

1. Jane flipped a coin and rolled a number cube with sides labeled 1 through 6. What is the probability the coin will show heads and the number cube will show the number 4?

A $\frac{1}{6}$

B $\frac{1}{8}$

C $\frac{1}{10}$

D $\frac{1}{12}$

2. Heather tosses a coin and then rolls a number cube labeled 1 through 6. Which set represents S , the sample space for this experiment?

A $S = \{H, T, 1, 2, 3, 4, 5, 6\}$

B $S = \{HT, TH, 1, 2, 3, 4, 5, 6\}$

C $S = \{HT1, HT2, HT3, HT4, HT5, HT6\}$

D $S = \{H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6\}$

3. Four students want to have their picture taken together. They will stand side-by-side for the picture. In how many different ways can the four students be arranged to take a picture?

A 8

B 12

C 16

D 24

4. At a middle school, there are five starting basketball players for the team. The coach wants to select two players to be team captains. In how many different ways can he choose two captains from the five starting players?

A 1

B 2

C 5

D 10

5. Jamal will add one meat, one vegetable, and one dressing to his salad from the choices shown below.

Toppings for Salad

Meats	Vegetables	Dressings
ham	tomatoes	Ranch
turkey	carrots	bleu cheese
steak	celery	Italian
	onions	

How many possible salads can he make from these toppings?

- A 10
- B 18
- C 36
- D 40

6. Celina just got a new kitten. She is buying the kitten a collar and an identification tag at the pet store. There are several choices Celina can make about the color of the collar, the shape of the tag, and the type of font on the tag. The table below displays the available options.

Collar Colors	Tag Shapes	Types of Font
Orange	Square	Print
Purple	Circle	Script
Blue	Oval	
Red		

Part A: Draw a tree diagram to show all of the possible combinations of collar colors, tag shapes, and font types for a collar and tag. How many possible combinations are there?

Part B: If Celina decides she does **not** want an orange collar for her kitten, how many fewer combinations of collar colors, tag shapes, and font types are available?

7. A sandwich shop sells four kinds of sandwiches: chicken (C), turkey (T), ham (H), and vegetable (V). Each sandwich comes in three sizes: small, medium, or large. The shop also sells two side dishes: fries (F) or beans (B). An employee started this list of options for customers who want to order a small or medium sandwich and one side dish.

Small C F, Small C B, Medium C F, Medium C B,
Small T F, Small T B, Medium T F, Medium T B

Which option also belongs on the employee's list?

- A Small F B
- B Small C T
- C Medium H B
- D Large H F

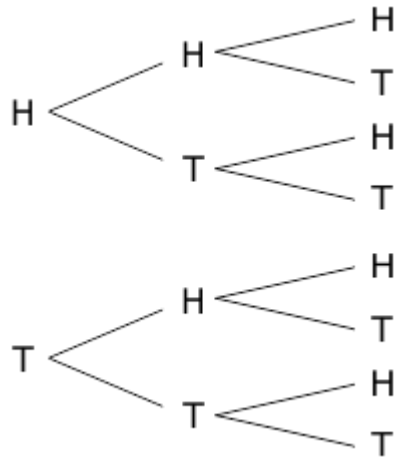
8. Logan wants to buy 5 different baseball cards. He only has enough money to buy 3 cards. How many choices does Logan have for the 3 baseball cards?

- A 5
- B 10
- C 15
- D 20

9. For a school project, Mike, Riley, Josh, and Wyatt need to work in groups of two. How many different groups can the four boys create?

- A 10
- B 8
- C 6
- D 4

10. Ben will toss a penny, a nickel, and a dime. The tree diagram shows the possible outcomes.



How many different outcomes are possible?

- A 4
- B 8
- C 12
- D 14

11. The table below lists some of the possible outcomes when tossing a dime and a nickel and rolling a die.

HH1
HH2
HH3
HH4
HH5
HH6
TT1
TT2
TT3
TT4
TT5
TT6

How many more possible outcomes are there?

- A 0
- B 6
- C 12
- D 24

12. Alan is decorating for a party. He wants one color of streamer, one type of flower, and one color of tablecloth.

- The streamers can be red, blue, or yellow.
- The flowers can be tulips, daisies, or roses.
- The color of the tablecloth can be plaid, striped, or solid.

How many possible combinations are there?

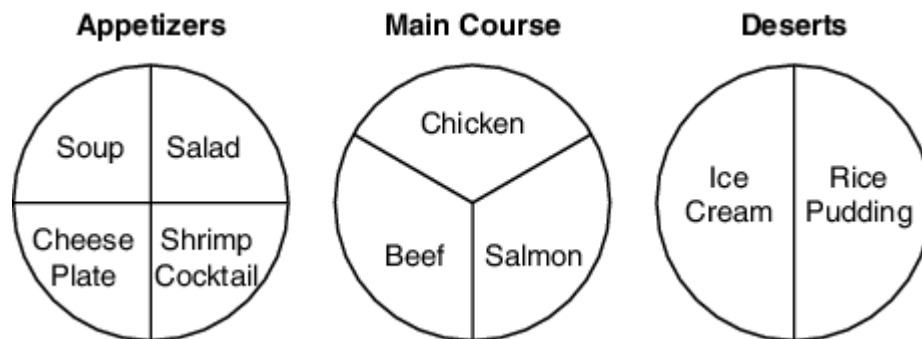
A. 3

B. 9

C. 12

D. 27

13. A restaurant is celebrating its 10th anniversary by giving out free meals to the first 10 customers of the day. Each of these customers will use the spinners below to randomly determine a free three-course meal.



How many unique meals are possible?

- A 4
- B 9
- C 12
- D 24

15. At Sammy's school, all seventh grade students are randomly assigned to reading group A or reading group B. Each student is then randomly assigned one of 7 books to read. The books are the same for both groups. Sammy has already read 2 of the 7 possible books. In how many of the possible combinations of reading groups and books would Sammy read a book he has not read before?

- A.** 2 out of 7 possible combinations
- B.** 5 out of 7 possible combinations
- C.** 7 out of 14 possible combinations
- D.** 10 out of 14 possible combinations

16. Jerry went to a restaurant for breakfast.

- He wants to eat either pancakes or waffles.
- He can then choose a topping: syrup, strawberries, or blueberries.
- Jerry's choices for a drink include coffee, orange juice, or apple juice.

If he chooses one topping and one drink, how many different choices for breakfast does Jerry have?

- A.** 6
- B.** 8
- C.** 12
- D.** 18

17. For picture day, Kim can choose a red or green shirt, blue or black pants, and white or brown sandals. How many different outfits are available for Kim to wear for picture day?

A. 8

B. 6

C. 3

18. Moesha has 3 dresses, 2 hats, and 5 pairs of shoes. She will choose an outfit that has one dress, one hat, and one pair of shoes. How many different outfits are possible?

A. 3

B. 10

C. 15

D. 30

19. Maya wants to purchase 6 different video games. She has saved enough money to buy 2 video games. How many choices does Maya have for the 2 video games she can buy?

A. 10

B. 12

C. 15

D. 30

20. Natalie, Sarah, Gabriella, and Maria were told to work in groups of two. How many different groups of two can the four girls make?

A. 2

B. 4

C. 6

D. 8

21. Rebecca's wardrobe has dresses from three different designers, P_1 , P_2 , and P_3 . She has two dresses from each designer, one red (R) and the other blue (B). She randomly picks a dress.

Part A. Draw a tree diagram to show all the possible ways in which she can choose a dress.

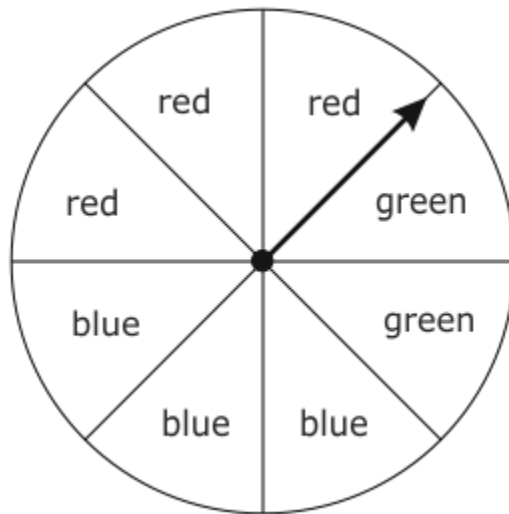
Part B. Use the tree diagram to write the sample space for choosing a dress.

Part C. What is the probability that the dress she chooses is from the designer P_1 ?

Part D. What is the probability that the dress she chooses is from the designer P_1 or P_2 ?

Use words, numbers, and/or pictures to show your work.

22. Nathan spins the spinner below two times.



What is the probability Nathan will spin red on the first spin and blue on the second spin?

A. $\frac{9}{64}$

B. $\frac{9}{25}$

C. $\frac{3}{8}$

23. Carrie will toss two six-sided number cubes, one red and one blue, to generate 2-digit numbers. The number on the red cube will be the first digit of Carrie's number, and the number on the blue cube will be the second digit. How many 2-digit numbers are possible for Carrie to generate?

A. 6

B. 12

C. 18

D. 36

24. William will toss a coin and roll a number cube with sides labeled 1 to 6. How many outcomes are possible?

A. 2

B. 6

C. 12

D. 24

25. How many possible combinations of two number cubes, numbered 1 through 6, would add up to exactly 7?

A. 2

B. 3

C. 5

D. 6

26. Mrs. Jones wants to make cookies.

- She can make chocolate, vanilla, butter, or oatmeal cookies.
- She will add either chocolate chips, nuts, or raisins.

How many different types of cookies can Mrs. Jones make?

A. 4

B. 7

C. 12

27. At a restaurant, a lunch special allows a customer to choose 2 of the same, or 2 different items from the list below.

hamburger, chicken sandwich, baked potato, chili

How many different choices does a customer have if they purchase the lunch special?

A. 16

B. 12

C. 10

D. 6

28. The chart below shows the student lunch menu at a school. A lunch consists of one sandwich, one snack, and one drink.

Lunch Menu

Sandwich	Snack	Drink
turkey	apple	juice
bologna	banana	milk
peanut butter	cookies	
ham	yogurt	

How many different lunch choices does a student have?

- A. 10
 - B. 16
 - C. 30
 - D. 32
29. Amy has four tubs of ice cream with different flavors in each—vanilla, chocolate, butterscotch, and strawberry. She needs to take three of these tubs to a party. If she chooses the chocolate first, how many different combinations of ice cream tubs are possible for her to bring?
- A. 3
 - B. 6
 - C. 9

D. 24

30. At a school, students may choose one entrée, one vegetable, and one dessert for lunch. The choices are listed in the table below.

Lunch Menu

Entrée	Vegetable	Dessert
baked chicken	corn	chocolate cake
spaghetti	broccoli	apple pie
tacos	green beans	brownie
	salad	

How many different lunch combinations are available?

- A. 12
- B. 36
- C. 72
- D. 144
31. A lunch special is made up of 1 sandwich, 1 drink, and 1 side dish. The choices for each are shown in the table.

Sandwiches	Drinks	Sides
Ham	Whole Milk	Carrots
Turkey	Chocolate Milk	Grapes
Tuna	Lemonade	Yogurt
Meatloaf	Orange Juice	
Peanut Butter		
Roast Beef		

How many different lunch combinations are possible?

- A. 3
- B. 13
- C. 62
- D. 72

32. A jar contains an equal number of red, blue, and green marbles.

Part A List all possible outcomes for randomly choosing two marbles from the jar. Let R represent red marbles, B represent blue marbles, and G represent green marbles.

Part B What is the probability that at least one of the two randomly chosen marbles will be blue? Express your answer as a fraction in simplest form. Show or explain your work.

Part C Red marbles cost \$0.15, blue marbles cost \$0.12, and green marbles cost

\$0.10. What is the probability that two randomly chosen marbles will have a total cost of \$0.25 or less? Express your answer as a fraction in simplest form. Show or explain your work.

Part D What is the probability that two randomly chosen marbles will have a cost of \$0.25 or less and that at least one of the two marbles will be blue? Express your answer as a fraction in simplest form. Show or explain your work.

33. Nigel went to a sandwich shop for lunch. The menu below shows the types of cheeses and meats available.

Cheeses	Meats
American	ham
cheddar	bologna
	turkey
	chicken

If Nigel chooses one cheese and one meat, how many different sandwiches are possible?

A. 4

B. 6

C. 8

D. 10