

Quiz #1 10/09/09

Name: _____

Directions: Make sure to read each problem carefully. To receive full credit, you must show all your work.

Problem 1. A new government is formed in a small country of 27 citizens. There are 7 public officials: President, Prime Minister, Czar, Prince, and 3 Senators.

a. (3 points) How many ways can the offices be assigned from the 27 citizens?

$$P(27, 4) \times C(23, 3)$$

b. (3 points) If Bob and Sue are each guaranteed that they will each get one of the offices besides Senator, how many ways can the offices be assigned?

(Choose which offices for Bob and Sue, pick the other 2 distinct offices, choose 3 senators)

$$P(4, 2) \times P(25, 2) \times C(23, 3)$$

Problem 2. Suppose a card player draws 5 cards from a deck.

a. (3 points) In how many ways can he draw a hand that includes exactly one heart, and two spades?

$$C(13, 1) \times C(13, 2) \times C(26, 2)$$

b. (3 points) In how many ways can he draw a hand that contains at least one club?

$$C(52, 5) - C(39, 5)$$

Problem 3. (4 points) Suppose a license plate contains 3 letters followed by 3 numbers. If there is no repetition among the letters, no repetition among the numbers, and the 3-digit number must be even, how many license plates can be formed?

$$P(26, 3) \times 5 \times 9 \times 8$$

Problem 4. (3 points) What is the coefficient of x^5y^8 in $(x + y)^{13}$?

$$C(13, 8) = C(13, 5)$$