Name:_____ Date:_____

Assign 12 Math Challengers: Counting Principles and Probability

1. How many ways can 6 students arrange themselves around a circular table?

2. There are 3 roads from town A to town B and 4 roads from town B to town C. If no road can be traveled more than once, how many ways can a person travel from Town A to town B to town C and back home again?

3. A bag contains 7 white and 5 black marbles. How many ways can 3 white and 2 black marbles be chosen?

4. A student body can elect a president and a vice-president in 14520 ways. If every grade 11 student in the school is eligible to run for these positions, how many grade 11 students are in the school?

5. Linda is one of 8 teachers in the Mathematics department. I nhow many different ways can three of the teachers be chosen so that Linda is one of the chosen teachers?

6. Assuming that at least one coin is used, how many different sums of mony can be made with a penny, nickel, dime, quarter, and dollar?

7. How many seven-digit number using all the digits 1,2,3,4,5,6,7 are possible if the digit 1 must be before the digit 7 but not neccessarily adjacent to it?

8. In how many ways can a teacher choose one or more students from 6 eligible students?

9. How many ways can 4 men and 3 women sit in a row such that men and women sit next to each other?

10. What is the probability that any four letter word made up of different letters of the alphabet is in alphabetical order?

11. In how many ways can the letters: ECONOMICS be arranged?

12. In how many ways can the letters: ECONOMICS be arranged if you must begin with the letter 'C'?

13. A football team plays a 10-game schedule. How many ways can the schedule end with 5 wins, 3 losses, and 2 ties?

14. In how many ways can 30 teachers be assigned to 6 schools, with each school receiving an equal number of teachers?

15. From a regular deck of 52 cards, how many 5 card hands have exactly 3 hearts and 2 clubs?

16. Three boys and their dates have 6 seats at a hockey game. In how many ways can they be seated if each boy and his date sit together?

Find the number of different 7-digit numbers that can be made by rearranging the digits in the number 3053345.

Ten balls numbered 1 to 10 are in a jar. Jack reaches into the jar and randomly removes one of the balls. Then Jill reaches into the jar and randomly removes a different ball. The probability that the sum of the two numbers on the balls removed is even is:

(a) $\frac{4}{9}$ (b) $\frac{9}{19}$ (c) $\frac{1}{2}$ (d) $\frac{10}{19}$ (e) $\frac{5}{9}$