

**DIRECTIONS:** Find the number of combinations.

1.  ${}_5C_3$

2.  ${}_4C_1$

3.  ${}_8C_6$

4.  ${}_{10}C_8$

5.  ${}_9C_3$

6.  ${}_{14}C_5$

7.  ${}_{100}C_3$

8.  ${}_6C_4 + {}_6C_5 + {}_6C_6$

**DIRECTIONS:** Answer the following questions.

9. A volleyball team has twelve players, one coach, and two managers. How many different combinations of seven people can be chosen to set up the court for a match?
10. A sample of three batteries must be taken for quality inspection from a batch of 75 batteries. How many different combinations of samples could be selected?
11. There are 15 games on a family's game shelf, and the family will take exactly four of them on vacation. How many ways could the family select which games to take?
12. You may order a hamburger with cheese, onions, pickles, relish, mustard, lettuce, ketchup, tomatoes, or mayonnaise. How many different combinations of "extras" could you order if you must choose exactly four of them (none more than once)?
13. Twelve runners are listed on a coach's roster for a cross-country race and the coach will put exactly seven runners in the varsity race. How many different lineups can be created?
14. A school club has 15 boys and 16 girls as members. How many different six-person committees can be selected from the membership if equal numbers of boys and girls are to be selected?
15. The junior and senior class councils each have 10 members. In how many ways can a prom committee be formed if it is to consist of three seniors and two juniors selected from the two class councils?

- 16.** The Super Summer Music Series will feature 11 concerts this summer – you plan to attend **exactly** eight of them. How many different combinations of concerts can you attend?
- 17.** The Super Summer Music Series will feature 11 concerts this summer – you plan to attend **at least** eight of them. How many different combinations of concerts can you attend?
- 18.** There are 50 states in the United States. Sharelle’s goal is to visit **at least** 45 of them in the next twenty years. How many combinations of states are possible for Sharelle’s successful list twenty years from now?

There are 52 cards in a standard deck of playing cards. There are four suits (clubs, diamonds, hearts, spades), each containing thirteen cards (ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, jack, queen, king). Jacks, queens, and kings are also known as face cards.

- 19.** How many 5-card hands with exactly 2 aces and 3 kings are possible?
- 20.** How many 5-card hands with exactly 5 face cards are possible?
- 21.** How many 5-card hands with exactly 3 aces and 2 other cards are possible?
- 22.** How many 13-card hands with exactly 11 diamonds are possible?
- 23.** How many 13-card hands with exactly 11 cards from any suit are possible?
- 24.** How many 7-card hands with exactly 7 spades are possible?
- 25.** How many 7-card hands with at least 5 spades are possible?