

1. Jan conducted a probability experiment in which she randomly selected a marker out of a bag that contained 12 markers. She repeated the procedure a total of 50 times and replaced the marker after each time. The results of Jan's experiment are listed below.
- 17 blue markers
  - 8 red markers
  - 25 yellow markers`

Based on the data, how many of each color of markers was most likely in the bag?

2. At the start of a four-player video game, one player is selected to begin playing the game. In order to determine if this is random, four friends repeatedly start the game and record which player is selected to begin. Their results are shown in the table below.

Player	Number of Times Selected
1	18
2	21
3	19
4	22

Do you think the selection process is random? Explain your reasoning.

What is the probability that the second player was chosen to begin the game? \_\_\_\_\_%

3. A safety inspector came into Julia's store to inspect the fire alarms. Four out of the 56 fire alarms inspected had a defect. What is the percent chance that the next fire alarm inspected has a defect?
4. There are 112 cars in a grocery store parking lot. The probability that a car selected at random is white is  $\frac{1}{8}$ . How many of the cars in the parking lot are white?

5. A bag of candies contains 10 candies that are orange. The probability of reaching into the bag, taking 1 candy from the bag without looking, and getting an orange candy is  $\frac{1}{8}$ . How many candies in the bag are NOT orange?
6. In a group of 20 students, there are 12 boys and 8 girls. 5 of the boys play on the football team. What is the probability of choosing 1 student at random from the group who is NOT on the football team?
7. There are 112 cars in a grocery store parking lot. The probability that a car selected at random is white is  $\frac{1}{8}$ . How many of the cars in the parking lot are NOT white?
8. During a festival game, children attempt to win a prize by drawing a token from a bag. The tokens are labeled *Large Prize*, *Small Prize*, or *No Prize*. After a token is drawn, it is returned to the bag. The table below shows the three types of tokens and the number of each token in the bag.

Token	Number of Tokens in the Bag
Large Prize	5
Small Prize	10
No Prize	25

Lia observes the game and keeps track of the results of 20 consecutive draws from the bag. She records her results in the table shown below.

Token	Count of Times Token Selected
Large Prize	4
Small Prize	3
No Prize	13

The theoretical probability of winning a small prize is \_\_\_\_\_.

The theoretical probability of winning a large prize is \_\_\_\_\_.

From the observed frequencies, the probability of getting no prize is \_\_\_\_\_.

From the observed frequencies, the probability of winning a large or small prize is \_\_\_\_\_.

Based on the theoretical probability, is it more likely to win a small prize or a large prize? \_\_\_\_\_

Does the observed probability model match the theoretical probability model? \_\_\_\_\_

9. Ms. Kingsley creates a game for a school festival. In her game, students draw a lettered token from the bag. Students win a prize depending on which letter is on the drawn token. Then the token is returned to the bag. The table below shows the three possible outcomes and the count of each type of token in the bag.

Letter on Token	Prize	Number of Tokens in the Bag
L	Large Prize	5
S	Small Prize	10
N	No Prize	25

Marcie, a student at the school, keeps track of the results of 20 consecutive draws from the bag before she plays the game. She records these results in a table, as shown below.

Letter on Token	Prize	Count of Times Token Selected
L	Large Prize	4
S	Small Prize	3
N	No Prize	13

How could the experimental results get closer to the theoretical results?

The theoretical probability of winning a large prize is \_\_\_\_\_.

From the observed frequencies, the probability of not winning is \_\_\_\_\_.

10. Tricia works for a dog food company. She wants to test a certain dog food with a brand new formula. She leads several dogs to the bowls containing the food and notices many of them do not touch the food. Some of the dogs will take a few bites but leave a lot of food behind. A rare dog or two will actually eat the food and lick the bowl clean. She predicts that the probability of the dogs liking the new formula is around 0.1, or 10%.

Determine which statements justify Tricia's predictions. Select Yes or No for each statement.

Statement	Yes	No
The probability must be close to 0 since it is unlikely the dogs will eat the food.	<input type="radio"/>	<input type="radio"/>
Since some of the dogs licked the bowl clean, the probability should be close to 0.	<input type="radio"/>	<input type="radio"/>
Since it is a new formula for the dog food, the probability should start at 0 until more dogs like it.	<input type="radio"/>	<input type="radio"/>
Since a few of the dogs eat the food, the probability cannot equal 0.	<input type="radio"/>	<input type="radio"/>

11. Yvette plays a card game with red, blue, green, yellow, and wild cards. Yvette randomly selects one card from the deck. The table below shows the probabilities of some outcomes.

Outcome	Probability
Blue	0.02
Wild or Red	0.14
Red or Green	0.46
Not Yellow	0.76

Which outcome is likely to occur? \_\_\_\_\_

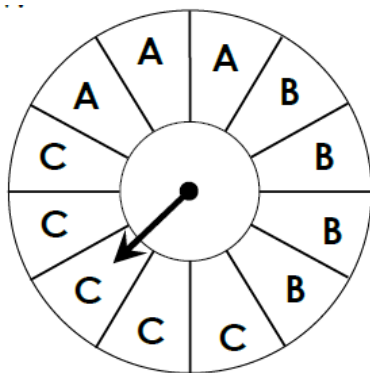
12. Based on this probability value, is each event *likely*, *neither likely nor unlikely*, or *unlikely* to occur?

0.9 \_\_\_\_\_

0.05 \_\_\_\_\_

0.55 \_\_\_\_\_

13. A spinner is shown. Match each outcome to a box to order them in terms of the likelihood of their occurrence from Likely to Not Likely, with the most likely on top.



Likely



Not Likely

A.

spinning an A

B.

spinning a B

C.

spinning a C

14. Rama threw a paper airplane 30 times. It landed right side up 12 times and upside down 18 times. If this pattern continues and Rama throws the paper airplane one more time, what is the probability it lands upside down?

15. Audrey has 400 songs on her MP3 player. Of these songs, 150 are by female vocalists, 75 are by male vocalists, and 175 are by groups. If one song is played at random, what is the probability it is sung by a male vocalist?

16. There is a game with rubber ducks floating on a pool of water at the fair. On the bottom of each duck is a black or red dot. To play the game a person randomly picks one of the floating ducks. If a person picks a duck with a red dot on the bottom they win a prize. The duck is then placed back in the water.

The table below summarizes the results of the first 50 people to play the game.

	Red Dot	Black Dot
Number of Times	12	38

Based on these results, what is the expected probability that the next rubber duck picked will have a red dot? Write your response as a decimal.

17. Karen has the cards below in a bag. Without looking, she pulls out a card.

M A T H E M A T I C A L

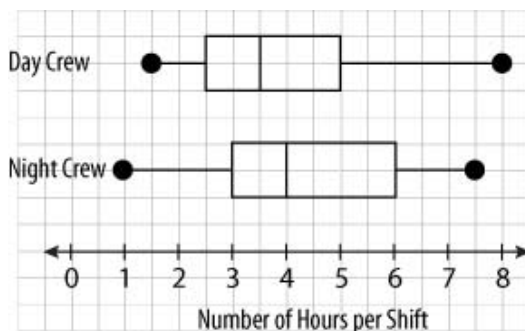
Karen is trying to determine whether each statement correctly describes the likelihood of an event based on the given cards. Help Karen to select True or False for each statement.

The probability of the card containing an M is \_\_\_\_\_.

The probability of the card containing an A is \_\_\_\_\_.

The probability of the card containing a vowel is \_\_\_\_\_.

18. A factory employs part-time workers in two shifts, a day crew and a night crew. The box-and-whisker plots represent the number of hours worked per day for 100 workers who were selected at random from the two shifts.



Which of the following is the most reasonable conclusion? Use the drop-down menus to choose the responses that correctly complete each statement.

The median number of hours worked by the day crew is \_\_\_\_\_.

The median number of hours worked by the night crew is \_\_\_\_\_.

The Q1 and Q3 for the day crew are \_\_\_\_\_ and \_\_\_\_\_.

The Q1 and Q3 for the night crew are \_\_\_\_\_ and \_\_\_\_\_.

19. The CEO of Hot Tires compares factory production for his two factories using the data in the table shown.

	Factory A Production	Factory B Production
Monday	102	112
Tuesday	106	119
Wednesday	114	105
Thursday	98	96
Friday	101	113

What do the means tell you about the two factories?

20. Jen and Ron each took five tests. Their test scores are shown below.

- Jen: {45, 91, 84, 66, 74}
- Ron: {70, 95, 99, 69, 72}

Find the medians of their test scores.

Find the means of their test scores.

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21. The table shows the sales for a cell phone company during two quarters, based on the marketing tool used.

Marketing Tool	Quarter 1 Sales	Quarter 2 Sales
Newspaper Ad	\$86,000	\$74,000
Radio Ad	\$78,000	\$64,000
Referred by Customer	\$47,000	\$52,000

Find the difference in the means of the total sales between quarter 1 and quarter 2.