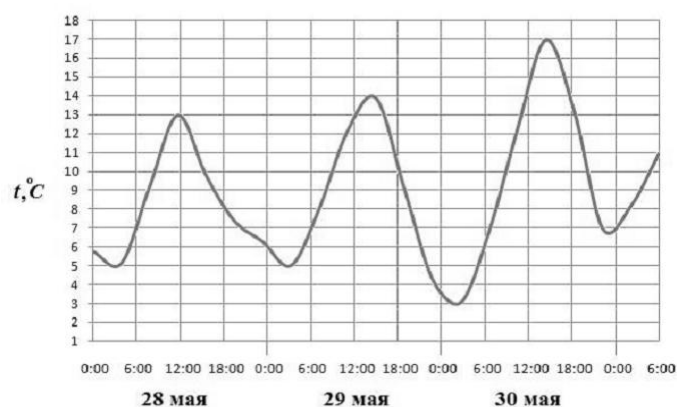


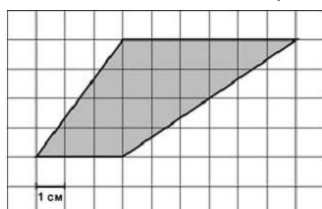
- High school graduates want to buy roses for their teachers: a regular bouquet contains 7 roses, and the bouquets for the principal and the homeroom teacher contain 11 roses. There are 20 teachers in the school (including the principal and the homeroom teacher). How many roses should they buy?
- What was the highest temperature on the 28<sup>th</sup>?



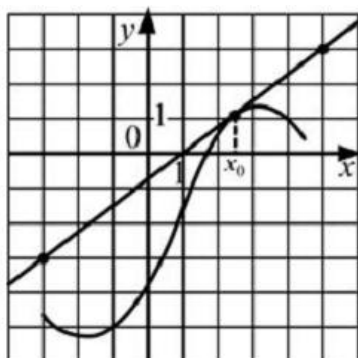
- Find the solution of this equation:  $\log_3(5x + 1) = 4$ .
- The acute angles of a right triangle are 24 and 66 degrees. Find the angle between the median and the altitude drawn from the right angle vertex.
- The construction firm needs to buy 40 cubic metres of wood. Given the prices of three potential suppliers, what's the lowest amount they can pay?

Suuplier	Price per cub.m.	Shipping cost	
A	4200	10500	
B	4500	8500	Free shipping of orders over 150000
C	4300	8500	Free shipping of order over 200000

- Find the area of the trapezium (1 square = 1 cm<sup>2</sup>)



- Find the value of  $2 + 3\tan^2\alpha \cos^2\alpha$ , if  $\sin \alpha = \sqrt{2/3}$ .
- Depicted are the function  $y=f(x)$  and the line tangent to it in a point with abscissa  $x_0$ . Find the value of the derivative of  $f(x)$  in  $x_0$



- The diagonal of a cube equals 11. Find its surface area.

10. The distance from an observer to the horizon ( $l$ ) is determined using the formula  $l = \sqrt{2Rh}$ , where  $h$  is the height of the observer's position above sea level in kilometers and  $R$  is the Earth's radius (6400 km). How high is the observer if the horizon is 48 km away?
11. Find the point where function  $y = (x^2 + 16)/x$  has its minimum.
12. If you combine 8 litres of a 15% solution with 12 litres of a 40% solution, what will be the concentration of the combined solution?
13. Solve the equation:  $(\sin x - 1)(2\cos x + 1)/\sqrt{\tan x} = 0$ .
14. The edges of a regular tetrahedron ABCD are 1 unit long. Find the angle between DM and CL, where M is the middle of edge BC and L is the middle of edge AB.
15. Solve the inequality:  $\log_2(2x)\log_{0.5x}2/\log_{0.125x}8 \leq 1$
16. The area of a trapezium ABCD equals 90, and one of the bases is twice as long as the other. The diagonals intersect in point O, line segments connecting P, the middle of AD, with vertices B and C intersect the diagonals in point M and N respectively. Find the area of quadrangle OMPN.
17. Find all values of  $a$  for which the system below has only one solution:
 
$$\begin{cases} |x + 2y + 1| \leq 11 \\ (x - a)^2 + (y - 2a)^2 = 2 + a \end{cases}$$
18. Find all solutions of the equation in natural numbers:
 
$$n^{k+1} - n! = 5(30k + 11).$$