

Count the number of possibilities for each scenario below.

1. the winner and first, second, and third runners-up in a contest with 10 finalists
2. selecting two of eight employees to attend a business seminar
3. an arrangement of letters in the word *flummox*
4. placing an algebra book, a geometry book, a chemistry book, an English book, and a health book on a shelf in any order
5. selecting 9 books to check out of the library from a reading list of twelve
6. selecting and ranking your top 3 favorite subjects from the 6 you are currently taking
7. an arrangement of the word *poppy*
9. Among the seven nominees for two vacancies on the city council are three men and four women. In how many ways may these vacancies be filled?
  - a) with any two of the nominees?
  - b) with any two of the women?
  - c) with one of the men and one of the women?

10. Stewy has 4 pairs of pants, 7 shirts, and 3 sweaters. In how many ways may she choose 2 of the pairs of pants, 3 of the shirts, and 1 of the sweaters to pack for a trip?

11. A bag is filled with marbles: 6 blue, 3 orange, and 4 puce. A damsel selects one marble and then puts it back and selects another. Find the probability of each situation below:

a)  $P(\text{pick orange, then puce})$

b)  $P(\text{pick orange and puce in any order})$

c)  $P(\text{pick two of the same color})$

12. The situation is the same as in question #11 except now the damsel holds onto her first marble and then selects the second. Find the probability of each situation below:

a)  $P(\text{pick orange, then puce})$

b)  $P(\text{pick orange and puce in any order})$

c)  $P(\text{pick two of the same color})$

13. The probability that it will rain in the next three days is 40% or 0.4. Find the probability that it will not rain on any of the next three days.

14. Expand the expressions below:

a)  $(2x + 3)^5$

b)  $(x^2 - 2y)^4$

15) Find the 7<sup>th</sup> term of  $(3x - 5)^9$