

Probability, Permutations, and Combinations

- Dan is in the bowling club. There are 33 students in the club. Four of them will be picked at random to attend an awards banquet. What is the probability that Dan will *not* be randomly chosen to attend the banquet?
[A] $\frac{4}{33}$ [B] $\frac{33}{4}$ [C] $\frac{33}{29}$ [D] $\frac{29}{33}$
- A spinner is evenly divided into 9 equal areas and numbered from 1 through 9. What is the probability of spinning a number less than 3 in a single spin?
[A] $\frac{1}{3}$ [B] $\frac{2}{9}$ [C] $\frac{2}{3}$ [D] $\frac{7}{9}$
- A spinner is evenly divided into 9 equal areas and numbered from 1 through 9. What is the probability of spinning a number less than 7 in a single spin?
[A] $\frac{2}{9}$ [B] $\frac{7}{9}$ [C] $\frac{1}{3}$ [D] $\frac{2}{3}$
- A spinner is evenly divided into 10 equal areas and numbered from 1 through 10. What is the probability of spinning a number less than 5 in a single spin?
[A] $\frac{3}{5}$ [B] $\frac{1}{2}$ [C] $\frac{3}{10}$ [D] $\frac{2}{5}$
- A box contains 4 green, 5 yellow, and 6 purple balls. Find the probability of obtaining a yellow ball in a single random draw.
- Determine the probability that you will roll the number 1 on a number cube.
- Determine the probability that you will roll a number different from 9 on a number cube.
- Determine the probability that you will roll a number less than 6 on a number cube.
- Determine the probability that you will roll a number greater than 2 on a number cube.
- Determine the probability that you will roll a number greater than 1 on a number cube.
- A lunch menu consists of 4 different kinds of sandwiches, 3 different kinds of soup, and 5 different drinks. How many choices are there for ordering a sandwich, a bowl of soup, and a drink?
[A] 12 [B] 60 [C] 17,280 [D] 3
- At a pizza parlor, Jerome has a choice of pizza toppings and sizes. There are topping choices of sausage, onions, and pineapple and size choices of large and extra large. Draw a tree diagram that shows the number of possible single-topping pizzas of either size that Jerome can order.
- How many different arrangements can be made using all of the letters in the word GAME?
[A] 36 [B] 24 [C] 16 [D] 4
- How many different arrangements can be made using all of the letters in the word MATH?
[A] 6 [B] 24 [C] 104 [D] 12

15. Find: ${}_8P_5$
[A] 40 [B] 13
[C] 13,440 [D] 6720
16. Find: ${}_4P_3$
[A] 24 [B] 12 [C] 7 [D] 48
17. Find: ${}_6P_3$
[A] 120 [B] 240 [C] 18 [D] 9
18. Find: ${}_5P_5$
[A] 120 [B] 240 [C] 10 [D] 25
19. Find: ${}_9P_7$
[A] 63 [B] 362,880
[C] 16 [D] 181,440
20. Evaluate: ${}_7C_4$
[A] 4 [B] 56 [C] 35 [D] 28
21. Evaluate: ${}_9C_4$
[A] 3024 [B] 2
[C] 126 [D] 362,880
22. Evaluate: ${}_9C_5$
[A] 362,880 [B] 126
[C] 15,120 [D] 4
23. Evaluate: ${}_9C_3$
[A] 3 [B] 54 [C] 84 [D] 504
24. Evaluate: ${}_8C_5$
[A] 56 [B] 40,320 [C] 40 [D] 4
25. How many different ways can 15 different runners finish in first, second, and third places in a race?
26. Alicia, Neil, Julio, and Elena are in the math club. The club advisor will assign students to 3-person teams at the next Math Team competition. How many different 3-person teams can be formed from these four students?
27. Leila, Erika, Martha, Hiro, Rachel, and Cindy are in the math club. The club advisor will assign students to 2-person teams at the next Math Team competition. How many different 2-person teams can be formed from these six students?
28. Mario, Sam, Jack, Jim, Alicia, and Erika are in the math club. The club advisor will assign students to 5-person teams at the next Math Team competition. How many different 5-person teams can be formed from these six students?
29. Sam, Neil, Bob, Julio, Billy, and Ralph are in the math club. The club advisor will assign students to 4-person teams at the next Math Team competition. How many different 4-person teams can be formed from these six students?
30. Laura, Ernest, Leila, Rachel, and Maria are in the math club. The club advisor will assign students to 2-person teams at the next Math Team competition. How many different 2-person teams can be formed from these five students?