

Grade 8**Problem №1.**

How many positive integers less than 500 have a sum of its digits equal to 5?

- A) 25 B) 20 C) 15 D) 10 E) 5

Problem №2.

When attending a 3-day competition, students are placed in either single rooms or double rooms by the local hotel. The hotel's plan is that 75% of students will be booked in double rooms and the remaining 25% of the students will be given single rooms.

What percentage of the rooms will be double rooms?

- A) 40 B) 45 C) 50 D) 55 E) 60

Problem №3.

What is the remainder when the product of the first 7 prime numbers is divided by 510?

- A) 0 B) 1 C) 2 D) 3 E) 4

Problem №4.

The factors of a certain number are all the values that you can divide that number by and not get any remainder. For example, the factors of 12 are 1, 2, 3, 4, 6, and 12.

We call a number *awesome*, if it has exactly four factors. How many *awesome* numbers are between 1 and 25?

- A) 6 B) 7 C) 8 D) 9 E) 10

Problem №5.

There are three different colored lights on a Christmas light: red, blue, and green. The red light flashes every 8 seconds, the blue light flashes every 9 seconds, and the green light flashes every 10 seconds. If they all start flashing together when

they lights are first plugged in, in every how many minutes will they flash at the same time again?

- A) 2 B) 3 C) 4 D) 5 E) 6

Problem №6.

Jean wants to make half-pound bags of trail mix made up of walnuts, raisins, peanuts, and almonds. She wants to mix four part walnuts, one part raisins, three parts peanuts, and two parts almonds in her mix.



At the store she found out that almonds cost \$12 per pound, walnuts cost \$9 per pound, raisins cost \$5 per pound, and peanuts cost \$8 per pound. Given that she has exactly \$54 in her pocket, what is the maximum possible half-pound trail mix bags she can make?

- A) 10 B) 11 C) 12 D) 13 E) 14

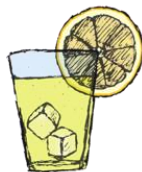
Problem №7.

A mathematics contest consisted of 20 problems. Three points were given for each correct answer, one point was subtracted from each incorrect answer and no points were given for problems that were left blank. Jack's team scored 48 points. How many answers did Jack's team get incorrect if they did not leave any questions blank?

- A) 6 B) 5 C) 4 D) 3 E) 2

Problem №8.

When making lemon juice, Jasmine mixes 200 grams of lemon juice and 100 grams of sugar with 400 grams of water. There are 0.25 calories in 1 gram of lemon juice and 3.86 calories in 1 grams of sugar, while water contains no calories. How many calories are in 7000 grams of lemonade?



- A) 4360 B) 4630 C) 3460 D) 6034 E) 3604

Problem №9.

Arno and Jane are painting a house. If Arno and Jane do not take any breaks, they will finish painting the house in 20 hours. If, however, Jane stops painting once the house is half-finished, then the house takes 30 hours to finish. Given that Arno and Jane paint at a constant rate, compute how many hours it will take for Jane to paint the entire house if she does it by herself.

- A) 35 B) 40 C) 45 D) 50 E) 55

Problem №10.

Katie and Lottie run on a track that is 160 meters around. It takes Katie 120 seconds to run 3 times around the track, and it takes Lottie 160 seconds to run 5 times around the track.

What is the **speed** of the **faster** runner, expressed in meters per second?

- A) $12 \frac{m}{s}$ B) $7 \frac{m}{s}$ C) $15 \frac{m}{s}$ D) $5 \frac{m}{s}$ E) $10 \frac{m}{s}$

Problem №11.

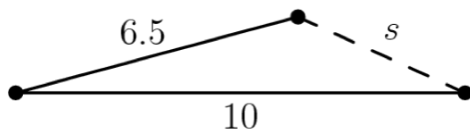
A 72-m long wire was cut into 12 pieces such that these 12 pieces can be then glued together to form the edges of a box.

What is the **largest possible volume** of a box that could have those 12 pieces of wire for edges?

- A) 300 B) 216 C) 236 D) 316 E) 200

Problem №12.

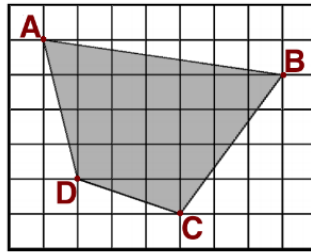
The sides of a triangle have lengths 6.5, 10, and S, where S is a whole number. What is the smallest possible value of S?



- A) 8 B) 7 C) 6 D) 5 E) 4

Problem №13.

Points A, B, C, and D marked on a coordinate grid are connected to form quadrilateral ABCD, as shown.



If the sides of each grid cell is 1 cm long, what is the area of the quadrilateral?
Express your answer in square centimeters.

- A) 49 B) 21 C) 34 D) 63 E) 45

Problem №14.

Using the laws of exponents, determine which of the following has the largest value. (Write the letter of your answer only.)

- | | |
|-----------------|--------------------|
| A: 6^6 | B: 3^{12} |
| C: 9^4 | D: 12^3 |

Remember, the use of calculator is not allowed!

- A) A B) B C) C D) D E) A, B

Problem №15.

Find the value of x in the following equation:

$$2^{2^{3^{2^2}}} = 4^{4^x}$$

- A) 21 B) 34 C) 54 D) 40 E) 45