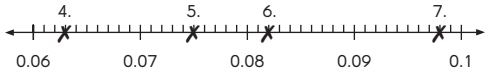
Answers

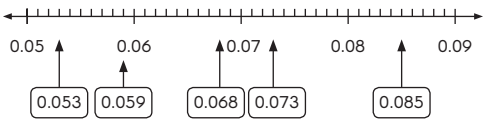
Chapter 8

Lesson 8.1

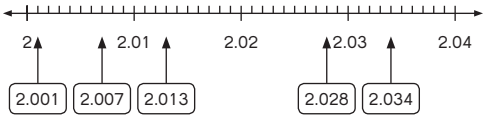
1. 2.045
2. 6.308
3. 0.175



8.



9.



10. 60
11. 212
12. 58
13. 3
14. 2
15. 0; 4
16. 0.009
17. 0.025
18. 0.416
19. 1.055
20. 0.005
21. 0.078
22. 0.110 or 0.11
23. 0.603
24. 2.508
25. 2.640 or 2.64
26. 3.009
27. 4.567
28. 1.004
29. 3.082
30. 5.606
31. 7.190 or 7.19
32. 217
33. 6
34. 95
35. 1,702
36. $8 + \frac{7}{10} + \frac{6}{100} + \frac{4}{1000}$
37. $3 + \frac{5}{10} + \frac{2}{100} + \frac{3}{1000}$
38. $5 + 0.2 + 0.01 + 0.003$
39. $1 + 0.9 + 0.04 + 0.005$
40. thousandths
41. 0
42. tenths
43. 9 ones

Lesson 8.2

1. 5.078 is greater than 4.087; $5.078 > 4.087$
2. 0.654 is less than 0.945; $0.654 < 0.945$
3. 4.720 is greater than 4.270; $4.720 > 4.270$
4. $<$
5. $>$
6. $<$
7. $>$
8. greatest: 5.69; least: 5.069
9. greatest: 80.202; least: 80.002
10. 0.569, 0.956, 0.965
11. 6.309, 6.903, 9.036
12. 0.088, 0.8, 0.808, 0.88
13. 0.029, 0.1, 0.999, 1
14. 4.33; 4.32
15. 7.00 or 7; 7.01
16. 3.46
17. 12.015; 12.02
18. 2.295; 2.30
19.

Decimal	Rounded to the Nearest		
	Whole Number	Tenth	Hundredth
2.768	3	2.8	2.77
3.184	3	3.2	3.18
0.476	0	0.5	0.48
8.695	9	8.7	8.70

20. Any answer from 1.45 to 1.54.
21. Any answer from 4.255 to 4.264.
22. Any answer from 8.031 to 8.034.
23. Any answer from 7.905 to 7.909.

Lesson 8.3

1. $\frac{16}{25}$
2. $1\frac{11}{50}$
3. $2\frac{29}{50}$
4. $3\frac{9}{100}$
5. $\frac{9}{250}$
6. $\frac{111}{1000}$
7. $1\frac{9}{100}$
8. $2\frac{73}{200}$
9. $2\frac{16}{25}$
10. $5\frac{3}{4}$
11. $7\frac{1}{125}$
12. $10\frac{357}{1000}$

Put on Your Thinking Cap!

Thinking skill: Classifying

1. 58
2. 209
3. 402
4. 2,067
5. 3,504
6. 953

Thinking skill: Classifying

7. 17
8. 17.0
9. 17.00

Thinking skill: Identifying patterns and relationships

Strategy: Look for a pattern

10. 9.78
11. 5.00 or 5
12. 16.8
13. 15.5
14. 21.6

Chapter 9

Lesson 9.1

1. 9; 36; 3.6
2. 15; 45; 4.5
3. 8; 40; 0.40
4. 27; 162; 1.62
5. 36; 252; 2.52
6. 4.8
7. 24.5
8. 35.1
9. 26.1
10. 27.6
11. 37.0
12. 73.6
13. 0.42
14. 0.63
15. 42.88
16. 28.16
17. 22.90
18. 33.84
19. 75.24

Lesson 9.2

1. 48.5
2. 3.75
3. 492.8
4. 230
5. 10
6. 66.22
7. 100
8. 4.03
9. 1,000
10. 0.108
11. 10; 100; 1,000
12. 401.6; 40.16; 4.016
13. 6; 5.724; 57.24
14. 8; 3.008; 300.8
15. 3; 2.91; 2,910
16. 25
17. 112
18. 4,770
19. 43,716
20. 0.085 kg × 200 + 0.56 kg = 17.56 kg
    The total mass of the box and 200 paperweights is 17.56 kilograms.

Lesson 9.3

1. 8; 4; 0.4
2. 24; 6; 0.6
3. 9; 3; 0.03
4. 63; 9; 0.09
5. 153; 17; 0.17
6. 2.3
7. 3.7
8. 3.2
9. 0.06
10. 11.33
11. 5.88
12. 0.8
13. 0.7
14. 2.59
15. 2.08

Lesson 9.4

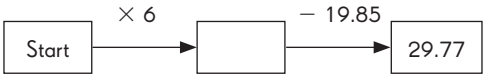
1. 0.236
2. 3.015
3. 5.082
4. 2.1
5. 0.78
6. 82.3
7. 10
8. 345
9. 100
10. 6,920
11. 1,000
12. 48,000
13. 10; 1,990; 19,900
14. 82.35; 100; 1,000
15. 40.1; 401; 4,010
16. 10; 100; 1,000
17. 2; 149; 14.9
18. 8; 4; 0.04
19. 6; 200; 0.2
20. 7.5
21. 0.81
22. 0.092
23. 0.64
24. 0.35
25. 2.08
26. 125 L ÷ 500 = 0.25 L
    0.25 liter of apple juice is in each cup.
27. 370 m ÷ 2,000 = 0.185 m
    The length of each cut piece of string is 0.185 meter.
28. Cost of 1 file = \$97.50 ÷ 30
    = \$3.25
    Cost of 1 book = \$3.25 × 10
    = \$32.50
    The cost of each book is \$32.50.
29. Cost of 10 pears and 10 oranges
    = \$0.94 × 10 = \$9.40
    Cost of 1 orange = \$10.05 − \$9.40
    = \$0.65
    The cost of 1 orange was \$0.65.

Lesson 9.5

1. \$16
2. \$70
3. \$80
4. \$70
5. 50
6. 320
7. 270
8. 7
9. 11
10. 24
11. 23.1 km
12. 4.3 kg
13. 68.4 kg
14. 1.2 L
15. \$4.95 × 4 ≈ \$5 × 4 = \$20
    The cost of 4 tins is about \$20.
16. 175 cm ÷ 18.5 cm ≈ 180 cm ÷ 20 cm = 9
    Vivien uses her handspan 9 times to measure the length.

Lesson 9.6

1. $1.25 \text{ L} \times 8 = 10 \text{ L}$
   There are 10 liters of orange juice in 8 bottles.

2. 

   $29.77 + 19.85 = 49.62$
   $49.62 \div 6 = 8.27$
   The number is 8.27.

3. $1.38 \text{ km} \times 2 = 2.76 \text{ km}$
   $2.76 \text{ km} \times 3 = 8.28 \text{ km}$
   Brian rides his bike 8.28 kilometers in all.

4. a. $0.85 \text{ L} \times 9 = 7.65 \text{ L}$
      Teresa adds 7.65 liters of water.
   b. $7.65 \text{ L} + 0.85 \text{ L} = 8.5 \text{ L}$
      1 L of drinks → 4 cups
      8.5 L of drinks → $8.5 \times 4 = 34$ cups
      Teresa can make 34 cups of juice.

5. 4 pencils → \$1.90
   14 pencils → $\frac{\$1.90}{4} \times 14 = \$6.65$
   The cost of 14 pencils is \$6.65.

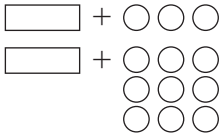
6. $(5.81 - 3.8) \div 3 = 0.67$
   $3.8 - 0.67 \times 5 = 0.45$
   The mass of the empty container is 0.45 kilogram.

7. 100 g of ham → \$1.50
   1,000 g (1 kg) → $\$1.50 \times 10 = \$15$
   1.2 kg → $\$15 + \$1.50 \times 2 = \$18$
   1.2 kilograms of ham cost \$18.
   100 g of sausages → $\$1.50 + \$0.85 = \$2.35$
   600 g → $\$2.35 \times 6 = \$14.10$
   600 grams of sausages cost \$14.10.
   $\$18 + \$14.10 = \$32.10$
   Paul pays \$32.10.

8. $30.0 - (2.7 \times 4) \text{ m} = 19.2 \text{ m} = 1{,}920 \text{ cm}$
   $1{,}920 \div 75 \approx 25$
   The maximum number of presents she could tie is 25.

9. 12 cakes → $10 \times \$1.50 = \$15$
   $100 \div 12 = 8 \text{ R } 4$
   $(\$15 \times 8) + (\$1.50 \times 4) = \$126$
   Maria will need to spend \$126 in all.

10. $\$5{,}120 - (160 \times \$3.50) = \$4{,}560$
    $\$4{,}560 \div \$(8.50 + 3.50) = 380$ adults
    $380 + 160 = 540$
    540 children visited the exhibition.

11. 
    6 balls → 2.16 kg − 1.02 kg = 1.14 kg
    3 balls → 1.14 kg ÷ 2 = 0.57 kg
    Empty box → 1.02 kg − 0.57 kg = 0.45 kg
    The mass of the empty box is 0.45 kilogram.

12. Paul's Stall → $\$2.20 \times 10 = \$22$ per kg
    Sam's Stall → $\$11.00 \times 2 = \$22$ per kg
    a. Paul's stall and Sam's stall sell shrimp for \$22 per kilogram.
    b. $\$(22 - 19) \times 2.5 \text{ kg} = \$7.50$
       You would save \$7.50.

13. $\frac{1{,}140¢}{30¢} = 38$ days
    $\$1.20 \times 38 = \$45.60$
    Mark saved \$45.60.

14. a. Cost of an orange → $\frac{\$2.10}{3} = \$0.70$
       Cost of a mango → $\$0.70 \times 4 = \$2.80$
       The cost of an orange is \$0.70 and the cost of a mango is \$2.80.
    b. $\$30.80 - \$2.80 \times 8 = \$8.40$
       Number of oranges Fiona bought $= \frac{840}{70} = 12$
       Total number of fruits bought $= 8 + 12 = 20$
       $\frac{\text{Number of oranges}}{\text{Total number of fruits}} = \frac{12}{12 + 8} = \frac{3}{5}$

15. a. $(1.75 \text{ kg} + 0.5 \text{ kg}) \div 3 = 0.75 \text{ kg}$
       0.75 kilogram of flour was needed for each loaf of bread.
    b. $0.75 \times 10 \times \$0.90 = \$6.75$
       Mrs. Belen would pay \$6.75 for the flour needed to bake 10 loaves of bread.

Put on Your Thinking Cap!

1. Thinking skill: Analyzing parts and whole
   Strategy: Solve part of the problem
   Solution:
   $12 - 9 = 3$ books
   Thickness of 12 books
   $= 9 \times 9.5 \text{ cm} = 85.5 \text{ cm}$
   Remaining thickness
   $= 120 \text{ cm} - 85.5 \text{ cm} = 34.5 \text{ cm}$
   Thickness of each book
   $= 34.5 \text{ cm} \div 3 = 11.5 \text{ cm}$
   Each book is 11.5 centimeters thick.

2. Thinking skill: Analyzing parts and whole

Strategy: Solve part of the problem

Solution:

$\frac{4}{5} \div 5 = \frac{4}{25}$

Each sibling pays $\frac{4}{25}$ of the cost of the present.

$\frac{1}{5} - \frac{4}{25} = \frac{1}{25}$

$\frac{1}{25}$ of the cost of the present is \$9.50.

\$9.50 × 25 = \$237.50

The cost of the present is \$237.50.

3. Thinking skill: Analyzing parts and whole

Strategy: Solve part of the problem

Solution:

1 carton = 2 cups

3 cups + 2 cartons = 1.8 L

3 cups + 4 cups = 1.8 L

7 cups = 1.8 L

$1 \text{ cup} = \frac{1.8 \text{ L}}{7}$

≈ 0.26 L

The capacity of a cup is about 0.26 liter.

4. Thinking skill: Analyzing parts and whole

Strategy: Solve part of the problem

Solution:

4M + 7J → 2.38 kg

2M + 3J → 1.1 kg

4M + 6J → 2.2 kg

1J → 2.38 kg − 2.2 kg = 0.18 kg

3J → 0.18 kg × 3 = 0.54 kg

2M → 1.1 kg − 0.54 kg = 0.56 kg

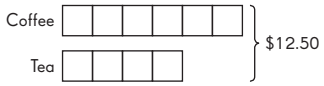
0.56 kg ÷ 2 = 0.28 kg

The mass of a carton of milk is 0.28 kilogram.

5. Thinking skill: Analyzing parts and whole

Strategy: Use a model

Solution:



a. \$12.50 ÷ 10 = \$1.25

\$1.25 × 3 = \$3.75

Each cup of coffee cost \$3.75.

b. \$1.25 × 8 = \$10

Leon paid \$10 for 2 cups of coffee and 1 cup of tea.

6. Thinking skill: Analyzing parts and whole

Strategy: Solve part of the problem

Solution:

9 cans of mango juice = 6 cans of orange juice

= 6 cans of mango juice + (0.16 kg × 6)

3 cans of mango juice = 0.16 kg × 6

= 0.96 kg

a. 0.96 kg ÷ 3 = 0.32 kg

The mass of each can of mango juice is 0.32 kilogram.

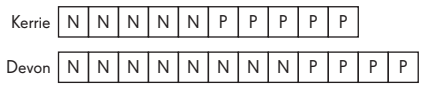
b. 0.32 kg + 0.16 kg = 0.48 kg

The mass of each can of orange juice is 0.48 kilogram.

7. Thinking skill: Analyzing parts and whole

Strategy: Use a model

Solution:



1 pen → 3 notebooks

1 notebook + \$3.70 → 3 notebooks

2 notebooks → \$3.70

a. \$3.70 ÷ 2 = \$1.85

Each notebook cost \$1.85.

b. \$1.85 + \$3.70 = \$5.55

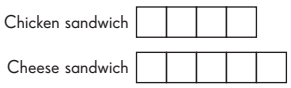
Each pen cost \$5.55.

8. Thinking skill: Analyzing parts and whole

Strategy: Use a model

Solution:

$0.8 = \frac{4}{5}$



$4 \times 9 = 36$ units
$5 \times 7 = 35$ units
$36 + 35 = 71$ units
71 units → \$46.15
1 unit → \$46.15 ÷ 71 = \$0.65
a. \$0.65 × 4 = \$2.60
The cost of each chicken sandwich is \$2.60.
b. \$0.65 × 5 = \$3.25
The cost of each cheese sandwich is \$3.25.

9. Thinking skill: Comparing

Strategy: Simplify the problem

Solution:
Difference in the price of an alarm clock
= \$16.00 − \$15.50 = \$0.50 (gained)
Difference in price of a patch
= \$2.30 − \$2.00 = \$0.30 (lost)
3 alarm clocks → gained \$1.50
5 patches → lost \$1.50
5 patches (loss) → 3 alarm clocks (gain)
30 patches (loss) → 18 alarm clocks (gain)
James sold 18 alarm clocks.

10. Thinking skill: Comparing

Strategy: Make a table

Solution:

Method 1:

Number of Days	Jessica	Sarah	Difference in Amount
10	0	\$1.50 × 10 = \$15	—
20	\$2.50 × 10 = \$25	\$1.50 × 20 = \$30	—
30	\$2.50 × 20 = \$50	\$1.50 × 30 = \$45	\$5
35	\$50 + \$12.50 = \$62.50	\$45 + \$7.50 = \$52.50	\$10
37	\$62.50 + \$5 = \$67.50	\$52.50 + \$3 = \$55.50	\$12

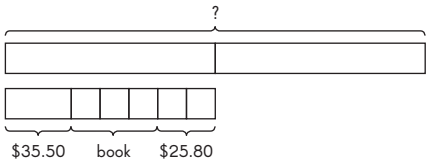
a. Sarah has been saving for 37 days.
b. Jessica has saved \$67.50 so far.

Method 2:

From Day 1 to Day 10, Sarah saved
\$1.50 × 10 = \$15
(\$15 + \$12) ÷ \$1 = 27 days
a. 10 + 27 = 37
Sarah has been saving for 37 days.
b. \$2.50 × 27 = \$67.50
Jessica has saved \$67.50 so far.

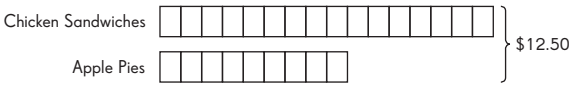
11. Thinking skill: Analyzing parts and whole

Strategy: Use a model



2 units → \$25.80
5 units → (\$25.80 ÷ 2) × 5
= \$64.50
Half of monthly allowance = \$64.50 + \$35.50
= \$100
Monthly allowance = \$100 × 2
= \$200
Albert's monthly allowance was \$200.

12.



25 units → \$12.50
1 unit → \$12.50 ÷ 25
= \$0.50
1 chicken sandwich = \$0.50 × 4
= \$2
1 chicken sandwich is \$2.

Chapter 10

Lesson 10.1

1. 0.5; 50%
2. 0.25; 25%
3. 0.2; 20%
4. $\frac{3}{10}$; 30%
5. $\frac{9}{20}$; 45%
6. $\frac{8}{25}$; 32%
7. $\frac{3}{4}$; 0.75
8. $\frac{3}{5}$; 0.6
9. $\frac{3}{20}$; 0.15

10. a. $100\% - 84\% = 16\%$
16% of the questions were not completed by Jerry.
b. $\frac{84}{100} = \frac{21}{25}$
Jerry completed $\frac{21}{25}$ of the questions.

11. $1 - \frac{36}{100} = \frac{64}{100}$
64% of the students are boys.

Lesson 10.2

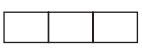
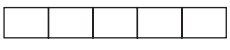
1. 50 2. 25 3. 40 4. 37.5
5. 62.5 6. 55 7. 64 8. 74
9. 24 10. 46 11. 90 12. 88

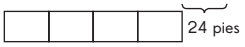
13. $300 - 240 = 60$
$\frac{60}{300} \times 100 = 20\%$
20% of the participants did not complete their drawings.

14. $250 - 60 = 190$
$190 \div 2 = 95$
$\frac{95}{250} \times 100\% = 38\%$
38% of the beads in the box are yellow.

15. Amount of money Maria spent
$= \$6.75 + \$1.25 = \$8$
Amount of money Maria had at first
$= \$8 + \$12 = \$20$
$\frac{8}{20} \times 100\% = 40\%$
Maria spent 40% of her money.

16. Number of big marbles $= 45 \times 4 = 180$
Number of small marbles $= 24 \times 5 = 120$
Total number of marbles $= 180 + 120 = 300$
$\frac{180}{300} = \frac{60}{100} = 60\%$
60% of the marbles are big.

17. Indian 
British 
8 units → $100\% - 52\% = 48\%$
1 unit → $48\% \div 8 = 6\%$
3 units → $3 \times 6\% = 18\%$
$18\% \times 450 = 81$
a. Glen has 81 Indian stamps.
b. $5 \times 6\% = 30\%$
30% of his collection are British stamps.

18. Strawberry pie 
Apple pie 

1 unit → 24 pies
9 units → $24 \times 9 = 216$ pies
$144 + 216 = 360$
$\frac{144}{360} = \frac{40}{100} = 40\%$
40% of the pies are blueberry pies.

Lesson 10.3

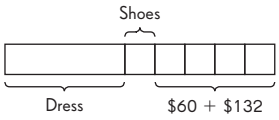
1. \$90
2. 18 h
3. 96 km
4. 4,480 people
5. 3.6 kg
6. 711 mL
7. $100\% - 30\% - 45\% = 25\%$
$25\% \times 480 = 120$
There are 120 roses in the shop.
8. $20\% \times 350 = 70$ girls at first
New number of girls $= 70 + 50 = 120$
New number of students $= 350 + 50 = 400$
$\frac{120}{400} \times 100\% = 30\%$
30% of students in the hall are girls now.

Lesson 10.4

1. Interest in 1 year → 2% of \$30,000
$= \frac{2}{100} \times \$30{,}000$
$= \$600$
$\$30{,}000 + \$600 = \$30{,}600$
Leon withdrew \$30,600.

2. Price of 1 flower $= \$10 \div 4 = \$2.50$
Price of 12 flowers $= 12 \times \$2.50$
$= \$30$
During the sale, price of 1 flower
$= 80\%$ of $\$2.50 = \$2$
$30 \div 2 = 15$ flowers
Mrs. Watson could buy 15 flowers with the amount of money she usually spends.

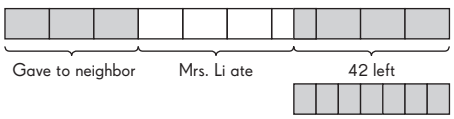
3. $\$432 \div 12 = \$36$
$\$114 + \$36 = \$150$
$\frac{36}{150} \times 100\% = 24\%$
Peter saves 24% of his allowance every month.

4. 

4 units → $\$60 + \$132 = \$192$
5 units → $\frac{\$192}{4} \times 5 = \$240$
60% of her money → $\$240$
100% of her money = $\frac{\$240}{60} \times 100 = \$400$
Cheryl had $400 at first.

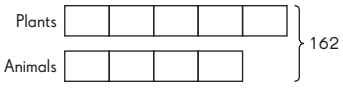
Put on Your Thinking Cap!

1. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:



7 units → 42 crackers
1 unit → 6 crackers
20 units → $6 \times 20 = 120$ crackers
Mrs. Li bought 120 crackers.

2. Thinking skill: Analyzing parts and whole
Strategy: Use a model
Solution:
$80\% = \frac{4}{5}$

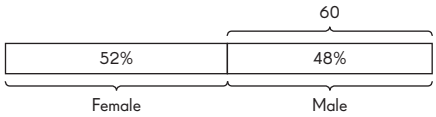


9 units → 162 aquatic plants and animals
4 units → $\frac{162}{9} \times 4 = 72$ aquatic animals
There are 72 aquatic animals in the eco-garden.

3. Thinking skill: Analyzing parts and whole
Strategy: Use before and after concept
Solution:

Before:
Female → 60% of $150 = \frac{60}{100} \times 150 = 90$
a. $150 - 90 = 60$
There were 60 male goldfish.

After:



48% → 60
52% → $\frac{60}{48} \times 52 = 65$
b. $90 - 65 = 25$
25 female goldfish died.

4. Thinking skill: Analyzing parts and whole
Strategy: Use before and after concept
Solution:

Before:
$40\% \times 280 = \frac{40}{100} \times 280 = 112$
There were 112 corn muffins.
$280 - 112 = 168$
There were 168 other muffins.

After:
40% → 168 (other muffins)
60% → $\frac{168}{40} \times 60 = 252$ (corn muffins)
$252 - 112 = 140$
Mr. Parker must bake 140 more corn muffins.

Test Prep for Chapters 8 to 10

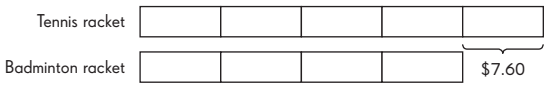
1. D	2. C
3. C	4. B
5. D	6. C
7. C	8. D
9. C	10. A
11. $7\frac{1}{4}$	12. 6.85
13. 2.65	14. 1.56
15. 22.50	16. 5
17. $72.67 \approx 73$	

18. Mother's age $= 9 \times 4 = 36$ years
Ivy's age 9 years from now
$= 9 + 9 = 18$ years
Mother's age 9 years from now
$36 + 9 = 45$ years
Ivy's age as a percent of her mother's age 9 years from now
$= \frac{18}{45} \times 100\% = 40\%$

19. Total number of students who scored an A
$= 20\% \times 300 = 60$
Remaining students $= 300 - 60 = 240$
Total number of students who scored a B
$= 45\% \times 240 = 108$

20. Total percent of boys
$= 100\% - 40\% - 5\% = 55\%$
Difference between percent of boys and girls
$= 55\% - 40\% = 15\% = \frac{3}{20}$

3 units → 270
1 unit → 90
90 adults participated in the survey.

21. 

1 unit → \$7.60
4 units → $\$7.60 \times 4 = \$30.40$
The cost of the badminton racket is \$30.40.

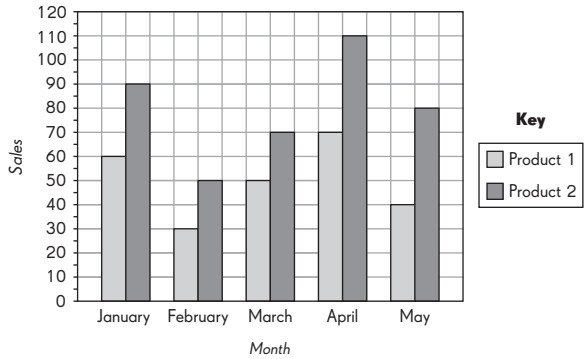
22. 13 units → $100\% - 48\% = 52\%$
1 unit → 4%
8 units → 32% (apples)
5 units → 20% (pears)
$48\% - 32\% = 16\%$
16% → 128
4% → 32
$20\% \rightarrow 32 \times 5 = 160$
There are160 pears in the basket.

23. **Before:**
apple pies → $55\% \times 160 = 88$
cherry pies → $160 - 88 = 72$

After:
60% → 72
100% → 120
a. 120 pies were left.
$120 - 72 = 48$
48 apple pies were left.
b. $88 - 48 = 40$
40 apple pies were sold.

Chapter 11

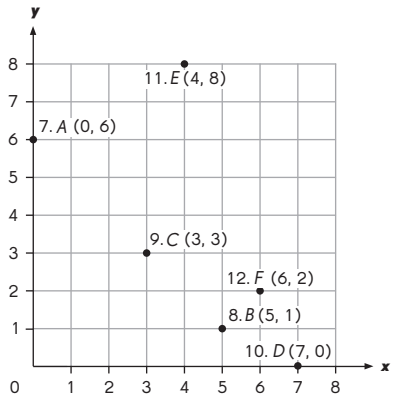
Lesson 11.1

1. $700 + 600 = 1{,}300$
2. $700 - 300 = 400$
3. $\frac{300}{900} = \frac{1}{3}$
4. Total $= 600 + 400 = 1{,}000$
$\frac{600}{1{,}000} \times 100\% = 60\%$
5. A : B : D $= 400 : 600 : 800 = 2 : 3 : 4$
6. 

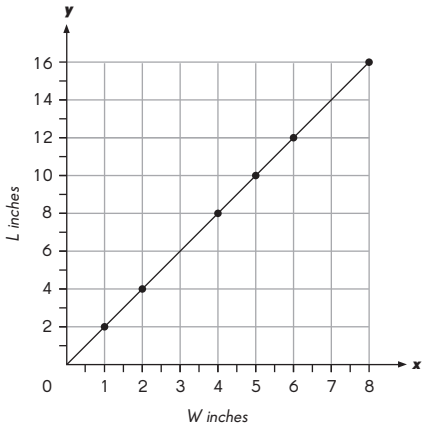
7. $(60 + 30 + 50 + 70 + 40) \div 5 = 50$
8. January : May $= 60 : 40 = 3 : 2$
9. February;
$90 - 50 = 40$
10. Total sales $= 90 + 50 + 70 + 110 + 80$
$= 400$
$\frac{80}{400} \times 100\% = 20\%$

Lesson 11.2

1. (3, 7) 2. (0, 4) 3. (4, 0)
4. (1, 8) 5. (5, 2) 6. (6, 1)



13. 9 ft
14. 16.5 ft
15. 4 yd
16. 7 yd
17. Y = 6.5; F = 19.5
18. Width (W) inch: 4; 6
Length (L) inch: 10; 16



19. 6
20. 11
21. 3
22. 7

Lesson 11.3

1.

Pies / Sizes	fish	beef	chicken	mushroom
small	small fish	small beef	small chicken	small mushroom
medium	medium fish	medium beef	medium chicken	medium mushroom
large	large fish	large beef	large chicken	large mushroom

$3 \times 4 = 12$
She can bake 12 different pies.

2.

Manual 1600 c.c. blue Manual 1600 c.c. white Manual 1600 c.c. grey	Automatic 1600 c.c. blue Automatic 1600 c.c. white Automatic 1600 c.c. grey
Manual 2000 c.c. blue Manual 2000 c.c. white Manual 2000 c.c. grey	Automatic 2000 c.c. blue Automatic 2000 c.c. white Automatic 2000 c.c. grey

$2 \times 2 \times 3 = 12$
Mr. Samuel needs to consider 12 combinations.

3. Let A, B, C, D, E, and F represent 6 people (Ms. Beckham and her 5 friends).
A shakes hands with B, C, D, E, F = 5 handshakes
B shakes hands with C, D, E, F = 4 handshakes
C shakes hands with D, E, F = 3 handshakes
D shakes hands with E, F = 2 handshakes
E shakes hands with F = 1 handshake
Total number = 1 + 2 + 3 + 4 + 5 = 15
There are 15 handshakes.

4. Make a list in order:

V S F V S A V S I
V F F V F A V F I
V L F V L A V L I

C S F C S A C S I
C F F C F A C F I
C L F C L A C L I

M S F M S A M S I
M F F M F A M F I
M L F M L A M L I

9 + 9 + 9 = 27
The restaurant has 27 different three-course meals.

Lesson 11.4

1. $\frac{1}{4}$
2. 1
3. $\frac{1}{4}$
4. $\frac{1}{3}$
5. Answers vary.
6. Answers vary.
7. Answers vary.
8. Answers vary.
9. Answers vary.
10.

2nd cube \ 1st cube	+	1	2	3	4	5	6
	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

11. 7; Answer varies.
12. 2 or 12; Answer varies.
13. $\frac{5}{36}$
14. $\frac{9}{40}$

15. $\frac{1}{5}$ 16. $\frac{3}{10}$

17. $\frac{11}{40}$ 18. $\frac{1}{4}$

Put on Your Thinking Cap!

1. Thinking skill: Induction

   Solution: Answers vary.

2. Thinking skill: Induction

   Strategy: Make suppositions

   Solution: Answers vary.

Chapter 12

Lesson 12.1

1. 55° 2. 53° 3. 56° 4. 90°

Lesson 12.2

1. 136° 2. 131° 3. 84°
4. $m\angle d = 62°$; $m\angle e = 124°$

Lesson 12.3

1. 97° 2. 35° 3. 142° 4. 24°
5. Angles at a Point:
   $\angle e$, $\angle f$, $\angle m$, and $\angle n$; $\angle i$, $\angle g$, $\angle h$, and $\angle p$; $\angle j$, $\angle k$, $\angle r$, and $\angle q$

   Vertical Angles:
   $\angle a$ and $\angle c$; $\angle e$ and $\angle n$; $\angle f$ and $\angle m$; $\angle i$ and $\angle p$; $\angle g$ and $\angle h$; $\angle j$ and $\angle q$; $\angle k$ and $\angle r$

   Angles on a Line:
   $\angle a$ and $\angle d$; $\angle a$ and $\angle b$; $\angle c$ and $\angle d$; $\angle f$ and $\angle n$; $\angle e$ and $\angle m$; $\angle e$ and $\angle f$; $\angle m$ and $\angle n$; $\angle i$ and $\angle h$; $\angle g$ and $\angle p$; $\angle i$ and $\angle g$; $\angle h$ and $\angle p$; $\angle j$ and $\angle r$; $\angle k$ and $\angle q$; $\angle j$ and $\angle k$; $\angle r$ and $\angle q$
6. 138° 7. 147°

Put on Your Thinking Cap!

1. Thinking skill: Spatial visualization

   Solution:
   $m\angle x = 90° - 49° = 41°$
2. Thinking skill: Spatial visualization

   Solution:
   $m\angle x + m\angle y + m\angle z = 180°$
   $m\angle x = 180° - 142° = 38°$
   $m\angle y = 180° - 94° = 86°$
   $m\angle z = 180° - 124° = 56°$
3. Thinking skill: Spatial visualization

   Solution:
   $m\angle x + m\angle y = (51° \div 3) \times 7 = 119°$
   $m\angle z = 360° - 119° = 241°$
4. Thinking skill: Spatial visualization

   Solution:
   $m\angle x + m\angle y \rightarrow 7$ units $= 180° - 54° = 126°$
   $m\angle y = (126° \div 7) \times 2 = 36°$
   $m\angle z = 180° - 36° - 38° = 106°$
5. Thinking skill: Spatial visualization

   Solution:
   $m\angle p + m\angle q + m\angle r \rightarrow 12$ units $= 180°$
   $m\angle p = (180° \div 12) \times 7 = 105°$
   $m\angle r = (180° \div 12) \times 4 = 60°$
6. Thinking skill: Spatial visualization

   Solution:
   $m\angle a + m\angle b + m\angle c \rightarrow 12$ units
   $= 360° - 132°$
   $= 228°$
   $m\angle a = (228° \div 12) \times 3 = 57°$
   $m\angle b = (228° \div 12) \times 4 = 76°$
   $m\angle c = (228° \div 12) \times 5 = 95°$
7. Thinking skill: Spatial visualization

   Solution:
   $\angle a$ ☐☐
   $\angle d$ ☐☐☐
   $\angle b$ ☐☐☐☐
   $\angle c$ ☐☐☐☐☐☐☐☐☐
   18 units $\rightarrow 360°$
   1 unit $\rightarrow 360° \div 18 = 20°$
   $m\angle a = 20° \times 2 = 40°$
   $m\angle b = 20° \times 4 = 80°$
   $m\angle c = 20° \times 9 = 180°$
   $m\angle d = 20° \times 3 = 60°$
8. Thinking skill: Spatial visualization

   Solution:
   $m\angle AOE = 180° - 108° = 72°$
   $m\angle AOC = 130° - 72° = 58°$
   $m\angle BOC = 90° - 58° = 32°$
   $m\angle BOD = m\angle AOC = 58°$
   $m\angle DOF = 90° - 58° = 32°$
   $m\angle BOC$ and $m\angle DOF$ are equal.

Chapter 13

Lesson 13.1

1. Scalene triangles: *LMN*; *XYZ*; *STU*
   Equilateral triangles: *ABC*; *PQR*
   Isosceles triangles: *DEF*; *GHK*; *KFC*
2. Right triangles: *DEF*; *LMN*; *XYZ*
   Equilateral triangles: *GHK*; *STU*
   Isosceles triangles: *ABC*; *PQR; VWX*

Lesson 13.2

1.	96°	2.	26°	3.	133°	4.	59°
5.	62°	6.	251°	7.	25°	8.	67°

Lesson 13.3

1.	32°	2.	53°	3.	101°	4.	29°
5.	33°	6.	30°	7.	120°	8.	106°

Lesson 13.4

1.	2; 2; 3	2.	4
3.	5	4.	5
5.	Yes	6.	Yes
7.	Yes	8.	6; 3; 5
9.	9	10.	8
11.	11	12.	*AC*
13.	*BC*	14.	*AB*

15. Answers vary. Accept any possible answer: 3 in., 4 in., or 5 in.
16. Answers vary. Accept any possible answer: 5 cm, 6 cm, 7 cm, or 8 cm
17. Answers vary. Accept any possible answer: 2 cm, 3 cm, 4 cm 5 cm, 6 cm, 7 cm, 8 cm, or 9 cm
18. 4 inches

Lesson 13.5

1.	16°	2.	118°; 62°
3.	131°	4.	116°
5.	154°	6.	44°
7.	76°	8.	46°

Put on Your Thinking Cap!

1. Thinking skill: Spatial visualization

   Solution:
   $m\angle UPT = 180° - 118° = 62°$
   $m\angle PUT = (180° - 62°) \div 2 = 59°$
   $m\angle TUV = m\angle TSV = 118° - 59° = 59°$
   $m\angle RSV = 118° - 59° = 59°$

2. Thinking skill: Spatial visualization

   Solution:
   $m\angle QPS = m\angle PST = 106°$
   $m\angle SPT = (180° - 106°) \div 2 = 37°$
   $m\angle a = 180° - 106° - 37° = 37°$

3. Thinking skill: Spatial visualization

   Solution:
   $m\angle FDE = 180° - 54° = 126°$
   $m\angle ADE = 126° \div 2 = 63°$
   $m\angle CDE = 90° - 63° = 27°$

4. Thinking skill: Spatial visualization

   Solution:
   $m\angle ABC = (180° - 32°) \div 2 = 74°$
   $m\angle x = 180° - 74° = 106°$
   $m\angle x = m\angle AFE = 106°$
   $m\angle y = (180° - 106°) \div 2 = 37°$

5. Thinking skill: Spatial visualization

   Solution:
   $m\angle PRQ = 180° - 27° \times 2 = 126°$
   $m\angle PRS = 180° - 126° = 54°$
   $m\angle x = 180° - 54° \times 2 = 72°$
   $3 \times m\angle TPS = 180° - 72° - 27° - 27° = 54°$
   $m\angle TPS = 18°$
   $m\angle STP = 2 \times 18° = 36°$
   $m\angle y = 180° - 36° = 144°$

6. Thinking skill: Spatial visualization

   Solution:
   $m\angle CEF = (180° - 118°) \div 2 = 31°$
   $m\angle x = 180° - 60° - 60° - 31° = 29°$
   $m\angle FEG = 180° - 31° - 54° = 95°$
   $m\angle EFG = 180° - 118° = 62°$
   $m\angle y = 180° - 95° - 62° = 23°$

7. Thinking skill: Spatial visualization

   Solution:
   $m\angle EAF = m\angle AEF = 90° - 34° = 56°$
   $m\angle AFE = m\angle BFG = 180° - 56° \times 2 = 68°$
   $m\angle FBG = m\angle FGB = (180° - 68°) \div 2 = 56°$
   $m\angle EBA = 90° - 58° = 32°$
   $m\angle y = 56° + 32° = 88°$
   $m\angle x = 180° - 56° - 88° = 36°$

8. Thinking skill: Spatial visualization

Solution:

$m\angle ABC = m\angle CDE = 56°$

$m\angle x = 180° - 56° - 90° = 34°$

$m\angle CFD = 180° - 103° = 77°$

$m\angle DCF = 180° - 77° - 56° = 47°$

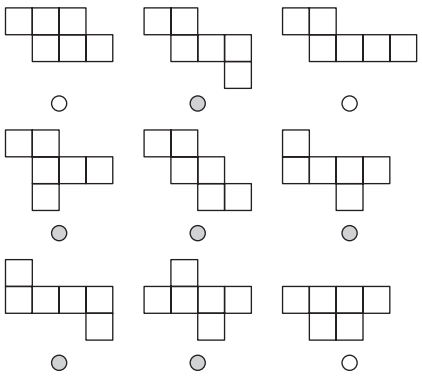
$m\angle y = 90° - 47° = 43°$

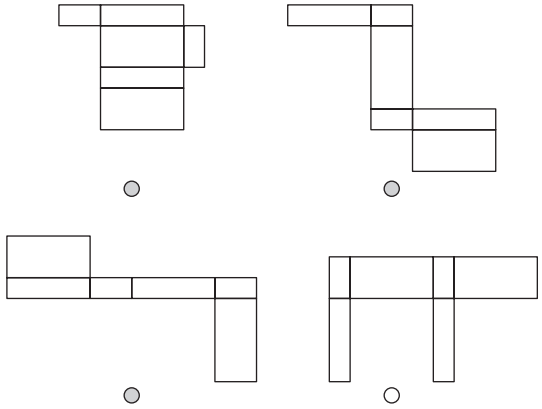
Chapter 14

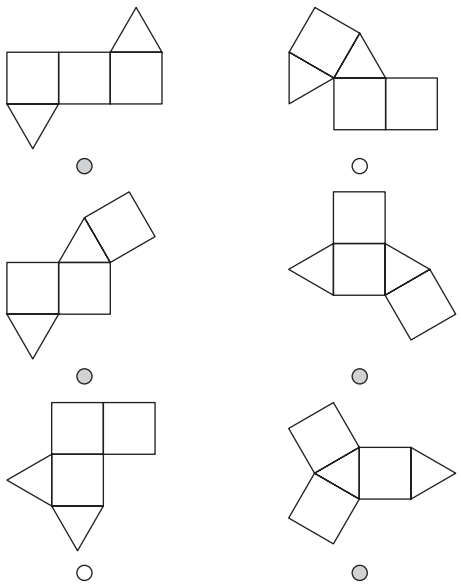
Lesson 14.1

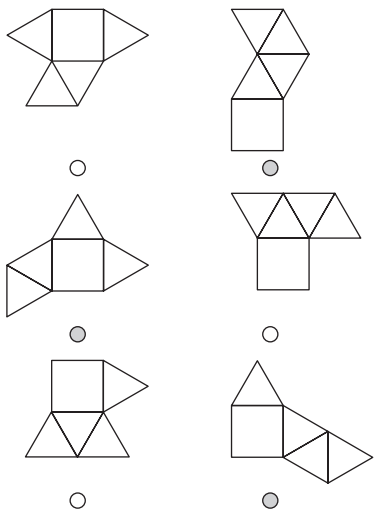
	Solid	Number of Faces (F)	Number of Vertices (V)	Number of Edges (E)
1.	cube	6	8	12
2.	rectangular prism	6	8	12
3.	triangular prism	5	6	9
4.	square pyramid	5	5	8
5.	triangular pyramid	4	4	6

6. For any prism and pyramid, subtracting the number of edges from the sum of the number of faces and the number of vertices, equals 2.

7. 

8. 

9. 

10. 

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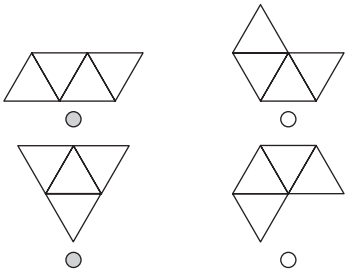
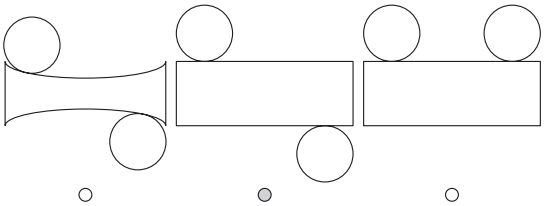
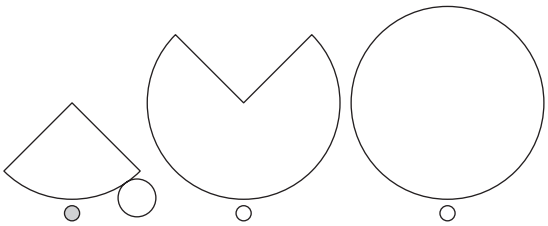


Lesson 14.2

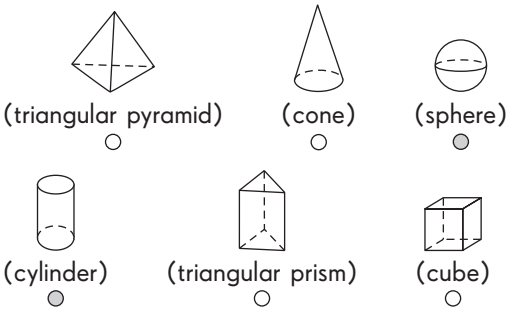
1. 2; 1



2. 1



3.



4. F
5. T
6. F
7. F
8. T
9. T

Put on Your Thinking Cap!

Thinking skill: Identifying patterns and relationship

Strategy: Look for a pattern

Solution:

	Solid	Number of Faces (F)	Number of Edges (E)	Number of Vertice (V)	F+V−E
1.	cube	6	12	8	2
2.	cone	1	0	1	2
3.	triangular prism	5	9	6	2
4.	square pyramid	5	8	5	2
5.	triangular pyramid	4	6	4	2
6.	cylinder	2	0	0	2

7. Thinking skill: Identifying patterns and relationships

Strategy: Look for a pattern

Solution:

Shape	Number of Sticks Used	Total Surface Area
4	36	18
5	44	22

8. Thinking skill: Identifying patterns and relationships

Strategy: Look for a pattern

Solution:

$8 \times 10 + 4 = 84$

84 sticks are needed to form Shape 10.

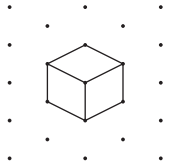
Chapter 15

Lesson 15.1

1. 8
2. 10
3. 12
4. 13
5. 10

Lesson 15.2

1.



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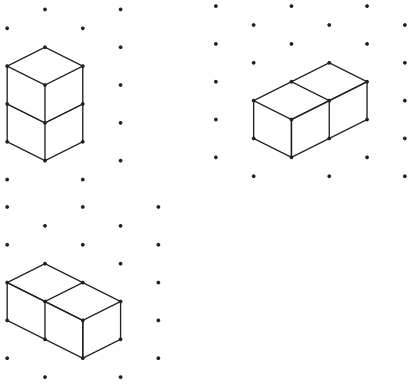

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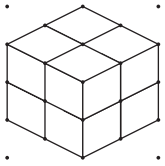
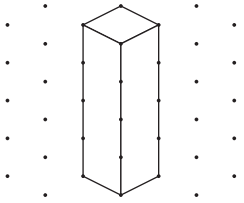


4.



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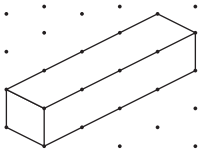

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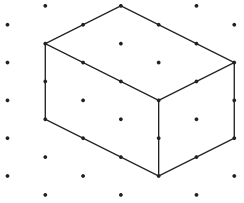

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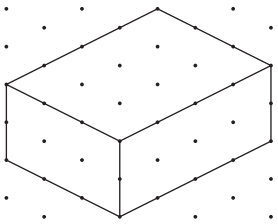

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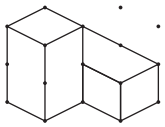

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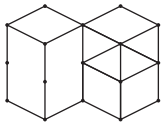
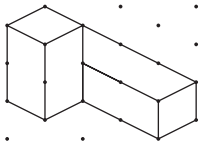


10.



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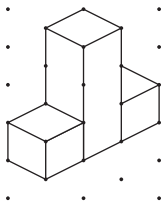

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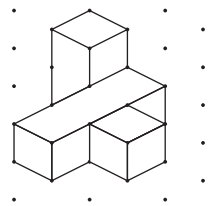

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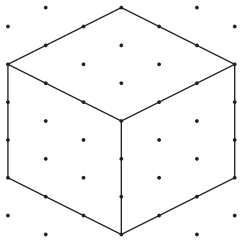

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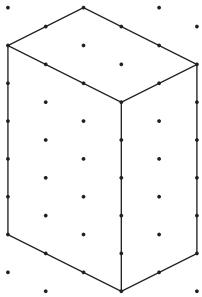

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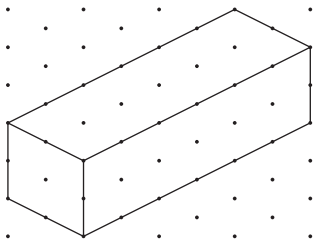

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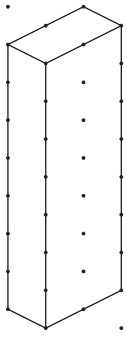


Lesson 15.3

1. $4 \text{ cm} \times 4 \text{ cm} = 16 \text{ cm}^2$
   $16 \text{ cm}^2 \times 6 = 96 \text{ cm}^2$
   The surface area of the cube is 96 square centimeters.
2. $5 \text{ cm} \times 3 \text{ cm} = 15 \text{ cm}^2$
   $3 \text{ cm} \times 2 \text{ cm} = 6 \text{ cm}^2$
   $5 \text{ cm} \times 2 \text{ cm} = 10 \text{ cm}^2$
   $(15 \text{ cm}^2 + 6 \text{ cm}^2 + 10 \text{ cm}^2) \times 2 = 62 \text{ cm}^2$
   The surface area of the rectangular prism is 62 square centimeters.
3. $5 \text{ cm} \times 5 \text{ cm} = 25 \text{ cm}^2$
   $25 \text{ cm}^2 \times 6 = 150 \text{ cm}^2$
4. $8 \text{ in.} \times 8 \text{ in.} = 64 \text{ in.}^2$
   $64 \text{ in.}^2 \times 6 = 384 \text{ in.}^2$
5. $20 \text{ cm} \times 6 \text{ cm} = 120 \text{ cm}^2$
   $10 \text{ cm} \times 6 \text{ cm} = 60 \text{ cm}^2$
   $20 \text{ cm} \times 10 \text{ cm} = 200 \text{ cm}^2$
   $(120 + 60 + 200) \text{ cm}^2 \times 2 = 760 \text{ cm}^2$
6. $10 \text{ cm} \times 10 \text{ cm} = 100 \text{ cm}^2$
   $18 \text{ cm} \times 10 \text{ cm} = 180 \text{ cm}^2$
   $100 \text{ cm}^2 \times 2 + 180 \text{ cm}^2 \times 4 = 920 \text{ cm}^2$
7. $7 \text{ in.} \times 7 \text{ in.} = 49 \text{ in.}^2$
   $49 \text{ in.}^2 \times 6 = 294 \text{ in.}^2$
8. $10 \text{ cm} \times 10 \text{ cm} = 100 \text{ cm}^2$
   $100 \text{ cm}^2 \times 6 = 600 \text{ cm}^2$
9. $10 \text{ in.} \times 9 \text{ in.} = 90 \text{ in.}^2$
   $10 \text{ in.} \times 6 \text{ in.} = 60 \text{ in.}^2$
   $9 \text{ in.} \times 6 \text{ in.} = 54 \text{ in.}^2$
   $(90 + 60 + 54) \text{ in.}^2 \times 2 = 408 \text{ in.}^2$
10. $20 \text{ cm} \times 15 \text{ cm} = 300 \text{ cm}^2$
    $20 \text{ cm} \times 10 \text{ cm} = 200 \text{ cm}^2$
    $15 \text{ cm} \times 10 \text{ cm} = 150 \text{ cm}^2$
    $(300 + 200 + 150) \text{ cm}^2 \times 2 = 1{,}300 \text{ cm}^2$
11. $8 \text{ in.} \times 6 \text{ in.} = 48 \text{ in.}^2$
    $8 \text{ in.} \times 12 \text{ in.} = 96 \text{ in.}^2$
    $12 \text{ in.} \times 6 \text{ in.} = 72 \text{ in.}^2$
    $(48 + 96 + 72) \text{ in.}^2 \times 2 = 432 \text{ in.}^2$
12. $12 \text{ cm} \times 12 \text{ cm} = 144 \text{ cm}^2$
    $12 \text{ cm} \times 20 \text{ cm} = 240 \text{ cm}^2$
    $144 \text{ cm}^2 \times 2 + 240 \text{ cm}^2 \times 4 = 1{,}248 \text{ cm}^2$
13. $216 \text{ cm}^2 \div 6 = 36 \text{ cm}^2$
    $\underline{6} \times \underline{6} = 36$
    The length of the cube is 6 centimeters.
14. $6 \text{ cm} \times 6 \text{ cm} = 36 \text{ cm}^2$
    $30 \text{ cm} \times 6 \text{ cm} = 180 \text{ cm}^2$
    $36 \text{ cm}^2 \times 2 + 180 \text{ cm}^2 \times 4 = 792 \text{ cm}^2$
    The surface area of the wood is 792 square centimeters.
15. $20 \text{ in.} \times 18 \text{ in.} = 360 \text{ in.}^2$
    $20 \text{ in.} \times 16 \text{ in.} = 320 \text{ in.}^2$
    $18 \text{ in.} \times 16 \text{ in.} = 288 \text{ in.}^2$
    $360 \text{ in.}^2 + (320 \text{ in.}^2 \times 2) + (288 \text{ in.}^2 \times 2) = 1{,}576 \text{ in.}^2$
    The total surface area of the tank in contact with the water is 1,576 square inches.

Lesson 15.4

1. 12	2. 9	3. 12	4. 11
5. B	6. A; C	7. 12	8. 12
9. 9	10. 17	11. G	12. H
13. E and F		14. 5; 2; 3; 30	
15. 4; 3; 4; 48		16. 8; 5; 4; 160	
17. 8; 6; 4; 192			

Lesson 15.5

1. 8; 5; 7
   Volume $= 8 \times 5 \times 7 = 280$
2. 14; 7; 10
   Volume $= 14 \times 7 \times 10 = 980$
3. 32; 28; 20
   Volume $= 32 \times 28 \times 20 = 17{,}920$
4. $25.8 \times 12 \times 18 = 5{,}572.8$
5. $15 \times 15 \times 28.6 = 6{,}435$

6. 8	7. 12
8. 18	9. 8
10. 390	11. 1,125
12. 2,600	13. 4,080
14. 5,050	15. 2,006
16. 0; 890	17. 1; 850
18. 3; 65	19. 0.53
20. 0.755	21. 1.65
22. 2.075	23. 6,552 mL
24. 7,200 mL	25. 3.24 L
26. 8.4 L	

27. Volume of fish tank $= 38 \text{ cm} \times 23 \text{ cm} \times 18 \text{ cm}$
$= 15{,}732 \text{ cm}^3$
$\frac{2}{3} \times 15{,}732 \text{ cm}^3 = 10{,}488 \text{ cm}^3 = 10 \text{ L } 488 \text{ mL}$
When the tank is $\frac{2}{3}$ full, there is
10 liters 488 milliliters of water in it.

28. Fraction of water left $= \frac{3}{4} \times \frac{4}{5} = \frac{3}{5}$
Volume of tank $= 30 \text{ cm} \times 22 \text{ cm} \times 25 \text{ cm}$
$= 16{,}500 \text{ cm}^3$
$\frac{3}{5} \times 16{,}500 \text{ cm}^3 = 9{,}900 \text{ cm}^3 = 9.9 \text{ L}$
The volume of water left in the tank is 9.9 liters.

29. Height of water needed $= 24 \text{ cm} - 7 \text{ cm}$
$= 17 \text{ cm}$
Volume of water needed $= 42 \text{ cm} \times 20 \text{ cm} \times 17 \text{ cm}$
$= 14{,}280 \text{ cm}^3$
$= 14.28 \text{ L}$
The volume of water needed is 14.28 liters.

Put on Your Thinking Cap!

1. Thinking skill: Identifying patterns and relationships
Strategy: Look for a pattern
Solution:
$7 \times 7 = 49$
Jessica will need 49 cubes.

2. Thinking skill: Identifying patterns and relationships
Strategy: Look for a pattern
Solution:
a.

T-Shaped Pattern	1	2	3	4
Number of Unit Cubes	5	$5 + 3 = 8$	$8 + 3 = 11$	$11 + 3 = 14$

b. Pattern 5: $14 + 3 = 17$
Pattern 6: $17 + 3 = 20$
c. Pattern 10: $3 \times 10 + 2 = 32$ cubes

3. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
Volume of each cube $= 960 \text{ cm}^3 \div 15$
$= 64 \text{ cm}^3$
$4 \text{ cm} \times 4 \text{ cm} \times 4 \text{ cm} = 64 \text{ cm}^3$
Length of each cube is 4 centimeters.
The solid has 42 exposed faces.
Surface area of solid $= 42 \times (4 \times 4) \text{ cm}^2$
$= 672 \text{ cm}^2$
The surface area that is painted blue is 672 square centimeters.

4. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
$6 \times 3 = 18$ cubes (1 layer)
$126 \div 18 = 7$ layers
$7 \times 3 \text{ cm} = 21 \text{ cm}$
The height of the box is 21 centimeters.

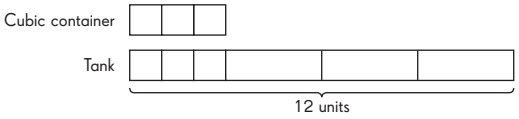
5. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
a. $(3 \times 3 \times 3) \text{ cm}^3 \times 12 = 324 \text{ cm}^3$
The volume of the solid is 324 cubic centimeters.
b. The solid has 38 exposed faces.
$38 \times (3 \times 3) \text{ cm}^2 = 342 \text{ cm}^2$
The total surface area of the solid is 342 square centimeters.
c. i. 2 cubes
ii. 6 cubes
iii. 4 cubes

6. Thinking skill: Analyzing parts and whole
Strategy: Solve part of the problem
Solution:
3 units $\rightarrow 12 \text{ cm} \times 10 \text{ cm} \times 6 \text{ cm} = 720 \text{ cm}^3$
7 units $\rightarrow \frac{720}{3} \text{ cm}^3 \times 7 = 1{,}680 \text{ cm}^3$.
a. The volume of block B is 1,680 cubic centimeters.
$\frac{1{,}680 \text{ cm}^3}{10 \text{ cm} \times 12 \text{ cm}} = 14 \text{ cm}$
b. The width of block B is 14 centimeters.

7. Thinking skill: Deduction

Strategy: Use a model

Solution:



12 units − 4 units = 8 units
8 units → 1,024 mL
4 units → 512 mL
Volume of the cubic container
= 8 cm × 8 cm × 8 cm = 512 cm^3
The length of the cubic container is 8 centimeters.

8. Thinking skill: Analyzing parts and whole

Strategy: Solve part of the problem

Solution:
Length → 36 ÷ 4 = 9
Width → 8 ÷ 2 = 4
Height → 21 ÷ 3 = 7
Total number of blocks needed = 9 × 4 × 7
= 252

$\frac{4}{9} \times 252 = 112$

John will need 112 blocks to complete the wall.

9. Thinking skill: Comparing, Spatial visualization

Strategy: Simplify the problem

Solution:
Length → 25 ÷ 2 is about 12
Width → 15 ÷ 2 is about 7
Height → 20 ÷ 2 = 10
Number of cubes = 12 × 7 × 10 = 840
840 cubes can be packed into the prism.

10. Thinking skill: Comparing, Spatial visualization

Strategy: Simplify the problem

Solution:
Length → 54 ÷ 6 = 9
Width → 44 ÷ 8 is about 5
Height → 22 ÷ 10 is about 2
9 × 5 × 2 = 90
The maximum number of watch boxes that can be packed into the container is 90.

11. Thinking skill: Analyzing parts and whole, Deduction

Strategy: Simplify the problem

Solution:
a. Dimensions: 5 cm by 5 cm by 12 cm
b. Dimensions: 3 cm by 3 cm by 20 cm
Accept possible drawings.
c. Volume of one solid
= 5 cm × 5 cm × 12 cm = 300 cm^3
Volume of the other solid
= 20 cm × 3 cm × 3 cm = 180 cm^3

End-of-Year Test

Multiple choice

1. C	2. C	3. C	4. C
5. B	6. D	7. B	8. A
9. B	10. C	11. B	12. D
13. B	14. A	15. C	16. A
17. C	18. D	19. B	20. B

Short Answer

21. Factors of 6 are: 1, 2, 3, and 6.
$\frac{4}{8} = \frac{1}{2}$

22. 19.4

23. $6\frac{7}{30}$

24. $2d + 6$

25. $19y - 6$

26. 5 × 10 = 50

27. $\frac{7}{8}$ kg × $\frac{3}{5} = \frac{21}{40}$ kg
$\frac{21}{40}$ kilogram of beef is left.

28. $\frac{2}{7} \times \frac{3}{4} = \frac{3}{14}$
$\frac{3}{14} \times 84 = 18$
Karen gets 18 beads.

29. $\frac{38}{0.2} = 190$

30. Photo B measures 16 cm by 12 cm.
$16 \text{ cm} \times 12 \text{ cm} = 192 \text{ cm}^2$
The area of Photo B is 192 square centimeters.

31. Area of shaded region
$= \frac{1}{2} \times 26 \times (20 - 10) = 130 \text{ cm}^2$

32. Surface area of the rectangular prism
$= (12 + 8) \times 2 \times 6 + 12 \times 8 \times 2$
$= 432 \text{ cm}^2$

33. Volume of each cube $= \frac{1{,}620}{60} = 27 \text{ cm}^3$
Length of each cube $= L \times L \times L = 27 \text{ cm}^3$
$L = 3 \text{ cm}$

34. Volume of water
$= 24 \text{ cm} \times 20 \text{ cm} \times 15 \text{ cm} = 7\frac{1}{5} \text{ L}$

35. 3 L

36. Total number of computers sold
$= 35 + 30 + 40 + 25 + 45 = 175$

37. Shop 4
$40 - 25 = 15$ (increase)

38. $180° - 35° \times 2 = 110°$
$m\angle ACD = 110° - 60° = 50°$

39. $(180° - 86°) \div 2 = 47°$
$m\angle RQT = 180° - 86° - 47° - 28° = 19°$

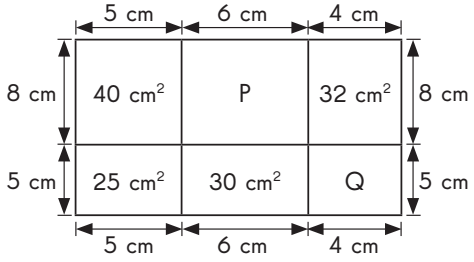
40. $58° - 23° = 35°$
$(180° - 42°) \div 2 = 69°$
$180° - 69° = 111°$
$m\angle AEF = 180° - 111° - 35° = 34°$

41. $\$95 - \$75 = \$20$
$40\% \rightarrow \$20$
$100\% \rightarrow \$50$ (his savings)
$\$95 + \$50 = \$145$
Lincoln has \$145 every month.

42.

Area (cm^2)	Common Factors
40, 25	1, 5
40, 32	1, 2, 4, 8
25, 30	1, 5

By deduction,



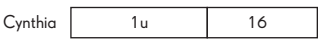
Length of P = 8 cm
Width of P = 6 cm
Length of Q = 5 cm
Width of Q = 4 cm.
Area of P $\rightarrow 8 \times 6 = 48 \text{ cm}^2$
Area of Q $\rightarrow 5 \times 4 = 20 \text{ cm}^2$
$48 \text{ cm}^2 + 20 \text{ cm}^2 = 68 \text{ cm}^2$
a. The total area of P and Q is 68 square centimeters.
$(13 \text{ cm} + 15 \text{ cm}) \times 2 = 56 \text{ cm}$
b. The perimeter of the figure is 56 centimeters.

43.

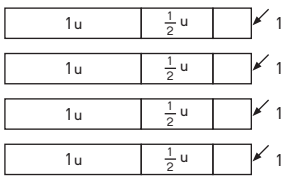
	A	B	C
Before:	3	5	2
After:	$1\frac{1}{2}$	$5\frac{1}{2}$	3

1 unit $\rightarrow$ 18
$18 \times 3 = 54$
a. Alex had 54 marbles before the game.
$18 \times 5.5 = 99$
b. Benny had 99 marbles at the end of the game.

44. Cynthia

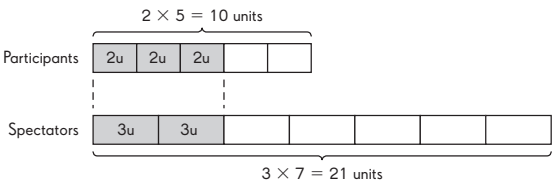


Roy



$\frac{1}{2}$ unit $\rightarrow 16 - 1 = 15$
1 unit $\rightarrow 15 \times 2 = 30$
$30 \times 6 + 4 = 184$
Roy had 184 stamps in the end.

45.



a. The number of participants is $\frac{10}{21}$ of the number of spectators.
11 units $\rightarrow$ 253
1 unit $\rightarrow 253 \div 11 = 23$
$23 \times 21 = 483$
b. 483 spectators were at the meet.