

Combinations (Assignment 47)

1. In your own words, describe the difference between a permutation and a combination.

State whether each scenario involves a permutation or a combination.

2. A team of 8 basketball players needs to choose a captain and a co-captain.

3. There are 45 applicants for three computer programming positions.

4. The batting order for seven players on A 12-person team.

5. A class is splitting into two different teams to play a review game.

Calculate.

6. ${}_{12}C_{11}$

7. ${}_9C_3$

8. ${}_{10}P_8$

9. ${}_{17}P_2$

10. ${}_{17}C_2$

11. ${}_6P_3$

12. ${}_{20}C_{19}$

13. ${}_7P_7$

14. ${}_7C_7$

How many different samples of four items could you make out of each of the sets below?

15. $\{0, 1, 2, 3, 4, 5, 6, 7\}$

16. 12 novels on a reading list

17. Jim, Ben, Sue, Tom, and Bill

18. $\{A, B, C, D\}$

19. The 50 states

20. Three objects

21. A committee must choose 3 finalists from 15 scholarship candidates. How many ways can the committee choose the three finalists?
22. In how many ways can three medals (gold, silver, and bronze) be awarded in a race involving nine runners?
23. A group of 21 students wants to elect a president, vice president, treasurer, and secretary. In how many ways can they do this?
24. There are 110 people in a meeting. If everyone shakes hands with everyone else exactly once, how many handshakes will there be in all?
25. A traveler can choose from three airlines, five hotels, and four rental car companies. How many arrangements of these services are possible?
26. In how many ways could you select 5 apples to buy out of a case of 80?
27. How many ways could a research group choose 4 people to participate in a study if they are selecting randomly from the Marin county phonebook, which contains 105,000 names?
28. a) How many different 6 letter words (including nonsense words) can be created from the English alphabet?
- b) How many different 6 letter words (including nonsense words) can be created from the English alphabet if you can't use the same letter twice?