

Practice

Permutations and Combinations

1. A six-character license plate number can begin with any two letters and end with four one-digit numbers.
- a. How many possible choices are there for the first two characters?

For the last four characters?

- b. How many different six-character license plate numbers are possible?

2. Six runners are available for the 400-meter relay. Four runners are needed to run 100 m a piece, in a specified order. How many different runner lineups can the coach consider for the relay with one of each?

3. A restaurant's menu offers 8 different sandwiches and 5 side dishes. How many lunch combinations can you order?

Find the value of each expression.

4. ${}_5P_2$ 5. ${}_4P_3$ 6. ${}_9P_3$ 7. ${}_{10}P_3$
8. ${}_9P_4$ 9. ${}_6P_3$ 10. ${}_5P_3$ 11. ${}_{11}P_2$
12. ${}_8P_5$ 13. ${}_5P_4$ 14. ${}_6P_5$ 15. ${}_{100}P_2$

16. There are 100 songs on your music player. In how many different ways can you arrange 20 songs to listen to while exercising?

Find the value of each expression.

17. ${}_5C_2$ 18. ${}_{10}C_8$ 19. ${}_5C_4$ 20. ${}_9C_4$
21. ${}_6C_3$ 22. ${}_7C_5$ 23. ${}_4C_3$ 24. ${}_8C_4$
25. ${}_6C_5$ 26. ${}_5C_4$ 27. ${}_7C_3$ 28. ${}_{10}C_3$

Practice (continued)

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29. There are 15 slips of paper in a jar. Each slip has a different name on it. How many ways can you draw 5 names from the jar?

Explain whether each situation is a combination problem or a permutation problem.

30. Your friends rented 6 different video games. In how many different orders can you play the 6 games?

31. There are 20 games to choose from at the local game store. How many different sets of 4 games could you choose to rent?

32. The Aluru family has a garage door that opens with a 4-digit PIN. They decide to base the code on Mrs. Aluru's birthday: 01/24/63. How many PINs are there that use four of the digits in Mrs. Aluru's birthday?

33. You have 10 photographs to choose from. How many different ways can you arrange 5 of the photographs in a single row above the sofa?

34. There are 6 class periods in the school day. There are 10 subjects to choose from. How many different class schedules are possible?

Determine which value is greater.

35. ${}_9P_6$ or ${}_6P_3$

36. ${}_9C_6$ or ${}_9C_5$

37. ${}_{10}C_4$ or ${}_{10}C_6$

38. ${}_{10}P_4$ or ${}_6P_6$