

***Business Math 12th edition Cleaves Solutions
Manual***

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Chapter 1 Review of Whole Numbers and Integers

Section Exercises

1-1, p. 9

- Twenty-two million, three hundred fifty-six thousand, twenty-seven
- One hundred six billion, three hundred fifty-seven million, two hundred ninety-one thousand, five hundred eighty-two
- Seven hundred thirty million, five hundred thirty-one thousand, nine hundred sixty-eight
- Twenty-one million, seventeen
- Five hundred twenty-three billion, eight hundred million, seven thousand, one hundred ninety
- Seven hundred thirteen million, two hundred five thousand, five hundred thirty-eight
- 14,985
- 32,943,608
- 17,000,803,075
- 50,612,078
- 306,541
- 300,760,512
- 8 is in the tens place. 3 is to its right and is less than 5. Leave 8 and replace 3 with zero; 480.
- 7 is in the hundreds place. The digit 6 is on the right and is 5 or more. Add 1 to 7 and replace 6 and 2 with zeros; 3,800.
- 9 is in the ten-thousands place and 8 is 5 or greater. So increase 9 by 1. Since $9 + 1 = 10$, we record 0 and carry 1 to the next place to the left. $2 + 1 = 3$. Replace digits to the right of the ten-thousands place with zeros; 300,000.
- 5 is the first digit. 7 is 5 or greater, so add 1 to 5 and replace all digits to its right with zeros; 60,000.
- \$4,000,000,000
- \$457,025,972,800
- 0 is in the millions place, 3 on the right is less than 5, so leave 0 as it is and replace all digits on its right with zeros; 860,000,000.
- 1 is in the first place. The digit to the right, 5, is 5 or more, so round up by adding 1 to the 1 in the first place. Replace all digits to the right with zeros; 2,000.
- Negative fifteen thousand, three hundred fourteen dollars
- Negative eight thousand, four hundred twenty dollars
- Negative eight thousand, six hundred thirty-six dollars
- Negative twenty-thousand, one hundred fifty-seven dollars
- \$520,000,000
- \$1,800,000,000

1-2, p. 24

- $300 + 600 + 700 = 1,600$; 1,637
- $700 + 1,000 + 60 = 1,760$; 1,710
- $800 + 1,000 + 50 = 1,850$; 1,843
- $6,000 + 20,000 + 30,000 = 56,000$; 53,871
- $$\begin{array}{r} 89 \\ -52 \\ \hline 37 \end{array}$$
- $$\begin{array}{r} 4\ 15 \\ 5\ 5 \\ -3\ 6 \\ \hline 1\ 9 \end{array}$$
- $$\begin{array}{r} 2\ 10 \\ 3\ 0\ 8 \\ -2\ 7\ 5 \\ \hline 3\ 3 \end{array}$$
- $$\begin{array}{r} 3\ 10 \\ 5,\ 4\ 0\ 9 \\ -2,\ 1\ 7\ 6 \\ \hline 3,\ 2\ 3\ 3 \end{array}$$
- 6
- 92
- 8,188
- 403
- 21
- 17
- 12
- 4
- $$\begin{array}{r} 730 \\ \times 60 \\ \hline 43,800 \end{array}$$
- $$\begin{array}{r} 904 \\ \times 24 \\ \hline 3\ 616 \\ 18\ 08 \\ \hline 21,696 \end{array}$$
- $$\begin{array}{r} 1,005 \\ \times 89 \\ \hline 9\ 045 \\ 80\ 40 \\ \hline 89,445 \end{array}$$

20. -138

21. -480

22. $5,312$

23. $-\$580,412$

24.
$$\begin{array}{r} 16 \\ 6 \overline{)96} \\ 6 \\ \hline 36 \\ 36 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 407 \\ 34 \overline{)13,838} \\ 136 \\ \hline 23 \\ 0 \\ \hline 238 \\ 238 \\ \hline \end{array}$$

26.
$$\begin{array}{r} 260 \text{ R4} \\ 17 \overline{)4,424} \\ 34 \\ \hline 102 \\ 102 \\ \hline 4 \\ 0 \\ \hline 4 \end{array}$$

27. -8

28. 7

29. -42

30. $-\$239$

31. 4

32. $\$51$

33. 26

34. -217

35. $2,950 \div 50 =$

$295 \div 5 = 59$

36. $689,100 \div 30 =$

$68,910 \div 3 = 22,970$

37. $57,800,000 \div 2,000 =$

$57,800 \div 2 = 28,900$

38. $5,730,000 \div 300 =$

$57,300 \div 3 = 19,100$

39. 922 R256

$$\begin{array}{r} 922 \text{ R256} \\ 352 \overline{)324,800} \\ 3168 \\ \hline 800 \\ 704 \\ \hline 960 \\ 704 \\ \hline 256 \end{array}$$

The average selling price of each trailer was nearly \$923.

40. $8,832 \div 8 = 1,104$

Each vendor supplied 1,104 boxes of cards.

41. $348 \div 12 = 29$ You will need 29 boxes.

42. $21,960 - 16,300 = 5,660$ Visitors increased by 5,660.

43. $200,000,000 - 500,000 = 199,500,000$

The sales increase is \$199,500,000.

44. $\$200,000,000 \div \$500,000 = 400$ times increase

45. $-\$39,583 + (-\$23,486) = -\$63,069$

46. $-\$32,871 + \$29,783 = -\$3,088$ loss

47. $291 \times (-\$3) = -\873

48. $-\$63,408 \div 12 = -\$5,284$

49. Number of reams in warehouse $= 1,358 \times 10 = 13,580$.

If 15,000 reams are needed to process all the store orders, she needs to order more paper.

50. $487 \times (-\$12) = -\$5,844$

Exercise Set, p. 32

1. $\$7,000,000,000$

2. $20,000$

3. 26

4. 5,400 hotels; 495,000 rooms; 70 countries; 20 percent owned by people from underrepresented groups

5. Negative fourteen billion, six hundred seventy-two million dollars

6. Thirty billion, eight hundred sixty million dollars

7. Negative twenty-seven billion, six hundred eighty-four million dollars

8. Negative eight billion, nine hundred twenty-two million dollars

9. 400

10. $9,000$

11. $8,200$

12. $350,000$

13. $\underline{2}65,472$; 2 is in the hundred-thousands place. 6 is to the right and is more than 5. $300,000$.

14. $\underline{3},899$; 3 is in the thousands place. 8 is to the right and is more than 5. $\$4,000$.

$6,\underline{3}16,436$; 3 is in the hundred-thousands place. 1 is to the right and is less than 5. $6,300,000$.

15. $\underline{2},017$; 2 is in the thousands place.
0 is to the right and is less than 5.
2,000 radios.

17. 5,000

19. 20,000,000,000

21. $32,948 + 6,804 + 15,695 + 415 + 7,739 = 63,601$

23. $46,867 + 7,083 + 723 + 5,209 = 59,882$

$$\begin{array}{r} 21,335 \\ 4,000 \\ 9,000 \\ 4,000 \\ + 5,000 \\ \hline 22,000 \end{array}$$

$$\begin{array}{r} 27. \quad 8,759 \\ 3,000 \\ 800 \\ 4,000 \\ + 600 \\ \hline 8,400 \end{array}$$

$$\begin{array}{r} 29. \quad 6,288 \\ 4,300 \\ 600 \\ 1,300 \\ + 100 \\ \hline 6,300 \end{array}$$

31. Mental estimation: $50 + 100 + 40 + 50 = 240$

$$48 \boxed{+} 96 \boxed{+} 36 \boxed{+} 50 \boxed{=} \Rightarrow 230$$

Mary bought 230 items.

33. Mental estimation: $60 + 40 + 100 + 200 + 300 = 700$

$$57 \boxed{+} 43 \boxed{+} 104 \boxed{+} 210 \boxed{+} 309 \boxed{=} \Rightarrow 723$$

Jorge has 723 cards.

$$\begin{array}{r} 34. \quad 4,072 \\ 10,000 \\ - 6,000 \\ \hline 4,000 \end{array}$$

$$\begin{array}{r} 35. \quad 55,632 \\ 80,000 \\ - 30,000 \\ \hline 50,000 \end{array}$$

$$\begin{array}{r} 36. \quad 56,539,090 \\ 80,000,000 \\ - 30,000,000 \\ \hline 50,000,000 \end{array}$$

$$\begin{array}{r} 37. \quad 182,902 \\ 400,000 \\ - 200,000 \\ \hline 200,000 \end{array}$$

$$\begin{array}{r} 38. \quad 7,310 \\ 10,000 \\ - 5,000 \\ \hline 5,000 \end{array}$$

$$\begin{array}{r} 39. \quad 74,385 \\ 100,000 \\ - 40,000 \\ \hline 60,000 \end{array}$$

$$40. \quad 130 \boxed{-} 42 \boxed{=} \Rightarrow 88$$

Sam must order 88 packages.

$$41. \quad 840 \boxed{-} 596 \boxed{=} \Rightarrow 244$$

The number of fan belts to order is 244.

$$42. \quad 148 \boxed{-} 75 \boxed{=} \Rightarrow 73$$

Frieda still has 73 tickets.

$$43. \quad 132 \boxed{-} 119 \boxed{=} \Rightarrow 13$$

Veronica lost 13 pounds.

$$44. \quad (-32) + (-27) = -59$$

$$45. \quad \$21 + (-\$47) = -\$26$$

$$46. \quad 14 - (-12) = 14 + 12 = 26$$

$$47. \quad -36 - (-18) = -36 + 18 = -18$$

$$48. \quad 46 + (-58) = -12$$

$$49. \quad \$35 + (-\$52) = -\$17$$

$$50. \quad 37 - (-21) = 37 + 21 = 58$$

$$51. \quad 72 - (-42) = 72 + 42 = 114$$

16. $\$2,\underline{4}99$; 4 is in the hundreds place.
9 is to the right and is more than 5.
\$2,500.

18. 4,000,000

20. 2,000,000

22. $47 + 385 + 87 + 439 + 874 = 1,832$

24. $72 + 385 + 29 + 523 + 816 = 1,825$

$$\begin{array}{r} 26. \quad 318,936 \\ 70,000 \\ 80,000 \\ 70,000 \\ + 90,000 \\ \hline 310,000 \end{array}$$

$$\begin{array}{r} 28. \quad 2,612 \\ 700 \\ 900 \\ 300 \\ + 700 \\ \hline 2,600 \end{array}$$

30. Mental estimation:

$$90 + 90 + 100 + 90 + 70 + 80 + 60 + 100 = 680$$

$$92 \boxed{+} 87 \boxed{+} 96 \boxed{+} 85 \boxed{+} 72 \boxed{+} 84 \boxed{+} 57 \boxed{+} 98 \boxed{=} \Rightarrow 671$$

Kiesha had 671 points.

32. Mental estimation:

$$500 + 500 + 500 + 500 + 500 + 100 + 100 = 2,700$$

$$483 \boxed{+} 472 \boxed{+} 497 \boxed{+} 486 \boxed{+} 464 \boxed{+} 146 \boxed{+} 87 \boxed{=} \Rightarrow 2635$$

The total labor-hours worked was 2,635.

$$\begin{array}{r} 52. \quad 5,931 \\ \times \quad 835 \\ \hline 29\,655 \\ 177\,93 \\ 4\,744\,8 \\ \hline 4,952,385 \end{array}$$

$$\begin{array}{r} 53. \quad 1,987 \\ \times \quad 394 \\ \hline 7948 \\ 17883 \\ 5961 \\ \hline 782,878 \end{array}$$

$$\begin{array}{r} 54. \quad 33 \\ \times \quad 500 \\ \hline 16,500 \end{array}$$

$$\begin{array}{r} 55. \quad 7,870 \\ \times \quad 6,000 \\ \hline 47,220,000 \end{array}$$

$$\begin{array}{r} 56. \quad 5,565 \\ \times \quad 839 \\ \hline 50\,085 \\ 166\,95 \\ 4\,452\,0 \\ \hline 4,669,035 \end{array}$$

$$\begin{array}{r} 57. \quad 78,626 \\ \times \quad 87 \\ \hline 550\,382 \\ 6\,290\,08 \\ \hline 6,840,462 \end{array}$$

$$\begin{array}{r} 58. \quad 283 \\ \times \quad 3,000 \\ \hline 849,000 \end{array}$$

$$\begin{array}{r} 59. \quad 405 \\ \times \quad 400 \\ \hline 162,000 \end{array}$$

$$\begin{array}{r} 60. \quad 7,000 \\ \times \quad 30 \\ \hline 210,000 \end{array} \quad \begin{array}{r} 7,489 \\ \times \quad 34 \\ \hline 29\,956 \\ 224\,67 \\ \hline 254,626 \end{array}$$

$$\begin{array}{r} 61. \quad 3,100 \\ \times \quad 500 \\ \hline 1,550,000 \end{array}$$

$$\begin{array}{r} \quad 3,128 \\ \times \quad 478 \\ \hline 25\,024 \\ 218\,96 \\ 1\,251\,2 \\ \hline 1,495,184 \end{array}$$

$$\begin{array}{r} 62. \quad 400 \\ \times \quad 500 \\ \hline 200,000 \end{array} \quad \begin{array}{r} \quad 378 \\ \times \quad 546 \\ \hline 2\,268 \\ 15\,12 \\ 189\,0 \\ \hline 206,388 \end{array}$$

$$\begin{array}{r} 63. \quad 400 \\ \times \quad 70 \\ \hline 28,000 \end{array} \quad \begin{array}{r} \quad 378 \\ \times \quad 72 \\ \hline 756 \\ 26\,46 \\ \hline 27,216 \end{array}$$

64. $28 \boxed{\times} 5 \boxed{=} \Rightarrow 140$
The center requires 140 pieces of fruit.

65. $2017 \boxed{\div} 6 \boxed{=} \Rightarrow 336.1666667$
There are approximately 336 radios per thousand people.

66. $2 \times \$15 = \30 ; $\$30 - \$27 = \$3$
Two filters can be purchased at a savings of \$3.

67. $793 \boxed{\div} 9 \boxed{=} \Rightarrow 88.1111111$
There are approximately 88 TVs per thousand people.

$$\begin{array}{r} 68. \quad 77 \\ 16 \overline{)1,232} \\ \underline{1\,12} \\ 112 \\ \underline{112} \\ 0 \end{array} \quad \begin{array}{r} 77 \\ \times 16 \\ \hline 462 \\ 77 \\ \hline 1,232 \end{array}$$

$$\begin{array}{r} 69. \quad 8,000 \\ 90 \overline{)748,431} \\ \underline{680} \\ 68\,4 \\ \underline{68\,0} \\ 43 \\ \underline{0} \\ 431 \\ \underline{425} \\ 6 \end{array} \quad \begin{array}{r} 8,805 \text{ R}6 \\ 85 \overline{)748,431} \\ \underline{680} \\ 68\,4 \\ \underline{68\,0} \\ 43 \\ \underline{0} \\ 431 \\ \underline{425} \\ 6 \end{array}$$

$$\begin{array}{r} 70. \quad 500 \\ 300 \overline{)174,891} \\ \underline{173} \\ 1\,89 \\ \underline{0} \\ 1\,891 \\ \underline{1\,730} \\ 161 \end{array} \quad \begin{array}{r} 505 \text{ R}161 \\ 346 \overline{)174,891} \\ \underline{173} \\ 1\,89 \\ \underline{0} \\ 1\,891 \\ \underline{1\,730} \\ 161 \end{array}$$

$$\begin{array}{r} 71. \quad 335 \\ 12 \overline{)4,020} \\ \underline{36} \\ 42 \\ \underline{36} \\ 60 \\ \underline{60} \\ 0 \end{array} \quad \begin{array}{r} 335 \\ \times 12 \\ \hline 670 \\ 3\,35 \\ \hline 4,020 \end{array}$$

72. $483,000 \div 3,000 = 483 \div 3 = 161$

73. $73,460,000 \div 10,000 = 7,346 \div 1 = 7,346$

74. $835,000 \div 5,000 = 835 \div 5 = 167$

75. $68,650,000 \div 1,000 = 68,650 \div 1 = 68,650$

$$76. 3,420 \div 12 = 285$$

The dealer can make 285 packages.

$$78. 238 \div 2 = 119 \text{ The stack has 119 countertops.}$$

$$80. 138(-\$7) = -\$966 \text{ loss}$$

$$82. -\$10,152 \div 4 = -\$2,538 \text{ loss}$$

$$84. 34 - 3 \times 7 = 34 - 21 = 13$$

$$86. (-3)(-12) - 5 = 36 - 5 = 31$$

$$88. 63 + 126 \div 7 = 63 + 18 = 81$$

$$77. 2,032 \div 127 = 16$$

The average hourly wage per employee is \$16 per hour.

$$79. 15 + 32 + 18 + 12 = 77 \text{ coins}$$

$$81. \$69,708 \div 12 = \$5,809 \text{ gain}$$

$$83. 219 \times \$3 = \$657 \text{ gain}$$

$$85. (\$32 - \$17 + \$57) \div 9 = \$72 \div 9 = \$8$$

$$87. (\$72 + \$38 - \$21 + \$32) \times 3 = \$121 \times 3 = \$363$$

$$89. (-5)(-11) - 18 = 55 - 18 = 37$$

Practice Test, p. 36

1. five hundred three

2. twelve million, fifty-six thousand, thirty-nine

3. 80,000

4. 600,000

5. 5,017,135,632

6. 17,500,608

7. Twenty-two billion, six hundred ninety-seven million dollars

8. Eighty-seven billion, four hundred seventy-one million, nine hundred thousand dollars

$$\begin{array}{r} 9. \quad 900 \quad 863 \\ \quad 1,000 \quad 983 \\ \quad + 300 \quad + 271 \\ \hline \quad 2,200 \quad 2,117 \end{array}$$

$$10. \begin{array}{r} 1,000 \quad 987 \\ - 300 \quad - 346 \\ \hline \quad 700 \quad 641 \end{array}$$

11. -21

12. -23

$$13. 5 - 32 = 5 + (-32) = -27$$

$$14. -8 - 21 = -8 + (-21) = -29$$

$$\begin{array}{r} 15. \quad 900 \quad 892 \\ \quad \times 50 \quad \times 46 \\ \hline \quad 45,000 \quad 5352 \\ \quad \quad 3568 \\ \hline \quad \quad 41,032 \end{array}$$

$$16. \begin{array}{r} 80 \\ 50 \overline{)4,021} \\ \underline{371} \quad 75 \text{ R}46 \\ \underline{311} \\ \underline{265} \\ 46 \end{array}$$

$$17. 438 \div 72 = 6.08 \Rightarrow 1153$$

1,153 items were counted.

$$18. 31 \div 2 = 15.5$$

Only 15 boxes can be stacked.

$$19. 2988 \div 12 = 249$$

249 packages can be made.

$$20. 43 - 23 = 20$$

20 pairs of shoes remain in inventory.

$$21. 680 \div 40 = 17$$

She makes \$17 per hour.

$$22. 28 \times 2 = 56$$

$$56 \times 5 = 280$$

280 pieces of fruit are required.

$$23. 16 \times 3 = 48$$

48 pages are devoted to review.

$$24. 48 \div 11 = 37$$

37 novels were received.

$$25. \$23,522,400,000 - \$4,313,200,000 = \$19,209,200,000$$

$$26. \text{ Loss} = \text{negative profit}; \$34,362,200,000 - (-\$394,900,000) =$$

$$\$34,362,200,000 + \$394,900,000 = \$34,757,100,000$$

27. $-\$8,915 + (-\$5,212) + (-\$6,103) = -\$20,230$
28. $-\$15,814 - (-\$7,928) = -\$15,814 + \$7,928 = -\$7,886$
29. $186 \times (-\$11) = -\$2,046$
30. $-\$26,136 \div 12 = -\$2,178$
31. $133 \div 7 \times (-4) + 26 =$
 $19 \times (-4) + 26 =$
 $-76 + 26 = -50$
32. $(\$68 + \$52 - \$71 + \$32) \times 9 = \$81 \times 9 = \729

Critical Thinking, p. 38

1. $n = 17 - 12$
 $n = 5$
2. $n = 45 \div 5$
 $n = 9$
3. Answers will vary.
 $(12 - 5) - 2 = 7 - 2 = 5$
 $12 - (5 - 2) = 12 - 3 = 9$
4. Answers will vary.
 $8 \div 4 = 4$
 $4 \div 8 = \frac{4}{8}$ does not $= 4$
5. Answers will vary. You made purchases of \$15 and \$18. What is the total of your purchases?
6. Answers will vary. You purchased seven items that cost \$23 each. What is the total of your purchases?
7. Answers will vary. Multiplication
 $4 + 4 + 4 + 4 + 4 = 5(4) = 20.$
8. Addition and Subtraction
9. Division
10.
$$\begin{array}{r} \text{zero missing} \\ \downarrow \\ 12 \overline{) 6,108} \\ \underline{60} \\ 108 \\ \underline{108} \\ 0 \end{array}$$
11. $5 + 3(8) - 12 =$
 $5 + 24 - 12 =$
 $29 - 12 = 17$
 The order of operations requires multiplication to be completed before addition or subtraction.
12. $25 - 12 + 7 =$
 $13 + 7 = 20$
 Addition and subtraction must be completed in the order they occur, working from *left* to *right*.
- The 5 in the quotient should align above the 1 in the dividend.

Combining Concepts, p. 38

1.
$$\begin{array}{r} 120 \\ 135 \\ + 165 \\ \hline 420 \end{array}$$

$$\begin{array}{r} 500 \\ - 420 \\ \hline 80 \text{ units} \end{array}$$

2. **TABLE 1-2**

Employee Name	Week 1	Week 2	Week 3	Week 4	Units Sold
Brown, Tyler	15	12	23	27	77
Lopez, Cierra	23	18	14	12	67
Prete, Aaron	18	19	27	9	73
Salayon, Steven	21	15	16	17	69
Vidrine, Stephen	31	12	9	15	67
Waddell, Dawn	17	18	12	21	68
Young, Travon	15	19	14	13	61

The overall monthly sales were 482 units. The monthly quota of 500 units was not reached. Tyler Brown and Aaron Prete reached their monthly sales goals.

3.

TABLE 1-3						
Region	W	Th	F	S	Su	Region Totals
Eastern	\$72,492	\$81,948	\$32,307	\$24,301	\$32,589	\$243,637
Southern	81,897	59,421	48,598	61,025	21,897	272,838
Central	71,708	22,096	23,222	21,507	42,801	181,334
Western	61,723	71,687	52,196	41,737	22,186	249,529
Daily Sales Total	\$287,820	\$235,152	\$156,323	\$148,570	\$119,473	\$947,338

Region Totals = \$243,637 + \$272,838 + \$181,334 +
\$249,529 = \$947,338

Difference = Goal – Actual = \$1,384,000 – \$947,338
= \$436,662

Daily Sales Totals = \$287,820 + \$235,152 + \$156,323 +
\$148,570 + \$119,473 + \$947,338

Goal was not reached.

4. Total pounds of candy = $84 \times 25 = 2,100$
Number of bags of candy = $2,100 \div 3 = 700$
Number of boxes of candy = $700 \div 12 = 58 \text{ R}4$
There are 58 boxes of candy and 4 bags left so 59 boxes will
be needed to ship all the candy. Enough bags and boxes are on hand to package.
5. Total length of fencing needed = $210 \times 4 = 840$ feet
Number of rolls of fencing needed = $840 \div 50 = 16 \text{ R}40$
Because a partial roll of fencing cannot be purchased,
17 rolls are needed.
Cost of 17 rolls of fencing = $\$49 \times 17 = \833
Cost of installing fence = $\$1 \times 840 = \840
Total cost = $\$833 + \$840 = \$1,673$
Your bid is the lowest bid and you are likely to get the business.
6. Wages = $3 \times \$15 \times 21 = \945
Gross profit = total – cost of materials – cost of labor
Gross profit = $\$1,673 - \$833 - \$945 = \105
7. $12 + 27 + 55 + 21 = 115$ gallons; yes, 100 gallons of fuel
can be stored in these containers.
8. $\$75 + \$45 + 4(\$10) = \$75 + \$45 + \$40 = \$160$;
 $\$160 - \$7 = \$153$

Case Studies

1-1, p. 41

1. Daily Pass: $250 \text{ days} \times \$6 = \$1,500$ Monthly Pass: $12 \text{ months} \times \$105 = \$1,260$
 $\$1,500 - \$1,260 = \$240$
2. Daily Mileage: $2 \times 20 \text{ miles} = 40 \text{ miles}$ $40 \text{ miles} = 1 \text{ gallon of gasoline per day} = \4
Annual Fuel Cost: $\$4 \times 250 \text{ days} = \$1,000$ Parking Cost: $\$120 \times 50 \text{ weeks} = \$6,000$
Cost to Drive to Work: $\$1,000 + \$6,000 = \$7,000$
3. Position 1 is \$70,000 per year;
 $\$70,000 - \$1,260 \text{ (annual cost of bus)} = \$68,740$
Position 2 is \$67,000 per year;
 $\$67,000 + \$2,000 \text{ (wellness bonus)} = \$69,000$
Position 2 is the better option.

1-2, p. 42

1. $45 \text{ ft} \times 20 \text{ ft} \times 2 \text{ sides} = 1,800 \text{ ft}^2$ $1,800 \text{ ft}^2 \div 100 = 18 \text{ roofing squares}$
For the roof, 1,800 ft^2 of roofing is required, which is 18 roofing squares.
2. $18 \text{ squares} \times 4 \text{ bundles} = 72 \text{ bundles}$ $18 \text{ squares} \div 3 = 6 \text{ rolls of roofing felt}$
 $72 \text{ bundles} \times \$42 \text{ per bundle} = \$3,024 \text{ total shingle cost}$ $6 \text{ rolls} \times \$27 \text{ per roll} = \$162 \text{ total roofing felt cost}$
For the roof, 72 bundles of shingles are needed at a cost of \$3,024. Also, 6 rolls of felt are needed at a cost of \$162.
3. $18 \text{ squares} \div 3 \text{ squares} = 6 \text{ boxes}$; $6 \text{ boxes} \times \$15 = \90 nail cost $17 \text{ drip edge pieces} \times \$6 \text{ per} = \$102 \text{ total drip edge cost}$
 $(20 \text{ ft} + 20 \text{ ft} + 45 \text{ ft}) = 85 \text{ ft per side of drip edge}$ $\text{Total cost} = \$3,024 + \$162 + \$90 + \$102 = \$3,378$
 $85 \text{ ft} \times 2 \text{ sides} = 170 \text{ ft}$; $170 \text{ ft} \div 10 \text{ ft length} = 17 \text{ pieces}$
6 boxes of roofing nails are needed at a cost of \$90; 17 lengths of drip edge are needed at a cost of \$102. The material costs for the entire roof are \$3,378.

1-3, p. 42

1. $150 + 75 + 25 = 250 \text{ people}$
 $\$100,000 \div 250 = \400
2. $\$400 \div 10 = \40
3. First shift: $100(\$40)(10 \text{ months}) = \$40,000$; $25(\$100) = \$2,500$; $15(\$50) = \750 ;
 $10(\$20)(10) = \$2,000$; $\$40,000 + \$2,500 + \$750 + \$2,000 = \$45,250 \text{ total}$
Second shift: $25(\$150) = \$3,750$; $25(\$40)(10) = \$10,000$; $25(\$35) = \875
 $\$3,750 + \$10,000 + \$875 = \$14,625 \text{ total}$
Third shift: $25(\$80)(10) = \$20,000 \text{ total}$
4. No, she is short \$20,125. $\$45,250 + \$14,625 + \$20,000 = \$79,875$; $\$100,000 - \$79,875 = \$20,125$
5. $\$79,875(2) = \$159,750 \text{ company contribution}$ $\$79,875 + \$159,750 = \$239,625 \text{ total contribution}$