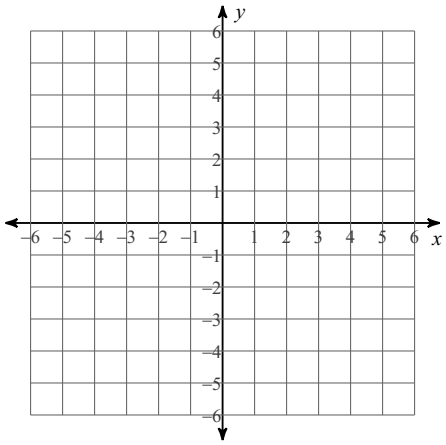
# Summer Work

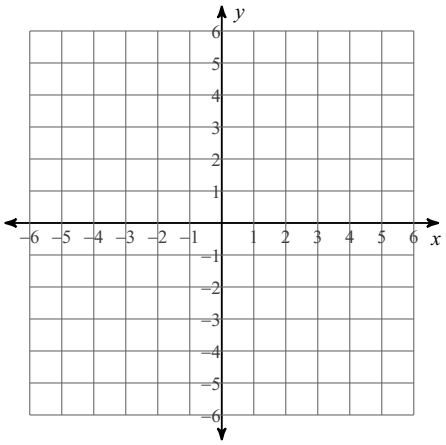
Date_____ Period____

**Sketch the graph of each line.**

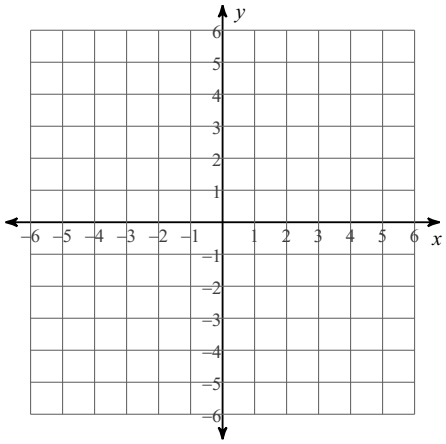
1) $5x + 3y = -9$



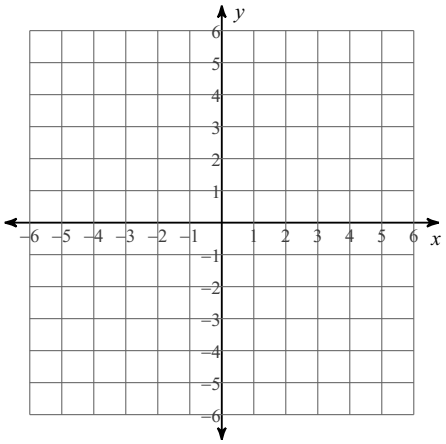

2) $x - 4y = 12$



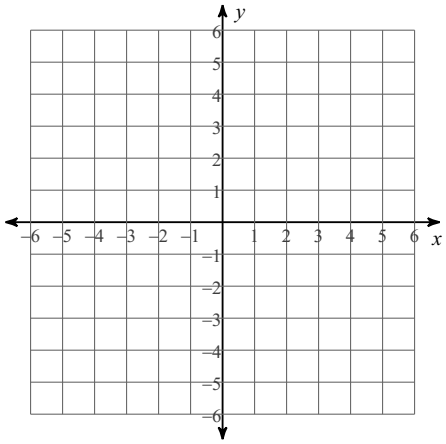

3) $y = \frac{1}{5}x - 4$



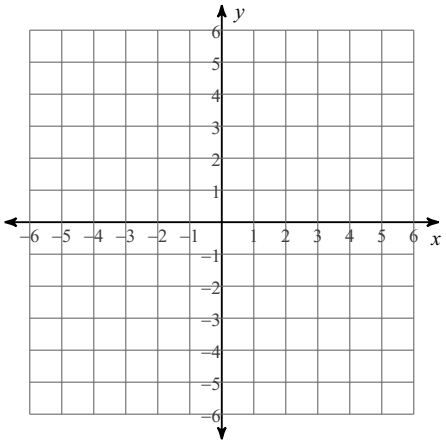

4) $y = 9x - 5$



5) $4 - y = 0$

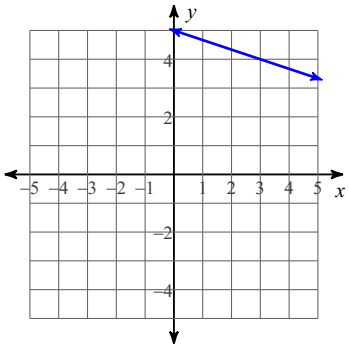



6) $y = -1 - 2x$

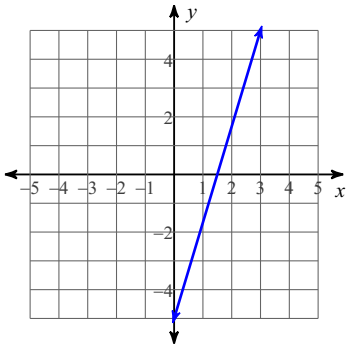



**Write the slope-intercept form of the equation of each line.**

7)




8)




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

9) through: $(5, 2)$, slope $= \frac{7}{5}$

10) through: $(-1, 3)$, slope $= 2$

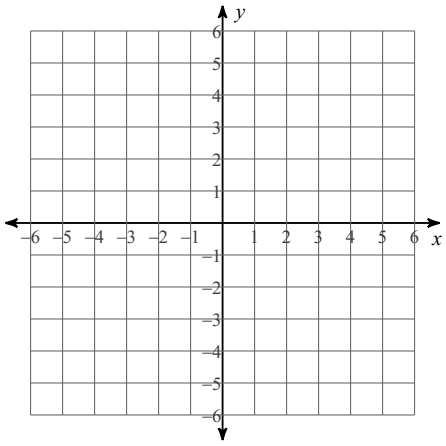
**Write the standard form of the equation of the line described.**

11) through: $(-5, 4)$, perp. to $y = x + 4$

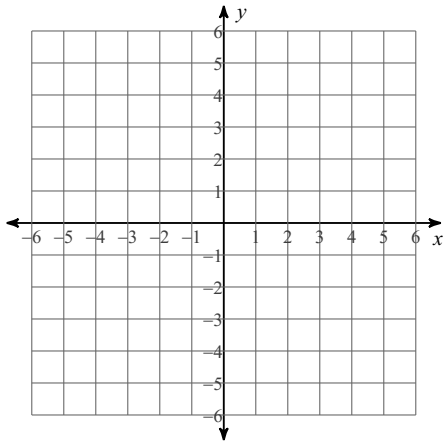
12) through: $(-3, -1)$, perp. to $y = -x + 4$

**Sketch the graph of each linear inequality.**

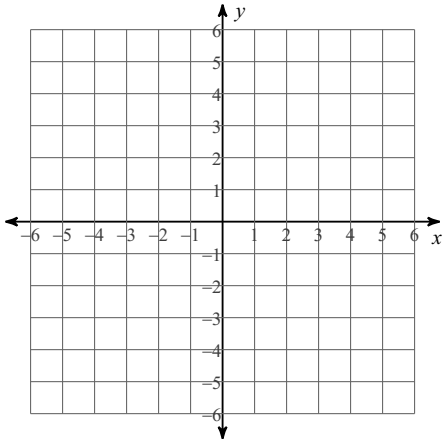
13) $y \leq -\frac{5}{2}x + 5$



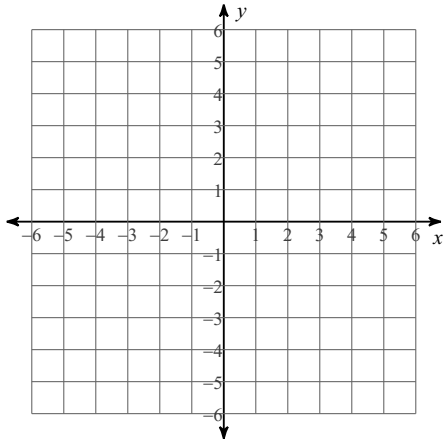

14) $y \geq \frac{5}{4}x + 4$



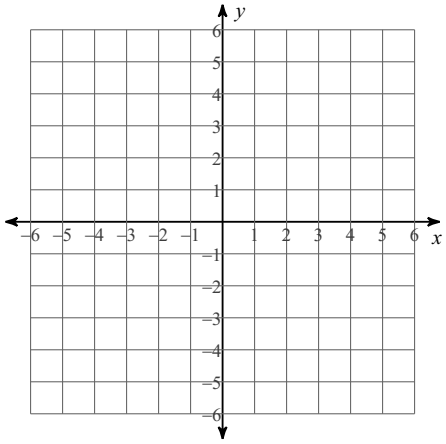

15) $y \leq -3x - 2$



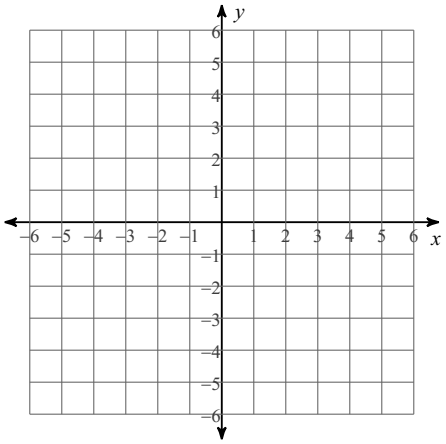

16) $y \leq 9x - 4$



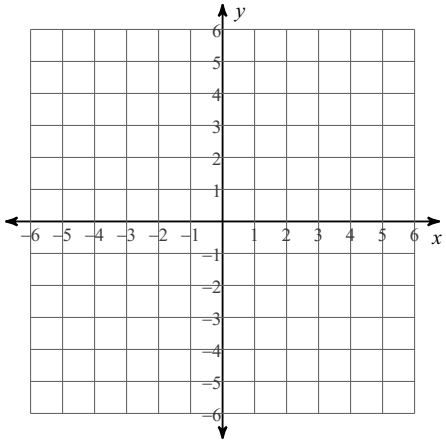
17) $y < -\frac{4}{5}x - 1$



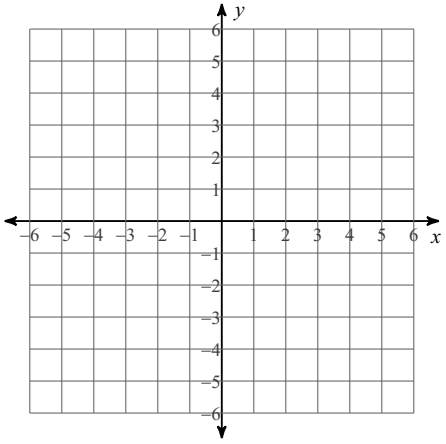

18) $y \leq -x$



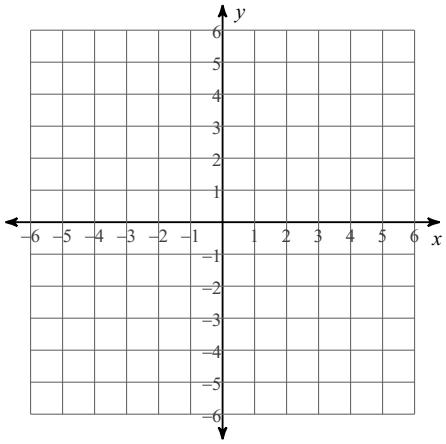

19) $y < -x + 1$



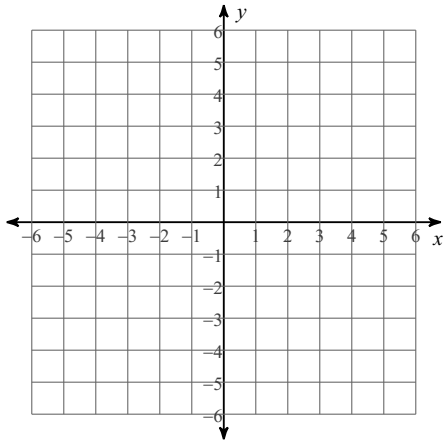

20) $y \geq \frac{9}{2}x - 4$



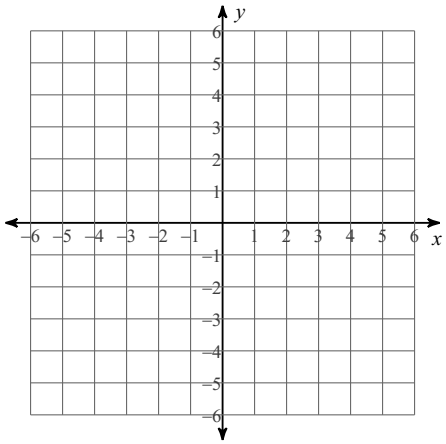
21) $3x - 4y \leq 12$



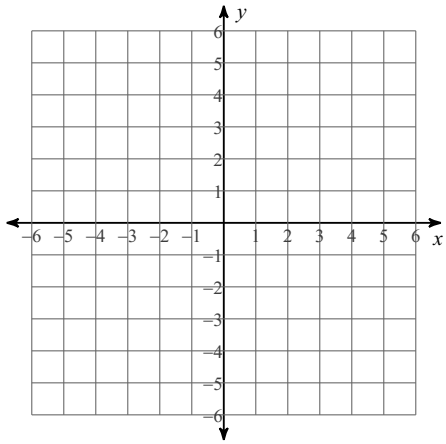

22) $3x + y \leq 2$




23) $5x + y < 3$




24) $y \geq -1$




**Solve each system by elimination.**

25) $10x + 2y = 4$
$-20x - y = -2$

**Solve each system by substitution.**

26) $8x - 5y = 24$
$x - 2y = 3$

**Factor each completely.**

27) $14v^3 + 8v^2 - 49v - 28$

28) $56r^3 - 35r^2 + 64r - 40$

29) $25xy + 15x + 20y + 12$

30) $60uv + 80u + 105v + 140$

31) $15x^3 - 9x^2 + 10x - 6$

32) $40b^3 + 8b^2 + 60b + 12$

33) $r^2 - 10r + 25$

34) $k^2 - 4$

35) $b^4 - 9$

36) $n^4 - 10n^2 + 25$

37) $x^6 - 8x^3 + 16$

38) $a^6 - 9$

39) $2x^6 - 72$

40) $5x^6 + 20x^3 - 60$

41) $4x^8 + 10x^4 + 6$

42) $-5x^6 - 19x^3 - 12$

43) $-15m^6 - 14m^3 + 49$

44) $-6x^6 - 29x^3 - 30$

**Factor each.**

45) $x^8 - 25x^4 + 144 = 0$

46) $x^6 + 63x^3 - 64 = 0$

47) $x^6 - 1 = 0$

48) $x^8 - 34x^4 + 225 = 0$

49) $9x^8 - 85x^4 + 36 = 0$

50) $25x^8 - 226x^4 + 9 = 0$

51) $16x^8 - 169x^4 + 225 = 0$

52) $9x^8 - 229x^4 + 100 = 0$

53) $-64x^3 + 27 = 0$

54) $6x^4 + x^2 - 40 = 0$

55) $15x^3 - 3x^2 + 25x - 5 = 0$

56) $25x^4 - 45x^2 + 18 = 0$

57) $9x^6 - 9x^4 - x^2 + 1 = 0$

58) $4x^6 - 3x^4 - 16x^2 + 12 = 0$

59) $2x^2 - 9x - 5 = 0$

60) $25x^8 - 109x^4 + 36 = 0$

61) $x^6 - 4x^4 - 9x^2 + 36 = 0$

62) $x^8 - 10x^4 + 9 = 0$

63) $x^8 - 29x^4 + 100 = 0$

64) $x^2 + 9x + 20 = 0$

**Solve each equation by factoring.**

65) $n^2 - 3n = 18$

66) $m^2 = 9m - 14$

67) $x^2 = 21 - 4x$

68) $p^2 + 4p = 0$

69) $x^2 = -8x$

70) $n^2 + 9n = -18$

71) $v^2 = -3v + 18$

72) $x^2 = x + 12$

73) $n^2 - 24 = 5n$

74) $b^2 + 7b = -12$

75) $5x^2 - 40x = -60$

76) $5n^2 + 35n = -50$

77) $8a^2 = 8$

78) $n^2 + 11n = -28$

79) $-3 + 8b = -7b^2 + 3b - 1$

80) $-3n^2 + 45n + 42 = 8n - 8n^2$

81) $15v^2 - 46v - 10 = 7v^2 + 2$

82) $7r = 40 - 3r^2$

83) $9n^2 - 35n + 44 = 3n^2 - 5$

**Find the discriminant of each quadratic equation then state the number and type of solutions.**

84) $5b^2 - 2b - 7 = 0$

85) $-10n^2 + 10n - 3 = 0$

86) $10x^2 + 3x + 8 = 0$

87) $-3v^2 - 4v - 9 = 0$

88) $-9p^2 - 6p - 1 = 0$

**Solve each equation by completing the square.**

89) $x^2 - 20x + 72 = -5$

90) $a^2 + 14a - 62 = 2$

91) $b^2 - 6b + 9 = 6$

92) $x^2 - 18x + 47 = -4$

93) $n^2 + 4n - 68 = 9$

**Solve each equation by taking square roots.**

94) $9k^2 - 7 = 18$

95) $9n^2 - 8 = -4$

96) $7n^2 - 8 = 517$

97) $2x^2 - 7 = 169$

98) $4n^2 + 4 = 8$

**Solve each equation with the quadratic formula.**

99) $9b^2 = 8$

100) $6x^2 = -6 - 3x$

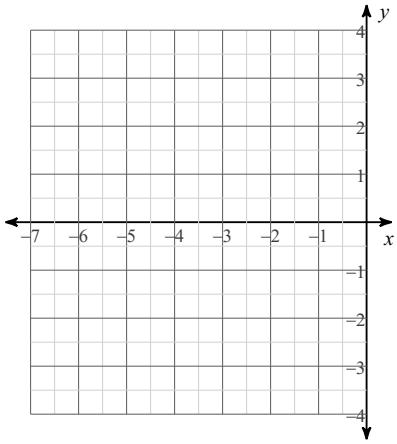
101) $3p^2 = 70 - p$

102) $10r^2 + 2 = 0$

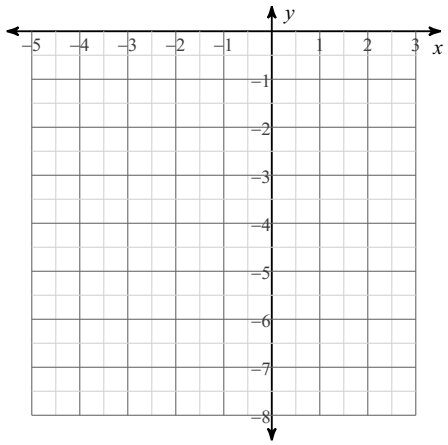
103) $3b^2 - 13 = -4b$

**Sketch the graph of each function.**

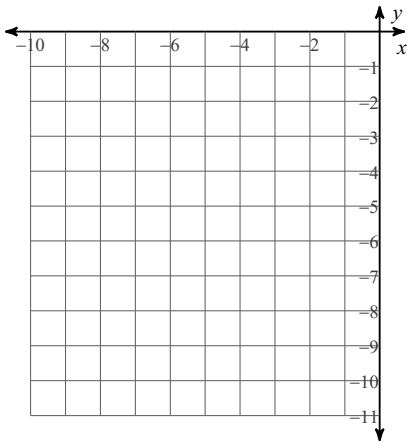
104) $y = -\frac{1}{2}(x+4)^2 + 1$



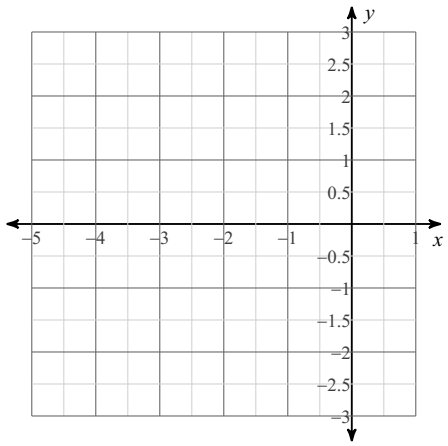

105) $y = -(x+3)^2 - 3$




106) $y = -2(x+3)^2 - 2$

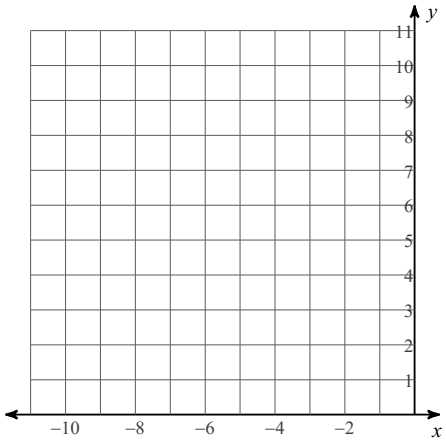



107) $y = -(x+3)^2 + 2$

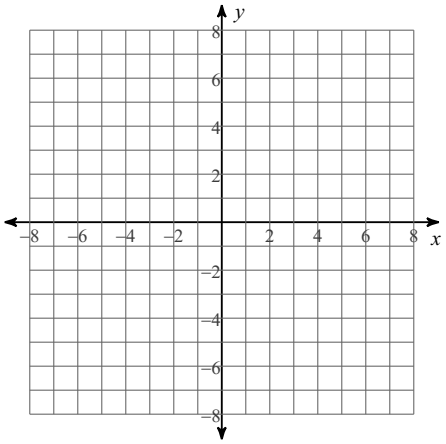


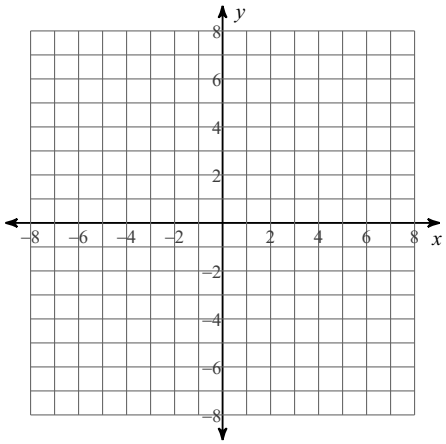
108) $y = 2(x + 4)^2 + 2$



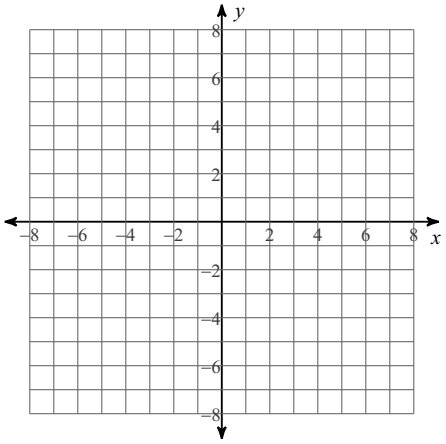

109) $f(x) = x^3 - x^2 - 2$



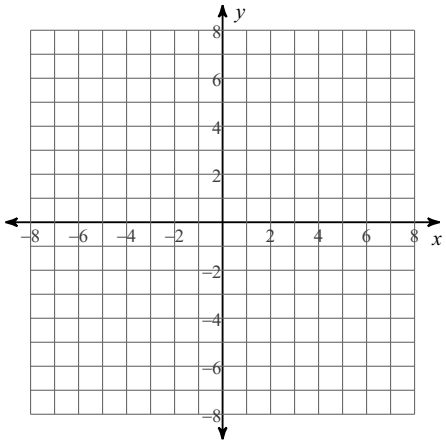

110) $f(x) = -x^4 + 4x^2 - 4$



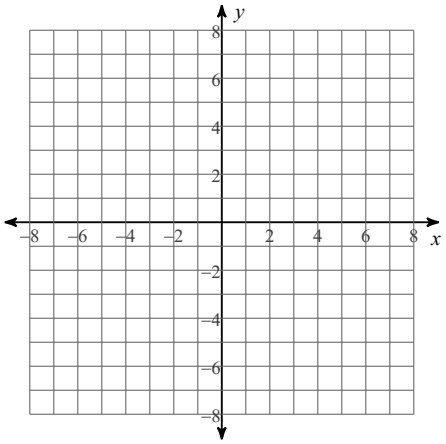

111) $y = 2 + \sqrt{x}$



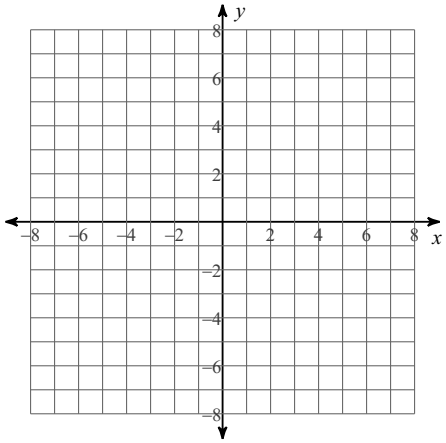

112) $y = 4\sqrt{x - 3}$



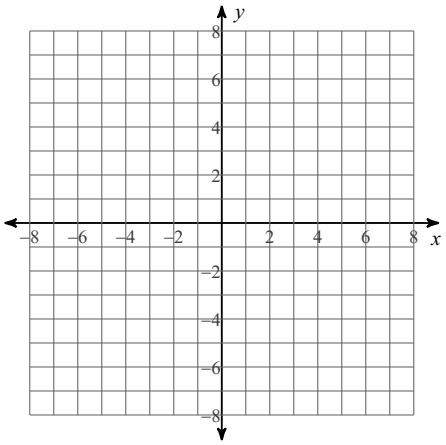

113) $y = \sqrt{x - 4} + 3$



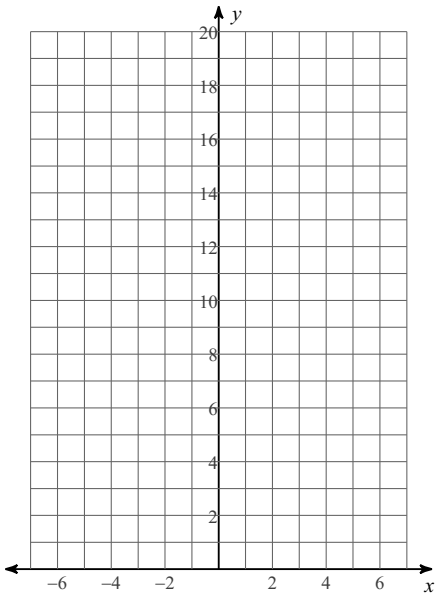
114) $y = \frac{3}{4}\sqrt{x}$



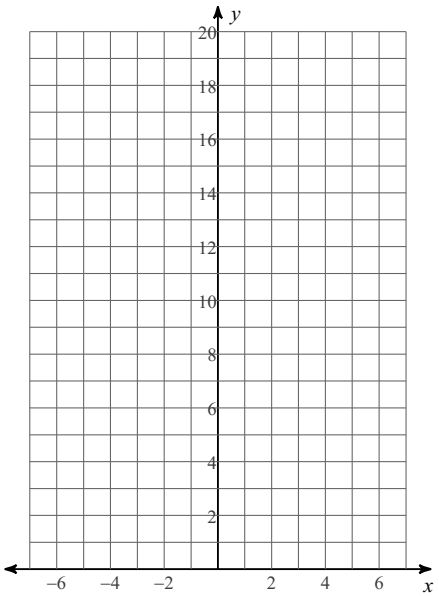

115) $y = \sqrt{x}$



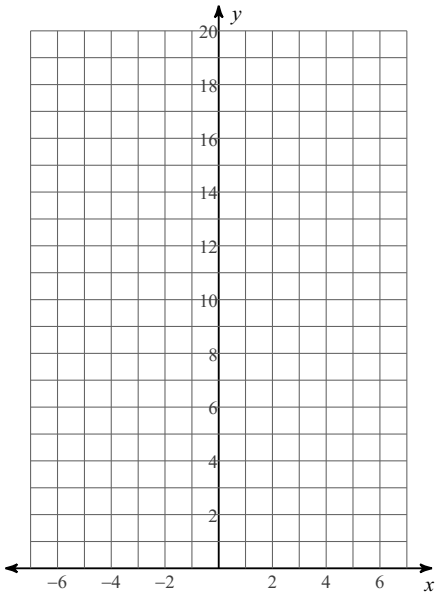

116) $y = \frac{1}{3} \cdot 6^x$



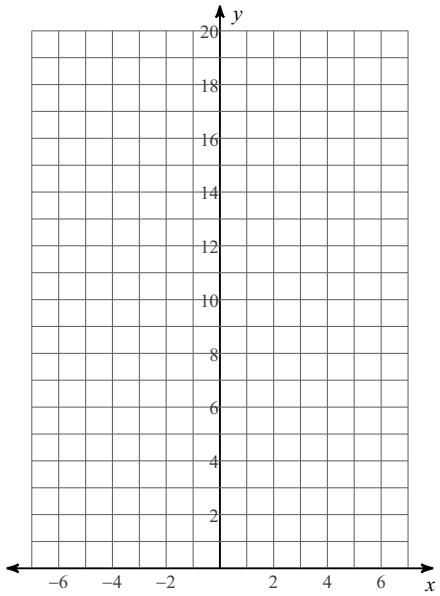

117) $y = \frac{1}{4} \cdot 2^x$



118) $y = 5 \cdot 2^x$




119) $y = 3 \cdot 2^x$




**Find each product.**

120) $(3k - 5)(5k - 4)$

121) $(2b + 4)(5b - 5)$

122) $(3p + 7)^2$

123) $(7n - 2)(7n + 2)$

**Solve each equation. Remember to check for extraneous solutions.**

124) $\frac{1}{2x^2} + \frac{1}{2x} = \frac{1}{x^2}$

125) $\frac{3}{5b^2} = \frac{1}{5b^2} + \frac{2}{5b}$

126) $\frac{1}{2p^2} + \frac{1}{2} = \frac{5}{2p^2}$

127) $\frac{1}{5} = \frac{6p - 36}{p^2} + \frac{6}{5p}$

128) $14 = 8 + \sqrt{9p}$

129) $\sqrt{3n} = \sqrt{2n + 1}$

130) $8 = \sqrt{-4 - 17k}$

131) $\sqrt{3a - 1} = \sqrt{2a}$

132) $1 + \sqrt{4x - 3} = \sqrt{6x - 2}$

133) $\sqrt{4m + 1} - \sqrt{2m - 3} = 2$

134) $\frac{2}{x - 2} - \frac{1}{x^2 - 2x} = \frac{7}{x^2 - 2x}$

135) $\frac{r}{r^2 - r - 20} - \frac{4}{r^2 - r - 20} = \frac{7}{r - 5}$

136) $\frac{3}{x+4} = \frac{4}{x+4} + \frac{2}{x^2+10x+24}$

137) $\frac{2}{r^2+5r-24} = \frac{7}{r^2+5r-24} - \frac{7}{r+8}$

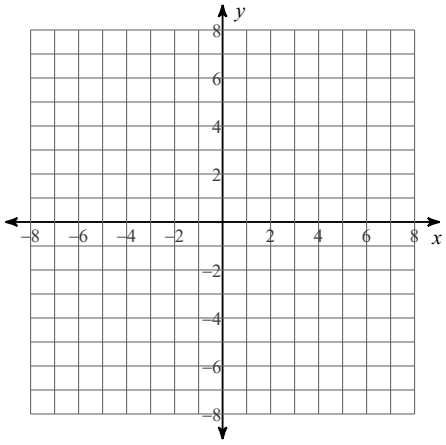
138) $\frac{a+6}{a^2-3a+2} = \frac{2}{a-2} + \frac{1}{a^2-3a+2}$

139) $\frac{2}{v+7} + \frac{5}{v^2+2v-35} = \frac{1}{v+7}$

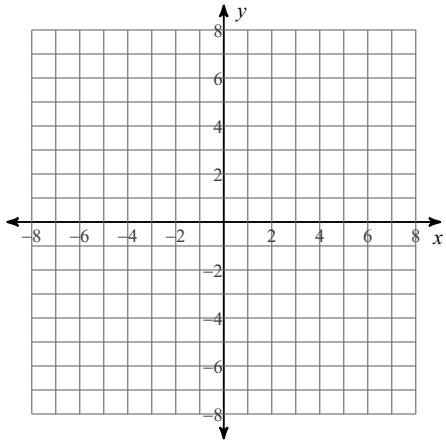
140) $\frac{1}{9p} + \frac{1}{3} = \frac{p-8}{9p}$

**Graph each function.**

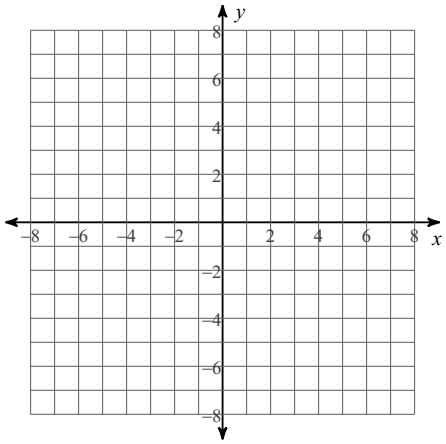
141) $f(x) = \frac{4}{x-1} - 1$



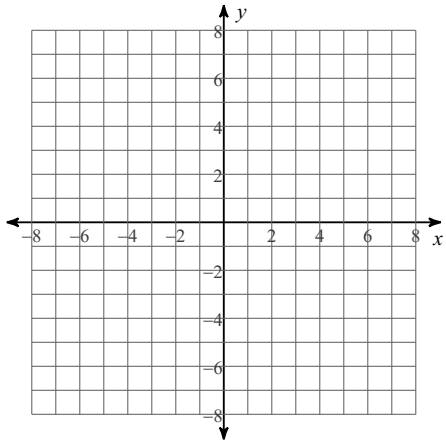

142) $f(x) = -\frac{4}{x+2} - 2$



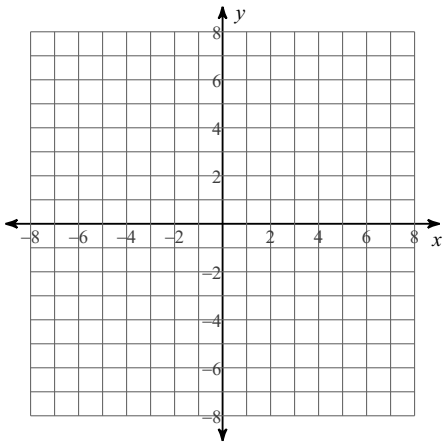

143) $f(x) = -\frac{2}{x-3} - 3$



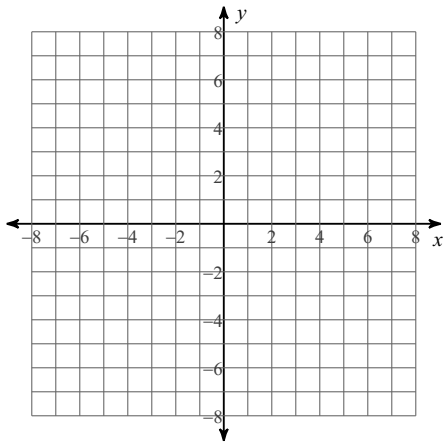

144) $f(x) = -\frac{4}{x-1} - 2$



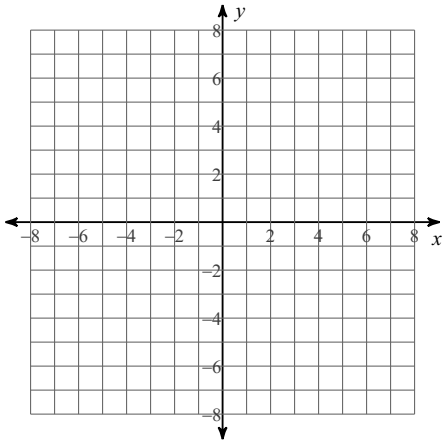
145) $f(x) = \dfrac{3}{x} + 1$



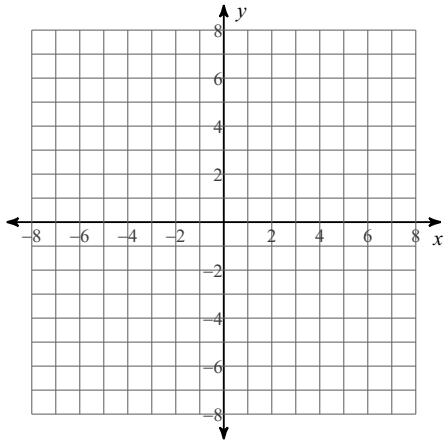

146) $f(x) = \dfrac{x^3 - x^2 - 12x}{3x^2 - 6x - 9}$



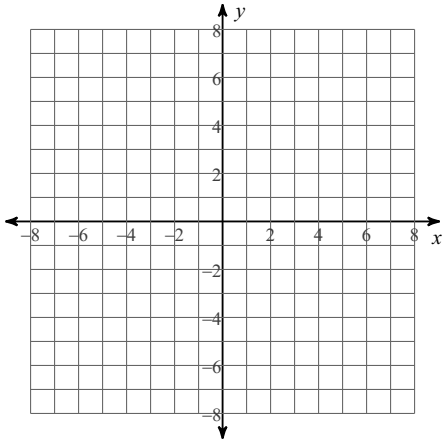

147) $f(x) = \dfrac{x^3 - x}{4x^2 + 4x - 24}$



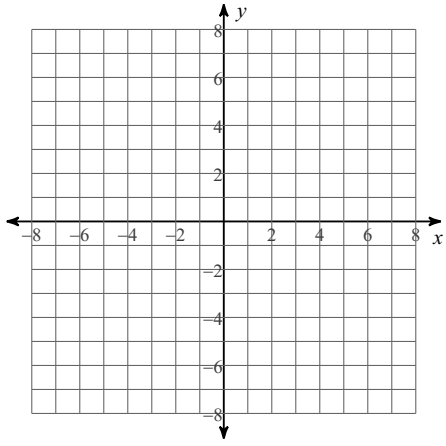

148) $f(x) = \dfrac{x + 2}{2x^2 + 2x - 4}$



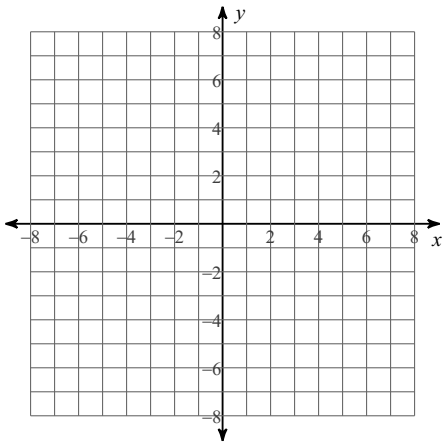

149) $f(x) = \dfrac{3x - 3}{x - 2}$



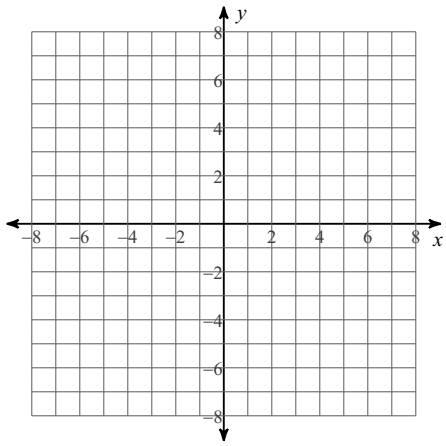

150) $f(x) = \dfrac{x^2 - 3x - 4}{2x^2 - 2x - 12}$



151) $f(x) = \dfrac{x-2}{x^2-3x+2}$




152) $f(x) = \dfrac{x+4}{-3x+3}$




**Simplify each expression.**

153) $\dfrac{a^2-13a+36}{a^2-14a+45} \cdot \dfrac{a+9}{4-a}$

154) $\dfrac{v^2-3v-70}{4} \cdot \dfrac{1}{v^2+15v+56}$

**Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.**

155) $4ba^{-\frac{1}{4}} \cdot a^{\frac{3}{2}}b^{\frac{1}{3}}$

156) $3x^{\frac{3}{2}}y^4 \cdot 2yx^{\frac{3}{2}}$

157) $3xy^{\frac{3}{4}} \cdot x^{-2}y^2$

158) $4x^{\frac{2}{3}} \cdot x$

159) $yx^2 \cdot yx^{\frac{3}{4}} \cdot 4x^{\frac{1}{2}}y^{\frac{1}{2}}$

**Write each expression in exponential form.**

160) $\left(\sqrt[5]{3a}\right)^6$

161) $\sqrt{7x}$

162) $\left(\sqrt[5]{3x}\right)^3$

163) $\sqrt[4]{5n}$

164) $\left(\sqrt[3]{6n}\right)^2$

**Simplify.**

165) $\sqrt{196x^3}$

166) $\sqrt{175a^4}$

167) $\sqrt[3]{1000k^7}$

168) $\sqrt[6]{256r}$

169) $\sqrt{128n^2}$

**Solve each equation.**

170) $2^{1-x} = 2^{-2x+2}$

171) $16^{a} = 4^{3}$

172) $36^{3n} = 216$

173) $4^{3v-3} = 16$

174) $\left(\frac{1}{5}\right)^{3m} = 125^{-m-3}$

175) $125 \cdot 25^{-2m} = 5^{2}$

176) $\frac{4^{1-2x}}{64} = 16$

177) $81^{2-m} = 3^{5}$

178) $625^{-2x} \cdot 125^{x} = 1$

179) $\frac{16^{-m-2}}{\left(\frac{1}{64}\right)^{3m}} = \left(\frac{1}{64}\right)^{-2m}$

180) $625^{-2p} \cdot 25^{3p} = 125^{-3p}$

181) $8^{-2x-1} \cdot 4^{3x} = 64$

182) $2184 = 3k^{\frac{3}{2}} - 3$

183) $16 = (k-18)^{\frac{2}{3}}$

184) $-3x^{-\frac{5}{6}} = -\frac{3}{32}$

185) $54 = 2k^{\frac{3}{4}}$

186) $-4r^{\frac{3}{2}} = -1372$

187) $-4 + 3m^{\frac{3}{2}} = 1532$

188) $(64m)^{-\frac{4}{3}} = \frac{1}{256}$

**Solve each equation. Round your answers to the nearest ten-thousandth.**

189) $4^{-3n} - 3 = 33$

190) $9 \cdot 7^{v-3} = 54$

191) $-8e^{b+10} = -72$

192) $-3 \cdot 11^{-8k} = -3.3$

193) $-8 \cdot 10^{n-9} = -35$

194) $3 \cdot 4^{10v} = 16$

195) $-17^{2a} = -31$

196) $20^{2k} + 1 = 68$

197) $10e^{-10n-5} - 5.2 = 21$

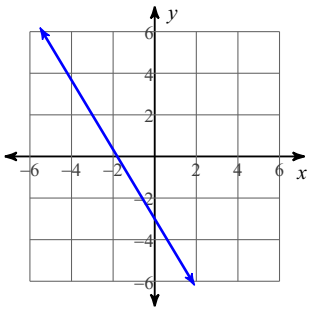
198) $-4e^{4r-1.1} - 7 = -68.7$

199) $5e^{-7p-9} + 1 = 76$

200) $9e^{1-4x} - 3 = 83.1$

# Answers to Summer Work (ID: 1)

1)



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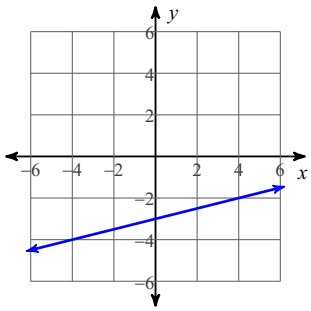

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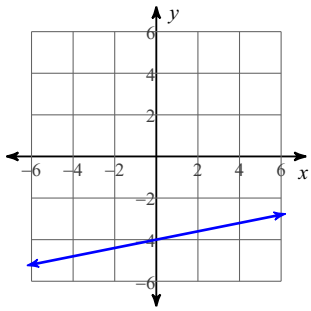

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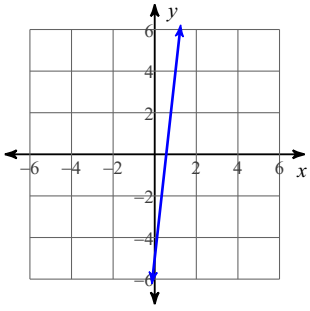

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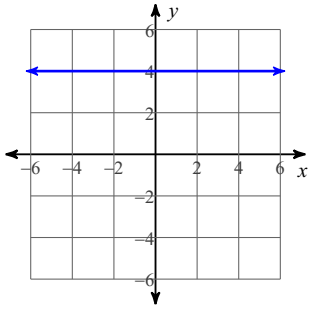

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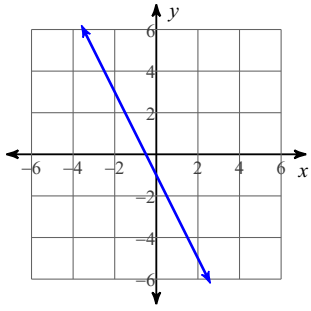


7) $y = -\frac{1}{3}x + 5$

8) $y = \frac{10}{3}x - 5$

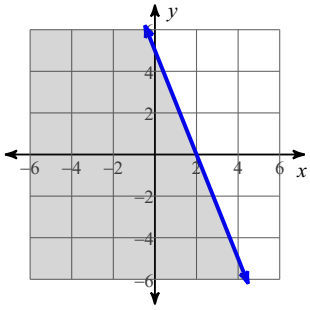
9) $y = \frac{7}{5}x - 5$

10) $y = 2x + 5$

11) $x + y = -1$

12) $x - y = -2$

13)



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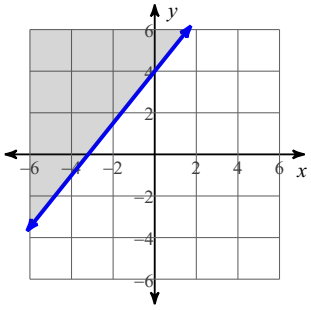

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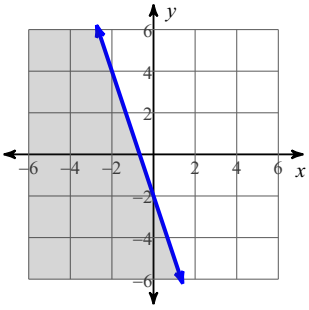

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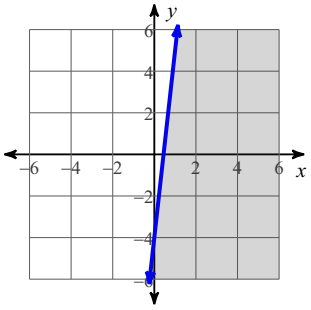

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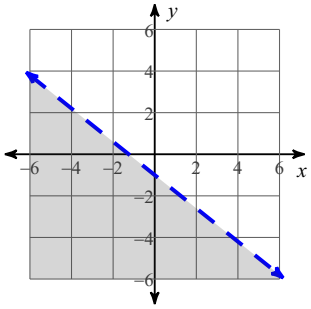

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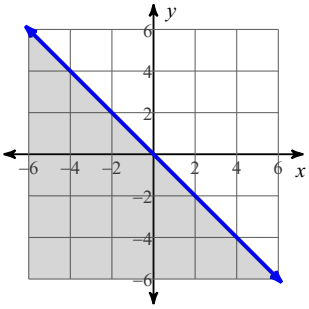

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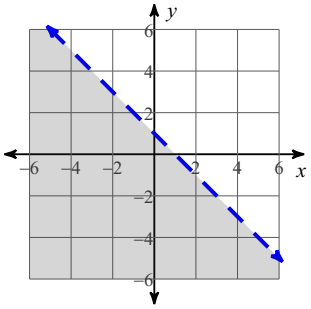
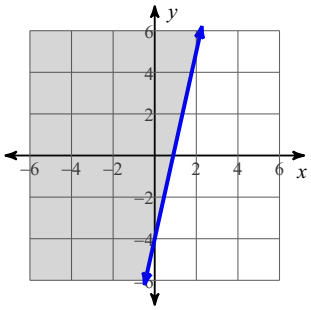
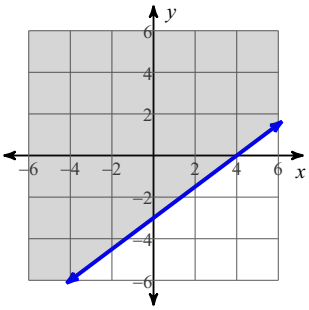
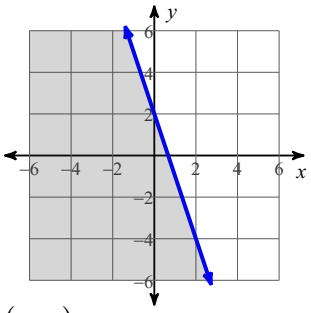
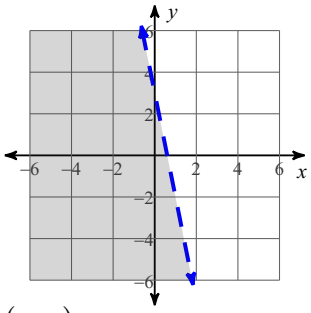
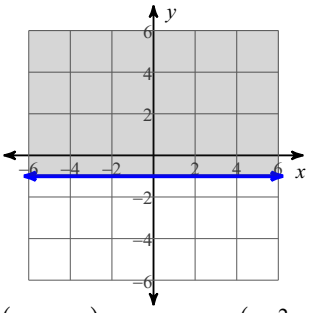


20) 

21) 

22) 

23) 

24) 

25) $(0, 2)$

26) $(3, 0)$

27) $(2v^2 - 7)(7v + 4)$

28) $(7r^2 + 8)(8r - 5)$

29) $(5x + 4)(5y + 3)$

30) $5(4u + 7)(3v + 4)$

31) $(3x^2 + 2)(5x - 3)$

32) $4(2b^2 + 3)(5b + 1)$

33) $(r - 5)^2$

34) $(k + 2)(k - 2)$

35) $(b^2 + 3)(b^2 - 3)$

36) $(n^2 - 5)^2$

37) $(x^3 - 4)^2$

38) $(a^3 + 3)(a^3 - 3)$

39) $2(x^3 + 6)(x^3 - 6)$

40) $5(x^3 - 2)(x^3 + 6)$

41) $2(2x^4 + 3)(x^4 + 1)$

42) $-(5x^3 + 4)(x^3 + 3)$

43) $-(5m^3 - 7)(3m^3 + 7)$

44) $-(3x^3 + 10)(2x^3 + 3)$

45) $(x - 2)(x + 2)(x^2 + 4)(x^2 - 3)(x^2 + 3) = 0$

46) $(x - 1)(x^2 + x + 1)(x + 4)(x^2 - 4x + 16) = 0$

47) $(x - 1)(x^2 + x + 1)(x + 1)(x^2 - x + 1) = 0$

48) $(x^2 - 5)(x^2 + 5)(x^2 - 3)(x^2 + 3) = 0$

49) $(x^2 - 3)(x^2 + 3)(3x^2 - 2)(3x^2 + 2) = 0$

50) $(x^2 - 3)(x^2 + 3)(5x^2 - 1)(5x^2 + 1) = 0$

51) $(4x^2 - 5)(4x^2 + 5)(x^2 - 3)(x^2 + 3) = 0$

52) $(x^2 - 5)(x^2 + 5)(3x^2 - 2)(3x^2 + 2) = 0$

53) $(4x - 3)(-16x^2 - 12x - 9) = 0$

54) $(3x^2 + 8)(2x^2 - 5) = 0$

55) $(5x - 1)(3x^2 + 5) = 0$

56) $(5x^2 - 6)(5x^2 - 3) = 0$

57) $(x - 1)(x + 1)(3x^2 - 1)(3x^2 + 1) = 0$

58) $(4x^2 - 3)(x^2 - 2)(x^2 + 2) = 0$

59) $(2x + 1)(x - 5) = 0$

60) $(5x^2 - 3)(5x^2 + 3)(x^2 - 2)(x^2 + 2) = 0$

61) $(x - 2)(x + 2)(x^2 - 3)(x^2 + 3) = 0$

62) $(x^2 - 3)(x^2 + 3)(x - 1)(x + 1)(x^2 + 1) = 0$

63) $(x^2 - 2)(x^2 + 2)(x^2 - 5)(x^2 + 5) = 0$

64) $(x + 4)(x + 5) = 0$

65) $\{6, -3\}$

66) $\{7, 2\}$

67) $\{3, -7\}$

68) $\{-4, 0\}$

69) $\{-8, 0\}$

70) $\{-3, -6\}$

71) $\{3, -6\}$

72) $\{-3, 4\}$

73) $\{8, -3\}$

74) $\{-4, -3\}$

75) $\{2, 6\}$

76) $\{-5, -2\}$

77) $\{1, -1\}$

78) $\{-4, -7\}$

79) $\left\{\frac{2}{7}, -1\right\}$

80) $\left\{-\frac{7}{5}, -6\right\}$

81) $\left\{-\frac{1}{4}, 6\right\}$

82) $\left\{\frac{8}{3}, -5\right\}$

83) $\left\{\frac{7}{2}, \frac{7}{3}\right\}$

84) 144; two real solutions

85) −20; two imaginary solutions

86) −311; two imaginary solutions

87) −92; two imaginary solutions

88) 0; one real solution

89) $\{10 + \sqrt{23}, 10 - \sqrt{23}\}$

90) $\{-7 + \sqrt{113}, -7 - \sqrt{113}\}$

91) $\{3 + \sqrt{6}, 3 - \sqrt{6}\}$

92) $\{9 + \sqrt{30}, 9 - \sqrt{30}\}$

93) $\{7, -11\}$

94) $\left\{\frac{5}{3}, -\frac{5}{3}\right\}$

95) $\left\{\frac{2}{3}, -\frac{2}{3}\right\}$

96) $\{5\sqrt{3}, -5\sqrt{3}\}$

97) $\{2\sqrt{22}, -2\sqrt{22}\}$

98) $\{1, -1\}$

99) $\left\{\frac{2\sqrt{2}}{3}, -\frac{2\sqrt{2}}{3}\right\}$

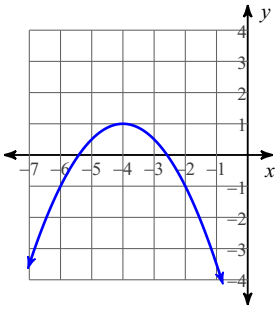
100) $\left\{\frac{-1 + i\sqrt{15}}{4}, \frac{-1 - i\sqrt{15}}{4}\right\}$

101) $\left\{\frac{14}{3}, -5\right\}$

102) $\left\{\frac{i\sqrt{5}}{5}, -\frac{i\sqrt{5}}{5}\right\}$

103) $\left\{\frac{-2+\sqrt{43}}{3}, \frac{-2-\sqrt{43}}{3}\right\}$

104)



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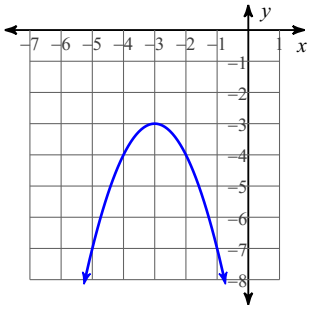

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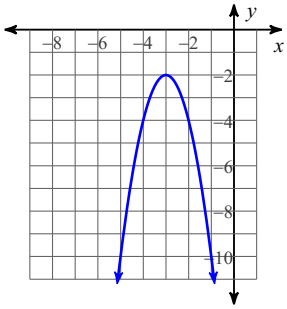

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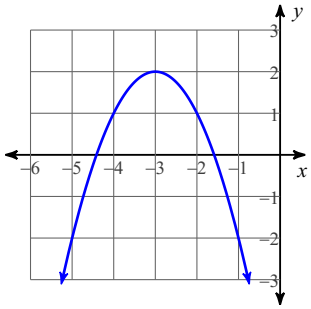

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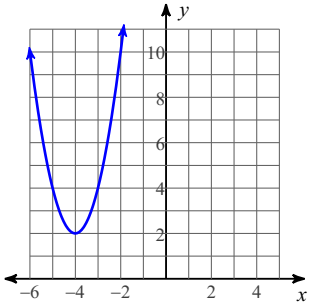

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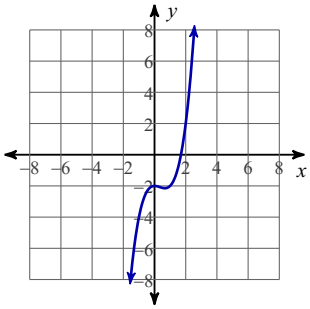

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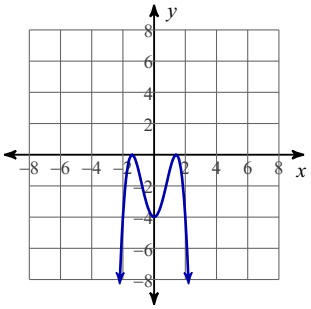

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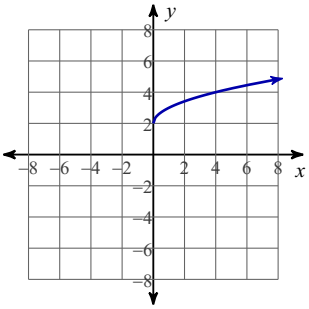

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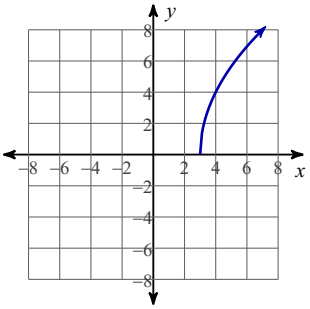

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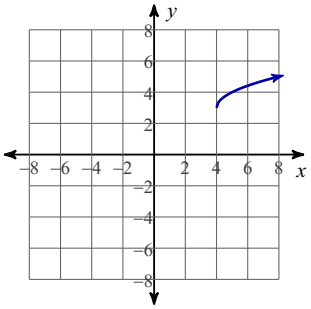

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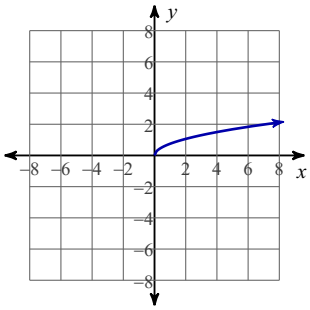

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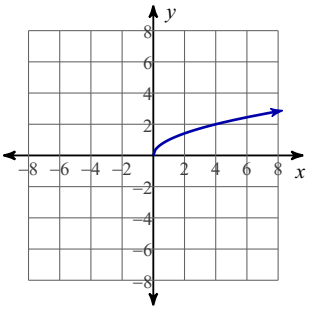

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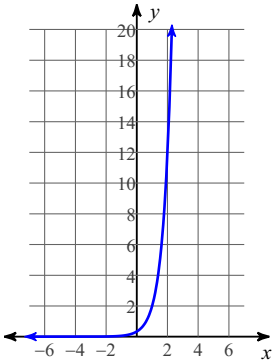
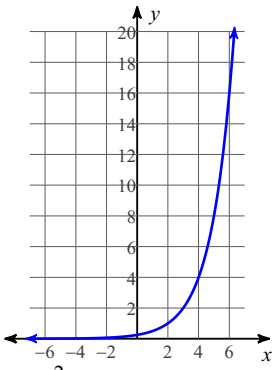
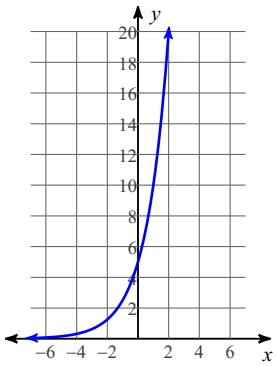
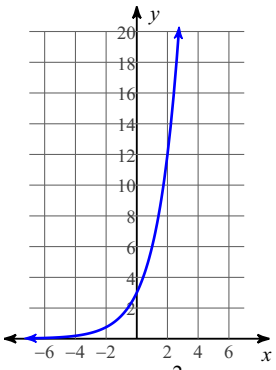


117) 

118) 

119) 

120) $15k^2 - 37k + 20$

121) $10b^2 + 10b - 20$

122) $9p^2 + 42p + 49$

123) $49n^2 - 4$

124) $\{1\}$

125) $\{1\}$

126) $\{2, -2\}$

127) $\{30, 6\}$

128) $\{4\}$

129) $\{1\}$

130) $\{-4\}$

131) $\{1\}$

132) $\{3, 1\}$

133) $\{6, 2\}$

134) $\{4\}$

135) $\left\{-\frac{16}{3}\right\}$

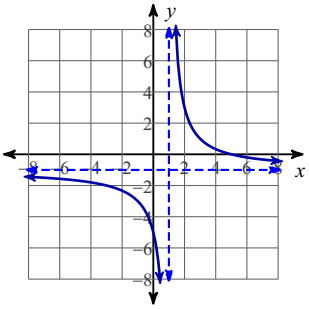
136) $\{-8\}$

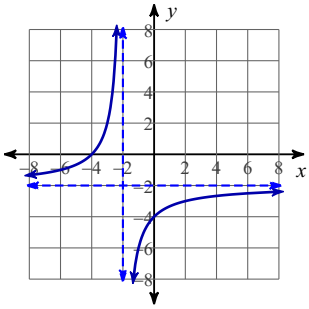
137) $\left\{\frac{26}{7}\right\}$

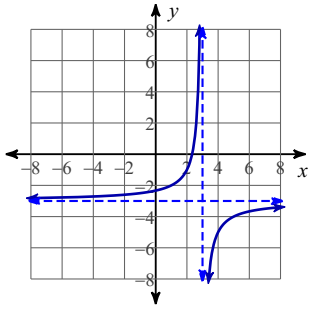
138) $\{7\}$

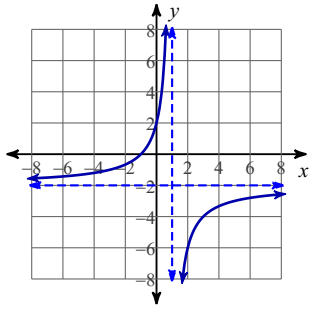
139) $\{0\}$

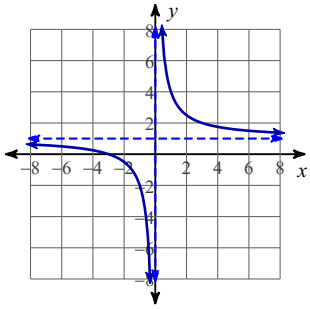
140) $\left\{-\frac{9}{2}\right\}$

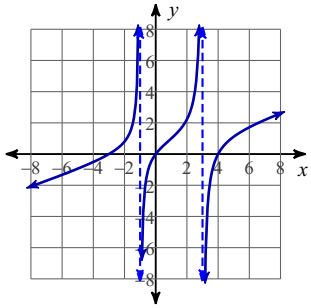
141) 

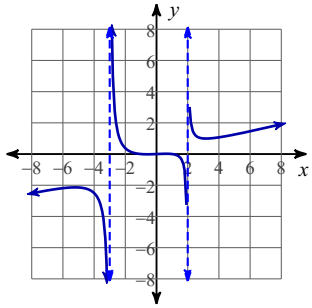
142) 

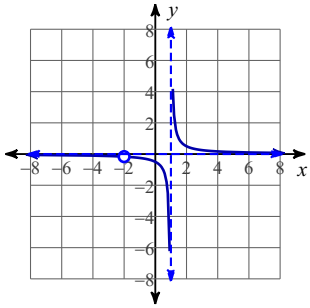
143) 

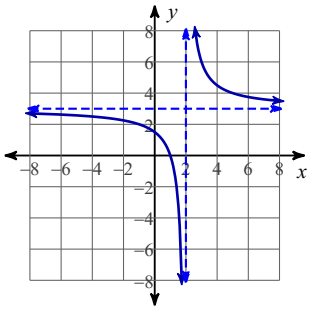
144) 

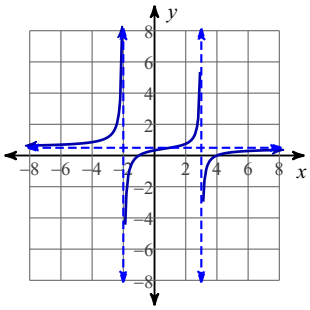
145) 

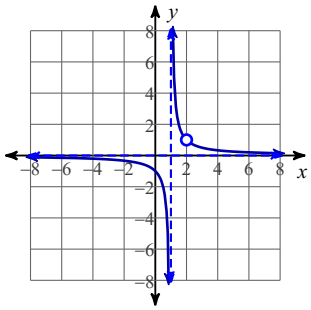
146) 

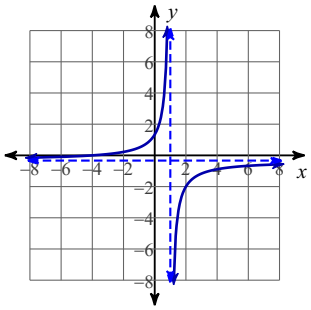
147) 

148) 

149) 

150) 

151) 

152) 

153) $\dfrac{-a-9}{a-5}$

154) $\dfrac{v-10}{4(v+8)}$

155) $4a^{\frac{5}{4}}b^{\frac{4}{3}}$

156) $6y^5 \cdot x^3$

157) $\dfrac{3y^{\frac{11}{4}}}{x}$

158) $4x^{\frac{5}{3}}$

159) $4x^{\frac{13}{4}}y^{\frac{5}{2}}$

160) $(3a)^{\frac{6}{5}}$

161) $(7x)^{\frac{1}{2}}$

162) $(3x)^{\frac{3}{5}}$

163) $(5n)^{\frac{1}{4}}$

164) $(6n)^{\frac{2}{3}}$

165) $14x\sqrt{x}$

166) $5a^2\sqrt{7}$

167) $10k^2\sqrt[3]{k}$

168) $2\sqrt[6]{4r}$

169) $8n\sqrt{2}$

170) $\{1\}$

171) $\left\{\frac{3}{2}\right\}$

172) $\left\{\frac{1}{2}\right\}$

173) $\left\{\frac{5}{3}\right\}$

174) No solution.

175) $\left\{\frac{1}{4}\right\}$

176) $\{-2\}$

177) $\left\{\frac{3}{4}\right\}$

178) $\{0\}$

179) $\{4\}$

180) $\{0\}$

181) No solution.

182) $\{81\}$

183) $\{82, -46\}$

184) $\{64\}$

185) $\{81\}$

186) $\{49\}$

187) $\{64\}$

188) $\{1, -1\}$

189) $-0.8617$

190) $3.9208$

191) $-7.8028$

192) $-0.005$

193) $9.641$

194) $0.1208$

195) $0.606$

196) $0.7018$

197) $-0.5963$

198) $0.959$

199) $-1.6726$

200) $-0.3146$