$P(D)=\frac{4}{100}$ $\quad P(S)=\frac{3}{99}$ $\quad P(U)=\frac{96}{98}$

$P(D)=\frac{1}{25}$ $\quad P(S)=\frac{1}{33}$ $\quad P(U)=\frac{48}{49}$

$$P(G)=P(D)\cdot P(S)\cdot P(U)\cdot 3$$
$$P(G)=\frac{1}{25}\cdot\frac{1}{33}\cdot\frac{48}{49}\cdot 3$$
$$P(G)=\frac{144}{40\,425}$$
$$P(G)=\frac{48}{13\,475}$$

The total probability can now be determined.

$$P(A)=P(G)+P(O)$$
$$P(A)=\frac{48}{13\,475}+\frac{1}{40\,425}$$
$$P(A)=\frac{144}{40\,425}+\frac{1}{40\,425}$$
$$P(A)=\frac{145}{40\,425}$$
$$P(A)=\frac{29}{8\,085}$$

The probability of drawing more defective chips than non-defective chips is $\frac{29}{8085}$, or about 0.0036 or 0.36%.

Lesson 5.6: Independent Events, page 360

1. a) These events are independent, because the result of the spinner does not affect the result of the die, and vice versa.
b) These events are independent, because the result of the red die does not affect the result of the green die, and vice versa.
c) These events are dependent. Because there is no replacement, the deck that the second card is drawn from is technically different than the original deck.
d) These events are independent, because replacement is occurring, which 'resets' the probability for each draw.
2. a) These events are likely independent. The cardio workouts focus on the heart, and use the legs the most often. Therefore, there would be no specific reason why one workout would be favoured over another.
b) Let B represent Celeste using a stationary bike, and let F represent Celeste using free weights.

$P(B)=\frac{1}{3}$ $\quad P(F)=\frac{1}{2}$

$$P(B\cap F)=P(B)\cdot P(F)$$
$$P(B\cap F)=\frac{1}{3}\cdot\frac{1}{2}$$
$$P(B\cap F)=\frac{1}{6}$$

The probability Celeste will use a stationary bike and free weights for her next workout is $\frac{1}{6}$, or about 0.167 or 16.7%.

3. a) The two workouts are dependent. After Ian chooses a workout, he won't choose the same one again.
b) Let T represent Ian running the track, and let E represent Ian using an elliptical walker.

$P(T)=\frac{1}{4}$ $\quad P(E|T)=\frac{1}{3}$

$$P(T\cap E)=P(T)\cdot P(E|T)$$
$$P(T\cap E)=\frac{1}{4}\cdot\frac{1}{3}$$
$$P(T\cap E)=\frac{1}{12}$$

The probability that Ian will run the track and use the elliptical walker is $\frac{1}{12}$, or about 0.0833 or 8.33%.

4. a) Let R represent spinning a red, and let T represent rolling a two.

$P(R)=\frac{1}{4}$ $\quad P(T)=\frac{1}{6}$

$$P(R\cap T)=P(R)\cdot P(T)$$
$$P(R\cap T)=\frac{1}{4}\cdot\frac{1}{6}$$
$$P(R\cap T)=\frac{1}{24}$$

The probability the spinner will land on red and the die will land on 2 is $\frac{1}{24}$, or about 0.0417 or 4.17%.

b) Let O represent rolling a one on the red die, and F represent rolling a five on the green die.

$P(O)=\frac{1}{6}$ $\quad P(F)=\frac{1}{6}$

$$P(O\cap F)=P(O)\cdot P(F)$$
$$P(O\cap F)=\frac{1}{6}\cdot\frac{1}{6}$$
$$P(O\cap F)=\frac{1}{36}$$

The probability of rolling a 1 on the red die and a 5 on the green die is $\frac{1}{36}$, or about 0.0278 or 2.78%.

c) Let K represent drawing a king, and let A represent drawing an ace.

$$P(K)=\frac{4}{52}$$
$$P(K)=\frac{1}{13}$$
$$P(A|K)=\frac{4}{51}$$
$$P(K\cap A)=P(K)\cdot P(A|K)$$
$$P(K\cap A)=\frac{1}{13}\cdot\frac{4}{51}$$
$$P(K\cap A)=\frac{4}{663}$$

The probability a king will be drawn first, and an ace will be drawn second is $\frac{4}{663}$, or about 0.006 or 0.6%.

d) Let N represent drawing a prime number, and let F represent drawing a multiple of five.

$$P(N)=\frac{10}{30} \qquad P(F)=\frac{6}{30}$$
$$P(N)=\frac{1}{3} \qquad P(F)=\frac{1}{5}$$
$$P(N\cap F)=P(N)\cdot P(F)$$
$$P(N\cap F)=\frac{1}{3}\cdot\frac{1}{5}$$
$$P(N\cap F)=\frac{1}{15}$$

The probability that the first card drawn is prime and the second card is a multiple of 5 is $\frac{1}{15}$, or about 0.0667 or 6.67%.

5. a) If two events are independent, then $P(A \cap B)$ is equal to $P(A) \cdot P(B)$.

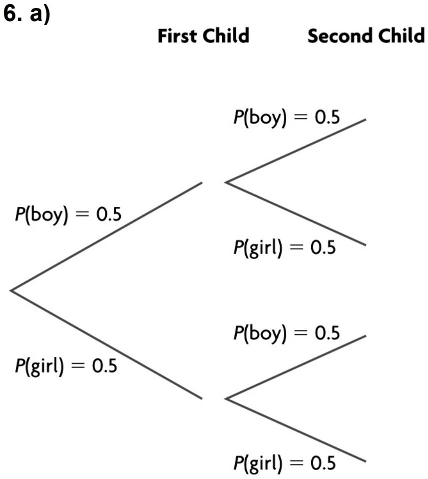
$P(A \cap B) = 0.12$
$P(A) \cdot P(B) = 0.35 \cdot 0.4$
$P(A) \cdot P(B) = 0.14$

Since $P(A \cap B) \neq P(A) \cdot P(B)$, no, these events are not independent.

b) $P(A \cap B) = 0.468$
$P(A) \cdot P(B) = 0.720 \cdot 0.650$
$P(A) \cdot P(B) = 0.468$

Since $P(A \cap B) = P(A) \cdot P(B)$, yes, these events are independent.

6. a)



b) The genders of the children are independent events. Also, there is only one way that both children can be boys. Let B represent a child being a boy.

$P(B) = 0.5$
$P(B \cap B) = P(B) \cdot P(B)$
$P(B \cap B) = 0.5 \cdot 0.5$
$P(B \cap B) = 0.25$

The probability that both children are boys is 0.25, or 25%.

c) There are two that one child can be a boy and the other can be a girl.
Let B represent a child being a boy, and let G represent a child being a girl.

$P(B) = 0.5$
$P(G) = 0.5$
$P(B \cap G) = P(B) \cdot P(G) \cdot 2$
$P(B \cap G) = 0.5 \cdot 0.5 \cdot 2$
$P(B \cap G) = 0.5$

The probability that one child is a boy and the other is a girl is 0.5, or 50%.

7. These events are dependent, because the deck has 40 cards when the first card is dealt, but it has 39 cards when the second card is dealt.
Let C represent a club being dealt, and let H represent a heart being dealt.

$$P(C)=\frac{10}{40} \qquad P(C\cap H)=P(C)\cdot P(H|C)$$
$$P(C)=\frac{1}{4} \qquad P(C\cap H)=\frac{1}{4}\cdot\frac{10}{39}$$
$$P(H|C)=\frac{10}{39} \qquad P(C\cap H)=\frac{10}{156}$$
$$P(C\cap H)=\frac{5}{78}$$

The probability the first card dealt is a club and the second card dealt is a heart is $\frac{5}{78}$, or about 0.0641 or 6.41%.

8. Let *A* represent the first roll, and *B* represent the second.

a) $P(A \cap B) = P(A) \cdot P(B)$

$P(A \cap B) = \frac{1}{6} \cdot \frac{1}{6}$

$P(A \cap B) = \frac{1}{36}$

The probability is $\frac{1}{36}$.

b) $P(A \cap B) = P(A) \cdot P(B)$

$P(A \cap B) = \frac{3}{6} \cdot \frac{3}{6}$

$P(A \cap B) = \frac{1}{2} \cdot \frac{1}{2}$

$P(A \cap B) = \frac{1}{4}$

The probability is $\frac{1}{4}$.

c) $P(A \cap B) = P(A) \cdot P(B)$

$P(A \cap B) = \frac{5}{6} \cdot \frac{5}{6}$

$P(A \cap B) = \frac{25}{36}$

The probability is $\frac{25}{36}$.

9. These two events are independent. Let *C* represent seeing a camel, and let *B* represent seeing an ibis.

a) $P(C \cap B) = P(C) \cdot P(B)$

$P(C \cap B) = \frac{4}{5} \cdot \frac{3}{4}$

$P(C \cap B) = \frac{3}{5}$

The probability Jeremiah will see a camel and an ibis is $\frac{3}{5}$, 0.6 or 60%.

b) $P(C') = 1 - P(C)$ $\quad P(B') = 1 - P(B)$

$P(C') = 1 - \frac{4}{5}$ $\quad P(B') = 1 - \frac{3}{4}$

$P(C') = \frac{1}{5}$ $\quad P(B') = \frac{1}{4}$

$P(C' \cap B') = P(C') \cdot P(B')$

$P(C' \cap B') = \frac{1}{5} \cdot \frac{1}{4}$

$P(C' \cap B') = \frac{1}{20}$

The probability Jeremiah will see neither animal is $\frac{1}{20}$, 0.05 or 5%.

c) The probability Jeremiah will see only one of these animals is the same as the probability that he will not see both or neither of them. So, subtract these probabilities from 1 to determine the new probability. Let *O* represent Jeremiah seeing only one of these animals.

$P(O) = 1 - P(C \cap B) - P(C' \cap B')$

$P(O) = 1 - \frac{3}{5} - \frac{1}{20}$

$P(O) = \frac{7}{20}$

The probability Jeremiah will see only one of these animals is $\frac{7}{20}$, 0.35 or 35%.

10. a) These two events are independent. Let *H* represent getting heads from tossing a coin, and let *S* represent spinning a six on a spinner.

$P(H) \cdot P(S) = P(H \cap S)$

$\frac{1}{2} \cdot P(S) = \frac{1}{12}$

$\frac{2}{2} \cdot P(S) = \frac{1}{12} \cdot 2$

$P(S) = \frac{1}{6}$

The probability of spinning a six is $\frac{1}{6}$.

e.g., Spinner has 6 equal areas, numbered 1 to 6.

b) These two events are independent. Let *H* represent getting heads from tossing a coin, and let *S* represent spinning a six on a spinner.

$P(H) \cdot P(S) = P(H \cap S)$

$\frac{1}{2} \cdot P(S) = \frac{1}{20}$

$\frac{2}{2} \cdot P(S) = \frac{1}{20} \cdot 2$

$P(S) = \frac{1}{10}$

The probability of spinning a six is $\frac{1}{10}$.

e.g., Spinner has 10 equal areas, numbered 1 to 10.

11. a) Anne's first bag contains 7 red marbles and 3 blue marbles, and her second bag contains 4 red marbles and 5 blue marbles. Because she is drawing 2 marbles from 2 separate bags, the two events are independent.

Let *F* represent a blue marble drawn from the first bag, and let *S* represent a blue marble drawn from the second bag. Let *B* represent drawing two blue marbles.

$P(F) = \frac{3}{10}$ $\quad P(S) = \frac{5}{9}$

$P(B) = P(F) \cdot P(S)$

$P(B) = \frac{3}{10} \cdot \frac{5}{9}$

$P(B) = \frac{1}{6}$

The probability Anne will draw two blue marbles is $\frac{1}{6}$, or about 0.167 or 16.7%.

Abby's bag contains 11 red marbles and 8 blue marbles. Since she is drawing 2 marbles from the same bag, the two events are dependent.

Let F represent the first marble drawn being blue, and let S represent the second marble drawn being blue. Let B represent drawing two blue marbles.

$P(F) = \frac{8}{19}$

$P(S|F) = \frac{7}{18}$

$P(B) = P(F) \cdot P(S|F)$

$P(B) = \frac{8}{19} \cdot \frac{7}{18}$

$P(B) = \frac{28}{171}$

The probability Abby will draw two blue marbles is $\frac{28}{171}$, or about 0.164 or 16.4%.

No. e.g., Anne has a $\frac{1}{6}$ or about 0.167 probability of drawing two blue marbles, while Abby has a $\frac{28}{171}$ or about 0.164 probability of drawing two blue marbles.

b) For both girls, there are two ways that they can draw one red marble and one blue marble. However, in Abby's case, the probabilities will be the same, because the events are dependent. Therefore, only one probability needs to be determined, and that result can be multiplied by 2 to determine the total probability.

Anne: Let F represent Anne drawing a red marble from her first bag, and a blue marble from her second bag, and let S represent Anne drawing a blue marble from her first bag and a red marble from her second bag. Let O represent drawing one red marble and one blue marble.

$P(F) = \frac{7}{10} \cdot \frac{5}{9}$ $\quad P(S) = \frac{3}{10} \cdot \frac{4}{9}$

$P(F) = \frac{7}{18}$ $\quad P(S) = \frac{2}{15}$

$P(O) = P(F) + P(S)$

$P(O) = \frac{7}{18} + \frac{2}{15}$

$P(O) = \frac{35}{90} + \frac{12}{90}$

$P(O) = \frac{47}{90}$

Abby: Let R represent drawing a red marble, and let B represent drawing a blue marble. Let OA represent drawing one red marble and one blue marble.

$P(R) = \frac{11}{19}$

$P(B|R) = \frac{8}{18}$

$P(B|R) = \frac{4}{9}$

$P(OA) = 2 \cdot P(R) \cdot P(B|R)$

$P(OA) = 2 \cdot \frac{11}{19} \cdot \frac{4}{9}$

$P(OA) = \frac{88}{171}$

Let A represent that Anne and Abby will both draw one red marble and one blue marble.

$P(A) = P(O) \cdot P(OA)$

$P(A) = \frac{47}{90} \cdot \frac{88}{171}$

$P(A \cap B) = \frac{4136}{15\,390}$

$P(A \cap B) = \frac{2068}{7695}$

The probability both girls will each draw one red and one blue marble is $\frac{2068}{7695}$, or about 0.269 or 26.9%.

c) Anne: Let F represent drawing a red marble from the first bag, and let S represent drawing a red marble from the second bag. Let R represent drawing two red marbles.

$P(F) = \frac{5}{10}$

$P(F) = \frac{1}{2}$

$P(S) = \frac{1}{2}$

$P(R) = P(F) \cdot P(S)$

$P(R) = \frac{1}{2} \cdot \frac{1}{2}$

$P(R) = \frac{1}{4}$

The probability Anne will draw two red marbles is $\frac{1}{4}$, 0.25 or 25%.

Abby: Let F represent the first marble drawn being red, and let S represent the second marble drawn being red. Let R represent drawing two red marbles.

$P(F) = \frac{10}{20}$

$P(F) = \frac{1}{2}$

$P(S|F) = \frac{9}{19}$

$P(O) = P(F) \cdot P(S|F)$

$P(O) = \frac{1}{2} \cdot \frac{9}{19}$

$P(O) = \frac{9}{38}$

The probability that Abby draws two red marbles is $\frac{9}{38}$, or about 0.237 or 23.7%.

No, e.g., Anne has a $\frac{1}{4}$ or 0.25 probability of drawing two red marbles, while Abby has a $\frac{9}{38}$ or about 0.237 probability of drawing two red marbles.

12. The two drawings are independent, because the first treat is replaced after it is picked.
Let G represent drawing a granola bar, let F represent drawing a fruit bar, and let C represent drawing a cheese strip.
a) The second granola bar can be kept if a granola bar is drawn both times.

$$P(G)=\frac{10}{20} \qquad P(G\cap G)=P(G)\cdot P(G)$$
$$P(G)=\frac{1}{2} \qquad P(G\cap G)=\frac{1}{2}\cdot\frac{1}{2}$$
$$P(G\cap G)=\frac{1}{4}$$

The probability that a granola bar is kept is $\frac{1}{4}$, 0.25 or 25%.
b) Let K represent keeping a treat.
Any treat can be kept if two of the same treats are drawn.

$$P(F)=\frac{7}{20} \qquad P(C)=\frac{3}{20}$$
$$P(F\cap F)=P(F)\cdot P(F) \qquad P(C\cap C)=P(C)\cdot P(C)$$
$$P(F\cap F)=\frac{7}{20}\cdot\frac{7}{20} \qquad P(C\cap C)=\frac{9}{400}$$

$$P(K)=P(G\cap G)+P(F\cap F)+P(C\cap C)$$
$$P(K)=\frac{1}{4}+\frac{49}{400}+\frac{9}{400}$$
$$P(K)=\frac{79}{200}$$

The probability that any treat can be kept is $\frac{79}{200}$, 0.395 or 39.5%.
c) $P(K') = 1 - P(K)$

$$P(K') = 1 - \frac{79}{200}$$
$$P(K') = \frac{121}{200}$$

The probability that a treat is not kept is $\frac{121}{200}$, 0.605 or 60.5%.
13. Because the winner's ticket is returned to the draw after the first prize is awarded, the two events are independent.
Let W represent Tiegan winning the first prize, and let X represent winning the second prize.

a) $P(W)=\frac{5}{100} \qquad P(W\cap X)=P(W)\cdot P(X)$

$$P(W)=\frac{1}{20} \qquad P(W\cap X)=\frac{1}{20}\cdot\frac{1}{20}$$
$$P(X)=\frac{1}{20} \qquad P(W\cap X)=\frac{1}{400}$$

The probability Tiegan wins both prizes is $\frac{1}{400}$, 0.0025 or 0.25%.

b) $P(W')=1-P(W) \qquad P(W'\cap X')=P(W')\cdot P(X')$

$$P(W')=1-\frac{1}{20} \qquad P(W'\cap X')=\frac{19}{20}\cdot\frac{19}{20}$$
$$P(W')=\frac{19}{20} \qquad P(W'\cap X')=\frac{361}{400}$$
$$P(W')=P(X')$$

The probability that Tiegan wins neither prize is $\frac{361}{400}$, 0.9025 or 90.25%.

14. a) e.g., Problem: What is the probability of drawing a card from a shuffled standard deck and getting a red card, then replacing it, shuffling the deck again, drawing a second card, and getting a heart?
Solution: Let R represent getting a red card and H represent getting a heart.

$$P(R\cap H)=P(R)\cdot P(H)$$
$$P(R\cap H)=\frac{26}{52}\cdot\frac{13}{52}$$
$$P(R\cap H)=\frac{1}{2}\cdot\frac{1}{4}$$
$$P(R\cap H)=\frac{1}{8}$$

The probability is $\frac{1}{8}$, 0.125 or 12.5%.
b) e.g., Problem: What is the probability of drawing a card from a shuffled standard deck and getting a red card, then drawing a second card without replacing the first one, and getting a spade?
Solution: Let R represent getting a red card on the first draw, and S represent getting a spade on the second draw.

$$P(R)=\frac{26}{52} \qquad P(S\mid R)=\frac{13}{51}$$
$$P(R\cap S)=P(R)\cdot P(S\mid R)$$
$$P(R\cap S)=\frac{26}{52}\cdot\frac{13}{51}$$
$$P(R\cap S)=\frac{13}{102}$$

The probability is $\frac{13}{102}$, or about 0.127 or 12.7%.

15. There are nine ways that two single-digit numbers can add up to 10, and there are 100 ways to select two single-digit numbers. Therefore, the probability the sum of these two numbers is 10 is $\frac{9}{100}$, 0.09 or 9%.

16. a) The formula is $P(A \cap B) = P(A) \cdot P(B)$ only when A and B are independent events.
b) e.g. Drawing two red marbles from a bag containing 5 red and 15 blue marbles, with replacement: A = {red on 1st draw} and B = {red on 2nd draw} are independent events, so

$$P(A \cap B) = P(A) \cdot P(B)$$
$$P(A \cap B) = \frac{1}{4} \cdot \frac{1}{4}$$
$$P(A \cap B) = \frac{1}{16}$$

c) e.g., Drawing two red marbles from a bag containing 5 red and 15 blue marbles, without replacement: A = {red on 1st draw} and B = {red on 2nd draw} are dependent events so

$$P(A \cap B) = P(A) \cdot P(B \mid A)$$
$$P(A \cap B) = \frac{1}{4} \cdot \frac{4}{19}$$
$$P(A \cap B) = \frac{1}{19}$$

17. The failure of each part is independent. Let F represent a part failing, and let O represent no parts failing for one year.
a) $P(F) = 0.01$
$P(F') = 0.99$
Because each event is independent, the probability that no parts fail is determined by multiplying the probability that one part does not fail by itself 100 times.

$$P(O) = (P(F'))^{100}$$
$$P(O) = (0.99)^{100}$$
$$P(O) = 0.366...$$

The probability that the machine will operate continuously for one year is about 0.366 or 36.6%.
b) $P(F) = 0.005$
$P(F') = 0.995$
Determine the probability that no parts can fail in the same way.

$$P(O) = (P(F'))^{100}$$
$$P(O) = (0.995)^{100}$$
$$P(O) = 0.605...$$

The probability the machine will operate continuously for one year is about 0.606 or 60.6%.
c)
$$P(O) = (P(F'))^{100}$$
$$0.9 = (P(F'))^{100}$$
$$\sqrt[100]{0.9} = \sqrt[100]{(P(F'))^{100}}$$
$$P(F') = 0.998...$$

The probability of not failing needs to be about 0.999 or 99.9% to ensure that the probability that the machine will operate continuously is 90%.

18. Let W represent a win, and let L represent a loss.
a) There is only one way that four games in a row can be wins. Let F represent winning the series in 4 games.
$P(F) = P(W) \cdot P(W) \cdot P(W) \cdot P(W)$
$P(F) = (0.65)^4$
$P(F) = 0.178…$
The probability that Montreal would win the series in four games is about 0.179 or 17.9%.
b) Since the odds in favour of Montreal winning four games in a row were 5 : 4, the probability of this occurring was $\frac{5}{9}$ or about 0.555…. Let F represent winning the series in 4 games.
$P(F) = P(W) \cdot P(W) \cdot P(W) \cdot P(W)$
$P(F) = P(W)^4$
$0.555… = P(W)^4$
Taking the square root twice:
$P(W) = 0.863…$
The probability Montreal would win any single game in the series was about 0.863… or 86.3%, assuming the chance of winning any of the four games was equal.

19. To pass each test, Gavin must answer at least three questions correctly. For the true-false test, the probability of answering each question correctly (C), is 0.5, as is the probability of answering it wrongly (W). By the tree diagram, there are 32 different possible outcomes, each one with an equal chance of occurring (0.03125). Of these 32 outcomes, there are 16 in which at least 3 answers are correct so the probability of passing the true-false test is, $\frac{16}{32}$ or 0.5. Note: Another way to calculate this is $16 \cdot 0.03125 = 0.5$.
With the multiple-choice test, the probability of answering a question correctly is $\frac{1}{4}$ and the probability of answering it wrongly is $\frac{3}{4}$. There are also 32 possible outcomes, 16 of which allow for at least 3 correct answers. These outcomes are not equally likely.
One outcome has 5 correct answers.
$P(\text{5 correct, 0 wrong}) = \left(\frac{1}{4}\right)^5$
Five outcomes have 4 correct answers and one wrong answer. $5 \cdot P(\text{4 correct, 1 wrong}) = 5\left(\frac{1}{4}\right)^4 \cdot \left(\frac{3}{4}\right)$
Ten outcomes have 3 correct answers and 2 wrong answers. $10 \cdot P(\text{3 correct, 1 wrong}) = 10\left(\frac{1}{4}\right)^3 \cdot \left(\frac{3}{4}\right)^2$

$P(\text{at least 3 correct answers})$

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

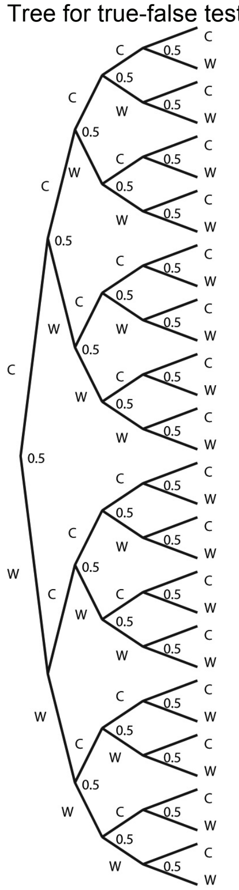
$$= \frac{1}{1024} + \frac{15}{1024} + \frac{90}{1024}$$

$$= \frac{106}{1024}$$

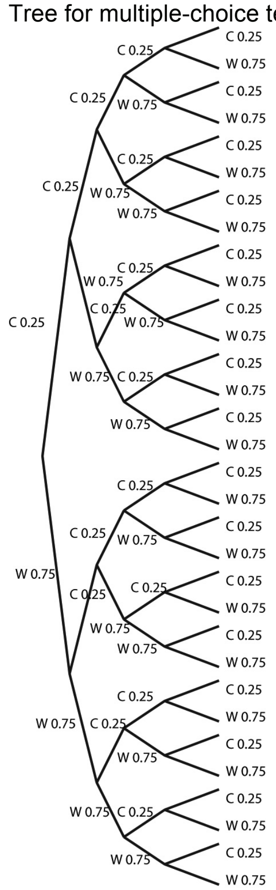
$$= \frac{53}{512} \text{ or } 0.1035...$$

The probability of passing the multiple-choice test is $\frac{53}{512}$ or about 0.1035.

Tree for true-false test



Tree for multiple-choice test



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The group found that the experiment of drawing one ball at a time was the most productive. This is because when two balls are drawn at once, conditional probability exists, which can be hard to deal with.

The best way to make the conjecture more reliable is to increase the number of trials. When this is done, the experimental probability slowly begins to act more like the theoretical probability.

However, there is no type of experiment that can guarantee a correct conjecture. This is because theoretical probability is just that; theoretical. This probability is only guaranteed to work after millions or possibly billions of trials, or continuous trials.

Chapter Self-Test, page 364

1. Outcome Table

	Tile 1						
	SUM	**1**	**2**	**3**	**4**	**5**	**6**
Tile 2	**1**	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

$P(\text{odd sum}) = \frac{18}{36}$ $P(\text{even sum}) = \frac{18}{36}$

$P(\text{odd sum}) = \frac{1}{2}$ $P(\text{even sum}) = \frac{1}{2}$

Yes, e.g., The probabilities of winning are equal.

2. Let *A* represent an Inuit person being able to converse in at least two Aboriginal languages.

$P(A) = \frac{7}{7+3}$

$P(A) = \frac{7}{10}$

The probability that an Inuit person can converse in at least two Aboriginal languages is $\frac{7}{10}$, 0.7 or 70%.