Probability - Permutations and Combinations

# Homework

For #1-3, use the spinner to find each probability

1. P(M) 2. P(Q or T) 3. P(vowel)

For #4-7, a bag contains 7 blue, 5 purple, 12 red and 6 orange marbles. Find each probability if one marble is drawn at random from the bag.

4. P(Purple) 5. P(Not Green) 6. P(Yellow) 7. P(Red or Blue)

8. Pizzas can be made with a choice of crust (thick crust or thin crust), a choice of meat (Pepperoni, Ham or Sausage), and a choice of vegetables (mushrooms or onions).

 a) Make a list or tree showing the Sample Space – include all possible outcomes.

b) Use the Counting Principle to find the number of possible outcomes.

9. Jeans come in different sizes (30, 32, 34, 36, 38), styles (slim fit, relaxed fit, boot cut, loose fit) and lengths (30, 32, 34).

 a) Find the number of jeans available.

 b) Find the probability of selecting a size 32 x 34 slim fit.

For #10-13, use the Fundamental Counting Principle to find the total number of outcomes in each situation.

10. Tossing three coins (H or T)

11. Choosing pancakes or waffles, with bacon, sausage or ham, and milk or orange juice

12. Choosing a number on a number cube and picking a marble from the bag

13. Picking a month of the year and a day of the week.

For #14-20, find the number of permutations.

14. In how many different ways can the starting six players of a volleyball team stand in a row for a picture?

15. How many different 3-digit area codes can be created if no digit can be replaced?

16. In how many ways can a president, vice president, and secretary be randomly selected from a class of 25 students?

17. A password consists of four letters, of which none are repeated. What is the probability that a person could guess the entire password by randomly selecting the four letters?

18. A child has wooden blocks with the letters G,R,T,I and E. Find the probability that the child randomly arranges the letters in the order TIGER.

19. A family discovered they can stand in a row for their portrait in 720 different ways. How many people are in their family?

20. There are 1320 ways for three students to win first, second, and third place during a debate match. How many students are there on the debate team?

For #21-28, find the number of combinations.

21. In how many ways can you pick 2 stickers from a package of 7?

22. In how many ways can you select 4 volunteers out of 10?

23. You are allowed to omit two out of 12 questions on a quiz. How many ways can you select the questions to omit?

24. On an 8 member volleyball team, how many different 6 players starting lineups are there?

25. At a hotdog stand, customers can select three toppings from among chili, onions, cheese, mustard, ketchup or relish. What is the probability that three toppings selected at random will include onions, mustard and relish?

26. Six students are to be chosen from a class of 28 to represent the class at a math contest. How many ways can the six students be chosen?

27. How many ways can two names be chosen from 76 in a raffle if only one entry per person is allowed?

28. How many ways can 2 fish be chosen from a tank containing 15 fish?

For #29-32, decide whether each problem represents a permutation or a combination then solve the problem.

29. How many different 6-digit serial numbers are available if no digit can be repeated?

 Permutation/Combination?

30. How many ways can a group of 5 students be chosen from a class of 28.

 Permutation/Combination?

31. Braden is dealt five playing cards. In how many different orders could Braden have been dealt the same hand?

 Permutation/Combination?

32. There are 156 ways for 2 cars to win first and second place in a race. How many cars are in the race?

 Permutation/Combination?

33. How many ways can you choose 6 websites from a list of 15 possible choices?

 Permutation/Combination?