

LESSON

Practice A

Key

11-5

Probability of Independent and Dependent Events

Decide if each set of events is independent or dependent.
Explain your answer.

1. A student spins a spinner and rolls a number cube.

Independent. spinning the spinner does not affect the rolling of the number cube.

2. A student picks a raffle ticket from a box and then picks a second raffle ticket without replacing the first raffle ticket.

Dependent. There are fewer tickets left and therefore the probability changes

Find the probability of each set of independent events. Choose the letter for the best answer.

3. drawing a black checker from a bag of 6 black checkers and 4 red checkers, replacing it, and drawing another black checker

A $\frac{2}{3}$

C $\frac{2}{5}$

B $\frac{9}{25}$

D $\frac{3}{5}$

4. rolling a six on the first roll of a 1-6 number cube and rolling an odd number on the second roll of the same cube

F $\frac{1}{12}$

H $\frac{1}{6}$

G $\frac{1}{8}$

J $\frac{1}{2}$

5. flipping a tail on a coin and spinning a 5 on a spinner with sections of equal area numbered 1-5

A $\frac{1}{2}$

C $\frac{1}{7}$

B $\frac{1}{5}$

D $\frac{1}{10}$

6. drawing a 1, 2, or 3 from 9 cards numbered 1-9, replacing the card, and drawing a 7, 8, or 9

F $\frac{1}{3}$

H $\frac{1}{9}$

G $\frac{3}{8}$

J $\frac{1}{12}$

Solve.

7. There are 4 black marbles and 2 white marbles in a bag. What is the probability of choosing a black marble, not replacing it, then choosing a white marble?

$$P(B, \text{white}) = \frac{2}{3} \times \frac{2}{5} = \frac{4}{15}$$

Practice B

Keep

Probability of Independent and Dependent Events

Decide if each set of events is independent or dependent.
Explain your answer.

1. A student spins a spinner and chooses a Scrabble® tile

Independent - don't affect each other

2. A boy chooses a sock from a drawer of socks, then chooses a second sock without replacing the first.

Dependent. There are fewer socks to choose from

3. A student picks a raffle ticket from a box, replaces the ticket, then picks a second raffle ticket.

Dependent - There are fewer tickets to choose from

Find the probability of each set of independent events.

4. drawing a red checker from a bag of 9 black checkers and 6 red checkers, replacing it, and drawing another red checker

Total 15 checkers

$$P(r, r) = \frac{6}{15} \times \frac{6}{15} = \frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$$

5. drawing a black checker from a bag of 9 black checkers and 6 red checkers, replacing it, and drawing a red checker

$$P(b, r) = \frac{9}{15} \times \frac{6}{15} = \frac{3}{5} \times \frac{2}{5} = \frac{6}{25}$$

6. rolling a 1, 2, or 3 on the first roll of a 1-6 number cube and rolling a 4, 5, or 6 on the second roll of the same cube

$$P(1, 2, 3, 4, 5, 6) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

Solve.

7. Randy has 4 pennies, 2 nickels, and 3 dimes in his pocket. If he randomly chooses 2 coins, what is the probability that both are dimes?

9 total

$$\begin{aligned} P(D, D) &= \frac{3}{9} \times \frac{2}{8} \\ &= \frac{1}{3} \times \frac{1}{4} \\ &= \frac{1}{12} \end{aligned}$$