

**MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
TOMSK STATE UNIVERSITY**

Here you can find an example of tasks that you will get in the online mathematics entrance test.

1. There is a tradition to present an odd number of flowers to a person's birthday. Chrysanthemums cost 65 rubles per flower. What is the maximum number of flowers that Artem can buy for his girlfriend's birthday if he has 800 rubles?
2. Anna pays 4500 rubles per month for utilities. Next year the cost will rise by 18%. How much will Anna have to pay each month next year?

3. Evaluate the expression  $5 - \left(\frac{3\sqrt{5}}{2} - 1\right) \cdot \left(\frac{3\sqrt{5}}{2} + 1\right)$ .

4. Simplify the expression:  $\left(\frac{2}{x} - \frac{x-2}{x^2-x}\right) : \left(\frac{3}{x} + \frac{x+3}{x^2-x}\right)$ .

5. Solve the equation:  $\left(\frac{5}{6}\right)^{1-5x} = \left(\frac{6}{5}\right)^{2+x}$ .

6. Find the number of integers in the domain of the function:

$$f(x) = \frac{3}{\sqrt{15+3x}} - 5\sqrt{2-9x}.$$

7. Find the sum of all integer solutions of the inequality:  $\frac{4-x}{x-5} > \frac{1}{1-x}$ .

8. The perimeter of a rhombus equals to 120 and one of the angles is  $30^\circ$ . Find the area of the rhombus.

9. Find the surface area of the right triangular prism the height of which is 6, at its base is a regular triangle with the hypotenuse that equals 10 and one of the catheti (legs) equals 8.

10. First pipe passes 4 liters of water per minute less than second pipe. How many liters of water per minute passes through the first pipe if it fills a 480 liter basin 8 minutes longer than the second pipe fills a 384 basin?

11. Find the point of minimum of the function:  $y = -x^3 - 3x^2 + 10$ .