

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.

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 4.

Evaluate the value of the expression:

$$\frac{2 + 2a}{6 - 3a} \div \frac{a^2 - 1}{4 - a^2},$$

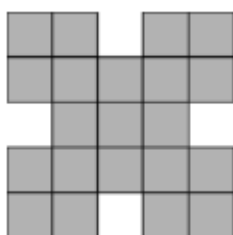
where $a = -5$.

Question 5.

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

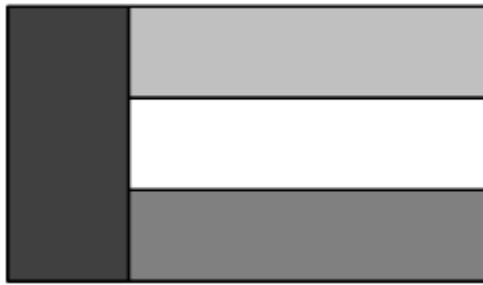


In how many different ways she can do that?



Question 6.

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 7.**

Number of negative integers which satisfy the inequality $\frac{2x-4}{x+3} + x - 2 \geq 0$ is?

- a) 0
- b) 1
- c) 2
- d) 3

Question 8.

In a factory, machines A and B produce electronic components. Machine A produces 40% of components and machine B produces 60%. Some of the components are defective. Machine A produces 4% and machine B 3% defective components. Evaluate the probability that a randomly selected component is defective.

Question 9.

Suppose that we are given a function $f(x) = 1 + 3x + \sqrt{\frac{x^3}{x-2}}$. Find the domain of a function $f(x)$.

Question 10.

Solve the system of equations:

$$\begin{aligned}\frac{1}{3} - 0.2(x-1) &= \frac{y-2}{6} \\ \frac{2}{3} \left(3 - \frac{y-1}{2} \right) &= 0.75 + \frac{x}{2}\end{aligned}$$