7-4 Probability - Practice and Problem Solving

The spinner shown is spun once. Find the probability of each event. Write each answer as a fraction.

9. $P(\text{orange})$

$$P\left(\text{orange}\right) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{0}{1} \text{ or } 0$$

The probability of spinning a orange is 0.

11. $P(\text{red, yellow, or green})$

$$P\left(\text{red, or green}\right) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{3}{4}$$

The probability of spinning red, yellow, or green is $\frac{3}{4}$.

13. $P(\textit{not} \text{ green})$

There is 5 spaces on the spinner that are not green.

$$P\left(\textit{not} \text{ green}\right) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{5}{8}$$

The probability of spinning something other than green is $\frac{5}{8}$.

Ten cards numbered 1 through 10 are mixed together and then one card is drawn. Find the probability of each event. Write each answer as a fraction.

15. $P(7 \text{ or } 9)$

$$P(7 \text{ or } 9) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{2}{10} = \frac{1}{5}$$

The probability of drawing a 7 or 9 is $\frac{1}{5}$.

17. $P(\text{greater than } 3)$

$$P(\text{greater than } 3) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{7}{10}$$

The probability of drawing a number greater than 3 is $\frac{7}{10}$.

19. $P(\text{even})$

$$P(\text{even}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{5}{10} = \frac{1}{2}$$

The probability of drawing an even number is $\frac{1}{2}$.

21. $P(not \text{ 5, 6, 7, or 8})$

$$P(not \text{ 5, 6, 7, or 8}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{6}{10} = \frac{3}{5}$$

The probability of drawing a card other than a 5, 6, 7,

or 8 is $\frac{3}{5}$.

ANALYZE TABLES Use the table on air travel at selected airports.

| Texas Air Travel	
Airport	**Arrivals (Percent on-time)**
El Centro (CA)	80
Baltimore (MD)	82
Charleston (SC)	77
Islip (NY)	83
Milwaukee (WI)	76

Source: U.S. Department of Transportation

23. Suppose a flight that arrived at Islip is selected at random. What is the probability that the flight did arrive on time?

   83% of the flights arriving at Islip arrived on time.

   $$83\% = \frac{83}{100}$$
   $$= 0.83$$

   The probability that the flight did arrive on time is 83%, 0.83, or $\frac{83}{100}$.

   One jelly bean is picked, without looking, from the jar shown. Write a sentence stating how likely it is for each event to happen. Justify your answer.
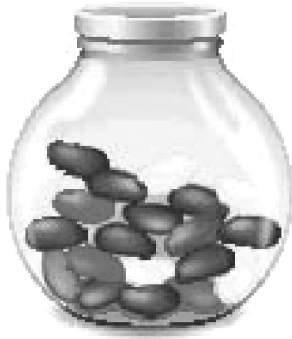
25. purple

   The chances of picking a purple jelly bean or not choosing a purple jelly bean are equal likely to happen since the probability of picking a purple jelly bean is 50%.

27. green

   Picking a green jelly bean is not likely to happen since the probability of picking a green jelly bean is 10%.

GEOMETRY Use the spinners and information shown.
The probability of landing in a certain section on a spinner can be found by considering the size of the angle formed by that section. In spinner A, the angle formed by the blue section is one-fourth of the angle formed by the entire circle. So, $P(\text{blue}) = \dfrac{1}{4}$, 0.25, or 25%.
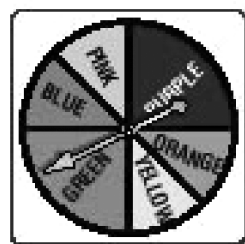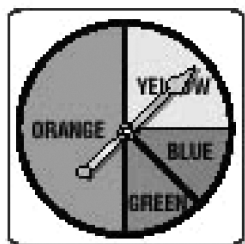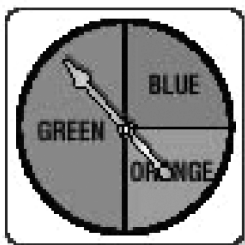
29. Determine $P(\text{green})$ for each spinner. Write the probabilities as fractions, decimals, and percents. Justify your response.

Spinner A: $\dfrac{1}{2}$, 0.5, 50%;

Spinner B: $\dfrac{1}{8}$, 0.125, 12.5%;

Spinner C: $\dfrac{1}{4}$, 0.25, 25%;

Sample answer: In spinner A, the green section is half of the circle. In spinner B, the green section is one-eighth of the circle. In spinner C, the green section is one-fourth of the circle.

31. For each of the three spinners, are the outcomes of spinning each color equally likely? Explain your reasoning

No; Sample answer: The sizes of the angles formed by each section are not equal.

CHALLENGE Another way to describe the chance of an event occurring is with odds. The *odds* in favor of an event is the ratio that compares the number of ways the event can occur to the ways that the event *cannot* occur.

odds of rolling a 3 or a 4 on a number cube is the ratio of ways to occur : ways to not occur = 2:4 or 1:2

Find the odds of each outcome if a number cube is rolled.
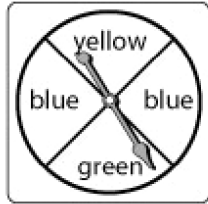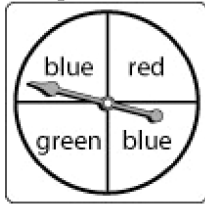
33. a 2, 3, 5, or 6

ways to occur : ways not to occur
4:2 or 2:1

35. an even number

ways to occur : ways not to occur
3:3 or 1:1

37. **CHALLENGE** A spinner for a board game has more than three sections, all of equal size, and the probability of the spinner stopping on blue is 0.5. Design two possible spinners for the game. Explain why each spinner drawn makes sense.

Sample answer:

Sample answer: The first spinner is a possibility because $\frac{2}{4}$ or $\frac{1}{2}$ of the sections are blue. The second spinner is a possibility because $\frac{2}{4}$ of the whole spinner is blue.

39. Joel has a bowl containing the mints shown in the table.

Color	Number
Red	5
Orange	3
Yellow	1
Green	6

If he randomly chooses one mint from the bowl, what is the probability that the mint will be orange?

A $\frac{1}{5}$

B $\frac{2}{3}$

C $\frac{11}{15}$

D $\frac{4}{5}$

Find the total number of mints.
5 + 3 + 1 + 6 = 15

$$P(\text{orange}) = \frac{3}{15}$$

$$= \frac{1}{5}$$

The correct answer is A.

41. **FARMS** About 93% of Nebraska's land area is occupied by 48,500 farms and ranches. Write 93% as a decimal.

$$93\% = \frac{93}{100}$$
$$= 0.93$$

Add or subtract. Write in simplest form.

43. $4\dfrac{3}{8} + 7\dfrac{1}{8}$

$$4\frac{3}{8} + 7\frac{1}{8} = (4+7) + \left(\frac{3}{8} + \frac{1}{8}\right)$$
$$= 11 + \frac{4}{8}$$
$$= 11\frac{1}{2}$$

45. $4\dfrac{3}{5} - 1\dfrac{1}{2}$

$$4\frac{3}{5} - 1\frac{1}{2} = (4-1) + \left(\frac{3}{5} - \frac{1}{2}\right)$$
$$= 3 + \left(\frac{6}{10} - \frac{5}{10}\right)$$
$$= 3 + \frac{1}{10}$$
$$= 3\frac{1}{10}$$

PREREQUISITE SKILL List all possible outcomes for each situation.

47. tossing a coin

heads, tails

49. selecting a month of the year

January, February, March, April, May, June, July, August, September, October, November, December