DIRECTIONS: Find the number of combinations.

1. ${}_5C_3$
10

2. ${}_4C_1$
4

3. ${}_8C_6$
28

4. ${}_{10}C_8$
45

5. ${}_9C_3$
84

6. ${}_{14}C_5$
2002

7. ${}_{100}C_3$
161,700

8. ${}_6C_4 + {}_6C_5 + {}_6C_6$
22

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?
6435

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?
67,525

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?
1365

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)?
126

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?
792

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?
254, 800

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?
5400

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?
165

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?
232

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?
2,369,936

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?
24

20. How many 5-card hands with exactly 5 face cards are possible?
792

21. How many 5-card hands with exactly 3 aces and 2 other cards are possible?
4512

22. How many 13-card hands with exactly 11 diamonds are possible?
57,798

23. How many 13-card hands with exactly 11 cards from any suit are possible?
231,192

24. How many 7-card hands with exactly 7 spades are possible?
1716

25. How many 7-card hands with at least 5 spades are possible?
1,022,307