

Sarajevo School of Science and Technology

Entrance Examination

Mathematics

Duration: 1,5 hours

Use of calculators: Allowed

Department of study: Game Design and Development

Question 1.

Mara runs faster than Gail.

Lily runs faster than Mara.

Gail runs faster than Lily.

If the first two statements are true, the third statement is

- A. true
- B. false
- C. uncertain

Question 2.

Which number replaces the question mark?

1 3	6 5	7 8	5 2
2 7	6 1	8 8	4 ?

- a) 7
- b) 8
- c) 9
- d) 6

Question 3.

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

Question 4.

In the following question, select a figure from amongst the four alternatives, which when placed in the blank space of figure (x) would complete the pattern.

Identify the figure that completes the pattern:



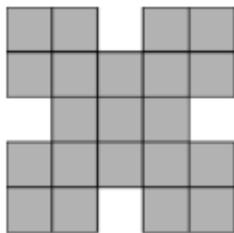
- a) 1,
- b) 2
- c) 3
- d) 4

Question 5.

Lana wants to colour one square of dimension 2×2 given in the figure.



In how many different ways she can do that?



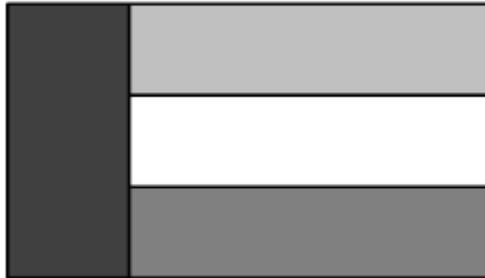
Question 6.

Simplify the expression:

$$\frac{(x-1)^2 - y^2}{(x+1)^2 - y^2} \cdot \frac{x^2 - x - xy}{x^2 + x - xy}$$

Question 7.

Suppose we are given the big rectangle in the figure. The lengths of the big rectangle have a ratio 3:5. It is divided into four smaller rectangles with the same area, as it can be seen in a figure. Evaluate the ratio of the lengths of the white rectangle.

**Question 8.**

A box contains three black cubes and seven white cubes. One cube is drawn from the box. Its colour is noted and a cube of the other colour is then added to the box. A second cube is then drawn. What is the probability that the second cube selected is black?

Question 9.

Evaluate a parameter m such that a point $x = 2$ is a zero of a function :

$$f(x) = 3 - mx + 3m - 2x.$$

Question 10.

Solve the system of equations:

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