1-13 Cumulative Review

1-4 Evaluate.

1. $(x - 3)^2 + 5$ for $x = 10$
2. $(y - 1)^2 + (y + 6)^2$ for $y = 4$
3. $(x - y)^2 + 2(x + y)$ for $x = 10$ and $y = 2$

1-5 Use the associative property to write an equivalent expression.

4. $(7 + 6) + 4$
5. $a \cdot (b \cdot c)$

2-3, 2-4 Add.

6. $-12.8 + 2.6 + (-11.9) + 6.2 + 0.9$
7. $-\frac{1}{8} - 4 - \frac{3}{4} + 2\frac{1}{2} - 6\frac{1}{4}$
8. $2 + 6x - 14 - 5x$
9. $18a + 16b + 2a - 10b$

2-5 Multiply.

10. $(-8)(-5)$
11. $(-11.2)(3.1)$

2-6 Divide.

12. $-\frac{4}{7} \div \frac{1}{14}$
13. $-\frac{8}{9} \div -\frac{1}{3}$

3-3 to 3-5 Solve.

14. $3x - 12 = 2x$
15. $-\frac{7}{8}x + 7 = \frac{3}{8}x - 3$
16. $0.6x - 1.8 = 1.2x$
17. Three fifths of the automobiles entering the city each morning will be parked in city parking lots. These cars fill 3654 parking spaces. How many cars enter the city each morning?

3-7

18. Solve $A = \pi r^2$ for r.
19. Solve $A = 2\pi r^2 + 2\pi rh$ for h.

3-9

20. After election results of 378 votes were tallied, the new student-body president won by a margin of 5 to 4. How many votes did she get?

Chapters 1–13 Cumulative Review

1. 54
2. 109
3. 88
4. $7 + (6 + 4)$
5. $(a \cdot b) \cdot c$
6. -15
7. $-8\frac{5}{8}$
8. $x - 12$
9. $20a + 6b$
10. 40
11. -34.72
12. -8
13. $\frac{8}{3}$
14. 12
15. 8
16. -3
17. 6090 cars
18. $r = \sqrt{\frac{A}{\pi}}$ or $\frac{\sqrt{A \cdot \pi}}{\pi}$
19. $h = \frac{A}{2\pi r} - r$ or $\frac{A - 2\pi r^2}{2\pi r}$
20. 210

3-10 Solve.

21. What percent of 52 is 13?
22. What percent of 86 is 129?
23. 60 is what percent of 720?
24. 12 is what percent of 0.5?
25. 110% of what number is 11?
26. What is 25% of 16?

4-2 to 4-4 Solve.

27. $x - 9 < 12$
28. $3a + 8 \geq -5 + 2a$
29. $6y \leq 3$
30. $3c - 6 < 5c$
31. $7y + 2 > 5y - 8$
32. $23 - 7x - 3x \geq -11$

4-5

33. The width of a rectangle is 15 cm. What length will make the area at least 225 cm^2?

5-1, 5-2 Simplify.

34. $a^4 \cdot a^6$
35. $\frac{4m^5}{m^3}$
36. y^{-3}
37. $(2y^6)^3$
38. $\left(\frac{x}{y^3}\right)^2$
39. $(3x^5y^4)^3$

5-3, 5-4 Multiply.

40. $(-3y)(2y^2)$
41. $(-3ab^2c)(-4b^2c^4)$

Divide.

42. $\frac{-25x^4}{10x}$
43. $\frac{-18x^2y^3z}{-3xyz}$

5-7, 5-8 Add or subtract.

44. $(2m^3 - 9) + (5m^3 - 10m^2 + 10)$
45. $(-6a^2 - a + 3) - (a^3 - 10a^2 + a + 3)$

5-10 Multiply.

46. $(4b - 1)(4b + 3)$
47. $(2m + 3)(m - 6)$
48. $(7y + 6)(7y - 6)$
49. $(a + 2)^2$
50. $(a - 3)^2$
51. $(3m + 5)^2$

21. 25%
22. 150%
23. $8\frac{1}{3}\%$
24. 2400%
25. 10
26. 4
27. $x < 21$
28. $a \geq -13$
29. $y \leq \frac{1}{2}$
30. $c > -3$
31. $y > -5$
32. $x \leq \frac{17}{5}$
33. $l \geq 15$
34. a^{10}
35. $4m^2$
36. $\frac{1}{y^3}$
37. $8y^{18}$
38. $\frac{x^2}{y^6}$
39. $27x^{15}y^{12}$
40. $-6y^3$
41. $12ab^4c^5$
42. $-\frac{5x^3}{2}$
43. $6xy^2$
44. $7m^3 - 10m^2 + 1$
45. $-a^3 + 4a^2 - 2a$
46. $16b^2 + 8b - 3$
47. $2m^2 - 9m - 18$
48. $49y^2 - 36$
49. $a^2 + 4a + 4$
50. $a^2 - 6a + 9$
51. $9m^2 + 30m + 25$

6-1 to 6-5 Factor.

52. $m^3 - m$
53. $49x^2 - 64$
54. $m^4 - 1$
55. $2x^2 + 13x - 99$
56. $7m^2 - 8m + 1$
57. $9x^2 - 24x + 16$
58. $9x^4 - 30x^2y + 25y^2$
59. $100x^3 + 60x^2 + 9x$

7-3 Graph each equation.

60. $x + y = 5$
61. $2x + 3y = -1$
62. $-y = 7$

7-5 Find the slope and y-intercept of each line.

63. $10x = 125 - 20y$
64. $2y - 3x + 1 = 0$

7-6 Write an equation for each line.

65. the line containing (0, 10) and parallel to the x-axis
66. the line containing the origin and $(-3, 3)$
67. the line with slope of $-\frac{2}{3}$ that crosses the x-axis at -7
68. the line with x-intercept 6 and y-intercept -1

8-1

In Exercises 69–71, which of these pairs are solutions of the system of equations? $(0, 0), (-2, 1), (4, 3), (1, 1)$

69. $5x - 2y = -12$
$3x + 8y = 2$
70. $2y = 6$
$-3x = -12$
71. $x + 8y = 6$
$3x + 6y = 0$

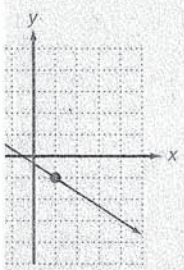
8-2, 8-3 Solve each system of equations.

72. $y = x - 6$
$x + y = -2$
73. $\frac{1}{2}x + 2y = 9$
$4x + 3y = 7$

8-4 to 8-6

74. The difference of two numbers is 14. Three times the larger number is 45 less than four times the smaller. What are the two numbers?
75. In 15 years Dorothy will be three times as old as Stan. Five years ago the difference in their ages was 50. How old are Dorothy and Stan?
76. An airplane whose speed in still air is 530 mi/h carries enough fuel for 10 hours of flight. On a certain flight it flies against a wind of 30 mi/h. On the return flight it travels with a wind of 30 mi/h. How far can the plane fly without refueling?
77. For the school festival, 600 tickets were sold. Student tickets sold for \$1.60, and adult tickets sold for \$2.25. If the total amount received was \$1122.50, how many tickets of each kind were sold?

52) $m(m+1)(m-1)$
53) $(7x+8)(7x-8)$
54) $(m^2+1)(m+1)(m-1)$
55) $(2x-9)(x+11)$
56) $(m-1)(7m-1)$
57) $(3x-4)^2$
58) $(3x^2-5y)^2$
59) $x(10x+3)^2$



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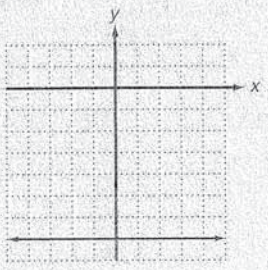


63. $m = -\frac{1}{2}, b = \frac{25}{4}$
64. $m = \frac{3}{2}, b = -\frac{1}{2}$
65. $y = 10$
66. $y = -x$
67. $y = -\frac{2}{3}x - \frac{14}{3}$
68. $y = \frac{1}{6}x - 1$
69. $(-2, 1)$
70. $(4, 3)$
71. $(-2, 1)$
72. $(2, -4)$
73. $(-2, 5)$
74. 87, 101
75. Dorothy is 60 years old; Stan is 10 years old.
76. Approximately 2641.5 mi each way or 5283 mi
77. 350 student tickets, 250 adult tickets

9-1

Let $A = \{100, 105, 110, 115, 120\}$, $B = \{100, 102, 104, 106, 108, 110, 112\}$, and $C = \{99, 102, 105, 108, 111\}$.
Find the following.

78. $A \cup B$ **79.** $A \cup C$ **80.** $B \cup C$
81. $A \cap B$ **82.** $A \cap C$ **83.** $B \cap C$

9-4 Solve and graph.

84. $|x| < 4$ **85.** $|x| > 5$
86. $|x - 6| \leq 10$ **87.** $2|x| \geq 6$

10-2 Multiply. Simplify the product when possible.

88. $\frac{-5}{3x - 4} \cdot \frac{-6}{5x + 6}$ **89.** $\frac{x + 3}{x^2 - 2} \cdot \frac{x + 3}{x^2 - 2}$

90. $\frac{x^2 - 6x}{x - 6} \cdot \frac{x + 3}{x}$ **91.** $\frac{5a + 5}{a + 3} \cdot \frac{2a + 6}{a^2 + 2a + 1}$

10-3 Divide. Simplify the quotient.

92. $\frac{y + 4}{y^2 - 1} \div \frac{y^2 + y - 12}{y + 1}$ **93.** $\frac{8x - 12}{5} \div \frac{6x - 9}{35}$

10-4, 10-5 Add or subtract. Simplify.

94. $\frac{2x^2}{2x - 1} - \frac{1 - x}{2x - 1}$ **95.** $\frac{x^2}{x - 3} + \frac{9}{3 - x}$

96. $\frac{x - 5}{x} - \frac{x}{x - 5}$ **97.** $\frac{3}{12 + x - x^2} - \frac{2}{x^2 - 9}$

10-6, 10-7 Solve.

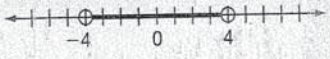
98. $\frac{6x - 2}{2x - 1} = \frac{9x}{3x + 1}$ **99.** $\frac{2}{x + 1} = \frac{5}{2x}$

100. In checking records a contractor finds that crew A can pave a certain length of highway in 8 hours. Crew B can do the same job in 10 hours. How long would it take if they worked together?

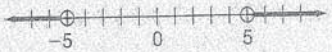
101. One boat travels 5 km/h slower than another. While one boat travels 85 km, the other travels 110 km. Find their speeds.

102. Two women were partners in a store, one investing \$50,000 and the other \$38,000. They agreed to share the profits in the ratio of the amount invested. The profits for the first year were \$11,000. How much should each receive?

78. {100, 102, 104, 105, 106, 108, 110, 112, 115, 120}
79. {99, 100, 102, 105, 108, 110, 111, 115, 120}
80. {99, 100, 102, 104, 105, 106, 108, 110, 111, 112}
81. {100, 110}
82. {105}
83. {102, 108}
84. $-4 < x < 4$

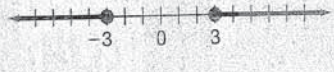


85. $x < -5$ or $x > 5$



86. $-4 \leq x \leq 16$

87. $x \leq -3$ or $x \geq 3$



88. $\frac{30}{15x^2 - 2x - 24}$

89. $\frac{x^2 + 6x + 9}{x^4 - 4x^2 + 4}$
90. $x + 3$
91. $\frac{10}{a + 1}$
92. $\frac{1}{(y - 1)(y - 3)}$
93. $\frac{28}{3}$
94. $x + 1$
95. $x + 3$
96. $\frac{-10x + 25}{x(x - 5)}$
97. $\frac{-5x + 17}{(x - 4)(x + 3)(x - 3)}$

98. $\frac{2}{9}$
99. -5
100. $4\frac{4}{9}$ h
101. 17 km/h, 22 km/h
102. \$6250, \$4750

11-1 Simplify.

103. $\sqrt{49}$ **104.** $-\sqrt{81}$

11-2 Determine the replacements for the variable that will make each expression a real number.

105. $\sqrt{x+4}$ **106.** $\sqrt{x-6}$

Simplify.

107. $\sqrt{c^2d^2}$ **108.** $\sqrt{(x+1)^2}$ **109.** $\sqrt{64x^2}$

11-3 Simplify. Assume all variables are nonnegative.

110. $\sqrt{150}$ **111.** $\sqrt{9y}$ **112.** $\sqrt{16x-16}$

113. $\sqrt{y^7}$ **114.** $\sqrt{8x^4y^4}$ **115.** $\sqrt{9(a+4)^2}$

11-4, 11-5 Multiply and simplify. Assume all variables are nonnegative.

116. $\sqrt{4xy^2} \cdot \sqrt{8x^2y}$ **117.** $\sqrt{32ab} \cdot \sqrt{6a^4b^2}$

Rationalize the denominator. Assume all variables are nonnegative.

118. $\sqrt{\frac{1}{6}}$ **119.** $\frac{\sqrt{5}}{\sqrt{18}}$ **120.** $\sqrt{\frac{x^2}{27}}$

11-6 Add or subtract.

121. $6\sqrt{a} + 7\sqrt{a}$ **122.** $\sqrt{81y^3} - \sqrt{4y}$

123. $3x\sqrt{x^2y} - x\sqrt{x^2y^3} - 2\sqrt{y^3}$

11-7

124. In a right triangle with hypotenuse c, $a = 9$ and $c = 41$. Find the length of side b.

12-1 Find the indicated output for the function $f(x) = 2x^2 + 7x - 4$.

125. $f(0)$ **126.** $f\left(\frac{1}{2}\right)$ **127.** $f(-2)$

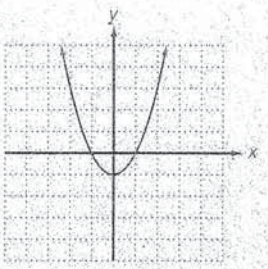
12-4 Graph each function.

128. $g(x) = x^2 - 1$ **129.** $f(x) = \frac{1}{4}x^2$

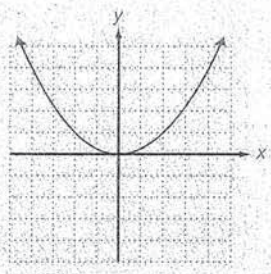
3) 7
4) -9
5) $x \geq -4$
6) $x \geq 6$
7) $|cd|$
8) $|x+1|$
9) $8|x|$
10) $5\sqrt{6}$
11) $3\sqrt{y}$
12) $4\sqrt{x-1}$
13) $y^3\sqrt{y}$
14) $2x^2y^2\sqrt{2}$
15) $3(a+4)$
16) $4xy\sqrt{2xy}$

117. $8a^2b\sqrt{3ab}$
118. $\frac{\sqrt{6}}{6}$
119. $\frac{\sqrt{10}}{6}$
120. $\frac{x\sqrt{3}}{9}$
121. $13\sqrt{a}$
122. $(9y-2)\sqrt{y}$
123. $(3x^2 - x^2y - 2y)\sqrt{y}$
124. 40
125. -4
126. 0
127. -10

128.



129.



12-5 to 12-7

130. When you swim underwater, the pressure in your ears varies directly as the depth at which you swim. At 50 ft the pressure is about 21.5 pounds per square inch (psi). Find the pressure at 20 ft.

131. The volume of a certain quantity of gas varies inversely as its pressure. If its pressure is 15 psi when its volume is 3 cubic feet, what will the pressure be when the gas is expanded to a volume of 5 cubic feet?

132. Assume that p varies directly as r and inversely as s, where p is 10 when r is 8 and s is 4. Find p when r is 10 and s is 2.

13-1 to 13-4 Solve.

133. $3x^2 = 30$

134. $3x^2 - 7x = 0$

135. $x^2 + 4 = 4x$

136. $6x^2 + x - 2 = 0$

137. $(x - 3)^2 = 6$

138. $x^2 - 10x - 4 = 0$

139. $9x^2 - 12x - 2 = 0$

140. $x^2 = 7x - 1$

13-5 Solve.

141. $\frac{x + 2}{x^2 - 2} = \frac{2}{2 - x}$

142. $1 + \frac{1}{x} = \frac{6}{x^2}$

13-6 Solve.

143. $p = \sqrt{4p - 3}$

144. $2\sqrt{x^2 - 1} = x - 1$

13-7

145. The speed of a boat in still water is 8 km/h. It travels 60 km upstream and 60 km downstream in a total time of 16 hours. What is the speed of the stream?

146. The width of a rectangle is half its length. The area is 32 m^2. Find the length and the width.

130. 8.6 psi
131. 9 psi
132. 25
133. $\sqrt{10}, -\sqrt{10}$
134. $0, \frac{7}{3}$
135. 2
136. $\frac{1}{2}, -\frac{2}{3}$
137. $3 \pm \sqrt{6}$
138. $5 \pm \sqrt{29}$
139. $\frac{2 \pm \sqrt{6}}{3}$
140. $\frac{7 \pm 3\sqrt{5}}{2}$
141. $\frac{\pm 2\sqrt{6}}{3}$
142. $-3, 2$
143. $1, 3$
144. 1
145. 2 km/h
146. $l = 8$ m, $w = 4$ m

ysis

Lesson
1-2
1-4
1-1
1-3
1-4
1-3
1-2
1-1
1-2
1-3, 1-4

Mixed Practice 1

For use after Lesson 1-4

Write an equivalent expression.

1. $\frac{a}{3}$ Use $\frac{2}{2}$ for 1.
2. $\frac{3}{4}$ Use $\frac{m}{m}$ for 1.
3. $\frac{x}{7}$ Use $\frac{y}{y}$ for 1.
4. $5 \cdot (m \cdot n)$
5. $(s + 3) + t$
6. $a \cdot b \cdot 11$
7. $r(2 + s)t$
8. $1 + (2m^2 + n)$
9. $(xy)z + w$

Evaluate.

10. $9 + y + y$ for $y = 2$
11. $2a + 5b$ for $a = 3$ and $b = 7$
12. $\frac{3x}{5y}$ for $x = 10$ and $y = 2$
13. $\frac{2m + n}{3}$ for $m = 7$ and $n = 4$
14. $h + 3k$ for $h = 5$ and $k = 1$
15. $4(r + 6) - 3$ for $r = 7$
16. $(3a)^2$ for $a = 11$
17. $5y^2$ for $y = 1$
18. $6a^3$ for $a = 2$
19. $5r^2 + 1$ for $r = 2$
20. $m^3 + 4$ for $m = 0$
21. $x^3 - 7$ for $x = 2$
22. $(2c)^5$ for $c = 1$
23. $2c^2$ for $c = 1$
24. $5y^8$ for $y = 0$
25. $(3xy)^2$ for $x = 5$ and $y = 1$
26. $(ab)^3$ for $a = 2$ and $b = 3$
27. $(2mn)^4$ for $m = 0$ and $n = 2$
28. $(st)^5$ for $s = 1$ and $t = 1$
29. $(m - 4)(m + 1)$ for $m = 6$
30. $(9 - w)^2$ for $w = 5$
31. $y(11 - y)$ for $y = 5$
32. $5(a + 3)$ for $a = 9$
33. $\frac{a^2 + 4}{3a}$ for $a = 6$
34. $\frac{m^2 + 3m}{7m}$ for $m = 4$

Write using exponential notation.

35. $3 \cdot 3 \cdot 3 \cdot 3$
36. $7 \cdot n \cdot n \cdot n \cdot n$
37. w

Tell whether each pair of expressions is equivalent.

38. $3t + 5t$ and $8 + 2t$
39. $xy + yz$ and $xz + yy$
40. $mn + pq$ and $n \cdot p \cdot m \cdot q$
41. $a \cdot b + xyz$ and $xzy + ba$
42. $rs + tu$ and $r + s + t + u$
43. $hj + lm$ and $ml + jh$

Simplify.

44. $18 - 6 \times 8 - 2$
45. $19 - 2 \times 8 + 1$
46. $3 \times 8 - 6 \times 0$
47. $\frac{3w}{15w}$
48. $\frac{24mn}{6m}$
49. $\frac{11uvw}{2uw}$
50. $\frac{8ced}{2ec}$
51. $\frac{12st}{3rs}$
52. $\frac{5xtv}{7vxy}$

Calculate.

53. $(5 + 2)^2$
54. $5 + 2^2$
55. $5^2 + 2$
56. $(5 - 2)^2$
57. $5^2 - 2$
58. $5 - 2^2$
59. $5 \cdot 2^2$
60. $(5 \cdot 2)^2$
61. $5^2 \cdot 2^2$

1) $\frac{29}{6}$
2) $\frac{3m}{4m}$
3) $\frac{xy}{7y}$
4) Answers will Vary
5) Answers will Vary
6) Answers will Vary
7) Answers will Vary
8) Answers will Vary
9) Answers will Vary
10) 13
11) 41

12. 3
13. 6
14. 8
15. 49
16. 1089
17. 5
18. 48
19. 21
20. 4
21. 1
22. 32
23. 2
24. 0
25. 225
26. 216
27. 0
28. 1
29. 14
30. 16
31. 30
32. 60
33. $\frac{20}{9}$
34. 1
35. 3^4
36. $7n^4$
37. w^1
38. no
39. no
40. no
41. yes
42. no
43. yes
44. -32
45. 4
46. 24
47. $\frac{1}{5}$
48. $4n$
49. $\frac{11v}{2}$
50. $4d$
51. $\frac{4t}{r}$
52. $\frac{5t}{7y}$
53. 49
54. 9
55. 27
56. 9
57. 23
58. 1
59. 20
60. 100
61. 100

Mixed Practice 2

For use after Lesson 1-9

Factor and check by multiplying.

1. $12a + 42b + 18$ **2.** $25x + 60y + 40z$ **3.** $14m + 10n + 6$

Simplify each expression. Factor and collect like terms as needed.

4. $xy + 3x + 6xy + 4x$ **5.** $6a^2 + 3ab + 2ab + 4a^2$

6. $8xy + 9xz + 4xy + 3xz$ **7.** $27c + 5 + 8c$

Write as an algebraic expression.

8. a number n divided among 5 **9.** a number y increased by 17

10. Let p be the number of problems Lonnie completed. Ray completed 8 more than Lonnie. Write an expression for the problems Ray completed.

11. Let b be the number of books Victor read. Donna read half as many books as Victor. Write an expression for the number of books Donna read.

12. Let w be Barbara's weight. Laurel weighs 6 pounds less than Barbara. Write an expression for Laurel's weight.

Evaluate.

13. $\frac{12m}{18n}$ for $m = 12$ and $n = 8$ **14.** $\frac{x \cdot y}{6} + \frac{x + 2}{2}$ for $x = 8$ and $y = 3$

Evaluate $\frac{2a + c}{5}$ when

15. a is 3 and c is 4. **16.** c is 1 and a is twice c.

17. a is 15 and c is twice a. **18.** c is 25 and a is half c.

Solve for the given replacement set.

19. $3m^2 - 1 = 47 \quad \{2, 4, 6\}$ **20.** $y + 3 = 5y - 25 \quad \{5, 6, 7\}$

Simplify, then solve mentally.

21. $6x + 3x = 36$ **22.** $n + 7n = 16$ **23.** $3t + 2t = 35$

24. $\frac{32m}{8} = 12$ **25.** $5a^2 = 5$ **26.** $\frac{15k}{3} = 20$

Determine whether each pair of equations is equivalent.

27. $3a + 6 = 12$

$3a + 6 - 6 = 12 + 6$

28. $10 + 3x = 12x - 4$

$10 + 3x - 3x = 12x - 4 + 4$

29. $2y - 5 = 19 - 4y$

$2y - 5 + 4y = 19 - 4y + 4y$

30. $17 - 5t = 2t - 4$

$17 - 5t + 5t = 2t - 4 - 5t$

31. Find the area (A) of a playing field with length (l) of 25 yd and width (w) of 50 ft using the formula $A = lw$.

32. Find the sales tax (T) paid on an item selling for a price (p) of \$12.50 using the formula $T = 0.06p$ (6% tax rate).

Item Analysis

Item	Lesson
1–3	1-5
4–7	1-5
8–12	1-6
13–18	1-6
19, 20	1-7
21–26	1-7
27–30	1-7
31, 32	1-8

Answers

1. $6(2a + 7b + 3)$
2. $5(5x + 12y + 8z)$
3. $2(7m + 5n + 3)$
4. $7x(y + 1)$
5. $5a(2a + b)$
6. $12x(y + z)$
7. $5(7c + 1)$
8. $\frac{n}{5}$
9. $y + 17$
10. $p + 8$
11. $\frac{b}{2}$
12. $w - 6$
13. 1
14. 9
15. 2
16. 1
17. 12
18. 10
19. (4)
20. (7)
21. 4
22. 2
23. 7
24. 3
25. ± 1
26. 4
27. no
28. no
29. yes
30. no
31. 3750 ft^2
32. \$0.75

is

Lesson
2-1
2-1
2-1
2-2
2-3
2-4
2-1
2-4
2-3
2-4

Mixed Practice 3

For use after Lesson 2-4

Name the integer that is suggested by each situation.

1. Letitia gained 3 pounds.

2. Lost Canyon is 1073 ft deep.

Find the absolute value.

3. $|22|$ **4.** $|-15|$ **5.** $|0.6|$ **6.** $|-1.295|$

Write a true sentence using < or >.

7. $-9 \square 7$ **8.** $3 \square 4$ **9.** $5 \square -8$ **10.** $-2 \square -3$

11. $-63 \square -51$ **12.** $0.01 \square 0.011$ **13.** $4.12 \square -4.13$ **14.** $7.52 \square 7.25$

15. $\frac{2}{3} \square \frac{1}{2}$ **16.** $-\frac{1}{8} \square -\frac{3}{16}$ **17.** $-\frac{2}{5} \square \frac{1}{3}$ **18.** $\frac{4}{5} \square \frac{7}{10}$

Add.

19. $-9 + (-2)$ **20.** $5 + (-18)$ **21.** $-6 + 8$

22. $-\frac{3}{8} + \frac{1}{2}$ **23.** $\frac{2}{5} + -\frac{4}{5}$ **24.** $-\frac{3}{4} + -\frac{1}{16}$

25. $17 + (-39) + 3.5$ **26.** $-21 + (-5) + 103$

27. $-\frac{2}{3} + \frac{5}{6} + -\frac{1}{4} + 1$ **28.** $3 + -\frac{1}{5} + -\frac{2}{3}$

Subtract.

29. $-7 - (-7)$ **30.** $19 - (-21)$ **31.** $-8 - 1.75$

32. $23 - (35.2)$ **33.** $-1.25 - (-3.4)$ **34.** $-9 - (-5.1)$

Evaluate.

35. $|2| + |-9|$ **36.** $|-4| \cdot |2| + |-7|$ **37.** $|3| + |-4| \cdot |0|$

38. $|a| - 17$ for $a = -23$ **39.** $|n| - |m|$ for $n = -5$ and $m = 6$

40. $2|x| \cdot |y|$ for $x = -3$ and $y = -4$ **41.** $16 - 3|t|$ for $t = -5$

Simplify.

42. $19 + (-27) - 5 - (-13)$ **43.** $-53 + (-19) - 41 - (-8)$

44. $-7 - (16) + (-9) - (-25)$ **45.** $11 - (3a) - 26a + 8 - (-17a)$

46. $21x - (17x) - (-32) + (-9x)$ **47.** $10 - (-5y) + (-9) + (-8y)$

Solve.

48. Bob entered the elevator on the eighth floor. The elevator went up 4 floors. Next it went down 10 floors. Then the elevator went up 3 floors and Bob got off. What floor was he on?

49. Cheryl's checking account was overdrawn by \$102.75. After she made a deposit, she was overdrawn by \$67.85. How much did she deposit?

50. At 4 a.m. the temperature at Anchorage was −12°F. By noon, the temperature was 39°F. How many degrees did the temperature rise?

Answers

1. +3
2. −1073
3. 22
4. 15
5. 0.6
6. 1.295
7. <
8. <
9. >
10. >
11. <
12. <
13. >
14. >
15. >
16. >
17. <
18. >
19. −11
20. −13
21. 2
22. $\frac{1}{8}$
23. $-\frac{2}{5}$
24. $-\frac{13}{16}$
25. −18.5
26. 77
27. $\frac{11}{12}$
28. $\frac{32}{15}$
29. 0
30. 40
31. −9.75
32. −12.2
33. 2.15
34. −3.9
35. 11
36. 15
37. 3
38. 6
39. −1
40. 24
41. 1
42. 0
43. −105
44. −7
45. $19 - 12a$
46. $-5x + 32$
47. $1 - 3y$
48. 5
49. \$34.90
50. 51°

Mixed Practice 4

For use after Lesson 2-9

Item Analysis

Item	Lesson
1–4	2-5
5–13	2-6
14, 15	2-4
16–19	2-8
20–25	2-5
26–31	2-1
32–35	2-5
36–39	2-7
40–45	2-6
46–51	2-7

Simplify.

1. $2[5(6 - 4) + (-3)^2]$

2. $(-2)^3 - (-1)^8 + (-3)^2$

3. $3(-2)^3 \cdot (-1)^{21}$

4. $5[-3(2^3) + (-2)^2(7)]$

5. $\frac{5(-11) + (-1)}{7}$

6. $3\frac{1}{8} \div 5\frac{1}{2}$

7. $\frac{4^3}{(-2)^6}$

8. $2\frac{1}{3} \div 5\frac{1}{4}$

9. $\frac{(-6)^3}{-(3^2)}$

10. $\frac{4 + (-8)5}{-9}$

11. $\frac{(-8)^2}{(-2)^2}$

12. $\frac{10 + 2(-5)^2}{(2^2)(3)}$

13. $-4\frac{2}{5} \div 2\frac{5}{8}$

14. $45 - (-21) + (-7) - 9 + 3 - (-5) + (-12) - 37$

15. $-11 + (-36) + 27 - (-8) - 15 + (-2) + 21 - 6$

16. $[3(x + 5) - 7] + [-5(x - 2) + 11]$

17. $[4(x - 3) + 18] - [3(x + 1) + 2]$

18. $[4(x + 1) + 11] - [7(x - 3) - 1]$

19. $[9(3 - x) + 7] + [4(5 + x) - 2]$

Evaluate for $x = -4$, $y = 2$, $z = 3$.

20. $(-2x)yz$

21. $5y^2 + 2xz$

22. $y(x^2) - 5z$

23. $5(2y - x) + z$

24. $2[(x - y) + z]$

25. $z(9y + 4x)$

26. $3|x| - yz$

27. $5x - 2|y|$

28. $4|x| + 7|z| - 5y$

29. $|x| \cdot |y| + |z|$

30. $|x| \cdot |-y| \cdot |z|$

31. $|x| - |y| + |z|$

Multiply or divide.

32. $3(-5)(1.2)(1)(-2.5)(0.08)(-10)$

33. $-2(5)(1.4)(-0.25)(20)(0.5)$

34. $-\frac{1}{3}\left(\frac{2}{5}\right)\left(\frac{5}{7}\right)\left(-\frac{7}{8}\right)\left(-\frac{3}{8}\right)$

35. $\left(-\frac{2}{9}\right)\left(\frac{6}{5}\right)\left(-\frac{4}{7}\right)\left(-\frac{1}{8}\right)\left(\frac{3}{20}\right)$

36. $\frac{3}{8}\left(\frac{1}{5}x - \frac{2}{3}y + 4\right)$

37. $-\frac{2}{5}\left(-\frac{3}{8}x + \frac{1}{2}y - \frac{2}{3}\right)$

38. $1.2(2x + 4y - 7)$

39. $-2.25(-5x + 2.4y)$

40. $-\frac{2}{3} \div \frac{3}{8}$

41. $\frac{5}{6} \div \left(-\frac{3}{4}\right)$

42. $-\frac{3}{16} \div \left(-\frac{3}{4}\right)$

43. $107.25 \div (-5.5)$

44. $-69.3 \div (4.2)$

45. $-48.16 \div (-8.6)$

Factor.

46. $256 - 80y$

47. $21x - 56y + 14$

48. $12x + 12y - 36z$

49. $-\frac{2}{3}x + y - \frac{1}{3}z$

50. $\frac{5}{24}x - \frac{5}{4}y$

51. $\frac{24}{5}x - \frac{4}{5}y + \frac{8}{15}$

Answers

1. 38
2. 0
3. 24
4. 20
5. -8
6. $\frac{25}{44}$
7. 1
8. $\frac{4}{9}$
9. 24
10. 4
11. 16
12. 5
13. $-1\frac{71}{105}$
14. 9
15. -14
16. $-2x + 29$
17. $x + 1$
18. $-3x + 37$
19. $-5x + 52$
20. 48
21. -4
22. 17
23. 43
24. -6
25. 6
26. 6
27. -24
28. 27
29. 11
30. 24
31. 5
32. -36
33. 35
34. $-\frac{1}{32}$
35. $-\frac{1}{350}$
36. $\frac{3}{40}x - \frac{1}{4}y + \frac{3}{2}$
37. $\frac{3}{20}x - \frac{1}{5}y + \frac{4}{15}$
38. $2.4x + 4.8y - 8.4$
39. $11.25x - 5.4y$
40. $-\frac{16}{9}$
41. $-\frac{10}{9}$
42. $\frac{1}{4}$
43. -19.5
44. -16.5
45. 5.6
46. $16(16 - 5y)$
47. $7(3x - 8y + 2)$
48. $12(x + y - 3z)$
49. $-\frac{1}{3}(2x - 3y + z)$
50. $\frac{5}{4}\left(\frac{1}{6}x - y\right)$
51. $-\frac{4}{5}\left(-6x + y - \frac{2}{3}\right)$

Mixed Practice 5

For use after Lesson 3-5

Solve.

1. $-17.4t = 87$
2. $-9y = 193.5$
3. $-14x = -126$
4. $-\frac{2}{3}x = 4$
5. $\frac{5}{8}x = -\frac{3}{16}$
6. $-\frac{3}{4}y = \frac{1}{8}$
7. $m + \frac{2}{5} = -\frac{1}{2}$
8. $x + \frac{5}{8} = \frac{1}{4}$
9. $y - \frac{5}{6} = -\frac{3}{8}$
10. $x - 7.3 = -2.5$
11. $3.4 = r - 6.1$
12. $y + 9 = 5.4$
13. $10 - x - 7 = 3x - 1$
14. $18 + 3x - 5 = 7x - 14 - x$
15. $4a - (5a + 3) = -1$
16. $7y - 5 = 8(5 - y)$
17. $6(m + 3) = 2(m - 1)$
18. $7(a - 7) = -3(a + 3)$
19. $2(5t - 3) = 3(2t + 6)$
20. $4(2m + 1) = 2(3m - 1)$
21. $x + 5 = x + (9 - x)$
22. $20 - (4 - y) = 26$
23. $5x + 6 = 7x$
24. $4t + 5t = -27$
25. $3y - 9y = 102$
26. $4.3x - 7.9x = -18$
27. $4(5x - 7) - 8x = -16$
28. $2(9 - 6x) - 49 = 5$
29. $-2(4x + 5) - 11 = -5$
30. $6x - 5(3 + 2x) = 1$

Write as an algebraic expression.

31. 24 less than half a number
32. 3 times the sum of a number and its reciprocal
33. 4 times the difference of a number and 3
34. one-half of the product of a number and 5

Translate to an equation and solve.

35. Nine more than a number is -53. Find the number.
36. There are 64 members in the History Club. 11 less than half of the members are girls. How many members are boys?
37. The number of girls in Mrs. Busbee's class is 3 more than twice the number of boys. There are 19 girls. What is the total number of boys and girls in the class?
38. Mara reads an average of 0.75 pages a minute. At that rate, in how many minutes will she read 36 pages?
39. Rico spent \$18.50 to rent a lawn mower. The fee for the first hour was \$8.00. Each additional hour cost \$3.50. For how many hours did he rent the mower?
40. Twelve times a number is 132. Find the number.

Answers

1. -5
2. -21.5
3. 9
4. -6
5. $-\frac{3}{10}$
6. $-\frac{1}{6}$
7. $-\frac{9}{10}$
8. $-\frac{3}{8}$
9. $\frac{11}{24}$
10. 4.8
11. 9.5
12. -3.6
13. 1
14. 9
15. -2
16. 3
17. -5
18. 4
19. 6
20. -3
21. 4
22. 10
23. 3
24. -3
25. -17
26. 5
27. 1
28. -3
29. -2
30. -4
31. $\frac{x}{2} - 24$
32. $3\left(x + \frac{1}{x}\right)$
33. $4(x - 3)$
34. $\frac{1}{2}(x \cdot 5)$
35. -62
36. 43 boys
37. 27 boys and girls
38. 48 min
39. 4 hr
40. 11

Mixed Practice 6

For use after Lesson 3-11

Write as a decimal.

1. 23% **2.** 0.04% **3.** 13.5% **4.** 160% **5.** 6.7%

Express as a percent. Round to the nearest tenth of a percent if necessary.

6. $\frac{3}{5}$ **7.** $\frac{1}{25}$ **8.** $\frac{5}{8}$ **9.** $\frac{2}{3}$ **10.** $\frac{37}{100}$

Solve.

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

12. $\frac{3}{4}n - \frac{1}{8}n = 6 + \frac{1}{8}n$

13. $\frac{1}{4} - x = \frac{1}{2}x + \frac{9}{4}$

14. $5|x| + 7 = 32$

15. $|y| + 7 = 3|y| - 9$

16. $|-x| = 14$

17. $A = \frac{1}{2}bh$, for h

18. $V = \frac{s}{t + r}$, for t

19. $B = 2(x + y)$, for x

20. What is 4% of 65?

21. 15 is 6% of what number?

22. 28 is what percent of 35?

Translate to an equation and solve.

23. The ratio of right-handed students to left-handed students in Mr. Duggan's class is 7 to 2. There are 27 students in the class. How many are right-handed?

24. The sum of three consecutive integers is 108. What are the integers?

25. At the end of the week, Lori had \$440.28 in her account. She had written checks for \$57.34, \$19.09, and \$30.77, and had made deposits of \$42.00 and \$15.85. How much was in her account at the beginning of the week?

26. Darrell bought a box of 36 ball point pens for \$20.88. Find the cost of a single pen.

27. Raoul bought some \$3 rolls of film and an \$8 photo album. The total cost was \$35. How many rolls of film did he buy?

28. Carl's age in years, 32, is 25 less than one-third his weight in pounds. How much does Carl weigh?

29. A movie theater had 46 more occupied seats than empty seats. It had a total of 320 seats. How many seats were occupied?

30. Alondra worked 5 hours and was paid \$28.75. At that rate, how long will it take Alondra to earn \$69?

Item Analysis

Item	Lesson
1–10	3-10
11–13	3-6
14–16	3-8
17–19	3-7
20–22	3-10
23	3-9
24	3-11
25	3-1
26	3-2
27	3-3
28	3-4
29	3-5
30	3-11

Answers

1. 0.23
2. 0.0004
3. 0.135
4. 1.6
5. 0.067
6. 60%
7. 4%
8. 62.5%
9. 66.7%
10. 37%
11. 8
12. 12
13. $-\frac{4}{3}$
14. 5 and −5
15. 8 and −8
16. 14 and −14
17. $h = \frac{2A}{b}$
18. $t = \frac{s}{V} - r$
19. $x = \frac{B}{2} - y$
20. 2.6
21. 250
22. 80%
23. 21 students
24. 35, 36, 37
25. \$489.63
26. \$0.58
27. 9 rolls of film
28. 171 lb
29. 183 seats
30. 12 hours

sis

Lesson
4-1
4-1
4-2
4-3
4-2
4-1
4-3
4-2

Mixed Practice 7

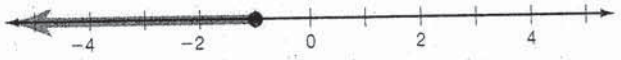
For use after Lesson 4-3

Determine whether the given number is a solution of the inequality.

1. $x \le -1$	**a.** 2	**b.** -4	**c.** -1	**d.** 0
2. $y > -3$	**a.** 0	**b.** -2	**c.** -4	**d.** -3
3. $x < 4$	**a.** 3	**b.** 4	**c.** -1	**d.** 7
4. $x \le \frac{1}{3}$	**a.** $\frac{1}{8}$	**b.** $-\frac{1}{2}$	**c.** $\frac{1}{2}$	**d.** 0.5
5. $y \ge -\frac{3}{8}$	**a.** $\frac{3}{8}$	**b.** $-\frac{3}{5}$	**c.** -0.2	**d.** $-\frac{1}{8}$

Write the inequality shown by each graph.

6.



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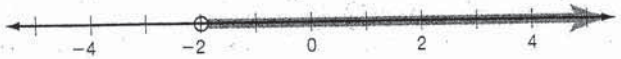

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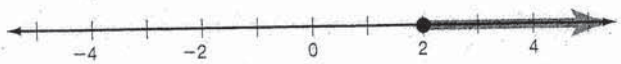

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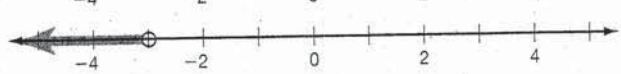

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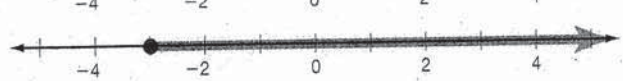


Solve.

11. $x + \frac{1}{2} < \frac{1}{8}$	**12.** $y - \frac{2}{3} > \frac{1}{4}$	**13.** $x - \frac{1}{5} \le \frac{2}{5}$
14. $x - \frac{1}{8} > 0$	**15.** $\frac{2}{5} + a < \frac{1}{2}$	**16.** $x + \frac{1}{8} \ge \frac{3}{4}$
17. $-6m < 102$	**18.** $9y \ge 31.5$	**19.** $-15x \ge 225$
20. $7y \le -98$	**21.** $9x - 7x \le 6$	**22.** $66 \ge 2y - 8y$
23. $5(x + 3) - 4x < 17$	**24.** $3y - 2(y + 4) > 2$	**25.** $-3(x + 5) + 4(x + 8) > 24$
26. $-5m + 4 + 6m < 2$	**27.** $5(x - 2) - 4x > 5$	**28.** $-2(x - 4) + 3x \le 1$

Classify each statement as true or false.

29. $-4 \le -5$	**30.** $7 \le -7$	**31.** $4.5 \ge 4.5$
32. $\lvert -0.3 \rvert \ge 0$	**33.** $\lvert -2 \rvert < \lvert 1 \rvert$	**34.** $3.01 < 3.10$
35. $\lvert x \rvert \ge x$	**36.** $\lvert x \rvert \ge 0$	**37.** $\lvert x + 1 \rvert > x$

Solve and graph the solution.

38. $t + \frac{3}{5} \le \frac{9}{10}$	**39.** $m + \frac{1}{3} > -2$	**40.** $\frac{1}{3}x \le \frac{7}{6}$
41. $-6y > 9$	**42.** $8m > -4$	**43.** $5x + 4 - 7x \le 10$

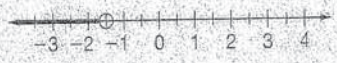
no, yes, yes, NO
yes, yes, NO, NO
yes, no, yes, NO
yes, yes, NO, NO
yes, NO, yes, yes
1) $x \le -1$
2) $x > -2$
3) $x \ge 2$
4) $x < -3$
5) $x \ge -3$
6) $x < -\frac{3}{8}$
12) $y > \frac{11}{12}$
13) $x \le \frac{13}{15}$
14) $x > \frac{1}{8}$
15) $a < \frac{1}{10}$
16) $x \ge \frac{5}{8}$
17) $m > -17$
18) $y \ge 3.5$
19) $x \le -15$
20) $y \le -14$
21) $x \le 3$

22. $y \ge -11$
23. $x < 2$
24. $y > 10$
25. $x > 7$
26. $m < -2$
27. $x > 15$
28. $x \le -7$
29. false
30. false
31. true
32. true
33. false
34. true
35. true
36. true
37. true
38. $x \le \frac{3}{10}$

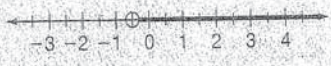
39. $m > -2\frac{1}{3}$

40. $x \le \frac{7}{2}$

41. $y < -\frac{3}{2}$



42. $m > -\frac{1}{2}$



43. $x \ge -3$

ced Practice

Mixed Practice 8

For use after Lesson 4-6

Item Analysis

Item	Lesson
1–12	4-4
13–18	4-5
19–25	4-5

Solve using the addition and multiplication properties.

1. $3(5 - x) \leq 2(x - 9)$
2. $4(x + 5) \leq 3(6 + x)$
3. $10 + 3y - 3 \geq 5y - 7$
4. $4x - 3 < 10x - 5$
5. $12 - 9c > 38 + 4c$
6. $2(x - 6) + 5 \geq 9$
7. $\frac{3}{8}y - 5 > \frac{7}{8}y$
8. $\frac{3}{4}x + 3 \leq x + \frac{1}{2}$
9. $1.6x - 0.5 \leq 1.2x + 1.5$
10. $2.2y + 3.2 < 3.4y - 1.6$
11. $6(1.5 - x) + 3x < 4(3 - x)$
12. $5(x + 2) - 4 > 3x$

Translate to an inequality.

13. 6 more than half a number is less than 7.
14. 9 less than twice a number is less than 2.
15. 15 is greater than or equal to half a number.
16. 7 more than 5 times a number is at most 31.
17. 6 less than 4 times a number is at least 40.
18. 3 more than half a number is at least 15.

Solve.

19. Find the greatest possible pair of integers such that one integer is 4 less than twice the other and their sum is at most 50.
20. Find all numbers such that the sum of the number and 24 is greater than 4 times the number.
21. The sum of four consecutive even integers is less than or equal to 116. Find the greatest possible values of the integers.
22. Roberta wants to buy a scarf and sweater and must not spend more than \$56.00 for both. If the scarf costs \$33.80, how much can she pay for the sweater?
23. Mitch scored 25 points in the first basketball game, 18 in the second, and 35 in the third. How many points must he score in the fourth game to maintain an average of at least 28 points scored for the four games?
24. The length of a rectangle is 22.5 cm. What width will make the area at least 405 cm^2?
25. Find the greatest possible pair of integers such that one integer is 2 less than three times the other and the sum is less than 42.

Answers

1. $x \geq 6.6$
2. $x \leq -2$
3. $y \leq 7$
4. $x > \frac{1}{3}$
5. $c < -2$
6. $x \geq 8$
7. $y < -10$
8. $x \geq 10$
9. $x \leq 5$
10. $y > 4$
11. $x < 3$
12. $x > -3$
13. $\frac{n}{2} + 6 < 7$
14. $(2n - 9) < 2$
15. $15 \geq \frac{n}{2}$
16. $5n + 7 \leq 31$
17. $4n - 6 \geq 40$
18. $\frac{n}{2} + 3 \geq 15$
19. 18, 32
20. $x < 8$
21. 26, 28, 30, 32
22. \$22.20
23. 34 pts
24. $w \geq 18$ cm
25. 11, 31

is

Lesson
5-1
5-2
5-3
5-1
5-2
5-3
5-4
5-1
5-4
5-5
5-4
5-5
5-5

Mixed Practice 9

For use after Lesson 5-5

Simplify.

1. $(-8)^0$
2. $(x^3y)(x^2y)$
3. $(3^{-1})^4$
4. $(2w^9)^5$
5. $[2(-x^9)]^3$
6. $(-3m^4)^3$
7. $(2y^2)(y^5)^2$
8. $(x^2)^3(x^3)^2$
9. $\frac{2^5}{2^8}$
10. $\frac{(-2)^2}{(-2)^9}$
11. $\frac{x^3 \cdot y^4}{x^2y}$
12. $\frac{(4 \cdot 2^3)^2}{3}$
13. $\frac{(-y)^4}{2y}$
14. $\frac{(3y^4)^2}{27y^5}$
15. $\frac{-16m^5}{-4m^2n}$
16. $\frac{-3ab^2}{27a^2}$

Multiply or divide. Express the result using scientific and standard notation.

17. $(5.1 \times 10^3)(2.4 \times 10^{-5})$
18. $(1.1 \times 10^{-4})(3.0 \times 10^{-3})$
19. $\frac{1.8 \times 10^4}{2 \times 10^7}$
20. $\frac{3.5 \times 10^{-3}}{7 \times 10^{-5}}$
21. $\frac{(4.0 \times 10^3)(9.0 \times 10^5)}{(6.0 \times 10^5)}$
22. $\frac{(1.2 \times 10^4)(4.0 \times 10^{-3})}{(6.0 \times 10^7)}$

Evaluate each expression.

23. $x^2 \cdot x^1$ for $x = 10$
24. $2^a \cdot 2^b \cdot 2^c$ for $a = 1, b = 4, c = 0$
25. $7^a \cdot 5^a \cdot 3^a$ for $a = 0$
26. $10^x \cdot 10^y \cdot 10^z$ for $x = 3, y = 2, z = 1$

Write using standard notation.

27. 4.003×10^5
28. 9.6×10^{-4}
29. 1.392×10^3
30. 1.4×10^{-3}
31. 3.8×10^4
32. 3.752×10^{-5}

Identify the degree of each term and the degree of the polynomial.

33. $4x^3y - 19x^2y^2 + 21$
34. $-3x^5y^3 - 5x^4y^9 + 8xy^{21} + 15$
35. $4x^2 + 15 - 8x^3 + 11x$
36. $9x^2y^3 + 4x^5y - 2xy^2 - 1$

Write using scientific notation.

37. 9,475,001
38. 0.00037
39. 65
40. 0.000001
41. 0.0939
42. 46,300

Identify the terms. Give the coefficient of each term.

43. $-3a^3c + 11a^2c^2 + 5c^3$
44. $4x^2 - 6xy - 8y^2$
45. $-3x^3yz + 4x^2y^2z - 19xy^2z^3 + 15$

Collect like terms.

46. $9xy^3 - 3x^2y - 2xy^3$
47. $3m^2 - m^2 + 3m + m$
48. $\frac{3}{5}x^2 + 4 - 2x - x^2$
49. $\frac{1}{2}x + \frac{2}{3}x^2 - x + 3$
50. $2 - \frac{1}{2}x^3 - 2x + \frac{2}{3}x^3$
51. $\frac{1}{2}x^4 - 2x^2 - \frac{4}{5}x^4 + \frac{4}{5}x$

13. $\frac{y^3}{2}$
14. $\frac{y^3}{3}$
15. $\frac{4m^3}{n}$
16. $-\frac{b^2}{9a}$
17. 1.224×10^{-1} 0.1224
18. 3.3×10^{-7} 0.00000033
19. 9.0×10^{-4} 0.0009
20. 5.0×10^1 50
21. 6.0×10^3 6000
22. 8.0×10^{-7} 0.0000008
23. 1000
24. 32
25. 1
26. 1,000,000
27. 400,300
28. 0.00096
29. 1392
30. 0.0014
31. 38,000
32. 0.00003752
33. 4, 4, 0; 4
34. 8, 13, 22, 0; 22
35. 2, 0, 3, 1; 3
36. 5, 6, 3, 0; 6
37. 9.475001×10^6
38. 3.7×10^{-4}
39. 6.5×10^1
40. 1.0×10^{-6}
41. 9.39×10^{-2}
42. 4.63×10^4
43. $-3a^3c$, $11a^2c^2$, $5c^3$; -3, 11, 5
44. $4x^2$, $-6xy$, $-8y^2$; 4, -6, -8
45. $-3x^3yz$, $4x^2y^2z$, $-19xy^2z^3$, 15; -3, 4, -19, 15
46. $7xy^3 - 3x^2y$
47. $2m^2 + 4m$
48. $-\frac{2}{5}x^2 - 2x + 4$
49. $\frac{2}{3}x^2 - \frac{1}{2}x + 3$
50. $\frac{1}{6}x^3 - 2x + 2$
51. $-\frac{3}{10}x^4 - 2x^2 + \frac{4}{5}x$

1) 1
2) x^5y^2
3) 3^{-4}
4) $32w^{45}$
5) $-8x^{27}$
6) $-27m^{12}$
7) $2y^{12}$
8) x^{12}
9) 2^{-3}
10) $(-2)^{-7}$
11) xy^3
12) $\frac{2^{10}}{3}$

Mixed Practice 10

For use after Lesson 5-12

Collect like terms and then arrange in descending order for the variable x.

1. $5x^3 + 6x - 4x^2 - x + 4$
2. $xy - 7x^2 + 5xy + 21 - 3$
3. $3x - 3x^2 + 4x - x^2$
4. $5y^5 - x^2 + 4xy + 7x^2$
5. $-xy + 5x^2y^3 - 5 + 7xy - x^3 + 4xy + x^2y^3 - 2$

Add or subtract.

6. $(-3x^2 + 4x - 19) + (9x + 11 + 4x^2y - 5y)$
7. $(3m^2n + mn - 25) - (6m^2n - 5m + 9)$
8. $(4x^3 + 8x^2 - x + 4) - (3x^2 - 5x^3 + 1)$
9. $(2x^5y^2 - 4x^3 - 2x + 4) + (x^3 - 4x^5y^2 - 9x + 6)$

Simplify.

10. $(x^2 - x) + (x - 8) - (x + 5x^2) + (2x^2 - 9x + 1)$
11. $(5x^2 - 2x + 1) - (3x + 4) + (25 - 4x^2) - (9x + 7)$
12. $(4x^2y - 5x + 1) + (3y^2 - 4) - (7x + 4y^2 + 2x^2y)$
13. $(-4x^4 + 2xy) - (x^2 - 5xy + x^4) + (3x^4 + 2xy)$

Evaluate each polynomial for $x = -2$ and $y = 3$.

14. $4x^2 - 5xy$
15. $10 - 3x^2 - 5y$
16. $3x^2 + 10xy + 2y^2$
17. $x^3y^2 + 9x - 2y + 10$
18. $x^2y^3 + 15x - 20$
19. $2y^3 - 2y^2x + 4x^2 + 1$

Add or subtract using columns.

20. $(7y^5 + 4y^2 - 9) - (5y^3 - 7y^2 + 6y - 3)$
21. $(3x^5 - 9x^3y + 15 - 9x) + (14x^3y + 6x - y + 4 - 11x^5)$
22. $(4x^5y + 3x^3y^3 - 9xy + 4) - (2x^5y + 4x^4y^2 - 10xy - 3)$
23. $(-4mn^2 + 3m^4 + 6n - m^3) + (15n + 7m^3 - m^2 + 6mn^2 - 4)$

Multiply.

24. $(0.5x^3)(4x^5)$
25. $4x^2(x^3 - 5x + 16)$
26. $(5a^3 - 7)(-2a^2 + a)$
27. $(4x + 3)(3x - 4)$
28. $(4m + 0.5)(4m - 0.5)$
29. $(7 - 5x)^2$
30. $(3y + 2)^2$
31. $(2x^3 - 11)(2x^3 + 11)$
32. $(x^2 - 5)(x^3 - 2x^2 - 2)$
33. $(-2x^3 + 5x + 1)(x + 1)$
34. Find the area of a rectangle with length $= (a + 5)$ and width $= (a - 7)$.
35. Find the area of a square with each side $= (x + y)$.
36. Find three consecutive numbers, the sum of whose squares is 29 more than three times the square of the smallest.

Item Analysis

Item	Lesson
1–5	5-6
6	5-7
7, 8	5-8
9	5-7
10–13	5-8
14–19	5-6
20	5-8
21	5-7
22	5-8
23	5-7
24–27	5-9
28–31	5-10
32, 33	5-11
34, 35	5-9
36	5-10

Answers

1. $5x^3 - 4x^2 + 5x + 4$
2. $-7x^2 + 6xy + 18$
3. $-4x^2 + 7x$
4. $6x^2 + 4xy + 5y^5$
5. $-x^3 + 6x^2y^3 + 10xy - 7$
6. $x^2y + 13x - 5y - 8$
7. $-3m^2n + 5m + mn - 34$
8. $9x^3 + 5x^2 - x + 3$
9. $-2x^5y^2 - 3x^3 - 11x + 10$
10. $-2x^2 - 10x - 7$
11. $x^2 - 14x + 15$
12. $2x^2y - 12x - y^2 - 3$
13. $-2x^4 - x^2 + 9xy$
14. 46
15. -17
16. -30
17. -86
18. 58
19. 107
20. $7y^5 - 5y^3 + 11y^2 - 6y - 6$
21. $-8x^5 + 5x^3y - 3x - y + 19$
22. $2x^5y - 4x^4y^2 + 3x^3y^3 + xy + 7$
23. $3m^4 + 6m^3 - m^2 + 2mn^2 + 21n - 4$
24. $2x^8$
25. $4x^5 - 20x^3 + 64x^2$
26. $-10a^5 + 5a^4 + 14a^2 - 7a$
27. $12x^2 - 7x - 12$
28. $16m^2 - 0.25$
29. $25x^2 - 70x + 49$
30. $9y^2 + 12y + 4$
31. $4x^6 - 121$
32. $x^5 - 2x^4 - 5x^3 + 8x^2 + 10$
33. $-2x^4 - 2x^3 + 5x^2 + 6x + 1$
34. $a^2 - 2a - 35$
35. $x^2 + 2xy + y^2$
36. 4, 5, 6

sis

Lesson
6-2
6-1
6-4
6-3
6-2
6-1
6-5
6-2
6-2
6-5
6-4
6-5
6-1
6-5
6-1
6-4

Mixed Practice 11

For use after Lesson 6-5

Factor.

1. $m^4 - 25$ **2.** $81t^2 - 100s^4$ **3.** $-9 + 4y^2$ **4.** $49 - w^6$

5. $x^4 - 5x^3 + x^2$ **6.** $x^2 - 3x - 10$ **7.** $t^2 + 4t + 3$ **8.** $c^2 - 8c + 7$

State whether each expression is a difference of two squares.

9. $4y^2 - x$ **10.** $9x^2 - 25$ **11.** $m^2 + n^2$

12. $4a^3 - b^2$ **13.** $36 - 49t^2$ **14.** $12m^2 - 4n^2$

Factor.

15. $c^2 - 4$ **16.** $81m^2 - 25$

17. $y^{10} - z^{10}$ **18.** $49 - n^8$

19. $2a^4b + 2a^3b^2 - 2a^2b^2$ **20.** $5x^4y + 5x^2y - 10x$

21. $2x^2 - 8x - 10$ **22.** $2x^2 - 9x - 5$

23. $2x^2 + 3x - 5$ **24.** $2x^2 - 3x - 5$

State whether each expression is a trinomial square.

25. $x^2 - 2xy - y^2$ **26.** $4x^2 + 4xy + y^2$

27. $x^2 - 10xy + 25y^2$ **28.** $9x^2 - 18xy + 9y^2$

29. $2v^2 + 4vw + 4w^2$ **30.** $24x^2 + 20xy + 4y^2$

31. $x^2 + 2x + 1$ **32.** $y^2 - 6y - 9$

33. $c^4 + 4c + 4$ **34.** $7m^2 + 14m + 49$

Factor.

35. $m^4 - 9$ **36.** $4y^2 - 1$

37. $6x^2 + 3x - 9$ **38.** $10x^2 + x - 3$

39. $x^2 - 4x - 45$ **40.** $t^2 - 7t + 12$

41. $12 - x - x^2$ **42.** $2y^2 - 9y - 5$

Find three factorizations for each monomial.

43. $4x^2y$ **44.** $-9m^3n$ **45.** $15t^23$ **46.** $-12pq^2$

Factor.

47. $x^5 - 4x^3 + 3x$ **48.** $7x - 6 - 2x^2$ **49.** $4y^3 - 12y^2 + 4y$ **50.** $6a^2 - 2a + 10$

51. $x^2 + 5x - xy - 5y$ **52.** $6t^2 + 5t + 1$ **53.** $2x^2 - 9x + 4$ **54.** $3x^2 + 10x - 8$

)$(m^2+5)(m^2-5)$
)$(9t+10s^2)(9t-10s^2)$
)$(2y+3)(2y-3)$
)$(7-w^3)(7+w^3)$
)$x^2(x^2-5x+1)$
)$(x-5)(x+2)$
)$(t+3)(t+1)$
)$(c-7)(c-1)$
) no
) yes
) NO
) NO

13. yes
14. no
15. $(c - 2)(c + 2)$
16. $(9m - 5)(9m + 5)$
17. $(y^5 - z^5)(y^5 + z^5)$
18. $(7 - n^4)(7 + n^4)$
19. $2a^2b(a^2 + ab - b)$
20. $5x(x^3y + xy - 2)$
21. $2(x + 1)(x - 5)$
22. $(2x + 1)(x - 5)$
23. $(x - 1)(2x + 5)$
24. $(x + 1)(2x - 5)$
25. no
26. yes
27. yes
28. yes
29. no
30. no
31. yes
32. no
33. no
34. no
35. $(m^2 - 3)(m^2 + 3)$
36. $(2y - 1)(2y + 1)$
37. $3(2x + 3)(x - 1)$
38. $(5x + 3)(2x - 1)$
39. $(x - 9)(x + 5)$
40. $(t - 4)(t - 3)$
41. $(3 - x)(x + 4)$
42. $(2y + 1)(y - 5)$
43–46. Answers will vary.
47. $x(x + 1)(x - 1)(x^2 - 3)$
48. $(x - 2)(3 - 2x)$
49. $4y(y^2 - 3y + 1)$
50. $2(3a^2 - a + 5)$
51. $(x + 5)(x - y)$
52. $(2t + 1)(3t + 1)$
53. $(x - 4)(2x - 1)$
54. $(3x - 2)(x + 4)$

Mixed Practice 12

For use after Lesson 6-9

Factor.

1. $2y^2 - 9y - 5$
2. $2t^2 + 25t + 12$
3. $4m^2 - 1$
4. $3y^2 + y - 10$
5. $x^2 + 4x - 21$
6. $y^2 - 12y + 36$
7. $10 + 3x - x^2$
8. $t^2 + 8t + 16$
9. $3x^3 + 3x^2 - 15x$
10. $x^3 + 3x^2 - x$

Solve.

11. $t^2 - 25 = 0$
12. $x^2 - x = 20$
13. $x^2 + 49 = 14x$
14. $3x^2 + x = 0$
15. $(2y - 1)(y - 5) = 0$
16. $t(t + 7) = 4(3 + 2t)$
17. $t^2 + 3t - 4 = 36$
18. $3y^2 + 17y + 10 = 0$
19. $t^2 - \frac{25}{4} = 0$
20. $\frac{3x^2}{4} = 27$

Factor by grouping.

21. $x^3 + 3x^2 - x - 3$
22. $2x^4 + 5x^3 + 2x + 5$
23. $6y^3 - 10y^2 + 9y - 15$
24. $x^3 + 2x^2 - 7x - 14$

Translate to an equation and solve.

25. Find two consecutive even integers whose product is 288.
26. Twelve more than the square of a number is seven times the number. Find the number.
27. The width of a rectangle is 7 ft less than the length. The area of the rectangle is 228 ft^2. Find the length and width.
28. If the sides of a square are lengthened by 4 in., the area becomes 256 $in.^2$. Find the length of a side of the original square.
29. Find two consecutive integers whose product is 182.
30. The sum of squares of two consecutive odd positive integers is 202. Find the integers.
31. The height of a triangle is 6 m more than the base. The area is 216 m^2. Find the base and height.
32. If a number is subtracted from its square, the result is 2. Find the number.
33. Four times the square of a number is 9. Find the number.

Item Analysis

Item	Lesson
1, 2	6-5
3–10	6-7
11–20	6-8
21–24	6-6
25–33	6-9

Answers

1. $(2y + 1)(y - 5)$
2. $(t + 12)(2t + 1)$
3. $(2m + 1)(2m - 1)$
4. $(3y - 5)(y + 2)$
5. $(x + 7)(x - 3)$
6. $(y - 6)^2$
7. $(x + 2)(5 - x)$
8. $(t + 4)^2$
9. $3x(x^2 + x - 5)$
10. $x(x^2 + 3x - 1)$
11. 5, −5
12. 5, −4
13. 7
14. 0, $-\frac{1}{3}$
15. $\frac{1}{2}$, 5
16. 4, −3
17. 5, −8
18. $-\frac{2}{3}$, −5
19. $\frac{5}{2}$, $-\frac{5}{2}$
20. 6, −6
21. $(x + 1)(x - 1)(x + 3)$
22. $(x + 1)(x^2 - x + 1)(2x + 5)$
23. $(2y^2 + 3)(3y - 5)$
24. $(x^2 - 7)(x + 2)$
25. 16, 18 or −16, −18
26. 3, 4
27. 19 ft, 12 ft
28. 12 in.
29. 13, 14 or −13, −14
30. 9, 11
31. 18 m, 24 m
32. 2, −1
33. $\frac{3}{2}$, $-\frac{3}{2}$

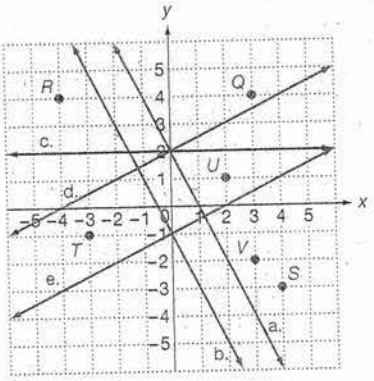
Mixed Practice 13

For use after Lesson 7-4

Find the coordinates of each point.

1. Q **2.** R **3.** S

4. T **5.** U **6.** V



Match each equation with its corresponding graph at the right.

7. $y = -2x + 2$ **8.** $y = \frac{1}{2}x - 1$

9. $y = -2x - 1$ **10.** $y = 2$

11. $y = \frac{1}{2}x + 2$

Find the slopes of the lines containing these points.

12. (3, 7) (6, 5)

13. (10, 9) (2, 4)

14. (2, −2) (10, 2)

15. (4, 13) (7, 16)

Determine whether the given point is a solution of the equation.

16. $(4, 1), y = \frac{1}{2}x - 3$

17. $\left(-\frac{1}{2}, \frac{9}{8}\right), y = -\frac{1}{4}x + 1$

18. $(0, 2), 5y = 2x + 10$

19. $(4, -4), 2y + 3x = 4$

Find three points that satisfy the following conditions.

20. The x-coordinate is half of the y-coordinate.

21. The x-coordinate is 3 less than the y-coordinate.

22. The x-coordinate is 5 less than twice the y-coordinate.

Solve.

23. A line contains $(-3, 10)$ and $(x, -5)$. It has slope -3. Find x.

24. A line contains $(-2, -17)$ and $(x, 8)$. It has slope 5. Find x.

25. A line contains $(2, 7)$ and $(x, -9)$. It has slope 2. Find x.

26. The vertices of a triangle are $A(3, 2)$, $B(4, -2)$, and $C(-1, -1)$. Find the slope of each side of the triangle.

27. Write an equation of a line that is parallel to the y-axis and 3 units to the left of it.

28. Write an equation of a line that is parallel to the x-axis and intersects the y-axis at $(0, -2.5)$.

In which quadrant is each point located?

29. $(27, -4)$ **30.** $(-6, -53)$ **31.** $(0, 4)$ **32.** $(2, 17)$

Answers

1. (3, 4)
2. (−4, 4)
3. (4, −3)
4. (−3, −1)
5. (2, 1)
6. (3, −2)
7. *a*
8. *e*
9. *b*
10. *c*
11. *d*
12. $-\frac{2}{3}$
13. $\frac{5}{8}$
14. $\frac{1}{2}$
15. 1
16. no
17. yes
18. yes
19. yes
20. Answers may vary.
21. Answers may vary.
22. Answers may vary.
23. 2
24. 3
25. −6
26. slope $AB = -4$, slope $BC = -\frac{1}{5}$, slope $CA = \frac{3}{4}$
27. $x = -3$
28. $y = -2.5$
29. Quadrant IV
30. Quadrant III
31. not in a quadrant
32. Quadrant I

Mixed Practice 14

For use after Lesson 7-9

Write an equation for each line that contains the given pair of points.

1. $(1, 5)$ $(-4, -5)$

2. $(-3, 1)$ $(0, -1)$

3. $(2, 6)$ $(-4, -24)$

4. $(0, 5)$ $(3, -13)$

Graph each line using the slope and y-intercept.

5. $4y + 8x = -12$

6. $2y - 10 = 6x$

7. $5y + 20x = 5$

8. $x - y = 2$

Write an equation for each line.

9. the line containing $(-3, 1)$ and parallel to the line $y + 2x = 3$

10. the line containing $(2, 6)$ and perpendicular to the line $4y = x - 4$

11. the line containing $(3, 5)$ and parallel to the line $3y = 15x - 7$

12. the line containing $(2, -4)$ and perpendicular to the line $y = -3x + 5$

13. the line that has the same slope as the line described by $5y + 15 = 2x$ and contains the point $(-5, -1)$

14. the line that has the same slope as the line described by $2y + 4x = 6$ and contains the point $(-6, 5)$

15. the line that is perpendicular to the y-axis and intersects the y-axis at $(0, 3)$

Graph using intercepts.

16. $2x + 2y = 6$

17. $2y + 1 = x$

18. $3y + 6 = 15x$

19. $3y - 2x = 12$

Find the slope of each line by solving for y.

20. $8y + 3x = 16$

21. $-9x = -1 - y$

22. $2y + 4 = x - 2$

23. $2y + 8x = 14$

Write an equation for each line given the slope and y-intercept. Express the equation in slope-intercept form.

24. $m = -\frac{1}{3}, b = 2$

25. $m = \frac{4}{3}, b = \frac{1}{8}$

26. $m = 2, b = 0$

27. $m = 0, b = -1$

Solve. Assume a linear relationship fits the data.

28. A catering company advertised the following rates: "Complete Texas-style barbeque lunch just \$277.50 (d) for 50 people (p), or \$526.00 for 120 people." Use the ordered pairs (p, d).

a. Find a linear equation for the data points.

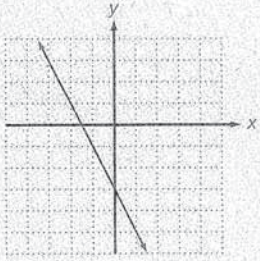
b. Use this linear equation to find the cost of lunch for 65 people.

Item Analysis

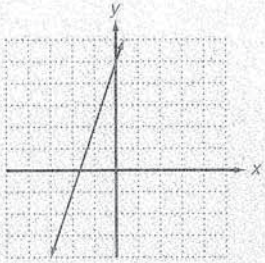
Item	Lesson
1–4	7-6
5–8	7-5
9–12	7-8
13, 14	7-6
15	7-3
16–19	7-3
20–23	7-5
24–27	7-5
28	7-7

Answers

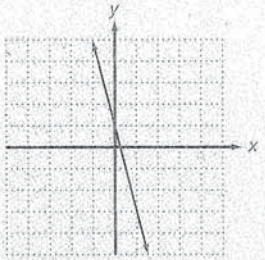
1. $y = 2x + 3$
2. $y = -\frac{2}{3}x - 1$
3. $y = 5x - 4$
4. $y = -6x + 5$
5. $y = -2x - 3$



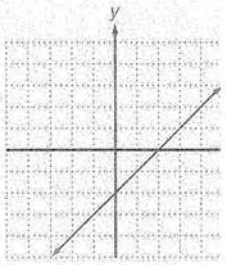
6. $y = 3x + 5$



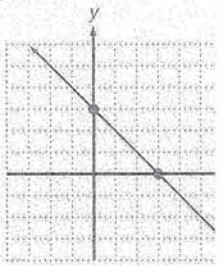
7. $y = -4x + 1$



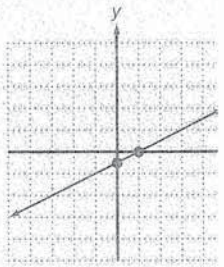
8. $y = x - 2$



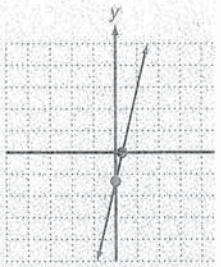
9. $y = -2x - 5$
10. $y = -4x - 14$
11. $y = 5x - 10$
12. $y = \frac{1}{3}x - \frac{14}{3}$
13. $y = \frac{2}{5}x + 1$
14. $y = -2x - 7$
15. $y = 3$
16.



17.



18.



19–28. See Additional Ar

esson
3-1
3-2
3-3
8-2
8-1
8-3
8-2
8-3

Mixed Practice 15

For use after Lesson 8-3

Determine whether the given ordered pair is a solution of the system of equations.

1. $(4, 5)$; $2y - x = 6$, $y + x = 7$
2. $(-8, -8)$; $8y + 40 = 3x$, $y - x = 0$
3. $(4, 3)$; $4y + 8 = 5x$, $2x - y = 5$
4. $(2, -7)$; $3x + y = -1$, $y + 5 = -x$
5. $(-2, 3)$; $2x - y = -7$, $-y + x = -5$, $y = 3$
6. $(7, -2)$; $x + 2y = 3$, $-y + 9 = x$, $-x - y = -5$

Solve using the addition method.

7. $3x - 4y = 1$, $-x + 2y = 3$
8. $3x - 5y = -2$, $5y - 2x = -2$
9. $3x + 2y = 1$, $5x + 3y = -1$
10. $4x + 9y = 6$, $5y + 3x = 1$

Solve using the substitution method.

11. $3y = x - 2$, $y - x = -4$
12. $2y + 5x = 4$, $x + y = 5$
13. $5y - x = -1$, $3y - 2x = 5$
14. $5x + 2y = 5$, $2x - y = 11$

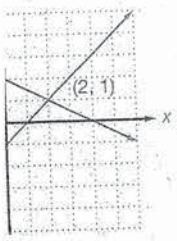
Solve these systems graphically.

15. $2y = -x + 4$, $x - y = 1$
16. $y - x = 5$, $x + y = -1$
17. $x + y = -4$, $3y = x - 4$
18. $y + 1 = -x$, $y = x - 7$

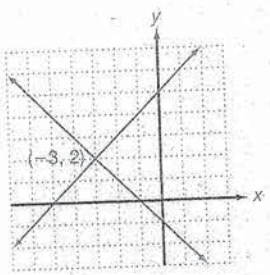
Translate to a system of equations and solve.

19. The perimeter of a rectangle is 61 m. The length of the rectangle is 7 less than twice the width. Find the length and width of the rectangle.
20. Find two numbers whose sum is 101 and whose difference is 45.
21. The difference between two numbers is 36. Five times the larger is 11 times the smaller. What are the numbers?
22. The sum of two numbers is 26. Two-fifths of the first number plus three-eighths of the second number is 10. Find the numbers.

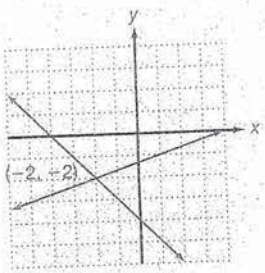
)NO
)yes
)yes
)yes
)yes
)NO
)(7,5)
)(-4,-2)
)(-5,8)
)(-3,2)
)(5,1)
)(-2,7)
)(-4,-1)
)(3,-5)
5)



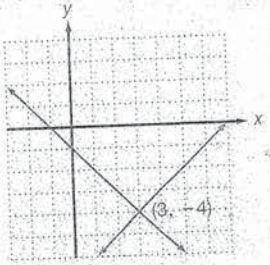
16.



17.



18.



19. 18 m, 12.5 m
20. 73, 28
21. 66, 30
22. 10, 16

ed Practice

Mixed Practice 16

For use after Lesson 8-6

Solve.

1. $2x - 5y = 7$
   $2y - 3x = 6$
2. $2x - 3y = 4$
   $5y - 3x = -5$
3. $6x + 12y = 5$
   $6y - 10x = 9$
4. $x - 3y = 7$
   $3x + 2y = 10$
5. $x + 2y = 15$
   $5x - y = -2$
6. $4x + 7y = -3$
   $2y - 3x = 24$

Solve by graphing.

7. $3y + 2x = 6$
   $6y = 3x - 2$
8. $y = x + 5$
   $2y + x = -2$

Translate to a system of equations and solve.

9. A collection of nickels and dimes totals \$22.40. There are 304 coins in all. How many nickels are there?
10. The sum of the digits of a two-digit number is 11. When the number is reversed, the new sum is 27 less than the original number. Find the original number.
11. A fishing boat broke down after traveling 2 hours against a 4 km/h current. The boat was carried back to its starting point by the current. The whole trip took 5.5 hours. Find the speed of the boat in still water before the motor failed.
12. Admission to the gymnastics meet cost \$2.40 for adults and \$1.25 for students. If 540 tickets were sold for a total of \$934.90, how many tickets of each kind were sold?
13. The sum of two numbers is 248. Their difference is 64. Find the numbers.
14. Two cars leave town at the same time traveling in opposite directions. One travels 51 mi/h and the other travels 45 mi/h. In how many hours will they be 432 miles apart?
15. A two-digit number is four times the sum of its digits. The ones digit is 4 more than the tens digit. Find the original number.
16. Two cars leave town at the same time going in the same direction on the same road. One travels 28 mi/h and the other travels 46 mi/h. In how many hours will they be 63 miles apart?

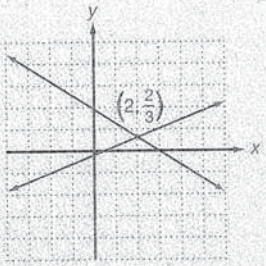
Item Analysis

Item	Lesson
1–3	8-3
4, 5	8-2
6	8-3
7, 8	8-1
9	8-6
10	8-6
11	8-5
12	8-6
13	8-3
14	8-5
15	8-6
16	8-5

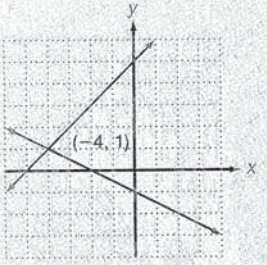
Answers

1. $(-4, -3)$
2. $(5, 2)$
3. $\left(-\frac{1}{2}, \frac{2}{3}\right)$
4. $(4, -1)$
5. $(1, 7)$
6. $(-6, 3)$

7.



8.



9. 160 nickels
10. 74
11. 11 km/h
12. 226 adults, 314 students
13. 156, 92
14. 4.5 hr
15. 48
16. 3.5 hr

Lesson
9-2
9-3
9-2
9-3
9-2
9-1
9-2
9-1
9-2

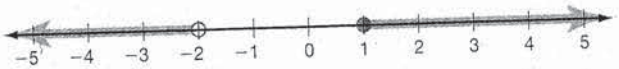
Mixed Practice 17

For use after Lesson 9-3

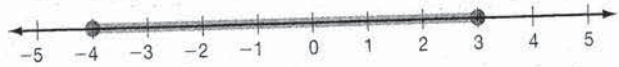
Solve.

1. $2x + 1 > 5$ or $x - 2 \leq -1$
2. $2x + 1 < 5$ and $x - 2 \geq -1$
3. $|3x - 7| = 11$
4. $-|x - 3| = -5$
5. $-5 \leq 2x + 3 < 21$
6. $-x + 1 > 3$ or $2x - 5 > 3$
7. $2|5x - 3| = 26$
8. $7 + |2x + 3| = 11$

Write the inequality shown by each group.

9. 

10. 

11. 

12. 

Write using (**a**) roster notation and (**b**) set-builder notation.

13. the set W of positive multiples of 5 less than 38
14. the set P of prime numbers between 15 and 25
15. the set F of positive integers that are factors of 24
16. the set N of integers whose absolute values are less than 6

Write a compound sentence for each situation.

17. Water must be more than 0°C but less that 100°C to be in liquid form.
18. Special classes were created for students who scored less than 58 or more than 97 on the placement test.
19. Each crate of melons weighed at least 40 pounds and less than 45 pounds.

Let $A = \{2, 3, 5, 7\}$, $B = \{0, 3, 6, 9\}$, $C = \{1, 3, 5, 7, 9\}$, and $D = \{0, 1, 2, 3, 4, 5, 6\}$.

Find each of the following.

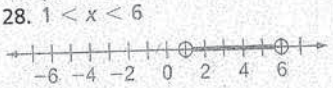
20. $A \cup B$
21. $C \cap D$
22. $A \cup C$
23. $B \cap C$
24. $A \cap D$
25. $B \cup C$
26. $A \cap C$
27. $B \cup D$

Solve and graph.

28. $-2 < x - 3 < 3$
29. $-2 > x + 3$ or $x + 6 \geq 7$
30. $-3x > 9$ or $2x - 5 > -3$
31. $-7 < 2x + 3 \leq 7$

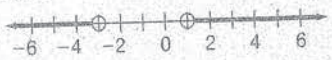
Answers

1. $x > 2$ or $x \leq 1$
2. $1 \leq x < 2$
3. $4, -\frac{4}{3}$
4. $8, -2$
5. $-4 \leq x < 9$
6. $x < -2$ or $x > 4$
7. $\frac{16}{5}, -2$
8. $1/2, -\frac{7}{8}$
9. $x < -2$ or $x \geq 1$
10. $-1 \leq x < 2$
11. $-4 \leq x \leq 3$
12. $x \leq 1$ or $x > 3$
13. (a) $W = \{5, 10, 15, 20, 25, 30, 35\}$
    (b) $W = \{x \mid x$ is multiple of 5 and $0 < x < 38\}$
14. (a) $P = \{17, 19, 23\}$
    (b) $P = \{x \mid x$ is prime and $15 < x < 25\}$
15. (a) $F = \{1, 2, 3, 4, 6, 8, 12, 24\}$
    (b) $F = \{x \mid x$ is an integer factor of 24 and $0 < x\}$
16. (a) $N = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$
    (b) $N = \{x \mid x$ is an integer and $|x| < 6\}$
17. $0°C < w < 100°C$
18. $x < 58$ or $x > 97$
19. $40 \leq x < 45$
20. $\{0, 2, 3, 5, 6, 7, 9\}$
21. $\{1, 3, 5\}$
22. $\{1, 2, 3, 5, 7, 9\}$
23. $\{3, 9\}$
24. $\{2, 3, 5\}$
25. $\{0, 1, 3, 5, 6, 7, 9\}$
26. $\{3, 5, 7\}$
27. $\{0, 1, 2, 3, 4, 5, 6, 9\}$
28. $1 < x < 6$



29. $x < -5$ or $x \geq 1$

30. $x < -3$ or $x > 1$



31. $-5 < x \leq 2$

Mixed Practice 18

For use after Lesson 9-6

Graph on a number line.

1. $|y + 1| < 6$
2. $|3x| > 6$
3. $|x - 4| > 2$

Solve.

4. $|y + 4| = 6$
5. $|2x + 1| = -5$
6. $|2x + 1| > 3$
7. $4|3y| > 20$
8. $2|3x| < 20$
9. $|3y - 2| < 7$
10. $|3x + 2| < -3$
11. $2|-3x| = 24$
12. $|2x - 7| = 21$
13. $-2|x - 3| < -8$
14. $|2a + 5| < 1$
15. $|3x + 1.5| = 5.7$

Graph on a coordinate plane.

16. $-x < y$
17. $y < x - 1$
18. $2y < x + 4$

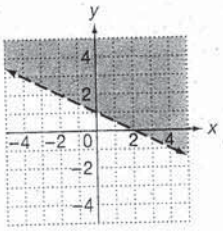
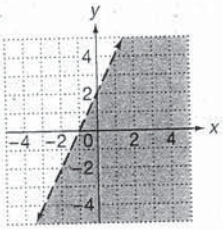
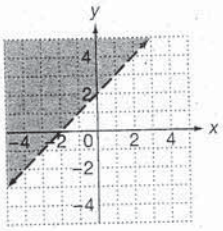
Determine whether the given point is a solution of the inequality.

19. $(1, 3); 2x - y > 5$
20. $(-2, 3); 2x + 3y \geq 5$
21. $(4, -1); 2x - 4y < 16$
22. $(-2, -7); y + 5x \leq 2$

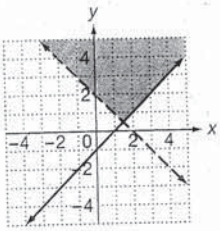
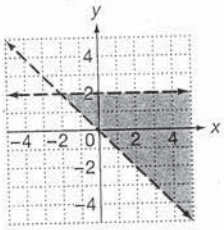
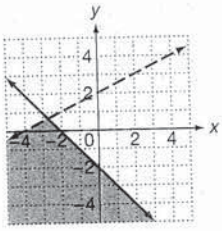
Solve by graphing.

23. $y < 2x$
    $y < 4$
24. $y - x < 0$
    $3y + 2x > 1$
25. $x + y > 1$
    $x < 2$

Write an inequality for each graph.

26. 
27. 
28. 

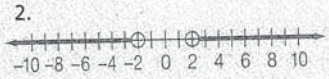
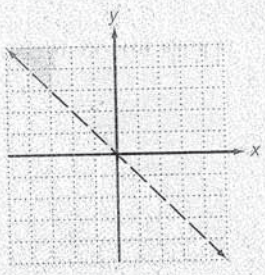
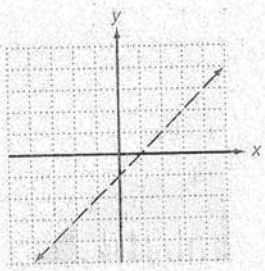
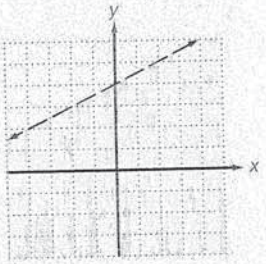
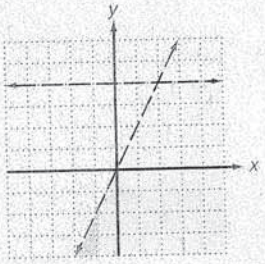
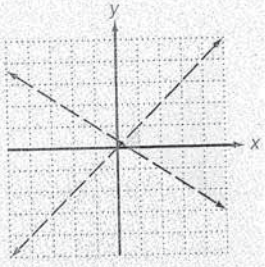
Write a system of inequalities whose solution is shown by each graph.

29. 
30. 
31. 

Item Analysis

Item	Lesson
1–3	9-4
4, 5	9-3
6–10	9-4
11, 12	9-3
13, 14	9-4
15	9-3
16–18	9-5
19–22	9-5
23–25	9-6
26–28	9-5
29–31	9-6

Answers

1. 
2. 
3. 
4. {2, −10}
5. no solution
6. $\{x | x < -2 \text{ or } x > 1\}$
7. $\left\{y | y < -\frac{5}{3} \text{ or } y > \frac{5}{3}\right\}$
8. $\left\{x | -\frac{10}{3} < x < \frac{10}{3}\right\}$
9. $\left\{x | -\frac{5}{3} < y < 3\right\}$
10. no solution
11. {−4, 4}
12. {−7, 14}
13. $\{x | x > 7 \text{ or } x < -1\}$
14. $\{a | -3 < a < -2\}$
15. {−2.4, 1.4}
16. 
17. 
18. 
19. no
20. yes
21. yes
22. yes
23. 
24. 

25–31. See Additional Answe

Mixed Practice 19

For use after Lesson 10-5

Simplify.

1. $\frac{x^2 - 2x - 3}{x^2 - 5x + 6}$
2. $\frac{25x^2 - 9}{5x + 3}$
3. $\frac{5x^2 - 5}{10x^2 - 10}$
4. $\frac{2y^2 + 5y - 7}{2y + 7}$
5. $\frac{16 - a}{a - 16}$
6. $\frac{2x^2 - 6x}{2x^2 + 2x}$

Add or subtract and simplify.

7. $\frac{2x + 9}{x + 7} + \frac{x + 12}{x + 7}$
8. $\frac{7x + 9}{3x + 2} - \frac{7x + 6}{3x + 2}$
9. $\frac{3y + 1}{y - 3} - \frac{2y - 4}{y - 3}$
10. $\frac{3}{y} - \frac{y + 4}{y^2}$
11. $\frac{3a}{a + 2} + \frac{12a}{a^2 - 4}$
12. $\frac{3m + 7}{4m} - \frac{4m + 11}{8m}$
13. $\frac{2 - x}{x^2 - 7x + 10} + \frac{x - 4}{x - 5}$
14. $\frac{x}{x + 1} - \frac{1}{x - 1}$
15. $\frac{1}{x} + \frac{x + 5}{x^2}$
16. $\frac{x^2}{x^2 - 1} - \frac{1}{x + 1}$
17. $\frac{x + 4}{2} + \frac{x + 4}{x}$
18. $\frac{a + 1}{a - 1} + \frac{a - 1}{a + 1}$

Multiply or divide and simplify.

19. $\frac{3}{2(x - 1)} \cdot \frac{4}{3(x - 1)}$
20. $\frac{x^2 - 1}{x^2 - 4} \cdot \frac{x + 2}{x + 1}$
21. $\frac{m}{m + 1} \cdot \frac{m^2 - m - 2}{m^2 + m}$
22. $\frac{6x^2}{6x^2 + 9x + 3} \cdot \frac{6x + 3}{2x}$
23. $\frac{mn + n^2}{m} \div \frac{m^2 - n^2}{mn^2}$
24. $\frac{x^2 - x - 12}{x + 2} \div \frac{(x - 4)^2}{x + 2}$
25. $\frac{x^2 - 3x - 10}{x^2 + 2x - 15} \cdot \frac{x^2 + 8x + 15}{x^2 - 7x + 10}$
26. $\frac{x^2 - 4x}{x + 1} \div \frac{x^2 - 16}{x^2 - 1}$
27. $\frac{x^2 - 9}{x + 5} \div \frac{x + 3}{x^2 + 2x - 15}$
28. $\frac{a^2 + 6a + 9}{a - 3} \div \frac{a^2 + 4a + 3}{a + 1}$
29. $\frac{x^2 - 4}{x + 1} \div \frac{x + 2}{x - 2}$
30. $\frac{m - 1}{5} \div \frac{m^2 - 2m + 1}{m^2 + 2m - 3}$
31. $\frac{2}{x^2 + 4x + 4} \cdot \frac{x + 2}{x - 2}$

Find the LCM.

32. $2x - 3, 4x^2 - 9$
33. $x^2 - 5x + 6, x^2 - 6x + 9$
34. $x^2 - 16, 2x + 8$
35. $10 - 2a, a^2 - 25$
36. $24a^3b, 18abc$
37. $x^2 - 1, x^2 - 3x + 2, \ x^2 + x - 6$

Answers

- $\frac{x+1}{x-2}$
- $5x-3$
- $1/2$
- $y-1$
- -1
- $\frac{x-3}{x+1}$
- 3
- $\frac{3}{3x+2}$
- $\frac{x+5}{4-3}$
- $\frac{2(y-2)}{y^2}$
- $\frac{3a}{a-2}$

12. $\frac{2m + 3}{8m}$
13. 1
14. $\frac{x^2 - 2x - 1}{x^2 - 1}$
15. $\frac{2x + 5}{x^2}$
16. $\frac{x^2 - x + 1}{x^2 - 1}$
17. $\frac{(x + 2)(x + 4)}{2x}$
18. $\frac{2(a^2 + 1)}{a^2 - 1}$
19. $\frac{2}{(x - 1)^2}$
20. $\frac{x - 1}{x - 2}$
21. $\frac{m - 2}{m + 1}$
22. $\frac{3x}{x + 1}$
23. $\frac{n^3}{m - n}$
24. $\frac{x + 3}{x - 4}$
25. $\frac{(x + 2)(x + 3)}{(x - 2)(x - 3)}$
26. $\frac{x(x - 1)}{x + 4}$
27. $(x - 3)^2$
28. $\frac{a + 3}{a - 3}$
29. $\frac{(x - 2)^2}{x + 1}$
30. $\frac{m + 3}{5}$
31. $\frac{2}{x^2 - 4}$
32. $(2x + 3)(2x - 3)$
33. $(x - 3)^2(x - 2)$
34. $2(x + 4)(x - 4)$
35. $2(a + 5)(a - 5)$
36. $72a^3bc$
37. $(x - 1)(x - 2)(x + 1)(x + 3)$

Mixed Practice 20

For use after Lesson 10-10

Solve.

1. $\frac{x+2}{x-2} = x - 1$
2. $\frac{x+6}{x+2} = \frac{x}{x-1}$
3. $\frac{4x-5}{2x+1} + \frac{x+1}{x-1} = 3$
4. $2a - 1 = \frac{8a+3}{a+1}$

Write and solve an equation.

5. The Highway Department has purchased wildflower seed mixtures from two companies. Mixture A is 28% bluebonnets, and Mixture B is 48% bluebonnets. How much of each mix should be used to create 250 pounds of blended seed that is 35% bluebonnets?
6. The reciprocal of two more than a number is three-fourths of the reciprocal of the number itself. What is the number?
7. It takes Sylvia 8 hours to assemble a carton of widgets. Joe can do the same job in 12 hours. How long would it take them to assemble a carton of widgets if they worked together?
8. Marty drove his fully loaded moving van 270 miles to Memphis. With his van empty, Marty drove 15 mi/h faster and made the return trip in 1.5 hours less. Find the speed going to Memphis.
9. The reciprocal of 5 less than a number is 4 times the reciprocal of twice the number. Find the number.

Divide.

10. $\frac{3x^4 \div 27x^3 + 3x^2}{3x^2}$
11. $\frac{16x^3 + 4x^2 - 4x - 1}{4x + 1}$
12. $x^2 + 4x - 24 \div x - 3$
13. $10a^2 + 7a - 12 \div (2a + 3)$
14. $2x^4 - x^2 - 15 \div x^2 - 3$
15. $y^4 - 4y^2 + 3 \div y - 1$

Simplify.

16. $\dfrac{\frac{x}{(3x-1)(x-y)}}{\frac{y}{x-y}}$
17. $\dfrac{\frac{x(y-3)}{y}}{\frac{y-3}{x}}$
18. $\dfrac{\frac{1}{m} + \frac{1}{n}}{\frac{1}{m} - \frac{1}{n}}$
19. $\dfrac{1 - \frac{1}{a^2}}{1 - \frac{1}{a}}$
20. $\dfrac{\frac{x^2}{x^2 - y^2}}{\frac{x}{x+y}}$
21. $\dfrac{\frac{x}{2} + \frac{y}{3}}{\frac{2}{x} - \frac{3}{y}}$

Item Analysis

Item	Lesson
1–4	10-6
5	10-8
6	10-7
7	10-8
8, 9	10-7
10–15	10-9
16–21	10-10

Answers

1. 0, 4
2. 2
3. 3
4. 4, $-\frac{1}{2}$
5. 162.5 lb A, 87.5 lb B
6. 6
7. 4.8 hours
8. 45 mi/h
9. 10
10. $x^2 - 9x + 1$
11. $4x^2 - 1$
12. $x + 7 - \frac{3}{x-3}$
13. $5a - 4$
14. $2x^2 + 5$
15. $y^3 + y^2 - 3y - 3$
16. $\frac{x}{y(3x-1)}$
17. $\frac{x^2}{y}$
18. $\frac{n+m}{n-m}$
19. $\frac{a+1}{a}$
20. $\frac{x}{x-y}$
21. $\frac{-xy}{6}$

Mixed Practice 21

For use after Lesson 11-5

Simplify. Assume that all radicands are nonnegative.

1. $\sqrt{169}$
2. $-\sqrt{49}$
3. $\sqrt{6^2 + 8^2}$
4. $\sqrt{(6 + 8)^2}$
5. $\sqrt{m^2n^2}$
6. $\sqrt{25y^4}$
7. $\sqrt{(-2x)^2}$
8. $\sqrt{x^2 - 6x + 9}$
9. $\sqrt{9y^3}$
10. $\sqrt{(x - 2)^5}$
11. $2\sqrt{49m^3}$
12. $\sqrt{75x^5y^2}$
13. $\sqrt{\frac{y^2}{100}}$
14. $\sqrt{\frac{9m^4}{25n^6}}$
15. $\sqrt{\frac{36x^2}{49}}$
16. $\sqrt{\frac{x^2 - 8x + 16}{x^2 - 2x + 1}}$

Determine the values for the variable that will make each expression a real number.

17. $\sqrt{5y}$
18. $\sqrt{2x - 1}$
19. $\sqrt{2x - 10}$
20. $\sqrt{2x^2}$
21. $\sqrt{x^2 + 17}$
22. $\sqrt{x + 5}$

Multiply and simplify.

23. $\sqrt{25} \cdot \sqrt{32}$
24. $\sqrt{14} \cdot \sqrt{2}$
25. $\sqrt{5a} \cdot \sqrt{5ab}$
26. $\sqrt{3} \cdot \sqrt{3} \cdot \sqrt{3}$
27. $\sqrt{2x^2} \cdot \sqrt{2y}$
28. $\sqrt{8m} \cdot \sqrt{2m}$
29. $\sqrt{30b} \cdot \sqrt{2bc}$
30. $\sqrt{2}(\sqrt{2} - 2)$
31. $\sqrt{15} \cdot \sqrt{45a^3}$
32. $\sqrt{12xy} \cdot \sqrt{18xyz}$
33. $\sqrt{10^2} \cdot \sqrt{x^{31}}$
34. $\sqrt{8y^2} \cdot \sqrt{2y^3} \cdot \sqrt{12y^9}$

Simplify.

35. $\sqrt{512x^{315}}$
36. $\sqrt{1500(x + 1)^3}$
37. $\sqrt{25(x^4 - 1)^2}$
38. $\sqrt{9w^{32}}$
39. $\sqrt{18m^4n^5}$
40. $3a\sqrt{18a^3}$
41. $\sqrt{4x^2 - 40x + 100}$
42. $\sqrt{8x^2 + 16x + 8}$
43. $\sqrt{25x^2 + 50xy + 25y^2}$
44. $\sqrt{\frac{100}{25}}$
45. $\sqrt{\frac{50}{6}}$
46. $\sqrt{\frac{y^7}{xy}}$
47. $\sqrt{\frac{x^2y}{28}}$
48. $\sqrt{\frac{y^7}{x^3}}$
49. $\sqrt{\frac{48}{84}}$
50. $\sqrt{\frac{1}{256}}$
51. $\sqrt{\frac{75}{63}}$

Divide and simplify.

52. $\frac{\sqrt{36x^3}}{\sqrt{6x}}$
53. $\frac{\sqrt{48m^5}}{\sqrt{12m^2}}$
54. $\frac{\sqrt{72}}{\sqrt{200}}$
55. $\frac{\sqrt{7}}{\sqrt{252}}$
56. $\frac{\sqrt{50x^3}}{\sqrt{2x}}$
57. $\frac{\sqrt{7y^5}}{\sqrt{21y}}$
58. $\frac{\sqrt{m^2n}}{\sqrt{n^2m}}$
59. $\frac{\sqrt{m^2n^2}}{\sqrt{25}}$
60. $\frac{\sqrt{a - b}}{\sqrt{a + b}}$

is

Lesson
11-1
11-2
11-3
11-2
11-2
11-4
11-3
11-5
11-5

Answers

1. 13
2. −7
3. 10
4. 14
5. mn
6. $5y^2$
7. 2x
8. x − 3
9. $3y\sqrt{y}$
10. $(x-2)^2\sqrt{x-2}$
11. $14m\sqrt{m}$
12. $5x^2y\sqrt{3x}$
13. $\frac{y}{10}$
14. $\frac{3m^2}{5n^3}$
15. $\frac{6x}{7}$
16. $\frac{x-4}{x-1}$
17. $y \geq 0$
18. $x \geq 0$ ½
19. $x \geq 5$
20. any value

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21. any value
22. $x > -5$
23. $20\sqrt{2}$
24. $2\sqrt{7}$
25. $5a\sqrt{b}$
26. $3\sqrt{3}$
27. $2x\sqrt{y}$
28. $4m$
29. $2b\sqrt{15c}$
30. $2 - 2\sqrt{2}$
31. $15a\sqrt{3a}$
32. $6xy\sqrt{6z}$
33. $10x^{15}\sqrt{x}$
34. $8y^7\sqrt{3}$
35. $16x^{157}\sqrt{2x}$
36. $10(x + 1)\sqrt{15(x + 1)}$
37. $5(x^4 - 1)$
38. $3w^{16}$
39. $3m^2n^2\sqrt{2n}$
40. $9a^2\sqrt{2a}$
41. $2(x - 5)$
42. $2(x + 1)\sqrt{2}$
43. $5(x + y)$
44. 2
45. $\frac{5\sqrt{3}}{3}$
46. $\frac{y^3\sqrt{x}}{x}$
47. $\frac{x\sqrt{7y}}{14}$
48. $\frac{y^3\sqrt{xy}}{x^2}$
49. $\frac{2\sqrt{7}}{7}$
50. $\frac{1}{16}$
51. $\frac{5\sqrt{21}}{21}$
52. $x\sqrt{6}$
53. $2m\sqrt{m}$
54. $\frac{3}{5}$
55. $\frac{1}{6}$
56. $5x$
57. $\frac{y^2\sqrt{3}}{3}$
58. $\frac{\sqrt{mn}}{n}$
59. $\frac{mn}{5}$
60. $\frac{\sqrt{(a^2 - b^2)}}{a + b}$

Mixed Practice 22

For use after Lesson 11-9

Add or subtract.

1. $\sqrt{25x} - 3\sqrt{x}$
2. $\sqrt{54} - \sqrt{20}$
3. $\sqrt{18x + 9} + \sqrt{2x + 1}$
4. $3\sqrt{18} + 5\sqrt{12} - 3\sqrt{2}$
5. $2\sqrt{108} - 6\sqrt{3} + \sqrt{75}$
6. $2\sqrt{147} + \sqrt{12} - \sqrt{432}$
7. $\sqrt{18x^5y} + \sqrt{32xy^3} - \sqrt{128xy}$
8. $\sqrt{7x^4} - \sqrt{28x^2y^2} + \sqrt{7y^4}$
9. $\sqrt{\frac{3}{8}} + \sqrt{\frac{2}{3}} + \sqrt{\frac{8}{12}}$
10. $\sqrt{\frac{1}{12}} - \sqrt{\frac{1}{8}} + \sqrt{\frac{3}{4}}$

Rationalize the denominator.

11. $\frac{5\sqrt{7}}{7\sqrt{5}}$
12. $\frac{3\sqrt{8}}{2\sqrt{2}}$
13. $\frac{14}{\sqrt{7}}$
14. $\frac{24\sqrt{3}}{18\sqrt{2}}$
15. $\frac{10}{\sqrt{20}}$
16. $\frac{3\sqrt{21}}{5\sqrt{15}}$
17. $\frac{6\sqrt{27}}{4\sqrt{3}}$
18. $\frac{5\sqrt{338}}{8\sqrt{2}}$
19. $\frac{2\sqrt{\frac{3}{5}}}{3\sqrt{\frac{1}{20}}}$
20. $\frac{\sqrt{\frac{3}{5}}}{\sqrt{\frac{5}{8}}}$
21. $\frac{\sqrt{\frac{x}{y}}}{\sqrt{\frac{y}{x}}}$
22. $\frac{\frac{3\sqrt{15}}{2}}{\frac{2\sqrt{5}}{3}}$

Find the length of the side not given for a right triangle with hypotenuse c and legs a and b.

23. $a = 12, c = 20$
24. $a = 8, b = 15$
25. $c = 13, b = 12$
26. $b = 4, c = 5$
27. $a = 6, c = 10$
28. $a = 16, b = 30$

Simplify.

29. $7mn\sqrt{32m^3n^2}$
30. $-5\sqrt{24}$
31. $2x^2\sqrt{75xy}$
32. $\sqrt{27x} \cdot \sqrt{8x}$
33. $\sqrt{10}\sqrt{3a}\sqrt{5a^3}$
34. $\sqrt{x^{35}}\sqrt{10^{15}}\sqrt{10^4x^{21}}$
35. $\frac{\sqrt{18x^3}}{\sqrt{24x}}$
36. $\frac{\sqrt{27x^3y}}{\sqrt{48x}}$
37. $\frac{\sqrt{65xy}}{\sqrt{5xy}}$

Solve.

38. $3\sqrt{2x - 1} = 9$
39. $2\sqrt{3y - 2} = \sqrt{10y + 4}$
40. $\sqrt{2x + 20} = \sqrt{x + 8}$
41. $5\sqrt{3x + 7} = 2\sqrt{32x + 4}$
42. How long must a wire be to reach from the top of a 30-ft flag pole to a point on the ground 16 ft from the foot of the pole?
43. Find a number such that twice its square root is one fifth of the number itself.
44. Find a number such that nine times the inverse of its square root is -72.

Item Analysis

Item	Lesson
1–10	11-6
11–22	11-5
23–28	11-7
29–31	11-3
32–34	11-4
35–37	11-5
38–41	11-9
42	11-8
43, 44	11-9

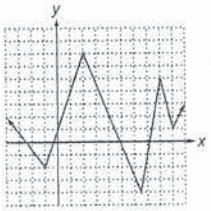
Answers

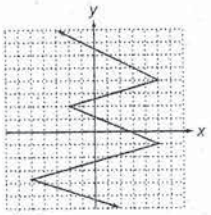
1. $2\sqrt{x}$
2. $3\sqrt{6} - 2\sqrt{5}$
3. $4\sqrt{2x + 1}$
4. $6\sqrt{2} + 10\sqrt{3}$
5. $11\sqrt{3}$
6. $4\sqrt{3}$
7. $(3x^3 + 4y - 8)\sqrt{2xy}$
8. $(x - y)^2\sqrt{7}$
9. $\frac{11}{12}\sqrt{6}$
10. $\frac{8\sqrt{3} - 3\sqrt{2}}{12}$
11. $\frac{\sqrt{35}}{7}$
12. 3
13. $2\sqrt{7}$
14. $\frac{2\sqrt{6}}{3}$
15. $\sqrt{5}$
16. $\frac{3\sqrt{35}}{25}$
17. $\frac{9}{2}$
18. $\frac{65}{8}$
19. $\frac{4\sqrt{3}}{3}$
20. $\frac{2\sqrt{6}}{5}$
21. $\frac{x}{y}$
22. $\frac{9\sqrt{3}}{4}$
23. 16
24. 17
25. 5
26. 3
27. 8
28. 34
29. $28m^2n^2\sqrt{2m}$
30. $-10\sqrt{6}$
31. $10x^2\sqrt{3xy}$
32. $6x\sqrt{6}$
33. $5a^2\sqrt{6}$
34. $10^9x^{28}\sqrt{10}$
35. $\frac{x\sqrt{3}}{2}$
36. $\frac{3x\sqrt{y}}{4}$
37. $\sqrt{13}$
38. 5
39. 6
40. no value
41. 3
42. 34 ft
43. 100
44. 64

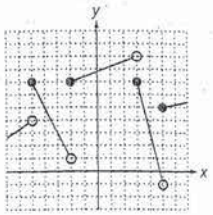
Mixed Practice 23

For use after Lesson 12-4

Which of the following are graphs of functions?

1. 

2. 

3. 

Find the indicated outputs for these functions.

4. $M(s) = |s| - 3s$; find $M(-4), M(-2), M(0), M(2), M(4)$.
5. $W(x) = 3x - 2$; find $W(-3), W(0), W(-1), W(2), W(3)$.
6. $h(x) = x^2 - 4$; find $h(-5), h(3), h(1), h(-1), h(0)$.
7. $f(t) = t^3$; find $f(-4), f(5), f(1), f(-1), f(2)$.
8. $g(a) = |a| - a$; find $g(-3), g(10), g(-2), g(0), g(4)$.

Graph each function.

9. $f(x) = -x + 4$ where the domain is $\{-3, -1, 0, 2, 5\}$
10. $h(x) = |x| - 1$ where the domain is all real numbers
11. $f(x) = 2x - 5$ where the domain is all real numbers
12. $g(x) = 2x - 1$ where the domain is $\{-3, -1, 0, 2, 3\}$

Write a linear function describing each situation. Use the function to solve the problem.

13. A fabric store sells flannel for \$4.15 a yard. Find the total cost of 14 yards of flannel and a \$3 spool of thread.
14. Each semester, Maria's college charges \$180 per class unit plus a registration fee. Last semester Maria paid \$2285 for 12 class units. Find the registration fee. Next semester, Maria will be taking 14 class units. How much will she have to pay?
15. Thi Tran makes advertising banners. He charges \$40 per color plus \$5.50 per letter. Find the cost of a three-color banner with 16 letters. How many letters can you have on a two-color banner and keep the cost under \$125?

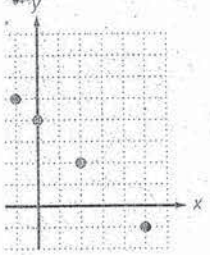
Graph each function. Find the vertex and axis of symmetry.

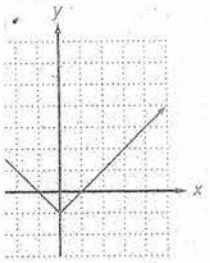
16. $y = x^2 + x$
17. $y = x^2 - 3x + 2$
18. $y = -x^2 + 4$

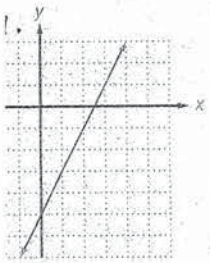
alysis

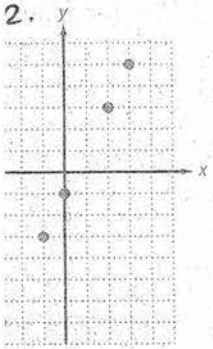
Lesson
12-2
12-1
12-2
12-3
12-4

ANSWERS
1. yes
2. NO
3. yes
4. 12, 8, 0, -4, -8
5. -11, -2, -5, 4, 7
6. 21, 5, -3, -3, -4
7. -64, 125, 1, -1, 8
8. 12, 0, 4, 90

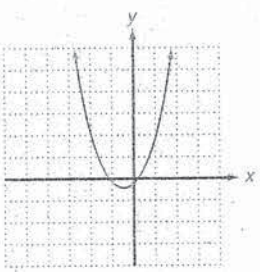




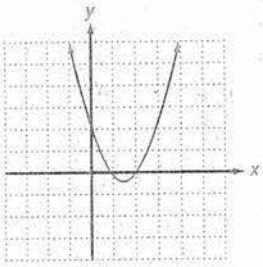


2. 

13. $y = \$4.15x + \$3.00$, \$61.10
14. $\$2285 = 12(\$180) + r$, \$125; $y = \$180x + \$125$, \$2645
15. $C = \$40(c) + \$5.50(l)$; \$208; $\$40(2) + \$5.50(l) < \$125$, 8 letters

16. 

$\left(-\frac{1}{2}, -\frac{1}{4}\right), x = -\frac{1}{2}$

17. 

$\left(\frac{3}{2}, -\frac{1}{4}\right), x = \frac{3}{2}$

18. See Additional Answers.

Pgs 658-663

Mixed Practice 24

For use after Lesson 12-7

Find an equation of variation where y varies directly as x, and the following are true.

1. $y = 150$ when $x = 0.75$
2. $y = 128$ when $x = 16$
3. $y = 12$ when $x = 30$
4. $y = 0.36$ when $x = 45$

Find an equation of variation where y varies inversely as x. One pair of values is given.

5. $y = 26$ when $x = 18$
6. $y = 0.2$ when $x = 15$
7. $y = 1$ when $x = 100$
8. $y = 32$ when $x = 150$

Find an equation of joint or combined variation for each. Then solve for the missing value.

9. x varies jointly as y and z. One set of values is $x = 67.5$, $y = 6$, and $z = 9$. Find x when $y = 4$ and $z = 10$.
10. w varies directly as y and inversely as z. One set of values is $w = 12$, $y = 8$, and $z = 5$. Find x when $y = 9$ and $z = 15$.
11. a varies jointly as b, c, and d. One set of values is $a = 24$, $b = 3$, $c = 2$, and $d = 8$. Find a when $b = 10$, $c = 1$, and $d = 5$.
12. r varies directly as s and inversely as t. One set of values is $r = 2.7$, $s = 18$, and $t = 16$. Find r when $s = 10$ and $t = 4$.

Determine whether the following vary directly or inversely.

13. the amount of interest earned and the balance in a standard savings account
14. the amount of time required to do a job and the number of people working on the job
15. the size of a room and the amount of paint required to cover its walls
16. the distance a string is stretched by a hanging object and the weight of the object
17. the number of people that share a pizza and the size of each share

Solve.

18. The amount Tyler earns varies directly with the number of hours he works. He earns \$101.25 in 15 hours. How much does he earn in 40 hours?
19. The time required to set up the chairs for a school assembly varies inversely as the number of people working. It takes 5 hours for 3 people to do the job. How long will it take 20 people to set up the chairs?

Item Analysis

Item	Lesson
1–4	12-5
5–8	12-6
9–12	12-7
13	12-5
14	12-6
15, 16	12-5
17	12-6
18	12-5
19	12-6

Answers

1. $y = 200x$
2. $y = 8x$
3. $y = 0.4x$
4. $y = 0.008x$
5. $y = \frac{468}{x}$
6. $y = \frac{3}{x}$
7. $y = \frac{100}{x}$
8. $y = \frac{4800}{x}$
9. $x = 1.25yz$; 50
10. $w = \frac{7.5y}{z}$; 4.5
11. $a = 0.5bcd$; 25
12. $r = \frac{2.4s}{t}$; 6
13. directly
14. inversely
15. directly
16. directly
17. inversely
18. \$270
19. $\frac{3}{4}$ hr

Mixed Practice 25

For use after Lesson 13-4

Complete the square.

1. $a^2 + 18a$
2. $x^2 - 7x$
3. $x^2 - 20x$
4. $y^2 + 100y$
5. $x^2 - 12x$
6. $m^2 - 6m$

Write each equation in standard form and determine a, b, and c.

7. $3x^2 - 15 = 0$
8. $x^2 + 4 = 6x$
9. $5y^2 + 3y = 91$
10. $8t - 9 = t^2$
11. $x^2 + 4 = 11x - 5$
12. $35 + x^2 = 10x$

Find the value of the discriminant and determine the number of real-number solutions for each quadratic equation.

13. $x^2 + 12x + 32 = 0$
14. $y^2 - 10y + 25 = 0$
15. $x^2 - 2x + 5 = 0$
16. $x^2 = 11x$

Solve.

17. $3x^2 - 9x = 0$
18. $2x^2 - 10x = 0$
19. $4y^2 + 4y = 0$
20. $5x^2 = 20$
21. $9y^2 - 64 = 0$
22. $3x^2 - 243 = 0$
23. $(x - 5)^2 = 121$
24. $(y + 3)^2 = 7$
25. $(x + 4)^2 = 25$
26. $x(x - 2) = 15$
27. $9y^2 - 14y = 10y - 16$
28. $x^2 + 3x - 10 = 30$
29. $(y - 1)^2 - 81 = 0$
30. $m^2 + 6m - 6 = 21$
31. $x(2x + 1) = 28$

Solve by completing the square.

32. $x^2 - 6x - 16 = 0$
33. $y^2 - 4y = 3$
34. $x^2 + 3x - 180 = 0$
35. $x^2 - 6x + 8 = 0$
36. $a^2 - 7a + 12 = 0$
37. $x^2 - 15x - 15 = 1$

Solve using the quadratic formula.

38. $x^2 - 5x + 4 = 0$
39. $6t^2 - 5t - 6 = 0$
40. $8x^2 = 60$
41. $2x^2 - x - 15 = 0$
42. $m^2 + 5m - 24 = 0$
43. $x^2 - 4x - 77 = 0$
44. $2x(x - 2) = 3(4 - x)$
45. $(3x + 4)(5x - 1) = 0$

Find all middle terms that complete the square.

46. $x^2 + ? + 81$
47. $x^2 + ? + 30$
48. $x^2 + ? + 24$

Solve.

49. $21x^2 = x$
50. $4x^2 + 12x + 5 = 0$
51. $8x^2 = 14x + 15$
52. $m^2 - 4m + 3 = 0$
53. $x^2 - 9 = 3x$
54. $x^2 + 6x = 27$

sis
Lesson
13-3
13-1
13-4
13-1
13-2
13-1
13-2
13-3
13-4
13-3
13-4

Answers

$a^2+18a+81$

$x^2-7x+\frac{49}{4}$

$x^2-20x+100$

$y^2+100y+2500$

$x^2-12x+36$

m^2-6m+9

$3x^3-15=0;3,0,-$

$x^2-6x+4=0;1,-6$

$5y^2+3y-91=0;5,$ 91

$t^2-8t+9=0;1,-8,$

$x^2-10x+35=0;1,-10,35$

16; 2 real number solutions

0; 1 real number solution

-16; no real number solution

121; 2 real number solutions

0, 3

0, 5

$-1, 0$

$-2, 2$

21. $-\frac{8}{3}, \frac{8}{3}$

22. $-9, 9$
23. $16, -6$
24. $-3 \pm \sqrt{7}$
25. $-9, 1$
26. $5, -3$
27. $\frac{4}{3}$
28. $-8, 5$
29. $10, -8$
30. $-9, 3$
31. $\frac{7}{2}, -4$
32. $8, -2$
33. $2 \pm \sqrt{7}$
34. $-15, 12$
35. $2, 4$
36. $3, 4$
37. $16, -1$
38. $4, 1$
39. $\frac{3}{2}, -\frac{2}{3}$
40. $\frac{\pm\sqrt{30}}{2}$
41. $3, -\frac{5}{2}$
42. $3, -8$
43. $11, -7$
44. $\frac{1 \pm \sqrt{97}}{4}$
45. $-\frac{4}{3}, \frac{1}{5}$
46. $\pm 18x$
47. $\pm 2x\sqrt{30}$
48. $\pm 4x\sqrt{6}$
49. $0, \frac{1}{21}$
50. $-\frac{1}{2}, -\frac{5}{2}$
51. $\frac{5}{2}, -\frac{3}{4}$
52. $3, 1$
53. $\frac{3 \pm 3\sqrt{5}}{2}$
54. $-9, 3$

Mixed Practice 26

For use after Lesson 13-7

Solve each rational equation.

1. $\frac{9}{x-3} - \frac{x-4}{x-3} = \frac{1}{4}$
2. $\frac{1}{x-1} + \frac{2}{x} = 0$
3. $\frac{y^2}{6} = \frac{y}{3} + \frac{1}{2}$
4. $\frac{m}{m-3} + \frac{6}{m+3} = 1$
5. $x - 3 = \frac{1}{x-3}$
6. $x - 6 = \frac{x}{x-6}$
7. $x + \frac{x}{x+1} = \frac{4x+3}{x+1}$
8. $\frac{1}{x+5} + \frac{5}{x^2-25} = 0$

Solve each radical equation.

9. $\sqrt{3x-5} = 4$
10. $\sqrt{x+5} = \sqrt{2x-3}$
11. $\sqrt{x-3} = 6 - x$
12. $\sqrt{y-5} = y - 7$
13. $\sqrt{x} + \sqrt{7} = \sqrt{x+7}$
14. $m + \sqrt{2m-6} = 3$

Solve.

15. $2x^2 - 5x + 3 = 0$
16. $(x+2)(x-1) = 10$
17. $6x^2 - x = 1$
18. $3t^2 + 5t = 28$
19. $(3y-10)^2 = 0$
20. $10x - 19 = x^2$

Solve.

21. Quentin deposited \$500 in his savings account. In two years it grew to \$561.80. What is the interest rate? (Use $A = P(1+r)^t$.)
22. A picture frame is 30 cm by 24 cm. There are 520 cm^2 of picture showing. Find the width of the frame.
23. The hypotenuse of a right triangle is 13 m long. One leg is 7 m shorter than the other. Find the lengths of the legs.
24. The length of a rectangle is 15 ft greater than the width. The area is 1000 ft^2. Find the length and width.
25. The current in a stream moves at a speed of 5 km/h. A boat travels 20 km upstream and 20 km downstream in a total of 3 hrs. Find the speed of the boat in still water.
26. Marla can type a 24-page report in 3 hours. If Marla and Gene work together, they can type the same report in 2 hours. How long would it take Gene alone to type the report?
27. Find the side of a square whose diagonal is 5 cm longer than a side.

Item Analysis

Item	Lesson
1–8	13-5
9–14	13-6
15–20	13-4
21	13-2
22–27	13-7

Answers

1. 11
2. $\frac{2}{3}$
3. $-1, 3$
4. 1
5. 2, 4
6. 9, 4
7. 3
8. 0
9. 7
10. 8
11. 4
12. 9
13. 0
14. 3
15. $1, \frac{3}{2}$
16. $3, -4$
17. $-\frac{1}{3}, \frac{1}{2}$
18. $-4, \frac{7}{3}$
19. $\frac{10}{3}$
20. $5 \pm \sqrt{6}$
21. 6%
22. 2 cm
23. 5 m, 12 m
24. 40 ft, 25 ft
25. 15 km/h
26. 6 hr
27. $5 + 5\sqrt{2}$ cm