

# Sarajevo School of Science and Technology

## Entrance Examination SAMPLE

### Mathematics

Duration: 1,5 hours

Use of calculators: Allowed

**Department of study: Economics**

#### Question 1.

Suppose that we are given a rectangle. A perimeter of rectangle is equal 36cm and length of one side is 10cm. The area of a rectangle is equal:

- a) 60
- b) 90
- c) 80
- d) 120

#### Question 2.

A number of all integers  $x$  which satisfy the inequality  $x^2 - 18x < 0$  is:

- a) 19
- b) 18
- c) 17
- d) 20

**Question 3.**

What are all the values of  $x$  such that it holds  $\left| \frac{x}{x+1} \right| \leq \frac{1}{2}$ ?

a)  $(-1/3, 0) \cup (0, 1)$

b)  $[-1/3, 1]$

c)  $(1, +\infty)$

d)  $(0, 1)$

**Question 4.**

Solve the following equation:

$$2 \sin x + 2\sqrt{2} = -2 \sin x.$$

**Question 5.**

Solve the following system of equations:

$$\begin{cases} \frac{5x-1}{6} + \frac{3y-1}{10} = 3 \\ \frac{11-x}{6} + \frac{11+y}{4} = 3 \end{cases}.$$

**Question 6.**

Solve the following equation:

$$3^{2x+1} + 20 \cdot 3^x + 3 = 0.$$

**Question 7.**

Evaluate the following expressions:

$$\left( 2a - \frac{10a-9}{2a-1} \right) \cdot \frac{1-2a}{9-4a^2}.$$

**Question 8.**

A sum of digits of number  $\overline{xy}$  is equal 11. If we change places of digits  $x$  and  $y$ , then we get a number which is less then the first number for 9. Evaluate the unknown number  $\overline{xy}$ .

**Question 9.**

A perimeter and the area of one circle have a ratio 1:2. Evaluate a radius of that circle.

**Question 10.**

Write an equation of the line that passes through a point (1,7) and is parallel to a line  $-6x + y = -1$ .