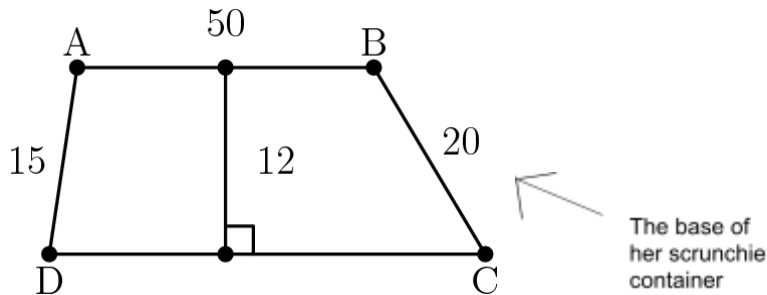


1. If $4^x + 21 = 85$ and $6^y + 3^2 = 45$, what is the product between x and y ? (1 point)
6

2. Vivian and Amy are meeting up for a school project at Starbucks. Vivian's house is twelve blocks west and sixteen blocks north from Starbucks. Amy's house is seven blocks east and twenty-four blocks south. Amy is traveling fifteen blocks per hour and Vivian is traveling at twelve blocks per hour. However, Vivian's phone battery dies and she is delayed for twenty minutes looking for directions. Once Amy arrives at Starbucks, how many minutes does she have to wait for Vivian to get there? (1 point) **4 minutes**

3. A car store has x amount of cars. When the store puts cars in rows of 11, there are nine cars left over. When the cars are put in rows of 9, there is 8 leftover. When the store puts the cars in rows of 10, there is two leftover. What's the least amount of cars the store can have? (1 point) **152 cars**

4. Vivian is trying to construct a container to place all her scrunchies in. The base of her container is a trapezoid. $AB = 50$ inches, $BC = 20$ inches, $AD = 15$ inches and the altitude of the trapezoid is 12 inches. What is the area of the base of her container in square inches? (1 point) **750**



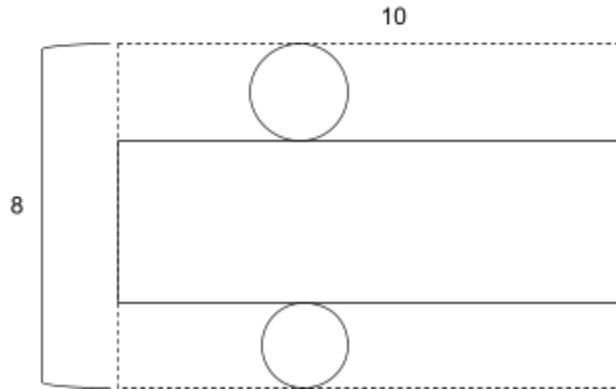
5. Three A's, three B's, and three C's are placed in the nine spaces so that each row and column contain one of each letter. If A is placed in the upper left corner, how many arrangements are possible? (1 point) **4**

A		

6. Vivian has a pet turtle named Mario and Weining has a pet turtle named Badescu. Vivian's pet Mario lives in a cubic tank that has a side length of 8 feet.

Weining's turtle Badescu lives in a pyramid tank that has a square base. The square base has a side length of 13 feet and the height of the pyramid is 9 feet. What is the absolute value of the difference in volume between Vivian and Weining's tanks? (2 points) **5**

7. Weining is trying to grab a Carmex from a bin of individual chapsticks. To increase her chances of grabbing a Carmex, Weining adds 5 more to the bin. This increases her chances by 20%. By the end, her chances of getting a Carmex is 60%. How many Carmex were in the bin originally? (2 points) **4**
8. Joe is cutting the net of a cylinder out of a piece of paper. The components of the cylinder are a rectangle and two circles, as shown below. What is the volume of the cylinder? Either leave in terms of π or round to three decimal places. (2 points)



Note that both of the circles are congruent.

9. 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? (2 points) **$\frac{1}{2}$**
10. If $x + \frac{1}{x} = 3$, what is the value of $x^4 + \frac{1}{x^4}$? (3 points)

47