830 Geometry Name_____

Summer Algebra Review - Not Optional

Teacher_____ Period____

Evaluate each expression.

1) $3 \times 3 - \left(5 - 1^2\right) \div \left(3 + 1\right)$

2) $5 \times 2 - 2 + 2 - \left(8 \div 2 - 3\right)$

3) $5\left(\frac{10}{1+1} + \frac{5 \cdot 3}{5}\right)$

4) $6 - 4 + \frac{16 - 4}{6 - 2} - 4$

Evaluate each using the values given.

5) $z + y + zx + \frac{2^3}{4}$; use $x = 6$, $y = 5$, and $z = 4$

6) $4c - \left(a + b^2\right) - \left(a - b\right)$; use $a = 2$, $b = 1$, and $c = 5$

7) $h - \left(k^2 - 1\right) + \frac{k}{2} + h$; use $h = 3$, and $k = 2$

Solve each equation.

8) $3\left(1 + 3b\right) = 7\left(b + 4\right) + 1$

9) $6x + 7\left(-7x - 5\right) = 4\left(3x + 5\right)$

10) $\frac{1}{2}\left(-2a - \frac{9}{8}\right) + \frac{5}{4} = \frac{8}{3}\left(-\frac{1}{4}a + \frac{1}{2}\right)$

11) $-\frac{19}{6}\left(\frac{3}{8}a + 1\right) = \frac{17}{6} - \left(a + \frac{17}{4}\right)$

Solve each proportion.

12) $\frac{x-3}{7x-4} = -\frac{14}{7}$

13) $\frac{12}{13p+5} = \frac{8}{5p+13}$

14) $\frac{13m-3}{12} = \frac{3m+7}{7}$

15) $\frac{x+13}{x+10} = \frac{13}{12}$

Solve each equation by factoring.

16) $8b^2 - 144 = -24b$

17) $5b^2 - 3b + 25 = 7b + 4b^2$

18) $x^2 - 6x + 13 = 3 + x$

19) $3b^2 + 14b + 15 = b^2 + 3$

20) $6p^2 + 20p = -30 + 3p + 4p^2$

21) $2a^2 - 16a - 2 = -4a^2 - 2$

22) $15k^2 + 90k + 21 = -3 - 6k^2$

23) $10p^2 - 34p - 1 = -8p + 7 + 3p^2$

Solve each equation by taking square roots.

24) $10 - 6n^2 = -344$

25) $6a^2 - 1 = 155$

26) $2x^2 + 9 = 99$

27) $4x^2 + 2 = 114$

28) $-4 - 7k^2 = -648$

29) $4x^2 - 6 = 294$

30) $4m^2 + 4 = 240$

31) $5n^2 + 6 = 466$

Solve each equation with the quadratic formula.

32) $3a^2 + 11a - 33 = -11$

33) $16p^2 + 4p - 57 = 11p^2$

34) $22n^2 - 4n + 11 = 10n^2$

35) $2k^2 + 12k + 9 = -k^2$

Solve each equation. Remember to check for extraneous solutions.

36) $r = 5 + \sqrt{5r - 29}$

37) $5 + \sqrt{2x + 5} = x$

38) $n + 2 = \sqrt{2n + 3}$

39) $b + 1 = \sqrt{6b - 3}$

40) $v = 3 + \sqrt{6v - 27}$

41) $\sqrt{14 - 5x} = x - 4$

42) $x = 3 + \sqrt{5x - 19}$

43) $a = -2 + \sqrt{4a + 8}$

Find the slope of the line through each pair of points.

44) $(-11, 11), (0, 12)$

45) $(-15, -10), (-9, -6)$

46) $(13, 19), (-18, 9)$

47) $(1, -2), (13, -9)$

Find the slope of each line.

48) $y = 6x - 1$

49) $y = -\frac{1}{2}x$

50) $y = \frac{3}{5}x$

51) $y = \frac{4}{3}x + 1$

Find the slope of a line parallel to each given line.

52) $y = 2x + 2$

53) $y = \frac{1}{2}x + 2$

54) $y = x + 4$

55) $y = -2x + 4$

Find the slope of a line perpendicular to each given line.

56) $y = 5x + 5$

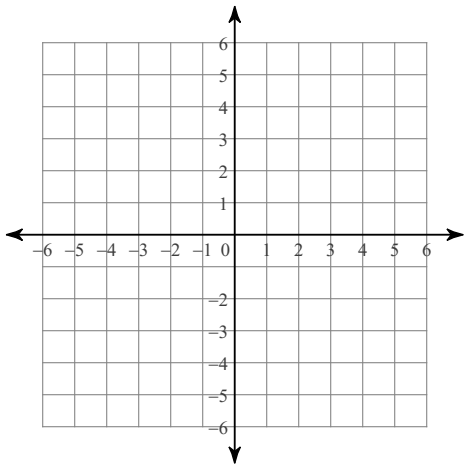
57) $y = \frac{2}{5}x + 5$

58) $y = x - 5$

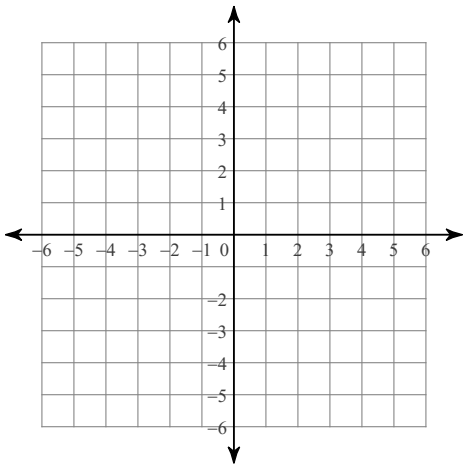
59) $y = -4$

Sketch the graph of each line.

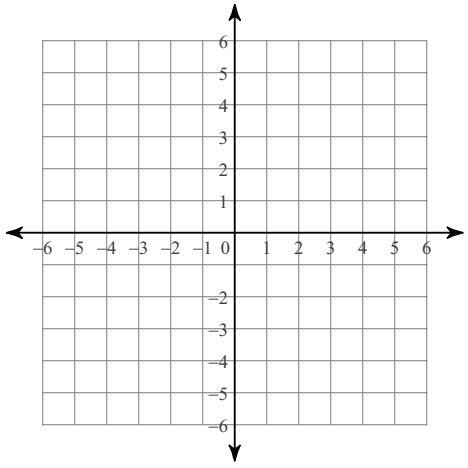
60) $y = -4$



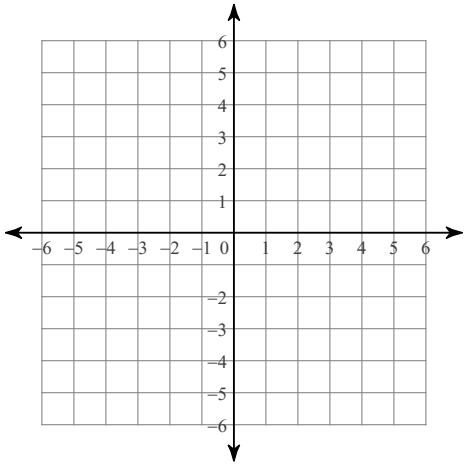
61) $3x - 4y = 8$



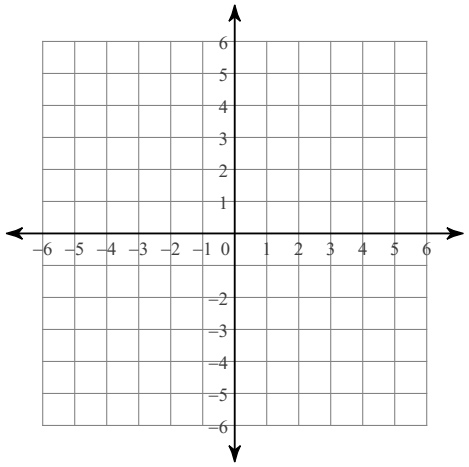
62) $y = -\frac{1}{4}x + 1$



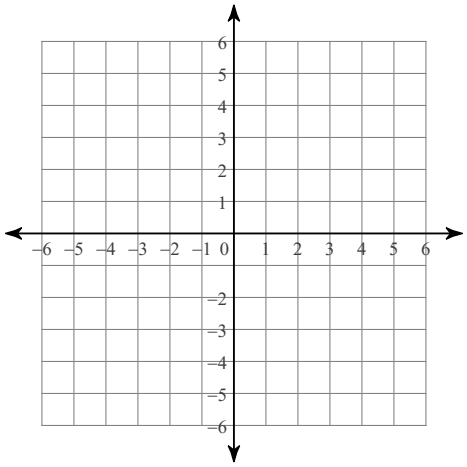
63) $y = \frac{1}{5}x$



64) $x = -3y + 9$

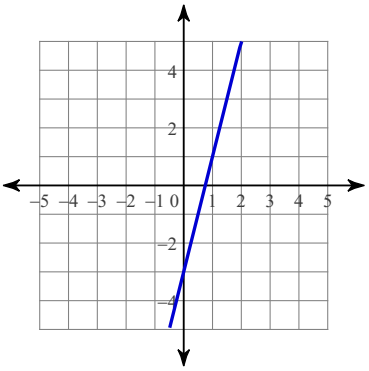


65) $2x + 5 = y$



Write the slope-intercept form of the equation of each line.

66)



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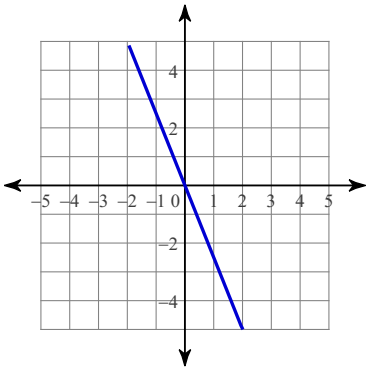
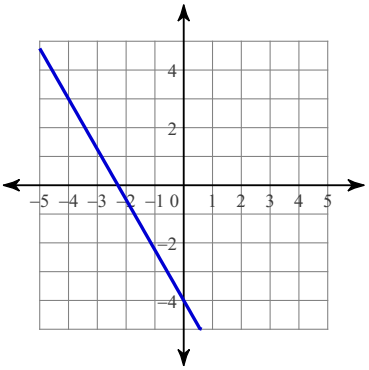


68)



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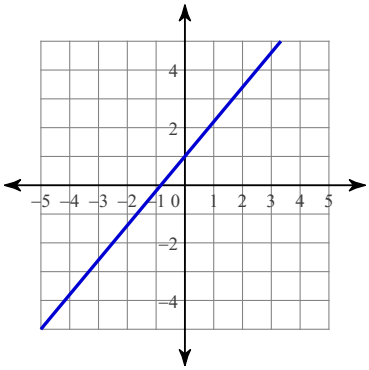


Write the slope-intercept form of the equation of each line given the slope and y-intercept.

70) Slope = –3, y-intercept = 2

71) Slope = 3, y-intercept = 5

72) Slope = 1, y-intercept = –3

73) Slope = $\frac{2}{5}$, y-intercept = –5

Write the slope-intercept form of the equation of each line.

74) $12x - 5y = 20$

75) $16x - 7y = -56$

76) $7x + 4y = -28$

77) $2x - 3y = 18$

78) $y - 2 = \frac{1}{5}(x - 5)$

79) $y - 4 = \frac{1}{7}(x - 2)$

80) $y - 4 = \frac{2}{5}(x - 4)$

81) $y + 4 = \frac{8}{7}(x + 5)$

Write the slope-intercept form of the equation of the line through the given point with the given slope.

82) through: $(-1, 2)$, slope = –2

83) through: $(5, -2)$, slope = $-\frac{7}{4}$

84) through: $(-2, 3)$, slope $= \frac{2}{7}$

85) through: $(5, 5)$, slope $= \frac{9}{7}$

Write the slope-intercept form of the equation of the line through the given points.

86) through: $(4, -4)$ and $(5, 3)$

87) through: $(5, 5)$ and $(5, -1)$

88) through: $(-1, 3)$ and $(0, -3)$

89) through: $(0, -3)$ and $(4, 0)$

Write the slope-intercept form of the equation of the line described.

90) through: $(3, -2)$, parallel to $y = -x + 4$

91) through: $(-2, -4)$, parallel to $y = 2x + 4$

92) through: $(-3, 3)$, perp. to $y = 3x + 3$

93) through: $(-3, 3)$, perp. to $y = -3x + 3$

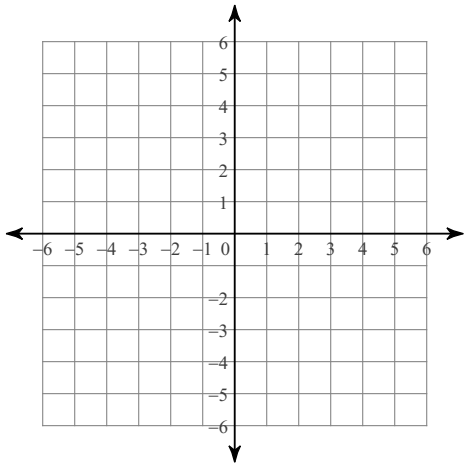
Write the standard form of the equation of the line through the given points.

94) through: $(0, 5)$ and $(-2, 1)$

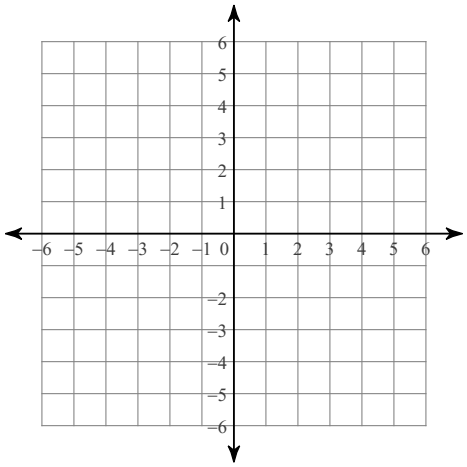
95) through: $(0, 5)$ and $(-5, -3)$

Sketch the graph of each linear inequality.

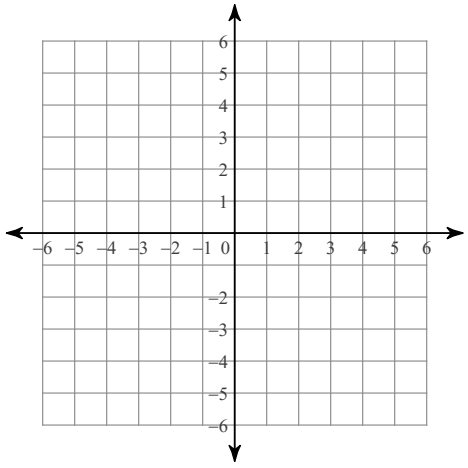
96) $5x - 2y \geq 8$



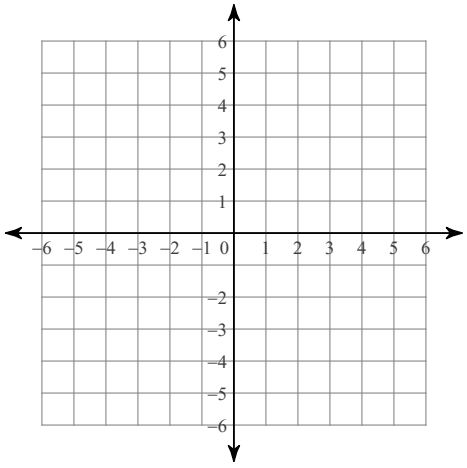
97) $x - y \geq -1$



98) $x + 5y > -10$

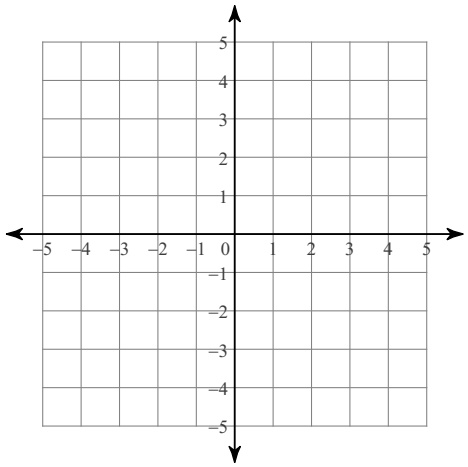


99) $2x + y < -1$

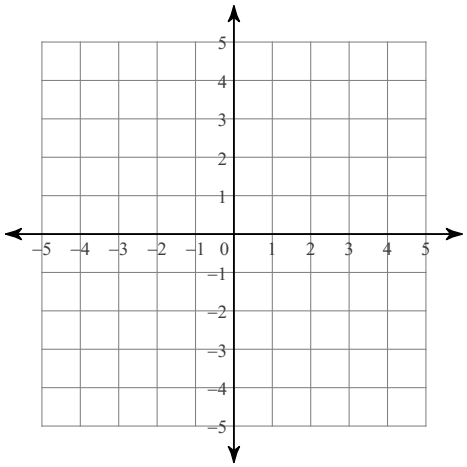


Sketch the solution to each system of inequalities.

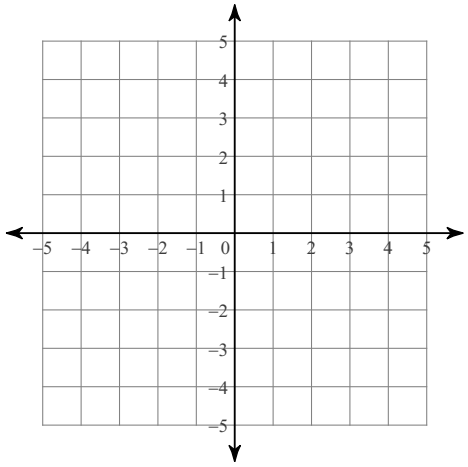
100) $y \geq -4x + 1$
$y < -x - 2$



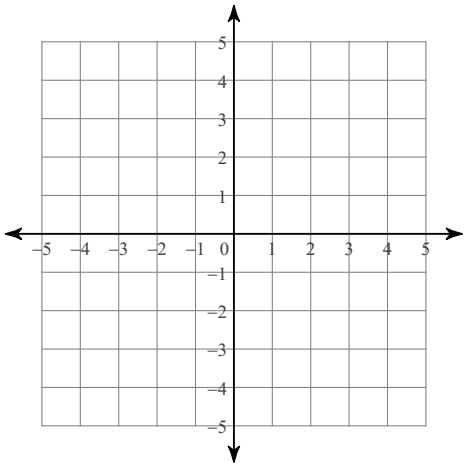
101) $y < -5x - 2$
$y > -x + 2$



102) $y > \frac{1}{3}x + 2$
$y \leq 2x - 3$



103) $y \leq -5x - 2$
$y > -x + 2$



Find the midpoint of the line segment with the given endpoints.

104) $(-8, 2), (-8, 3)$

105) $(-5, -9), (-2, -8)$

106) $(-1, 8),\ (5, 3)$

107) $(2, 5),\ (-2, -8)$

Solve each system by elimination.

108) $-14 + 14x = -14y$
$-60 + 60y = -60x$

109) $3y = -\frac{3}{2}x$
$10x = -10 - 20y$

110) $28x = -35y + 28$
$x = -\frac{5}{4}y$

111) $29 + 10x = -3y$
$0 = -2x + \frac{5}{3} - \frac{5}{3}y$

Solve each system by substitution.

112) $x + y = 1$
$-4x - 2y = 0$

113) $-8x + y = 21$
$7x + 6y = 16$

114) $y = -3x + 7$
$-3x + 7y = -23$

115) $5x + 4y = 0$
$y = 2x - 13$

Factor each completely.

116) $b^2 + 6b$

117) $v^2 + 12v + 20$

118) $n^2 + 4n - 45$

119) $6m^2 - 108m + 486$

120) $5x^2 - 25xy - 30y^2$

121) $6x^2 - 30xy + 36y^2$

122) $6x^2 + 6xy$

123) $4u^2 + 28uv + 48v^2$

124) $42x^2 + 6xy - 48y^2$

125) $9x^2 - 66xy + 120y^2$

126) $27p^2 - 75$

127) $20k^2 + 20k + 5$

128) $18x^2 + 24x + 8$

129) $45n^2 + 60n + 20$

130) $3r^3 + 4r^2 - 21r - 28$

131) $4m^3 - 24m^2 - 5m + 30$

132) $10x^3 - 5x^2 - 4x + 2$

133) $4n^3 - 10n^2 - 10n + 25$

Simplify.

134) $2\sqrt{20} - 2\sqrt{5} + 3\sqrt{5}$

135) $2\sqrt{3} - 3\sqrt{3} - 3\sqrt{12}$

136) $-3\sqrt{8} - 3\sqrt{8} - 2\sqrt{3}$

137) $-2\sqrt{2} - \sqrt{6} + 3\sqrt{8}$

138) $\dfrac{5\sqrt{3x^2y^4}}{\sqrt{2xy}}$

139) $\dfrac{3\sqrt{4u^3v^3}}{\sqrt{5u^4v^2}}$

140) $\dfrac{5-5\sqrt{3r}}{5\sqrt{6r}}$

141) $\dfrac{2-\sqrt{5k}}{\sqrt{3k^2}}$

142) $-5\sqrt{20k}\cdot -5\sqrt{10k^2}$

143) $-5\sqrt{5n^2}\cdot 3\sqrt{10n^3}$

144) $-4\sqrt{20p^3}\cdot -\sqrt{10p^2}$

145) $-2\sqrt{10}\left(4\sqrt{10x}+4\sqrt{2x}\right)$

146) $-4\sqrt{6n}\left(-2\sqrt{6}+4n^3\right)$

147) $-\sqrt{10m}\left(-2\sqrt{2}+5\sqrt{6}\right)$

148) $\left(-2\sqrt{5r}-1\right)\left(3\sqrt{5r}+4\right)$

149) $\left(4\sqrt{2}-3\sqrt{5}\right)\left(5\sqrt{2n}-\sqrt{5n}\right)$

150) $\left(-3-2\sqrt{2x}\right)\left(-3-2\sqrt{2}\right)$

151) $-6\sqrt{288h^3j^4k^4}$

152) $7\sqrt{100x^3y^3z^3}$

153) $4\sqrt{50a^4bc}$

154) $-3\sqrt{125m^4p^4q^4}$

Simplify each and state the excluded values.

155) $\dfrac{5k - 40}{k^3 - 16k^2 + 64k}$

156) $\dfrac{8a + 56}{2a^3 + 16a^2 + 14a}$

Simplify each expression.

157) $\dfrac{35p^2 - 30p - 5}{35p - 35}$

158) $\dfrac{x^2 - 18x + 81}{2x^2 - 6x - 108}$

159) $\dfrac{9r^2 - 63r}{7 + 6r - r^2} \cdot \dfrac{15r + 9}{45r^2 + 27r}$

160) $\dfrac{x + 5}{x^2 + 7x + 10} \cdot \dfrac{x^2 - 13x + 42}{28 - 4x}$

161) $\dfrac{10x^2 + 100x}{8x + 4} \div \dfrac{x + 10}{8x + 4}$

162) $\dfrac{v - 1}{v^2 + 5v - 50} \div \dfrac{v^2 + 5v - 6}{v^2 + 5v - 50}$

Simplify. Your answer should contain only positive exponents.

163) $3x^{-2} \cdot y^{-2}$

164) $-4a^3b^4 \cdot b^{-4}$

165) $-xy^{-1} \cdot 2x^{-3}y^{-2}$

166) $-3a^{-2}b^{-2} \cdot b$

167) $\left(-2x^4y^{-2}\right)^{-4}$

168) $\left(-4m^4n^4\right)^3$

169) $\left(-4x^0y^2\right)^2$

170) n^{-2}

171) $-\dfrac{4x^4}{4x^3y^{-4}}$

172) $\dfrac{-3y}{-x^4y^0}$

173) $-\dfrac{3x^{-2}}{xy^2}$

174) $\dfrac{2y^3}{3x^3y^2}$

175) $\dfrac{\left(-u^{-1}v^{-4}\right)^0}{-2u^2 \cdot 2u^3v^{-3}}$

176) $\dfrac{(-y)^{-4}}{x^3 \cdot -x^4y^3}$

177) $\dfrac{\left(-x^3y^3\right)^4}{2y^2 \cdot -x^3y^2}$

178) $\dfrac{2uv^3 \cdot \left(2u^{-4}v^{-3}\right)^2}{\left(u^4v^2\right)^0}$

Find the value of the discriminant of each quadratic equation.

179) $8r^2 - 7r - 6 = -9$

180) $6x^2 + 19x + 9 = 5 + 9x$

181) $5b^2 - 3b = 10$

182) $-n^2 + 7 = n$

Use the discriminant to determine the number of real solutions to each equation.

183) $4v^2 + 4v = -1$

184) $-x^2 + 7x + 2 = 6 + 3x$

185) $7n^2 - 5n - 2 = 2n - 6$

186) $-n^2 + 2n = -5n^2 + 5$

Find the distance between each pair of points.

187) $(-4, -5),\ (-7, -7)$

188) $(0, 8),\ (-2, 2)$

189) One of two complementary angles has a measure that is six more than twice the other's. Find the measure of the larger angle.

190) The measure of the supplement of an angle is five times that of the angle's complement. Find the measure of the complement.

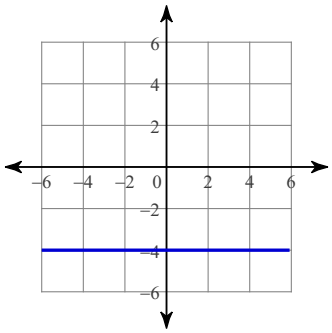
191) The complement of an angle is 24° greater than twice the angle. Find the measure of the complement.

192) When one-half the supplement of an angle is added to the complement of the angle, the sum is 120°. Find the measure of the complement.

Answers to Summer Algebra Review - Not Optional

1) 8
2) 9
3) 40
4) 1
5) 35
6) 16
7) 4
8) $\{13\}$
9) $\{-1\}$
10) $\left\{-\frac{31}{16}\right\}$
11) $\left\{-\frac{28}{3}\right\}$
12) $\{0.73\}$
13) $\{2.63\}$
14) $\{1.9\}$
15) $\{26\}$
16) $\{-6, 3\}$
17) $\{5\}$
18) $\{2, 5\}$
19) $\{-6, -1\}$
20) $\left\{-\frac{5}{2}, -6\right\}$
21) $\left\{\frac{8}{3}, 0\right\}$
22) $\left\{-\frac{2}{7}, -4\right\}$
23) $\left\{-\frac{2}{7}, 4\right\}$
24) $\{\sqrt{59}, -\sqrt{59}\}$
25) $\{\sqrt{26}, -\sqrt{26}\}$
26) $\{3\sqrt{5}, -3\sqrt{5}\}$
27) $\{2\sqrt{7}, -2\sqrt{7}\}$
28) $\{2\sqrt{23}, -2\sqrt{23}\}$
29) $\{5\sqrt{3}, -5\sqrt{3}\}$
30) $\{\sqrt{59}, -\sqrt{59}\}$
31) $\{2\sqrt{23}, -2\sqrt{23}\}$
32) $\{1.437, -5.104\}$
33) $\{3, -3.8\}$
34) No solution.
35) $\{-1, -3\}$
36) $\{9, 6\}$
37) $\{10\}$
38) $\{-1\}$
39) $\{2\}$
40) $\{6\}$
41) No solution.
42) $\{4, 7\}$
43) $\{-2, 2\}$
44) $\frac{1}{11}$
45) $\frac{2}{3}$
46) $\frac{10}{31}$
47) $-\frac{7}{12}$
48) 6
49) $-\frac{1}{2}$
50) $\frac{3}{5}$
51) $\frac{4}{3}$
52) 2
53) $\frac{1}{2}$
54) 1
55) -2
56) $-\frac{1}{5}$
57) $-\frac{5}{2}$
58) -1
59) Undefined

60)



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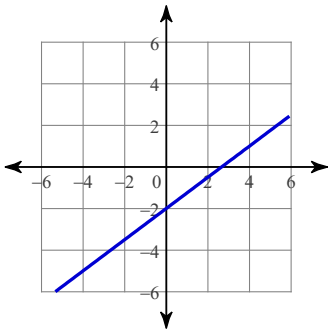

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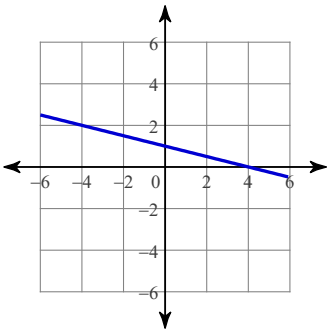

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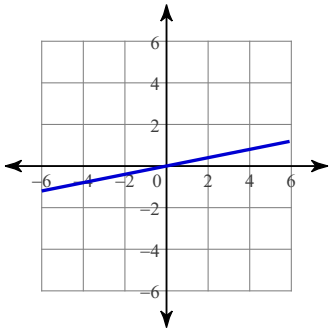

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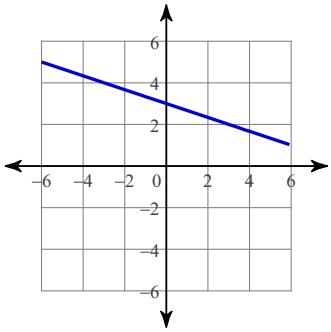

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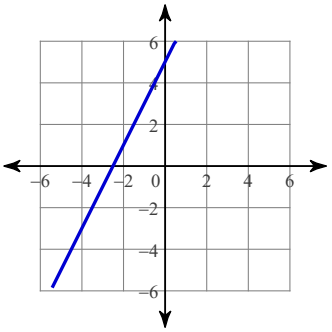


66) $y = 4x - 3$
67) $y = -\frac{5}{2}x$
68) $y = -\frac{7}{4}x - 4$
69) $y = \frac{6}{5}x + 1$
70) $y = -3x + 2$
71) $y = 3x + 5$
72) $y = x - 3$
73) $y = \frac{2}{5}x - 5$

74) $y = \frac{12}{5}x - 4$

75) $y = \frac{16}{7}x + 8$

76) $y = -\frac{7}{4}x - 7$

77) $y = \frac{2}{3}x - 6$

78) $y = \frac{1}{5}x + 1$

79) $y = \frac{1}{7}x + \frac{26}{7}$

80) $y = \frac{2}{5}x + \frac{12}{5}$

81) $y = \frac{8}{7}x + \frac{12}{7}$

82) $y = -2x$

83) $y = -\frac{7}{4}x + \frac{27}{4}$

84) $y = \frac{2}{7}x + \frac{25}{7}$

85) $y = \frac{9}{7}x - \frac{10}{7}$

86) $y = 7x - 32$

87) $x = 5$

88) $y = -6x - 3$

89) $y = \frac{3}{4}x - 3$

90) $y = -x + 1$

91) $y = 2x$

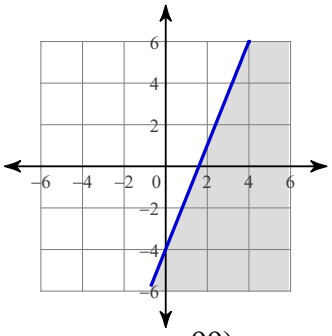
92) $y = -\frac{1}{3}x + 2$

93) $y = \frac{1}{3}x + 4$

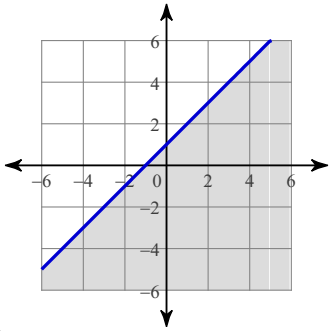
94) $2x - y = -5$

95) $8x - 5y = -25$

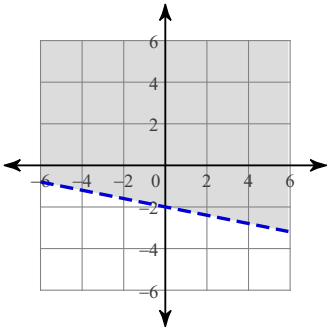
96)



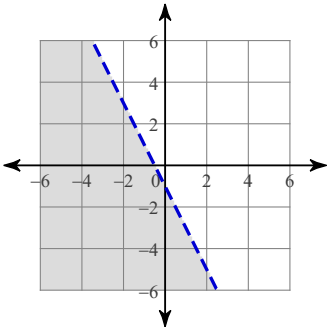
97)



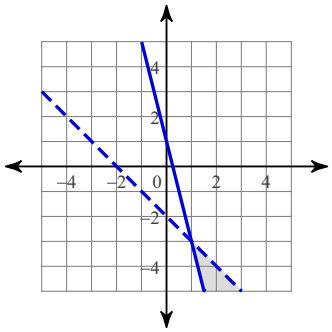
98)



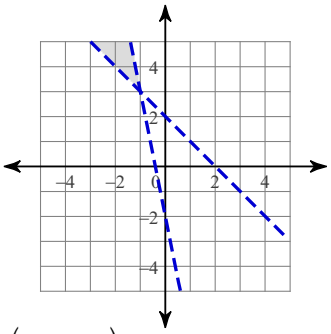
99)



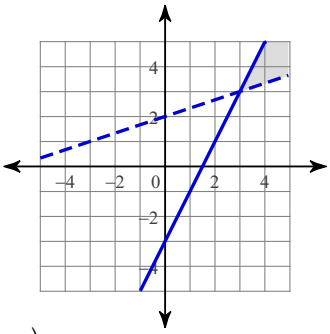
100)



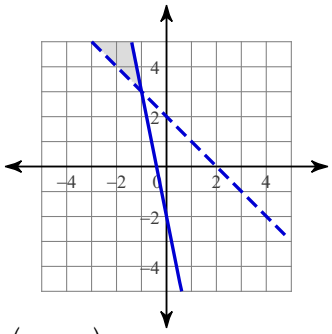
101)



102)



103)



104) $\left(-8, 2\frac{1}{2}\right)$

105) $\left(-3\frac{1}{2}, -8\frac{1}{2}\right)$

106) $\left(2, 5\frac{1}{2}\right)$

107) $\left(0, -1\frac{1}{2}\right)$

108) Infinite number of solutions

109) No solution

110) No solution

111) $(-5, 7)$

112) $(-1, 2)$

113) $(-2, 5)$
114) $(3, -2)$
115) $(4, -5)$
116) $b(b + 6)$
117) $(v + 2)(v + 10)$
118) $(n + 9)(n - 5)$
119) $6(m - 9)^2$
120) $5(x - 6y)(x + y)$
121) $6(x - 2y)(x - 3y)$
122) $6x(x + y)$
123) $4(u + 4v)(u + 3v)$
124) $6(7x + 8y)(x - y)$
125) $3(3x - 10y)(x - 4y)$
126) $3(3p + 5)(3p - 5)$
127) $5(2k + 1)^2$
128) $2(3x + 2)^2$
129) $5(3n + 2)^2$
130) $(r^2 - 7)(3r + 4)$
131) $(4m^2 - 5)(m - 6)$
132) $(5x^2 - 2)(2x - 1)$
133) $(2n^2 - 5)(2n - 5)$
134) $5\sqrt{5}$
135) $-7\sqrt{3}$
136) $-12\sqrt{2} - 2\sqrt{3}$
137) $4\sqrt{2} - \sqrt{6}$
138) $\frac{5y\sqrt{6xy}}{2}$
139) $\frac{6\sqrt{5uv}}{5u}$
140) $\frac{\sqrt{6r} - 3r\sqrt{2}}{6r}$
141) $\frac{2\sqrt{3} - \sqrt{15k}}{3k}$
142) $250k\sqrt{2k}$
143) $-75n^2\sqrt{2n}$
144) $40p^2\sqrt{2p}$
145) $-80\sqrt{x} - 16\sqrt{5x}$
146) $48\sqrt{n} - 16n^3\sqrt{6n}$
147) $4\sqrt{5m} - 10\sqrt{15m}$
148) $-30r - 11\sqrt{5r} - 4$
149) $55\sqrt{n} - 19\sqrt{10n}$
150) $9 + 6\sqrt{2} + 6\sqrt{2x} + 8\sqrt{x}$
151) $-72j^2k^2h\sqrt{2h}$
152) $70xyz\sqrt{xyz}$
153) $20a^2\sqrt{2bc}$
154) $-15m^2p^2q^2\sqrt{5}$
155) $\frac{5}{k(k - 8)}$; $\{0, 8\}$
156) $\frac{4}{a(a + 1)}$; $\{0, -1, -7\}$
157) $\frac{7p + 1}{7}$
158) $\frac{x - 9}{2(x + 6)}$
159) $-\frac{3}{1 + r}$
160) $-\frac{(x - 6)}{4(x + 2)}$
161) $10x$
162) $\frac{1}{v + 6}$
163) $\frac{3}{x^2y^2}$
164) $-4a^3$
165) $-\frac{2}{y^3x^2}$
166) $-\frac{3}{a^2b}$
167) $\frac{y^8}{16x^{16}}$
168) $-64m^{12}n^{12}$
169) $16y^4$
170) $\frac{1}{n^2}$
171) $-y^4x$
172) $\frac{3y}{x^4}$
173) $-\frac{3}{x^3y^2}$
174) $\frac{2y}{3x^3}$
175) $-\frac{v^3}{4u^5}$
176) $-\frac{1}{y^7x^7}$
177) $-\frac{x^9y^8}{2}$
178) $\frac{8}{u^7v^3}$
179) –47
180) 4
181) 209
182) 29
183) One
184) One
185) None
186) Two
187) $\sqrt{13}$
188) $2\sqrt{10}$
189) 62
190) 22.5
191) 68
192) 50