

Grade 7**Problem №1.**

The sum of four positive integers is 150. When we increase the first number by 4, decrease the second number by 4, multiply the third by 4, and divide the fourth by 4, we find that the results are all the same, became equal.

What is the smallest of the original four numbers?

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

Problem №2.

The first thing Jake did after purchasing his brand-new car was to go to a Shell gasoline station and fill up the car's tank with Shell gasoline. A week later, when the tank was exactly half empty, he went to a Caltex gasoline station to fill up the tank. Another week later, when the tank was half again, we went back to Shell and filled up the tank with Shell gasoline. At this time, how many liters of gasoline in the tank were from Shell, if the full tank holds 60 liters?

- A) 45 B) 30 C) 35 D) 50 E) 40

Problem №3.

When asked about her age, Melinda took joy in responding with riddles. One day she said the following:

«The sum of my age and my parents' age is 84. Six years from today, the ratio of my dad's age to my mom's age to my age will be 6:5:2, in this order.»

How old was Melinda when she said this?

- A) 12 B) 10 C) 8 D) 6 E) 4

Problem №4.

A palindrome in mathematics is a number that reads the same from left to right as from right to left. For example, the latest calendar year that was a palindrome was 2002. What is the positive difference between the next two palindrome calendar years?

- A) 130 B) 120 C) 110 D) 100 E) 90

Problem №5.

Oscar is asked to choose from the following list of three-digit numbers:

719, 222, 100, 451, 989

If he must subtract his three-digit number from 3000 and then triple the result, which of the 5 three-digit numbers should he choose so that his final result is the greatest possible?

- A) 100 B) 719 C) 222 D) 451 E) 989

Problem №6.

Three liters of solution containing 70% water and 30% acid is mixed with two liters of solution containing 45% water and 55% acid. What percent of the five-liter mixture is water?

- A) 100 B) 90 C) 80 D) 70 E) 60

Problem №7.

In number theory, an abundant number or excessive number is a number that is smaller than the sum of its proper divisors. The integer 12 is the first abundant number. Its proper divisors are 1, 2, 3, 4 and 6 for a total of $1+2+3+4+6=16$. The amount by which the sum exceeds the number is the abundance. The abundance of 12 is $16-12=4$. What is the abundance of 24?

- A) 8 B) 9 C) 10 D) 11 E) 12

Problem №8.

Find the sum of all odd integers between 500 and 900 that are divisible by both 5 and 11.

- A) 2541 B) 1452 C) 2145 D) 4512 E) 5124

Problem №9.

The population of Gulfport is exactly 71127 people. If the librarian wants to provide 3 books for 7 citizens, how many books should the librarian have?



- A) 40338 B) 30483 C) 803403 D) 308403 E) 84303

Problem №10.

The number 48 has the property that it is divisible by the digit in the ones position, because 48 is divisible by 8. The number 49, for example, does not have this property, because 49 is not divisible by 9. How many numbers between 20 and 40 have this property?

- A) 9 B) 8 C) 7 D) 6 E) 5

Problem №11.

A binary operation is simply a rule for combining two values to create a new value. The most widely known binary operations are those learned in elementary school: addition, subtraction, multiplication and division.

When discussing binary operations in class, Ms. Feng decided to create a new rule for a binary operation, for which she used asterisk (*) as her symbol. The rules of this operation are shown in the table. For example, $2 * 3 = 4$ and $4 * 3 = 1$, as shown.

*	1	2	3	4	5
1	1	2	3	4	5
2	2	3	4	5	1
3	3	4	5	1	2
4	4	5	1	2	3
5	5	1	2	3	4

What is the value of the expression shown below?

$$((2 * 3) * (3 * 4)) * (4 * 5)$$

- A) 10 B) 1 C) 11 D) 12 E) 2

Problem №12.

What is the length of the longest side of a triangle whose sides are in the ratio 6:4:3 and whose perimeter is 52 cm?

- A) 30 cm B) 26 cm C) 24 cm D) 22 cm E) 20 cm

Problem №13.

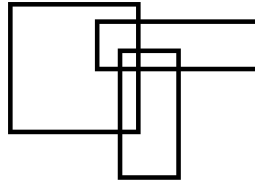
Fred is three times as rich as Barney. Wilma is 3 times as rich as Fred. Betty is 3 times as rich as Wilma. Altogether they have \$10000. How much money does Fred have?



- A) 550 B) 650 C) 700 D) 750 E) 600

Problem №14.

Emily drew a square and two rectangles on a sheet of paper, overlapping one another, as shown.



How many distinct rectangular regions are in Emily's drawing?

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

Problem №15.

In magic squares, the sums of numbers in each row, each column, and each diagonal are all the same. In the magic square shown, five numbers have been erased and replaced with letter A, B, C, D, and E.

A	24	B
18	C	D
25	E	21

What is the sum of these missing numbers, $A+B+C+D+E$?

- A) 90 B) 100 C) 110 D) 120 E) 130