Math Olympiad Beginner
Homework 3

Name _____

1. A boy has the following seven coins in his pocket: 2 pennies, 2 nickels, 2 dimes, and 1 quarter. He Takes out two coins, records the sum of their values, and then puts them back with the other coins. He continues to take out two coins, record the sum of their values, and put them back. How many different sums can he record at most?

2. A total of fifteen pennies are put into four piles so that each pile has a different number of pennies. What is the smallest possible number of pennies that could be in the largest pile?

3. Six people participated in a checker tournament. Each participant played exactly three games with each of the other participants. How many games were played in full?

4. Peter has one of each of the following coins in his pocket: a penny, a nickel, a dime, a quarter, and a half-dollar. Four of these coins are taken out of the pocket and the sum of their values is calculated. How many different sums are possible?

5. A purse contains 4 pennies, 2 nickels, 1 dime, and 1 quarter. Different values can be obtained by using one or more coins in the purse. How many different values can be obtained?

6. The product of three counting numbers is 24. How many different sets of 3 numbers have this property if the order of the 3 numbers in a set does not matter?

7. (1,1,8) is a triple of counting numbers which has a sum of 10. Consider (1,8,1) and (8,1,1) to be the same triple as (1,1,8). How many different triples of counting numbers have a sum of 10? Include (1,1,8) as one of your triples.

8. Five disks, numbered 1, 2, 4, 8, and 16, are placed in a bag. Three disks are withdrawn from the bag, the sum of their numbers is recorded, and the three disks are then returned to the bag. Suppose this process is repeated indefinitely. What is the largest number of different sums that can be recorded?

9. A shopkeeper sells house numbers. She has a large supply of the numerals 4, 7, and 8, but no other numerals. How many different three-digit house numbers could be made using only the numerals in her supply?

10. There are 5 girls in a tennis class. How many different doubles teams of 2 girls each can be formed from the students in the class?