SOLUTIONS MANUAL

Mathematics for Business

NINTH EDITION

STANLEY SALZMAN • GARY CLENDENEN • CHARLES MILLER

Online Instructor's Solutions Manual
to accompany

Mathematics for Business

Ninth Edition

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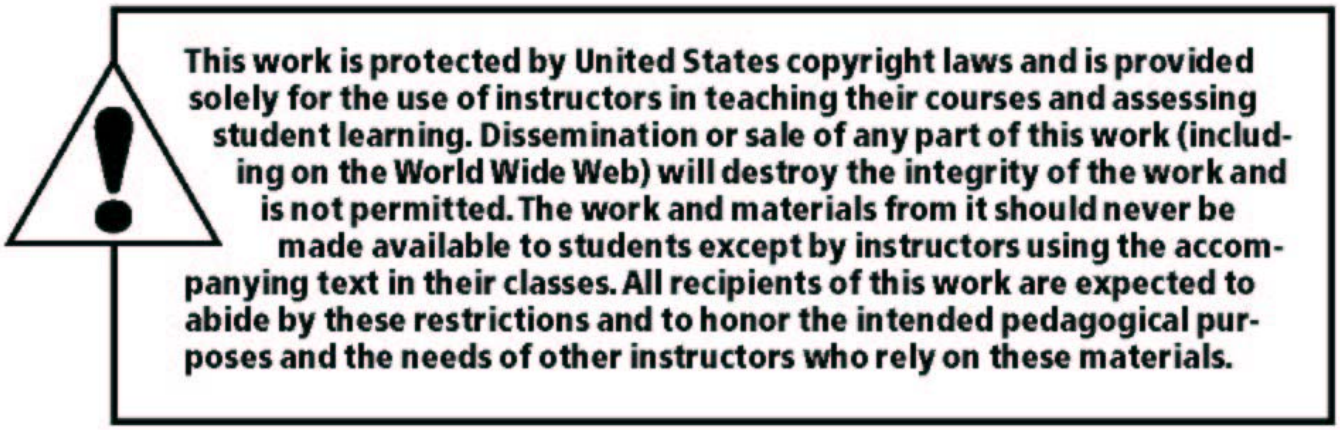

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PREFACE

This manual provides complete solutions for the exercises in *Mathematics for Business*, Ninth Edition, by Stanley A. Salzman, Gary Clendenen, and Charles D. Miller. Solutions are provided for all section-level exercises and supplementary exercises (including those contained in the appendices) and for all the Review Exercise, Business Applications, and Cumulative Review exercises.

The supplement should be used as an aid to mastering the course work. Students, try to solve the exercises on your own before you refer to the solutions in this manual. Then, if you have difficulty, study the solutions. A conscientious effort has been made to write solutions so as to be consistent with the methods and format used in the textbook examples.

Special thanks go to Dallas Freeman and to Dean R. Richmond for technical support and for the careful accuracy check of this supplement.

CONTENTS

Chapter 1 Problem Solving and Operations with Fractions

1.1 Problem Solving

1. $80+75+135+40+52=382$
Beth rode 382 miles.

2. $325+75+137+495+105=1137$
1137 pounds of these coffees were sold.

3. $1815-1348=467$
467 passengers remain on the ship.

4. $\$250,000-\$15,000=\$235,000$
There is \$235,000 more in the large machines than in the small machines.

5. $2.5-0.8=1.7$
The required reduction is 1.7 billion tons.

6. $8900\times24\times365=77,964,000$
The increase in world population in one year is 77,964,000.

7. $2425-582+634=2477$
The car will weigh 2477 pounds.

8. $\$2324-\$734+\$568=\$2158$
The balance in the account is \$2158.

9. $24,000,000-7000=23,993,000$
There are 23,993,000 small and midsize businesses.

10. $21,375-9250=12,125$
The weight of the firewood is 12,125 pounds.

11. $900\times365=328,500$
328,500 World War II veterans are projected to die in the next year.

12. $\$30,000\times12,600=378,000,000$
The total cost to the bank is \$378,000,000.

13. $\$239-\$89=\$150$
$\$150\times5=\$750$
The amount saved is \$750.

14. $\$625-\$75=\$550$
$\$550\times4=\$2200$
The amount saved is \$2200.

15. $(6\times\$1256)+(15\times\$895)=\$20,961$
The total cost is \$20,961.

16. $(27\times\$986)+(12\times\$179)=\$28,770$
The total cost is \$28,770.

17. $1250-(30\times25)=500$
There are 500 balcony seats
$500\div25=20$
There must be 20 seats in each row.

18. $(24\times30)\div6=120$
A total of 120 boxes of wreaths are shipped.
$120\div5=24$
Each shop will receive 24 boxes.

19. $4.4\times8=35.2$
35.2 hours would be needed.

20. $\$2679.99\times14=\$37,519.86$
The cost is \$37,519.86.

21. $38\div0.58\approx65.5$
There are 65.5 million shares.

22. $42\div0.65\approx64.6$
There are 64.6 million shares.

23. $221\div8.359\approx26$
26 coins can be produced.

24. $57.13\div1.62\approx35$
35 dosages can be made.

25. **(a)** $100\times0.0043=0.43$
The pile is 0.43 inch high.

(b) $1000\times0.0043=4.3$
The pile is 4.3 inches high.

26. **(a)** $43 \div 0.0043 = 10{,}000$
There are 10,000 bills.

(b) $10{,}000 \times \$20 = \$200{,}000$
You would have \$200,000.

27. **(a)** $42 \times 4.3 = 180.6$
The manager worked 180.6 hours each month.

(b) $\$3250 \div 180.6 \approx \$18.00$
The manager earned \$18.00 per hour.

28. **(a)** $48 \times 4.3 = 206.4$
The assistant manager worked 206.4 hours each month.

(b) $\$3539.76 \div 206.4 \approx \$17.15$
The assistant manager earned \$17.15 per hour.

29. $\$246{,}500 \times 0.06 = \$14{,}790$
The fee was \$14,790.

30. $6.5 \times \$8.70 = \$56.55$
Her total cost was \$56.55.

1.2 Addition and Subtraction of Fractions

1. $1\frac{3}{8} = \frac{(1\times 8)+3}{8} = \frac{11}{8}$

2. $2\frac{4}{5} = \frac{(2\times 5)+4}{5} = \frac{14}{5}$

3. $4\frac{1}{4} = \frac{(4\times 4)+1}{4} = \frac{17}{4}$

4. $2\frac{8}{11} = \frac{(2\times 11)+8}{11} = \frac{30}{11}$

5. $22\frac{7}{8} = \frac{(22\times 8)+7}{8} = \frac{183}{8}$

6. $15\frac{2}{3} = \frac{(15\times 3)+2}{3} = \frac{47}{3}$

7. $12\frac{5}{8} = \frac{(12\times 8)+5}{8} = \frac{101}{8}$

8. $17\frac{5}{8} = \frac{(17\times 8)+5}{8} = \frac{141}{8}$

9. $\frac{8}{16} = \frac{8\div 8}{16\div 8} = \frac{1}{2}$

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

11. $\frac{40}{75} = \frac{40\div 5}{75\div 5} = \frac{8}{15}$

12. $\frac{36}{42} = \frac{36\div 6}{42\div 6} = \frac{6}{7}$

13. $\frac{25}{40} = \frac{25\div 5}{40\div 5} = \frac{5}{8}$

14. $\frac{27}{45} = \frac{27\div 9}{45\div 9} = \frac{3}{5}$

15. $\frac{120}{150} = \frac{120\div 30}{150\div 30} = \frac{4}{5}$

16. $\frac{24}{64} = \frac{24\div 8}{64\div 8} = \frac{3}{8}$

17. $\frac{132}{144} = \frac{132\div 12}{144\div 12} = \frac{11}{12}$

18. $\frac{40}{96} = \frac{40\div 8}{96\div 8} = \frac{5}{12}$

19. $\frac{96}{180} = \frac{96\div 12}{180\div 12} = \frac{8}{15}$

20. $\frac{32}{128} = \frac{32\div 32}{128\div 32} = \frac{1}{4}$

21. $2\overline{)\,\begin{matrix}3\\7\\6\\1\end{matrix}}$ $\qquad \frac{7}{2} = 3\frac{1}{2}$

22. $5\overline{)\,\begin{matrix}1\\9\\5\\4\end{matrix}}$ $\qquad \frac{9}{5} = 1\frac{4}{5}$

23. $20\overline{)76}$, $\frac{60}{16}$ $\quad \frac{76}{20}=3\frac{16}{20}=3\frac{4}{5}$

24. $15\overline{)42}$, $\frac{30}{12}$ $\quad \frac{42}{15}=2\frac{12}{15}=2\frac{4}{5}$

25. $11\overline{)14}$, $\frac{11}{3}$ $\quad \frac{14}{11}=1\frac{3}{11}$

26. $8\overline{)55}$, $\frac{48}{7}$ $\quad \frac{55}{8}=6\frac{7}{8}$

27. $15\overline{)21}$, $\frac{15}{6}$ $\quad \frac{21}{15}=1\frac{6}{15}=1\frac{2}{5}$

28. $52\overline{)85}$, $\frac{52}{33}$ $\quad \frac{85}{52}=1\frac{33}{52}$

29. $64\overline{)124}$, $\frac{64}{60}$ $\quad \frac{124}{64}=1\frac{60}{64}=1\frac{15}{16}$

30. $35\overline{)190}$, $\frac{175}{15}$ $\quad \frac{190}{35}=5\frac{15}{35}=5\frac{3}{7}$

31. $32\overline{)81}$, $\frac{64}{17}$ $\quad \frac{81}{32}=2\frac{17}{32}$

32. $64\overline{)360}$, $\frac{320}{40}$ $\quad \frac{360}{64}=5\frac{40}{64}=5\frac{5}{8}$

33. Answers will vary.

34. Answers will vary.

35. $\frac{2}{5}+\frac{1}{5}=\frac{2+1}{5}=\frac{3}{5}$

36. $\frac{2}{9}+\frac{4}{9}=\frac{2+4}{9}=\frac{6}{9}=\frac{2}{3}$

37. $\frac{7}{10}+\frac{3}{20}=\frac{14}{20}+\frac{3}{20}=\frac{14+3}{20}=\frac{17}{20}$

38. $\frac{3}{8}+\frac{1}{4}=\frac{3}{8}+\frac{2}{8}=\frac{3+2}{8}=\frac{5}{8}$

39. $\frac{7}{12}+\frac{8}{15}=\frac{35}{60}+\frac{32}{60}=\frac{35+32}{60}=\frac{67}{60}=1\frac{7}{60}$

40. $\frac{5}{8}+\frac{7}{12}=\frac{15}{24}+\frac{14}{24}=\frac{15+14}{24}=\frac{29}{24}=1\frac{5}{24}$

41. $\frac{9}{11}+\frac{1}{22}=\frac{18}{22}+\frac{1}{22}=\frac{18+1}{22}=\frac{19}{22}$

42. $\frac{5}{6}+\frac{7}{9}=\frac{15}{18}+\frac{14}{18}=\frac{15+14}{18}=\frac{29}{18}=1\frac{11}{18}$

43. $\frac{3}{4}+\frac{5}{9}+\frac{1}{3}=\frac{27}{36}+\frac{20}{36}+\frac{12}{36}$
$=\frac{27+20+12}{36}=\frac{59}{36}=1\frac{23}{36}$

44. $\frac{1}{4}+\frac{1}{8}+\frac{1}{12}=\frac{6}{24}+\frac{3}{24}+\frac{2}{24}$
$=\frac{6+3+2}{24}=\frac{11}{24}$

45. $\frac{5}{6}+\frac{3}{4}+\frac{5}{8}=\frac{20}{24}+\frac{18}{24}+\frac{15}{24}$
$=\frac{20+18+15}{24}=\frac{53}{24}=2\frac{5}{24}$

46. $\frac{7}{10}+\frac{8}{15}+\frac{5}{6}=\frac{21}{30}+\frac{16}{30}+\frac{25}{30}$
$=\frac{21+16+25}{30}=\frac{62}{30}=2\frac{2}{30}=2\frac{1}{15}$

47.
$$\begin{array}{r} 82\frac{3}{5} \\ +\,15\frac{1}{5} \\ \hline 97\frac{4}{5} \end{array}$$

48.
$$\begin{array}{r} 25\frac{2}{7} \\ +\,14\frac{3}{7} \\ \hline 39\frac{5}{7} \end{array}$$

49.
$$\begin{array}{r} 51\frac{1}{4} = 51\frac{1}{4} \\ +\,29\frac{1}{2} = 29\frac{2}{4} \\ \hline 80\frac{3}{4} \end{array}$$

50.
$$\begin{array}{r} 38\frac{5}{6} = 38\frac{15}{18} \\ 29\frac{1}{3} = 29\frac{6}{18} \\ +\,47\frac{1}{2} = 47\frac{9}{18} \\ \hline 114\frac{30}{18} \end{array}$$
$$114\frac{30}{18} = 114 + 1\frac{12}{18} = 115\frac{12}{18} = 115\frac{2}{3}$$

51.
$$\begin{array}{r} 32\frac{3}{4} = 32\frac{18}{24} \\ 6\frac{1}{3} = 6\frac{8}{24} \\ +\,14\frac{5}{8} = 14\frac{15}{24} \\ \hline 52\frac{41}{24} \end{array}$$
$$52\frac{41}{24} = 52 + 1\frac{17}{24} = 53\frac{17}{24}$$

52.
$$\begin{array}{r} 16\frac{7}{10} = 16\frac{28}{40} \\ 26\frac{1}{5} = 26\frac{8}{40} \\ +\,8\frac{3}{8} = 8\frac{15}{40} \\ \hline 50\frac{51}{40} \end{array}$$
$$50\frac{51}{40} = 50 + 1\frac{11}{40} = 51\frac{11}{40}$$

53.
$$\begin{array}{r} 89\frac{5}{9} = 89\frac{5}{9} \\ 10\frac{1}{3} = 10\frac{3}{9} \\ +\,87\frac{1}{9} = 87\frac{1}{9} \\ \hline 186\frac{9}{9} \end{array}$$
$$186\frac{9}{9} = 186 + 1 = 187$$

54.
$$\begin{array}{r} 74\frac{1}{5} = 74\frac{14}{70} \\ 58\frac{3}{7} = 58\frac{30}{70} \\ +\,21\frac{3}{10} = 21\frac{21}{70} \\ \hline 153\frac{65}{70} \end{array}$$
$$153\frac{65}{70} = 153\frac{13}{14}$$

55. $\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$

56. $\frac{11}{12} - \frac{5}{12} = \frac{6}{12} = \frac{1}{2}$

57. $\frac{2}{3} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6} = \frac{4-1}{6} = \frac{3}{6} = \frac{1}{2}$

58. $\frac{7}{8} - \frac{1}{2} = \frac{7}{8} - \frac{4}{8} = \frac{7-4}{8} = \frac{3}{8}$

59. $\frac{5}{12} - \frac{1}{16} = \frac{20}{48} - \frac{3}{48} = \frac{17}{48}$

60. $\frac{5}{6} - \frac{7}{9} = \frac{15}{18} - \frac{14}{18} = \frac{15-14}{18} = \frac{1}{18}$

61. $\frac{3}{4} - \frac{5}{12} = \frac{9}{12} - \frac{5}{12} = \frac{9-5}{12} = \frac{4}{12} = \frac{1}{3}$

62. $\frac{5}{7} - \frac{1}{3} = \frac{15}{21} - \frac{7}{21} = \frac{15-7}{21} = \frac{8}{21}$

63.
$$\begin{array}{r} 16\frac{3}{4} = 16\frac{6}{8} \\ -\,12\frac{3}{8} = 12\frac{3}{8} \\ \hline 4\frac{3}{8} \end{array}$$

64.
$$\begin{array}{r} 25\frac{13}{24} = 25\frac{13}{24} \\ \underline{-\ 18\frac{5}{12} = 18\frac{10}{24}} \\ 7\frac{3}{24} = 7\frac{1}{8} \end{array}$$

65.
$$\begin{array}{r} 9\frac{7}{8} = 9\frac{21}{24} \\ \underline{-\ 6\frac{5}{12} = 6\frac{10}{24}} \\ 3\frac{11}{24} \end{array}$$

66.
$$\begin{array}{r} 24\frac{5}{6} = 24\frac{15}{18} \\ \underline{-\ 18\frac{5}{9} = 18\frac{10}{18}} \\ 6\frac{5}{18} \end{array}$$

67.
$$\begin{array}{r} 71\frac{3}{8} = 71\frac{9}{24} \\ \underline{-\ 62\frac{1}{3} = 62\frac{8}{24}} \\ 9\frac{1}{24} \end{array}$$

68.
$$\begin{array}{r} 19\frac{5}{6} = 19\frac{10}{12} \\ \underline{-\ 12\frac{3}{4} = 12\frac{9}{12}} \\ 7\frac{1}{12} \end{array}$$

69.
$$\begin{array}{r} 19 \quad = 18\frac{4}{4} \\ \underline{-\ 12\frac{3}{4} = 12\frac{3}{4}} \\ 6\frac{1}{4} \end{array}$$

70.
$$\begin{array}{r} 374 \quad = 373\frac{6}{6} \\ \underline{-\ 211\frac{5}{6} = 211\frac{5}{6}} \\ 162\frac{1}{6} \end{array}$$

71. Answers will vary.

72. Answers will vary.

73. Answers will vary.

74. Answers will vary.

75. $\frac{1}{8}+\frac{1}{4}+\frac{2}{5}=\frac{5}{40}+\frac{10}{40}+\frac{16}{40}$

$=\frac{5+10+16}{40}=\frac{31}{40}$

The total length of the screw is $\frac{31}{40}$ inch.

76. $\frac{1}{5}+\frac{1}{3}+\frac{1}{4}=\frac{12}{60}+\frac{20}{60}+\frac{15}{60}$

$=\frac{12+20+15}{60}=\frac{47}{60}$

The total length of the bolt is $\frac{47}{60}$ inch.

77. $1\frac{7}{8}+\frac{1}{2}+1\frac{2}{3}+\frac{1}{3}=1\frac{21}{24}+\frac{12}{24}+1\frac{16}{24}+\frac{8}{24}$

$=2\frac{57}{24}=4\frac{9}{24}=4\frac{3}{8}$

The total distance around the wetlands reserve is $4\frac{3}{8}$ miles.

78. $9\frac{7}{8}+5\frac{1}{8}+9\frac{7}{8}+5\frac{1}{8}=28\frac{16}{8}=30$

The length of trim needed is 30 inches.

79. $\frac{15}{16}-\left(\frac{3}{8}+\frac{3}{8}\right)=\frac{15}{16}-\frac{6}{8}=\frac{15}{16}-\frac{12}{16}=\frac{3}{16}$

The diameter of the hole is $\frac{3}{16}$ inch.

80. $\frac{7}{8}-\left(\frac{1}{6}+\frac{1}{3}\right)=\frac{7}{8}-\left(\frac{1}{6}+\frac{2}{6}\right)=\frac{7}{8}-\frac{3}{6}$

$=\frac{7}{8}-\frac{1}{2}=\frac{7}{8}-\frac{4}{8}=\frac{3}{8}$

There is $\frac{3}{8}$ liter of fluid remaining.

81. $5\frac{1}{2}+6\frac{1}{4}+3\frac{3}{4}+7$

$=5\frac{2}{4}+6\frac{1}{4}+3\frac{3}{4}+7$

$=21\frac{6}{4}=22\frac{2}{4}=22\frac{1}{2}$

Hernando drove $22\frac{1}{2}$ hours.

82. $3\frac{1}{4}+2\frac{3}{8}+7\frac{1}{2}+1\frac{5}{16}$

$=3\frac{4}{16}+2\frac{6}{16}+7\frac{8}{16}+1\frac{5}{16}$

$=13\frac{23}{16}=14\frac{7}{16}$

A total of $14\frac{7}{16}$ tons of vegetables were sold.

83. $8\frac{7}{8}-\left(2\frac{1}{2}+3+1\frac{3}{4}\right)$

$=8\frac{7}{8}-\left(2\frac{2}{4}+3+1\frac{3}{4}\right)$

$=8\frac{7}{8}-\left(6\frac{5}{4}\right)$

$=8\frac{7}{8}-\left(7\frac{1}{4}\right)$

$=8\frac{7}{8}-7\frac{2}{8}$

$=1\frac{5}{8}$

$1\frac{5}{8}$ cubic yards of concrete remain in the truck.

84. $15-\left(3\frac{3}{4}+4\frac{1}{8}+3\frac{7}{8}\right)$

$=15-\left(3\frac{6}{8}+4\frac{1}{8}+3\frac{7}{8}\right)$

$=15-\left(10\frac{14}{8}\right)$

$=15-\left(11\frac{6}{8}\right)$

$=14\frac{4}{4}-11\frac{3}{4}$

$=3\frac{1}{4}$

84. (continued)

There are $3\frac{1}{4}$ yards of material remaining.

85. $4\frac{1}{2}+5\frac{1}{4}+3\frac{3}{4}+6\frac{1}{3}$

$=4\frac{6}{12}+5\frac{3}{12}+3\frac{9}{12}+6\frac{4}{12}$

$=18\frac{22}{12}=18+1\frac{10}{12}=18+1\frac{5}{6}=19\frac{5}{6}$

A total of $19\frac{5}{6}$ cases were sold.

86. $3\frac{3}{8}+5\frac{1}{2}+4\frac{3}{4}+3\frac{1}{4}+6$

$=3\frac{3}{8}+5\frac{4}{8}+4\frac{6}{8}+3\frac{2}{8}+6$

$=21\frac{15}{8}=21+1\frac{7}{8}=22\frac{7}{8}$

Altogether, she worked $22\frac{7}{8}$ hours.

87. $40-\left(8\frac{1}{4}+6\frac{1}{6}+7\frac{2}{3}+8\frac{3}{4}\right)$

$=40-\left(8\frac{3}{12}+6\frac{2}{12}+7\frac{8}{12}+8\frac{9}{12}\right)$

$=40-\left(29\frac{22}{12}\right)$

$=40-\left(30\frac{10}{12}\right)$

$=40-\left(30\frac{5}{6}\right)$

$=39\frac{6}{6}-30\frac{5}{6}$

$=9\frac{1}{6}$

Julie worked $9\frac{1}{6}$ hours on Friday.

88. $34\frac{1}{2}+23\frac{3}{4}+34\frac{1}{2}+23\frac{3}{4}$

$=34\frac{2}{4}+23\frac{3}{4}+34\frac{2}{4}+23\frac{3}{4}$

$=114\frac{10}{4}$

$=116\frac{2}{4}$

$=116\frac{1}{2}$

The length needed is $116\frac{1}{2}$ inches.

89. $518\frac{3}{4}-\left(108\frac{1}{4}+162\frac{3}{8}+143\frac{1}{2}\right)$

$=518\frac{3}{4}-\left(108\frac{2}{8}+162\frac{3}{8}+143\frac{4}{8}\right)$

$=518\frac{3}{4}-\left(413\frac{9}{8}\right)$

$=518\frac{3}{4}-\left(414\frac{1}{8}\right)$

$=518\frac{6}{8}-414\frac{1}{8}$

$=104\frac{5}{8}$

The length of the fourth side is $104\frac{5}{8}$ feet.

90. $527\frac{1}{24}-\left(107\frac{2}{3}+150\frac{3}{4}+138\frac{5}{8}\right)$

$=527\frac{1}{24}-\left(107\frac{16}{24}+150\frac{18}{24}+138\frac{15}{24}\right)$

$=527\frac{1}{24}-\left(395\frac{49}{24}\right)$

$527\frac{1}{24}-397\frac{1}{24}$

$=130$

The length of the fourth side is 130 feet.

1.3 Multiplication and Division of Fractions

1. $\frac{5}{\cancel{8}_{4}}\times\frac{\overset{1}{\cancel{2}}}{3}=\frac{5\times1}{4\times3}=\frac{5}{12}$

2. $\frac{\overset{1}{\cancel{3}}}{8}\times\frac{1}{\cancel{6}_{2}}=\frac{1\times1}{8\times2}=\frac{1}{16}$

3. $\frac{9}{10}\times\frac{11}{16}=\frac{9\times11}{10\times16}=\frac{99}{160}$

4. $1\frac{1}{4}\times3\frac{1}{2}=\frac{5}{4}\times\frac{7}{2}=\frac{5\times7}{4\times2}=\frac{35}{8}=4\frac{3}{8}$

5. $1\frac{2}{3}\times2\frac{7}{10}=\frac{\overset{1}{\cancel{5}}}{\cancel{3}_{1}}\times\frac{\overset{9}{\cancel{27}}}{\cancel{10}_{2}}=\frac{1\times9}{1\times2}=\frac{9}{2}=4\frac{1}{2}$

6. $6\times4\frac{2}{3}=\frac{\overset{2}{\cancel{6}}}{1}\times\frac{14}{\cancel{3}_{1}}\times=\frac{2\times14}{1\times1}=28$

7. $4\frac{3}{5}\times15=\frac{23}{\cancel{5}_{1}}\times\frac{\overset{3}{\cancel{15}}}{1}=\frac{23\times3}{1\times1}=69$

8. $\frac{3}{4}\times\frac{8}{9}\times2\frac{1}{2}=\frac{\overset{1}{\cancel{3}}}{\cancel{4}_{1}}\times\frac{\overset{2}{\cancel{8}}}{\cancel{9}_{3}}\times\frac{5}{2}$

$=\frac{1\times2\times5}{1\times3\times2}=\frac{10}{6}=1\frac{4}{6}=1\frac{2}{3}$

9. $\frac{5}{9}\times2\frac{1}{4}\times3\frac{2}{3}=\frac{5}{\cancel{9}_{1}}\times\frac{\overset{1}{\cancel{9}}}{4}\times\frac{11}{3}$

$=\frac{5\times1\times11}{1\times4\times3}=\frac{55}{12}=4\frac{7}{12}$

10. $\frac{2}{3}\times\frac{9}{8}\times3\frac{1}{4}=\frac{\overset{1}{\cancel{2}}}{\cancel{3}_{1}}\times\frac{\overset{3}{\cancel{9}}}{\cancel{8}_{4}}\times\frac{13}{4}$

$=\frac{1\times3\times13}{1\times4\times4}=\frac{39}{16}=2\frac{7}{16}$

11. $12\times 2\frac{1}{2}\times 3=\frac{\overset{6}{\cancel{12}}}{1}\times\frac{5}{\underset{1}{\cancel{2}}}\times\frac{3}{1}$

$=\frac{6\times 5\times 3}{1\times 1\times 1}=90$

12. $18\times 1\frac{2}{3}\times 2=\frac{\overset{6}{\cancel{18}}}{1}\times\frac{5}{\underset{1}{\cancel{3}}}\times\frac{2}{1}$

$=\frac{6\times 5\times 2}{1\times 1\times 1}=60$

13. $\frac{1}{6}\div\frac{1}{3}=\frac{1}{\underset{2}{\cancel{6}}}\times\frac{\overset{1}{\cancel{3}}}{1}=\frac{1\times 1}{2\times 1}=\frac{1}{2}$

14. $\frac{5}{8}\div\frac{3}{16}=\frac{5}{\underset{1}{\cancel{8}}}\times\frac{\overset{2}{\cancel{16}}}{3}=\frac{5\times 2}{1\times 3}=\frac{10}{3}=3\frac{1}{3}$

15. $\frac{13}{20}\div\frac{26}{30}=\frac{\overset{1}{\cancel{13}}}{\underset{2}{\cancel{20}}}\times\frac{\overset{3}{\cancel{30}}}{\underset{2}{\cancel{26}}}=\frac{1\times 3}{2\times 2}=\frac{3}{4}$

16. $\frac{7}{8}\div\frac{3}{4}=\frac{7}{\underset{2}{\cancel{8}}}\times\frac{\overset{1}{\cancel{4}}}{3}=\frac{7\times 1}{2\times 3}=\frac{7}{6}=1\frac{1}{6}$

17. $\frac{15}{16}\div\frac{5}{8}=\frac{\overset{3}{\cancel{15}}}{\underset{2}{\cancel{16}}}\times\frac{\overset{1}{\cancel{8}}}{\underset{1}{\cancel{5}}}=\frac{3\times 1}{2\times 1}=\frac{3}{2}=1\frac{1}{2}$

18. $\frac{12}{11}\div\frac{3}{22}=\frac{\overset{4}{\cancel{12}}}{\underset{1}{\cancel{11}}}\times\frac{\overset{2}{\cancel{22}}}{\underset{1}{\cancel{3}}}=\frac{4\times 2}{1\times 1}=\frac{8}{1}=8$

19. $2\frac{1}{2}\div 3\frac{3}{4}=\frac{5}{2}\div\frac{15}{4}=\frac{\overset{1}{\cancel{5}}}{\underset{1}{\cancel{2}}}\times\frac{\overset{2}{\cancel{4}}}{\underset{3}{\cancel{15}}}=\frac{1\times 2}{1\times 3}=\frac{2}{3}$

20. $6\frac{1}{2}\div\frac{1}{2}=\frac{13}{2}\div\frac{1}{2}$

$=\frac{13}{\underset{1}{\cancel{2}}}\times\frac{\overset{1}{\cancel{2}}}{1}=\frac{13\times 1}{1\times 1}=\frac{13}{1}=13$

21. $3\frac{1}{8}\div\frac{15}{16}=\frac{25}{8}\div\frac{15}{16}$

$=\frac{\overset{5}{\cancel{25}}}{\underset{1}{\cancel{8}}}\times\frac{\overset{2}{\cancel{16}}}{\underset{3}{\cancel{15}}}=\frac{5\times 2}{1\times 3}=\frac{10}{3}=3\frac{1}{3}$

22. $5\frac{1}{2}\div 4=\frac{11}{2}\div\frac{4}{1}$

$=\frac{11}{2}\times\frac{1}{4}=\frac{11\times 1}{2\times 4}=\frac{11}{8}=1\frac{3}{8}$

23. $6\div 1\frac{1}{4}=6\div\frac{5}{4}$

$=\frac{6}{1}\times\frac{4}{5}=\frac{6\times 4}{5}=\frac{24}{5}=4\frac{4}{5}$

24. $3\div 1\frac{1}{4}=3\div\frac{5}{4}$

$=\frac{3}{1}\times\frac{4}{5}=\frac{3\times 4}{5}=\frac{12}{5}=2\frac{2}{5}$

25. Answers will vary.

26. Answers will vary.

27. $\$8\times 1\frac{1}{2}=\frac{\$\overset{4}{\cancel{8}}}{1}\times\frac{3}{\underset{1}{\cancel{2}}}=\frac{\$4\times 3}{1\times 1}=\$12$

28. $\$14\times 1\frac{1}{2}=\frac{\$\overset{7}{\cancel{14}}}{1}\times\frac{3}{\underset{1}{\cancel{2}}}=\frac{\$7\times 3}{1\times 1}=\$21$

29. $\$17\times 1\frac{1}{2}=\frac{\$17}{1}\times\frac{3}{2}$

$=\frac{\$17\times 3}{1\times 2}=\frac{\$51}{2}=\$25.50$

30. $\$9\times 1\frac{1}{2}=\frac{\$9}{1}\times\frac{3}{2}$

$=\frac{\$9\times 3}{1\times 2}=\frac{\$27}{2}=\$13.50$

31. $\$10.50\times 1\frac{1}{2}=\frac{\$21}{2}\times\frac{3}{2}$

$=\frac{\$21\times 3}{2\times 2}=\frac{\$63}{4}=\$15.75$

32. $\$18.50 \times 1\frac{1}{2} = \frac{\$37}{2} \times \frac{3}{2}$

$= \frac{\$37 \times 3}{2 \times 2} = \frac{\$111}{4} = \$27.75$

33. $0.8 = \frac{8}{10} = \frac{4}{5}$

34. $0.6 = \frac{6}{10} = \frac{3}{5}$

35. $0.24 = \frac{24}{100} = \frac{6}{25}$

36. $0.64 = \frac{64}{100} = \frac{16}{25}$

37. $0.73 = \frac{73}{100}$

38. $0.625 = \frac{625}{1000} = \frac{5}{8}$

39. $0.875 = \frac{875}{1000} = \frac{7}{8}$

40. $0.805 = \frac{805}{1000} = \frac{161}{200}$

41. $0.0375 = \frac{375}{10,000} = \frac{3}{80}$

42. $0.8125 = \frac{8125}{10,000} = \frac{13}{16}$

43. $0.1875 = \frac{1875}{10,000} = \frac{3}{16}$

44. $0.3125 = \frac{3125}{10,000} = \frac{5}{16}$

45. 3.5218 to the nearest tenth is 3.5.
Locate the tenths digit and draw a line.

$3.5|218$

Since the digit to the right of the line is 2, leave the tenths digit alone.

3.5218 to the nearest hundredth is 3.52.
Locate the hundredths digit and draw a line.

$3.52|18$

Since the digit to the right of the line is 1, leave the hundredths digit alone.

46. 4.8361 to the nearest tenth is 4.8.
Locate the tenths digit and draw a line.

$4.8|361$

Since the digit to the right of the line is 3, leave the tenths digit alone.

4.8361 to the nearest hundredth is 4.84.
Locate the hundredths digit and draw a line.

$4.83|61$

Since the digit to the right of the line is 6, increase the tenths digit by 1.

47. 0.0837 to the nearest tenth is 0.1.
Locate the tenths digit and draw a line.

$0.0|837$

Since the digit to the right of the line is 8, increase the tenths digit by 1.

0.0837 to the nearest hundredth is 0.08.
Locate the hundredths digit and draw a line.

$0.08|37$

Since the digit to the right of the line is 3, leave the hundredths digit alone.

48. 2.548 to the nearest tenth is 2.5.
Locate the tenths digit and draw a line.

$2.5|48$

Since the digit to the right of the line is 4, leave the tenths digit alone.

2.548 to the nearest hundredth is 2.55.
Locate the hundredths digit and draw a line.

$2.54|8$

Since the digit to the right of the line is 8, increase the tenths digit by 1.

49. 8.643 to the nearest tenth is 8.6.
Locate the tenths digit and draw a line.

$$8.6|43$$

Since the digit to the right of the line is 4, leave the tenths digit alone.

8.643 to the nearest hundredth is 8.64.
Locate the hundredths digit and draw a line.

$$8.64|3$$

Since the digit to the right of the line is 3, leave the hundredths digit alone.

50. 86.472 to the nearest tenth is 86.5.
Locate the tenths digit and draw a line.

$$86.4|72$$

Since the digit to the right of the line is 7, increase the tenths digit by 1.

86.472 to the nearest hundredth is 86.47.
Locate the hundredths digit and draw a line.

$$86.47|2$$

Since the digit to the right of the line is 2, leave the hundredths digit alone.

51. 58.956 to the nearest tenth is 59.0.
Locate the tenths digit and draw a line.

$$58.9|56$$

Since the digit to the right of the line is 5, increase the tenths digit by 1 (which increases the ones digit by 1).

58.956 to the nearest hundredth is 58.96.
Locate the hundredths digit and draw a line.

$$58.95|6$$

Since the digit to the right of the line is 6, increase the hundredths digit by 1.

52. 8.065 to the nearest tenth is 8.1.
Locate the tenths digit and draw a line.

$$8.0|65$$

Since the digit to the right of the line is 6, increase the tenths digit by 1.

8.065 to the nearest hundredth is 8.07.
Locate the hundredths digit and draw a line.

$$8.06|5$$

Since the digit to the right of the line is 5, increase the hundredths digit by 1.

53. 23.047 to the nearest tenth is 23.0.
Locate the tenths digit and draw a line.

$$23.0|47$$

Since the digit to the right of the line is 4, leave the tenths digit alone.

23.047 to the nearest hundredth is 23.05.
Locate the hundredths digit and draw a line.

$$23.04|7$$

Since the digit to the right of the line is 7, increase the hundredths digit by 1.

54. 65.464 to the nearest tenth is 65.5.
Locate the tenths digit and draw a line.

$$65.4|64$$

Since the digit to the right of the line is 6, increase the tenths digit by 1.

65.464 to the nearest hundredth is 65.46.
Locate the hundredths digit and draw a line.

$$65.46|4$$

Since the digit to the right of the line is 4, leave the hundredths digit alone.

55. 39.496 to the nearest tenth is 39.5.
Locate the tenths digit and draw a line.

$$39.4|96$$

Since the digit to the right of the line is 9, increase the tenths digit by 1.

39.496 to the nearest hundredth is 39.50.
Locate the hundredths digit and draw a line.

$$39.49|6$$

Since the digit to the right of the line is 6, increase the hundredths digit by 1 (which increases the tenths digit by 1).

56. 92.337 to the nearest tenth is 92.3.
Locate the tenths digit and draw a line.

$$92.3|37$$

Since the digit to the right of the line is 3, leave the tenths digit alone.

92.337 to the nearest hundredth is 92.34.
Locate the hundredths digit and draw a line.

$$92.33|7$$

Since the digit to the right of the line is 7, increase the hundredths digit by 1.

57. $\frac{3}{4} = 0.75$

$$4\overline{)3.00}\quad \begin{array}{r}0.75\\ \underline{28}\\ 20\\ \underline{20}\\ 0\end{array}$$

58. $\frac{7}{8} = 0.875$

$$8\overline{)7.000}\quad \begin{array}{r}0.875\\ \underline{64}\\ 60\\ \underline{56}\\ 40\\ \underline{40}\\ 0\end{array}$$

59. $\frac{3}{8} = 0.375$

$$8\overline{)3.000}\quad \begin{array}{r}0.375\\ \underline{24}\\ 60\\ \underline{56}\\ 40\\ \underline{40}\\ 0\end{array}$$

60. $\frac{5}{6} = 0.8\overline{3} \approx 0.833$

$$6\overline{)5.0000}\quad \begin{array}{r}0.8333\\ \underline{48}\\ 20\\ \underline{18}\\ 20\\ \underline{18}\\ 20\\ \underline{18}\\ 2\end{array}$$

61. $\frac{1}{6} = 0.1\overline{6} \approx 0.167$

$$6\overline{)1.0000}\quad \begin{array}{r}0.1666\\ \underline{6}\\ 40\\ \underline{36}\\ 40\\ \underline{36}\\ 40\\ \underline{36}\\ 4\end{array}$$

62. $\frac{2}{3} = 0.\overline{6} \approx 0.667$

$$3\overline{)2.0000}\quad \begin{array}{r}0.6666\\ \underline{18}\\ 20\\ \underline{18}\\ 20\\ \underline{18}\\ 20\\ \underline{18}\\ 2\end{array}$$

63. $\frac{13}{16} = 0.8125 \approx 0.813$

$$16\overline{)13.0000}\quad \begin{array}{r}0.8125\\ \underline{128}\\ 20\\ \underline{16}\\ 40\\ \underline{32}\\ 80\\ \underline{80}\\ 0\end{array}$$

64. $\frac{19}{50} = 0.38$

$$50\overline{)19.00}\quad \begin{array}{r}0.38\\ \underline{150}\\ 400\\ \underline{400}\\ 0\end{array}$$

65. $\frac{8}{25} = 0.32$

$$25\overline{)8.00}\quad \begin{array}{r}0.32\\ \underline{75}\\ 50\\ \underline{50}\\ 0\end{array}$$

66. $\frac{1}{3} = 0.\overline{3} \approx 0.333$

$$3\overline{)1.0000}\quad \begin{array}{r}0.3333\\ \underline{9}\\ 10\\ \underline{9}\\ 10\\ \underline{9}\\ 10\\ \underline{9}\\ 1\end{array}$$

67. $\frac{1}{99} = 0.\overline{01} \approx 0.010$

$$\begin{array}{r} 0.0101 \\ 99\overline{)1.0000} \\ \underline{99} \\ 10 \\ \underline{0} \\ 100 \\ \underline{99} \\ 1 \end{array}$$

68. $\frac{73}{93} \approx 0.785$

$$\begin{array}{r} 0.7849 \\ 93\overline{)73.0000} \\ \underline{651} \\ 790 \\ \underline{744} \\ 460 \\ \underline{372} \\ 880 \\ \underline{837} \\ 43 \end{array}$$

69. $\frac{5}{8} = 0.625$

$$\begin{array}{r} 0.625 \\ 8\overline{)5.000} \\ \underline{48} \\ 20 \\ \underline{16} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

70. $\frac{5}{9} = 0.\overline{5} \approx 0.555$

$$\begin{array}{r} 0.5555 \\ 9\overline{)5.0000} \\ \underline{45} \\ 50 \\ \underline{45} \\ 50 \\ \underline{45} \\ 50 \\ \underline{45} \\ 5 \end{array}$$

71. $\frac{5}{6} = 0.8\overline{3} \approx 0.833$

$$\begin{array}{r} 0.8333 \\ 6\overline{)5.0000} \\ \underline{48} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

72. $\frac{7}{16} = 0.4375 \approx 0.438$

$$\begin{array}{r} 0.4375 \\ 16\overline{)7.0000} \\ \underline{64} \\ 60 \\ \underline{48} \\ 120 \\ \underline{112} \\ 80 \\ \underline{80} \\ 0 \end{array}$$

73. Answers will vary.

74. Answers will vary.

75. Answers will vary.

76. Answers will vary.

77. $16 \times 2\frac{1}{4} = \frac{\overset{4}{\cancel{16}}}{1} \times \frac{9}{\underset{1}{\cancel{4}}} = \frac{4 \times 9}{1 \times 1} = 36$

Laura needs 36 yards of ribbon.

78. $345 \div 11\frac{1}{2} = \frac{345}{1} \div \frac{23}{2}$

$= \frac{\overset{15}{\cancel{345}}}{1} \times \frac{2}{\underset{1}{\cancel{23}}} = \frac{15 \times 2}{1 \times 1} = 30$

30 trips are required.

79. $11 \div \frac{1}{8} = 11 \times 8 = 88$

88 dispensers can be filled.

80. $10 \div \frac{5}{16} = \frac{\overset{2}{\cancel{10}}}{1} \times \frac{16}{\underset{1}{\cancel{5}}} = \frac{2 \times 16}{1 \times 1} = 32$

32 footings can be constructed.

81. $1314 \div 109\frac{1}{2} = \frac{1314}{1} \div \frac{219}{2}$

$= \frac{\overset{6}{\cancel{1314}}}{1} \times \frac{2}{\underset{1}{\cancel{219}}} = \frac{6 \times 2}{1 \times 1} = 12$

12 homes can be fitted with baseboards.

82. $1200 \div 7\frac{1}{2} = \frac{1200}{1} \div \frac{15}{2}$

$= \frac{\overset{80}{\cancel{1200}}}{1} \times \frac{2}{\underset{1}{\cancel{15}}} = \frac{80 \times 2}{1 \times 1} = 160$

160 acres can be fertilized.

83. $12\frac{1}{2} \times 1\frac{3}{4} = \frac{25}{2} \times \frac{7}{4} = \frac{25 \times 7}{2 \times 4} = \frac{175}{8} = 21\frac{7}{8}$

$21\frac{7}{8}$ ounces of chemical are needed.

84. $36 \times 37\frac{3}{4} = \frac{\overset{9}{\cancel{36}}}{1} \times \frac{151}{\underset{1}{\cancel{4}}} = \frac{9 \times 151}{1 \times 1} = 1359$

1359 pounds of roofing nails are needed.

85. $12\frac{3}{4} \times 28 = \frac{51}{\underset{1}{\cancel{4}}} \times \frac{\overset{7}{\cancel{28}}}{1} = \frac{51 \times 7}{1 \times 1} = 357$

$7\frac{1}{8} \times 16 = \frac{57}{\underset{1}{\cancel{8}}} \times \frac{\overset{2}{\cancel{16}}}{1} = \frac{57 \times 2}{1 \times 1} = 114$

$357 + 114 = 471$

471 gallons of fuel are used.

86. $6\frac{1}{2} \times 36 = \frac{13}{\underset{1}{\cancel{2}}} \times \frac{\overset{18}{\cancel{36}}}{1} = \frac{13 \times 18}{1 \times 1} = 234$

$3\frac{1}{8} \times 22 = \frac{25}{\underset{4}{\cancel{8}}} \times \frac{\overset{11}{\cancel{22}}}{1} = \frac{25 \times 11}{4 \times 1} = \frac{275}{4} = 68\frac{3}{4}$

$234 + 68\frac{3}{4} = 302\frac{3}{4}$

It takes a total of $302\frac{3}{4}$ minutes.

87. $40 \div \frac{2}{3} = \frac{\overset{20}{\cancel{40}}}{1} \times \frac{3}{\underset{1}{\cancel{2}}} = \frac{20 \times 3}{1 \times 1} = 60$

60 trips are needed.

88. $220 \times \frac{1}{5} = \frac{\overset{44}{\cancel{220}}}{1} \times \frac{1}{\underset{1}{\cancel{5}}} = \frac{44 \times 1}{1 \times 1} = 44$

44 cars were sold.

$220 - 44 = 176$

176 cars remain on the lot.

89. $135 \times 19\frac{1}{2} = \frac{135}{1} \times \frac{39}{2}$

$= \frac{135 \times 39}{1 \times 2} = \frac{5265}{2} = 2632\frac{1}{2}$

$2632\frac{1}{2}$ inches of steel tubing are needed.

90. $182 \times 61\frac{1}{2} = \frac{\overset{91}{\cancel{182}}}{1} \times \frac{123}{\underset{1}{\cancel{2}}}$

$= \frac{91 \times 123}{1 \times 1} = 11{,}193$

11,193 inches of wood are necessary.

Chapter 1 Review Exercises

1. $\frac{24}{40} = \frac{24 \div 8}{40 \div 8} = \frac{3}{5}$

2. $\frac{32}{64} = \frac{32 \div 32}{64 \div 32} = \frac{1}{2}$

3. $\frac{27}{81} = \frac{27 \div 27}{81 \div 27} = \frac{1}{3}$

4. $\frac{147}{294} = \frac{147 \div 147}{294 \div 147} = \frac{1}{2}$

5. $\frac{63}{70} = \frac{63 \div 7}{70 \div 7} = \frac{9}{10}$

6. $\frac{84}{132} = \frac{84 \div 12}{132 \div 12} = \frac{7}{11}$

7. $\frac{24}{1200} = \frac{24 \div 24}{1200 \div 24} = \frac{1}{50}$

8. $\frac{375}{1000} = \frac{375 \div 125}{1000 \div 125} = \frac{3}{8}$

9. $8\overline{)65}$ $\quad \frac{65}{8} = 8\frac{1}{8}$

$\underline{64}$

1

10. $12\overline{)56}$ $\quad \frac{56}{12} = 4\frac{8}{12} = 4\frac{2}{3}$

$\underline{48}$

8

11. $24\overline{)38}$ $\quad \frac{38}{24} = 1\frac{14}{24} = 1\frac{7}{12}$

$\underline{24}$

14

12. $7\overline{)55}$ $\quad \frac{55}{7} = 7\frac{6}{7}$

$\underline{49}$

6

13. $45\overline{)120}$ $\quad \frac{120}{45} = 2\frac{30}{45} = 2\frac{2}{3}$

$\underline{90}$

30

14. $24\overline{)196}$ $\quad \frac{196}{24} = 8\frac{4}{24} = 8\frac{1}{6}$

$\underline{192}$

4

15. $32\overline{)258}$ $\quad \frac{258}{32} = 8\frac{2}{32} = 8\frac{1}{16}$

$\underline{256}$

2

16. $64\overline{)194}$ $\quad \frac{194}{64} = 3\frac{2}{64} = 3\frac{1}{32}$

$\underline{192}$

2

17. $\frac{5}{8} + \frac{7}{12} = \frac{15}{24} + \frac{14}{24} = \frac{15+14}{24} = \frac{29}{24} = 1\frac{5}{24}$

18. $\frac{1}{5} + \frac{3}{10} + \frac{3}{8} = \frac{8}{40} + \frac{12}{40} + \frac{15}{40}$

$= \frac{8+12+15}{40} = \frac{35}{40} = \frac{7}{8}$

19. $\frac{5}{7} - \frac{1}{3} = \frac{15}{21} - \frac{7}{21} = \frac{15-7}{21} = \frac{8}{21}$

20. $\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12} = \frac{9-8}{12} = \frac{1}{12}$

21. $25\frac{1}{6} = 25\frac{1}{6}$

$+\ 46\frac{2}{3} = 46\frac{4}{6}$

$71\frac{5}{6}$

22. $18\frac{3}{5} = 18\frac{18}{30}$

$47\frac{7}{10} = 47\frac{21}{30}$

$+\ 25\frac{8}{15} = 25\frac{16}{30}$

$90\frac{55}{30} = 90 + 1\frac{25}{30}$

$= 91\frac{25}{30} = 91\frac{5}{6}$

23. $6\frac{7}{12} = 6\frac{7}{12}$

$-\ 2\frac{1}{3} = 2\frac{4}{12}$

$4\frac{3}{12} = 4\frac{1}{4}$

24. $92\frac{5}{16} = 92\frac{5}{16}$

$-\ 11\frac{1}{4} = 11\frac{4}{16}$

$81\frac{1}{16}$

25. $\$3.80 + \$2.75 = \$6.55$

The cost per square foot is \$6.55.

$\$6.55 \times 580 = \$3799$

The total cost is \$3799.

26. $3.4-1.6=1.8$

1.8 gallons are saved per flush.

$1.8\times 22\times 365=14,454$

14,454 gallons are saved in one year.

27. $5\frac{1}{2}+6\frac{1}{4}+3\frac{3}{4}+7=5\frac{2}{4}+6\frac{1}{4}+3\frac{3}{4}+7$

$=21\frac{6}{4}=22\frac{2}{4}=22\frac{1}{2}$

Desiree worked $22\frac{1}{2}$ hours.

28. $68\frac{1}{2}+37\frac{3}{8}+5\frac{3}{4}=68\frac{4}{8}+37\frac{3}{8}+5\frac{6}{8}$

$=110\frac{13}{8}=111\frac{5}{8}$

$111\frac{5}{8}$ gallons of paint were used.

$$\begin{array}{r} 147\frac{1}{2} = 147\frac{4}{8} = 146\frac{12}{8} \\ \underline{-\,111\frac{5}{8} = \;\;111\frac{5}{8} = \;\;111\frac{5}{8}} \\ 35\frac{7}{8} \end{array}$$

There are $35\frac{7}{8}$ gallons of paint remaining.

29.
$$\begin{array}{r} 202\frac{1}{8} = 202\frac{1}{8} \\ 370\frac{3}{4} = 370\frac{6}{8} \\ \underline{+\,274\frac{1}{2} = 274\frac{4}{8}} \\ 846\frac{11}{8} = 846+1\frac{3}{8} = 847\frac{3}{8} \end{array}$$

The three sides measure $847\frac{3}{8}$ feet.

$$\begin{array}{r} 1166\frac{7}{8} \\ \underline{-\,847\frac{3}{8}} \\ 319\frac{4}{8}=319\frac{1}{2} \end{array}$$

The length of the fourth side is $319\frac{1}{2}$ feet.

30.
$$\begin{array}{r} 12\frac{2}{3} = 12\frac{16}{24} \\ 16\frac{1}{8} = 16\frac{3}{24} \\ 15\frac{1}{2} = 15\frac{12}{24} \\ \underline{+\,10\frac{1}{6} = 10\frac{4}{24}} \\ 53\frac{35}{24}=53+1\frac{11}{24}=54\frac{11}{24} \end{array}$$

The total weight is $54\frac{11}{24}$ pounds.

31. $\frac{5}{\cancel{8}_{4}}\times\frac{\overset{1}{\cancel{2}}}{3}=\frac{5\times 1}{4\times 3}=\frac{5}{12}$

32. $\frac{1}{\cancel{3}_{1}}\times\frac{7}{8}\times\frac{\overset{1}{\cancel{3}}}{5}=\frac{1\times 7\times 1}{1\times 8\times 5}=\frac{7}{40}$

33. $\frac{1}{6}\div\frac{1}{3}=\frac{1}{\cancel{6}_{2}}\times\frac{\overset{1}{\cancel{3}}}{1}=\frac{1\times 1}{2\times 1}=\frac{1}{2}$

34. $10\div\frac{5}{8}=\frac{\overset{2}{\cancel{10}}}{1}\times\frac{8}{\cancel{5}_{1}}=\frac{2\times 8}{1\times 1}=16$

35. $2\frac{1}{2}\div 3\frac{3}{4}=\frac{5}{2}\div\frac{15}{4}=\frac{\overset{1}{\cancel{5}}}{\cancel{2}_{1}}\times\frac{\overset{2}{\cancel{4}}}{\cancel{15}_{3}}=\frac{1\times 2}{1\times 3}=\frac{2}{3}$

36. $3\frac{3}{4}\div\frac{27}{16}=\frac{15}{4}\div\frac{27}{16}$

$=\frac{\overset{5}{\cancel{15}}}{\cancel{4}_{1}}\times\frac{\overset{4}{\cancel{16}}}{\cancel{27}_{9}}=\frac{5\times 4}{1\times 9}=\frac{20}{9}=2\frac{2}{9}$

37. $12\frac{1}{2}\times 1\frac{2}{3}=\frac{25}{2}\times\frac{5}{3}=\frac{25\times 5}{2\times 3}=\frac{125}{6}=20\frac{5}{6}$

38. $12\frac{1}{3}\div 2=\frac{37}{3}\div\frac{2}{1}=\frac{37}{3}\times\frac{1}{2}$

$=\frac{37\times 1}{3\times 2}=\frac{37}{6}=6\frac{1}{6}$

39. $16.5\times\$0.48=\$7.92$

$3\times\$1.05=\$3.15$

$\$7.92+\$3.15=\$11.07$

The total amount is \$11.07.

$(3\times\$5)-\$11.07=\$3.93$

Barry got \$3.93 change.

40. $\$1.4\div\$0.39\approx3.59\approx3.6$

There are 3.6 million shares.

41. One-third is sold, so two-thirds is left.

$$\frac{2}{3}\times63\frac{3}{4}=\frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}}\times\frac{\overset{85}{\cancel{255}}}{\underset{2}{\cancel{4}}}=\frac{1\times85}{1\times2}=\frac{85}{2}=42\frac{1}{2}$$

There are $42\frac{1}{2}$ acres left.

42. $25,730\div10\frac{3}{8}=\frac{25,730}{1}\div\frac{83}{8}$

$$=\frac{\overset{310}{\cancel{25,730}}}{1}\div\frac{8}{\underset{1}{\cancel{83}}}=\frac{310\times8}{1\times1}=2480$$

2480 anchors can be manufactured.

43. $157\frac{1}{2}\div4\frac{3}{8}=\frac{315}{2}\div\frac{35}{8}$

$$=\frac{\overset{9}{\cancel{315}}}{\underset{1}{\cancel{2}}}\times\frac{\overset{4}{\cancel{8}}}{\underset{1}{\cancel{35}}}=\frac{9\times4}{1\times1}=36$$

36 pull cords can be made.

44. $\frac{1}{4}$ of the profits will be retained for remodeling costs, so $\frac{3}{4}$ will be disbursed equally to each of three partners.

$$\frac{\overset{1}{\cancel{3}}}{4}\times\frac{1}{\underset{1}{\cancel{3}}}\times\frac{\$562,200}{1}=\frac{1\times1\times\$562,200}{4\times1\times1}$$

$$=\frac{\overset{1}{\cancel{\$562,200}}}{4}=\$140,550$$

Each partner receives \$140,550.

45. $0.25=\frac{25}{100}=\frac{1}{4}$

46. $0.625=\frac{625}{1000}=\frac{5}{8}$

47. $0.93=\frac{93}{100}$

48. $0.005=\frac{5}{1000}=\frac{1}{200}$

49. 68.433 to the nearest tenth is 68.4.
Locate the tenths digit and draw a line.

$$68.4\vert33$$

Since the digit to the right of the line is 3, leave the tenths digit alone.

68.433 to the nearest hundredth is 68.43.
Locate the hundredths digit and draw a line.

$$68.43\vert3$$

Since the digit to the right of the line is 3, leave the hundredths digit alone.

50. 975.536 to the nearest tenth is 975.5.
Locate the tenths digit and draw a line.

$$975.5\vert36$$

Since the digit to the right of the line is 3, leave the tenths digit alone.

975.536 to the nearest hundredth is 975.54.
Locate the hundredths digit and draw a line.

$$975.53\vert6$$

Since the digit to the right of the line is 6, increase the hundredths digit by 1.

51. 0.3549 to the nearest tenth is 0.4.
Locate the tenths digit and draw a line.

$$0.3\vert549$$

Since the digit to the right of the line is 5, increase the tenths digit by 1.

0.3549 to the nearest hundredth is 0.35.
Locate the hundredths digit and draw a line.

$$0.35\vert49$$

Since the digit to the right of the line is 4, leave the hundredths digit alone.

52. 8.025 to the nearest tenth is 8.0.
Locate the tenths digit and draw a line.

$$8.0\,|\,25$$

Since the digit to the right of the line is 2, leave the tenths digit alone.

8.025 to the nearest hundredth is 8.03.
Locate the hundredths digit and draw a line.

$$8.02\,|\,5$$

Since the digit to the right of the line is 5, increase the hundredths digit by 1.

53. 6.965 to the nearest tenth is 7.0.
Locate the tenths digit and draw a line.

$$6.9\,|\,65$$

Since the digit to the right of the line is 6, increase the tenths digit by 1 (which increases the ones digit by 1).

6.965 to the nearest hundredth is 6.97.
Locate the hundredths digit and draw a line.

$$6.96\,|\,5$$

Since the digit to the right of the line is 5, increase the hundredths digit by 1.

54. 0.428 to the nearest tenth is 0.4.
Locate the tenths digit and draw a line.

$$0.4\,|\,28$$

Since the digit to the right of the line is 2, leave the tenths digit alone.

0.428 to the nearest hundredth is 0.43.
Locate the hundredths digit and draw a line.

$$0.42\,|\,8$$

Since the digit to the right of the line is 8, increase the hundredths digit by 1.

55. 0.955 to the nearest tenth is 1.0.
Locate the tenths digit and draw a line.

$$0.9\,|\,55$$

Since the digit to the right of the line is 5, increase the tenths digit by 1 (which increases the ones digit by 1).

0.955 to the nearest hundredth is 0.96.
Locate the hundredths digit and draw a line.

$$0.95\,|\,5$$

Since the digit to the right of the line is 5, increase the hundredths digit by 1.

56. 71.249 to the nearest tenth is 71.2.
Locate the tenths digit and draw a line.

$$71.2\,|\,49$$

Since the digit to the right of the line is 4, leave the tenths digit alone.

71.249 to the nearest hundredth is 71.25.
Locate the hundredths digit and draw a line.

$$71.24\,|\,9$$

Since the digit to the right of the line is 9, increase the hundredths digit by 1.

57. $\frac{5}{8} = 0.625$

$$\begin{array}{r} 0.625 \\ 8\overline{)5.000} \\ \underline{48} \\ 20 \\ \underline{16} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

58. $\frac{3}{4} = 0.75$

$$\begin{array}{r} 0.75 \\ 4\overline{)3.00} \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

59. $\frac{5}{6} = 8.\overline{3} \approx 0.833$

$$\begin{array}{r} 0.8333 \\ 6\overline{)5.0000} \\ \underline{48} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

60. $\frac{7}{16} \approx 0.438$

$$\begin{array}{r} 0.4375 \\ 16\overline{)7.0000} \\ \underline{64} \\ 60 \\ \underline{48} \\ 120 \\ \underline{112} \\ 80 \\ \underline{80} \\ 0 \end{array}$$

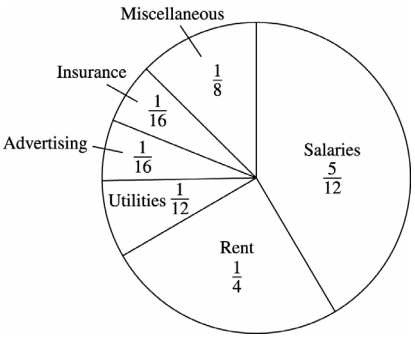
Business Application Case #1 Operating Expenses

(a) Multiply each monthly amount by 12.
Salaries: $\$15,000 \times 12 = \$180,000$
Rent: $\$9000 \times 12 = \$108,000$
Utilities: $\$3000 \times 12 = \$36,000$
Insurance: $\$2250 \times 12 = \$27,000$
Advertising: $\$2250 \times 12 = \$27,000$
Miscellaneous: $\$4500 \times 12 = \$54,000$

$\$180,000 + \$108,000 + \$36,000$
$+\$27,000 + \$27,000 + \$54,000 = \$432,000$
The total annual operating expenses are $432,000.

(b) Divide each annual amount by the total annual operating expenses.
Salaries: $\dfrac{\$180,000}{\$432,000} = \dfrac{5}{12}$
Rent: $\dfrac{\$108,000}{\$432,000} = \dfrac{1}{4}$
Utilities: $\dfrac{\$36,000}{\$432,000} = \dfrac{1}{12}$
Insurance: $\dfrac{\$27,000}{\$432,000} = \dfrac{1}{16}$
Advertising: $\dfrac{\$27,000}{\$432,000} = \dfrac{1}{16}$
Miscellaneous: $\dfrac{\$54,000}{\$432,000} = \dfrac{1}{8}$

(c)



Business Application Case #2 Home Repair

(a) 10 feet $= 10 \times 12 = 120$ inches
8 feet $= 8 \times 12 = 96$ inches

8 feet $8\dfrac{3}{8}$ inches $= 96 + 8\dfrac{3}{8} = 104\dfrac{3}{8}$ inches

$120 - 104\dfrac{3}{8} = 119\dfrac{8}{8} - 104\dfrac{3}{8} = 15\dfrac{5}{8}$ inches

$= 1$foot $3\dfrac{5}{8}$ inches

The length of the remaining piece is
1foot $3\dfrac{5}{8}$ inches.

(b) $\$10,000 \div \$25.80 \approx 387.6$
387 shares can be purchased for $10,000.

(c) Answers will vary.

(d) Answers will vary.

Chapter 2 Equations and Formulas

2.1 Solving Equations

1. $z+8=50$

$z+8-8=50-8$ *Subtract* 8.

$z=42$

2. $r+13=83$

$r+13-13=83-13$ *Subtract* 13.

$r=70$

3. $z+95=400$

$z+95-95=400-95$ *Subtract* 95.

$z=305$

4. $v-29=17$

$v-29+29=17+29$ *Add* 29.

$v=46$

5. $25=x+12$

$25-12=x+12-12$ *Subtract* 12.

$13=x$

6. $312=m-40$

$312+40=m-40+40$ *Add* 40.

$352=m$

7. $10k=42$

$\frac{10k}{10}=\frac{42}{10}$ *Divide by* 10.

$k=4.2$

8. $7s=84$

$\frac{7s}{7}=\frac{84}{7}$ *Divide by* 7.

$s=12$

9. $12q=144$

$\frac{12q}{12}=\frac{144}{12}$ *Divide by* 12.

$q=12$

10. $8z=136$

$\frac{8z}{8}=\frac{136}{8}$ *Divide by* 8.

$z=17$

11. $60=30m$

$\frac{60}{30}=\frac{30m}{30}$ *Divide by* 30.

$2=m$

12. $94=2z$

$\frac{94}{2}=\frac{2z}{2}$ *Divide by* 2.

$47=z$

13. $5.9y=17.7$

$\frac{5.9y}{5.9}=\frac{17.7}{5.9}$ *Divide by* 5.9.

$y=3$

14. $16.5x=39.6$

$\frac{16.5x}{16.5}=\frac{39.6}{16.5}$ *Divide by* 16.5.

$x=2.4$

15. $1.54=0.7y$

$\frac{1.54}{0.7}=\frac{0.7y}{0.7}$ *Divide by* 0.7.

$2.2=y$

16. $3.9a=15.6$

$\frac{3.9a}{3.9}=\frac{15.6}{3.9}$ *Divide by* 3.9.

$a=4$

17. $3.92w=3.136$

$\frac{3.92w}{3.92}=\frac{3.136}{3.92}$ *Divide by* 3.92.

$w=0.8$

18. $2.773m=3.3276$

$\frac{2.773m}{2.773}=\frac{3.3276}{2.773}$ *Divide by* 2.773.

$m=1.2$

19. $0.0002x = 0.08$

$$\frac{0.0002x}{0.0002} = \frac{0.08}{0.0002} \quad \textit{Divide by } 0.0002.$$

$$x = 400$$

20. $0.0324 = 0.0135y$

$$\frac{0.0324}{0.0135} = \frac{0.0135y}{0.0135} \quad \textit{Divide by } 0.0135.$$

$$2.4 = y$$

21. $\frac{s}{7} = 42$

$$\frac{s}{7} \cdot 7 = 42 \cdot 7 \quad \textit{Multiply by } 7.$$

$$s = 294$$

22. $\frac{m}{5} = 6$

$$\frac{m}{5} \cdot 5 = 6 \cdot 5 \quad \textit{Multiply by } 5.$$

$$m = 30$$

23. $\frac{r}{7} = 1$

$$\frac{r}{7} \cdot 7 = 1 \cdot 7 \quad \textit{Multiply by } 7.$$

$$r = 7$$

24. $\frac{c}{7} = 2$

$$\frac{c}{7} \cdot 7 = 2 \cdot 7 \quad \textit{Multiply by } 7.$$

$$c = 14$$

25. $\frac{2}{3}b = 8$

$$\frac{3}{2} \cdot \frac{2}{3}b = \frac{3}{2} \cdot 8 \quad \textit{Multiply by } \frac{3}{2}.$$

$$b = 12$$

26. $22 = \frac{5}{4}s$

$$\frac{4}{5} \cdot 22 = \frac{4}{5} \cdot \frac{5}{4}s \quad \textit{Multiply by } \frac{4}{5}.$$

$$\frac{88}{5} = s$$

$$17.6 = s$$

27. $35 = \frac{7}{5}t$

$$\frac{5}{7} \cdot 35 = \frac{5}{7} \cdot \frac{7}{5}t \quad \textit{Multiply by } \frac{5}{7}.$$

$$25 = t$$

28. $\frac{7}{3}s = 21$

$$\frac{3}{7} \cdot \frac{7}{3}s = \frac{3}{7} \cdot 21 \quad \textit{Multiply by } \frac{3}{7}.$$

$$s = 9$$

29. $2x = \frac{5}{3}$

$$\frac{1}{2} \cdot 2x = \frac{1}{2} \cdot \frac{5}{3} \quad \textit{Multiply by } \frac{1}{2}.$$

$$x = \frac{5}{6}$$

30. $4y = \frac{1}{3}$

$$\frac{1}{4} \cdot 4y = \frac{1}{4} \cdot \frac{1}{3} \quad \textit{Multiply by } \frac{1}{4}.$$

$$y = \frac{1}{12}$$

31. $3p = \frac{5}{12}$

$$\frac{1}{3} \cdot 3p = \frac{1}{3} \cdot \frac{5}{12} \quad \textit{Multiply by } \frac{1}{3}.$$

$$p = \frac{5}{36}$$

32. $\frac{3}{4} = 9a$

$$\frac{1}{9} \cdot \frac{3}{4} = \frac{1}{9} \cdot 9a \quad \textit{Multiply by } \frac{1}{9}.$$

$$\frac{1}{12} = a$$

33. $7b + 9 = 37$

$$7b + 9 - 9 = 37 - 9 \quad \textit{Subtract } 9.$$

$$7b = 28$$

$$\frac{7b}{7} = \frac{28}{7} \quad \textit{Divide by } 7.$$

$$b = 4$$