Answers

Chapter 1

Lesson 1.1

1.

<table>
<thead>
<tr>
<th>Hundred Thousands</th>
<th>Ten Thousands</th>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
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<td>☐</td>
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<td>☐</td>
</tr>
</tbody>
</table>

a. three hundred fifty-six thousand, four hundred one
b. 356,401

2. 28,199

3. 90,038

4. 412,603

5. 800,005

6. 507,700

7. 600,600

8. Fifty thousand, six hundred eighty

9. Two hundred fifty-five thousand, four hundred thirty

10. One hundred ninety-nine thousand, three hundred three

11. Eight hundred seventy-two thousand, nine hundred

12. Three hundred five thousand, seventy-two

13. 304,678

14. 876,430

15. 304,687

16. 876,403

17. Answers vary.
   Samples: 306,748; 346,780; 387,406

18.

<table>
<thead>
<tr>
<th>Millions</th>
<th>Hundred Thousands</th>
<th>Ten Thousands</th>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

a. six million, two hundred four thousand, three hundred thirteen
b. 6,204,313

19. 9,270,050

20. 6,084,101

21. 7,006,899

22. 4,502,015

23. 5,050,602

24. 8,400,085

25. 3,000,703

26. Eight million, eight hundred eighty thousand, four hundred twenty-nine

27. Three million, two thousand, five hundred sixty-six

28. Five million, nine hundred seventy thousand, one hundred three

29. Two million, fifty thousand, sixty

30. Four million, seven hundred thousand, nine hundred

31. 1,023,596

32. Answers vary.
   Samples: 3,629,501; 3,269,510; 3,029,561

33. Answers vary.
   Samples: 3,902,615; 3,260,519; 3,150,269

34. Answers vary.
   Samples: 6,903,512; 6,935,012; 9,052,136

Lesson 1.2

1. 900,000

2. 20,000

3. 5,000

4. 0

5. 30

6. 8

2. ten thousands

3. 90,000

4. 90,000

5. ten thousands

6. hundreds

7. hundred thousands

8. 5,000

9. 500

10. 500,000

11. 8

12. ten thousands

13. hundred thousands

14. 60,000; ten thousands

15. 0; 0

16. 10,000

17. 700,000

18. 4,000

19. 204,891

20. 570,030

21. 306,010

Extra Practice 5A
Lesson 1.4
1. 4,000 2. 28,000
3. 725,000 4. 300,000
5. 15,000 6. 8,000
7. 12,000 8. 2,000
9. 56,000 10. 81,000
11. 900 12. 500
13. 900 14. 600
15. 2,832 rounds to 3,000.
   1,475 rounds to 1,000.
   3,000 / 1,000 = 4,000
   The estimated number of tourists was 4,000.
16. 4,342
   7 is about 4,200
   600.
The estimated number of visitors on Monday was 600.
17. $1,000
   $4,000
   His estimated total sales was $4,000.
18. $1,500
   $6,000
   His estimated total sales was $6,000.
19. 4
   $1,499
   $5,996
   His actual total sales was $5,996. Answers vary; Exercise 17 is easier to calculate; Exercise 18 gives an estimate that is closer to the actual total sales.

Lesson 1.3
1. 123,087 2. 625,897
3. 4,314,356 4. 32,049
5. 785,900 6. 5,468,015
7. 197,500 283,500 1,795,000 2,385,000 2,583,000
8. 895,390 8,476,900 8,593,800 8,746,800 8,764,500
9. 5,298,053 5,296,000 2,890,670 980,576 594,287
10. 3,900,100 3,003,500 2,900,800 390,300 303,500
11. a. 1,000
    b. 1,000
    c. 1,000; 479,270
    d. 479,270
12. a. 20,000
    b. 20,000
    c. 20,000; 4,440,000
    d. 4,440,000
13. 1,005,600; 1,205,600; count on by 200,000
14. 935,800; 920,800; count back by 15,000
15. 5,391,200; 5,441,200; count on by 50,000
16. 1,158,600; 1,058,500; count back by 100,100

Put on Your Thinking Cap!
Thinking skill: Identifying patterns and relationships
Strategy: Look for pattern
1. 200,000 2. 9,750
3. 1,800,000 4. 1,000
5. 27,000
6. Thinking skill: Comparing
   Strategy: Use guess and check
   Solution: Estimate the number. Then guess and check your answers.
   20 × 20 = 400, 30 × 30 = 900
   600 is between 400 and 900 so the two numbers are greater than 20 but less than 30.
   24 × 25 = 600
   The page numbers are 24 and 25.
7. Thinking skill: Comparing
   Strategy: Use guess and check
   Solution: 9,805,472
thinking skill: comparing
strategy: use guess and check
solution: 394,825 or 394,865

chapter 2

lesson 2.1
1. 6,541 2. 8,594
3. 6,471 4. 7,624
5. 2,538 6. 3,185
7. 13,176 8. 92,136
9. 13,176 10. 1,020,600
11. 75,792 12. 1,020,600
13. 908 14. 793
15. 56 16. 84
17. 436 18. 3286.5
19. answers vary.
samples: 679 × 11 × 91 = 679,679;
189 × 11 × 91 = 189,189. the answer will be the 3-digit number repeated.

lesson 2.2
1. 380 2. 7,460
3. 6,240 4. 8,570
5. 7,580 6. 6,800
7. 10 8. 190
9. 10 10. 10
11. 6,400 12. 80,800
13. 8; 448; 4,480
14. 4; 3,024; 30,240
15. 5; 3,400; 34,000
16. 857; 6; 5,142; 51,420
17. 1,520 18. 45,760
19. 14,700 20. 26,250
21. 4,700 22. 32,500
23. 16,800 24. 231,000
25. 192,000 26. 759,000
27. 100 28. 7,120
29. 1,000 30. 100
31. 7,910 32. 5,200
33. 6; 144; 14,400 34. 4; 432; 43,200

lesson 2.3
1. 3,680 2. 4,770
3. 2,254 4. 3,016
5. 2,331 6. 3,055
7. 3,698 8. 8,064
9. 30,520 10. 22,200
11. 13,365 12. 47,936
13. 49,452 14. 97,278
15. 93,834 16. 74,592

lesson 2.4
1. 720 2. 280
3. 2,300 4. 68,000
5. 232 6. 1,600
7. 10 8. 10
9. 3,980 10. 55,000
11. 10; 930; 310 12. 5; 950; 5; 190
13. 6; 12,600; 6; 2,100
14. 1,500 15. 6,200
16. 5,400 17. 3,820
18. 48 19. 357
20. 79 21. 350
22. 192 23. 275,000
24. 100 25. 1,000
26. 514,000 27. 680,000
28. 100; 135; 45 29. 5; 850; 5; 170
30. 100; 8,400; 2,100 31. 1,000; 924; 154
32. 9; 981; 9; 109 33. 1,000; 756; 108
34. 31 35. 152
36. 800; 40; 20 37. 7,000; 500; 14
38. 9,000; 300; 30 39. 4,000; 20; 200

extra practice 5a 159
Lesson 2.5

1. 4
2. 5 R 10
3. 3 R 1
4. 11 R 48
5. 8 R 14
6. 7 R 2
7. 21 R 15
8. 18 R 21

9. Estimated quotient = 80
   Actual quotient = 79
10. Estimated quotient = 60
    Actual quotient = 65
11. Estimated quotient = 100
    Actual quotient = 106
12. Estimated quotient = 80
    Actual quotient = 82
13. Estimated quotient = 100
    Actual quotient = 99
14. Estimated quotient = 40
    Actual quotient = 38
15. Estimated quotient = 30
    Actual quotient = 26
16. Estimated quotient = 20
    Actual quotient = 19

Lesson 2.6

1. 110
   Step 1 60 - 20 = 40
   Step 2 40 + 70 = 110
2. 280
   Step 1 200 ÷ 5 = 40
   Step 2 40 × 7 = 280
3. 82
   Step 1 135 ÷ 3 = 45
   Step 2 100 - 45 = 55
   Step 3 55 + 27 = 82
4. 200
   Step 1 108 ÷ 9 = 12
   Step 2 12 ÷ 10 = 120
   Step 3 80 ÷ 120 = 200
5. 411
   Step 1 42 × 10 = 420
   Step 2 72 ÷ 8 = 9
   Step 3 420 - 9 = 411
6. 18
   Step 1 38 - 18 = 20
   Step 2 90 × 20 = 1,800
   Step 3 1,800 ÷ 100 = 18

7. 0
   Step 1 80 ÷ 2 = 40
   Step 2 100 - 40 = 60
   Step 3 15 × 4 = 60
   Step 4 60 - 60 = 0

<table>
<thead>
<tr>
<th></th>
<th>Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>34 × 3 ÷ 6 = 17</td>
</tr>
<tr>
<td>9.</td>
<td>184 + 27 × 3 = 265</td>
</tr>
<tr>
<td>10.</td>
<td>100 - 68 + 37 × 4 = 180</td>
</tr>
<tr>
<td>11.</td>
<td>19 × 4 + 84 ÷ 6 = 90</td>
</tr>
<tr>
<td>12.</td>
<td>7 + 47 × 8 ÷ 4 - 28 = 73</td>
</tr>
<tr>
<td>13.</td>
<td>30 - (45 - 17) = 2</td>
</tr>
<tr>
<td>14.</td>
<td>7 × (14 + 26) ÷ 8 = 35</td>
</tr>
<tr>
<td>15.</td>
<td>(73 + 27) ÷ 136 ÷ 4 = 66</td>
</tr>
</tbody>
</table>

Lesson 2.7 (Part 1)

1. 1,456 ÷ 56 = 26
   26 × $18 = $468
   He collects $468.
2. 230 - 50 = 180
   180 ÷ 15 = 12
   12 × $20 = $240
   Each child collected $240.
3. 641 + 490 = 1,131
   1,131 × 8 = 9,048
   9,048 ÷ 58 = 156
   There are 156 origami art pieces in each classroom.
4. 487 + 345 = 832
   832 - 40 = 792
   792 ÷ 36 = 22
   There are 22 seashells in each box.
5. $4 + 3 × $7 = $25
   He paid $25.

Lesson 2.7 (Part 2)

1. Cost of tickets for 1 adult and 3 children
   = $7 + 3 × $3
   = $16

   Tickets × $6,000

   Adult  | Child  | Child  | Child  |
   Ticket  | $16

   $6,000 ÷ $16 = 375
   375 × 4 = 1,500

   1,500 people bought tickets.

160 Answers
2. **Handbag**

3 pairs of shoes

\[
\begin{align*}
9 \text{ units} & \rightarrow \text{ } 9 \times \frac{324}{9} = 324 \\
1 \text{ unit} & \rightarrow \text{ } \frac{324}{3} = 108 \\
3 \text{ units} & \rightarrow \text{ } 3 \times \frac{324}{3} = 324
\end{align*}
\]

The cost of the handbag is $108.

3. **Mr. Jacob**

55

Tony

\[(55 - 7) \div 3 = 16 \]

16 - 7 = 9

In 9 years, Mr. Jacob will be 4 times as old as Tony.

4. **3 video cameras**

5 digital cameras

\[
\begin{align*}
1 \text{ unit} & \rightarrow \text{ } \frac{3,213}{17} = 189 \\
5 \text{ units} & \rightarrow \text{ } 5 \times 189 = 945
\end{align*}
\]

He pays $945.

5. **Anne**

Ryan

Joel

1,925

\[7 \text{ units} \rightarrow 1,925 \]

1 unit \[\rightarrow 1,925 \div 7 = 275 \]

4 units \[\rightarrow 4 \times 275 = 1,100 \]

Joel collects 1,100 cans.

6. **David**

Joseph

\[
\begin{align*}
4 \text{ units} & \rightarrow 328 - 176 = 152 \\
1 \text{ unit} & \rightarrow 152 \div 4 = 38 \\
176 - 38 & = 138
\end{align*}
\]

David has 138 marbles.

7. **Fiction**

Non-fiction

Picture

\[
\begin{align*}
3 \text{ units} & \rightarrow 2,630 - 240 - 190 - 190 = 2,010 \\
1 \text{ unit} & \rightarrow 2,010 \div 3 = 670 \\
670 + 190 & = 860 \\
860 + 240 & = 1,100
\end{align*}
\]

There are 670 picture books, 860 non-fiction books, and 1,100 fiction books.

8. **Blue**

Yellow

\[
\begin{align*}
49 \text{ m} & \rightarrow \text{ } \frac{49}{17} = 3 \\
17 \text{ m} & \rightarrow \text{ } \frac{17}{5} = 3
\end{align*}
\]

Length of 3 yellow banners

\[= 49 - 17 - 17 = 15 \text{ m} \]

Length of 1 yellow banner \[= \frac{15}{3} = 5 \text{ m} \]

Length of 1 blue banner \[= \frac{17 - 5}{2} = 6 \text{ m} \]

The length of each blue banner is 6 meters.

9. **S: shirt, J: jacket**

\[
\begin{align*}
3 \text{ shirts} & \rightarrow \text{ } 3 \times \frac{220}{3} = 220 \\
9 \text{ jackets} & \rightarrow \text{ } 9 \times \frac{360}{9} = 360
\end{align*}
\]

Cost of 3 shirts and 9 jackets \[= 220 + 360 = 660 \]

Cost of 5 jackets \[= 660 - 360 = 300 \]

Cost of 1 jacket \[= \frac{300}{5} = 60 \]

Cost of 1 shirt \[= 220 - (60 \times 3) = 40 \]

The cost of each shirt is $40.

10. **Day**

<table>
<thead>
<tr>
<th>Amount More Than First Day (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

(1,260 - 420) \[\div 7 = 120 \]

The hamsters ate 120 grams of food on the first day.

11. **Ann**

Sister

\[
\begin{align*}
1 \text{ unit} & \rightarrow \frac{198}{1} = 198 \\
$198 +$20 = $218 \\
$218 \times 2 = $436 \\
Ann & had $296 at first.
\]
4. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaron</td>
<td>976</td>
</tr>
<tr>
<td>Benga</td>
<td>976</td>
</tr>
</tbody>
</table>

8 units → 976
1 unit → 976 ÷ 8 = 122
5 units → 5 × 122 = 610

Benga should give Aaron 610 cards.

5. Thinking skill: Comparing

Strategies: Use a model, Use before-after concept

Solution:

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goldfish</td>
<td>149</td>
</tr>
<tr>
<td>Angelfish</td>
<td>149</td>
</tr>
<tr>
<td>Guppies</td>
<td>114</td>
</tr>
</tbody>
</table>

3 units → 149 − 35 = 114
1 unit → 114 ÷ 3 = 38
7 units → 7 × 38 = 266

266 fish are left in the aquarium.

6. Thinking skill: Comparing

Strategy: Use guess and check

Solution: Common multiples of 5 and 7 are 35, 70, 105, ...

<table>
<thead>
<tr>
<th>No. of fruits</th>
<th>Cost of oranges</th>
<th>Cost of pears</th>
<th>Difference in amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>(35 ÷ 7) × $2</td>
<td>(35 ÷ 5) × $3</td>
<td>$11</td>
</tr>
<tr>
<td>70</td>
<td>(70 ÷ 7) × $2</td>
<td>(70 ÷ 5) × $3</td>
<td>$22</td>
</tr>
<tr>
<td>105</td>
<td>(105 ÷ 7) × $2</td>
<td>(105 ÷ 5) × $3</td>
<td>$33</td>
</tr>
</tbody>
</table>

a. $30 + $63 = $93

Sophia pays $93 in all.
b. 2 × 105 = 210

She buys 210 oranges and pears altogether.

7. Thinking skill: Comparing

Strategy: Use a model, Use before-after concept

Solution:

<table>
<thead>
<tr>
<th>Left</th>
<th>Eaten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jennifer</td>
<td>24</td>
</tr>
<tr>
<td>Mark</td>
<td>96</td>
</tr>
</tbody>
</table>

Put on Your Thinking Cap!

1. Strategy: Use guess and check

Solution:

<table>
<thead>
<tr>
<th>No. of correct answers</th>
<th>No. of incorrect answers</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>5</td>
<td>75 − 10 = 65</td>
</tr>
<tr>
<td>14</td>
<td>6</td>
<td>70 − 12 = 58</td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>65 − 14 = 51</td>
</tr>
</tbody>
</table>

She has 13 correct answers.

2. Strategy: Use guess and check

Solution: Estimate the number. Then guess and check your answer.

20 × 20 = 400
30 × 30 = 900

624 is in between 400 and 900. So the two numbers are greater than 20 but less than 30.

The last digit of the product 624 is

4 → 4 × 6 = 24.
24 × 26 = 624

The greater number is 26.

3. Thinking skill: Identifying patterns and relationships

Strategy: Look for pattern

Solution: 264; 385; 792; 759; 638; 836

There is a pattern in the answers. To find the answers without using a calculator, follow these steps:

**Step 1** Separate the digits of the first factor. For example, 69 × 11 → 6 9.

**Step 2** Add the digits of the first factor. For example, 6 + 9 = 15.

**Step 3** Put the ones digit of the sum from Step 2 between the digits in Step 1. For example, 659.

**Step 4** Add the tens digit of the sum from Step 2 to the hundreds digit of the number in Step 3. For example, 759.
Difference in number of crackers left
= 96 - 24
= 72

Difference in number of crackers eaten each day = 6
Number of days = 72 ÷ 6
= 12
12 × 12 + 96 = 240
Each of them had 240 crackers at first.

8. Thinking skill: Comparing
Strategies: Use a model, Use before-after concept
Solution:

<table>
<thead>
<tr>
<th></th>
<th>Left</th>
<th>Left</th>
<th>Left</th>
<th>Left</th>
<th>Spent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$12</td>
</tr>
<tr>
<td>Damien</td>
<td>$12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Difference in amount left = 3 × $12
= $36

Difference in spending in each day
= $6 - $4
= $2
Number of days = $36 ÷ $2
= 18
18 × $6 + $12 = $120
Each boy had $120 at first.

9. Thinking skill: Identifying patterns and relationships
Solution:
80 ÷ (5 + 1) = 13 R 2
80 - 13 = 67
The least number of highlighters is 67.

10. Thinking skill: Identifying patterns and relationships
Strategies: Work backward, Use guess and check
Solution:
a. Work backward to find the greatest factor of 54, 108 and 189.
54 = 2 × 27
108 = 4 × 27
189 = 7 × 27
The length of each piece of cut rope is 27 centimeters.
b. 2 + 4 + 7 = 13
Benita gets 13 pieces of cut rope.

11. Thinking skill: Analyzing parts and whole
Strategy: Use a diagram
Solution:

The total distance covered was 1,200 meters.

12. Thinking skill: Identifying patterns and relationships
Strategy: Use guess and check
Solution:
Greatest: 542 × 63 = 34,146
Least: 356 × 24 = 8,544
Lesson 3.4
1. 0.9  2. 0.8
3. 0.15  4. 0.36
5. 2.3  6. 2.5
7. 2.75  8. 3.6
9. 0.68  10. 3.75
11. 2.6  12. 3.875
13. 4.35  14. 5.75
15. $15 \div 6 = $2.50
She pays $2.50 for each notebook.

Lesson 3.5
1. 5  7 _ 8   2. 4  5 _ 12
3. 5  13 _ 24   4. 3  11 _ 36
5. 7  19 _ 24   6. 6  11 _ 30
7. 3  1 _ 2   8. 10  1 _ 2
9. 3  1 _ 2   10. 7
11. 6  1 _ 2   12. 19

Lesson 3.6
1. 2   5 _ 9   2. 1   1 _ 4
3. 2   7 _ 20   4. 4   5 _ 24
5.   13 _ 21   6. 1   7 _ 18
7. 2 8. 4   1 _ 2
9.   1 _ 2   10. 2
11. 2 12. 1   1 _ 2

Lesson 3.7
1. a. $28 \div 8 = 3\frac{1}{2}$
   It takes $3\frac{1}{2}$ minutes to play 1 song.
   b. $3\frac{1}{2} = 3.5$
   It takes 3.5 minutes to play 1 song.
2. \[ \frac{1}{4} + \frac{1}{6} = \frac{5}{12} \]
\[ 1 - \frac{5}{12} = \frac{7}{12} \]
\[ \frac{7}{12} \text{ of the participants have black hair.} \]

3. \[ 3 \frac{7}{10} + 2 \frac{3}{4} = 6 \frac{9}{20} \]
\[ 6 \frac{9}{20} - 4 \frac{3}{5} = 1 \frac{17}{20} = 1.85 \]
1.85 pounds of flour are left.

4. \[ 2 \frac{3}{4} - \frac{5}{8} = 2 \frac{1}{8} \]
\[ 2 \frac{3}{4} + 2 \frac{1}{8} = 4 \frac{7}{8} = 4.875 \]
She uses 4.875 meters of cloth in all.

5. \[ 7 \times \frac{1}{6} = \frac{7}{6} \]
\[ 1 - \frac{7}{6} = \frac{13}{18} \]
\[ \frac{13}{18} \text{ liter of apple juice is left after a week.} \]

6. \[ \frac{1}{8} + \frac{1}{6} + \frac{1}{6} = \frac{5}{8} \]
\[ 1 - \frac{5}{8} = \frac{3}{8} \]
\[ \frac{3}{8} \text{ of the loaf of bread is left.} \]

7. \[ \frac{2}{9} + \frac{1}{6} + \frac{2}{6} = \frac{13}{18} \]
\[ 1 - \frac{13}{18} = \frac{5}{18} \]
\[ \frac{5}{18} \text{ of the book is not read.} \]

8. a. \[ 1 \frac{2}{3} + \frac{7}{8} = 2 \frac{13}{24} \]
Jamal spent \( \frac{13}{24} \) hours watching television and helping with housework.

b. \[ 1 \frac{4}{5} - \frac{7}{8} = \frac{37}{40} \]
Jamal spent \( \frac{37}{40} \) hour more on the nap.

9. \[ 2 \frac{3}{5} + \frac{3}{4} = 3 \frac{7}{20} \]
\[ 3 \frac{7}{20} + 2 \frac{3}{5} = 5 \frac{19}{20} \]
They buy \( 5 \frac{19}{20} \) pounds of meat altogether.

10. \[ \frac{7}{10} - \frac{1}{4} = \frac{9}{20} \]
\[ \frac{7}{10} + \frac{9}{20} = \frac{3}{20} \]
The total weight of the two boxes is \( \frac{3}{20} \) pounds.

11. \[ 4 \frac{3}{5} - \frac{3}{4} = 3 \frac{17}{20} \]
\[ 4 \frac{3}{5} + 4 \frac{3}{5} + 3 \frac{17}{20} + 3 \frac{17}{20} = 16 \frac{9}{10} \]
The perimeter of the storeroom is \( 16 \frac{9}{10} \) meters.

12. \[ 4 \frac{1}{5} + 3 \frac{2}{5} = 7 \frac{3}{5} \]
\[ 7 \frac{3}{5} - 2 \frac{1}{2} = 5 \frac{1}{10} \]
There were \( 5 \frac{1}{10} \) liters of water in the tank at first.

Put on Your Thinking Cap!

1. Thinking skill: Comparing
Solution:
Length of each piece of rope P
\[ = 2 \div 3 = \frac{2}{3} \text{ m} \]
Length of each piece of rope Q
\[ = \frac{2}{3} + \frac{2}{5} \]
\[ = \frac{11}{15} \text{ m} \]
Length of rope Q
\[ = \frac{11}{15} + \frac{1}{15} + \frac{1}{15} \]
\[ = \frac{3}{5} \]
The length of rope Q is \( 3 \frac{1}{5} \) meters.

2. Thinking skill: Comparing
Strategy: Use a model
Solution:
Vivian has 12 units of money and Lionel has 3 units.
\[ 12 \div 3 = 4 \]
Vivian’s amount of money is 4 times Lionel’s amount of money.
3. Thinking skill: Comparing
Strategy: Use a model
Solution:
Andrew

Malik

Andrew’s savings is $\frac{5}{8}$ of Malik’s savings.

4. Thinking skill: Identifying patterns and relationships
Strategy: Look for pattern
Solution:
\[
\frac{1}{100} + \frac{2}{100} + \frac{49}{100} + \frac{50}{100} + \frac{51}{100} + \ldots + \frac{98}{100} + \frac{99}{100}
\]
The sum of each pair of fractions is 1.
Number of such pairs of fractions
\[= \frac{98}{2} = 49\]
Value
\[= 49 + \frac{50}{100} = 49\frac{1}{2}\]

5. Thinking skill: Identifying patterns and relationships
Strategy: Look for pattern
Solution:
Look for pairs of numbers that give a sum of 11.
\[
1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 5 \times 11 = 55
\]
Value
\[= \frac{1}{99} \times 55 = \frac{5}{9}\]

6. Thinking skill: Identifying patterns and relationships
Strategy: Look for pattern
Solution:
\[
\frac{1}{1 \times 2} + \frac{1}{2 \times 3} = \frac{2}{3}
\]
\[
\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{3}{3 \times 4} = \frac{3}{4}
\]
\[
\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{3}{3 \times 4} + \frac{1}{4 \times 5} = \frac{4}{5}
\]
\[
\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{3}{3 \times 4} + \ldots + \frac{28}{28 \times 29} + \frac{1}{29 \times 30} = \frac{29}{30}
\]

7. Thinking skill: Comparing
Strategy: Use a model
Solution:
\[
\frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10} = \frac{1}{2}
\]
\[
\frac{5}{10} = \frac{5 \times 1}{10 \times 1} = \frac{5}{10}
\]

8. Thinking skill: Comparing
Strategy: Use a model
Solution:
\[
\frac{3}{12} = \frac{1}{4}
\]
Sean gets $\frac{1}{4}$ of the marbles.

Chapter 4

Lesson 4.1
1. $\frac{1}{2}, \frac{3}{5}, \frac{3}{10}$
2. $\frac{3}{8}, \frac{5}{7}, \frac{15}{28}$
3. $\frac{15}{22}$
4. $\frac{7}{18}$
5. $\frac{5}{8}$
6. $\frac{4}{5}$
7. $\frac{1}{5}$
8. $\frac{1}{2}$

Lesson 4.2
1. $\frac{2}{7} \times \frac{3}{4} = \frac{3}{14}$
2. $\frac{3}{14} \times 56 = 12$
Rahul gets 12 paper clips.
3. $\frac{1}{3} \times \frac{9}{10} = \frac{3}{10}$
\[
\frac{3}{10} \text{ hour is left.}
\]
3. **Method 1**

\[
\frac{3}{6} = \frac{1}{2}
\]

\(\frac{1}{2}\) of his savings are left.

**Method 2**

\[
1 - \frac{1}{6} = \frac{5}{6}
\]

\[
2 \times \frac{5}{6} = \frac{1}{3}
\]

\[
1 - \frac{1}{6} - \frac{1}{3} = \frac{1}{2}
\]

\(\frac{1}{2}\) of his savings are left.

4. Fraction of caps that are not red or blue

\[
= 1 - \frac{1}{6} - \frac{1}{3}
\]

\[
= \frac{1}{2}
\]

Fraction of caps that are green

\[
= \frac{3}{7} \times \frac{1}{2}
\]

\[
= \frac{3}{14}
\]

3 units \(\rightarrow 27\)

1 unit \(\rightarrow 27 \div 3 = 9\)

14 units \(\rightarrow 14 \times 9 = 126\)

There are 126 caps altogether.

5. \(1 - \frac{1}{5} = \frac{4}{5}\)

\[
\frac{7}{10} \times \frac{4}{5} = \frac{7}{10}
\]

\[
\frac{7}{10} \times 30 = 21
\]

She receives 21 text messages.

6. \(1 - \frac{2}{5} = \frac{3}{5}\)

\[
\frac{4}{9} \times \frac{3}{5} = \frac{4}{15}
\]

\[
\frac{3}{5} - \frac{4}{15} = \frac{5}{15} = \frac{1}{3}
\]

1 unit \(\rightarrow 15\)

3 units \(\rightarrow 3 \times 15 = 45\)

Sam makes 45 bread rolls.

7. **Method 1**

\[6 \times 24 = 144\]

Anne has 144 cards.

**Method 2**

9. \(\frac{1}{5} = \frac{2}{10}\)

\(\frac{1}{2} = \frac{5}{10}\)

\[
1 - \frac{1}{5} - \frac{1}{2} = \frac{3}{10}
\]

Marcos has 99 more beads than Roxanne.

8. **Method 1**

\(\frac{4}{5} \times 165 = 132\)

\(132 \div 2 = 66\)

\(165 - 66 = 99\)

Marcos has 99 more beads than Roxanne.

**Method 2**

9. \(\frac{1}{5} = \frac{2}{10}\)

\(\frac{1}{2} = \frac{5}{10}\)

\[
1 - \frac{1}{5} - \frac{1}{2} = \frac{3}{10}
\]

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\]

\[
\frac{7}{10} \times 30 = 21
\]

She receives 21 text messages.

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\[
\frac{4}{9} \times \frac{3}{5} = \frac{4}{15}
\]

\[
\frac{3}{5} - \frac{4}{15} = \frac{5}{15} = \frac{1}{3}
\]

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\[
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\]

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\(\frac{3}{7} \times \frac{1}{2}\)

\[
= \frac{3}{14}
\]

3 units \(\rightarrow 27\)

1 unit \(\rightarrow 27 \div 3 = 9\)

14 units \(\rightarrow 14 \times 9 = 126\)

There are 126 caps altogether.

5. \(1 - \frac{1}{5} = \frac{4}{5}\)

\[
\frac{7}{10} \times \frac{4}{5} = \frac{7}{10}
\]

\[
\frac{7}{10} \times 30 = 21
\]

She receives 21 text messages.

6. \(1 - \frac{2}{5} = \frac{3}{5}\)

\[
\frac{4}{9} \times \frac{3}{5} = \frac{4}{15}
\]

\[
\frac{3}{5} - \frac{4}{15} = \frac{5}{15} = \frac{1}{3}
\]

1 unit \(\rightarrow 15\)

3 units \(\rightarrow 3 \times 15 = 45\)

Sam makes 45 bread rolls.

7. **Method 1**

\[6 \times 24 = 144\]

Anne has 144 cards.

**Method 2**

8. **Method 1**

\(\frac{4}{5} \times 165 = 132\)

\(132 \div 2 = 66\)

\(165 - 66 = 99\)

Marcos has 99 more beads than Roxanne.

**Method 2**

9. \(\frac{1}{5} = \frac{2}{10}\)

\(\frac{1}{2} = \frac{5}{10}\)

\[
1 - \frac{1}{5} - \frac{1}{2} = \frac{3}{10}
\]

Marcos has 99 more beads than Roxanne.

9. **Method 1**

\(\frac{3}{7} \times \frac{1}{2}\)

\[
= \frac{3}{14}
\]

3 units \(\rightarrow 27\)

1 unit \(\rightarrow 27 \div 3 = 9\)

14 units \(\rightarrow 14 \times 9 = 126\)

There are 126 caps altogether.

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\[
\frac{7}{10} \times \frac{4}{5} = \frac{7}{10}
\]

\[
\frac{7}{10} \times 30 = 21
\]

She receives 21 text messages.

6. \(1 - \frac{2}{5} = \frac{3}{5}\)

\[
\frac{4}{9} \times \frac{3}{5} = \frac{4}{15}
\]

\[
\frac{3}{5} - \frac{4}{15} = \frac{5}{15} = \frac{1}{3}
\]

1 unit \(\rightarrow 15\)

3 units \(\rightarrow 3 \times 15 = 45\)

Sam makes 45 bread rolls.

7. **Method 1**

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Anne has 144 cards.

**Method 2**

8. **Method 1**

\(\frac{4}{5} \times 165 = 132\)

\(132 \div 2 = 66\)

\(165 - 66 = 99\)

Marcos has 99 more beads than Roxanne.

**Method 2**

9. \(\frac{1}{5} = \frac{2}{10}\)

\(\frac{1}{2} = \frac{5}{10}\)

\[
1 - \frac{1}{5} - \frac{1}{2} = \frac{3}{10}
\]

Marcos has 99 more beads than Roxanne.

9. **Method 1**

\(\frac{3}{7} \times \frac{1}{2}\)

\[
= \frac{3}{14}
\]

3 units \(\rightarrow 27\)

1 unit \(\rightarrow 27 \div 3 = 9\)

14 units \(\rightarrow 14 \times 9 = 126\)

There are 126 caps altogether.

5. \(1 - \frac{1}{5} = \frac{4}{5}\)

\[
\frac{7}{10} \times \frac{4}{5} = \frac{7}{10}
\]

\[
\frac{7}{10} \times 30 = 21
\]

She receives 21 text messages.

6. \(1 - \frac{2}{5} = \frac{3}{5}\)

\[
\frac{4}{9} \times \frac{3}{5} = \frac{4}{15}
\]

\[
\frac{3}{5} - \frac{4}{15} = \frac{5}{15} = \frac{1}{3}
\]

1 unit \(\rightarrow 15\)

3 units \(\rightarrow 3 \times 15 = 45\)

Sam makes 45 bread rolls.
11.  

<table>
<thead>
<tr>
<th>Sister</th>
<th>Brother</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>7 units → 98</td>
</tr>
<tr>
<td>1 unit → 98 ÷ 7 = 14</td>
<td></td>
</tr>
<tr>
<td>5 units → 5 × 14 = 70 (gave away)</td>
<td></td>
</tr>
</tbody>
</table>

Melody must buy 168 more stickers.

12. 1 - \(\frac{3}{7}\) = \(\frac{4}{7}\)

Fraction of biscuits in container B

\(= \frac{5}{8} \times \frac{4}{7}\)

\(= \frac{5}{14}\)

Fraction of biscuits in container C

\(= 1 - \frac{3}{7} - \frac{5}{14}\)

\(= \frac{3}{14}\)

Container A has 3 more units than container C.

3 units → 21

1 unit → 21 ÷ 3 = 7

14 units → 14 × 7 = 98

Jacky bakes 98 biscuits.

**Lesson 4.3**

1. \(\frac{1}{8}\)
2. \(\frac{1}{5}\)
3. \(\frac{1}{3}\)
4. \(\frac{1}{14}\)
5. \(\frac{2}{14}\)
6. \(\frac{9}{10}\)
7. 6
8. \(\frac{3}{16}\)
9. \(\frac{5}{5}\)
10. \(\frac{2}{3}\)
11. \(\frac{2}{9}\)

**Lesson 4.4**

1. \(\frac{3}{5}\)
2. 22
3. \(\frac{8}{3}\)
4. 39

5. 105
6. \(20\frac{2}{3}\)
7. \(62\frac{1}{3}\)
8. \(38\frac{6}{7}\)
9. \(30\frac{2}{3}\)
10. \(33\frac{3}{4}\)
11. \(46\frac{1}{5}\)
12. \(25\frac{1}{2}\)

**Lesson 4.5**

1. \(\frac{4}{5} \times 7 = 12\frac{3}{5}\)

12 \(\frac{3}{5}\) liters are about 13 liters.

\(13 ÷ 2 = 6\frac{1}{2}\)

Mrs. Smith needs to buy 7 bottles every week.

2. \(\frac{3}{4} \times 9 = 15\frac{3}{4}\)

15 \(\frac{3}{4}\) meters are about 16 meters.

Lily needs 16 meters of ribbon.

3. 

\[\text{Puppy B} \quad \text{Puppy A} \quad \text{Puppy C}\]

4 units → 8 lb

1 unit → 2 lb

6 units → 12 lb

The weight of puppy C is 12 pounds.

4. Area of flowerbed = \(3\frac{3}{4} \times 2\)

\(= 7\frac{1}{2}\) m²

Area of flowerbed with border

\(= (3\frac{3}{4} + \frac{1}{2} + \frac{1}{2}) \times (2 + \frac{1}{2} + \frac{1}{2})\)

\(= 4\frac{3}{4} \times 3\)

\(= 14\frac{1}{4}\) m²

Area of border = \(14\frac{1}{4} - 7\frac{1}{2}\)

\(= 6\frac{3}{4}\) m²

Cost = \(6\frac{3}{4} \times $20\)

\(= $135\)

Uncle James has to pay $135.
Lesson 4.6

1. \( \frac{1}{6} + \frac{1}{6} = \frac{1}{3} \)

2. \( \frac{1}{12} \)

3. \( \frac{1}{9} \)

4. \( \frac{2}{15} \)

5. \( \frac{1}{24} \)

6. \( \frac{3}{10} \)

7. \( \frac{1}{18} \)

8. \( \frac{5}{12} \div 5 = \frac{1}{12} \)

   There is \( \frac{1}{12} \) liter of paint in each pot.

9. \( \frac{1}{2} + 5 = \frac{1}{10} \)

   Each girl has \( \frac{1}{10} \) of the loaf of bread.

10. \( \frac{9}{10} + 6 = \frac{3}{20} \)

    \[ \frac{3}{20} + \frac{3}{20} = \frac{3}{10} \]

    The total length of 2 of the pieces is \( \frac{3}{10} \) meter.

11. \( 1 - \frac{1}{5} = \frac{4}{5} \)

    \[ \frac{4}{5} \div 3 = \frac{4}{15} \]

    Each friend got \( \frac{4}{15} \) of the bag of nuts.

Lesson 4.7

1. \( \frac{2}{3} \)

   Farida had 18 beads.

   Maria had 250 beads.

Method 1

   8 units \( 250 - 18 = 232 \)

   1 unit \( 232 \div 8 = 29 \)

   \( 3 \times 29 + 18 = 105 \)

   Maria had 105 beads at first.

Method 2

   \( 250 - 18 = 232 \)

   \( \frac{3}{8} \times 232 = 87 \)

   \( 87 + 18 = 105 \)

   Maria had 105 beads at first.

2. 

   Paul

   Shown

   Tim

   \[ \begin{array}{c}
   10 \text{ units} \rightarrow 280 \\
   1 \text{ unit} \rightarrow 280 \div 10 = 28 \\
   3 \text{ units} \rightarrow 3 \times 28 = 84 \\
   \end{array} \]

   Tim has 84 more postcards than Paul.

3. \( 1 - \frac{5}{9} = \frac{4}{9} \)

   Number of boys who do not take part in sports activities

   \[ \frac{4}{9} \times 540 \]

   \[ = 240 \]

   Number of boys in school

   \[ \frac{3}{5} \times 1,800 \]

   \[ = 1,080 \]

   Number of boys who take part in sports activities

   \[ 1,080 - 240 = 840 \]

   840 boys take part in sports activities.

4. 

   Daniel

   William

   \[ \begin{array}{c}
   5 \text{ units} \rightarrow 195 \\
   \end{array} \]

   \[ \begin{array}{c}
   10 \text{ units} \rightarrow 195 \times 2 = 390 \\
   \end{array} \]

   Daniel has 390 marbles.

5. 

   Shally

   Katherine

   \[ \begin{array}{c}
   4 \text{ units} \rightarrow \$288 + \$68 = \$356 \\
   1 \text{ unit} \rightarrow \$356 \div 4 = \$89 \\
   \$89 - \$68 = \$21 \\
   \end{array} \]

   Shally had \$21 at first.

6. 

   Class C

   Class A

   Class B

   \[ \begin{array}{c}
   1 \text{ unit} \rightarrow 160 - 92 = 68 \\
   2 \text{ units} \rightarrow 2 \times 68 = 136 \\
   136 + 160 = 296 \\
   \end{array} \]

   Class B folds 296 paper cranes.
7. Mrs. Spencer:

<table>
<thead>
<tr>
<th>Units</th>
<th>Amount</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>$534</td>
<td>/H11004</td>
</tr>
<tr>
<td>1</td>
<td>$534</td>
<td>/H11005</td>
</tr>
<tr>
<td>8</td>
<td>$178</td>
<td>/H11003</td>
</tr>
<tr>
<td>4</td>
<td>$178</td>
<td>/H11005</td>
</tr>
</tbody>
</table>

Mrs. Spencer's paycheck is $1,424.

8. 5 kg of flour $12
4 kg of sugar $12

9. Number of girls = \( \frac{3}{8} \times 40 \)
   = 15

Number of boys = 40 - 15 = 25

(15 \times 2) + (25 \times 1) = 55
55 units → 220
1 unit → 220 ÷ 55 = 4
(15 \times 2) - 25 = 5
5 units → 5 \times 4 = 20

All the girls receive 20 more balloons than all the boys.

10. Number of nickels = 1,200 ÷ 5 = 240

<table>
<thead>
<tr>
<th>Units</th>
<th>Amount</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>240 ÷ 4 = 60</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7 \times 60 = 420</td>
<td></td>
</tr>
</tbody>
</table>

There are 420 coins in the piggy bank.

11. Mr. Donovan:

<table>
<thead>
<tr>
<th>Units</th>
<th>Amount</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>$1,335</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$1,335 ÷ 5 = $267</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2 \times $267 = $534</td>
<td></td>
</tr>
</tbody>
</table>

Mrs. Spencer:

<table>
<thead>
<tr>
<th>Units</th>
<th>Amount</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>$534</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$534 ÷ 3 = $178</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8 \times $178 = $1,424</td>
<td></td>
</tr>
</tbody>
</table>

Mrs. Spencer's paycheck is $1,424.

12. 5 kg of flour $12
4 kg of sugar $12

40 units → $12
5 units → $12 ÷ 8 = $1.50

The cost of 1 kilogram of sugar was $1.50.

Put on Your Thinking Cap!

1. Thinking skill: Comparing
   Strategy: Use a model
   Solution:

<table>
<thead>
<tr>
<th>Savings</th>
<th>Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerator</td>
<td>$280</td>
</tr>
<tr>
<td>Oven</td>
<td>$1,960</td>
</tr>
</tbody>
</table>

1 unit → $280
7 units → 7 \times $280 = $1,960
5 units → $1,960 ÷ 5 = $392
8 units → 8 \times $392 = $3,136

Mrs. Tan's savings was $3,136 at first.

2. Thinking skill: Comparing
   Strategy: Use a model
   Solution:

<table>
<thead>
<tr>
<th>Reena</th>
<th>Pauline</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>35</td>
</tr>
</tbody>
</table>

1 unit → 28 + 35 = 63
3 units → 3 \times 63 = 189
189 - 35 = 154

Reena has 154 bookmarks.

3. Thinking skill: Comparing
   Strategies: Use a model, Use before-after concept
   Solution:

<table>
<thead>
<tr>
<th>Kerrie (before spending)</th>
<th>$3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane (after spending)</td>
<td>$203</td>
</tr>
</tbody>
</table>

\[ \frac{3}{4} = \frac{9}{12} \cdot \frac{1}{6} = \frac{2}{12} \]
1. Kerrie had $348.

4. Strategy: Use a model, Use before-after concept
Solution:
Before:
Number of girls = \( \frac{3}{5} \times 120 = 72 \)
Number of boys = \( 120 - 72 = 48 \)
After:
Boys
3 units → 48
1 unit → 48 ÷ 3 = 16
4 units → 4 × 16 = 64
72 - 64 = 8
8 girls left the library.

5. Thinking skill: Comparing
Strategy: Use before-after concept
Solution:
Before:
Adults → 3 units
Children → 5 units
= 2 units
After:
Adults → 2 units × 2 = 4 units
Children → 3 units × 2 = 6 units
= 2 units
4 units − 3 units = 1 unit
1 unit → 6
8 units → 8 × 6 = 48
48 people were on the bus at first.

6. Strategies: Use a model, Use before-after concept
Solution:
Before:

| 3 | 3 | 3 | 3 |

After:

| 3 | 6 | 48 |

3 units → 48
1 unit → 48 ÷ 3 = 16
5 units → 5 × 16 = 80
There were 80 counters in the box at first.

7. Thinking skill: Comparing
Strategy: Use a model, Use before-after concept
Solution:
Before:

<table>
<thead>
<tr>
<th>Apples</th>
<th>Oranges</th>
</tr>
</thead>
</table>

After:

<table>
<thead>
<tr>
<th>Apples</th>
<th>Oranges</th>
</tr>
</thead>
</table>

15 units → 120
1 unit → 120 ÷ 15 = 8
26 units → 26 × 8 = 208
There were 208 apples and oranges at the stand at first.

8. Thinking skill: Comparing
Strategy: Use before-after concept
Solution:
After:

<table>
<thead>
<tr>
<th>In puzzle</th>
<th>Not in puzzle</th>
</tr>
</thead>
</table>

Total = 20 units
Before:

<table>
<thead>
<tr>
<th>In puzzle</th>
<th>Not in puzzle</th>
</tr>
</thead>
</table>

Total = 20 units
12 units − 7 units = 5 units
5 units → 300
1 unit → 300 ÷ 5 = 60
20 units → 20 × 60 = 1,200
The jigsaw puzzle consists of 1,200 pieces.

9. Thinking skill: Analyzing parts and whole
Strategy: Work backward
Solution:
720 ÷ 2 = 360
Each had 360 stamps in the end.

<table>
<thead>
<tr>
<th>Samuel</th>
<th>Pat</th>
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<tbody>
<tr>
<td>Finally</td>
<td>360</td>
</tr>
<tr>
<td>Pat to Samuel</td>
<td>360 − 180 = 180</td>
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<td>(( \frac{1}{2} ) left)</td>
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<td>Samuel to Pat</td>
<td>180 ÷ 3 = 60</td>
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<td>180 ÷ 60 = 240</td>
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Samuel had 240 stamps at first.
10. Thinking skill: Analyzing parts and whole
Strategy: Work backward
Solution:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Work</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<tr>
<td>Finally</td>
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<td>18 gal</td>
<td>18 gal</td>
<td>18 gal</td>
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<tr>
<td>C to A</td>
<td>Pal C: 18 - 3 x 4 = 24</td>
<td>12 gal</td>
<td>18 gal</td>
<td>24 gal</td>
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<tr>
<td></td>
<td>Pal A: 18 - 6 = 12</td>
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<tr>
<td>B to C</td>
<td>Pal B: 18 - 3 x 4 = 24</td>
<td>12 gal</td>
<td>24 gal</td>
<td>18 gal</td>
</tr>
<tr>
<td></td>
<td>Pal C: 24 - 6 = 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A to B</td>
<td>Pal A: 12 - 3 x 4 = 16</td>
<td>16 gal</td>
<td>18 gal</td>
<td>20 gal</td>
</tr>
<tr>
<td></td>
<td>Pal B: 24 - 4 = 20</td>
<td></td>
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</tbody>
</table>

Pail A had 16 gallons of water,
pail B had 20 gallons of water and
pail C had 18 gallons of water at first.

Test Prep for Chapters 1 to 4
11. 2,467,058  12. 710,000
13. 203,485
14. 3,190,500  3,090,500  2,090,500
    319,500  290,500
15. 16  16. 424
17. 4\frac{7}{12}  18. 144
19. 5.925  20. 21\frac{40}{40}
21. Mrs. Jones
    Mr. Graham
    $2,055
    3 units $2,055
    1 unit $2,055 ÷ 3 = $685
    4 units $4 × $685 = $2,740
    Mr. Graham had $2,740.
22. Colin: Eaten
    Rosie: Eaten
    Difference in quantity left = 4 x 9 = 36

Chapter 5

Lesson 5.1
1. w + 8  2. a - 10
3. p + 3\frac{3}{4}  4. 5 - 6y
5. 6g  6. \frac{3k}{2}
7. 4h  8. 5s - 12
9. 7b + 8  10. \frac{5d}{4}
11. 7  12. 13
13. 31  14. 60
15. 14  16. 37
17. 7  18. 5
19. 10  20. 9
21. Mrs. Smith pays 5x dollars.
22. Alyssa has (6p - 15) dollars more than her brother.
23. 2 x 7 = 14
    (5m - 14) liter of milk is left.
24. Each of them has \frac{(3y + 8)}{2} comics.
25. \( k \) bottles of pasta sauce cost
\( k \times \$4 = \$4k. \)
He received \( \$(10 - 4k) \) change.

26. The cost of 3 such books is \( \frac{3y}{8} \) dollars.

27. John has \((y - 20)\) stickers for his sisters.
Each sister gets \( \left(\frac{y - 20}{2}\right) \) stickers.

28. Kenny has \((m + 10)\) fish.
He buys another \((20 + 30)\) = 50 fish.
Kenny has \((m + 60)\) fish now.

29. The shorter piece is \( \left(\frac{g - 10}{2}\right) \) inches long.

Lesson 5.2
1. 3\( g \)
2. 10\( w \)
3. 5\( a \)
4. 8\( b \)
5. 7\( h \)
6. 6\( k \)
7. 11\( d \)
8. 15\( n \)
9. 12\( x - 4 \)
10. 6 + 10\( g \)
11. 4\( n + 5 \)
12. 6\( d - 5 \)
13. 12 + 3\( k \)
14. 7\( w + 3 \)
15. 4 + 13\( h \)
16. 5 + 3\( m \)
17. 5 + 3\( s \)
18. 4\( n + 13 \)

Lesson 5.3
1. < 2. = 3. > 4. >
5. > 6. < 7. > 8. =
9. 7 10. 4 11. 6 12. 7
13. 8 14. 9

Lesson 5.4
1. a. Joan’s brother is \((4y - 28)\) years old.
b. \(4 \times 12 - 28 = 20\)
Her brother is 20 years old.
2. a. The cost of renting the car is \(\$(120 + 18n)\).
b. \(\$(120 + 18 \times 8) = \$264\)
The cost of renting the car is \$264.
3. a. \$5 = 500 cents
He spends \(7g\) cents in one week.
\(\text{He has } (500 - 7g) \text{ cents left.}\)
b. \(7g\) cents = \(\frac{7g}{100}\) dollars
\(\text{He has } (5 - \frac{7g}{100}) \text{ dollars left.}\)

4. a. \(10w - 2w = 8w\)
\(8w \div 2 = 4w\)
Cindy’s age is 4\( w \) years.
b. If \(w = 4\),
\(4w = 4 \times 4 = 16\)
Cindy is 16 years old.

5. a. Patrick paid \(3p\) dollars.
b. \(3p = 36\)
\(p = 12\)
When \(p = 12\), Patrick and Amanda pay the same amount of money for the model planes.

6. a. \(4k + 6 = 4 \times 5 + 6 = 26\)
\(6k - 2 = 6 \times 5 - 2 = 28\)
\(26 < 28\)
Nancy has a shorter ribbon.
b. \(6k - 2 = 4k + 6\)
\(2k = 8\)
\(k = 4\)
When \(k = 4\), they will have the same length of ribbon.

7. \(50b - 28b = 22b\)
\(22b > 22b\)
No, he does not save more than he spends.

8. Benny has \(3p\) game cards.
Together Anne and Benny have \((p + 3p) = 4p\) game cards.
If \(4p > 30\), then \(p\) must be 8, 9, 10, ....
The least value of \(p\) is 8 so that Anne and Benny together have more game cards than Colin.

Put on Your Thinking Cap!
1. Thinking skill: Analyzing parts and whole
Strategy: Solve part of the problem
Solution:
\(5 \times p = 5p\)
\(200g \times 5 = 1,000g = 1kg\)
The total mass of the crackers in 5 boxes is \((5p - 1)\) kilograms.

2. Thinking skill: Analyzing parts and whole
Strategy: Solve part of the problem
Solution:
a. Mr. Johnson will pay \(\$(2x + 30)\).
b. \(2 \times 200 + 30 = 430\)
He will have to pay \$430.
3. Thinking skill: Analyzing parts and whole
   Strategy: Solve part of the problem
   Solution:
   a. The remaining stickers are shared
      by 3 people.
      She gives each brother \( \frac{80 - 5m}{3} \) stickers.
   b. If \( m = 4 \),
      \( \frac{80 - 5 \times 4}{3} = 20 \)
      Each brother gets 20 stickers.
4. Thinking skill: Analyzing parts and whole
   Strategy: Solve part of the problem
   Solution:
   a. Jerry’s allowance = 3k dollars
      Danny’s allowance = \((3k + 20)\) dollars
      \( k + 3k + 3k + 20 = 7k + 20 \)
      Their total monthly allowance is
      \((7k + 20)\) dollars.
   b. \( 7 \times $18 + $20 = $146 \)
      Their total monthly allowance is $146.

**Chapter 6**

**Lesson 6.1**

1. \( AD \)
2. \( BE \)
3. \( CF \)
4. \( QR \)
5. \( PR \)
6. \( PQ \)
7. 
   ![Diagram](image)
8. 
9. 
   ![Diagram](image)
10. 
11. Base = \( KL \), Height = \( LM \) or
    Base = \( LM \), Height = \( KL \)
12. Base = \( KL \), Height = \( VM \) or
    Base = \( LM \), Height = \( UK \)

**Lesson 6.2**

1. 324 in.\(^2\)
2. 1,350 cm\(^2\)
3. \( 346 \frac{1}{2} \) ft\(^2\)
4. 962 \( \frac{1}{2} \) m\(^2\)
5. 891 cm\(^2\)
6. 900 in.\(^2\)
7. 1,058 cm\(^2\)
8. 1,944 ft\(^2\)

**174 Answers**

**Put on Your Thinking Cap!**

1. Thinking skill: Spatial visualization
   Strategy: Simplify the problem
   Solution:
   Area of \( ABC \) = \( \frac{1}{2} \times 72 \times 96 \)
   = 3,456 in.\(^2\)
   Area of \( ADC \) = \( \frac{1}{2} \times 72 \times 48 \)
   = 1,728 in.\(^2\)
   Shaded area = 3,456 - 1,728
   = 1,728 in.\(^2\)

2. Thinking skill: Spatial visualization
   Strategy: Simplify the problem
   Solution:
   Area of \( ABCD \) = 60 \times 60
   = 3,600 cm\(^2\)
   Area of \( ABC \) = \( \frac{1}{2} \times 60 \times 18 \)
   = 540 cm\(^2\)
   Shaded area = 3,600 - 2 \times 540
   = 2,520 cm\(^2\)

3. Thinking skill: Spatial visualization
   Strategy: Simplify the problem
   Solution:
   ![Method 1 Diagram](image)
   Base of 1 triangle = 60 \div 5
   = 12 cm
   Height of 1 triangle = 30 \div 2
   = 15 cm
   Area of 5 triangles = 5 \times \frac{1}{2} \times 12 \times 15
   = 450 cm\(^2\)
   Area of remaining paper
   = 60 \times 30 - 450
   = 1,350 cm\(^2\)
   **Method 2**
   Since the cut triangles make up a quarter of the paper,
   area of the remaining paper
   = \( \frac{3}{4} \times 60 \times 30 \)
   = 1,350 cm\(^2\)
4. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
Area of BCD = \(\frac{1}{2} \times 24 \times 10\)
\[= 120 \text{ cm}^2\]
Area of BDE = \(\frac{1}{2} \times 26 \times 6\)
\[= 78 \text{ cm}^2\]
Shaded area = 120 - 78
\[= 42 \text{ cm}^2\]

5. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
\[\text{Area of } \frac{1}{2} \times 24 \times 28\]
\[= 336 \text{ ft}^2\]
\[\text{Area of } \frac{1}{2} \times 24 \times 10\]
\[= 240 \text{ ft}^2\]
Shaded area = 1,008 - 336 - 240
\[= 432 \text{ ft}^2\]

6. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
\[CD = 2 \times 16\]
\[= 32 \text{ cm}\]
\[AB = (42 \div 2) \times 3\]
\[= 63 \text{ cm}\]
Area of ABC = \(\frac{1}{2} \times 63 \times 32\)
\[= 1,008 \text{ cm}^2\]
Area of BEG = \(\frac{1}{2} \times 42 \times 16\)
\[= 336 \text{ cm}^2\]
Shaded area = 1,008 - 336
\[= 672 \text{ cm}^2\]

7. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
Shaded area = \(\frac{1}{2} \times 12 \times 12\)
\[= 72 \text{ cm}^2\]

8. Thinking skill: Spatial visualization
Strategy: Simplify the problem
Solution:
Area of 2 triangles = \(2 \times \frac{1}{2} \times 24 \times 24\)
\[= 576 \text{ in.}^2\]
Area of square = 10 \times 10 = 100 \text{ in.}^2
Unshaded area = 576 - 100 = 376 \text{ in.}^2
3. 16 – 4 = 12
   18 + 3 = 21
   21 : 12 = 7 : 4
   The ratio of the number of boys to the number of girls is 7 : 4.

4. 2 units → 16 in.
   1 unit → 16 ÷ 2 = 8 in.
   Length = 5 × 8
   = 40 in.
   Width = 3 × 8
   = 24 in.
   Area of rectangle = 40 × 24
   = 960 in.²

Lesson 7.4
1. 8 : 5
   2. \(\frac{8}{5}\)
3. \(\frac{5}{8}\)
   4. \(\frac{8}{13}\)
5. \(\frac{13}{5}\) times
   6. \(\frac{3}{8}\)
7. \(\frac{3}{8}\)
   8. \(\frac{2\frac{2}{3}}{3}\) times

Lesson 7.5
1. 35; 20
   2. 9; 18
3. 28; 36
   4. 35; 63
5. 3 : 2 : 5
   6. 6 : 3 : 5
7. 3 : 5 : 8
   8. 4 : 7 : 8

Lesson 7.6
1. Keisha’s age this year = 12 + 3
   = 15 years
   Sarah’s age : Keisha’s age = 4 : 5 = 12 : 15
   Ratio in 9 years = (12 + 9) : (15 + 9)
   = 21 : 24
   = 7 : 8
   The ratio of Sarah’s age to Keisha’s age in 9 years is 7 : 8.
2. Distance dog runs : Distance cat runs
   = 7 : 4
   7 ÷ 4 = 3
   12 ÷ 3 = 4 times
   4 × 7 = 28
   The dog has to run 28 meters.

3. $\frac{10 \text{ bears}}{+ 5 \text{ dolls}}$
   4 units → 20 bears
   2 units → 10 bears
   1 unit → 5 bears
   3 units → 5 dolls
   The ratio was 3 : 1.

4. Area of P : Area of Q = 3 : 2 = 12 : 8
   Number of units for the figure
   = 12 + 8 – 5
   = 15
   Number of units for the unshaded part
   = 15 – 5
   = 10
   10 : 15 = 2 : 3
   The ratio is 2 : 3.

Put on Your Thinking Cap!
1. Thinking skill: Analyzing parts and whole
   Strategy: Use a model
   Solution:
   Blue
   Red
   Green
   16
   2
   Green
   162
   3 units
   1 unit
   162
   3
   54
   7 units
   1 unit
   378
   2
   189
   3 units
   3
   54
   378
   There are 567 ribbons in the basket.

2. Thinking skill: Analyzing parts and whole
   Strategy: Use a model
   Solution:
   Matthew
   Ava
   $78
   3 units → $78
   1 unit → $78 ÷ 3 = $26
   14 units → $26 × 14 = $364
   They have $364 altogether.

176 Answers
3. Thinking skill: Analyzing parts and whole  
Strategy: Use a model  
Solution: 
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Chloe  
6 units → 18  
1 unit → 18 ÷ 6 = 3  
16 units → 16 × 3 = 48  
They have 48 books altogether.

4. Thinking skill: Analyzing parts and whole  
Strategy: Use a model  
Solution: 
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Square tiles  
5 units → 79 + 106 = 185  
1 unit → 185 ÷ 5 = 37  
11 units → 11 × 37 = 407  
There were 407 tiles in the box at first.

5. Thinking skill: Analyzing parts and whole  
Strategy: Use a model  
Solution: 
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Apples  
3 units → 261 + 261 = 522  
1 unit → 522 ÷ 3 = 174  
2 units → 2 × 174 = 348  
He had 348 apples at first.

6. Thinking skill: Analyzing parts and whole  
Strategy: Use a model  
Solution: 
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a. Method 1  
Andy  
Bobby  
The new ratio was 9 : 5.

b. 4 units → 108  
1 unit → 108 ÷ 4 = 27  
10 units → 10 × 27 = 270  
Bobby had 270 antique coins at first.

7. Thinking skill: Analyzing parts and whole  
Strategy: Use a model  
Solution: 
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Blue Green  
9 units → 1,350  
1 unit → 1,350 ÷ 9 = 150  
4 units → 4 × 150 = 600  
600 green beads are used.
42. Area of triangle $BDC = \frac{1}{2} \times 12 \times 12$
    \[= 72 \text{ cm}^2\]
Area of square $GEFC = 6 \times 6$
    \[= 36 \text{ cm}^2\]
Area of triangle $EDF = \frac{1}{2} \times (12 + 6) \times 6$
    \[= 54 \text{ cm}^2\]
Shaded area = $BDC + GEFC - EDF$
    \[= 72 + 36 - 54\]
    \[= 54 \text{ cm}^2\]

43. 

44. a. Number of red balls = $48 \div 3$
    \[= 16\]
Number of white balls = $30 \div 5$
    \[= 6\]
Total number of balls = $16 + 6 + 30 + 48$
    \[= 100\]
There are 100 balls altogether.

b. $1 - \frac{7}{10} = \frac{3}{10}$
    \[\frac{3}{10} \times 100 = 30\]
30 balls will be left.

45. Ben

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Pete

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a. 2 units $\rightarrow 30$
    1 unit $\rightarrow 30 \div 2 = 15$
    14 units $\rightarrow 14 \times 15 = 210$
They have 210 marbles altogether.

b. $210 \div 3 = 70$
    3 units $\rightarrow 3 \times 15 = 45$
    70 - 45 = 25
25 more marbles must be given to Pete.