

Grade 7**Problem №1.**

Suppose a and b are non-zero additive inverses (opposites) of each other, what is the value of the following expression?

$$2(a + b - 1)^{2019} + 3\left(\frac{a}{b}\right)^{2020} + 2019$$

- A) 1 B) 2017 C) 2019 D) 2020 E) None of preceding

Problem №2.

The pages of Ayhan's book are numbered from 1. The page numbers have a total of 459 digits. How many pages does the book have?

- A) 119 B) 189 C) 190 D) 215 E) None of preceding

Problem №3.

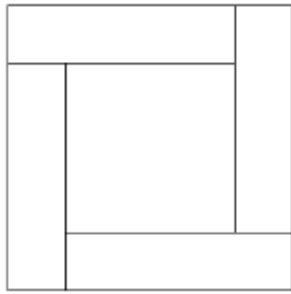
If $a + c = 4.98$ and $b + c = 6.48$, what is the value of

$$b^2 + bc - ab - ca?$$

- A) 7.47 B) 8.16 C) 9.08 D) 9.72 E) None of preceding

Problem №4.

The diagram shows four identical rectangles placed inside a square. The perimeter of each identical rectangle is 24 cm and the perimeter of the center square is 20 cm. What is the sum of the area of outer rectangles (border area)?



- A) 110 B) 120 C) 124 D) 136 E) None of preceding

Problem №5.

Find the value of $10^{2019} + 10^{2017}$ divided by $10^{2019} - 10^{2017}$.

- A) 2019/2017 B) 101/99 C) 11/9 D) 2018 E) 99/101

Problem №6.

For how many positive integer values of x is the expression $\frac{x^2 - 7x + 60}{x}$ an integer?

- A) 24 B) 16 C) 12 D) 10 E) 8

Problem №7.

How many three-digit numbers are even but have exactly one odd digit?

- A) 100 B) 125 C) 200 D) 225 E) None of preceding

Problem №8.

Let x , y , and z be three numbers randomly picked with replacement from the set $\{1, 2, 3, 4, 5\}$. What is the probability that $xz + y$ is even number?

- A) $\frac{2}{5}$ B) $\frac{23}{25}$ C) $\frac{39}{125}$ D) $\frac{64}{125}$ E) $\frac{59}{125}$

Problem №9.

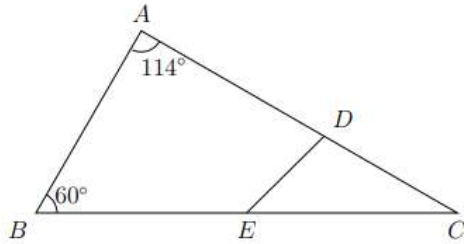
Let A , B and C be three digits so that the sum of the two-digit numbers AB , BC and CA equals to the three-digit number ABC . What is $A + B + C$?

- A) 17 B) 18 C) 19 D) 20 E) 21

Problem №10.

ABC is a triangle with $|AB| = |AD| = |BE|$. $m \angle A = 114^\circ$ and $m \angle B = 60^\circ$.

Find $m \angle EDC$.



- A) 114 B) 115 C) 116 D) 117 E) 118

Problem №11.

If $2^{2018} - 2^{2017} - 2^{2016} + 2^{2015} = a \times 2^{2015}$, then what the value of a ?

- A) 3 B) 5 C) 8 D) 13 E) 16

Problem №12.

How many digits are in the number $125^4 \times 64^2$, when written in base 10?

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

Problem №13.

A restaurant offers four appetizers, five entrees and three desserts. Leah will order one entrée, at most one appetizer and at most one dessert. How many different meal combinations can Leah order?

- A) 12 B) 60 C) 75 D) 90 E) 100

Problem №14.

How many of the following five shapes could be the shape of the region where two

triangles overlap?

I. *equilateral triangle*

II. *regular pentagon*

III. *regular hexagon*

IV. *square*

V. *kite*

- A) 1 B) 2 C) 3 D) 4 E) 5

Problem №15.

Five students stand in line from shortest to tallest. The average height of the three shortest students is 58 inches and the average height of the three tallest students is 70 inches. The average height of all five students is 63 inches. What is the median height of the five students, in inches?

- A) 59 B) 64 C) 67 D) 68 E) 69