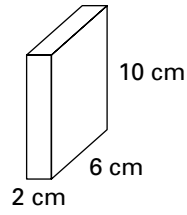
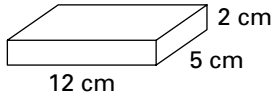
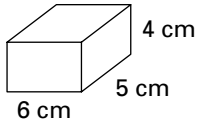
2. b)



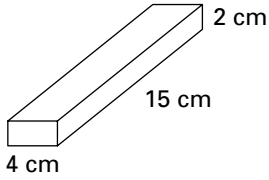
c)



d)



e)



3. The three prisms can have dimensions 2 cm $\times$ 9 cm $\times$ 10 cm; 3 cm $\times$ 6 cm $\times$ 10 cm; 6 cm $\times$ 6 cm $\times$ 5 cm; or any other combination of three numbers that multiply to give 180 cm^3.

4.

Length (cm)	Width (cm)	Height (cm)	Surface Area (cm^2)
100.0	40.0	50.0	22 000
90.0	44.4	50.0	21 432
80.0	50.0	50.0	21 000
70.0	57.1	50.0	20 704
60.0	66.7	50.0	20 674
50.0	80.0	50.0	21 000

According to the chart above, a base with length = 60.0 cm and width = 66.7 cm results in the smallest surface area. This is a good answer. However, you can keep going to find a better answer. Notice that these dimensions are almost equal. From this, you can guess that a length and width that are equal will result in the smallest possible surface area:

Length (cm)	Width (cm)	Height (cm)	Surface Area (cm^2)
63.2	63.2	50	20 628.5

5. 25 cm, 30 cm, and 10 cm

11.4 Relating the Dimensions of a Rectangular Prism to Its Volume

1. a) i) 4 cm $\times$ 6 cm $\times$ 10 cm
ii) 4 cm $\times$ 5 cm $\times$ 12 cm
b) If you doubled the height of the dimensions in part (i), the new volume would be 480 cm^3, or double the original volume.
c) Yes, the new volume would be equal. Doubling any one dimension results in a volume that is doubled.
d) i) 480 cm^3 **ii)** 480 cm^3

2. a) 720 cm^3 **b)** 180 cm^3 **c)** 1080 cm^3
d) 5 cm **e)** 100 cm **f)** 1 cm

11.5 Exploring the Surface Area and Volume of Prisms

1. a) 96 cm^2 and 64 cm^3
b) 136 cm^2 and 64 cm^3
c) 160 cm^2 and 64 cm^3

2. a) 64.0 cm^2 and 28.0 cm^3
b) 64.0 cm^2 and 32.0 cm^3
c) 64.0 cm^2 and 34.848 cm^3

3. The prism on the right side has the greatest surface area. If two prisms have the same volume, the prism that is closest in shape to a cube will have the smallest surface area.

4. The prism on the left side has the greatest volume. If two prisms have the same surface area, the prism that is closest in shape to a cube will have the greatest volume.

Test Yourself

1. a) 78 $units^2$ **b)** 32 $units^2$
c) 142 cm^2

2. a) 24 $units^3$ **b)** 48 $units^3$
c) 360 cm^3

3. a) 248 cm^2 **b)** 240 cm^3
c) 120 cm^3 **d)** 480 cm^3

4. a) 30 cm^3 **b)** 1 cm
c) 3 cm **d)** 125 cm^3
e) 21 cm^3

5. Sandra's tower should be 3 blocks high.

Chapter 12

12.1 Exploring Probability

1. a) probably $\frac{1}{2}$ to 1, depending on your habits
b) $\frac{1}{2}$ **c)** 0 **d)** probably about $\frac{1}{8}$
e) $\frac{1}{2}$

2. a) This is not a fair game.
b) Omar is most likely to win.

3. a) red marble, red marble, blue, blue, blue, yellow, yellow, green, green, green, green green

b) $\frac{3}{12}$ or $\frac{1}{4}$

12.2 Calculating Probability

1. a) $\frac{1}{3}$ **b)** $\frac{1}{3}$

2. a) red + green, red + blue, green + red, green + blue, blue + red, blue + green

b) 0.333

3. $\frac{6}{30}$, or $\frac{1}{5}$

4. a) $\frac{1}{4}$ **b)** $\frac{3}{4}$

12.3 Solve Problems Using Organized Lists

1. a)

$5 bills	3	2	2	1	1	1	0	0	0	0
$10 bills	0	1	0	2	0	1	3	0	2	1
$20 bills	0	0	1	0	2	1	0	3	1	2
Sum	$15	$20	$30	$25	$45	$35	$30	$60	$40	$50

b) 10 different combinations are possible

c) 1 combination adds up to $60

d) $\frac{1}{10}$ **e)** $\frac{7}{10}$

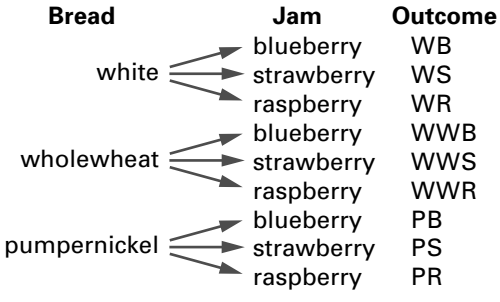
2. a)

Win	4	3	3	2	2	2	1	1	1	1	0	0	0	0	0
Lose	0	1	0	2	0	1	3	0	2	1	4	0	3	1	2
Tie	0	0	1	0	2	1	0	3	1	2	0	4	1	3	2

b) $\frac{1}{15}$

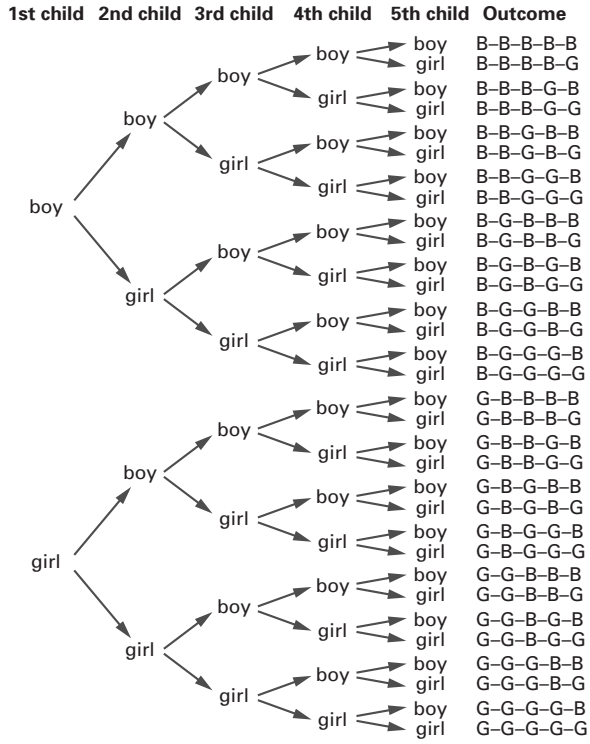
12.4 Using Tree Diagrams to Calculate Probability

1. a)



b) $\frac{3}{9}$, or $\frac{1}{3}$ **c)** $\frac{1}{9}$

2. a)



b) $\frac{5}{32}$ **c)** $\frac{10}{32}$, or $\frac{5}{16}$

12.5 Applying Probabilities

1. Romona is the most likely to make her next shot.

2. a) Indira is the most likely to win.

b) Bonnie and Simon have the same probability of winning.

3. a) $\frac{1}{4}$ **b)** $\frac{1}{6}$

c) Paul is the most likely to win.

4. $\frac{1}{3}$

5. a) Bag B **b)** $\frac{12}{17}$

6. James's throw of 2 was the least likely event.

7. The most likely total is 7, because you can get it in the most number of ways (1 + 6, 3 + 4, and 2 + 5).

8. It is not certain that she has touched a Norway maple, although it is very likely. Calculating the probabilities will show that there is a chance of touching three trees in a row that are not Norway maples.

Test Yourself

1. a) $\frac{2}{3}$ **b)** $\frac{1}{2}$

2. a) $\frac{3}{10}$ **b)** $\frac{2}{10}$ **c)** $\frac{1}{10}$ **d)** $\frac{2}{5}$

3. a)

Quarters	4	3	3	2	2	2	1	1	1	1	0	0	0	0	0
Dimes	0	1	0	2	0	1	3	0	2	1	4	0	3	1	2
Nickels	0	0	1	0	2	1	0	3	1	2	0	4	1	3	2
Total value	100	85	80	70	60	65	55	40	50	45	40	20	35	25	30

b) $\frac{1}{15}$

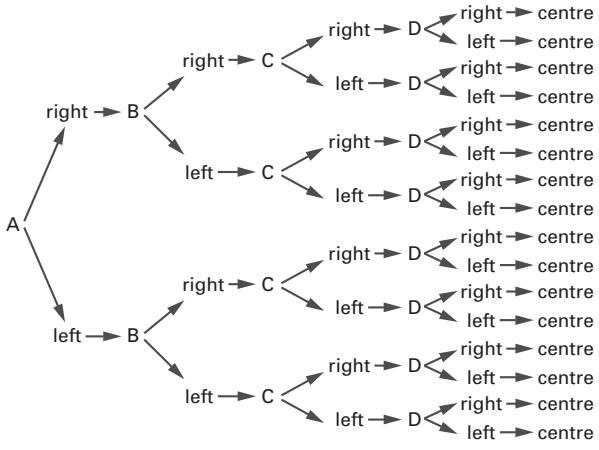
c) You are certain to guess them, so the probability is 1, or 100%.

4. a)

Story 1	1	1	1	1	1	2	2	2	2	3	3	3	4	4	5
Story 2	1	5	2	4	3	1	4	2	3	1	3	2	1	2	1
Story 3	5	1	4	2	3	4	1	3	2	3	1	2	2	1	1

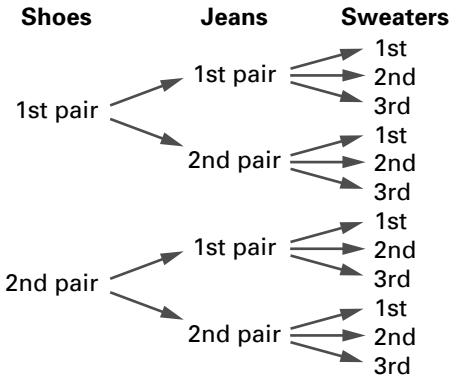
b) $\frac{1}{5}$ **c)** $\frac{2}{5}$

5. a)



b) $\frac{1}{16}$ **c)** $\frac{3}{8}$

6.



7. a) Team 2 is the most likely to win.

b) Team 1 is the most likely to lose.

8. a) Romona should choose Tynessa's wallet.

b) $\frac{6}{25}$