

INSTRUCTOR'S  
SOLUTIONS MANUAL

BUSINESS MATH  
ELEVENTH EDITION

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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
- \$25,972,800
- 6 is in the millions place, 3 on the right is less than 5, so leave 6 as it is and replace all digits on its right with zeros; 86,000,000.
- 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

$$\begin{array}{r} 24. \quad \frac{16}{6 \overline{)96}} \\ \underline{6} \\ 36 \\ \underline{36} \\ 0 \end{array}$$

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

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

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. 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.

40. Total pounds of candy =  $84 \times 25 = 2,100$   
Number of bags of candy =  $2,100 \div 3 = 700$   
Number of boxes of candy =  $700 \div 12 = 58 \text{ R4}$   
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.

41. 
$$\begin{array}{r} \frac{922 \text{ R256}}{352 \overline{)324,800}} \\ \underline{3168} \\ 800 \\ \underline{704} \\ 960 \\ \underline{704} \\ 256 \end{array}$$
 The average selling price of each trailer was nearly \$923.

42. Total length of fencing needed =  $210 \times 4 = 840$  feet  
Number of rolls of fencing needed =  $840 \div 50 = 16 \text{ R40}$   
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.

43. Wages =  $3 \times \$15 \times 21 = \$945$   
Gross profit = total - cost of materials - cost of labor  
Gross profit =  $\$1,673 - \$833 - \$945 = \$105$

44.  $8832 \div 8 \Rightarrow 1104$  Each vendor supplied 1,104 boxes of cards.

45.  $348 \div 12 \Rightarrow 29$  You will need 29 boxes.

46.  $21960 - 16300 \Rightarrow 5660$  Visitors increased by 5,660.

47.  $200000000 - 500000 \Rightarrow 199500000$   
The sales increase is \$199,500,000.

48.  $42000000 \times 2 \Rightarrow 84000000$  cents  
 $84000000 \div 100 \Rightarrow 840000$  dollars  
 STS paid \$840,000 for the purchase.

50.  $214302 \div 32 \Rightarrow 6696.9375$   
 On average, 6,697 employees work at each location.

52.  $-\$32,871 + \$29,783 = -\$3,088$  loss

54.  $-\$63,408 \div 12 = -\$5,284$

56.  $487 \times (-\$12) = -\$5,844$

49.  $42000000 \times 6 \div 84000000 \Rightarrow 168000000$   
 $168000000 \div 100 = 1680000$   
 STS will make a profit of \$1,680,000.

51.  $-\$39,583 + (-\$23,486) = -\$63,069$

53.  $291 \times (-\$3) = -\$873$

55. 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.

## Exercise Set, p. 33

1. \$7,000,000,000

3. 26

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

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

9. 400

11. 8,200

13.  $\underline{2}65,472$ ; 2 is in the hundred-thousands place. 6 is to the right and is more than 5. 300,000.  
 $\underline{6},\underline{3}16,436$ ; 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.  $46,867 + 7,083 + 723 + 5,209 = 59,882$

25. 21,335	4,000
	9,000
	4,000
	+ 5,000
	22,000

27. 8,759	3,000
	800
	4,000
	+ 600
	8,400

2. 20,000

4. 5,400 hotels; 495,000 rooms; 70 countries; 20 percent minority-owned

6. Thirty billion, eight hundred sixty million dollars

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

10. 9,000

12. 350,000

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

16.  $\underline{\$}2,499$ ; 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.  $72 + 385 + 29 + 523 + 816 = 1,825$

26. 318,936	70,000
	80,000
	70,000
	+ 90,000
	310,000

28. 2,612	700
	900
	300
	+ 700
	2,600

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

31. Mental estimation:  $50 + 100 + 40 + 50 = 240$   
 $48 \square + 96 \square + 36 \square + 50 \square \Rightarrow 230$   
 Mary bought 230 items.

33.  $57 \square + 43 \square + 104 \square + 210 \square + 309 \square \Rightarrow 723$   
 Jorge has 723 cards.

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

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

40.  $130 \square - 42 \square \Rightarrow 88$   
 Sam must order 88 packages.

43.  $132 \square - 119 \square \Rightarrow 13$   
 Veronica lost 13 pounds.

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

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

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

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

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

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

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

41.  $840 \square - 596 \square \Rightarrow 244$   
 The number of fan belts to order is 244.

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

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

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

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

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

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

30. Mental estimation:  
 $90 + 90 + 100 + 90 + 70 + 80 + 60 + 100 = 680$   
 $92 \square + 87 \square + 96 \square + 85 \square + 72 \square + 84 \square + 57 \square + 98 \square \Rightarrow 671$   
 Kiesha had 671 points.

32.  $483 \square + 472 \square + 497 \square + 486 \square + 464 \square + 146 \square + 87 \square \Rightarrow 2635$   
 The total labor-hours worked was 2,635.

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

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

42.  $148 \square - 75 \square \Rightarrow 73$   
 Frieda still has 73 tickets.

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

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

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

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

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

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



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

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

$$\begin{array}{r} 62. \quad 400 \\ \times \quad 500 \\ \hline 200,000 \end{array}$$

$$\begin{array}{r} 378 \\ \times \quad 546 \\ \hline 2\,268 \\ 1512 \\ 1890 \\ \hline 206,388 \end{array}$$

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

64.  $28 \times 5 \Rightarrow 140$   
The center requires 140 pieces of fruit.

65.  $2017 \div 6 \Rightarrow 336.1666667$   
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.  $793 \div 9 \Rightarrow 88.11111111$   
There are approximately 88 TVs per thousand people.

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

$$\begin{array}{r} 69. \quad 8,000 \\ 90 \overline{)748,431} \\ \underline{720} \\ 28431 \\ \underline{27000} \\ 1431 \\ \underline{1350} \\ 81 \\ \underline{80} \\ 1 \\ \underline{1} \\ 0 \end{array} \quad \begin{array}{r} 8,805 \text{ R}6 \\ 85 \overline{)748,431} \\ \underline{680} \\ 684 \\ \underline{680} \\ 43 \\ \underline{43} \\ 0 \\ \underline{0} \\ 431 \\ \underline{425} \\ 6 \end{array}$$

$$\begin{array}{r} 70. \quad 500 \\ 300 \overline{)174,891} \\ \underline{1500} \\ 24891 \\ \underline{24000} \\ 891 \\ \underline{891} \\ 0 \\ \underline{0} \\ 1730 \\ \underline{1610} \\ 161 \end{array} \quad \begin{array}{r} 505 \text{ R}161 \\ 346 \overline{)174,891} \\ \underline{1730} \\ 189 \\ \underline{189} \\ 0 \\ \underline{0} \\ 1891 \\ \underline{1730} \\ 161 \end{array}$$

$$\begin{array}{r} 71. \quad 335 \\ 12 \overline{)4,020} \\ \underline{360} \\ 42 \\ \underline{36} \\ 60 \\ \underline{60} \\ 0 \end{array} \quad \begin{array}{r} 335 \\ \times \quad 12 \\ \hline 670 \\ 335 \\ \hline 4,020 \end{array}$$

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.  $3,420 \div 12 \Rightarrow 285$   
The dealer can make 285 packages.

77.  $2,032 \div 127 \Rightarrow 16$   
The average hourly wage per employee is \$16 per hour.

78.  $238 \div 2 \Rightarrow 119$  The stack has 119 countertops.

79.  $15 + 32 + 18 + 12 = 77$  coins

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

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

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

83.  $219 \times (+\$3) = \$657$  gain

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

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

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

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

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

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

# Practice Test, p. 37

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
9. 
$$\begin{array}{r} 900 \\ 1,000 \\ + 300 \\ \hline 2,200 \end{array}$$
9. 
$$\begin{array}{r} 863 \\ 983 \\ + 271 \\ \hline 2,117 \end{array}$$
10. 
$$\begin{array}{r} 1,000 \\ - 300 \\ \hline 700 \end{array}$$
10. 
$$\begin{array}{r} 987 \\ - 346 \\ \hline 641 \end{array}$$
11. -21
12. -23
13.  $5 - 32 = 5 + (-32) = -27$
14.  $-8 - 21 = -8 + (-21) = -29$
15. 
$$\begin{array}{r} 900 \\ \times 50 \\ \hline 45,000 \end{array}$$
15. 
$$\begin{array}{r} 892 \\ \times 46 \\ \hline 5352 \\ 3568 \\ \hline 41,032 \end{array}$$
16. 
$$\begin{array}{r} 80 \\ 50 \overline{)4,021} \\ \underline{4,000} \\ 21 \\ \underline{20} \\ 1 \end{array}$$
16. 
$$\begin{array}{r} 75 \text{ R}46 \\ 53 \overline{)4,021} \\ \underline{371} \\ 311 \\ \underline{265} \\ 46 \end{array}$$
17.  $438 \boxed{+} 72 \boxed{+} 643 \boxed{=} \Rightarrow 1153$   
1,153 items were counted.
18.  $31 \boxed{\div} 2 \boxed{=} \Rightarrow 15.5$   
Only 15 boxes can be stacked.
19.  $2988 \boxed{\div} 12 \boxed{=} \Rightarrow 249$   
249 packages can be made.
20.  $43 \boxed{-} 23 \boxed{=} \Rightarrow 20$   
20 pairs of shoes remain in inventory.
21.  $680 \boxed{\div} 40 \boxed{=} \Rightarrow 17$   
She makes \$17 per hour.
22.  $28 \boxed{\times} 2 \boxed{=} \Rightarrow 56$
22.  $56 \boxed{\times} 5 \boxed{=} \Rightarrow 280$   
280 pieces of fruit are required.
23.  $16 \boxed{\times} 3 \boxed{=} \Rightarrow 48$   
48 pages are devoted to review.
24.  $48 \boxed{-} 11 \boxed{=} \Rightarrow 37$   
37 novels were received.
25.  $\$23,522,400,000 - \$4,313,200,000 = \$19,209,200,000$
26. Loss = 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. 39

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 have 15 rock CDs and 18 classical CDs. Find the total.

6. Answers will vary. You and each of your seven friends have 23 CDs. What is the total number of CDs you eight own?

7. Answers will vary. Multiplication  
 $4 + 4 + 4 + 4 + 4 = 5(4) = 20$

8. Addition and Subtraction

9. Division

10. 
$$\begin{array}{r} \phantom{12} \overline{) 6,108} \\ \underline{60} \\ 108 \\ \underline{108} \\ 0 \end{array}$$
 zero missing

11.  $5 + 3(8) - 12 =$   
 $5 + 24 - 12 =$   
 $29 - 12 = 17$

12.  $25 - 12 + 7 =$   
 $13 + 7 = 20$

The order of operations requires multiplication to be completed before addition or subtraction.

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.

## Challenge Problem p. 39

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

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

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.

## Case Studies

### 1-1, p. 41

1. Amtrak:  $(\$198 \times 4) + (\$40 \times 2) = \$872$     Airplane:  $(\$175 \times 4) + (\$40 \times 2) = \$780$   
Individual Cars:  $(\$244 + \$125) \times 4 = \$1,476$     Limo Liner:  $((\$198 - \$20) \times 4) + (\$20 \times 2) = \$752$   
Two-Car Carpool:  $(\$244 + \$125) \times 2 = \$738$

2.  $\$1,140 - \$738 = \$402$  savings by two-car carpool  
 $\$1,140 - \$752 = \$388$  savings by Limo Liner

Although the savings are greater if they carpool, taking the Limo Liner would allow the managers to work en route for three hours, either as a group or individually. Additionally, traveling by Limo Liner should also decrease the fatigue factor for two people having to drive for three to four hours. The Limo Liner seems like an idea worth trying.

3.  $\$388$  savings for one trip  $\times 12$  trips  $= \$4,656$  savings in a year

## 1-2, p. 42

1.  $45 \text{ ft} \times 20 \text{ ft} \times 2 \text{ sides} = 1,800 \text{ ft}^2$        $1,800 \text{ ft}^2 \div 100 = 18$  roofing squares

For the roof,  $1,800 \text{ ft}^2$  of roofing is required, which is 18 roofing squares.

2.  $18 \text{ squares} \times 4 \text{ bundles} = 72 \text{ bundles}$

$18 \text{ squares} \div 3 = 6$  rolls of roofing felt

$72 \text{ bundles} \times \$14 \text{ per bundle} = \$1,008$  total shingle cost

$6 \text{ rolls} \times \$9 \text{ per roll} = \$54$  total roofing felt cost

For the roof, 72 bundles of shingles are needed at a cost of \$1,008. Also, 6 rolls of felt are needed at a cost of \$54.

3.  $18 \text{ squares} \div 3 \text{ squares} = 6$  boxes;  $6 \text{ boxes} \times \$5$   
= \$30 nail cost

$17 \text{ drip edge pieces} \times \$3 \text{ per} = \$51$  total drip edge cost

$(20 \text{ ft} + 20 \text{ ft} + 45 \text{ ft}) = 85 \text{ ft}$  per side of drip edge

Total cost =  $\$1,008 + \$54 + \$30 + \$51 = \$1,143$

$85 \text{ ft} \times 2 \text{ sides} = 170 \text{ ft}$ ;  $170 \text{ ft} \div 10 \text{ ft length} = 17$  pieces

6 boxes of roofing nails are needed at a cost of \$30; 17 lengths of drip edge are needed at a cost of \$51. The material costs for the entire roof are \$1,143.

## 1-3, p. 42

1.  $150 + 75 + 25 = 250$  people

$\$100,000 \div 250 = \$400$

2.  $\$400 \div 10 = \$40$

3. First shift:  $100(\$40)(10 \text{ months}) = \$40,000$ ;  $25(\$100) = \$2,500$ ;  $15(\$50) = \$750$ ;

$10(\$20)(10) = \$2,000$ ;  $\$40,000 + \$2,500 + \$750 + \$2,000 = \$45,250$  total

Second shift:  $25(\$150) = \$3,750$ ;  $25(\$40)(10) = \$10,000$ ;  $25(\$35) = \$875$

$\$3,750 + \$10,000 + \$875 = \$14,625$  total

Third shift:  $25(\$80)(10) = \$20,000$  total

4. No, she is short \$20,125.       $\$45,250 + \$14,625 + \$20,000 = \$79,875$ ;  $\$100,000 - \$79,875 = \$20,125$

5.  $\$79,875(2) = \$159,750$  company contribution       $\$79,875 + \$159,750 = \$239,625$  total contribution