

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.
- Three billion, five hundred eighty-five million dollars
- \$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
- 6
- 92
- 8,188
- $\frac{4}{8} \frac{15}{8}$
- $\frac{2}{8} \frac{10}{8} \frac{8}{8}$
- $\frac{3}{4} \frac{10}{9}$
- 21
- 17
- 12
- 4
- $\begin{array}{r} 5,4\cancel{0}9 \\ -2,176 \\ \hline 3,233 \end{array}$
- $\begin{array}{r} 904 \\ \times 24 \\ \hline 3616 \\ 1808 \\ \hline 21,696 \end{array}$
- $\begin{array}{r} 1,005 \\ \times 89 \\ \hline 9045 \\ 8040 \\ \hline 89,445 \end{array}$
- 138
- 480
- $\begin{array}{r} 730 \\ \times 60 \\ \hline 43,800 \end{array}$

20. 5,312 21. $-\$580,412$ 22. $\begin{array}{r} 16 \\ 6 \overline{)96} \\ \underline{6} \\ 36 \\ \underline{36} \end{array}$ 23. $\begin{array}{r} 407 \\ 34 \overline{)13,838} \\ \underline{136} \\ 23 \\ \underline{0} \\ 238 \\ \underline{238} \end{array}$ 24. $\begin{array}{r} 260 \text{ R}4 \\ 17 \overline{)4,424} \\ \underline{34} \\ 102 \\ \underline{102} \\ 4 \\ \underline{0} \\ 4 \end{array}$
25. -8 26. 7 27. -42 28. $-\$239$ 29. 4 30. $\$51$ 31. 26 32. -217
34. $2,950 \div 50 = 295 \div 5 = 59$ 34. $689,100 \div 30 = 68,910 \div 3 = 22,970$ 35. $57,800,000 \div 2,000 = 57,800 \div 2 = 28,900$ 36. $5,730,000 \div 300 = 57,300 \div 3 = 19,100$
- 37.
- | 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 = $\$243,637 + \$272,838 + \$181,334 + \$249,529 = \$947,338$ Daily Sales Totals = $\$287,820 + \$235,152 + \$156,323 + \$148,570 + \$119,473 = \$947,338$
- Difference = Goal - Actual = $\$1,384,000 - \$947,338 = \$436,662$ Goal was not reached.
38. 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.
39. $\begin{array}{r} 922 \text{ R}256 \\ 352 \overline{)324,800} \\ \underline{3168} \\ 800 \\ \underline{704} \\ 960 \\ \underline{704} \\ 256 \end{array}$ The average selling price of each trailer was nearly \$923.
40. 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.
41. Wages = $3 \times \$9 \times 21 = \567
Gross profit = total - cost of materials - cost of labor
Gross profit = $\$1,673 - \$833 - \$567 = \273
42. $8832 \div 8 \Rightarrow 1104$ Each vendor supplied 1,104 boxes of cards.
43. $348 \div 12 \Rightarrow 29$ You will need 29 boxes.
44. $21960 - 16300 \Rightarrow 5660$ Visitors increased by 5,660.
45. $200000000 - 500000 \Rightarrow 199500000$
The sales increase is \$199,500,000.
46. $42000000 \times 2 \Rightarrow 84000000$ cents
 $84000000 \div 100 \Rightarrow 840000$ dollars
STS paid \$840,000 for the purchase.
47. $42000000 \times 6 - 84000000 \Rightarrow 168000000$
 $168000000 \div 100 = 1680000$
STS will make a profit of \$1,680,000.
48. $214302 \div 32 \Rightarrow 6696.9375$
On average, 6,697 employees work at each location.
49. $-\$23,486 + (-\$39,583) = -\$63,069$
50. $-\$32,871 + \$29,783 = -\$3,088$
51. $291 \times (-\$3) = -\873

52. $-\$63,408 \div 12 = -\$5,284$

54. $487 \times (-\$12) = -\$5,844$

53. 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.

Exercises Set A, p. 33

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

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

5. 400

7. -830

9. $\underline{2}65,472$; 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.

11. 5,000

13. $32,948 + 6,804 + 15,695 + 415 + 7,739 = 63,601$

$$\begin{array}{r} 15. \quad 21,335 \\ \quad 4,000 \\ \quad 9,000 \\ \quad 4,000 \\ + \quad 5,000 \\ \hline 22,000 \end{array}$$

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

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

Mary bought 230 items.

$$\begin{array}{r} 19. \quad 4,072 \\ \quad 10,000 \\ - \quad 6,000 \\ \hline 4,000 \end{array}$$

22. $130 \boxed{-} 42 \boxed{=} \Rightarrow 88$

Sam must order 88 packages.

25. $\$21 + (-\$47) = -\$26$

$$\begin{array}{r} 28. \quad \times \quad 5,931 \\ \quad \quad 835 \\ \hline \quad 29 \, 655 \\ \quad 177 \, 93 \\ \quad 4 \, 744 \, 8 \\ \hline 4,952,385 \end{array}$$

$$\begin{array}{r} 31. \quad 7,870 \\ \times \quad 60,000 \\ \hline 47,220,000 \end{array}$$

2. 20,000

4. Thirty billion, eight hundred sixty million dollars

6. 9,000

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

10. 4,000,000

12. $47 + 385 + 87 + 439 + 874 = 1,832$

$$\begin{array}{r} 14. \quad 318,936 \\ \quad 70,000 \\ \quad 80,000 \\ \quad 70,000 \\ + \quad 90,000 \\ \hline 310,000 \end{array}$$

$$\begin{array}{r} 16. \quad 2,612 \\ \quad 700 \\ \quad 900 \\ \quad 300 \\ + \quad 700 \\ \hline 2,600 \end{array}$$

18. $92 \boxed{+} 87 \boxed{+} 96 \boxed{+} 85 \boxed{+} 72 \boxed{+} 84 \boxed{+} 57 \boxed{+} 98 \boxed{=} \Rightarrow 671$

Kiesha had 671 points.

$$\begin{array}{r} 20. \quad 56,539,090 \\ \quad 80,000,000 \\ - \quad 30,000,000 \\ \hline 50,000,000 \end{array}$$

$$\begin{array}{r} 21. \quad 55,632 \\ \quad 80,000 \\ - \quad 30,000 \\ \hline 50,000 \end{array}$$

23. $840 \boxed{-} 596 \boxed{=} \Rightarrow 244$

The number of fan belts to order is 244.

24. $(-32) + (-27) = -59$

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

27. $-36 - (-18) =$
 $-36 + (+18) = -18$

$$\begin{array}{r} 29. \quad \times \quad 1,987 \\ \quad \quad 394 \\ \hline \quad 7 \, 948 \\ \quad 178 \, 83 \\ \quad 596 \, 1 \\ \hline 782,878 \end{array}$$

$$\begin{array}{r} 30. \quad 33 \\ \times \quad 500 \\ \hline 16,500 \end{array}$$

$$\begin{array}{r} 32. \quad 7,000 \\ \times \quad 30 \\ \hline 210,000 \end{array}$$

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

$$\begin{array}{r} 33. \quad 3,100 \\ \times \quad 500 \\ \hline 1,550,000 \end{array}$$

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

34. $28 \times 5 = 140$

The center requires 140 pieces of fruit.

35. $2017 \div 6 = 336.166667$

There are approximately 336 radios per thousand people.

36.
$$\begin{array}{r} 77 \\ 16 \overline{)1,232} \\ \underline{112} \\ 112 \\ \underline{112} \\ 0 \end{array} \quad \begin{array}{r} 77 \\ \times 16 \\ \hline 462 \\ 77 \\ \hline 1,232 \end{array}$$

37.
$$\begin{array}{r} 8,000 \\ 90 \overline{)748,431} \end{array}$$

$$\begin{array}{r} 8,805 \text{ R}6 \\ 85 \overline{)748,431} \\ \underline{680} \\ 684 \\ \underline{680} \\ 43 \\ \underline{0} \\ 431 \\ \underline{425} \\ 6 \end{array}$$

38. $483,000 \div 3,000 = 483 \div 3 = 161$

39. $73,460,000 \div 10,000 = 7,346 \div 1 = 7,346$

40. $2,988 \div 12 = 249$

The dealer can make 249 packages.

41. $2,032 \div 127 = 16$

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

42. $138(-\$7) = -\966

43. $-\$69,708 \div 12 = -\$5,809$

44. $34 - 21 = 13$

45. $\$72 \div 9 = \8

46. $(-3)(-12) - 5 = 36 - 5 = 31$

Exercises Set B, p. 35

1. 26

2. 5,400 hotels; 495,000 rooms; 70 countries; 20 percent minority-owned

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

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

5. 8,200

6. 350,000

7. 30,000

8. \$2,499; 4 is in the hundreds place. 9 is to the right and is more than 5. \$2,500.

9. 2,017; 2 is in the thousands place. 0 is to the right and is less than 5. 2,000 radios.

10. 2,000,000

11. 20,000,000,000

12. $72 + 385 + 29 + 523 + 816 = 1,825$

13. $46,867 + 7,083 + 723 + 5,209 = 59,882$

14.
$$\begin{array}{r} 3,097 \\ 400 \\ 800 \\ 500 \\ 900 \\ + 500 \\ \hline 3,100 \end{array}$$

15. 8,759

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

16.
$$\begin{array}{r} 6,288 \\ 4,300 \\ 600 \\ 1,300 \\ + 100 \\ \hline 6,300 \end{array}$$

17. $57 + 43 + 104 + 210 + 309 = 723$
Jorge has 723 cards.

18. $483 + 472 + 497 + 486 + 464 + 146 + 87 = 2,635$
The total hours worked was 2,635.

19.
$$\begin{array}{r} 182,902 \\ 400,000 \\ - 200,000 \\ \hline 200,000 \end{array}$$

20.
$$\begin{array}{r} 7,310 \\ 10,000 \\ - 5,000 \\ \hline 5,000 \end{array}$$

21.
$$\begin{array}{r} 74,385 \\ 100,000 \\ - 40,000 \\ \hline 60,000 \end{array}$$

22. $148 - 75 = 73$ Frieda still has 73 tickets.

23. $132 \square 119 \square \Rightarrow 13$ Veronica lost 13 pounds.

25. $\$35 + (-\$52) = -\$17$

27. $72 - (-42) = 72 + (+42) = 114$

29.
$$\begin{array}{r} 78,626 \\ \times \quad 87 \\ \hline 550\ 382 \\ 6290\ 08 \\ \hline 6,840,462 \end{array}$$

31.
$$\begin{array}{r} 40\ 5 \\ \times \quad 400 \\ \hline 162,000 \end{array}$$

33.
$$\begin{array}{r} 400 \\ \times \quad 500 \\ \hline 200,000 \end{array} \quad \begin{array}{r} 378 \\ \times \quad 546 \\ \hline 2\ 268 \\ 15\ 12 \\ 189\ 0 \\ \hline 206,388 \end{array}$$

35. $793 \square 9 \square \Rightarrow 88.1111111$
There are approximately 88 TVs per thousand people.

37.
$$\begin{array}{r} 500 \\ 300 \overline{)174,891} \end{array} \quad \begin{array}{r} 505\ R161 \\ 346 \overline{)174,891} \\ \underline{173\ 0} \\ 1\ 89 \\ \underline{0} \\ 1\ 891 \\ \underline{1\ 730} \\ 161 \end{array}$$

39. $68,650,000 \div 10,000 = 6,865 \div 1 = 6,865$

41. $15 + 32 + 18 + 12 = 77$ coins

43. $219 \times (-\$3) = -\657

45. $(\$72 + \$38 - \$21 + \$32) \times 3 = \$121 \times 3 = \363

24. $46 + (-58) = -12$

26. $37 - (-21) = 37 + 21 = 58$

28.
$$\begin{array}{r} 5,565 \\ \times \quad 839 \\ \hline 50\ 085 \\ 166\ 95 \\ 4452\ 0 \\ \hline 4,669,035 \end{array}$$

30.
$$\begin{array}{r} 283 \\ \times \quad 3,000 \\ \hline 849,000 \end{array}$$

32.
$$\begin{array}{r} 400 \\ \times \quad 70 \\ \hline 28,000 \end{array} \quad \begin{array}{r} 378 \\ \times \quad 72 \\ \hline 756 \\ 26\ 46 \\ \hline 27,216 \end{array}$$

34. $2 \times \$15 = \30 ; $\$30 - \$27 = \$3$
Two filters can be purchased at a savings of \$3.

36.
$$\begin{array}{r} 335 \\ 12 \overline{)4,020} \\ \underline{3\ 6\ 0} \\ 42 \\ \underline{36} \\ 60 \\ \underline{60} \end{array} \quad \begin{array}{r} 335 \\ \times \quad 12 \\ \hline 670 \\ 3\ 35 \\ \hline 4,020 \end{array}$$

38. $835,000 \div 5,000 = 835 \div 5 = 167$

40. $238 \square 2 \square \Rightarrow 119$ The stack has 119 countertops.

42. $-\$10,152 \div 4 = -\$2,538$

44. $63 + 126 \div 7 = 63 + 18 = 81$

46. $(-5)(-11) - 18 = 55 - 18 = 37$

Practice Test, p. 37

1. five hundred three

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

3. 84,300

4. 59,000

5. 80,000

6. 600,000

7. 5,017,135,632

8. 17,500,608

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

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

11. Negative nine hundred forty-nine million, seven hundred thousand dollars

12. Negative four billion, eight hundred three million dollars

$$\begin{array}{r} 13. \quad 900 \quad 863 \\ 1,000 \quad 983 \\ + 300 \quad + 271 \\ \hline 2,200 \quad 2,117 \end{array}$$

$$\begin{array}{r} 14. \quad 1,000 \quad 987 \\ - 300 \quad - 346 \\ \hline 700 \quad 641 \end{array}$$

$$\begin{array}{r} 15. \quad 900 \quad 892 \\ \times 50 \quad \times 46 \\ \hline 45,000 \quad 5 \ 352 \\ \hline 35 \ 68 \\ \hline 41,032 \end{array}$$

$$\begin{array}{r} 16. \quad 80 \quad 75 \text{ R}46 \\ 50 \overline{)4,021} \quad 53 \overline{)4,021} \\ \underline{3 \ 71} \\ 311 \\ \underline{265} \\ 46 \end{array}$$

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. $28 \boxed{\times} 2 \boxed{=} \Rightarrow 56$
 $56 \boxed{\times} 5 \boxed{=} \Rightarrow 280$
280 pieces of fruit are required.

23. $16 \boxed{\times} 3 \boxed{=} \Rightarrow 48$
48 pages are devoted to reviews.

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. $186 \times (-\$11) = -\$2,046$

28. $-\$26,136 \div 12 = -\$2,178$

29. $133 \div 7 \times (-4) + 26 =$
 $19 \times (-4) + 26 =$
 $-76 + 26 = -50$

30. $(\$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.
$$\begin{array}{r} \text{zero missing} \\ \downarrow \\ 12 \overline{)6,108} \quad 12 \overline{)6,108} \\ \underline{6 \ 0} \quad \underline{6 \ 0} \\ 108 \quad 10 \\ \underline{108} \quad \underline{0} \\ 108 \quad 108 \end{array}$$

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.

Challenge Problem p. 39

$$\begin{array}{r} 1. \quad 120 \quad 500 \\ \quad 135 \quad - 420 \\ \quad + 165 \quad \hline \quad 420 \quad 80 \text{ units} \end{array}$$

Case Studies

1-1, p. 40

1. Amtrak: $(\$242 \times 4) + (\$40 \times 2) = \$1,048$ Airplane: $(\$443 \times 4) + (\$40 \times 2) = \$1,852$
Individual Cars: $(\$244 + \$125) \times 4 = \$1,476$ Limo Liner: $((\$242 - \$60) \times 4) + (\$20 \times 2) = \768
2-Car Carpool: $(\$244 + \$125) \times 2 = \$738$

2. $\$1,140 - \$738 = \$402$ savings by two-car carpool $\$1,140 - \$768 = \$372$ 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. $\$372$ savings for one trip $\times 12$ trips = $\$4,464$ savings in a year

1-2, p. 40

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 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. $18 \text{ squares} \div 3 \text{ squares} = 6 \text{ boxes}$; $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
24 pounds 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. 41

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

Chapter 2 Review of Fractions

Section Exercises

2-1, p. 49

1. proper
 2. improper
 3. improper
 4. proper
 5. proper
 6. improper
7.
$$\begin{array}{r} 1\frac{5}{7} \\ 7\overline{)12} \\ \underline{7} \\ 5 \end{array}$$
 8.
$$\begin{array}{r} 1\frac{1}{20} \\ 20\overline{)21} \\ \underline{20} \\ 1 \end{array}$$
 9.
$$\begin{array}{r} 1 \\ 18\overline{)18} \\ \underline{18} \end{array}$$
 10.
$$\begin{array}{r} 2\frac{3}{7} \\ 7\overline{)17} \\ \underline{14} \\ 3 \end{array}$$
 11.
$$\begin{array}{r} 2 \\ 8\overline{)16} \\ \underline{16} \end{array}$$
 12.
$$\begin{array}{r} 24\frac{3}{16} \\ 16\overline{)387} \\ \underline{32} \\ 67 \\ \underline{64} \\ 3 \end{array}$$
13. $\frac{1,300}{1,000} = \frac{13}{10} = 1\frac{3}{10}$ phones per person
 14. $\frac{1,500}{1,000} = \frac{3}{2} = 1\frac{1}{2}$ phones per person
 15. $(4 \times 6) + 1 = 25; \frac{25}{4}$
 16. $(5 \times 27) + 2 = (135) + 2 = 137; \frac{137}{5}$
 17. $(3 \times 2) + 1 = 7; \frac{7}{3}$
 18. $(5 \times 3) + 4 = 19; \frac{19}{5}$
 19. $(8 \times 1) + 5 = 13; \frac{13}{8}$
 20. $(3 \times 6) + 2 = 20; \frac{20}{3}$
 21. $\frac{12 \div 3}{15 \div 3} = \frac{4}{5}$
 22. $\frac{12 \div 4}{20 \div 4} = \frac{3}{5}$
 23. $\frac{20 \div 4}{24 \div 4} = \frac{5}{6}$
 24. $\frac{18 \div 18}{36 \div 18} = \frac{1}{2}$
 25. $\frac{24 \div 12}{36 \div 12} = \frac{2}{3}$
 26. $\frac{13 \div 13}{39 \div 13} = \frac{1}{3}$
 27. $\frac{400 \text{ million}}{9,000 \text{ million}} = \frac{2}{45}$
 28. $\frac{4,000 \text{ million}}{24,000 \text{ million}} = \frac{1}{6}$
29.
$$\begin{array}{r} 1 \text{ R}15 \\ 21\overline{)36} \\ \underline{21} \\ 15 \end{array} \quad \begin{array}{r} 1 \text{ R}6 \\ 15\overline{)21} \\ \underline{15} \\ 6 \end{array} \quad \begin{array}{r} 2 \text{ R}3 \\ 6\overline{)15} \\ \underline{12} \\ 3 \end{array} \quad \begin{array}{r} 2 \text{ R}0 \\ 3\overline{)6} \\ \underline{6} \\ 0 \end{array} \quad \begin{array}{r} 2 \\ 3\overline{)6} \\ \underline{6} \\ 0 \end{array} \quad \text{GCD} = 3 \quad \frac{21}{36} = \frac{21 \div 3}{36 \div 3} = \frac{7}{12}$$
 30.
$$\begin{array}{r} 1 \text{ R}9 \\ 15\overline{)24} \\ \underline{15} \\ 9 \end{array} \quad \begin{array}{r} 1 \text{ R}6 \\ 9\overline{)15} \\ \underline{9} \\ 6 \end{array} \quad \begin{array}{r} 1 \text{ R}3 \\ 6\overline{)9} \\ \underline{6} \\ 3 \end{array} \quad \begin{array}{r} 2 \text{ R}0 \\ 3\overline{)6} \\ \underline{6} \\ 0 \end{array} \quad \text{GCD} = 3 \quad \frac{15}{24} = \frac{15 \div 3}{24 \div 3} = \frac{5}{8}$$
 31.
$$\begin{array}{r} 2 \text{ R}12 \\ 18\overline{)48} \\ \underline{36} \\ 12 \end{array} \quad \begin{array}{r} 1 \text{ R}6 \\ 12\overline{)18} \\ \underline{12} \\ 6 \end{array} \quad \begin{array}{r} 2 \text{ R}0 \\ 6\overline{)12} \\ \underline{12} \\ 0 \end{array} \quad \text{GCD} = 6 \quad \frac{18}{48} = \frac{18 \div 6}{48 \div 6} = \frac{3}{8}$$
 32.
$$\begin{array}{r} 2 \text{ R}10 \\ 15\overline{)40} \\ \underline{30} \\ 10 \end{array} \quad \begin{array}{r} 1 \text{ R}5 \\ 10\overline{)15} \\ \underline{10} \\ 5 \end{array} \quad \begin{array}{r} 2 \text{ R}0 \\ 5\overline{)10} \\ \underline{10} \\ 0 \end{array} \quad \text{GCD} = 5 \quad \frac{15}{40} = \frac{15 \div 5}{40 \div 5} = \frac{3}{8}$$
 33. $\frac{2}{8\overline{)16}} \quad \frac{3 \times 2}{8 \times 2} = \frac{6}{16}$
 34. $\frac{4}{5\overline{)20}} \quad \frac{4 \times 4}{5 \times 4} = \frac{16}{20}$
 35. $\frac{4}{8\overline{)32}} \quad \frac{3 \times 4}{8 \times 4} = \frac{12}{32}$
 36. $\frac{3}{9\overline{)27}} \quad \frac{5 \times 3}{9 \times 3} = \frac{15}{27}$
 37. $\frac{5}{3\overline{)15}} \quad \frac{1 \times 5}{3 \times 5} = \frac{5}{15}$
 38. $\frac{3}{5\overline{)15}} \quad \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$

2-2, p. 57

$$\begin{array}{r} 1. \quad \frac{1}{9} \\ \frac{2}{9} \\ + \frac{5}{9} \\ \hline \frac{8}{9} \end{array}$$

$$\begin{array}{r} 4. \quad \frac{5}{8} = \frac{15}{24} \\ + \frac{7}{12} = + \frac{14}{24} \\ \hline \frac{29}{24} = 1\frac{5}{24} \end{array}$$

$$\begin{array}{r} 7. \quad 51\frac{5}{18} = 51\frac{20}{72} \\ + 86\frac{9}{24} = + 86\frac{27}{72} \\ \hline 137\frac{47}{72} \end{array}$$

$$\begin{array}{r} 10. \quad 3\frac{5}{9} = 3\frac{20}{36} \\ 5\frac{1}{12} = 5\frac{3}{36} \\ + 2\frac{2}{3} = + 2\frac{24}{36} \\ \hline 10\frac{47}{36} = 11\frac{11}{36} \end{array}$$

$$\begin{array}{r} 13. \quad \frac{3}{4} = \frac{21}{28} \\ - \frac{5}{7} = - \frac{20}{28} \\ \hline \frac{1}{28} \end{array}$$

$$\begin{array}{r} 16. \quad 21\frac{3}{5} = 21\frac{6}{10} = 20\frac{16}{10} \\ - 12\frac{7}{10} = - 12\frac{7}{10} = - 12\frac{7}{10} \\ \hline 8\frac{9}{10} \end{array}$$

$$\begin{array}{r} 19. \quad 8\frac{1}{3} \\ - 5 \\ \hline 3\frac{1}{3} \end{array}$$

$$\begin{array}{r} 2. \quad \frac{7}{8} \\ + \frac{5}{8} \\ \hline \frac{12}{8} = 1\frac{4}{8} = 1\frac{1}{2} \end{array}$$

$$\begin{array}{r} 5. \quad 4\frac{5}{6} = 4\frac{10}{12} \\ + 7\frac{1}{2} = + 7\frac{6}{12} \\ \hline 11\frac{16}{12} = 12\frac{4}{12} = 12\frac{1}{3} \end{array}$$

$$\begin{array}{r} 8. \quad 5\frac{7}{12} = 5\frac{7}{12} \\ 3\frac{1}{4} = 3\frac{3}{12} \\ + 2\frac{2}{3} = + 2\frac{8}{12} \\ \hline 10\frac{18}{12} = 11\frac{6}{12} = 11\frac{1}{2} \end{array}$$

$$\begin{array}{r} 11. \quad \frac{7}{8} \\ - \frac{3}{8} \\ \hline \frac{4}{8} = \frac{1}{2} \end{array}$$

$$\begin{array}{r} 14. \quad 9\frac{2}{3} = 9\frac{4}{6} \\ - 6\frac{1}{2} = - 6\frac{3}{6} \\ \hline 3\frac{1}{6} \end{array}$$

$$\begin{array}{r} 17. \quad 15\frac{8}{15} = 15\frac{32}{60} \\ - 7\frac{5}{12} = - 7\frac{25}{60} \\ \hline 8\frac{7}{60} \end{array}$$

$$\begin{array}{r} 20. \quad 12\frac{1}{5} = 11\frac{6}{5} \\ - 7\frac{4}{5} = - 7\frac{4}{5} \\ \hline 4\frac{2}{5} \end{array}$$

$$\begin{array}{r} 3. \quad \frac{5}{6} = \frac{25}{30} \\ + \frac{7}{15} = + \frac{14}{30} \\ \hline \frac{39}{30} = 1\frac{9}{30} = 1\frac{3}{10} \end{array}$$

$$\begin{array}{r} 6. \quad 23\frac{5}{12} = 23\frac{20}{48} \\ + 48\frac{7}{16} = + 48\frac{21}{48} \\ \hline 71\frac{41}{48} \end{array}$$

$$\begin{array}{r} 9. \quad \frac{7}{8} = \frac{21}{24} \\ 2\frac{3}{24} = 2\frac{3}{24} \\ + 6\frac{1}{6} = + 6\frac{4}{24} \\ \hline 8\frac{28}{24} = 9\frac{4}{24} = 9\frac{1}{6} \end{array}$$

$$\begin{array}{r} 12. \quad \frac{8}{9} \\ - \frac{2}{9} \\ \hline \frac{6}{9} = \frac{2}{3} \end{array}$$

$$\begin{array}{r} 15. \quad 15 = 14\frac{9}{9} \\ - 12\frac{7}{9} = - 12\frac{7}{9} \\ \hline 2\frac{2}{9} \end{array}$$

$$\begin{array}{r} 18. \quad 23\frac{1}{8} = 23\frac{3}{24} = 22\frac{27}{24} \\ - \frac{7}{12} = - \frac{14}{24} = - \frac{14}{24} \\ \hline 22\frac{13}{24} \end{array}$$

$$\begin{array}{r} 21. \quad 11\frac{3}{4} + 11\frac{3}{4} + 18\frac{5}{8} = \\ 11\frac{6}{8} + 11\frac{6}{8} + 18\frac{5}{8} = 40\frac{17}{8} = \\ 42\frac{1}{8} \text{ yards} \end{array}$$

$$22. 42\frac{3}{8} + 37\frac{5}{8} + 12\frac{3}{8} + 23\frac{3}{4} =$$

$$42\frac{3}{8} + 37\frac{5}{8} + 12\frac{3}{8} + 23\frac{6}{8} =$$

$$114\frac{17}{8} = 116\frac{1}{8} \text{ feet}$$

$$24. 4\frac{4}{5} + 4\frac{4}{5} + 4\frac{4}{5} + 7\frac{3}{8} + 7\frac{3}{8} =$$

$$4\frac{32}{40} + 4\frac{32}{40} + 4\frac{32}{40} + 7\frac{15}{40} + 7\frac{15}{40} =$$

$$26\frac{126}{40} = 29\frac{3}{20} \text{ inches}$$

$$26. 12 - 10\frac{3}{4} = 11\frac{4}{4} - 10\frac{3}{4} = 1\frac{1}{4} \text{ feet}$$

$$28. 8\frac{3}{4} + 8\frac{3}{4} = 16\frac{6}{4} = 17\frac{2}{4} = 17\frac{1}{2}$$

$$36 - 17\frac{1}{2} = 35\frac{2}{2} - 17\frac{1}{2} = 18\frac{1}{2} \text{ inches}$$

2-3, p. 64

$$1. \frac{3}{8} \times \frac{4}{5} = \frac{3}{10}$$

$$2. \frac{5}{7} \times \frac{1}{6} = \frac{5}{42}$$

$$3. \frac{23}{4} \times \frac{35}{9} = \frac{805}{36} = 22\frac{13}{36}$$

$$4. \frac{3}{8} \times \frac{24}{1} = 9$$

$$5. \frac{12}{7}$$

$$6. \frac{5}{3}$$

$$7. \frac{1}{9}$$

$$8. \frac{1}{12}$$

$$9. 5\frac{4}{7} = \frac{39}{7}; \frac{7}{39}$$

$$10. 3\frac{3}{8} = \frac{27}{8}; \frac{8}{27}$$

$$11. \frac{5}{8} \div \frac{3}{4} = \frac{5}{8} \times \frac{4}{3} = \frac{5}{6}$$

$$12. \frac{3}{5} \div \frac{9}{10} = \frac{3}{5} \times \frac{10}{9} = \frac{2}{3}$$

$$13. 2\frac{2}{5} \div 1\frac{1}{7} = \frac{12}{5} \div \frac{8}{7} = \frac{12}{5} \times \frac{7}{8} = \frac{21}{10} = 2\frac{1}{10}$$

$$14. 5\frac{1}{4} \div 2\frac{2}{3} = \frac{21}{4} \div \frac{8}{3} = \frac{21}{4} \times \frac{3}{8} = \frac{63}{32} = 1\frac{31}{32}$$

$$15. \frac{3}{4} \div 5 = \frac{3}{4} \div \frac{5}{1} = \frac{3}{4} \times \frac{1}{5} = \frac{3}{20}$$

$$16. 75 \div 1\frac{1}{8} = \frac{75}{1} \div \frac{9}{8} = \frac{75}{1} \times \frac{8}{9} = \frac{200}{3}$$

$$= 66\frac{2}{3}, \text{ or } 67 \text{ sheets}$$

$$17. 200 \div 9\frac{3}{4} = 200 \div \frac{39}{4} = \frac{200}{1} \times \frac{4}{39} = \frac{800}{39}$$

$$= 20\frac{20}{39} \text{ rooms}$$

$$18. 40 \div 8\frac{3}{4} = 40 \div \frac{35}{4} = \frac{40}{1} \times \frac{4}{35} = \frac{32}{7}$$

$$= 4\frac{4}{7}, 4 \text{ boxes}$$

$$19. 21 \div 3\frac{1}{2} = \frac{21}{1} \div \frac{7}{2} = \frac{21}{1} \times \frac{2}{7} = 6$$

$$20. 4 \times 18\frac{5}{8} = \frac{4}{1} \times \frac{149}{8} = \frac{149}{2} = 74\frac{1}{2} \text{ feet}$$

Theoretically, 6 cabinets will exactly fit on the wall.

$$21. 4 \times 4\frac{1}{8} = \frac{4}{1} \times \frac{33}{8} = \frac{33}{2} = 16\frac{1}{2} \text{ feet}$$

Yes, if no more than a total of $\frac{1}{8}$ inch is needed for spacing between the desks.

$$22. 3\frac{1}{4} \times 2 = \frac{13}{4} \times \frac{2}{1} = \frac{13}{2} = 6\frac{1}{2} \text{ inches long}$$

$$28 \div 2 = 14 \text{ inches wide}$$

$$6\frac{1}{2} \text{ inches long} \times 14 \text{ inches wide}$$

Exercises Set A, p. 71

$$1. \text{ Examples will vary. } \frac{3}{5}, \frac{7}{9}, \frac{5}{8}, \frac{100}{301}, \frac{41}{53}; \text{ proper fractions}$$

$$2. \text{ Examples will vary. } \frac{4}{4}, \frac{8}{5}, \frac{12}{4}, \frac{132}{89}, \frac{7}{1}; \text{ improper fractions}$$

$$3. 20\frac{2}{3}$$

$$4. 7$$

$$5. 8\frac{1}{2}$$

$$6. \frac{(6 \times 5) + 5}{6} = \frac{35}{6}$$

$$7. \frac{(3 \times 4) + 1}{3} = \frac{13}{3}$$

$$8. \frac{(3 \times 33) + 1}{3} = \frac{100}{3}$$

$$9. \frac{15 \div 3}{18 \div 3} = \frac{5}{6}$$

$$10. \frac{20 \div 10}{30 \div 10} = \frac{2}{3}$$

$$11. \frac{30 \div 6}{48 \div 6} = \frac{5}{8}$$

$$12. \frac{5 \times 2}{6 \times 2} = \frac{10}{12}$$

$$13. \frac{5 \times 4}{8 \times 4} = \frac{20}{32}$$

$$14. \frac{9 \times 13}{11 \times 13} = \frac{117}{143}$$

$$15. \frac{15}{105} = \frac{3}{21} = \frac{1}{7} \text{ of the employees}$$

$$16. \begin{array}{r} 2 \overline{)4 \ 12 \ 16} \\ \underline{2 \overline{)2 \ 6 \ 8}} \\ \underline{2 \overline{)1 \ 3 \ 4}} \\ \underline{2 \overline{)1 \ 3 \ 2}} \\ \underline{3 \overline{)1 \ 3 \ 1}} \\ 1 \ 1 \ 1 \end{array}$$

$$17. \begin{array}{r} 2 \overline{)56 \ 24 \ 12 \ 42} \\ \underline{2 \overline{)28 \ 12 \ 6 \ 21}} \\ \underline{2 \overline{)14 \ 6 \ 3 \ 21}} \\ \underline{3 \overline{)7 \ 3 \ 3 \ 21}} \\ \underline{7 \overline{)7 \ 1 \ 1 \ 7}} \\ 1 \ 1 \ 1 \ 1 \end{array}$$

$$2 \times 2 \times 2 \times 2 \times 3 = 48$$

$$2 \times 2 \times 2 \times 3 \times 7 = 168$$

$$18. \begin{array}{r} 2 \overline{)1 \ 5 \ 10 \ 6} \\ \underline{3 \overline{)1 \ 5 \ 5 \ 3}} \\ \underline{5 \overline{)1 \ 5 \ 5 \ 1}} \\ 1 \ 1 \ 1 \ 1 \end{array}$$

$$19. \frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$$

$$20. \frac{2}{5} + \frac{2}{3} = \frac{6}{15} + \frac{10}{15} = \frac{16}{15} = 1\frac{1}{15}$$

$$2 \times 3 \times 5 = 30$$

$$21. 7\frac{1}{2} + 4\frac{3}{8} = 7\frac{4}{8} + 4\frac{3}{8} = 11\frac{7}{8}$$

$$22. 11\frac{5}{6} + 8\frac{2}{3} = 11\frac{5}{6} + 8\frac{4}{6} = 19\frac{9}{6} = 20\frac{3}{6} = 20\frac{1}{2}$$

$$23. 12\frac{3}{8} + 16\frac{5}{8} = 28\frac{8}{8} = 29 \text{ yards}$$

$$24. \frac{5}{12} - \frac{3}{12} = \frac{2}{12} = \frac{1}{6}$$

$$25. \begin{array}{r} 7\frac{4}{5} = 7\frac{8}{10} \\ -4\frac{1}{2} = -4\frac{5}{10} \\ \hline 3\frac{3}{10} \end{array}$$

$$26. \begin{array}{r} 5 = 4\frac{5}{5} \\ -3\frac{2}{5} = -3\frac{2}{5} \\ \hline 1\frac{3}{5} \end{array}$$

$$27. \begin{array}{r} 4\frac{5}{6} = 4\frac{5}{6} \\ -3\frac{1}{3} = -3\frac{2}{6} \\ \hline 1\frac{3}{6} = 1\frac{1}{2} \end{array}$$

$$28. \begin{array}{r} 6 = 5\frac{8}{8} \\ -3\frac{5}{8} = -3\frac{5}{8} \\ \hline 2\frac{3}{8} \text{ feet} \end{array}$$

$$29. \frac{5}{18}$$

$$30. \frac{5}{1} \times \frac{2}{3} = \frac{10}{3} = 3\frac{1}{3}$$

$$31. \frac{28}{9} \times \frac{9}{2} = 28$$

$$32. \frac{8}{5}$$

$$33. 4$$