Grade 5

Problem №1.

Suppose $x + \frac{1}{y} = 3.125$. Find the decimal equal to $\frac{y}{xy+1}$.

    A) 0.25   B) 0.32   C) 0.8   D) 1.25   E) 3.35

Problem №2.

The lengths, in inches, of the sides of the equilateral triangle are $a + 2b$, $3a - b$, and $5b - a$. Which of the following **could not** be the values of a and b?

    A) $(12,8)$ B) $(\frac{9}{2},3)$ C) $(10, 6)$ D) $(3, 2)$ E) $(\frac{3}{2}, 1)$
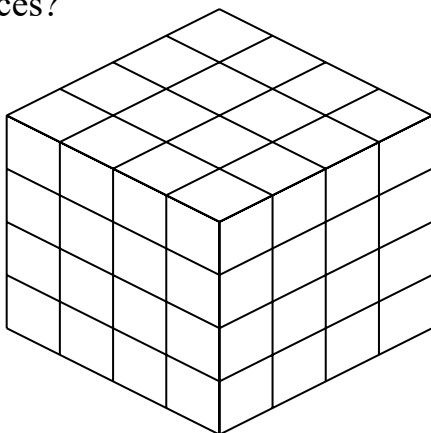
Problem №3.

Distinct, nonzero digit A, B and C are such that the three-digit numbers ABC, CAB and BCA are divisible by $4, 5$ and $9,$ respectively. What is the greatest possible value of $A \times B \times C$?

    A) 20   B) 180   C) 200   D) 210   E) 240

Problem №4.

The big cube is made up 64 white small cubes. All the faces of the big cube are then painted in red. How many of the small cubes have exactly two painted red faces?

A) 28   B) 20   C) 12   D) 10   E) None of preseding

Problem №5.

When an empty jar is filled with water, it weights 6 pounds. When 3/7 of the water is poured out, the jar weights 4 pounds. How much does the empty jar weight in pounds?

A) $\frac{4}{3}$ B) $\frac{3}{2}$ C) $\frac{5}{3}$ D) 2   E) $\frac{5}{2}$

Problem №6.

Suppose $ABCD$ is a rectangle with two identical regular hexagons. If the area of one hexagon is 6 unit squares, then find the area of the rectangle in unit squares.
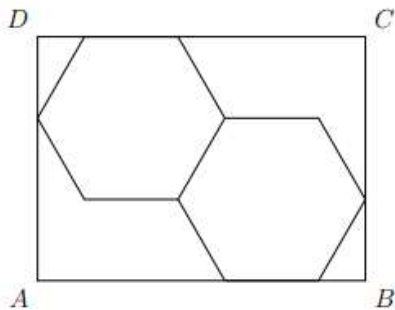
A) 18   B) 21   C) 24   D) 27   E) None of preceding

Problem №7.

Berti's friends add together the day and the month of their birthdays. They each get the answer 35, but no two have the same birthday. What is the maximum number of friends Berti has?

A) 7   B) 8   C) 9   D) 10   E) 12

Problem №8.

How many two-digit positive integers have at least one digit that is 8?

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

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Problem №9.

The difference between a two-digit number and the product of its digits is equal to three times the product of the sum of its digits. Find this number.

A) 55 B) 65 C) 30 D) 20 E) 25

Problem №10.

How many whole numbers from 1 to 1000 (including 1 and 1000) do not contain the digit 1?

A) 628 B) 638 C) 658 D) 718 E) 728

Problem №11.

If $x + 4 = y^2 - 1 = z^2 + 2 = t - 3 = m^2 + 12$, which of the numbers x, y, z, t and m is the greatest?

A) x B) y C) z D) t E) m

Problem №12.

Suppose a and b are integer and $a + b$ is an odd number. Which of the following is always true?

I) $a - 2b$ is even II) $a \times b$ is even III) $4a + b$ is even

A) Only I B) Only II C) Only III D) I and II E) I, II and III

Problem №13.

How many ways can the letters of the word TRIANGLE be arranged such that the letters ANGLE appear consecutively and in that order?

A) 6 B) 18 C) 20 D) 24 E) 56

Problem №14.

What is the area of an isosceles triangle with side length 10, 10 and 12?

A) 48 B) 50 C) 60 D) 72 E) 96

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Problem №15.

In an online math practice test, Junaid attempts exactly $\frac{3}{4}$ of the problems and answers $\frac{5}{8}$ of those problems correctly. When he submits the test, he finds that he answered 105 problems correctly. How many math problems were on this test?

A) 220   B) 224   C) 243   D) 248   E) None of preceding