

QUESTIONS PREPARED BY BURDUR VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL

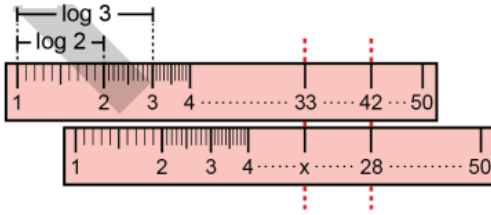
1. The equations are given where a and b are real numbers.

$$x^2 - 2x + a = 0$$

$$x^2 - x + b = 0$$

It is known that the sum of the roots of the first equation is a root of the second equation, and the product of the roots of the second equation is a root of the first equation. Accordingly, find out what the sum is. (2 points)

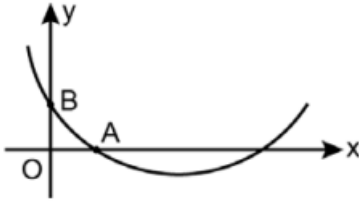
2. In a type of ruler on which integers from 1 to 50 are written, the distance of each integer n from 1 is $\log(n)$ units.



When two identical rulers with this feature are placed one under the other as shown in the figure, the number 42 on the upper ruler corresponds to the number 28 on the lower one, and the number 33 on the upper ruler corresponds to the number x on the lower one. Accordingly, find the value of x. (2 points)

3. on the set of real numbers, $0 < x_1 < x_2$

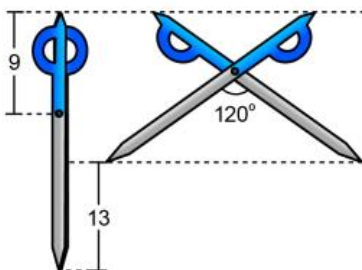
The parabola specified by a function f defined in the form $f(x) = (x - x_1) \cdot (x - x_2)$ intersects the axes in the perpendicular coordinate plane at different points A and B, as shown in the figure.



The distances of points A and B to the origin are equal, and this parabola takes its smallest value when $x = \frac{3}{5}$.

Accordingly, find the value of $\frac{x_1}{x_2}$. (5 points)

4. Two identical scissors, the parts of which are blue and gray in color from the connection points to the ends, are hung on the wall, one closed and perpendicular to the ground, the other opened 120° , as shown in the figure.



The length of the blue parts of these scissors is 9 units, the height of the blue ends of both scissors from the ground is equal, and the height of the gray ends of the open scissors from the ground is 13 units higher than the height of the gray ends of the closed scissors. Accordingly, how many units are the distance between the connection point of the scissors and a gray tip? (5 points)

5. Where x and y are integers,

The equation $|x-3| + |2x+y| + |2x+y-1| = 1$ is satisfied.

Accordingly, find the total values that y can take. (2 Points)