STUDENT SOLUTIONS MANUAL

John Garlow

BEGINNING ALGEBRA

FOURTH EDITION

K. Elayn Martin-Gay

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Upper Saddle River, NJ 07458

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Pearson Prentice Hall
Pearson Education, Inc.
Upper Saddle River, NJ 07458

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

ISBN 0-13-144492-1

Pearson Education Ltd., *London*
Pearson Education Australia Pty. Ltd., *Sydney*
Pearson Education Singapore, Pte. Ltd.
Pearson Education North Asia Ltd., *Hong Kong*
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Chapter 1

Exercise Set 1.1

Answers will vary on Exercises 1-19.

Exercise Set 1.2

1. $7 > 3$

3. $6.26 = 6.26$

5. $0 < 7$

7. $-2 < 2$

9. $32 < 212$

11. $44{,}300 > 34{,}611$

13. True, since 11=11.

15. False, since 10 is to the left of 11 on the number line.

17. False, since 11 is to the left of 24 on the number line.

19. True, since 7 is to the right of 0 on the number line.

21. $30 \le 45$

23. $8 < 12$

25. $5 \ge 4$

27. $15 \ne -2$

29. 535 represents an altitude of 535 feet.
-8 represents 8 feet below sea level.

31. $-34{,}841$ represents a population decrease of 34,841.

33. 350 represents a deposit of \$350.
-126 represents a withdrawal of \$126.

35. 1993

37. 1993,1994

39. $837 \ge 818$

41. The number 0 belongs to the sets of: whole numbers, integers, rational numbers, and real numbers.

43. The number -2 belongs to the sets of: integers, rational numbers, and real numbers.

45. The number 6 belongs to the sets of: natural numbers, whole numbers, integers, rational numbers, and real numbers.

47. The number 2/3 belongs to the sets of: rational numbers and real numbers.

49. The number $-\sqrt{5}$ belongs to the sets of: irrational numbers and real numbers.

51. False. Rational numbers may be non-integers.

53. True

55. True

57. True

59. False. An irrational number may not be written as a fraction

59. False. Irrational numbers are real.

61. $-10 > -100$

63. $32 > 5.2$

65. $\frac{18}{3} < \frac{24}{3}$

67. $-51 < -50$

69. $|-5| > -4$ since $5 > -4$

71. $|-1| = |1|$ since 1=1

73. $|-2| < |-3|$ since $2 < 3$

75. $|0| < |-8|$ since $8 < 8$

77. $-0.04 > -26.7$

79. The sun is brighter since $-26.7 < -0.04$.

81. The sun is the brightest since -26.7 is to the left of all other numbers listed.

83. $20 \le 25$

85. $6>0$

87. $-12 < -10$

89. Answers may vary.

Mental Math 1.3

1. $\frac{3}{8}$

2. $\frac{1}{4}$

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

4. $\frac{2}{5}$

5. numerator, denominator

6. $\frac{11}{7}$

Exercise Set 1.3

1. $33 = 3 \cdot 11$

3. $98 = 2 \cdot 7 \cdot 7$

5. $20 = 2 \cdot 2 \cdot 5$

7. $75 = 3 \cdot 5 \cdot 5$

9. $45 = 3 \cdot 3 \cdot 5$

11. $\frac{2}{4} = \frac{2}{2 \cdot 2} = \frac{1}{2}$

13. $\frac{10}{15}=\frac{2\cdot 5}{3\cdot 5}=\frac{2}{3}$

15. $\frac{3}{7}=\frac{3}{7}$

17. $\frac{18}{30}=\frac{2\cdot 3\cdot 3}{2\cdot 3\cdot 5}=\frac{3}{5}$

19. $\frac{1}{2}\cdot\frac{3}{4}=\frac{1\cdot 3}{2\cdot 2\cdot 2}=\frac{3}{8}$

21. $\frac{2}{3}\cdot\frac{3}{4}=\frac{2\cdot 3}{3\cdot 2\cdot 2}=\frac{1}{2}$

23. $\frac{1}{2}\div\frac{7}{12}=\frac{1}{2}\cdot\frac{12}{7}=\frac{1\cdot 2\cdot 2\cdot 3}{2\cdot 7}=\frac{2\cdot 3}{7}=\frac{6}{7}$

25. $\frac{3}{4}\div\frac{1}{20}=\frac{3}{4}\cdot\frac{20}{1}=\frac{3\cdot 2\cdot 2\cdot 5}{2\cdot 2}=\frac{3\cdot 5}{1}=15$

27. $\frac{7}{10}\cdot\frac{5}{21}=\frac{7\cdot 5}{2\cdot 5\cdot 3\cdot 7}=\frac{1}{2\cdot 3}=\frac{1}{6}$

29. $2\frac{7}{9}\cdot\frac{1}{3}=\frac{25}{9}\cdot\frac{1}{3}=\frac{5\cdot 5\cdot 1}{3\cdot 3\cdot 3}=\frac{25}{27}$

31. Area $=\frac{11}{12}\cdot\frac{3}{5}=\frac{11\cdot 3}{2\cdot 2\cdot 3\cdot 5}=\frac{11}{2\cdot 2\cdot 5}$

$=\frac{11}{20}$ sq. mi

33. $\frac{4}{5}-\frac{1}{5}=\frac{4-1}{5}=\frac{3}{5}$

35. $\frac{4}{5}+\frac{1}{5}=\frac{4+1}{5}=\frac{5}{5}=1$

37. $\frac{17}{21}-\frac{10}{21}=\frac{17-10}{21}=\frac{7}{21}=\frac{7}{3\cdot 7}=\frac{1}{3}$

39. $\frac{23}{105}+\frac{4}{105}=\frac{23+4}{105}=\frac{27}{105}=\frac{3\cdot 3\cdot 3}{3\cdot 5\cdot 7}$

$=\frac{3\cdot 3}{5\cdot 7}=\frac{9}{35}$

41. $\frac{7}{10}=\frac{7\cdot 3}{10\cdot 3}=\frac{21}{30}$

43. $\frac{2}{9}=\frac{2\cdot 2}{9\cdot 2}=\frac{4}{18}$

45. $\frac{4}{5}=\frac{4\cdot 4}{5\cdot 4}=\frac{16}{20}$

47. $\frac{2}{3}+\frac{3}{7}=\frac{2\cdot 7}{3\cdot 7}+\frac{3\cdot 3}{7\cdot 3}=\frac{14}{21}+\frac{9}{21}=\frac{23}{21}$

49. $2\frac{13}{15}-1\frac{1}{5}=\frac{43}{15}-\frac{6}{5}=\frac{43}{15}-\frac{6\cdot 3}{5\cdot 3}$

$=\frac{43-18}{15}=\frac{25}{15}=1\frac{2}{3}$

51. $\frac{5}{22}-\frac{5}{33}=\frac{5\cdot 3}{22\cdot 3}-\frac{5\cdot 2}{33\cdot 2}=\frac{15}{66}-\frac{10}{66}=\frac{5}{66}$

53. $\frac{12}{5}-1=\frac{12}{5}-\frac{5}{5}=\frac{12-5}{5}=\frac{7}{5}$

55. $1-\frac{3}{10}-\frac{5}{10}=\frac{10}{10}-\frac{3}{10}-\frac{5}{10}=\frac{10-3-5}{10}$

$=\frac{2}{10}=\frac{2}{2\cdot 5}=\frac{1}{5}$

The unknown part is $\frac{1}{5}$

57. $1-\frac{1}{4}-\frac{3}{8}=\frac{8}{8}-\frac{1\cdot 2}{4\cdot 2}-\frac{3}{8}=\frac{8-2-3}{8}=\frac{3}{8}$

The unknown part is $\frac{3}{8}$

59. $1-\frac{1}{2}-\frac{1}{6}-\frac{2}{9}=\frac{18}{18}-\frac{1\cdot 9}{2\cdot 9}-\frac{1\cdot 3}{6\cdot 3}-\frac{2\cdot 2}{9\cdot 2}$

$=\frac{18-9-3-4}{18}=\frac{2}{18}=\frac{1}{9}$

The unknown part is $\frac{1}{9}$

61. $\frac{10}{21}+\frac{5}{21}=\frac{10+5}{21}=\frac{15}{21}=\frac{3\cdot 5}{3\cdot 7}=\frac{5}{7}$

63. $\frac{10}{3}-\frac{5}{21}=\frac{10\cdot 7}{3\cdot 7}-\frac{5}{3\cdot 7}=\frac{70}{21}-\frac{5}{21}=\frac{65}{21}$

65. $\frac{2}{3}\cdot\frac{3}{5}=\frac{2\cdot 3}{3\cdot 5}=\frac{2}{5}$

67. $\frac{3}{4}\div\frac{7}{12}=\frac{3}{4}\cdot\frac{12}{7}=\frac{3\cdot 3\cdot 4}{4\cdot 7}=\frac{9}{7}$

69. $\frac{5}{12}+\frac{4}{12}=\frac{5+4}{12}=\frac{9}{12}=\frac{3\cdot 3}{3\cdot 4}=\frac{3}{4}$

71. $5+\frac{2}{3}=\frac{15}{3}+\frac{2}{3}=\frac{15+2}{3}=\frac{17}{3}$

73. $\frac{7}{8}\div 3\frac{1}{4}=\frac{7}{8}\div\frac{13}{4}=\frac{7}{8}\cdot\frac{4}{13}=\frac{7\cdot 4}{2\cdot 4\cdot 13}=\frac{7}{26}$

75. $\frac{7}{18}\div\frac{14}{36}=\frac{7}{18}\cdot\frac{36}{14}=\frac{7\cdot 2\cdot 18}{18\cdot 2\cdot 7}=1$

77. $\frac{23}{105}-\frac{2}{105}=\frac{23-2}{105}=\frac{21}{105}=\frac{21}{21\cdot 5}=\frac{1}{5}$

79. $1\frac{1}{2}+3\frac{2}{3}=\frac{3}{2}+\frac{11}{3}=\frac{3\cdot 3}{2\cdot 3}+\frac{11\cdot 2}{3\cdot 2}=\frac{9+22}{6}$

$=\frac{31}{6}=5\frac{1}{6}$

81. $\frac{2}{3}-\frac{5}{9}+\frac{5}{6}=\frac{2\cdot 2\cdot 3}{3\cdot 2\cdot 3}-\frac{5\cdot 2}{9\cdot 2}+\frac{5\cdot 3}{6\cdot 3}$

$=\frac{12-10+15}{18}=\frac{17}{18}$

83. $5+4\frac{1}{8}+4\frac{1}{8}+15\frac{3}{4}+15\frac{3}{4}+10\frac{1}{2}$

$=\frac{40}{8}+\frac{33}{8}+\frac{33}{8}+\frac{126}{8}+\frac{126}{8}+\frac{84}{8}$

$=\frac{40+33+33+126+126+84}{8}$

$=\frac{442}{8}$

$=55\frac{1}{4}$ feet

85. $4\frac{3}{4}+1\frac{2}{5}=\frac{19}{4}+\frac{7}{5}=\frac{19\cdot 5}{4\cdot 5}+\frac{7\cdot 4}{5\cdot 4}=\frac{95+28}{20}$

$=\frac{123}{20}=6\frac{3}{20}$ meters

87. Answers may vary.

89. $5\frac{1}{2}-2\frac{1}{8}=\frac{11}{2}-\frac{17}{8}=\frac{11\cdot 4}{2\cdot 4}-\frac{17}{8}=\frac{44-17}{8}$

$=\frac{27}{8}=3\frac{3}{8}$ miles

91. $\frac{7}{50}$ are in the physical sciences

93. $1-\frac{4}{25}-\frac{7}{50}-\frac{7}{50}-\frac{7}{100}-\frac{21}{100}-\frac{3}{100}$

$=\frac{100}{100}-\frac{4\cdot 4}{25\cdot 4}-\frac{7\cdot 2}{50\cdot 2}-\frac{7\cdot 2}{50\cdot 2}-\frac{7}{100}$

$-\frac{21}{100}-\frac{3}{100}$

$=\frac{100-16-14-14-7-21-3}{100}$

$=\frac{25}{100}=\frac{1}{4}$

$\frac{1}{4}$ are in the biological and agricultural sciences

95. $\frac{666}{3678}=\frac{111}{613}$ were Old Navy stores.

97. Area $=\frac{1}{2}\cdot\frac{7}{8}\cdot\frac{4}{9}=\frac{7\cdot 4}{2\cdot 2\cdot 4\cdot 9}=\frac{7}{36}$ sq ft

Calculator Explorations 1.4

1. $5^3=125$

3. $9^5=59,049$

5. $2(20-5)=30$

7. $24(862-455)+89=9857$

9. $\frac{4623+129}{36-34}=2376$

Mental Math 1.4

1. multiply

2. Add

3. Subtract

4. divide

Exercise Set 1.4

1. $3^5=3\cdot 3\cdot 3\cdot 3\cdot 3=243$

3. $3^3=3\cdot 3\cdot 3=27$

5. $1^5=1\cdot 1\cdot 1\cdot 1\cdot 1=1$

7. $5^1=5$

9. $\left(\frac{1}{5}\right)^3=\left(\frac{1}{5}\right)\left(\frac{1}{5}\right)\left(\frac{1}{5}\right)=\frac{1\cdot 1\cdot 1}{5\cdot 5\cdot 5}=\frac{1}{125}$

11. $\left(\frac{2}{3}\right)^4=\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)=\frac{2\cdot 2\cdot 2\cdot 2}{3\cdot 3\cdot 3\cdot 3}=\frac{16}{81}$

13. $7^2=7\cdot 7=49$

15. $(4)^2=(4)\cdot(4)=16$

17. $(1.2)^2=(1.2)\cdot(1.2)=1.44$

19. $5+6\cdot 2=5+12=17$

21. $4\cdot 8-6\cdot 2=32-12=20$

23. $2(8-3)=2(5)=10$

25. $2+(5-2)+4^2=2+3+4^2=2+3+16=21$

27. $5\cdot 3^2=5\cdot 9=45$

29. $\frac{1}{4}\cdot\frac{2}{3}-\frac{1}{6}=\frac{2}{12}-\frac{1}{6}=\frac{1}{6}-\frac{1}{6}=0$

31. $\dfrac{6-4}{9-2}=\dfrac{2}{7}$

33. $2\left[5+2(8-3)\right]=2\left[5+2(5)\right]=2\left[5+10\right]$
$=2\left[15\right]=30$

35. $\dfrac{19-3\cdot 5}{6-4}=\dfrac{19-15}{6-4}=\dfrac{4}{2}=2$

37. $\dfrac{|6-2|+3}{8+2\cdot 5}=\dfrac{|4|+3}{8+2\cdot 5}=\dfrac{4+3}{8+2\cdot 5}=\dfrac{4+3}{8+10}$
$=\dfrac{7}{18}$

39. $\dfrac{3+3(5+3)}{3^2+1}=\dfrac{3+3(8)}{3^2+1}=\dfrac{3+3(8)}{9+1}$
$=\dfrac{3+24}{9+1}=\dfrac{27}{10}$

41. $\dfrac{6+|8-2|+3^2}{18-3}=\dfrac{6+|6|+3^2}{18-3}=\dfrac{6+6+3^2}{18-3}$
$=\dfrac{6+6+9}{18-3}=\dfrac{21}{15}=\dfrac{3\cdot 7}{3\cdot 5}$
$=\dfrac{7}{5}$

43. No; since in the absence of grouping symbols we always perform multiplications or divisions before additions or subtractions in any expression.

45. **a.** $(6+2)\cdot(5+3)=8\cdot 8=64$

b. $(6+2)\cdot 5+3=8\cdot 5+3=40+3$
$=43$

c. $6+2\cdot 5+3=6+10+3=19$

d. $6+2\cdot(5+3)=6+2\cdot 8=6+16$
$=22$

47. Let $y=3$
$3y=3(3)=9$

49. Let $x=1$ and $z=5$
$\dfrac{z}{5x}=\dfrac{5}{5(1)}=\dfrac{5}{5}=1$

51. Let $x=1$
$3x-2=3(1)-2=3-2=1$

53. Let $x=1$ and $y=3$
$|2x+3y|=|2(1)+3(3)|=|2+9|=|11|=11$

55. Let $y=3$
$5y^2=5(3)^2=5(9)=45$

57. Let $x=12$, $y=8$ and $z=4$
$\dfrac{x}{z}+3y=\dfrac{12}{4}+3(8)=3+24=27$

59. Let $x=12$ and $y=8$.
$x^2-3y+x=(12)^2-3(8)+12$
$=144-24+12$
$=132$

61. Let $x = 12$, $y = 8$ and $z = 4$

$$\frac{x^2 + z}{y^2 + 2z} = \frac{(12)^2 + 4}{(8)^2 + 2(4)} = \frac{144 + 4}{64 + 8}$$

$$= \frac{148}{72} = \frac{37}{18}$$

63. Evaluate $16t^2$ for each value of t.

$t = 1; 16(1)^2 = 16(1) = 16$

$t = 2; 16(2)^2 = 16(4) = 64$

$t = 3; 16(3)^2 = 16(9) = 144$

$t = 4; 16(4)^2 = 16(16) = 256$

Time t (in seconds)	Distance $16t^2$ (in feet)
1	16
2	64
3	144
4	256

65. Let $x = 5$

$3x - 6 = 9$

$3(5) - 6 \stackrel{?}{=} 9$

$15 - 6 \stackrel{?}{=} 9$

$9 = 9$, true

5 is a solution of the equation.

67. Let $x = 0$

$2x + 6 = 5x - 1$

$2(0) + 6 \stackrel{?}{=} 5(0) - 1$

$0 + 6 \stackrel{?}{=} 0 - 1$

$6 = -1$, false

0 is not a solution of the equation.

69. Let $x = 8$

$2x - 5 = 5$

$2(8) - 5 \stackrel{?}{=} 5$

$16 - 5 \stackrel{?}{=} 5$

$9 = 5$, false

8 is not a solution of the equation.

71. Let $x = 2$

$x + 6 = x + 6$

$2 + 6 \stackrel{?}{=} 2 + 6$

$8 = 8$, true

2 is a solution of the equation.

73. Let $x = 0$

$x = 5x + 15$

$(0) \stackrel{?}{=} 5(0) + 15$

$0 \stackrel{?}{=} 0 + 15$

$0 = 15$, false

0 is not a solution of the equation.

75. $x + 15$

77. $x - 5$

79. $3x + 22$

81. $1 + 2 = 9 \div 3$

83. $3 \neq 4 \div 2$

85. $5 + x = 20$

87. $13 - 3x = 13$

89. $\frac{12}{x} = \frac{1}{2}$

91. Answers may vary.

93. $(20-4)\cdot 4 \div 2 = (16)\cdot 4 \div 2 = 64 \div 2 = 32$

95. Let $l = 8$ and $w = 6$

$2l + 2w = 2(8) + 2(6) = 16 + 12 = 28$ m.

97. Let $l = 120$ and $w = 100$

$lw = (120)(100) = 12{,}000$ sq.ft.

99. Let $P = 650$, $T = 3$, and $I = 126.75$

$$\frac{I}{PT} = \frac{126.75}{(650)(3)} = \frac{126.75}{1950} = 0.065 = 6.5\%$$

101. Let $m = 228$.

$$\begin{aligned} 4.00 + 0.07m &= 4.00 + 0.07(228) \\ &= 4.00 + 15.96 \\ &= \$19.96 \end{aligned}$$

101. Answers may vary.

Mental Math 1.5

1. negative
2. positive
3. 0
4. negative
5. negative
6. 0

Exercise Set 1.5

1. $6 + 3 = 9$

3. $-6 + (-8) = -14$

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

7. $-14 + 2 = -12$

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

11. $-9 + (-3) = -12$

13. $-7 + 3 = -4$

15. $10 + (-3) = 7$

17. $5 + (-7) = -2$

19. $-16 + 16 = 0$

21. $27 + (-46) = -19$

23. $-18 + 49 = 31$

25. $-33 + (-14) = -47$

27. $6.3 + (-8.4) = -2.1$

29. $|-8| + (-16) = 8 + (-16) = -8$

31. $117 + (-79) = 38$

33. $-9.6 + (-3.5) = -13.1$

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

37. $-\frac{7}{16}+\frac{1}{4}=-\frac{7}{16}+\frac{1\cdot 4}{4\cdot 4}=-\frac{7}{16}+\frac{4}{16}=-\frac{3}{16}$

39. $-\frac{7}{10}+\left(-\frac{3}{5}\right)=-\frac{7}{10}+\left(-\frac{3\cdot 2}{5\cdot 2}\right)$
$=-\frac{7}{10}+\left(-\frac{6}{10}\right)=-\frac{13}{10}$

41. $-15+9+(-2)=-6+(-2)=-8$

43. $-21+(-16)+(-22)=-37+(-22)=-59$

45. $-23+16+(-2)=-7+(-2)=-9$

47. $|5+(-10)|=|-5|=5$

49. $6+(-4)+9=2+9=11$

51. $[-17+(-4)]+[-12+15]=[-21]+[3]$
$=-18$

53. $|9+(-12)|+|-16|=|-3|+16=3+16=19$

55. $-1.3+[0.5+(-0.3)+0.4]$
$=-1.3+[0.2+0.4]$
$=-1.3+[0.6]$
$=-0.7$

57. $-15+9=-6$
The high temperature in Anoka was -6°.

59. $-1312+658=-654$
You are 654 feet below sea level.

61. $(-1411)+(-567)+(-149)$
$=(-1978)+(-149)$
$=-2127$
The total net income
was $-\$2127$ million.

63. $5+(-5)+(-2)=0+(-2)=-2$
Her score was 2 under par.

65. The opposite of 6 is -6.

67. The opposite of -2 is 2.

69. The opposite of 0 is 0.

71. Since $|-6|$ is 6, the opposite of $|-6|$ is -6.

73. Answers may vary.

75. $-|-2|=-2$

77. $-|0|=-0=0$

79. $-\left|-\frac{2}{3}\right|=-\frac{2}{3}$

81. Answers may vary

83. Let $x=-4$
$x+9=5$
$(-4)+9\stackrel{?}{=}5$
$5=5$, true
-4 is a solution of the equation.

85. Let $y = -1$

$y + (-3) = -7$

$(-1) + (-3) \stackrel{?}{=} -7$

$-4 = -7$, false

-1 is not a solution of the equation.

87. July

89. October

91. $\left[(-9.1) + 14.4 + 8.8\right] \div 3 = \left[5.3 + 8.8\right] \div 3$

$= \left[14.1\right] \div 3 = 4.7$

The average was 4.7° F.

93. $-a$ is a negative number.

95. $a + a$ is a positive number.

Exercise Set 1.6

1. $-6 - 4 = -6 + (-4) = -10$

3. $4 - 9 = 4 + (-9) = -5$

5. $16 - (-3) = 16 + 3 = 19$

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

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

9. $-16 - (-18) = -16 + 18 = 2$

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

13. $7 - (-4) = 7 + 4 = 11$

15. $-6 - (-11) = -6 + 11 = 5$

17. $16 - (-21) = 16 + 21 = 37$

19. $9.7 - 16.1 = 9.7 + (-16.1) = -6.4$

21. $-44 - 27 = -44 + (-27) = -71$

23. $-21 - (-21) = -21 + 21 = 0$

25. $-2.6 - (-6.7) = -2.6 + 6.7 = 4.1$

27. $-\frac{3}{11} - \left(-\frac{5}{11}\right) = -\frac{3}{11} + \frac{5}{11} = \frac{2}{11}$

29. $-\frac{1}{6} - \frac{3}{4} = -\frac{1}{6} + \left(-\frac{3}{4}\right) = -\frac{1 \cdot 2}{6 \cdot 2} + \left(-\frac{3 \cdot 3}{4 \cdot 3}\right)$

$= -\frac{2}{12} + \left(-\frac{9}{12}\right) = -\frac{11}{12}$

31. $8.3 - (-0.62) = 8.3 + 0.62 = 8.92$

33. $8 - (-5) = 8 + 5 = 13$

35. $-6 - (-1) = -6 + 1 = -5$

37. $7 - 8 = 7 + (-8) = -1$

39. $-8 - 15 = -8 + (-15) = -23$

41. Answers may vary

43. $-10-(-8)+(-4)-20$
$=-10+8+(-4)+(-20)$
$=-2+(-4)+(-20)=-6+(-20)=-26$

45. $5-9+(-4)-8-8$
$=5+(-9)+(-4)+(-8)+(-8)$
$=-4+(-4)+(-8)+(-8)$
$=-8+(-8)+(-8)=-16+(-8)=-24$

47. $-6-(2-11)=-6-(-9)=-6+9=3$

49. $3^3-8\cdot 9=27-8\cdot 9$
$=27-72=27+(-72)=-45$

51. $2-3(8-6)=2-3(2)=2-6=2+(-6)=-4$

53. $(3-6)+4^2=[3+(-6)]+4^2=[-3]+4^2$
$=[-3]+16=13$

55. $-2+[(8-11)-(-2-9)]$
$=-2+[(8+(-11))-(-2+(-9))]$
$=-2+[(-3)-(-11)]=-2+[(-3)+11]$
$=-2+[8]=6$

57. $|-3|+2^2+[-4-(-6)]=3+2^2+[-4+6]$
$=3+2^2+[2]=3+4+[2]=7+[2]=9$

59. Let $x=-5$ and $y=4$.
$x-y=-5-4=-5+(-4)=-9$

61. Let $x=-5$, $y=4$, and $t=10$.
$|x|+2t-8y=|-5|+2(10)-8(4)$
$=5+2(10)-8(4)=5+20-32$
$=25-32=25+(-32)=-7$

63. Let $x=-5$ and $y=4$.
$$\frac{9-x}{y+6}=\frac{9-(-5)}{4+6}=\frac{9+5}{4+6}=\frac{14}{10}=\frac{2\cdot 7}{2\cdot 5}=\frac{7}{5}$$

65. Let $x=-5$ and $y=4$.
$y^2-x=4^2-(-5)=16+5=21$

67. Let $x=-5$ and $t=10$.
$$\frac{|x-(-10)|}{2t}=\frac{|-5-(-10)|}{2(10)}=\frac{|-5+10|}{2(10)}$$
$$=\frac{|5|}{2(10)}=\frac{5}{20}=\frac{5}{4\cdot 5}=\frac{1}{4}$$

69. The change in temperature is the difference between the last temperature and the first temperature.
$-56-44=-56+(-44)=-100$
The temperature dropped 100°.

71. Gains: $+2$
Losses: $-5,-20$
$2+(-5)+(-20)=-3+(-20)=-23$
Total loss of 23 yards

73. $-475-94=-475+(-94)=-569$
He was born in 569 B.C.

75. Rises: $+120$
Drops: $-250, -178$
$120+(-250)+(-178)$
$=-130+(-178)=-308$
The overall vertical change was a drop of 308 feet.

77. $19{,}340-(-512)=19{,}340+512$
$=19{,}852$
19,852 feet higher

79. $y=180-50=180+(-50)=130$
The supplementary angle is 130°

81. $x=90-60=90+(-60)=30$
The complementary angle is 30°

83. Let $x=-4$
$x-9=5$
$-4-9\stackrel{?}{=}5$
$-13=5$, false
-4 is not a solution of the equation.

85. Let $x=-2$
$-x+6=-x-1$
$-(-2)+6\stackrel{?}{=}-(-2)-1$
$2+6\stackrel{?}{=}2+(-1)$
$8=1$, false
-2 is not a solution of the equation.

87. Let $x=2$
$-x-13=-15$
$-2-13\stackrel{?}{=}-15$
$-2+(-13)\stackrel{?}{=}-15$
$-15=-15$, true
2 is a solution of the equation.

89. The change in temperature is the difference between the given month's temperature and the previous month's.
F: $-23.7-(-19.3)=-23.7+19.3=-4.4^\circ$
Mr: $-21.1-(-23.7)=-21.1+23.7=2.6^\circ$
Ap: $-9.1-(-21.1)=-9.1+21.1=12^\circ$
Ma: $14.4-(-9.1)=14.4+9.1=23.5^\circ$
Jn: $29.7-14.4=29.7+(-14.4)=15.3^\circ$
Jy: $33.6-29.7=33.6+(-29.7)=3.9^\circ$
Au: $33.3-33.6=33.3+(-33.6)=-0.3^\circ$
S: $27.0-33.3=27.0+(-33.3)=-6.3^\circ$
O: $8.8-27.0=8.8+(-27.0)=-18.2^\circ$
N: $-6.9-8.8=-6.9+(-8.8)=-15.7^\circ$
D: $-17.2-(-6.9)=-17.2+6.9=-10.3^\circ$

91. October

93. True: answers may vary.

95. True: answers may vary.

97. $4.362-7.0086=-2.6466$

Calculator Explorations 1.7

1. $-38(26-27)=38$

3. $134+25(68-91)=-441$

5. $\dfrac{-50(294)}{175-265}=163.\overline{3}$

7. $9^5-4550=54,499$

9. $(-125)^2=15,625$

Mental Math 1.7

1. positive

2. positive

3. negative

4. negative

5. positive

6. negative

Exercise Set 1.7

1. $-6(4)=-24$

3. $2(-1)=-2$

5. $-5(-10)=50$

7. $-3\cdot 4=-12$

9. $-7\cdot 0=0$

11. $2(-9)=-18$

13. $-\dfrac{1}{2}\left(-\dfrac{3}{5}\right)=\dfrac{1\cdot 3}{2\cdot 5}=\dfrac{3}{10}$

15. $-\dfrac{3}{4}\left(-\dfrac{8}{9}\right)=\dfrac{3\cdot 8}{4\cdot 9}=\dfrac{24}{36}=\dfrac{2\cdot 12}{3\cdot 12}=\dfrac{2}{3}$

17. $5(-1.4)=-7.0$

19. $-0.2(-0.7)=0.14$

21. $-10(80)=-800$

23. $4(-7)=-28$

25. $(-5)(-5)=25$

27. $\dfrac{2}{3}\left(-\dfrac{4}{9}\right)=-\dfrac{2\cdot 4}{3\cdot 9}=-\dfrac{8}{27}$

29. $-11(11)=-121$

31. $-\dfrac{20}{25}\left(\dfrac{5}{16}\right)=-\dfrac{20\cdot 5}{25\cdot 16}=-\dfrac{100}{400}=-\dfrac{1}{4}$

33. $(-1)(2)(-3)(-5)$
$=-2(-3)(-5)=6(-5)=-30$

35. $(-2)(5)-(-11)(3)=-10-(-33)$
$=-10+33$
$=23$

37. $(-6)(-1)(-2)-(-5)=-12+5=-7$

39. True

41. False