Beginning and Intermediate Algebra 6th edition Tobey Solutions Manual

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INSTRUCTOR SOLUTIONS MANUAL

BEGINNING AND INTERMEDIATE ALGEBRA

SIXTH EDITION

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Chapter 0

0.1 Exercises

2. $\frac{13}{17}$: 17 is the denominator

4. 1: $\frac{3}{3}$ or $\frac{17}{17}$

6. $3\frac{3}{4}$



8. $\frac{20}{24}=\frac{5\times4}{6\times4}=\frac{5}{6}$

10. $\frac{8}{48}=\frac{1\times8}{6\times8}=\frac{1}{6}$

12. $\frac{72}{18}=\frac{18\times4}{18\times1}=4$

14. $\frac{30}{85}=\frac{5\times6}{5\times17}=\frac{6}{17}$

16. $\frac{33}{55}=\frac{11\times3}{11\times5}=\frac{3}{5}$

18. $\frac{63}{9}=\frac{9\times7}{9\times1}=\frac{7}{1}=7$

20. $\frac{19}{5}=5\overline{)19}=3\frac{4}{5}$
$\underline{15}$
4

22. $\frac{54}{7}=7\overline{)54}=7\frac{5}{7}$
$\underline{49}$
5

24. $\frac{41}{6}=6\overline{)41}=6\frac{5}{6}$
$\underline{36}$
5

26. $\frac{25}{3}=3\overline{)25}=8\frac{1}{3}$
$\underline{24}$
1

28. $\frac{79}{7}=7\overline{)79}=11\frac{2}{7}$
$\underline{7}$
09
$\underline{7}$
2

30. $\frac{124}{8}=8\overline{)124}=15\frac{4}{8}=15\frac{1}{2}$
$\underline{8}$
44
$\underline{40}$
4

32. $4\frac{2}{5}=\frac{(4\times5)+2}{5}=\frac{20+2}{5}=\frac{22}{5}$

34. $5\frac{1}{12}=\frac{(5\times12)+1}{12}=\frac{60+1}{12}=\frac{61}{12}$

36. $1\frac{5}{6}=\frac{(1\times6)+5}{6}=\frac{6+5}{6}=\frac{11}{6}$

38. $6\frac{2}{3}=\frac{(6\times3)+2}{3}=\frac{18+2}{3}=\frac{20}{3}$

40. $10\frac{1}{9}=\frac{(10\times9)+1}{9}=\frac{90+1}{9}=\frac{91}{9}$

42. $\frac{78}{6}=78\div6$
$6\overline{)78}$
$\underline{6}$
18
$\underline{18}$
0
$\frac{78}{6}=13$

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44. $\frac{5}{9}=\frac{?}{54}\Rightarrow\frac{5\times6}{9\times6}=\frac{30}{54}$

46. $\frac{5}{9}=\frac{?}{45}\Rightarrow\frac{5\times5}{9\times5}=\frac{25}{45}$

48. $\frac{13}{17}=\frac{?}{51}\Rightarrow\frac{13\times3}{17\times3}=\frac{39}{51}$

50. $\frac{10}{15}=\frac{?}{60}\Rightarrow\frac{10\times4}{15\times4}=\frac{40}{60}$

52. $\frac{7}{8}=\frac{?}{40}\Rightarrow\frac{7\times5}{8\times5}=\frac{35}{40}$

54. $\frac{45}{50}=\frac{?}{100}\Rightarrow\frac{45\times2}{50\times2}=\frac{90}{100}$

56. $\frac{20}{424}=\frac{5\times4}{106\times4}=\frac{5}{106}$

58. $\frac{1400}{2420}=\frac{70\times20}{121\times20}=\frac{70}{121}$

60. $\frac{3}{1+3+1}=\frac{3}{5}$ is raisins

62. $\frac{1+3}{1+3+1}=\frac{4}{5}$ does not contain nuts

64. $\frac{6}{6+8}=\frac{6}{14}=\frac{3\times2}{7\times2}=\frac{3}{7}$

$\frac{3}{7}$ of the students enrolled in 1994 were male.

Classroom Quiz 0.1

1. $\frac{56}{88}=\frac{7\times8}{11\times8}=\frac{7}{11}$

2. $5\frac{11}{14}\Rightarrow\frac{(5\times14)+11}{14}=\frac{70+11}{14}=\frac{81}{14}$

3. $\frac{109}{12}=9\frac{1}{12}$

$12\overline{)109}$ 9

$\underline{108}$

1

0.2 Exercises

2. You must change the fractions to equivalent fractions with a common denominator.

4. $\frac{21}{30}$ and $\frac{17}{20}$

$30=2\cdot3\cdot5$

$20=2\cdot2\cdot5$

$\text{LCD}=2\cdot2\cdot3\cdot5=60$

6. $\frac{5}{18}$ and $\frac{1}{24}$

$18=2\cdot3\cdot3$

$24=2\cdot2\cdot2\cdot3$

$\text{LCD}=2\cdot2\cdot2\cdot3\cdot3=72$

8. $\frac{5}{16}$ and $\frac{7}{48}$

$16=2\cdot2\cdot2\cdot2$

$48=2\cdot2\cdot2\cdot2\cdot3$

$\text{LCD}=2\cdot2\cdot2\cdot2\cdot3=48$

10. $\frac{11}{12}$ and $\frac{7}{20}$

$12=2\cdot2\cdot3$

$20=2\cdot2\cdot5$

$\text{LCD}=2\cdot2\cdot3\cdot5=60$

12. $\frac{7}{30}$ and $\frac{8}{45}$

$30=2\cdot3\cdot5$

$45=3\cdot3\cdot5$

$\text{LCD}=2\cdot3\cdot3\cdot5=90$

14. $\frac{1}{7}$, $\frac{3}{14}$, and $\frac{9}{35}$

$7=7$

$14=2\cdot7$

$35=5\cdot7$

$\text{LCD}=2\cdot5\cdot7=70$

16. $\frac{3}{8}$, $\frac{5}{12}$, and $\frac{11}{42}$

$8=2\cdot2\cdot2$

$12=2\cdot2\cdot3$

$42=2\cdot3\cdot7$

$\text{LCD}=2\cdot2\cdot2\cdot3\cdot7=168$

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18. $\frac{5}{8}, \frac{3}{14}$ and $\frac{11}{16}$

$8 = 2 \cdot 2 \cdot 2$

$14 = 2 \cdot 7$

$16 = 2 \cdot 2 \cdot 2 \cdot 2$

$\text{LCD} = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 7 = 112$

20. $\frac{3}{11} + \frac{5}{11} = \frac{3+5}{11} = \frac{8}{11}$

22. $\frac{11}{15} - \frac{2}{15} = \frac{11-2}{15} = \frac{9}{15} = \frac{3}{5}$

24. $\frac{3}{20} + \frac{13}{15} = \frac{3 \times 3}{20 \times 3} + \frac{13 \times 4}{15 \times 4} = \frac{9}{60} + \frac{52}{60} = \frac{61}{60}$ or $1\frac{1}{60}$

26. $\frac{4}{5} - \frac{3}{7} = \frac{4 \times 7}{5 \times 7} - \frac{3 \times 5}{7 \times 5} = \frac{28}{35} - \frac{15}{35} = \frac{13}{35}$

28. $\frac{3}{8} + \frac{1}{3} = \frac{3 \times 3}{8 \times 3} + \frac{1 \times 8}{3 \times 8} = \frac{9}{24} + \frac{8}{24} = \frac{17}{24}$

30. $\frac{2}{15} + \frac{7}{10} = \frac{2 \times 2}{15 \times 2} + \frac{7 \times 3}{10 \times 3} = \frac{4}{30} + \frac{21}{30} = \frac{25}{30} = \frac{5}{6}$

32. $\frac{21}{12} - \frac{23}{24} = \frac{21 \times 2}{12 \times 2} - \frac{23}{24} = \frac{42}{24} - \frac{23}{24} = \frac{19}{24}$

34. $\frac{13}{15} - \frac{1}{5} = \frac{13}{15} - \frac{1 \times 3}{5 \times 3} = \frac{13}{15} - \frac{3}{15} = \frac{10}{15} = \frac{2}{3}$

36. $\frac{7}{4} + \frac{5}{9} = \frac{7 \times 9}{4 \times 9} + \frac{5 \times 4}{9 \times 4} = \frac{63}{36} + \frac{20}{36} = \frac{83}{36}$ or $2\frac{11}{36}$

38. $\frac{4}{7} + \frac{7}{9} + \frac{1}{3} = \frac{36}{63} + \frac{49}{63} + \frac{21}{63} = \frac{106}{63}$ or $1\frac{43}{63}$

40. $\frac{1}{12} + \frac{3}{14} + \frac{4}{21} = \frac{1 \times 7}{12 \times 7} + \frac{3 \times 6}{14 \times 6} + \frac{4 \times 4}{21 \times 4}$

$= \frac{7}{84} + \frac{18}{84} + \frac{16}{84}$

$= \frac{41}{84}$

42. $\frac{1}{5} + \frac{2}{3} - \frac{11}{15} = \frac{1 \times 3}{5 \times 3} + \frac{2 \times 5}{3 \times 5} - \frac{11}{15}$

$= \frac{3}{15} + \frac{10}{15} - \frac{11}{15}$

$= \frac{2}{15}$

44. $\frac{5}{24} + \frac{3}{8} - \frac{1}{3} = \frac{5}{24} + \frac{9}{24} - \frac{8}{24} = \frac{6}{24} = \frac{1}{4}$

46. $3\frac{1}{8} + 2\frac{1}{6} = \frac{25}{8} + \frac{13}{6} = \frac{75}{24} + \frac{52}{24} = \frac{127}{24} = 5\frac{7}{24}$

48. $6\frac{2}{3} + \frac{3}{4} = \frac{20}{3} + \frac{3}{4} = \frac{80}{12} + \frac{9}{12} = \frac{89}{12} = 7\frac{5}{12}$

50. $7\frac{2}{5} - 3\frac{3}{4} = \frac{37}{5} - \frac{15}{4} = \frac{148}{20} - \frac{75}{20} = \frac{73}{20} = 3\frac{13}{20}$

52. $7\frac{8}{15} - 2\frac{3}{5} = \frac{113}{15} - \frac{13}{5} = \frac{113}{15} - \frac{39}{15} = \frac{74}{15} = 4\frac{14}{15}$

54. $3\frac{1}{7} + 4\frac{1}{3} = \frac{22}{7} + \frac{13}{3} = \frac{66}{21} + \frac{91}{21} = \frac{157}{21} = 7\frac{10}{21}$

56. $12\frac{1}{3} - 5\frac{2}{3} = \frac{37}{3} - \frac{17}{3} = \frac{20}{3} = 6\frac{2}{3}$

58. $9\frac{12}{13} + 9\frac{1}{13} = \frac{129}{13} + \frac{118}{13} = \frac{247}{13} = 19$

60. $\frac{19}{30} + \frac{3}{10} = \frac{19}{30} + \frac{9}{30} = \frac{28}{30} = \frac{14}{15}$

62. $5\frac{2}{3} + 7\frac{2}{5} = \frac{17}{3} + \frac{37}{5} = \frac{85}{15} + \frac{111}{15} = \frac{196}{15} = 13\frac{1}{15}$

64. $\frac{15}{24} - \frac{3}{8} = \frac{15}{24} - \frac{9}{24} = \frac{6}{24} = \frac{1}{4}$

66. $6\frac{1}{3} - 4\frac{1}{4} = \frac{19}{3} - \frac{17}{4} = \frac{76}{12} - \frac{51}{12} = \frac{25}{12} = 2\frac{1}{12}$

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

70. $1\frac{2}{3} + \frac{5}{18} = \frac{5}{3} + \frac{5}{18} = \frac{30}{18} + \frac{5}{18} = \frac{35}{18} = 1\frac{17}{18}$

72. $\frac{3}{15} + \frac{2}{15} = \frac{5}{15} = \frac{1}{3}$

74. $28 - 3\frac{5}{8} = \frac{28}{1} - \frac{29}{8} = \frac{224}{8} - \frac{29}{8} = \frac{195}{8} = 24\frac{3}{8}$

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76. $10\frac{1}{2}+5\frac{1}{4}+18\frac{2}{3}=\frac{21}{2}+\frac{21}{4}+\frac{56}{3}$
$=\frac{126}{12}+\frac{63}{12}+\frac{224}{12}$
$=\frac{413}{12}$
$=34\frac{5}{12}$

They ran a total of $34\frac{5}{12}$ miles.

78. $17\frac{3}{4}+1\frac{1}{4}-2\frac{2}{3}=\frac{71}{4}+\frac{5}{4}-\frac{8}{3}$
$=\frac{213}{12}+\frac{15}{12}-\frac{32}{12}$
$=\frac{196}{12}$
$=16\frac{4}{12}$
$=16\frac{1}{3}$

There are now $16\frac{1}{3}$ gallons.

80. $4\frac{5}{8}-4\frac{9}{16}=\frac{37}{8}-\frac{73}{16}=\frac{74}{16}-\frac{73}{16}=\frac{1}{16}$ inch
It is smaller so it will slide in and out easily.

82. $2\frac{1}{2}+\frac{1}{16}=\frac{5}{2}+\frac{1}{16}=\frac{40}{16}+\frac{1}{16}=\frac{41}{16}=2\frac{9}{16}$
The fairway grass could be as long as
$2\frac{9}{16}$ inches.
$\frac{7}{8}-\frac{1}{16}=\frac{14}{16}-\frac{1}{16}=\frac{13}{16}$

The putting greens could be as short as $\frac{13}{16}$ inch.

Cumulative Review

83. $\frac{36}{44}=\frac{9\times4}{1\times4}=\frac{9}{11}$

84. $26\frac{3}{5}=\frac{26\times5+3}{5}=\frac{133}{5}$

Classroom Quiz 0.2

1. $\frac{1}{6}+\frac{2}{3}+\frac{3}{8}=\frac{4}{24}+\frac{16}{24}+\frac{9}{24}=\frac{29}{24}$ or $1\frac{5}{24}$

2. $2\frac{17}{18}+4\frac{5}{9}=\frac{53}{18}+\frac{41}{9}$
$=\frac{53}{18}+\frac{82}{18}$
$=\frac{135}{18}$
$=7\frac{9}{18}$
$=7\frac{1}{2}$

3. $7\frac{2}{5}-3\frac{2}{3}=\frac{37}{5}-\frac{11}{3}=\frac{111}{15}-\frac{55}{15}=\frac{56}{15}=3\frac{11}{15}$

0.3 Exercises

2. Invert the second fraction. Multiply the result by the first fraction.

4. $\frac{5}{7}\times\frac{28}{15}=\frac{5}{7}\times\frac{7\cdot4}{5\cdot3}=\frac{4}{3}$ or $1\frac{1}{3}$

6. $\frac{17}{26}\times\frac{13}{34}=\frac{17}{2\cdot13}\times\frac{13}{17\cdot2}=\frac{1}{4}$

8. $\frac{3}{11}\times\frac{5}{7}=\frac{15}{77}$

10. $\frac{15}{24}\times\frac{8}{9}=\frac{3\cdot5}{3\cdot8}\times\frac{8}{3\cdot3}=\frac{5}{9}$

12. $\frac{6}{21}\times\frac{9}{18}=\frac{2\cdot3}{3\cdot7}\times\frac{9}{2\cdot9}=\frac{1}{7}$

14. $\frac{2}{21}\times15=\frac{2}{3\cdot7}\times\frac{3\cdot5}{1}=\frac{10}{7}$ or $1\frac{3}{7}$

16. $\frac{8}{11}\times3=\frac{8}{11}\times\frac{3}{1}=\frac{24}{11}$ or $2\frac{2}{11}$

18. $\frac{13}{9}\div\frac{13}{7}=\frac{13}{9}\times\frac{7}{13}=\frac{7}{9}$

20. $\frac{7}{8}\div4=\frac{7}{8}\times\frac{1}{4}=\frac{7}{32}$

22. $18\div\frac{2}{9}=\frac{18}{1}\times\frac{9}{2}=\frac{9}{1}\times\frac{9}{1}=81$

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24. $\frac{8}{12}\div\frac{5}{6}=\frac{8}{12}\times\frac{6}{5}=\frac{2\cdot4}{2\cdot6}\times\frac{6}{5}=\frac{4}{5}$

26. $\frac{9}{28}\div\frac{4}{7}=\frac{9}{28}\times\frac{7}{4}=\frac{9}{4\cdot7}\times\frac{7}{4}=\frac{9}{16}$

28. $\frac{\frac{5}{6}}{\frac{10}{13}}=\frac{5}{6}\div\frac{10}{13}=\frac{5}{6}\times\frac{13}{10}=\frac{5\times13}{6\times2\times5}=\frac{13}{12}=1\frac{1}{12}$

30. $\frac{\frac{3}{4}}{\frac{11}{12}}=\frac{3}{4}\div\frac{11}{12}=\frac{3}{4}\times\frac{12}{11}=\frac{3\times3\times4}{4\times11}=\frac{9}{11}$

32. $4\frac{1}{2}\div3\frac{3}{8}=\frac{9}{2}\div\frac{27}{8}=\frac{9}{2}\times\frac{8}{27}=\frac{4}{3}=1\frac{1}{3}$

34.
$$\begin{aligned}5\frac{1}{2}\div3\frac{3}{4}&=\frac{11}{2}\div\frac{15}{4}\\&=\frac{11}{2}\times\frac{4}{15}\\&=\frac{11}{2}\times\frac{2\times2}{15}\\&=\frac{22}{15}\\&=1\frac{7}{15}\end{aligned}$$

36. $\frac{1}{4}\div1\frac{7}{8}=\frac{1}{4}\div\frac{15}{8}=\frac{1}{4}\times\frac{8}{15}=\frac{1}{4}\times\frac{2\cdot4}{15}=\frac{2}{15}$

38. $\frac{18}{4\frac{1}{2}}=18\div4\frac{1}{2}=\frac{18}{1}\div\frac{9}{2}=\frac{18}{1}\times\frac{2}{9}=\frac{9\cdot2}{1}\times\frac{2}{9}=4$

40. $\frac{\frac{5}{6}}{2\frac{1}{2}}=\frac{5}{6}\div2\frac{1}{2}=\frac{5}{6}\div\frac{5}{2}=\frac{5}{6}\times\frac{2}{5}=\frac{5}{3\cdot2}\times\frac{2}{5}=\frac{1}{3}$

42. $\frac{12}{18}\times\frac{9}{2}=\frac{6\cdot2}{6\cdot3}\times\frac{3\cdot3}{2}=3$

44. $\frac{5}{6}\div\frac{11}{18}=\frac{5}{6}\times\frac{18}{11}=\frac{5}{6}\times\frac{3\cdot6}{11}=\frac{15}{11}$ or $1\frac{4}{11}$

46.
$$\begin{aligned}10\frac{2}{9}\div2\frac{1}{3}&=\frac{92}{9}\div\frac{7}{3}\\&=\frac{92}{9}\times\frac{3}{7}\\&=\frac{92}{3}\times\frac{1}{7}\\&=\frac{92}{21}\\&=4\frac{8}{21}\end{aligned}$$

48. $15\div1\frac{2}{3}=\frac{15}{1}\div\frac{5}{3}=\frac{15}{1}\times\frac{3}{5}=\frac{5\cdot3}{1}\times\frac{3}{5}=9$

50. $6\frac{1}{2}\times12=\frac{13}{2}\times\frac{2\cdot6}{1}=78$

52. $2\frac{1}{3}\times\frac{2}{3}\times\frac{3}{5}=\frac{7}{3}\times\frac{2}{3}\times\frac{3}{5}=\frac{7\cdot2}{3\cdot5}=\frac{14}{15}$

54. a. $\frac{1}{6}\times\frac{24}{15}=\frac{1}{6}\times\frac{4\cdot6}{15}=\frac{4}{15}$

b. $\frac{1}{6}\div\frac{24}{15}=\frac{1}{6}\times\frac{15}{24}=\frac{1}{2\cdot3}\times\frac{3\cdot5}{24}=\frac{5}{48}$

56. a. $\frac{3}{7}\div\frac{21}{25}=\frac{3}{7}\times\frac{25}{21}=\frac{3}{7}\times\frac{25}{3\cdot7}=\frac{25}{49}$

b. $\frac{3}{7}\times\frac{21}{25}=\frac{3}{7}\times\frac{3\cdot7}{25}=\frac{9}{25}$

58.
$$\begin{aligned}29\frac{1}{4}\div1\frac{5}{8}&=\frac{117}{4}\div\frac{13}{8}\\&=\frac{117}{4}\times\frac{8}{13}\\&=\frac{9\cdot13}{4}\times\frac{2\cdot4}{13}\\&=18\end{aligned}$$

The material can make 18 pullovers.

60. $15\times10\frac{1}{5}=\frac{15}{1}\times\frac{51}{5}=\frac{3\cdot5}{1}\times\frac{51}{5}=153$

The area of her garden is 153 square feet.

Cumulative Review

61. $\frac{11}{15}=\frac{?}{75}\Rightarrow\frac{11\times5}{15\times5}=\frac{55}{75}$

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62. $\frac{7}{9}=\frac{?}{63}\Rightarrow\frac{7\times7}{9\times7}=\frac{49}{63}$

Classroom Quiz 0.3

1. $\frac{4}{13}\times\frac{26}{29}=\frac{4}{13}\times\frac{13\cdot2}{29}=\frac{8}{29}$

2. $5\frac{1}{2}\times2\frac{5}{6}=\frac{11}{2}\times\frac{17}{6}=\frac{187}{12}=15\frac{7}{12}$

3. $1\frac{3}{7}\div2\frac{1}{14}=\frac{10}{7}\div\frac{29}{14}=\frac{10}{7}\times\frac{14}{29}=\frac{10}{7}\times\frac{7\cdot2}{29}=\frac{20}{29}$

0.4 Exercises

2. We write 0.42 in words as forty-two hundredths.

4. When dividing 96.3 by 10,000 we move the decimal point 4 places to the left.

6. $\frac{18}{25}=25\overline{)18.00}=0.72$

$$\begin{array}{r}0.72\\25\overline{)18.00}\\\underline{17\,5}\\50\\\underline{50}\\0\end{array}$$

8. $\frac{9}{15}=15\overline{)9.0}=0.6$

$$\begin{array}{r}0.6\\15\overline{)9.0}\\\underline{9\,0}\\0\end{array}$$

10. $\frac{1}{6}=6\overline{)1.000}=0.1\overline{6}$

$$\begin{array}{r}0.166\\6\overline{)1.000}\\\underline{6}\\40\\\underline{36}\\40\\\underline{36}\\4\end{array}$$

12. $0.5=\frac{5}{10}=\frac{1}{2}$

14. $0.35=\frac{35}{100}=\frac{7}{20}$

16. $0.775=\frac{775}{1000}=\frac{31\times25}{40\times25}=\frac{31}{40}$

18. $0.08=\frac{8}{100}=\frac{2}{25}$

20. $4.8=\frac{48}{10}=\frac{24\times2}{5\times2}=\frac{24}{5}$ or $4\frac{4}{5}$

22. $6.25=\frac{625}{1000}=\frac{25\times25}{4\times25}=\frac{25}{4}$ or $6\frac{1}{4}$

24.
$$\begin{array}{r}4.64\\+\ 0.23\\\hline4.87\end{array}$$

26.
$$\begin{array}{r}6.31\\4.20\\+\ 8.50\\\hline19.01\end{array}$$

28.
$$\begin{array}{r}33.010\\0.380\\+\ 175.401\\\hline208.791\end{array}$$

30.
$$\begin{array}{r}121.52\\-\ 79.85\\\hline41.67\end{array}$$

32.
$$\begin{array}{r}5.0032\\-\ 3.0036\\\hline1.9996\end{array}$$

34.
$$\begin{array}{r}212.54\\-\ 3.60\\\hline208.94\end{array}$$

36.
$$\begin{array}{r}6.12\\\times\ 3.4\\\hline2\ 448\\18\ 36\\\hline20.808\end{array}$$

38.
$$\begin{array}{r}6.32\\\times\ 1.31\\\hline632\\1\ 896\\6\ 32\\\hline8.2792\end{array}$$

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40.
$$\begin{array}{r} 3.84 \\ \times\ 0.0017 \\ \hline 2688 \\ 384 \\ \hline 0.006528 \end{array}$$

42.
$$\begin{array}{r} 23,000 \\ \times\ 0.0042 \\ \hline 4\ 6000 \\ 92\ 000 \\ \hline 96.6000 \end{array}$$
or 96.6

44.
$$\begin{array}{r} 0.3248 \\ 39\overline{)12.6672} \\ 11\ 7 \\ \hline 96 \\ 78 \\ \hline 187 \\ 156 \\ \hline 312 \\ 312 \\ \hline 0 \end{array}$$

46.
$$\begin{array}{r} 3.18 \\ 2.05\wedge\overline{)6.51\wedge90} \\ 6\ 15 \\ \hline 36\ \ 9 \\ 20\ \ 5 \\ \hline 16\ \ 40 \\ 16\ \ 40 \\ \hline 0 \end{array}$$

48.
$$\begin{array}{r} 6.2 \\ 0.005\wedge\overline{)0.031\wedge0} \\ 30 \\ \hline 1\ \ 0 \\ 1\ \ 0 \\ \hline 0 \end{array}$$

50.
$$\begin{array}{r} 0.095 \\ 0.09\wedge\overline{)0.00\wedge855} \\ 81 \\ \hline 45 \\ 45 \\ \hline 0 \end{array}$$

52. $1.36 \times 1000 = 1360$

54. $175{,}318 \div 1000 = 175.318$

56. $0.00243 \times 100{,}000 = 243$

58. $3.52 \div 1000 = 0.00352$

60. $85.54 \times 10{,}000 = 855{,}400$

62. $96.12 \div 10{,}000 = 0.009612$

64.
$$\begin{array}{r} 8.252 \\ \times\ \ 0.005 \\ \hline 0.041260 \end{array}$$
or 0.04126

66.
$$\begin{array}{r} 1.109 \\ 0.088 \\ +\ 16.4 \\ \hline 17.597 \end{array}$$

68.
$$\begin{array}{r} 25712. \\ 0.003\wedge\overline{)77.136\wedge} \\ 6 \\ \hline 17 \\ 15 \\ \hline 2\ 1 \\ 2\ 1 \\ \hline 3 \\ 3 \\ \hline 6 \\ 6 \\ \hline 0 \end{array}$$
or 25,712

70. $25.62 \times 10{,}000 = 256{,}200$

72.
$$\begin{array}{r} 14.30 \\ -\ 0.68 \\ \hline 13.62 \end{array}$$

74. $0.58 \div 1000 = 0.00058$

76.
$$\begin{array}{r} 13.2 \\ \times\ \ 44 \\ \hline 52\ 8 \\ 528 \\ \hline 580.8 \end{array}$$
Chris can drive 580.8 miles.

78. $1.3 \times 5 = 6.5$ milligrams
No; there was 0.3 milligram of copper in the 5 liters (or 0.06 milligram per liter) in excess of the standard.

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Cumulative Review

79. $3\frac{1}{2} \div 5\frac{1}{4} = \frac{7}{2} \div \frac{21}{4} = \frac{7}{2} \cdot \frac{4}{21} = \frac{1 \cdot 2}{1 \cdot 3} = \frac{2}{3}$

80. $\frac{3}{8} \cdot \frac{12}{27} = \frac{3}{2 \cdot 4} \cdot \frac{3 \cdot 4}{3 \cdot 3 \cdot 3} = \frac{1}{6}$

81. $\frac{12}{25} + \frac{9}{20} = \frac{48}{100} + \frac{45}{100} = \frac{48+45}{100} = \frac{93}{100}$

82. $1\frac{3}{5} - \frac{1}{2} = \frac{8}{5} - \frac{1}{2} = \frac{16}{10} - \frac{5}{10} = \frac{16-5}{10} = \frac{11}{10} = 1\frac{1}{10}$

Classroom Quiz 0.4

1.
$$\begin{array}{r} 9.0038 \\ -\ 4.6329 \\ \hline 4.3709 \end{array}$$

2.
$$\begin{array}{r} 47.9 \\ \times\ 0.07 \\ \hline 3.353 \end{array}$$

3.
$$\begin{array}{r} 25.9 \\ 0.23\wedge\overline{)5.95\wedge 7} \\ 4\ 6 \\ \hline 1\ 35 \\ 1\ 15 \\ \hline 20\quad 7 \\ 20\quad 7 \\ \hline 0 \end{array}$$

Use Math to Save Money

1. \$100, \$300, \$2000, \$8000, \$8000, \$8000, \$12,000

2. $3 \times \$25 + \$50 + \$200 + 2 \times \$20$
$= \$75 + \$50 + \$200 + \$40$
$= \$365$

3. The three smallest debts are \$100 loan, \$300 loan, and \$2000 car loan.

4. \$20 each, or \$40

5. $\$2000 - \$400 = \$1600$
$\frac{\$1600}{\$240} \approx 7$ (rounded to the nearest whole number)
It will take them 7 more months to pay off the third smallest debt.

6. Answers will vary.

How Am I Doing? Sections 0.1–0.4
(Available online through MyMathLab or from the Instructor's Resource Center.)

1. $\frac{15}{55} = \frac{3 \cdot 5}{11 \cdot 5} = \frac{3}{11}$

2. $\frac{46}{115} = \frac{2 \cdot 23}{5 \cdot 23} = \frac{2}{5}$

3. $\frac{15}{4} = 4\overline{)15} = 3\frac{3}{4}$
$\frac{12}{3}$

4. $4\frac{5}{7} = \frac{4 \cdot 7 + 5}{7} = \frac{28+5}{7} = \frac{33}{7}$

5. $\frac{4}{5} = \frac{?}{30} \Rightarrow \frac{4 \times 6}{5 \times 6} = \frac{24}{30}$

6. $\frac{5}{9} = \frac{?}{81} \Rightarrow \frac{5 \times 9}{9 \times 9} = \frac{45}{81}$

7. $8 = 2 \cdot 2 \cdot 2$
$6 = 2 \cdot 3$
$15 = 3 \cdot 5$
$\text{LCD} = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 = 120$

8. $\frac{3}{7} + \frac{2}{7} = \frac{3+2}{7} = \frac{5}{7}$

9. $\frac{5}{14} + \frac{2}{21} = \frac{5 \cdot 3}{14 \cdot 3} + \frac{2 \cdot 2}{21 \cdot 2} = \frac{15}{42} + \frac{4}{42} = \frac{19}{42}$

10. $2\frac{3}{4} + 5\frac{2}{3} = \frac{11}{4} + \frac{17}{3}$
$= \frac{11 \cdot 3}{4 \cdot 3} + \frac{17 \cdot 4}{3 \cdot 4}$
$= \frac{33}{12} + \frac{68}{12}$
$= \frac{101}{12}$
$= 8\frac{5}{12}$

11. $\frac{17}{18} - \frac{5}{9} = \frac{17}{18} - \frac{5 \cdot 2}{9 \cdot 2} = \frac{17}{18} - \frac{10}{18} = \frac{7}{18}$

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12. $\frac{6}{7}-\frac{2}{3}=\frac{6\cdot 3}{7\cdot 3}-\frac{2\cdot 7}{3\cdot 7}=\frac{18}{21}-\frac{14}{21}=\frac{4}{21}$

13. $3\frac{1}{5}-1\frac{3}{8}=\frac{16}{5}-\frac{11}{8}$
$=\frac{16\cdot 8}{5\cdot 8}-\frac{11\cdot 5}{8\cdot 5}$
$=\frac{128}{40}-\frac{55}{40}$
$=\frac{73}{40}$
$=1\frac{33}{40}$

14. $\frac{25}{7}\times\frac{14}{45}=\frac{5\cdot 5}{7}\times\frac{2\cdot 7}{5\cdot 9}=\frac{10}{9}=1\frac{1}{9}$

15. $12\times 3\frac{1}{2}=\frac{12}{1}\times\frac{7}{2}=\frac{6\cdot 2}{1}\times\frac{7}{2}=42$

16. $4\div\frac{8}{7}=\frac{4}{1}\cdot\frac{7}{8}=\frac{4}{1}\times\frac{7}{2\cdot 4}=\frac{7}{2}=3\frac{1}{2}$

17. $2\frac{1}{3}\div 3\frac{1}{4}=\frac{7}{3}\div\frac{13}{4}=\frac{7}{3}\times\frac{4}{13}=\frac{28}{39}$

18. $\frac{3}{8}=8\overline{)3.000}=0.375$

$$\begin{array}{r} 24 \\ \hline 60 \\ 56 \\ \hline 40 \\ 40 \\ \hline 0 \end{array}$$

19. $\frac{5}{6}=6\overline{)5.000}=0.8\overline{3}$

$$\begin{array}{r} 48 \\ \hline 20 \\ 18 \\ \hline 20 \\ 18 \\ \hline 2 \end{array}$$

20. $\frac{3}{200}=200\overline{)3.000}=0.015$

$$\begin{array}{r} 200 \\ \hline 1\,000 \\ 1\,000 \\ \hline 0 \end{array}$$

21.
$$\begin{array}{r} 15.230 \\ 3.600 \\ +\ 0.821 \\ \hline 19.651 \end{array}$$

22.
$$\begin{array}{r} 3.28 \\ \times\ 0.63 \\ \hline 984 \\ 1\,968 \\ \hline 2.0664 \end{array}$$

23. $\frac{3.015}{6.7}=6.7\wedge\overline{)3.0\wedge 15}=0.45$

$$\begin{array}{r} 26\ 8 \\ \hline 3\ \ 35 \\ 3\ \ 35 \\ \hline 0 \end{array}$$

24.
$$\begin{array}{r} 12.130 \\ -\ 9.884 \\ \hline 2.246 \end{array}$$

0.5 Exercises

2. The number directly following the word "of" should be the denominator. In this case you should use $\frac{30}{80}$ since 80 follows the word "of."

4. 0.54 = 54%

6. 0.063 = 6.3%

8. 0.046 = 4.6%

10. 7.49 = 749%

12. 5.7 = 570%

14. 8.674 = 867.4%

16. 6% = 0.06

18. 0.62% = 0.0062

20. 175% = 1.75

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22. $8.7\% = 0.087$

24. $0.1\% = 0.001$

26. $200\% = 2.00$ or 2

28. 7% of 69
$0.07 \times 69 = 4.83$

30. 25% of 600
$0.25 \times 600 = 150$

32. 154% of 270
$1.54 \times 270 = 415.8$

34. 49 is what percent of 28?
$\frac{49}{28} = 1.75 = 175\%$

36. What percent of 35 is 28?
$\frac{28}{35} = \frac{4}{5} = 0.8 = 80\%$

38. 48 is what percent of 600?
$\frac{48}{600} = \frac{2}{25} = 0.08 = 8\%$

40. 75 is what percent of 30?
$\frac{75}{30} = \frac{5}{2} = 2.5 = 250\%$

42. What percent of 440 is 11?
$\frac{11}{440} = 0.025 = 2.5\%$
2.5% of the units were defective.

44. 28% of 350
$0.28 \times 350 = 98$
98 of the new businesses failed.

46. $\frac{137}{180} \approx 0.7611 = 76.11\%$
About 76.11% had a grandparent not born in the United States.

48. $17\% \times 3690 = 0.17 \times 3690 = 627.30$
Her monthly cost is $627.30.

50. a. $65\% \times 18{,}600 = 12{,}090$
He traveled 12,090 miles.

b. $0.31 \times 12{,}090 = 3747.90$
He was paid $3747.90.

52. $729 \times 688 \approx 700 \times 700 = 490{,}000$

54. $8192 \times 5984 \approx 8000 \times 6000 = 48{,}000{,}000$

56. $318 + 494 + 613 + 243 \approx 300 + 500 + 600 + 200 = 1600$

58. $16\overline{)5{,}846{,}213} \approx 20\overline{)6{,}000{,}000}$
$300{,}000$

60. $\frac{53{,}610}{786} \approx \frac{50{,}000}{800} = \frac{500}{8} = 62.5$

62. 4.9% of $\$9321.88 \approx 0.05 \times \$9000 = \$450$

64. $85 \times 19 \times 5 \approx 90 \times 20 \times 5 = 9000$
An estimated $9000 is withdrawn each hour.

66. $\frac{11{,}900}{430} \approx \frac{10{,}000}{400} = 25$
It will take an estimated 25 trips.

Cumulative Review

67. Distance: $69{,}229.5 - 68{,}459.5 = 770$
$\frac{770}{35} = 22$
His car achieved 22 miles per gallon.

68. Total $= 4.6 + 4.5 + 2.9 = 12$
Average $= \frac{12}{3} = 4.0$ inches per month.

Classroom Quiz 0.5

1. 6.4% of $380 = 0.064 \times 380 = 24.32$

2. 247 is what percent of 380?
$\frac{247}{380} = 0.65 = 65\%$

3. $4498.56 \times 6721.18 \approx 4000 \times 7000 \approx 28{,}000{,}000$

0.6 Exercises

2. Area $= 22\frac{1}{2} \times 12\frac{1}{2} = \frac{45}{2} \times \frac{25}{2} = \frac{1125}{4}$
Cost $= 8.00 \times \frac{1125}{4} = 2250$
The total cost is $2250.

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4. a. $12\frac{1}{2}\times 20\frac{1}{2}\times 5=\frac{25}{2}\times\frac{41}{2}\times\frac{5}{1}$
$=\frac{5125}{4}$
$=1281.25$
≈ 1281
It will take 1281 cubic feet to fill the pool.

b. $1281 \text{ cu ft}\times\frac{7.5 \text{ gal}}{\text{cu ft}}=9607.5 \text{ gal}$
$\approx 10,000 \text{ gal}$
The pool holds 10,000 gallons.

c. $\frac{10,000}{5000}=2;\ 2\times 4=8$
They should add 8 ounces of chlorinator each day.

6. Increase from day 1 to day 3
$1\frac{1}{3}+\frac{1}{3}=\frac{5}{3}$
Jog: $\frac{5}{3}\times 1\frac{1}{2}=\frac{5}{3}\times\frac{3}{2}=2\frac{1}{2}$ miles
Walk: $\frac{5}{3}\times 1\frac{3}{4}=\frac{5}{3}\times\frac{7}{4}=\frac{35}{12}=2\frac{11}{12}$ miles
Rest: $\frac{5}{3}\times 2\frac{1}{2}=\frac{5}{3}\times\frac{5}{2}=\frac{25}{6}=4\frac{1}{6}$ minutes
Walk: $\frac{5}{3}\times 1=\frac{5}{3}=1\frac{2}{3}$ miles

8. Increase from day 1 to day 5
$1\frac{1}{3}\times 1\frac{1}{3}\times 1\frac{1}{3}\times 1\frac{1}{3}=\left(\frac{4}{3}\right)^4=\frac{256}{81}$
Jog: $\frac{256}{81}\times 1\frac{1}{2}=\frac{256}{81}\times\frac{3}{2}=\frac{128}{27}=4\frac{20}{27}$ mi
She would jog $4\frac{20}{27}$ miles on day 5.

10. Answers will vary. Possible answer: Melinda's trainer has the best plan because after 14 days she will be jogging and walking a gradual increase in distances. Over 14 days, Betty's schedule increases more. The amount of increase each day is larger. Eventually it is unrealistic.

12. a. 100% – 12% = 88%
0.88 × 24 = 21.12
You get 21.12 oz from a dozen large eggs.
0.88 × 21 = 18.48
You get 18.48 oz from a dozen medium eggs.

b. large: $\frac{2.79}{21.12}\approx \$0.1321/\text{oz}$;
medium: $\frac{2.39}{18.48}\approx \$0.1293/\text{oz}$
The medium eggs are the better buy.

14. a. From 13(b), the budget for food is $14,104.15.
$14,104.15 × 0.20 = $2820.83
$14,104.15 – $2820.83 = $11,283.32
The new food budget is $11,283.32.

b. $14,104.15 – $11,283.32 = $2820.83
$2820.83 would be available to reduce the debt.

16. $\frac{12.56+36.28}{1150}=\frac{48.84}{1150}\approx 0.04=4\%$
About 4% is deducted for retirement and medical.

18. $\frac{12.56+36.28+10.80}{1150}=\frac{59.64}{1150}\approx 0.05=5\%$
About 5% is deducted for special deductions.

Classroom Quiz 0.6

1. $\frac{650}{2.5}=260$ tiles
It will require 260 tiles to pave the courtyard.

2. 3% of 495,000 = 0.03 × 495,000 = 14,850.
$\frac{14,850}{20,150+14,850}=\frac{14,850}{35,000}\approx 0.42=42\%$
His commission was 42% of his total income.

3. 2(115) + 2(210) = 230 + 420 = 650
5 × 650 = $3250
The fence will cost $3250.

Career Exploration Problems

1. 90% of the first $826 = 0.9($826) = $743.40
32% of earnings between $826 and $4980
= 0.32($4200 – $826)
= 0.32($3374)
= $1079.68
She has no earnings over $4980.
Monthly benefit = $743.40 + $1079.68
= $1823.08
Cora's monthly benefit will be $1823.08.

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2. $\dfrac{\text{monthly benefit}}{\text{monthly earnings}} = \dfrac{\$1823.08}{\$4200} \approx 0.434$

Cora's benefit is about 43.4% of her pre-retirement earnings.

3. a. The reduction at age 66 is 6.7%.
$100\% - 6.7\% = 93.3\%$ or 0.933
$0.933(\$1823.08) \approx \$1700.93$
Cora's monthly benefit will be \$1700.93.
$\$1823.08 - \$1700.93 = \$122.15$
The total by which it would be reduced is \$122.15.

b. The reduction at age 65 is 13.3%.
$100\% - 13.3\% = 86.7\%$ or 0.867
$0.867(\$1823.08) \approx \$1580.61$
Cora's monthly benefit will be \$1580.61.
$\$1823.08 - \$1580.61 = \$242.47$
The total by which it would be reduced is \$242.47.

You Try It

1. a. $\dfrac{18}{27} = \dfrac{9\times 2}{9\times 3} = \dfrac{2}{3}$

b. $\dfrac{45}{60} = \dfrac{15\times 3}{15\times 4} = \dfrac{3}{4}$

c. $\dfrac{34}{85} = \dfrac{17\times 2}{17\times 5} = \dfrac{2}{5}$

2. a. $\dfrac{21}{5} = 5\overline{)21}\ \begin{matrix}4\\ \underline{20}\\ 1\end{matrix} = 4\dfrac{1}{5}$

b. $\dfrac{37}{7} = 7\overline{)37}\ \begin{matrix}5\\ \underline{35}\\ 2\end{matrix} = 5\dfrac{2}{7}$

3. a. $2\dfrac{2}{5} = \dfrac{2\times 5+2}{5} = \dfrac{10+2}{5} = \dfrac{12}{5}$

b. $6\dfrac{1}{9} = \dfrac{6\times 9+1}{9} = \dfrac{54+1}{9} = \dfrac{55}{9}$

4. $\dfrac{3}{8} = \dfrac{?}{40} \Rightarrow \dfrac{3\times 5}{8\times 5} = \dfrac{15}{40}$

5. a. $10 = 2\times 5$
$12 = 2\times 2\times 3$
$\text{LCD} = 2\times 2\times 3\times 5 = 60$

b. $25 = 5\times 5$
$20 = 2\times 2\times 5$
$\text{LCD} = 2\times 2\times 5\times 5 = 100$

6. a. $\dfrac{1}{2}+\dfrac{1}{9} = \dfrac{1\times 9}{2\times 9}+\dfrac{1\times 2}{9\times 2} = \dfrac{9}{18}+\dfrac{2}{18} = \dfrac{11}{18}$

b. $\dfrac{19}{24}-\dfrac{3}{8} = \dfrac{19}{24}-\dfrac{3\times 3}{8\times 3} = \dfrac{19}{24}-\dfrac{9}{24} = \dfrac{10}{24} = \dfrac{5}{12}$

7. a. $2\dfrac{2}{3}+3\dfrac{1}{9} = \dfrac{8}{3}+\dfrac{28}{9} = \dfrac{24}{9}+\dfrac{28}{9} = \dfrac{52}{9} = 5\dfrac{7}{9}$

b. $3\dfrac{5}{6}-1\dfrac{1}{3} = \dfrac{23}{6}-\dfrac{4}{3} = \dfrac{23}{6}-\dfrac{8}{6} = \dfrac{15}{6} = \dfrac{5}{2} = 2\dfrac{1}{2}$

8. a. $\dfrac{5}{11}\times\dfrac{2}{3} = \dfrac{5\times 2}{11\times 3} = \dfrac{10}{33}$

b. $\dfrac{7}{10}\times\dfrac{15}{21} = \dfrac{7}{2\cdot 5}\times\dfrac{3\cdot 5}{3\cdot 7} = \dfrac{1}{2}$

c. $6\times\dfrac{3}{5} = \dfrac{6}{1}\times\dfrac{3}{5} = \dfrac{18}{5}$ or $3\dfrac{3}{5}$

9. a. $\dfrac{3}{14}\div\dfrac{2}{5} = \dfrac{3}{14}\times\dfrac{5}{2} = \dfrac{15}{28}$

b. $\dfrac{7}{12}\div\dfrac{7}{5} = \dfrac{7}{12}\times\dfrac{5}{7} = \dfrac{5}{12}$

10. a. $1\dfrac{5}{6}\times 2\dfrac{1}{4} = \dfrac{11}{6}\times\dfrac{9}{4} = \dfrac{99}{24} = \dfrac{33}{8}$ or $4\dfrac{1}{8}$

b. $3\dfrac{1}{2}\div 1\dfrac{3}{4} = \dfrac{7}{2}\div\dfrac{7}{4} = \dfrac{7}{2}\times\dfrac{4}{7} = \dfrac{7}{2}\times\dfrac{2\cdot 2}{7} = \dfrac{2}{1} = 2$

11. $\dfrac{7}{8} = 8\overline{)7.000}\ \begin{matrix}0.875\\ \underline{64}\\ 60\\ \underline{56}\\ 40\\ \underline{40}\\ 0\end{matrix} = 0.875$

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12. a. $0.29 = \frac{29}{100}$

b. $0.175 = \frac{175}{1000} = \frac{7}{40}$

13. a.
$$\begin{array}{r} 2.338 \\ +\ 6.195 \\ \hline 8.533 \end{array}$$

b.
$$\begin{array}{r} 6.00 \\ -\ 2.54 \\ \hline 3.46 \end{array}$$

14. a.
$$\begin{array}{r} 1.5 \\ \times\ 0.9 \\ \hline 1.35 \end{array}$$

b.
$$\begin{array}{r} 5.12 \\ \times\ 0.67 \\ \hline 3584 \\ 3\,072 \\ \hline 3.4304 \end{array}$$

15.
$$\begin{array}{r} 18.5 \\ 0.5\overset{\wedge}{)}\overline{9.2\overset{\wedge}{5}} \\ \underline{5} \\ 42 \\ \underline{40} \\ 25 \\ \underline{25} \\ 0 \end{array}$$

16. a. 0.52 = 52%

b. 0.008 = 0.8%

c. 1.86 = 186%

d. 0.077 = 7.7%

e. 0.0009 = 0.09%

17. a. 28% = 0.28

b. 7.42% = 0.0742

c. 165% = 1.65

d. 0.25% = 0.0025

18. 15% of 92
$0.15 \times 92 = 13.8$

19. a. What percent of 12 is 10?
$\frac{10}{12} = \frac{5}{6} \approx 0.833 = 83.3\%$

b. 50 is what percent of 40?
$\frac{50}{40} = \frac{5}{4} = 1.25 = 125\%$

20. Area $= 27 \times 11.5 \approx 25 \times 12 = 300$
The room is approximately $300\ \text{ft}^2$.

21. 15 ft = 5 yd
$21\frac{3}{4}\ \text{ft} = 7\frac{1}{4}\ \text{yd}$
$\text{Area} = 5 \times 7\frac{1}{4} = \frac{5}{1} \times \frac{29}{4} = \frac{145}{4}\ \text{yd}^2$
$\text{Cost} = 4.25 \times \frac{145}{4} \approx 154.06$
The tile will cost \$154.06.

Chapter 0 Review Problems

1. $\frac{36}{48} = \frac{12 \times 3}{12 \times 4} = \frac{3}{4}$

2. $\frac{15}{50} = \frac{5 \times 3}{5 \times 10} = \frac{3}{10}$

3. $\frac{36}{82} = \frac{18 \times 2}{41 \times 2} = \frac{18}{41}$

4. $\frac{18}{30} = \frac{6 \times 3}{6 \times 5} = \frac{3}{5}$

5. $7\frac{1}{8} = \frac{7 \times 8 + 1}{8} = \frac{56 + 1}{8} = \frac{57}{8}$

6. $\frac{34}{5} = 5\overline{)34} = 6\frac{4}{5}$ (quotient 6, remainder 4, $\underline{30}$)

7. $\frac{80}{3} = 3\overline{)80} = 26\frac{2}{3}$ (quotient 26, $\underline{6}$, 20, $\underline{18}$, remainder 2)

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8. $\frac{5}{8}=\frac{?}{24}\Rightarrow\frac{5\cdot3}{8\cdot3}=\frac{15}{24}$

9. $\frac{1}{7}=\frac{?}{35}\Rightarrow\frac{1\cdot5}{7\cdot5}=\frac{5}{35}$

10. $\frac{3}{5}=\frac{?}{75}\Rightarrow\frac{3\times15}{5\times15}=\frac{45}{75}$

11. $\frac{2}{5}=\frac{?}{55}\Rightarrow\frac{2\times11}{5\times11}=\frac{22}{55}$

12. $\frac{3}{5}+\frac{1}{4}=\frac{3\times4}{5\times4}+\frac{1\times5}{4\times5}=\frac{12}{20}+\frac{5}{20}=\frac{17}{20}$

13. $\frac{7}{12}+\frac{5}{8}=\frac{7\times2}{12\times2}+\frac{5\times3}{8\times3}=\frac{14}{24}+\frac{15}{24}=\frac{29}{24}=1\frac{5}{24}$

14. $\frac{7}{20}-\frac{1}{12}=\frac{21}{60}-\frac{5}{60}=\frac{16}{60}=\frac{4}{15}$

15. $\frac{7}{10}-\frac{4}{15}=\frac{7\cdot3}{10\cdot3}-\frac{4\cdot2}{5\cdot2}=\frac{21}{30}-\frac{8}{30}=\frac{13}{30}$

16. $3\frac{1}{6}+2\frac{3}{5}=\frac{19}{6}+\frac{13}{5}=\frac{95}{30}+\frac{78}{30}=\frac{173}{30}=5\frac{23}{30}$

17. $2\frac{7}{10}+3\frac{3}{4}=\frac{27}{10}+\frac{15}{4}=\frac{54}{20}+\frac{75}{20}=\frac{129}{20}=6\frac{9}{20}$

18. $6\frac{2}{9}-3\frac{5}{12}=\frac{56}{9}-\frac{41}{12}$
$=\frac{56\cdot4}{9\cdot4}-\frac{41\cdot3}{12\cdot3}$
$=\frac{224}{36}-\frac{123}{36}$
$=\frac{101}{36}$
$=2\frac{29}{36}$

19. $3\frac{1}{15}-1\frac{3}{20}=\frac{46}{15}-\frac{23}{20}$
$=\frac{184}{60}-\frac{69}{60}$
$=\frac{115}{60}$
$=1\frac{55}{60}$
$=1\frac{11}{12}$

20. $6\times\frac{5}{11}=\frac{6}{1}\times\frac{5}{11}=\frac{30}{11}=2\frac{8}{11}$

21. $2\frac{1}{3}\times4\frac{1}{2}=\frac{7}{3}\times\frac{9}{2}=\frac{7}{3}\times\frac{3\cdot3}{2}=\frac{21}{2}=10\frac{1}{2}$

22. $16\times3\frac{1}{8}=\frac{16}{1}\times\frac{25}{8}=\frac{8\cdot2}{1}\times\frac{25}{8}=50$

23. $\frac{4}{7}\times5=\frac{4}{7}\times\frac{5}{1}=\frac{20}{7}=2\frac{6}{7}$

24. $\frac{3}{8}\div6=\frac{3}{8}\times\frac{1}{6}=\frac{3}{8}\times\frac{1}{2\cdot3}=\frac{1}{16}$

25. $\frac{\frac{8}{3}}{\frac{5}{9}}=\frac{8}{3}\div\frac{5}{9}=\frac{8}{3}\times\frac{9}{5}=\frac{8}{3}\times\frac{3\cdot3}{5}=\frac{24}{5}=4\frac{4}{5}$

26. $\frac{15}{16}\div6\frac{1}{4}=\frac{15}{16}\div\frac{25}{4}=\frac{15}{16}\times\frac{4}{25}=\frac{3}{4}\times\frac{1}{5}=\frac{3}{20}$

27. $2\frac{6}{7}\div\frac{10}{21}=\frac{20}{7}\times\frac{21}{10}=\frac{2\cdot10}{7}\times\frac{3\cdot7}{10}=6$

28.
$$\begin{array}{r} 1.634 \\ 3.007 \\ +\ 2.560 \\ \hline 7.201 \end{array}$$

29.
$$\begin{array}{r} 24.831 \\ -\ 17.094 \\ \hline 7.737 \end{array}$$

30.
$$\begin{array}{r} 47.251 \\ -\ 17.690 \\ \hline 29.561 \end{array}$$

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31.
$$\begin{array}{r} 1.900 \\ 2.530 \\ +\ 0.006 \\ \hline 4.436 \end{array}$$

32.
$$\begin{array}{r} 5.35 \\ \times\ 0.007 \\ \hline 0.03745 \end{array}$$

33. $362.341 \times 1000 = 362{,}341$

34. $2.6 \times 0.03 \times 1.02 = 0.07956$

35. $2.51 \times 100 \times 0.05 = 125.5$

36. $71.32 \div 1000 = 0.07132$

37. $0.523 \div 0.4 = 1.3075$

38.
$$\begin{array}{r} 90 \\ 0.015\wedge\overline{)1.350\wedge} \\ \underline{1\ 35} \\ 00 \end{array}$$

39.
$$\frac{4.186}{2.3} = 2.3\wedge\overline{)4.1\wedge86} = 1.82$$
$$\begin{array}{r} 1.82 \\ \underline{2\ 3} \\ 1\ 8\ \ 8 \\ \underline{1\ 8\ \ 4} \\ 46 \\ \underline{46} \\ 0 \end{array}$$

40.
$$\frac{3}{8} = 8\overline{)3.000} = 0.375$$
$$\begin{array}{r} 0.375 \\ \underline{2\ 4} \\ 60 \\ \underline{56} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

41. $0.36 = \frac{36}{100} = \frac{9}{25}$

42. $1.4\% = 0.014$

43. $36.1\% = 0.361$

44. $0.02\% = 0.0002$

45. $125.3\% = 1.253$

46. $0.0025 = 0.25\%$

47. $0.325 = 32.5\%$

48. $0.9 = 90\%$

49. $0.1 = 10\%$

50. 30% of 400
$0.30 \times 400 = 120$

51. 7.2% of 55
$0.072 \times 55 = 3.96$

52. 76 is what percent of 80?
$\frac{76}{80} = 0.95 = 95\%$

53. $\frac{750}{1250} = 0.6 = 60\%$

54. 80% of 16,850
$0.8 \times 16{,}850 = 13{,}480$
13,480 students have cell phones.

55. $\frac{720}{960} = 0.75 = 75\%$
75% of the class had a math deficiency.

56. $234{,}897 \times 1{,}936{,}112 \approx 200{,}000 \times 2{,}000{,}000$
$= 400{,}000{,}000{,}000$

57. $357 + 923 + 768 + 417 \approx 400 + 900 + 800 + 400$
$= 2500$

58. $634{,}318 - 284{,}000 \approx 600{,}000 - 300{,}000$
$\approx 300{,}000$

59. $21\frac{1}{5} - 8\frac{4}{5} - 1\frac{2}{3} \approx 20 - 9 - 2 = 9$

60. 18% of 56,297 $\approx 0.2 \times 60{,}000 = \$12{,}000$

61. $12{,}482 \div 389 \approx 10{,}000 \div 400 = 25$

62. $38.5 \times 8.35 \approx 40 \times 8 = \$320$
Her estimated salary is \$320.

63. $\frac{3875}{5} \approx \frac{4000}{5} = \$800$
Each family owes about \$800.

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64. Maximum distance $= 7\frac{2}{3} \times 240$
$= \frac{23}{3} \times 240$
$= 1840$ miles
The plane can fly 1840 miles.
Longest trip $= 80\% \times 1840$
$= 0.8 \times 1840$
$= 1472$ miles
The longest trip he would take is 1472 miles.

65. Distance at maximum speed:
$6\frac{1}{4} \times 240 = \frac{25}{4} \times 240 = 1500$
The plane can fly 1500 miles.
$0.70 \times 1500 = 1050$
The longest trip he would take is 1050 miles.

66. Area $= 12\frac{1}{2} \times 9\frac{2}{3}$
$= \frac{25}{2} \times \frac{29}{3}$
$= 120\frac{5}{6}$ sq feet
$= \frac{120\frac{5}{6}}{9}$
$= 13\frac{23}{54}$ sq yards

Cost $= 26.00 \times 13\frac{23}{54} = 26 \times \frac{725}{54} = \$349.07$
The total cost is \$349.07.

67. 8% of 5785
$0.08 \times 5785 = \$462.80$
His commission was \$462.80.

68. Amount paid $= 225 \times 4 \times 12 = \$10{,}800$
Interest $= 10{,}800 - 9214.50 = \$1585.50$
They paid \$1585.50 more than the car loan.

69. Regular pay $= 7.50 \times 40 = 300$
O/T hours $= 49 - 40 = 9$
O/T pay rate $= 1.5 \times 7.5 = 11.25$
O/T pay $= 11.25 \times 9 = 101.25$
Total pay $= 300 + 101.25 = \$401.25$
He was paid a total of \$401.25.

How Am I Doing? Chapter 0 Test

1. $\frac{16}{18} = \frac{2 \times 8}{2 \times 9} = \frac{8}{9}$

2. $\frac{48}{36} = \frac{4 \times 12}{3 \times 12} = \frac{4}{3}$

3. $6\frac{3}{7} = \frac{6 \times 7 + 3}{7} = \frac{45}{7}$

4. $\frac{105}{9} = 9\overline{)105} = 11\frac{6}{9} = 11\frac{2}{3}$
$\frac{9}{15}$
$\frac{9}{6}$

5. $\frac{2}{3} + \frac{5}{6} + \frac{3}{8} = \frac{2 \cdot 8}{3 \cdot 8} + \frac{5 \cdot 4}{6 \cdot 4} + \frac{3 \cdot 3}{8 \cdot 3}$
$= \frac{16}{24} + \frac{20}{24} + \frac{9}{24}$
$= \frac{45}{24}$
$= \frac{15}{8}$ or $1\frac{7}{8}$

6. $1\frac{1}{8} + 3\frac{3}{4} = \frac{9}{8} + \frac{15}{4} = \frac{9}{8} + \frac{30}{8} = \frac{9+30}{8} = \frac{39}{8} = 4\frac{7}{8}$

7. $3\frac{2}{3} - 2\frac{5}{6} = \frac{11}{3} - \frac{17}{6} = \frac{22}{6} - \frac{17}{6} = \frac{5}{6}$

8. $\frac{5}{7} \times \frac{28}{15} = \frac{1}{1} \times \frac{4}{3} = \frac{4}{3}$ or $1\frac{1}{3}$

9. $\frac{7}{4} \div \frac{1}{2} = \frac{7}{4} \times \frac{2}{1} = \frac{7}{2} \times \frac{1}{1} = \frac{7}{2}$ or $3\frac{1}{2}$

10. $5\frac{3}{8} \div 2\frac{3}{4} = \frac{43}{8} \div \frac{11}{4}$
$= \frac{43}{2 \cdot 4} \times \frac{4}{11}$
$= \frac{43}{22}$
$= 1\frac{21}{22}$

11. $2\frac{1}{2} \times 3\frac{1}{4} = \frac{5}{2} \times \frac{13}{4} = \frac{65}{8} = 8\frac{1}{8}$

12. $\frac{\frac{7}{8}}{\frac{1}{4}} = \frac{7}{8} \div \frac{1}{4} = \frac{7}{8} \times \frac{4}{1} = \frac{7}{2} \times \frac{1}{1} = \frac{7}{2}$ or $3\frac{1}{2}$

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13.
$$\begin{array}{r} 1.60 \\ 3.24 \\ +\ 9.80 \\ \hline 14.64 \end{array}$$

14.
$$\begin{array}{r} 7.0046 \\ -\ 3.0149 \\ \hline 3.9897 \end{array}$$

15.
$$\begin{array}{r} 32.8 \\ \times\ 0.04 \\ \hline 1.312 \end{array}$$

16. $0.07385 \times 1000 = 73.85$

17.
$$\begin{array}{r} 230 \\ 0.056_\wedge\overline{)12.880_\wedge} \\ 11\ 2 \\ \hline 1\ 68 \\ 1\ 68 \\ \hline 0 \end{array}$$

18. $26{,}325.9 \div 100 = 263.259$

19. $0.073 = 7.3\%$

20. $196.5\% = 1.965$

21. What is 3.5% of 180?
$0.035 \times 180 = 6.3$

22. 39 is what percent of 650?
$$\frac{39}{650} = 0.06 = 6\%$$

23. $4 \div \frac{2}{9} = \frac{4}{1} \times \frac{9}{2} = \frac{2}{1} \times \frac{9}{1} = 18$
18 chips are in the stack.

24. $52{,}344\overline{)4{,}678{,}987} \approx 50{,}000\overline{)5{,}000{,}000}$ with quotient 100

25.
$$\begin{aligned} 285.36 + 311.85 + 113.6 &\approx 300 + 300 + 100 \\ &= 700 \end{aligned}$$

26. Commission: (0.03)(870,000) = 26,100
Total income: 26,100 + 14,000 = 40,100
Percent: $\frac{26{,}100}{40{,}100} \approx 0.65 = 65\%$
Her commission was 65% of her total income.

27.
$$\begin{aligned} 210 \div 3\frac{1}{2} &= \frac{210}{1} \div \frac{7}{2} \\ &= \frac{210}{1} \times \frac{2}{7} \\ &= \frac{30 \times 7}{1} \times \frac{2}{7} \\ &= 60 \end{aligned}$$
They will need 60 tiles.

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Chapter 1

1.1 Exercises

	Number	Int	RaN	IR	ReN
2.	$-\frac{4}{5}$		X		X
4.	2.34		X		X
6.	$-\frac{7}{9}$		X		X
8.	14	X	X		X
10.	3.232232223...			X	X

12. Up \$0.07 $\Rightarrow$ +0.07

14. 3642 feet above sea level $\Rightarrow$ +3642

16. 52 feet below sea level $\Rightarrow$ −52

18. Opposite of $-\frac{3}{7}$ is $\frac{3}{7}$.

20. Opposite of 85.4 is −85.4.

22. $|-5.9| = 5.9$

24. $\left|\frac{3}{11}\right| = \frac{3}{11}$

26. $-14 + (-3) = -17$

28. $(-17) + (-23) = -40$

30. $-\frac{3}{7} + \left(-\frac{2}{7}\right) = -\frac{5}{7}$

32. $-\frac{3}{16} + \frac{5}{16} = \frac{2}{16} = \frac{1}{8}$

34. $-\frac{2}{7} + \frac{3}{14} = -\frac{4}{14} + \frac{3}{14} = -\frac{1}{14}$

36. $-5.4 + (-12.8) = -18.2$

38. $-0.8 + 0.5 = -0.3$

40. $-6.48 + (-3.7) = -10.18$

42. $-3 + (-9) + (-2) = -12 + (-2) = -14$

44. $-8 + 7 + (-15) = -1 + (-15) = -16$

46. $-\frac{3}{8} + \frac{11}{24} = -\frac{9}{24} + \frac{11}{24} = \frac{2}{24} = \frac{1}{12}$

48. $-18 + 10 + (-5) = -8 + (-5) = -13$

50. $15 + (-26) = -11$

52. $-114 + 186 = 72$

54. $-\frac{3}{5} + \frac{2}{3} = -\frac{9}{15} + \frac{10}{15} = \frac{1}{15}$

56. $-\frac{2}{3} + \left(-\frac{1}{4}\right) = -\frac{8}{12} + \left(-\frac{3}{12}\right) = -\frac{11}{12}$

58. $8.33 + (-14.2) = -5.87$

60. $-7 + (-15) + (-6) = -22 + (-6) = -28$

62.
$$\begin{aligned} -16 + 12 + (-26) + 15 &= -4 + (-26) + 15 \\ &= -30 + 15 \\ &= -15 \end{aligned}$$

64.
$$\begin{aligned} 28.37 + 4.08 + (-16.98) &= 32.45 + (-16.98) \\ &= 15.47 \end{aligned}$$

66. $-12 + 7 = -5$
The temperature at the summit is −5°F.

68. $11 + (-15) = -4$ hours from 12 A.M.
$12 + (-4) = 8$
It is 8 A.M. in New York.

70. Account balance: 643.85 − 185.50 = \$458.35
Short: 475 − 458.35 = \$16.65
No; she is short \$16.65.

72. $-258 + (-32) + 150 = -290 + 150 = -140$
He still owes \$140.

74.
$$\begin{aligned} &30 + 14 + (-16) + (-22) + 5 \\ &= 44 + (-16) + (-22) + 5 \\ &= 6 + 5 \\ &= 11 \end{aligned}$$
The total earnings were \$11,000,000.

76.
$$\begin{aligned} -18 + ? &= 10 \\ -18 + 28 &= 10 \\ ? &= 28 \end{aligned}$$

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Cumulative Review

77. $\frac{15}{16}+\frac{1}{4}=\frac{15}{16}+\frac{4}{16}=\frac{19}{16}$ or $1\frac{3}{16}$

78. $\frac{3}{7}\times\frac{14}{9}=\frac{3\cdot 14}{7\cdot 9}=\frac{3\cdot 7\cdot 2}{7\cdot 3\cdot 3}=\frac{2}{3}$

79. $\frac{2}{15}-\frac{1}{20}=\frac{8}{60}-\frac{3}{60}=\frac{5}{60}=\frac{1}{12}$

80. $2\frac{1}{2}\div 3\frac{2}{5}=\frac{5}{2}\div\frac{17}{5}=\frac{5}{2}\cdot\frac{5}{17}=\frac{25}{34}$

81. $0.72 + 0.8 = 1.52$

82. $1.63 - 0.98 = 0.65$

83.
$$\begin{array}{r} 1.63 \\ \times\ \ 0.7 \\ \hline 1.141 \end{array}$$

84. $0.208 \div 0.8 = 0.26$

Classroom Quiz 1.1

1. $27 + (-34) = -7$

2. $-3.4 + 8.9 + (-4.8) = 5.5 + (-4.8) = 0.7$

3. $-\frac{7}{8}+\frac{11}{24}=-\frac{21}{24}+\frac{11}{24}=-\frac{10}{24}=-\frac{5}{12}$

1.2 Exercises

2. First change subtracting –15 to adding a positive fifteen. Then use the rules for addition of two real numbers with different signs. Thus $-10 - (-15) = -10 + 15 = 5$.

4. $23 - 57 = 23 + (-57) = -34$

6. $8 - 19 = 8 + (-19) = -11$

8. $-17 - (-13) = -17 + 13 = -4$

10. $-48 - (-80) = -48 + 80 = 32$

12. $0 - (-7) = 0 + 7 = 7$

14. $-24 - (-24) = -24 + 24 = 0$

16. $-11 - (-19) = -11 + 19 = 8$

18. $\frac{2}{9}-\frac{7}{9}=\frac{2}{9}+\left(-\frac{7}{9}\right)=-\frac{5}{9}$

20. $-\frac{2}{3}-\frac{1}{4}+-\frac{2}{3}+\left(-\frac{1}{4}\right)=-\frac{8}{12}+\left(-\frac{3}{12}\right)=-\frac{11}{12}$

22.
$$\begin{aligned} -\frac{7}{10}-\frac{10}{15} &= -\frac{7}{10}+\left(-\frac{10}{15}\right) \\ &= -\frac{21}{30}+\left(-\frac{20}{30}\right) \\ &= -\frac{41}{30} \text{ or } -1\frac{11}{30} \end{aligned}$$

24. $-0.9 - 0.5 = -0.9 + (-0.5) = -1.4$

26. $-0.03 - 0.06 = -0.03 + (-0.06) = -0.09$

28. $\frac{5}{6}-3=\frac{5}{6}+\left(-\frac{18}{6}\right)=-\frac{13}{6}$ or $-2\frac{1}{6}$

30. $-\frac{1}{6}-5=-\frac{1}{6}+\left(-\frac{30}{6}\right)=-\frac{31}{6}$ or $-5\frac{1}{6}$

32. $19 - 76 = 19 + (-76) = -57$

34. $-74 - 11 = -74 + (-11) = -85$

36. $8.4 - (-2.7) = 8.4 + 2.7 = 11.1$

38. $\frac{2}{3}-(-6)=\frac{2}{3}+6=6\frac{2}{3}$ or $\frac{20}{3}$

40. $9-\frac{2}{3}=\frac{27}{3}+\left(-\frac{2}{3}\right)=\frac{25}{3}$ or $8\frac{1}{3}$

42. $-\frac{5}{6}-\frac{1}{5}=-\frac{25}{30}+\left(-\frac{6}{30}\right)=-\frac{31}{30}$ or $-1\frac{1}{30}$

44. $-97.6 - (-146) = -97.6 + 146 = 48.4$

46. $\frac{2}{7}-(-3)=\frac{2}{7}+3=\frac{2}{7}+\frac{21}{7}=\frac{23}{7}$ or $3\frac{2}{7}$

48. $5.2 - (-3.88) = 5.2 + 3.88 = 9.08$

50. $-1.043 - 4 = -1.043 + (-4) = -5.043$

52. $20 - (-12) = 20 + 12 = 32$

54. $9 + (-7) - 5 = 9 + (-7) + (-5) = 2 + (-5) = -3$

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56. $-18 + 12 - (-6) = -18 + 12 + 6 = -6 + 6 = 0$

58. $-23-(-12)-(-4)+17 = -23+12+4+17$
$= -11+4+17$
$= -7+17$
$= 10$

60. $-8.3-(-2.6)+1.9 = -8.3+2.6+1.9$
$= -5.7+1.9$
$= -3.8$

62. $300 - (-126) = 300 + 126 = 426$
The helicopter is 426 feet from the submarine.

64. $\$156 - (-\$37) = \$156 + \$37 = \$193$

Cumulative Review

65. $-37 + 16 = -21$

66. $-37 + (-14) = -51$

67. $-3 + (-6) + (-10) = -9 + (-10) = -19$

68. $-5 + 20 = 15$
The afternoon temperature was 15°F.

69. $\left(\frac{4}{5}\right)\left(8\frac{1}{3}\right) = \left(\frac{4}{5}\right)\left(\frac{25}{3}\right) = \frac{20}{3} = 6\frac{2}{3}$
There were $6\frac{2}{3}$ miles covered in snow.

Classroom Quiz 1.2

1. $-19 - (-13) = -19 + 13 = -6$

2. $-4.2 - 1.5 = -4.2 + (-1.5) = -5.7$

3. $\frac{2}{9} - \left(-\frac{3}{5}\right) = \frac{2}{9} + \frac{3}{5} = \frac{10}{45} + \frac{27}{45} = \frac{37}{45}$

1.3 Exercises

2. To multiply three or more real numbers, multiply the absolute values. The sign of the result is positive if there is an even number of negative signs. It is negative if there is an odd number of negative signs.

4. $9(-9) = -81$

6. $0(136) = 0$

8. $7.5(8) = 60$

10. $(-2.3)(-0.11) = 0.253$

12. $(3.4)(-2.2) = -7.48$

14. $(5)\left(-\frac{7}{10}\right) = -\frac{7}{2}$ or $-3\frac{1}{2}$

16. $\left(-\frac{4}{9}\right)\left(-\frac{3}{5}\right) = \frac{4}{15}$

18. $\left(\frac{14}{17}\right)\left(-\frac{3}{28}\right) = -\frac{3}{34}$

20. $0 \div (-13) = 0$

22. $-64 \div 8 = \frac{-64}{8} = -8$

24. $-180 \div (-4) = 45$

26. $\frac{-20}{10} = -2$

28. $8.1 \div (-0.03) = \frac{8.1}{-0.03} = -270$

30. $-7.2 \div 8 = \frac{-7.2}{8} = -0.9$

32. $\frac{2}{7} \div \left(-\frac{3}{5}\right) = \frac{2}{7} \cdot \left(-\frac{5}{3}\right) = -\frac{10}{21}$

34. $\left(-\frac{5}{6}\right) \div \left(-\frac{7}{18}\right) = \left(-\frac{5}{6}\right)\left(-\frac{18}{7}\right) = \frac{15}{7}$ or $2\frac{1}{7}$

36. $\left(-\frac{4}{9}\right) \div \left(-\frac{8}{15}\right) = \left(-\frac{4}{9}\right)\left(-\frac{15}{8}\right) = \frac{5}{6}$

38. $\frac{12}{-\frac{2}{5}} = \frac{12}{1}\left(-\frac{5}{2}\right) = -30$

40. $\frac{-\frac{3}{8}}{-\frac{2}{3}} = -\frac{3}{8}\left(-\frac{3}{2}\right) = \frac{9}{16}$

42. $\frac{\frac{9}{2}}{-3} = \frac{9}{2} \cdot \left(\frac{1}{-3}\right) = -\frac{9}{6} = -\frac{3}{2}$ or $-1\frac{1}{2}$

44. $(-6)(2)(-3)(4) = (12)(3)(4) = (36)(4) = 144$

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46. $-3(2)(-1)(-2)(5) = -60$

48. $-6(2)(-3)(0)(-9) = 0$

50. $-2(0.14)(-3)(0.5) = -0.28(-3)(0.5)$
$= 0.84(0.5)$
$= 0.42$

52. $\left(\frac{3}{7}\right)\left(-\frac{2}{3}\right)\left(-\frac{5}{3}\right) = -\frac{2}{7}\left(-\frac{5}{3}\right) = \frac{10}{21}$

54. $\left(-\frac{2}{3}\right)\left(-\frac{1}{4}\right)\left(\frac{3}{5}\right)\left(-\frac{2}{7}\right) = -\left(\frac{1}{6}\right)\left(\frac{3}{5}\right)\left(\frac{2}{7}\right)$
$= -\left(\frac{1}{10}\right)\left(\frac{2}{7}\right)$
$= -\frac{1}{35}$

56. $-5 - (-2) = -5 + 2 = -3$

58. $-4(-8) = 32$

60. $(-30) \div 5 = \frac{-30}{5} = -6$

62. $-6 + (-3) = -9$

64. $18 \div (-18) = -1$

66. $90(47.24 - 50.46) = 90(-3.22) = -289.8$
That day had a loss of \$289.80.

68. Payments: $180(12) = \$2160$
Owing: $6480 - 2160 = \$4320$
He still owes \$4320.

70. $-5(10) = -50$, lost 50 yards in small losses.

72. Total $= -50 + 20 = -30$, the result is a loss of 30 yards.

74. $15(6) = +90$, gained 90 yards in medium gains.

Cumulative Review

76. $-17.4 + 8.31 + 2.40 = -9.09 + 2.40 = -6.69$

77. $-\frac{3}{4} + \left(-\frac{2}{3}\right) + \left(-\frac{5}{12}\right) = -\frac{9}{12} + \left(-\frac{8}{12}\right) + \left(-\frac{5}{12}\right)$
$= -\frac{17}{12} + \left(-\frac{5}{12}\right)$
$= -\frac{22}{12}$
$= -\frac{11}{6}$ or $-1\frac{5}{6}$

78. $-47 - (-32) = -47 + 32 = -15$

79. $-37 - 51 = -37 + (-51) = -88$

Classroom Quiz 1.3

1. $\left(-\frac{4}{7}\right)(6) = -\frac{4}{7} \cdot \frac{6}{1} = -\frac{24}{7}$ or $-3\frac{3}{7}$

2. $-2(-5)(3)(-6) = 10(3)(-6) = 30(-6) = -180$

3. $-4.5 \div (-0.9) = \frac{-4.5}{-0.9} = 5$

1.4 Exercises

2. The base is 9 and the exponent is 2. Thus you multiply $(9)(9) = 81$.

4. The answer is negative. When you raise a negative number to an odd power the result is always negative.

6. If you have parentheses surrounding the -3, then the base is -3 and the exponent is 4. The result is 81. Without parentheses, the base is 3. You evaluate to obtain 81 and then take the opposite of 81, which is -81. Thus $(-3)^4 = 81$, but $-3^4 = -81$.

8. $(8) \cdot (8) \cdot (8) \cdot (8) \cdot (8) \cdot (8) = 8^6$

10. $(x)(x)(x)(x) = x^4$

12. $(r) \cdot (r) \cdot (r) \cdot (r) \cdot (r) \cdot (r) \cdot (r) = r^7$

14. $(2w)(2w)(2w)(2w)(2w) = (2w)^5$ or $2^5 w^5$

16. $9^2 = 81$

18. $7^3 = 343$

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20. $12^2 = 144$

22. $(-2)^3 = (-2)(-2)(-2) = -8$

24. $-(5)^3 = -(5)(5)(5) = -125$

26. $-4^2 = -(4)(4) = -16$

28. $\left(\frac{3}{4}\right)^2 = \left(\frac{3}{4}\right)\left(\frac{3}{4}\right) = \frac{9}{16}$

30. $\left(\frac{1}{3}\right)^3 = \left(\frac{1}{3}\right)\left(\frac{1}{3}\right)\left(\frac{1}{3}\right) = \frac{1}{27}$

32. $(1.5)^2 = (1.5)(1.5) = 2.25$

34. $(0.7)^3 = (0.7)(0.7)(0.7) = 0.343$

36. $(-7)^4 = (-7)(-7)(-7)(-7) = 2401$

38. $-7^4 = -(7)(7)(7)(7) = -2401$

40. $6^2 + 2^3 = 36 + 8 = 44$

42. $5^3 - 2^2 = 125 - 4 = 121$

44. $14^2 - (-6)^2 = 196 - 36 = 160$

46. $7^2 - (-2)^4 = 49 - 16 = 33$

Cumulative Review

48. $\begin{aligned}(-11) + (-13) + 6 + (-9) + 8 &= -24 + 6 + (-9) + 8 \\ &= -18 + (-9) + 8 \\ &= -27 + 8 \\ &= -19\end{aligned}$

49. $\begin{aligned}\frac{3}{4} \div \left(-\frac{9}{20}\right) &= \left(\frac{3}{4}\right)\left(-\frac{20}{9}\right) \\ &= \left(\frac{3}{4}\right)\left(-\frac{4 \cdot 5}{3 \cdot 3}\right) \\ &= -\frac{5}{3} \text{ or } -1\frac{2}{3}\end{aligned}$

50. $-17 - (-9) = -17 + 9 = -8$

51. $(-2.1)(-1.2) = 2.52$

52. 6% of 1600 = 0.06 × 1600 = 96
1600 + 96 = 1696
She has $1696 at the end of the year.

Classroom Quiz 1.4

1. $(-6)^3 = (-6)(-6)(-6) = -216$

2. $(2.3)^2 = (2.3)(2.3) = 5.29$

3. $\left(\frac{2}{5}\right)^4 = \left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\left(\frac{2}{5}\right) = \frac{16}{625}$

1.5 Exercises

2. $4 + 4 + 4 + 5 + 5 + 5 + 5 + 5 + 5 = 42$

4. (b) gives the correct total.

6. $\begin{aligned}(5-8)^2 \div 3 \times 6 &= (-3)^2 \div 3 \times 6 \\ &= 9 \div 3 \times 6 \\ &= 3 \times 6 \\ &= 18\end{aligned}$

8. $13 + 2(-8 + 6 - 3) = 13 + 2(-5) = 13 + (-10) = 3$

10. $\begin{aligned}7 - 3^2 \cdot 4 + 5 &= 7 - 9 \cdot 4 + 5 \\ &= 7 - 36 + 5 \\ &= -29 + 5 \\ &= -24\end{aligned}$

12. $7 + 36 \div 12 \cdot 3 - 14 = 7 + 3 \cdot 3 - 14 = 7 + 9 - 14 = 2$

14. $\begin{aligned}2 \cdot 6 + 5 \cdot 3 - 7 \cdot 4 &= 12 + 5 \cdot 3 - 7 \cdot 4 \\ &= 12 + 15 - 7 \cdot 4 \\ &= 12 + 15 - 28 \\ &= -1\end{aligned}$

16. $\begin{aligned}11 - 3(4)^2 \div (-6) &= 11 - 3(16) \div (-6) \\ &= 11 - 48 \div (-6) \\ &= 11 + 8 \\ &= 19\end{aligned}$

18. $\begin{aligned}-2(3-6)^2 - (-2) &= -2(-3)^2 + 2 \\ &= -2(9) + 2 \\ &= -18 + 2 \\ &= -16\end{aligned}$

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20. $(-5)^2+(15\div 3)+4\cdot 2=(-5)^2+5+4\cdot 2$
$=25+5+4\cdot 2$
$=25+5+8$
$=38$

22. $\frac{5}{6}\div\frac{2}{3}-6\cdot\left(\frac{1}{2}\right)^2=\frac{5}{6}\cdot\frac{3}{2}-\frac{6}{1}\cdot\frac{1}{4}=\frac{5}{4}-\frac{6}{4}=-\frac{1}{4}$

24. $0.05+1.4-(0.5-0.7)^3=0.05+1.4-(-0.2)^3$
$=0.05+1.4-(-0.008)$
$=1.45+0.008$
$=1.458$

26. $\frac{1}{2}\div\frac{4}{5}-\frac{3}{4}\left(\frac{5}{6}\right)=\frac{1}{2}\left(\frac{5}{4}\right)-\frac{3}{4}\left(\frac{5}{6}\right)$
$=\frac{5}{8}-\frac{15}{24}$
$=\frac{15}{24}-\frac{15}{24}$
$=0$

28. $(5-6)^2\cdot 7-4=(-1)^2\cdot 7-4$
$=1\cdot 7-4$
$=7-4$
$=3$

30. $\left(2\frac{4}{7}\right)\div\left(-1\frac{1}{5}\right)=\left(\frac{18}{7}\right)\div\left(-\frac{6}{5}\right)$
$=\left(\frac{18}{7}\right)\left(-\frac{5}{6}\right)$
$=-\frac{15}{7}$ or $-2\frac{1}{7}$

32. $5.15+4.2\div(-0.3)-(3.5)^2$
$=5.15+4.2\div(-0.3)-12.25$
$=5.15+(-14)-12.25$
$=-8.85-12.25$
$=-21.1$

34. $\left(\frac{1}{2}\right)^3+\frac{1}{4}-\left(\frac{2}{3}-\frac{1}{6}\right)+\left(-\frac{1}{3}\right)^2$
$=\left(\frac{1}{2}\right)^3+\frac{1}{4}-\frac{1}{2}+\left(-\frac{1}{3}\right)^2$
$=\frac{1}{8}+\frac{1}{4}-\frac{1}{2}+\frac{1}{9}$
$=\frac{9}{72}+\frac{18}{72}-\frac{36}{72}+\frac{8}{72}$
$=-\frac{1}{72}$

36. $1(-2)+5(-1)+10(0)+2(+1)$
$=-2+(-5)+0+2$
$=-5$ or 5 under par

38. Exercise 37 did not use the order of operations.

Cumulative Review

39. $(0.5)^3=(0.5)(0.5)(0.5)=0.125$

40. $-\frac{3}{4}-\frac{5}{6}=-\frac{9}{12}-\frac{10}{12}=-\frac{19}{12}=-1\frac{7}{12}$

41. $-1^{20}=-1$

42. $3\frac{3}{5}\div 6\frac{1}{4}=\frac{18}{5}\div\frac{25}{4}=\frac{18}{5}\cdot\frac{4}{25}=\frac{72}{125}$

Classroom Quiz 1.5

1. $6-4^3+7-12=6-64+7-12$
$=-58+7-12$
$=-51-12$
$=-63$

2. $(0.6)^2-(-2)(-3.5)+0.23$
$=0.36-(-2)(-3.5)+0.23$
$=0.36-7+0.23$
$=-6.64+0.23$
$=-6.41$

3. $-3(4-5)^5+36\div(-9)+8$
$=-3(-1)^5+36\div(-9)+8$
$=-3(-1)+36\div(-9)+8$
$=3+36\div(-9)+8$
$=3+(-4)+8$
$=-1+8$
$=7$

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Use Math to Save Money

1. $(\$2500 \times 0.05) \times 12 = \$1500$

2. $(\$2500 \times 0.15) \times 12 = \$4500$

3. $\$3000 + \$450 = \$3450$

4. $\$2500 \times 0.05 = \$125$
$\$3450 \div \$125 = 27.6 \approx 28$ months
He will need to save for 28 months or 2 years, 4 months.

5. $\$2500 \times 0.10 = \$250$
$\$3450 \div \$250 = 13.8 \approx 14$ months
He will need to save for 14 months or 1 year, 2 months.

6. $\left[2500 + \left(\frac{5800}{12}\right)\right] \times 0.05 = \$149.17$ per month

7. $\left[2500 + \left(\frac{5800}{12}\right)\right] \times 0.20 = \$596.67$ per month

8. Answers will vary.

9. Answers will vary.

10. Answers will vary.

How Am I Doing? Sections 1.1–1.5
(Available online through MyMathLab or from the Instructor's Resource Center.)

1. $3 + (-12) = -9$

2. $-\frac{5}{6} + \left(-\frac{7}{8}\right) = -\frac{20}{24} + \left(-\frac{21}{24}\right) = \frac{-41}{24} = -1\frac{17}{24}$

3. $\begin{array}{r} 0.34 \\ +\ 0.90 \\ \hline 1.24 \end{array}$

4. $\begin{aligned} -3.5 + 9 + 2.3 + (-3) &= 5.5 + 2.3 + (-3) \\ &= 7.8 + (-3) \\ &= 4.8 \end{aligned}$

5. $-23 - (-34) = -23 + 34 = 11$

6. $-\frac{1}{6} - \frac{4}{5} = -\frac{1}{6} + \left(-\frac{4}{5}\right) = -\frac{5}{30} + \left(-\frac{24}{30}\right) = -\frac{29}{30}$

7. $4.5 - (-7.8) = 4.5 + 7.8 = 12.3$

8. $-4 - (-5) + 9 = -4 + 5 + 9 = 10$

9. $(-3)(-8)(2)(-2) = 24(2)(-2) = 48(-2) = -96$

10. $\left(-\frac{6}{11}\right)\left(-\frac{5}{3}\right) = \frac{10}{11}$

11. $-0.072 \div 0.08 = \frac{-0.072}{0.08} = -0.9$

12. $\frac{5}{8} \div \left(-\frac{17}{16}\right) = \left(\frac{5}{8}\right) \cdot \left(-\frac{16}{17}\right) = -\frac{10}{17}$

13. $(0.7)^3 = (0.7)(0.7)(0.7) = 0.343$

14. $(-4)^4 = (-4)(-4)(-4)(-4) = 256$

15. $-2^8 = -(2)(2)(2)(2)(2)(2)(2)(2) = -256$

16. $\left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right) = \frac{8}{27}$

17. $-3^3 + 3^4 = -27 + 81 = 54$

18. $\begin{aligned} 20 - 12 \div 3 - 8(-1) &= 20 - 4 - 8(-1) \\ &= 20 - 4 + 8 \\ &= 16 + 8 \\ &= 24 \end{aligned}$

19. $\begin{aligned} 15 + 3 - 2 + (-6) &= 18 + (-2) + (-6) \\ &= 16 + (-6) \\ &= 10 \end{aligned}$

20. $\begin{aligned} (9 - 13)^2 + 15 \div (-3) &= (-4)^2 + 15 \div (-3) \\ &= 16 + 15 \div (-3) \\ &= 16 + (-5) \\ &= 11 \end{aligned}$

21. $\begin{aligned} &-0.12 \div 0.6 + (-3)(1.2) - (-0.5) \\ &= -0.2 + (-3)(1.2) + 0.5 \\ &= -0.2 + (-3.6) + 0.5 \\ &= -3.8 + 0.5 \\ &= -3.3 \end{aligned}$

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22. $\left(\frac{3}{4}\right)\left(-\frac{2}{5}\right)+\left(-\frac{1}{2}\right)\left(\frac{4}{5}\right)+\left(\frac{1}{2}\right)^2$
$=\left(\frac{3}{4}\right)\left(-\frac{2}{5}\right)+\left(-\frac{1}{2}\right)\left(\frac{4}{5}\right)+\frac{1}{4}$
$=-\frac{3}{10}+\left(-\frac{1}{2}\right)\left(\frac{4}{5}\right)+\frac{1}{4}$
$=-\frac{3}{10}+\left(-\frac{2}{5}\right)+\frac{1}{4}$
$=-\frac{6}{20}+\left(-\frac{8}{20}\right)+\frac{5}{20}$
$=-\frac{14}{20}+\frac{5}{20}$
$=-\frac{9}{20}$

1.6 Exercises

2. When we write an expression with numbers and variables such as $7x$, it indicates that we are multiplying 7 by x.

4. It distributes a factor of a to each term inside the parentheses. Distribute means "to give out to each member of a group."

6. She made an error with the sign rules. She should multiply $(-5)(-2)$ to get $+10$. The answer to the problem is $-5x - 15y + 10$.

8. $6(3x - 6y) = 6(3x) + 6(-6y) = 18x - 36y$

10. $-3(2a - 4b) = -3(2a) + (-3)(-4b) = -6a + 12b$

12. $8(5x + y) = 8(5x) + 8(y) = 40x + 8y$

14. $10(-2m - n) = 10(-2m) + 10(-n) = -20m - 10n$

16. $-(-3y + x) = (-1)(-3y) + (-1)(x) = 3y - x$

18. $-3(4x+8-6y) = (-3)(4x)+(-3)(8)+(-3)(-6y)$
$= -12x - 24 + 18y$

20. $1.5(2x-6y-5) = 1.5(2x)+1.5(-6y)+1.5(-5)$
$= 3x - 9y - 7.5$

22. $\frac{2}{3}(-27a^4+9a^2-21)$
$=\frac{2}{3}(-27a^4)+\frac{2}{3}(9a^2)+\frac{2}{3}(-21)$
$=-18a^4+6a^2-14$

24. $\frac{y}{3}(3y-4x-6)=\frac{y}{3}(3y)+\frac{y}{3}(-4x)+\frac{y}{3}(-6)$
$= y^2-\frac{4xy}{3}-2y$

26. $3a(2a+b-c)$
$= 3a(2a)+3ab+3a(-c)$
$= 6a^2+3ab-3ac$

28. $(-3.2x+5)(-4) = (-3.2x)(-4)+5(-4)$
$= 12.8x - 20$

30. $(2x-2y+6)(3x) = 2x(3x)+(-2y)(3x)+6(3x)$
$= 6x^2-6xy+18x$

32. $(5a-3b-1)(-ab)$
$= 5a(-ab)+(-3b)(-ab)+(-1)(-ab)$
$= -5a^2b+3ab^2+ab$

34. $(2a-b-5)3ab$
$= 2a(3ab)+(-b)(3ab)+(-5)(3ab)$
$= 6a^2b-3ab^2-15ab$

36. $\frac{1}{3}(-15a^2-21a+4)$
$=\frac{1}{3}(-15a^2)+\frac{1}{3}(-21a)+\frac{1}{3}(4)$
$=-5a^2-7a+\frac{4}{3}$

38. $-0.6q(1.2q^2+2.5r-0.7s)$
$= -0.6q(1.2q^2)+(-0.6q)(2.5r)+(-0.6q)(-0.7s)$
$= -0.72q^3-1.5qr+0.42qs$

40. $850(10x+7y) = 850(10x)+850(7y)$
$= 8500x+5950y$
The area is $(8500x+5950y)$ ft^2.

42. $2x(1800+3y) = 2x(1800)+2x(3y)$
$= 3600x+6xy$
The area is $(3600x+6xy)$ ft^2.

Cumulative Review

44. $-18+(-20)+36+(-14) = -38+36+(-14)$
$= -2+(-14)$
$= -16$

45. $(-2)^6 = (-2)(-2)(-2)(-2)(-2)(-2) = 64$

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46. $-27-(-41)=-27+41=14$

47. $25\div 5(2)+(-6)=5(2)+(-6)=10+(-6)=4$

48. $(12-10)^2+(-3)(-2)=(2)^2+(-3)(-2)$
$=4+(-3)(-2)$
$=4+6$
$=10$

Classroom Quiz 1.6

1. $6(-4x-9y)=6(-4x)+6(-9y)=-24x-54y$

2. $-3x(2x+4y-7)$
$=-3x(2x)+(-3x)(4y)+(-3x)(-7)$
$=-6x^2-12xy+21x$

3. $-4ab(-5a+7b+8)$
$=-4ab(-5a)+(-4ab)(7b)+(-4ab)(8)$
$=20a^2b-28ab^2-32ab$

1.7 Exercises

2. Like terms are terms that have identical variables and exponents.

4. The two terms $12a$ and $-9a$ are like terms because they both have the variable a with the exponent of one.

6. The only like terms are $-12ab$ and $9ab$ because the other two have different exponents even though they have the same variables.

8. $-14x^3-21x^3=(-14-21)x^3=-35x^3$

10. $2b^3+8b^2-9b^3=(2-9)b^3+8b^2=-7b^3+8b^2$

12. $5x-9b-6x-5b=(5-6)x+(-9-5)b$
$=-1x+(-14)b$
$=-x-14b$

14. $3.1a-0.2b-0.8a+5.3b$
$=(3.1-0.8)a+(-0.2+5.3)b$
$=2.3a+5.1b$

16. $1.9x-2.4b-3.8x-8.2b$
$=(1.9-3.8)x+(-2.4-8.2)b$
$=-1.9x-10.6b$

18. $6x-5y-3y+7-11x-5$
$=(6-11)x+(-5-3)y+7-5$
$=-5x-8y+2$

20. $7ab-3bc-12ac+8ab=(7+8)ab-3bc-12ac$
$=15ab-3bc-12ac$

22. $5x+7-6x^2+6-11x+4x^2$
$=(-6+4)x^2+(-11+5)x+7+6$
$=-2x^2-6x+13$

24. $3y^2+9y-12-4y^2-6y+2$
$=(3-4)y^2+(9-6)y-12+2$
$=-y^2+3y-10$

26. $\frac{2}{5}s-\frac{3}{8}t-\frac{4}{15}s-\frac{5}{12}t$
$=\left(\frac{2}{5}-\frac{4}{15}\right)s+\left(-\frac{3}{8}-\frac{5}{12}\right)t$
$=\left(\frac{6}{15}-\frac{4}{15}\right)s+\left(-\frac{9}{24}-\frac{10}{24}\right)t$
$=\frac{2}{15}s-\frac{19}{24}t$

28. $\frac{2}{5}y-\frac{3}{4}x^2-\frac{1}{3}y+\frac{7}{8}x^2$
$=\left(\frac{2}{5}-\frac{1}{3}\right)y+\left(-\frac{3}{4}+\frac{7}{8}\right)x^2$
$=\left(\frac{6}{15}-\frac{5}{15}\right)y+\left(-\frac{6}{8}+\frac{7}{8}\right)x^2$
$=\frac{1}{15}y+\frac{1}{8}x^2$

30. $-rs+10s+5r-rs+6s-2r$
$=(-1-1)rs+(10+6)s+(5-2)r$
$=-2rs+16s+3r$

32. $\frac{3}{7}ab-\frac{2}{7}a^2b+2ab+\frac{9}{7}a^2b$
$=\left(\frac{3}{7}+2\right)ab+\left(-\frac{2}{7}+\frac{9}{7}\right)a^2b$
$=\left(\frac{3}{7}+\frac{14}{7}\right)ab+\left(-\frac{2}{7}+\frac{9}{7}\right)a^2b$
$=\frac{17}{7}ab+\frac{7}{7}a^2b$
$=\frac{17}{7}ab+1a^2b$
$=\frac{17}{7}ab+a^2b$

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34. $8(3x-2y)+4(3y-5x)$
$=24x-16y+12y-20x$
$=(24-20)x+(-16+12)y$
$=4x-4y$

36. $3a(2a-3b)-3(-5a^2+ab)$
$=6a^2-9ab+15a^2-3ab$
$=(6+15)a^2+(-9-3)ab$
$=21a^2-12ab$

38. $-4(3cd+2c^2)+2c(5d-c)$
$=-12cd-8c^2+10cd-2c^2$
$=(-12+10)cd+(-8-2)c^2$
$=-2cd-10c^2$

40. $5(6-x)-2(9-11x)=30-5x-18+22x$
$=(-5+22)x+(30-18)$
$=17x+12$

42. $2(6x-3)+2(8x-7)=12x-6+16x-14$
$=28x-20$
The perimeter is $(28x-20)$ units.

44. $3a+8+5a-b+12-2b$
$=(3+5)a+(-1-2)b+(8+12)$
$=8a-3b+20$
The perimeter is $(8a-3b+20)$ meters.

Cumulative Review

45. $-\frac{3}{4}-\frac{1}{3}=-\frac{9}{12}-\frac{4}{12}=-\frac{13}{12}$ or $-1\frac{1}{12}$

46. $\left(\frac{2}{3}\right)\left(-\frac{9}{16}\right)=-\frac{18}{48}=-\frac{3\cdot 6}{8\cdot 6}=-\frac{3}{8}$

47. $\frac{4}{5}+\left(-\frac{1}{25}\right)+\left(-\frac{3}{10}\right)=\frac{40}{50}+\left(-\frac{2}{50}\right)+\left(-\frac{15}{50}\right)$
$=\frac{23}{50}$

48. $\left(\frac{5}{7}\right)\div\left(-\frac{14}{3}\right)=\left(\frac{5}{7}\right)\left(-\frac{3}{14}\right)=-\frac{15}{98}$

Classroom Quiz 1.7

1. $5ab-\frac{3}{5}a^2b+\frac{1}{4}ab+\frac{4}{5}a^2b$
$=\left(5+\frac{1}{4}\right)ab+\left(-\frac{3}{5}+\frac{4}{5}\right)a^2b$
$=\frac{21}{4}ab+\frac{1}{5}a^2b$

2. $-6.5x^2y+3.8xy^2-7.6x^2y-6.8xy^2$
$=(-6.5-7.6)x^2y+(3.8-6.8)xy^2$
$=-14.1x^2y-3xy^2$

3. $-3(5x-2y)-7(2x-3y)$
$=-15x+6y-14x+21y$
$=(-15-14)x+(6+21)y$
$=-29x+27y$

1.8 Exercises

2. If $x=6$, then
$-5x-6=-5(6)-6=-30-6=-36$.

4. If $y=-6$, then
$\frac{5}{6}y-5=\frac{5}{6}(-6)-5=-5-5=-10$.

6. If $x=-\frac{3}{2}$, then $5x+15=5\left(-\frac{3}{2}\right)+15$
$=-\frac{15}{2}+15$
$=-\frac{15}{2}+\frac{30}{2}$
$=\frac{15}{2}$ or $7\frac{1}{2}$.

8. If $x=8$, then $3-5x=3-5(8)=3-40=-37$.

10. If $x=2.3$, then
$6.3-3x=6.3-3(2.3)=6.3-6.9=-0.6$.

12. If $x=-\frac{2}{3}$, then
$5x+7=5\left(-\frac{2}{3}\right)+7=-\frac{10}{3}+\frac{21}{3}=\frac{11}{3}$ or $3\frac{2}{3}$.

14. If $x=4$, then
$x^2+3x=(4)^2+3(4)=16+12=28$.

16. If $y=-1$, then $8y^2=8(-1)^2=8(1)=8$.

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18. If $x = 3$, then $-5x^3 = -5(3)^3 = -5(27) = -135$.

20. If $x = -3$, then $-2x^2 = -2(-3)^2 = -2(9) = -18$.

22. If $x = -3$, then
$18 + 3x^2 = 18 + 3(-3)^2 = 18 + 3(9) = 18 + 27 = 45$.

24. If $x = -2$, then $2 - x^2 = 2 - (-2)^2 = 2 - 4 = -2$.

26. If $x = -4$, then
$$\begin{aligned} 2x - 3x^2 &= 2(-4) - 3(-4)^2 \\ &= -8 - 3(16) \\ &= -8 - 48 \\ &= -56. \end{aligned}$$

28. If $a = -3$, then
$$\begin{aligned} 9a - (2a)^2 &= 9(-3) - [2(-3)]^2 \\ &= 9(-3) - (-6)^2 \\ &= -27 - 36 \\ &= -63. \end{aligned}$$

30. If $x = \frac{1}{3}$, then

$$5 - 9x^2 = 5 - 9\left(\frac{1}{3}\right)^2 = 5 - 9\left(\frac{1}{9}\right) = 5 - 1 = 4.$$

32. If $a = 1$ and $b = -4$, then
$$\begin{aligned} a^3 + 2b - 4 &= (1)^3 + 2(-4) - 4 \\ &= 1 + 2(-4) - 4 \\ &= 1 - 8 - 4 \\ &= -11. \end{aligned}$$

34. If $x = -3$ and $y = \frac{3}{4}$, then
$$\begin{aligned} \frac{1}{3}x^2 + 4y - 5 &= \frac{1}{3}(-3)^2 + 4\left(\frac{3}{4}\right) - 5 \\ &= \frac{1}{3}(9) + 4\left(\frac{3}{4}\right) - 5 \\ &= 3 + 3 - 5 \\ &= 1. \end{aligned}$$

36. If $r = -2$ and $s = 3$, then
$$\begin{aligned} -r^2 + 5rs + 4s^2 &= -(-2)^2 + 5(-2)(3) + 4(3)^2 \\ &= -4 - 30 + 36 \\ &= 2. \end{aligned}$$

38. If $a = 3$, $b = 2$, and $c = -4$, then
$$\begin{aligned} a^3 - 2ab + 2c^2 &= 3^3 - 2(3)(2) + 2(-4)^2 \\ &= 27 - 12 + 2(16) \\ &= 27 - 12 + 32 \\ &= 47. \end{aligned}$$

40. If $x = -2$ and $y = -3$, then
$$\begin{aligned} \frac{x^2 - 2xy}{2y} &= \frac{(-2)^2 - 2(-2)(-3)}{2(-3)} \\ &= \frac{4 - 12}{-6} \\ &= \frac{-8}{-6} \\ &= \frac{4}{3} \text{ or } 1\frac{1}{3}. \end{aligned}$$

42. $A = ab$, $b = 92$, $a = 54$
$A = (92)(54) = 4968$
The area is 4968 square feet.

44. $A = s^2$
$$\begin{aligned} \text{Decrease} &= A_{\text{old}} - A_{\text{new}} \\ &= (23)^2 - (20)^2 \\ &= 529 - 400 \\ &= 129 \end{aligned}$$
The area is decreased by 129 square millimeters.

46. $A = \frac{1}{2}a(b_1 + b_2)$, $a = 9$, $b_1 = 17$, $b_2 = 20$

$$A = \frac{1}{2}(9)(20 + 17) = \frac{9(37)}{2} = 166.5$$

The area is 166.5 square inches.

48. $A = \frac{1}{2}ab$, $a = 14$, $b = 19$

$$A = \frac{1}{2}(14)(19) = 133$$

The area is 133 square feet.

50. $A = \frac{1}{2}ab$, $a = 400$, $b = 280$

$$A = \frac{1}{2}(400)(280) = 56,000$$

The area is 56,000 square feet.

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52. $C = \frac{5}{9}(F-32),\ F=-3$

$C = \frac{5}{9}(-3-32)$

$= \frac{5}{9}(-35)$

$= -\frac{175}{9}$

$= -19\frac{4}{9}$

Yes, the coat will be warm enough. Her coat is rated for $-19\frac{4}{9}$ degrees Celsius.

54. $A = \frac{1}{2}\pi r^2,\ r=14$

$A \approx \frac{1}{2}(3.14)(14)^2 = 307.72$ square inches

Cost = (1.15)(307.72) ≈ 353.88
The total cost is $353.88.

56. $r \approx 0.62k$

$r \approx 0.62\left(\frac{3642}{20}\right) \approx 0.62(182.1) \approx 112.9$

The distance was approximately 112.9 miles.

Cumulative Review

57. $(-2)^4 - 4 \div 2 - (-2) = 16 - 4 \div 2 - (-2)$
$= 16 - 2 + 2$
$= 16$

58. $3(x-2y) - (x^2 - y) - (x-y)$
$= 3x - 6y - x^2 + y - x + y$
$= -x^2 + 2x - 4y$

Classroom Quiz 1.8

1. If $x = -3$, then

$3x^2 + 5x - 15 = 3(-3)^2 + 5(-3) - 15$
$= 3(9) + 5(-3) - 15$
$= 27 - 15 - 15$
$= -3.$

2. If $a = \frac{2}{3}$ and $b = -\frac{1}{4}$, then

$-7a + 4b = -7\left(\frac{2}{3}\right) + 4\left(-\frac{1}{4}\right)$
$= -\frac{14}{3} - 1$
$= -\frac{14}{3} - \frac{3}{3}$
$= -\frac{17}{3}$ or $-5\frac{2}{3}$.

3. If $x = 3$ and $y = -2$, then

$x^3 - 2x^2y - 3y + 4 = 3^3 - 2(3)^2(-2) - 3(-2) + 4$
$= 27 + 36 + 6 + 4$
$= 73.$

1.9 Exercises

2. $-x + 5y = -x - (-5y) = -(x - 5y)$

4. When an expression contains many grouping symbols, remove the innermost grouping symbol first.

6. $-6y - 2(x - 5y) = -6y - 2x + 10y = 4y - 2x$

8. $6(2c-d) - (4c+d) = 12c - 6d - 4c - d = 8c - 7d$

10. $-4(x+5y) + 3(6y - 3x) = -4x - 20y + 18y - 9x$
$= -13x - 2y$

12. $4y[-3y^2 + 2(4-y)] = 4y[-3y^2 + 8 - 2y]$
$= -12y^3 + 32y - 8y^2$
$= -12y^3 - 8y^2 + 32y$

14. $-3(x+3y) + 2(2x+y) = -3x - 9y + 4x + 2y$
$= x - 7y$

16. $[-5(-x+3y) - 12] - 4(2x-3)$
$= 5x - 15y - 12 - 8x + 12$
$= (5-8)x - 15y + (-12+12)$
$= -3x - 15y$

18. $3[x - y(3x+y) + y^2] = 3[x - 3xy - y^2 + y^2]$
$= 3[x - 3xy]$
$= 3x - 9xy$

20. $7b(3b^2 - 2b - 5) - 2b(4-b)$
$= 21b^3 - 14b^2 - 35b - 85 + 2b^2$
$= 21b^3 - 12b^2 - 43b$

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22. $2b^2 - 3[5b + 2b(2-b)] = 2b^2 - 3[5b + 4b - 2b^2]$
$= 2b^2 - 3[9b - 2b^2]$
$= 2b^2 - 27b + 6b^2$
$= 8b^2 - 27b$

24. $3a - \{-2[a - 4(3a + b)] - 2\}$
$= 3a - \{-2[a - 12a - 4b] - 2\}$
$= 3a - \{-2[-11a - 4b] - 2\}$
$= 3a - \{22a + 8b - 2\}$
$= 3a - 22a - 8b + 2$
$= -19a - 8b + 2$

26. $4\{4x^2 + 2[3x - (4 - x)]\} = 4\{4x^2 + 2[3x - 4 + x]\}$
$= 4\{4x^2 + 2[4x - 4]\}$
$= 4\{4x^2 + 8x - 8\}$
$= 16x^2 + 32x - 32$

28. $-3\{x^2 - 5[x - (x - 3x^2)]\}$
$= -3\{x^2 - 5[x - x + 3x^2]\}$
$= -3\{x^2 - 5[3x^2]\}$
$= -3\{x^2 - 15x^2\}$
$= -3\{-14x^2\}$
$= 42x^2$

Cumulative Review

29. If $C = 1064.18$, then
$F = 1.8C + 32$
$= 1.8(1064.18) + 32$
$= 1915.524 + 32$
$= 1947.524$
The melting point is 1947.52°F.

30. $A = \pi r^2$, $r = 380$
$A \approx 3.14(380)^2 \approx 3.14(144,400) \approx 453,416$
The area is approximately 453,416 square feet.

31. $k = 0.45p$
If $p = 120$, $k = 0.45(120) = 54$.
If $p = 150$, $k = 0.45(150) = 67.5$.
Great Danes weigh on average from 54 to 67.5 kg.

32. $k = 0.45p$
If $p = 9$, $k = 0.45(9) = 4.05$.
If $p = 14$, $k = 0.45(14) = 6.3$.
Miniature Pinschers weigh on average 4.05 to 6.3 kg.

Classroom Quiz 1.9

1. $3[4x - 6(2x + y)] = 3(4x - 12x - 6y)$
$= 3(-8x - 6y)$
$= -24x - 18y$

2. $2[x - 4(x + 2y) - 4y] = 2[x - 4x - 8y - 4y]$
$= 2[-3x - 12y]$
$= -6x - 24y$

3. $-3\{a^2 - 4[a - (a - 2a^2)]\}$
$= -3\{a^2 - 4[a - a + 2a^2]\}$
$= -3\{a^2 - 4[2a^2]\}$
$= -3\{a^2 - 8a^2\}$
$= -3\{-7a^2\}$
$= 21a^2$

Career Exploration Problems

1. $P = I \times E = 12\text{ A} \times 1.8\text{ V} = 21.6\text{ W}$
The power loss is 21.6 W per conductor. Since there are two conductors, the total power loss is $2 \times 21.6\text{ W} = 43.2\text{ W}$.

2. $E = 3\% \times 240\text{ V} = 0.03 \times 240\text{ V} = 7.2\text{ V}$
$P = I \times E = 24\text{ A} \times 7.2\text{ V} = 172.8\text{ W}$
The power loss is 172.8 W.

3. $I = \dfrac{E}{R} = \dfrac{120\text{ V}}{200\text{ ohms}} = 0.6\text{ A}$
The amount of current flow is 0.6 A.

4. $V = L \times W \times H = 4\text{ in.} \times 4\text{ in.} \times 1\dfrac{1}{2}\text{ in.} = 24\text{ in.}^3$
The volume of one box is 24 in.^3.
volume of one box $\times$ 7 boxes $= 24\text{ in.}^3 \times 7$
$= 168\text{ in.}^3$
The total volume is 168 in.^3.

You Try It

1. a. $|5| = 5$

b. $|-1| = 1$

c. $|0.5| = 0.5$

d. $\left|-\dfrac{1}{4}\right| = \dfrac{1}{4}$

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e. $|-4.57| = 4.57$

2. $-10 + (-4) = -14$

3. a. $(-5) + 11 = 6$

b. $5 + (-11) = -6$

4. $-4 + 1 + (-8) + 12 + (-3) + 5$
$= -3 + (-8) + 12 + (-3) + 5$
$= -11 + 12 + (-3) + 5$
$= 1 + (-3) + 5$
$= -2 + 5$
$= 3$

5. $-8 - (-7) = -8 + 7 = -1$

6. a. $9(-6) = -54$

b. $24 \div (-3) = -8$

c. $-48 \div (-8) = 6$

d. $-3(-7) = 21$

7. a. $3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = 81$

b. $1.5^2 = 1.5 \cdot 1.5 = 2.25$

c. $\left(\frac{1}{2}\right)^4 = \left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{16}$

8. a. $(-2)^3 = (-2)(-2)(-2) = -8$

b. $(-4)^4 = (-4)(-4)(-4)(-4) = 256$

9. $4^2 + 2(6-3)^3 - (5-2)^2 \div 3$
$= 4^2 + 2(3)^3 - (3)^2 \div 3$
$= 16 + 2(27) - 9 \div 3$
$= 16 + 54 - 9 \div 3$
$= 16 + 54 - 3$
$= 67$

10. a. $4(2a - 3) = 4(2a) + 4(-3) = 8a - 12$

b. $-5(5x - 1) = -5(5x) + (-5)(-1) = -25x + 5$

11. $9a^2 - 10a + 3ab + 7a - 12a^2 + 5ab$
$= (9-12)a^2 + (-10+7)a + (3+5)ab$
$= -3a^2 - 3a + 8ab$

12. If $x = 4$ and $y = -1$, then
$6x^2 - xy + 3y^2 = 6(4)^2 - (4)(-1) + 3(-1)^2$
$= 6(16) - (4)(-1) + 3(1)$
$= 96 - (-4) + 3$
$= 96 + 4 + 3$
$= 103$

13. $A = \frac{1}{2}a(b_1 + b_2)$
$= \frac{1}{2}(50)(40 + 60)$
$= 25(100)$
$= 2500$
The area is 2500 square feet.

14. $4\{9x - [2(x+3) - 8]\} = 4\{9x - [2x + 6 - 8]\}$
$= 4\{9x - [2x - 2]\}$
$= 4\{9x - 2x + 2\}$
$= 4\{7x + 2\}$
$= 28x + 8$

Chapter 1 Review Problems

1. $-6 + (-2) = -8$

2. $-12 + 7.8 = -4.2$

3. $5 + (-2) + (-12) = 3 + (-12) = -9$

4. $3.7 + (-1.8) = 1.9$

5. $\frac{1}{2} + \left(-\frac{5}{6}\right) = \frac{3}{6} + \left(-\frac{5}{6}\right) = -\frac{2}{6} = -\frac{1}{3}$

6. $-\frac{3}{11} + \left(-\frac{1}{22}\right) = -\frac{6}{22} + \left(-\frac{1}{22}\right) = -\frac{7}{22}$

7. $\frac{3}{4} + \left(-\frac{1}{12}\right) + \left(-\frac{1}{2}\right) = \frac{9}{12} + \left(-\frac{1}{12}\right) + \left(-\frac{6}{12}\right)$
$= \frac{2}{12}$
$= \frac{1}{6}$

8. $\frac{2}{15} + \frac{1}{6} + \left(-\frac{4}{5}\right) = \frac{4}{30} + \frac{5}{30} + \left(-\frac{24}{30}\right)$
$= -\frac{15}{30}$
$= -\frac{1}{2}$

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9. $5-(-3)=5+3=8$

10. $-2-(-15)=-2+15=13$

11. $-30-(+3)=-30+(-3)=-33$

12. $8-(-1.2)=8+1.2=9.2$

13. $-\frac{7}{8}+\left(-\frac{3}{4}\right)=-\frac{7}{8}+\left(-\frac{6}{8}\right)=-\frac{13}{8}$ or $-1\frac{5}{8}$

14. $-\frac{3}{8}+\frac{5}{6}=-\frac{9}{24}+\frac{20}{24}=\frac{11}{24}$

15. $-20.8-1.9=-20.8+(-1.9)=-22.7$

16. $-151-(-63)=-151+63=-88$

17. $87\div(-29)=-3$

18. $-10.4\div(-0.8)=13$

19. $\frac{-24}{-\frac{3}{4}}=-24\div\left(-\frac{3}{4}\right)=\left(\frac{-24}{1}\right)\left(-\frac{4}{3}\right)=32$

20. $-\frac{2}{3}\div\left(-\frac{4}{5}\right)=-\frac{2}{3}\cdot\left(-\frac{5}{4}\right)=\frac{10}{12}=\frac{5}{6}$

21. $\frac{5}{7}\div\left(-\frac{5}{25}\right)=\frac{5}{7}\cdot\left(-\frac{25}{5}\right)=-\frac{25}{7}$ or $-3\frac{4}{7}$

22. $-6(3)(4)=(-18)(4)=-72$

23. $-1(-4)(-3)(-5)=4(-3)(-5)=-12(-5)=60$

24. $(-5)\left(-\frac{1}{2}\right)(4)(-3)=\left(\frac{5}{2}\right)(4)(-3)=10(-3)=-30$

25. $(-3)^5=(-3)(-3)(-3)(-3)(-3)=-243$

26. $(-2)^6=(-2)(-2)(-2)(-2)(-2)(-2)=64$

27. $(-5)^4=(-5)(-5)(-5)(-5)=625$

28. $\left(-\frac{2}{3}\right)^3=\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)=-\frac{8}{27}$

29. $-9^2=-(9)(9)=-81$

30. $(0.6)^2=(0.6)(0.6)=0.36$

31. $\left(\frac{5}{6}\right)^2=\left(\frac{5}{6}\right)\left(\frac{5}{6}\right)=\frac{25}{36}$

32. $\left(\frac{3}{4}\right)^3=\left(\frac{3}{4}\right)\left(\frac{3}{4}\right)\left(\frac{3}{4}\right)=\frac{27}{64}$

33. $\begin{aligned}(5)(-4)+(3)(-2)^3&=(5)(-4)+(3)(-8)\\&=-20+(-24)\\&=-44\end{aligned}$

34. $\begin{aligned}8\div0.4+0.1\times(0.2)^2&=8\div0.4+0.1\times0.04\\&=20+0.1\times0.04\\&=20+0.004\\&=20.004\end{aligned}$

35. $\begin{aligned}&(3-6)^2+(-12)\div(-3)(-2)\\&=(-3)^2+(-12)\div(-3)(-2)\\&=9+(-12)\div(-3)(-2)\\&=9+4(-2)\\&=9-8\\&=1\end{aligned}$

36. $7(-3x+y)=7(-3x)+7(y)=-21x+7y$

37. $\begin{aligned}3x(6-x+3y)&=3x(6)+3x(-x)+3x(3y)\\&=18x-3x^2+9xy\end{aligned}$

38. $\begin{aligned}&-(7x^2-3x+11)\\&=-1(7x^2)+(-1)(-3x)+(-1)(11)\\&=-7x^2+3x-11\end{aligned}$

39. $\begin{aligned}&(2xy+x-y)(-3y^2)\\&=(2xy)(-3y^2)+x(-3y^2)-y(-3y^2)\\&=-6xy^3-3xy^2+3y^3\end{aligned}$

40. $\begin{aligned}&3a^2b-2bc+6bc^2-8a^2b-6bc^2+5bc\\&=(3-8)a^2b+(-2+5)bc+(6-6)bc^2\\&=-5a^2b+3bc\end{aligned}$

41. $9x+11y-12x-15y=-3x-4y$

42. $\begin{aligned}&4x^2-13x+7-9x^2-22x-16\\&=(4-9)x^2+(-13-22)x+7-16\\&=-5x^2-35x-9\end{aligned}$

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43. $-x+\frac{1}{2}+14x^2-7x-1-4x^2$
$=(14-4)x^2+(-7-1)x+\frac{1}{2}-1$
$=10x^2-8x-\frac{1}{2}$

44. If $x=-7$, then
$7x-6=7(-7)-6=-49-6=-55.$

45. If $x=8$, then $7-\frac{3}{4}x=7-\frac{3}{4}(8)=7-6=1.$

46. If $x=-3$, then
$x^2+3x-4=(-3)^2+3(-3)-4$
$=9-9-4$
$=-4.$

47. If $x=3$, then
$-x^2+5x-9=-3^2+5(3)-9=-9+15-9=-3.$

48. If $x=-1$, then
$2x^3-x^2+6x+9=2(-1)^3-(-1)^2+6(-1)+9$
$=-2-1-6+9$
$=0.$

49. If $a=-1$, $b=5$, and $c=-2$, then
$b^2-4ac=(5)^2-4(-1)(-2)=25-8=17.$

50. If $m=-4$, $M=15$, $G=-1$, and $r=-2$, then
$\frac{mMG}{r^2}=\frac{-4(15)(-1)}{(-2)^2}=\frac{60}{4}=15.$

51. If $p=6000$, $r=18\%$, and $t=\frac{3}{4}$, then
$I=prt=6000(0.18)\left(\frac{3}{4}\right)=810.$
The interest is \$810.

52. $F=\frac{9C+160}{5}$
$=\frac{9(20)+160}{5}$
$=\frac{180+160}{5}$
$=\frac{340}{5}$
$=68$

$F=\frac{9C+160}{5}$
$=\frac{9(25)+160}{5}$
$=\frac{225+160}{5}$
$=\frac{385}{5}$
$=77$
The range is 68°F to 77°F.

53. If $r=4$, $A=\pi r^2$
$\approx 3.14(4)^2$
$\approx 3.14(16)$
≈ 50.24 square feet.
Cost = (50.24 sq ft)(\$1.50/sq ft) = \$75.36
The total cost is \$75.36.

54. $P=180S-R-C$
$=180(56)-300-1200$
$=10,080-300-1200$
$=8580$
The daily profit is \$8580.

55. $A=\frac{1}{2}a(b_1+b_2)$, $a=200$, $b_1=700$, $b_2=300$
$A=\frac{1}{2}(200)(700+300)$
$=100(1000)$
$=100,000$
Cost = 2(100,000) = 200,000
The area is $100,000$ ft^2 and the cost is \$200,000.

56. $A=\frac{1}{2}ab$, $a=3.8$, $b=5.5$
$A=\frac{1}{2}(3.8)(5.5)=10.45$
Cost = 66(10.45) = 689.70
The area is 10.45 ft^2 and the cost is \$689.70.

57. $5x-7(x-6)=5x-7x+42=-2x+42$

58. $3(x-2)-4(5x+3)=3x-6-20x-12$
$=-17x-18$

59. $2[3-(4-5x)]=2(3-4+5x)$
$=2(-1+5x)$
$=-2+10x$

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60. $-3x[x+3(x-7)] = -3x(x+3x-21)$
$= -3x(4x-21)$
$= -12x^2 + 63x$

61. $2xy^3 - 6x^3y - 4x^2y^2 + 3(xy^3 - 2x^2y - 3x^2y^2)$
$= 2xy^3 - 6x^3y - 4x^2y^2 + 3xy^3 - 6x^2y - 9x^2y^2$
$= (2+3)xy^3 - 6x^3y + (-4-9)x^2y^2 - 6x^2y$
$= 5xy^3 - 6x^3y - 13x^2y^2 - 6x^2y$

62. $-5(x+2y-7) + 3x(2-5y)$
$= -5x - 10y + 35 + 6x - 15xy$
$= x - 10y + 35 - 15xy$

63. $-(a+3b) + 5[2a - b - 2(4a - b)]$
$= -(a+3b) + 5(2a - b - 8a + 2b)$
$= -(a+3b) + 5(-6a + b)$
$= -a - 3b - 30a + 5b$
$= -31a + 2b$

64. $-5\{2a - [5a - b(3+2a)]\}$
$= -5\{2a - [5a - 3b - 2ab]\}$
$= -5\{2a - 5a + 3b + 2ab\}$
$= -5\{-3a + 3b + 2ab\}$
$= 15a - 15b - 10ab$

65. $-3\{2x - [x - 3y(x-2y)]\}$
$= -3[2x - (x - 3xy + 6y^2)]$
$= -3(2x - x + 3xy - 6y^2)$
$= -3(x + 3xy - 6y^2)$
$= -3x - 9xy + 18y^2$

66. $2\{3x + 2[x + 2y(x-4)]\}$
$= 2[3x + 2(x + 2xy - 8y)]$
$= 2(3x + 2x + 4xy - 16y)$
$= 2(5x + 4xy - 16y)$
$= 10x + 8xy - 32y$

67. $-6.3 + 4 = -2.3$

68. $4 + (-8) + 12 = -4 + 12 = 8$

69. $-\frac{2}{3} - \frac{4}{5} = -\frac{10}{15} + \left(-\frac{12}{15}\right) = -\frac{22}{15}$ or $-1\frac{7}{15}$

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

71. $3 - (-4) + (-8) = 3 + 4 + (-8) = 7 + (-8) = -1$

72. $-1.1 - (-0.2) + 0.4 = -1.1 + 0.2 + 0.4$
$= -0.9 + 0.4$
$= -0.5$

73. $\left(-\frac{9}{10}\right)\left(-2\frac{1}{4}\right) = \left(-\frac{9}{10}\right)\left(-\frac{9}{4}\right) = \frac{81}{40}$ or $2\frac{1}{40}$

74. $3.6 \div (-0.45) = -8$

75. $-14.4 \div (-0.06) = 240$

76. $(-8.2)(3.1) = -25.42$

77. $400 + 1000 - 800 = 1400 - 800 = 600$
Her score was \$600.

78. $(-0.3)^4 = (-0.3)(-0.3)(-0.3)(-0.3) = 0.0081$

79. $-0.5^4 = -(0.5)(0.5)(0.5)(0.5) = -0.0625$

80. $9(5) - 5(2)^3 + 5 = 9(5) - 5(8) + 5$
$= 45 - 5(8) + 5$
$= 45 - 40 + 5$
$= 5 + 5$
$= 10$

81. $3.8x - 0.2y - 8.7x + 4.3y$
$= (3.8 - 8.7)x + (-0.2 + 4.3)y$
$= -4.9x + 4.1y$

82. If $p = -2$ and $q = 3$, then
$\frac{2p+q}{3q} == \frac{2(-2)+3}{3(3)} = \frac{-4+3}{9} = -\frac{1}{9}$.

83. If $s = -3$ and $t = -2$, then
$\frac{4s-7t}{s} = \frac{4(-3)-7(-2)}{-3} = \frac{-12+14}{-3} = -\frac{2}{3}$.

84. $F = \frac{9}{5}C + 32, \ C = 38.6$

$F = \frac{9}{5}(38.6) + 32$
$F = 69.48 + 32$
$F = 101.48°$
Your dog does not have a fever; in fact, its temperature is below normal.

85. $-7(x - 3y^2 + 4) + 3y(4 - 6y)$
$= -7x + 21y^2 - 28 + 12y - 18y^2$
$= -7x + 3y^2 + 12y - 28$

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86. $-2\{6x-3[7y-2y(3-x)]\}$
$=-2\{6x-3[7y-6y+2xy]\}$
$=-2\{6x-3[y+2xy]\}$
$=-2\{6x-3y-6xy\}$
$=-12x+6y+12xy$

How Am I Doing? Chapter 1 Test

1. $-2.5+6.3+(-4.1)=3.8+(-4.1)=-0.3$

2. $-5-(-7)=-5+7=2$

3. $\left(-\frac{2}{3}\right)(7)=-\frac{14}{3}=-4\frac{2}{3}$

4. $-5(-2)(7)(-1)=-(10)(7)(1)=-(70)(1)=-70$

5. $-12\div(-3)=4$

6. $-1.8\div(0.6)=-3$

7. $(-4)^3=(-4)(-4)(-4)=-64$

8. $(1.6)^2=(1.6)(1.6)=2.56$

9. $\left(\frac{2}{3}\right)^4=\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)=\frac{16}{81}$

10. $(0.2)^2-(2.1)(-3)+0.46$
$=0.04-(2.1)(-3)+0.46$
$=0.04-(-6.3)+0.46$
$=0.04+6.3+0.46$
$=6.34+0.46$
$=6.8$

11. $3(4-6)^3+12\div(-4)+2$
$=3(-2)^3+12\div(-4)+2$
$=3(-8)+12\div(-4)+2$
$=-24+(-3)+2$
$=-25$

12. $-5x(x+2y-7)=-5x(x)-5x(2y)-5x(-7)$
$=-5x^2-10xy+35x$

13. $-2ab^2(-3a-2b+7ab)$
$=-2ab^2(-3a)-2ab^2(-2b)-2ab^2(7ab)$
$=6a^2b^2+4ab^3-14a^2b^3$

14. $6ab-\frac{1}{2}a^2b+\frac{3}{2}ab+\frac{5}{2}a^2b$
$=\left(6+\frac{3}{2}\right)ab+\left(-\frac{1}{2}+\frac{5}{2}\right)a^2b$
$=\left(\frac{12}{2}+\frac{3}{2}\right)ab+\frac{4}{2}a^2b$
$=\frac{15}{2}ab+2a^2b$

15. $2.3x^2y-8.1xy^2+3.4xy^2-4.1x^2y$
$=(2.3-4.1)x^2y+(-8.1+3.4)xy^2$
$=-1.8x^2y-4.7xy^2$

16. $3(2-a)-4(-6-2a)=6-3a+24+8a$
$=5a+30$

17. $5(3x-2y)-(x+6y)=15x-10y-x-6y$
$=(15-1)x+(-10-6)y$
$=14x-16y$

18. If $x=3$ and $y=-4$, then
$x^3-3x^2y+2y-5=3^3-3(3)^2(-4)+2(-4)-5$
$=27-3(9)(-4)-8-5$
$=27+108-8-5$
$=122.$

19. If $x=-3$, then
$3x^2-7x-11=3(-3)^2-7(-3)-11$
$=3(9)-7(-3)-11$
$=27+21-11$
$=37.$

20. If $a=\frac{1}{3}$ and $b=-\frac{1}{2}$, then
$2a-3b=2\left(\frac{1}{3}\right)-3\left(-\frac{1}{2}\right)$
$=\frac{2}{3}+\frac{3}{2}$
$=\frac{4}{6}+\frac{9}{6}$
$=\frac{13}{6}$ or $2\frac{1}{6}$.

21. $k=1.61r=1.61(60)=96.6$
You are traveling at 96.6 kilometers per hour.

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22. $A = \frac{1}{2}a(b_1 + b_2),\ a = 120,\ b_1 = 200,\ b_2 = 180$

$A = \frac{1}{2}(120)(200 + 180)$

$= 60(380)$

$= 22{,}800$

The area is 22,800 square feet.

23. $A = \frac{1}{2}ab,\ a = 6.8,\ b = 8.5$

$A = \frac{1}{2}(6.8)(8.5) = 28.9$

Cost = 0.80(28.9) = 23.12

The cost is \$23.12.

24. $A = 60 \times 10 = 600$

$600 \text{ sq ft} \times \frac{1 \text{ can}}{200 \text{ sq ft}} = 3 \text{ cans}$

You should buy 3 cans.

25. $3[x - 2y(x + 2y) - 3y^2] = 3[x - 2xy - 4y^2 - 3y^2]$

$= 3[x - 2xy - 7y^2]$

$= 3x - 6xy - 21y^2$

26. $-3\{a + b[3a - b(1 - a)]\} = -3[a + b(3a - b + ab)]$

$= -3(a + 3ab - b^2 + ab^2)$

$= -3a - 9ab + 3b^2 - 3ab^2$

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