

MIĘDZYNARODOWE LICEUM OGÓLNOKSZTAŁCĄCE
PADEREWSKI w Lublinie

ENTRANCE EXAM
MATHEMATICS

Instructions for the candidate:

1. Write down all crucial calculations.
2. Do not use a calculator.
3. Work independently.

Good luck!

Date:

April 2021

Work time:

90 minut

Max points: 40

Exercise 1. (2 points)

What is the difference between the greatest and the smallest of the following numbers:

$$-\frac{2}{5}, -2, 1\frac{1}{3}, \frac{5}{3}, 1?$$

Exercise 2. (3 points)

Write down the following sentence in the form of arithmetic expression and calculate its value

From the sum of $5\frac{1}{3}$ and $-1,8$ subtract the quotient of $0,5$ and $\frac{1}{6}$.

Exercise 3.

Write down the value of the expression $\frac{8^2 \cdot (4^5)^2}{(2^2)^2}$ as a power of number 2.

Exercise 4. (3 points)

Verify if the equations are TRUE or FALSE. Mark the answers on your paper.

- a) $(5^5)^{-3} = 5^2$ TRUE FALSE
- b) $3^4 + 3^4 + 3^4 = 3^5$ TRUE FALSE
- c) $\sqrt{5^2 - 4^2} = 1$ TRUE FALSE

Exercise 5. (2 points)

Complete the sentences below by choosing the correct answers A or B and C or D.

On the map made in the scale of 1: 45 000, the distance between two cities is 24 cm.

The actual distance between these cities is .

A. 10,8 km

B. 108 km

On the map made in the scale of 1: 60 000, the distance between these cities is .

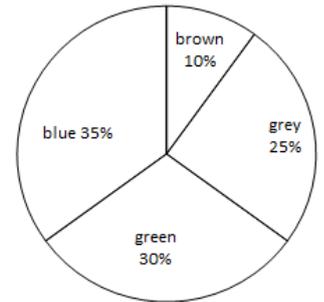
C. 18 cm

B. 32 cm

Exercise 6. (2 points)

The diagram shows the eye colour information for class 8A students

- a) How many students are in 8A, if only two people have brown eyes?
- b) How many students have grey eyes?



Exercise 7. (3 points)

The participants of the training camp chose the chairman. There were two candidates: Mary and John. Each participant cast one vote. Mary obtained 52% of all the votes, which was 6 votes more than John received.

- a) How many participants were at the training camp?
- b) How many people voted for Mary?

Exercise 8. (2 points)

Rearrange the formula to get v : $E = \frac{m \cdot v^2}{2}$.

Exercise 9. (1 pkt)

Brian eats on average j apples during d days.

Which expression describes how many apples Brian eats on average in a week? Choose the correct answer.

A. $\frac{7j}{d}$

B. $\frac{7d}{j}$

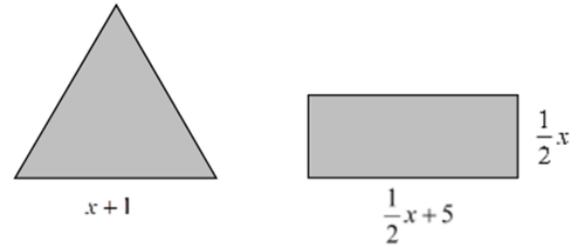
A. $\frac{jd}{7}$

A. $\frac{7}{jd}$

Exercise 10. (4 pkt)

The figure shows an equilateral triangle and a rectangle with the lengths of their sides written as algebraic expressions. The polygons have equal perimeters.

- a) Calculate the side length of the triangle
- b) Calculate the area of the rectangle



Exercise 11. (3 points)

The children attended the performance under the supervision of adults, and there were 24 more children than adults. The ticket price for an adult was PLN 40, and the ticket price for a child was 45% lower than for an adult. 900 PLN was paid for all tickets. How many total tickets for the show were purchased? Show your calculations.

Exercise 12. (2 points)

One of the angles in the triangle ABC is twice the sum of the measures of the other two angles of the triangle. Calculate the measure of the greatest angle of a triangle ABC. Show your calculations.

Exercise 13. (2 points)

The side of the square is 12 cm. Each side of the square is divided into 3 equal parts. Consecutive points are connected by segments to form an octagon. Find the area of this octagon. Show your calculations.

Exercise 14. (3 points)

The area of the rhombus is 96 cm^2 . The length of one of the diagonals is 0.75 of the length of the other diagonal. Calculate the perimeter of the rhombus. Show your calculations.

Exercise 15. (3 points)

0.5 liters of water was poured from a water-filled rectangular vase with the base dimensions of 12.5 cm and 16 cm. How much did the water level in the vase drop? Show your calculations.

Exercise 16. (2 points)

The figure shows a fragment of the regular quadrilateral pyramid grid. Calculate the sum of the lengths of all edges of this pyramid.

