1. How many multiples of 7 are there between 1 and 100? **(2 points)**

2. Dhruv and Isaiah finally decide to have the race of the century. Dhruv runs at 8 miles per hour, while Isaiah runs at 12 miles per hour. Dhruv knows he's going to lose so he cheats and takes a 1 hour head start. How far from the start line does Isaiah pass Dhruv? **(2 points)**

3. Jason is a 128 foot tall Giant. Unfortunately Jason is cursed. Every time he says "short", his height is cut in half. After how many times of Jason saying "short" will he become 2 feet tall? **(2 points)**

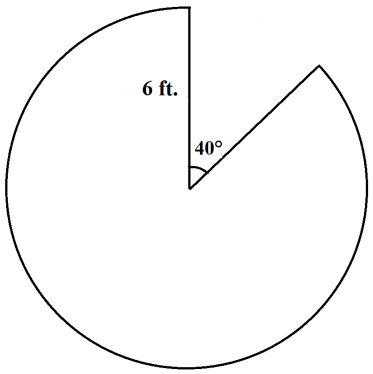
4. 60% of x is equal to 20% of 360. What is the value of x? **(2 points)**

5. Apurva has a collection of shapes. This collection consists of a square, a triangle, and a trapezoid. The side length of the square is $\frac{1}{2}$. The triangle has a base of 8 and a height of 6. The trapezoid has bases of 6 and 10, with a height of 7. Given this information, compute the product of the areas of each shape. **(3 points)**

6. The probability of Rayyan placing 1^{st} at a single math competition is $\frac{9}{10}$. The probability of him not placing is $\frac{1}{10}$. If Rayyan does not place in his first 7 competitions, then what is the probability that he places 1^{st} in the next two? Express your answer as a decimal. **(3 points)**

7. Every day at midnight, Siddharth thinks of a random integer. Given the information below, figure out what number Siddharth is thinking of. **(3 points)**
   I. Number contains less than 3 digits
   II. Number is less than 100
   III. Number is not a perfect square
   IV. Number is a multiple of 7
   V. Number does not contain the digits 1, 3, 5, 7, or 8.

8. Samay visits a pizza parlor to satisfy his hunger. He picks the largest pizza he finds. Unfortunately for Samay, a portion of it has already been eaten. What is the area of the remaining portion of the pizza? (Express your answer in terms of π) **(3 points)**



9. Jash is mining for diamonds deep underground. After weeks of mining he ends up 255 feet below the ground and decides to head back up to the surface. During the day he mines his way up 20 feet. At night, however, he drops 13 feet again. How many days will it take for Jash to make it back up to the surface? **(4 points)**

10. Martin is taking Algebra II and the semester is finally over. He has taken 5 test in total. Martin's first 4 test grades are 90, 80, 83, and 86. Martin "forgot to study" for the final test of the semester causing his average to drop to a 79. What was Martin's score on the last test of the semester? **(4 points)**

11. How many of the following statements are true? **(4 points)**
I. 0 is a positive number.
II. 0 is a negative number.
III. 0 is a whole number.
IV. 0 is an integer.
V. 0 is a natural number.

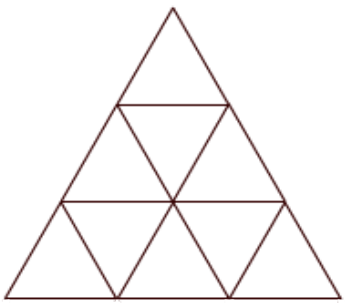
12. Let

A = $\left[\text{(Number of sides in a dodecagon)} + \text{(Number of faces on a cone)}\right] \times$ (Number of vertices on a sphere)
$B = 0.75 \times \frac{8}{9} \times \frac{4}{7}$
C = The square of the number of sides of a square.
D = The remainder of $\frac{357614}{9}$

Compute the value of $\frac{C-D}{A+B}$ **(4 points)**

13. Let

A = The sum of the mean, median, and mode of the data set [0, 9, 4, 4, 1, 1, 0, 8, 2, 2, 6, 4, 7, 8, 9, 10, 10]
B = 45% of the reciprocal of $\left(\frac{3}{2} \times \frac{8}{5} \times \frac{3}{4} \div \frac{9}{7}\right)$
C = (Number of sides in a hexagon) + (Number of sides in a triangle)
D = How many triangles are in the figure below?



Compute $\frac{A}{D} \times \frac{C}{B}$ **(5 points)**

14. Max does not believe he is in shape for an upcoming soccer tournament. He decides to come up with a weekly routine in order to stay fit. He runs 10560 feet on Mondays and Fridays, 3 miles on Tuesdays and Thursdays, and 7040 yards on Wednesdays and Saturdays. On Sundays he takes a break. He follows this routine for 8 weeks. Max sprains his ankle in the middle of this time period and doesn't run from Tuesday of Week 2 to Thursday of Week 4 inclusive. What is the total distance he runs in miles after the 8 week period? **(5 points)**

15. A hollow rectangular prism has dimensions $12 \times 12 \times 24$. How many $2 \times 3 \times 4$ blocks can this box contain without any blocks extending past the box's height (i.e overflowing) or being sliced/reshaped to fit into the box? **(5 points)**