



Challenge 5

1. _____ A bag of candy has 19 red candies and 14 orange candies. If I eat one red, then one orange, then one red, and so on, alternating between red and orange, how many candies will I have eaten when the number of orange candies is exactly $\frac{1}{3}$ the number of red candies?



2. _____ For how many integer values of n is $\frac{5}{n}$ greater than one-third but less than two-thirds?

3. _____ oz



A hummingbird consumes twice its weight in nectar each day (without gaining any weight). If you want to feed eight $\frac{1}{2}$ -ounce hummingbirds, how much nectar must be added to your feeder each week?

4. _____ If $\frac{1}{x+1} = 7$ and $\frac{1}{y-1} = 7$, what is $\frac{1}{x+y}$? Express your answer as a common fraction.

5. _____ How many four-digit palindromes (numbers which read the same forwards and backwards like 3,553 and 1,111) are divisible by 99?

6. _____ Six students hold hands and form a circle. How many different ways can they stand in a circle if Pamela and Corey refuse to hold each other's hand? Two arrangements are considered identical if every student is holding the same right hand in his or her left hand.



7. _____ How many distinct arithmetic sequences of positive integers include each of the integers 101, 137, and 209 in ascending order?

8. _____ cm^2 A sphere is centered within a cube such that the sphere trisects the edges of the cube at its points of intersection. The edges of the cube are 6cm long. How many square centimeters are in the surface area of the sphere? Express your answer in terms of pi.

9. _____ Donnie, Eddie, and Freddie all play for the same soccer team. Last season they scored a total of 21 goals between them, with each scoring at least one goal and no two scoring the same number of goals. How many distributions of goals scored by the three teammates are possible given these restrictions?



10. _____ times Mika and Phillip start walking at the same time from opposite vertices of square ABCD, which is 13 meters on each side. Mika walks from A to B and Phillip walks from C to D, each walking at the same constant rate. How many times is the distance between them a whole number of meters?