

1. The figure below shows the flag of Finland, which consists of a cross, whose width is a uniform  $9\text{cm}$ , with a solid white background.

The flag measures  $33\text{cm} \times 54\text{cm}$ .

What fraction of the whole flag does the cross occupy?

Express your answer as fraction in lowest terms.



\_\_\_\_\_ 1

2. Let  $k$  be a positive number such that 225 and 216 are divisors of  $k$ .

If  $k$  is expressed as  $k = 2^a 3^b 5^c$ , and  $a$ ,  $b$ , and  $c$  are positive integers, what is the least possible value of  $a + b + c$ ?

\_\_\_\_\_ 2

3. The operation  $|x|$  is the absolute value of  $x$ .

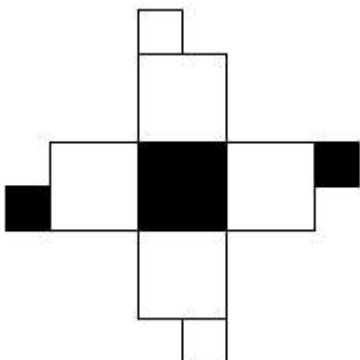
For example:  $|2.5| = 2.5$ ,  $|0| = 0$ ,  $|-3.1| = 3.1$ .

What is the smallest value of  $x$  such that  $-2x + |x| + |4 - 5x| = 20$ ?

\_\_\_\_\_ 3

4. You fold the paper below along the creases to make a die such that the area of each face is one unit, and such that the colors of black and white are outside. You roll the die three times. What is the probability that the total black area of the three rolls combined is at least 2 units?

Express your answer as fraction in lowest terms.



\_\_\_\_\_ 4

Grade Six (6) Division

5. A decimal point is added in front of one of the digits of a positive four-digit number, and then the new number is added to the old number to get 2368.45. What is the four-digit number?

\_\_\_\_\_ 5

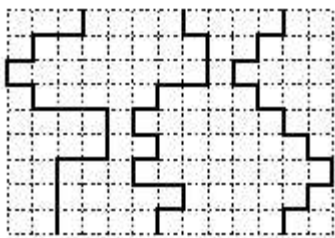
6. A teacher takes 37 students to a field trip. A student asks for the teacher's age. The teacher says, "If you start with my age, multiply it 2, subtract 12, divide by 2, and then add 8, the result is the total number of people participating in our field trip (including me)." What is the teacher's age?

\_\_\_\_\_ 6

7. Miki Niki and Oki walk from one side of the garden to the other side (each on a path shown as bold), starting at the same time. The length of each segment is 25 metres ( $m$ ).

Miki walks at  $1.50 \frac{m}{s}$ , Niki walks at  $1.25 \frac{m}{s}$ , and Oki walks at  $1.00 \frac{m}{s}$ .

How many seconds ( $s$ ) does it take for the last one of them to finish?



Miki Niki Oki

\_\_\_\_\_ ( $s$ ) 7

8. In the summation below,  $F$ ,  $L$ ,  $Y$ ,  $A$ , and  $W$  are all different digits and none of  $F$ ,  $A$ , and  $Y$  is equal to 0.

$$FLY + FLY + FLY = AWAY.$$

What is the sum of all possible sums in the case that  $A = 2$ ?

\_\_\_\_\_ 8

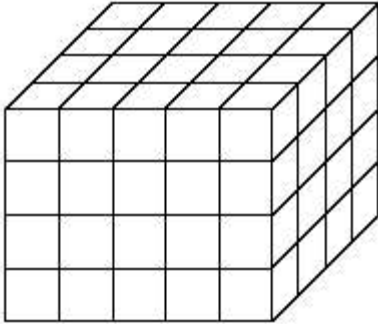
Grade Six (6) Division

9. Today is Saturday May 6, 2017.

What calendar year will it be 2017 days from today?

\_\_\_\_\_ 9

10. The box below consists of identical wooden cubes (no hollow spaces inside).  
How many of the cubes have no faces that are on the outside of the box?



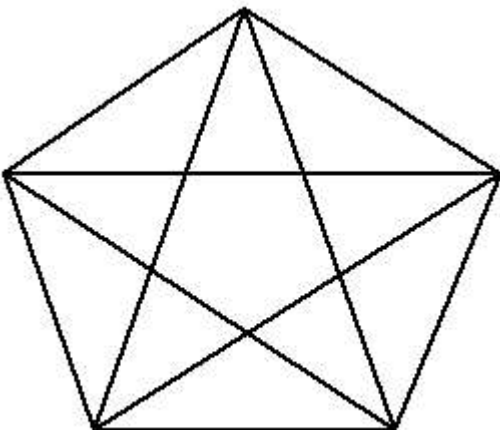
\_\_\_\_\_ 10

11. Take two different prime numbers smaller than 100 to form a fraction.

What is the value of the smallest fraction larger than  $\frac{1}{2}$  that can be formed?

\_\_\_\_\_ 11

12. How many triangles of all sizes are in the figure below?



\_\_\_\_\_ 12