

STUDENT NAME: _____

1)

For what value of m does $\frac{1}{m} + \frac{1}{2m} = 6$? Express your answer as a common fraction.

2)

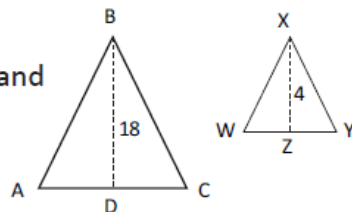
A pasture with an area of 25 hectares is enclosed using 2 km of fencing. Another pasture is to be enclosed. For the second pasture, how many hectares of land can 8 km of fencing enclose if the two fenced areas are similar?

3)

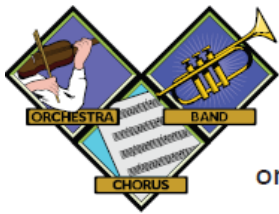
Tim drove at an average rate of 30 mi/h, and Kim drove at an average rate of 40 mi/h for three times as long as Tim. Together they drove a total of 225 mi. How far did Tim drive?

4)

Triangle ABC with an area of 243 cm^2 is similar to $\triangle WXY$. If $BD = 18 \text{ cm}$ and $XZ = 4 \text{ cm}$, what is the length of segment WY ?



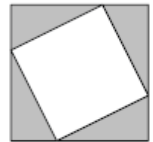
5)



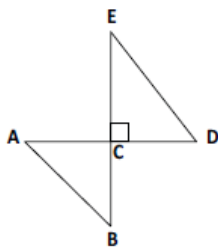
At Euclid Middle School there are 33 students in the chorus, 45 students in the band and 21 students in the orchestra. Fifteen students are in both the band and chorus, 9 are in both orchestra and chorus, 4 are in the band and orchestra and 2 students are in all three. How many students are in the orchestra only?

6)

If the vertices of the smaller square divide each side of the larger square in the ratio of 2:1, in the figure shown, what percentage of the larger square is shaded? Express your answer to the nearest whole number.

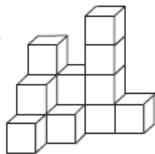


7)



In the figure shown, point C is the midpoint of segment AD, and $BC = \frac{2}{3} EC$. If $AD = 10$ units, and the area of $\triangle CDE$ is 30 units², how long is segment AB? Express your answer in simplest radical form.

8)



Gerard glues together 14 bricks to form the solid shown. Each brick is a cube with edge length 1 cm. Adjacent bricks are glued together so that faces entirely overlap. What is the surface area of Gerard's solid, including the bottom face?

9)

A line contains the points $P(1, 3)$ and $Q(17, 43)$. How many points on this line lie strictly between points P and Q and have two integer coordinates?

10)

Let a , b and c be numbers with $0 < a < b < c$. Which of the following is impossible?

- (A) $a + c < b$ (B) $a \cdot b < c$ (C) $a + b < c$ (D) $a \cdot c < b$ (E) $\frac{b}{c} = a$

11)

The product of the two 99-digit numbers

$303,030,303, \dots, 030,303$ and $505,050,505, \dots, 050,505$

has thousands digit A and units digit B . What is the sum of A and B ?

12)

Pick two consecutive positive integers whose sum is less than 100. Square both of those integers and then find the difference of the squares. Which of the following could be the difference?

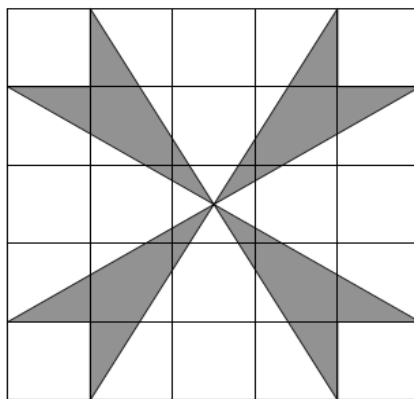
(A) 2 (B) 64 (C) 79 (D) 96 (E) 131

13)

Two cards are dealt from a deck of four red cards labeled A, B, C, D and four green cards labeled A, B, C, D . A winning pair is two of the same color or two of the same letter. What is the probability of drawing a winning pair?

14)

What is the area of the shaded pinwheel shown in the 5×5 grid?



15)

A bag contains four pieces of paper, each labeled with one of the digits 1, 2, 3 or 4, with no repeats. Three of these pieces are drawn, one at a time without replacement, to construct a three-digit number. What is the probability that the three-digit number is a multiple of 3?

16)

A recipe that makes 5 servings of hot chocolate requires 2 squares of chocolate, $\frac{1}{4}$ cup sugar, 1 cup water and 4 cups milk. Jordan has 5 squares of chocolate, 2 cups of sugar, lots of water and 7 cups of milk. If she maintains the same ratio of ingredients, what is the greatest number of servings of hot chocolate she can make?

17)

Two angles of an isosceles triangle measure 70° and x° . What is the sum of the three possible values of x ?

18)

How many non-congruent triangles have vertices at three of the eight points in the array shown below?



19)

How many whole numbers between 1 and 1000 do **not** contain the digit 1?