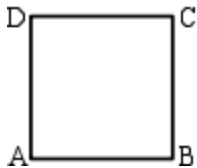


1. What is the smallest prime number that is larger than 11? \_\_\_\_\_ 1

2. How much is 200% of 20% of 30? \_\_\_\_\_ 2

3. Express  $\frac{3}{8}$  as a decimal correct to 3 decimal places. \_\_\_\_\_ 3

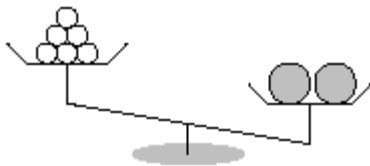
4. The perimeter of the square  $ABCD$  is 44.  
What is the area of the square?



\_\_\_\_\_ 4

5. In 2015, 330 students registered to participate in the Elmacon competition.  
132 of them are boys. What percent of the total registration is of girls? \_\_\_\_\_(%) 5

6. The scale is balanced. The weight of each of the smaller weights is 2 kg.  
What is the combined weight (in kg) of the two larger weights?



\_\_\_\_\_ (kg) 6

7. The cost of a pair of shoes (before tax of 12%) is 150 dollars.  
What is the total cost including tax? \_\_\_\_\_ (\$) 7

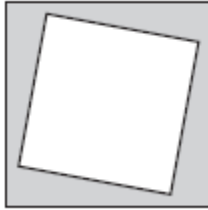
8. What is the value of  $(2 + 0) \times (1 + 5)$ ? \_\_\_\_\_ 8

9. How many whole numbers smaller than 2015 have digit sum of 28? \_\_\_\_\_ 9

Grade Five (5) Division

10. If you increase the volume of a cube by 2600%, by what percent do you increase the value of its side? \_\_\_\_\_ (%) 10

11. The side of the larger square is 20 and the side of the smaller square is 17. What is the area of the shaded region?



\_\_\_\_\_ 11

12. P and Q are the two largest different primes both smaller than 12. What is their product? \_\_\_\_\_ 12

13. You roll two fair dice. What is the probability that both show “1”? \_\_\_\_\_ 13

14. The perimeter of a rectangle is 30 and its area is 50. What is the value of its largest side?

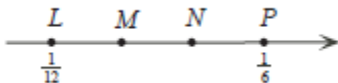


\_\_\_\_\_ 14

15. Express  $\frac{1}{2015} + \frac{2}{2015} + \dots + \frac{9}{2015}$  as a fraction in lowest terms. \_\_\_\_\_ 15

16. Gordi likes to trade Magic cards. He bought a card for \$100. Then, he sold it for \$ 110, bought it again for \$120, sold it again for \$130, and so on in increments of \$10 until he finally sold the card for \$230. What was his total profit from the combined trading transactions (in \$)? \_\_\_\_\_ (\$)16

17. The points  $L$ ,  $M$ ,  $N$ , and  $P$  are equally spaced. What is the value of  $M + N$ ?



\_\_\_\_\_ 17

18. It takes 10 hours for 10 identical tractors to plow a 10 hectare field. How much time (in hours) does it take one tractor to plow a one hectare field? \_\_\_\_\_ (h)18

Grade Five (5) Division

19. In the subtraction below, what is the value of  $M + L$ ?

$$\begin{array}{r} 5\ K\ 3\ L \\ -\ M\ 4\ N\ 1 \\ \hline 4\ 4\ 5\ 1 \end{array}$$

20.  $N$ ,  $N + K$ , and  $N + 2K$  are all integers and  $K > 0$ .  
 $N(N + K)(N + 2K) = P$  where  $P$  is prime.

\_\_\_\_\_ 19

What is the value of  $N$ ?

\_\_\_\_\_ 20

21. Jake tossed a coin 4 times and got at least one head.  
 What is the probability that he got 4 heads?  
 Express your answer as a common fraction in lowest terms.

\_\_\_\_\_ 21

22. You can use the digits 2, 0, 1, and 5 to form three digit numbers (but only the digit 1 is allowed to be used more than once). How many numbers can be formed? Examples for valid numbers: 111, 101, 251, 502.

\_\_\_\_\_ 22

23. A regular polygon has 30 sides. How many non congruent regular polygons can be drawn using corners of this polygon as their corners?

\_\_\_\_\_ 23

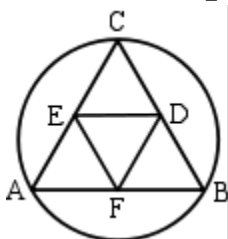
24. Yoko is more than 8 years old and is younger than 50.  
 The sum of all factors of her age is twice her age.  
 What is her age (in years)? Note that 1 and N are factors of N.

\_\_\_\_\_ 24

25. Alice selects at random a digit from the four digits 2, 0, 1, 5. Then, Bob selects at random a digit from 2, 0, 1, 5, possibly the same digit as Alice's.  
 Suppose that Alice's selected digit is  $N$ , and Bob's selected digit is  $M$ .  
 What is the probability that  $N + M$  is less than 5?  
 Express your answer as a common fraction in lowest terms.

\_\_\_\_\_ 25

26.  $ABC$  is an equilateral triangle inscribed in a circle with radius 1.  
 $D$ ,  $E$ , and  $F$  are mid points of the sides of  $ABC$ . What is the area of triangle  $DEF$ ? Express your answer as  $\frac{p\sqrt{q}}{n}$  where  $p$  and  $q$  are primes and  $n$  is a whole number.



\_\_\_\_\_ 26