

Imię i nazwisko:

Klasa:

Grupa 1

Wynik:

Question 1 (1 pt)

It's Thursday today. What will the day of the week be in 200 days:

- A. Saturday B. Sunday C. Monday D. Tuesday

Question 2 (1 pt)

Consider the number $1235613X$, where X is the units digit. If this number is divisible by 12, then X can be

- A. 0 B. 2 C. 6 D. 9

Question 3 (1 pt)

The greatest common divisor of 1015 and 1305 is

- A. 15 B. 29 C. 45 D. 145

Question 4 (1 pt)

The remainder when x is divided by 6 is 3 and the remainder when x is divided by 7 is 5. Find the remainder when x is divided by 42.

- A. 8 B. 9 C. 15 D. 33

Question 5 (1 pt)

The following sum

$$\frac{5}{1 \times 4} + \frac{5}{4 \times 7} + \frac{5}{7 \times 11} + \dots + \frac{5}{41 \times 45}$$

is equal to?

- A. $\frac{44}{27}$ B. $\frac{44}{375}$ C. $\frac{44}{45}$ D. $\frac{44}{135}$

Question 6 (2 pts)

Find all values of n , with $n \in \mathbb{Z} - \{0\}$, for which the number $\frac{3n + 12}{n}$ is prime.

Question 7 (3 pts)

Solve the equation:

$$2x - 3 = x\sqrt{2} + 5\sqrt{2}$$

Question 8 (3 pts)

You invest 30000zł into savings account with a 8% annual interest rate. The tax on the interest is 25%.

- a) Write down the expression for the amount of money you will have after n years.
- b) You want to buy a car for 40000zł. For how many years do you need to save the money in order to afford it?

Question 10 (3 pts)

The sum of 5 consecutive numbers that are divisible by 6 is -420. Find these numbers.

Question 9 (4 pts)

Solve the the following inequalities:

a)

$$\frac{5x + 4}{12} + \frac{x}{3} > \frac{2 - x}{3}$$

b)

$$\frac{x + 1}{3} - \frac{2x + 5}{15} < \frac{1 - 2x}{3}$$

c) Write down examples of a rational number and an irrational number that satisfy both inequalities

Extra question

The population N of rats in a lab is to be modelled. The initial population is 100. Every month the population increases by 20%. At the end of each month 10 rats are taken for experiments (and sadly never return). Find the expression for N in terms of t , where t is the time in months. Hence find the population after 1 year.