Name: _____ Date: _____ Period: _____

Algebra 1
Semester 2 Final Review

1. Given $y = mx + b$ what does m represent? What does b represent?

2. What axis is generally used for x?

3. What axis is generally used for y?

4. Given the equation $y = \dfrac{5}{8}x - 4$ what is the slope? What is the y-intercept?

5. Given the equation $y = -\dfrac{2}{3}x + 7$ what is the slope of the line parallel to this line? What is the slope of the line perpendicular to this line?

6. Graph the function $x = -2$

7. Graph the function $y = 4$
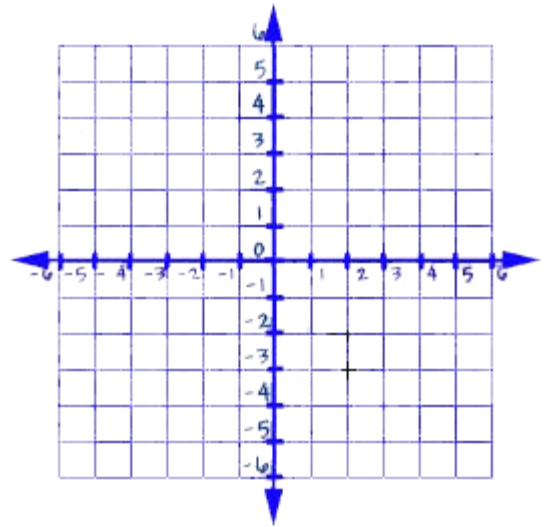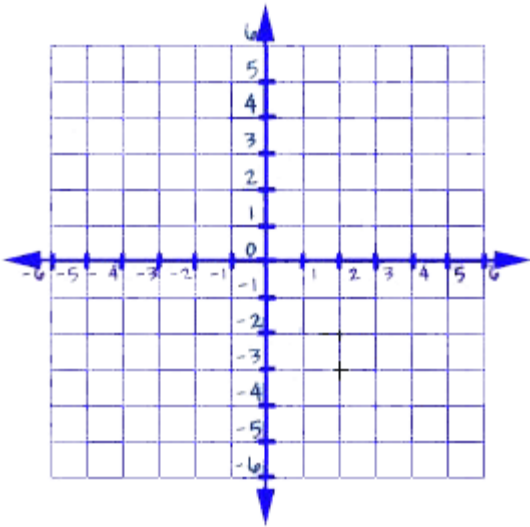
8. Find the slope of the line that passes through the points $(6, 2)$ and $(-3, 7)$.

What is the x-intercept of the given function?

9. $4x - y = 8$

10. $3x - 2y = 24$

11. $5x + 2y = 10$

12. $-2x + 4y = 8$

What is the y-intercept of the given function?

13. $4x - y = 8$

14. $3x - 2y = 24$

15. $5x + 2y = 10$

16. $-2x + 4y = 8$

What is the slope of the given function?

17. $4x - y = 8$

18. $3x - 2y = 24$

Convert the given function into slope-intercept form.

19. $4x - y = 8$

20. $3x - 2y = 24$

21. Which point is on the line $y = \dfrac{2}{3}x + 1$?

   a)   (-3, 1)   b)   (2, 1)

   c)   (3, 3)   d)   (-2, 3)

22. Which point is on the line $y = \dfrac{1}{4}x - 2$?

   a)   (0, 2)   b)   (4, -1)

   c)   (4, -2)   d)   (2, 0)
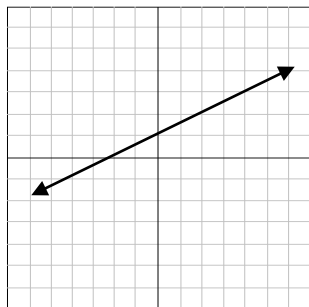
23. Which point is on the line $3x - y = 9$?

   a)   (6, 2)   b)   (4, -2)

   c)   (3, 0)   d)   (-3, 0)

24. Which point is on the line $5x + y = 10$?

   a)   (2, 0)   b)   (2, -5)

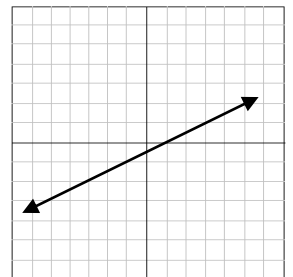   c)   (5, -10)   d)   (0, -5)

25. Which point is on the line shown on the graph?

   a) (1, 0)

   b) (3, 4)

   c) (4, 3)

   d) (0, -2)

26. Which point is on the line shown on the graph?

   a)   (2, 0)
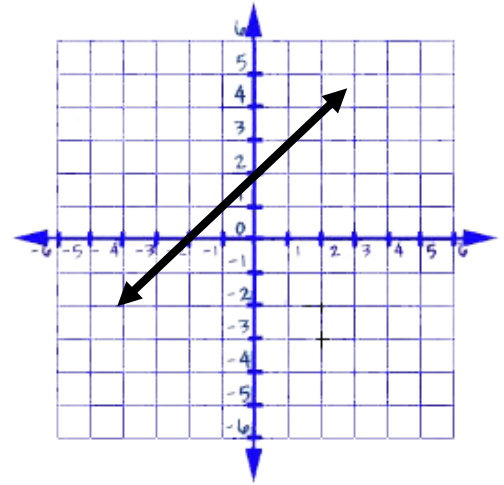
   b)   (3, 1)

   c)   (3, -3)

   d)   (-3, 1)

27. Is (4, 3) a solution to the equation y = -3x + 10 ?   28. Is (4, 3) a solution to the equation y = 3x – 9 ?

For problems 29 and 30 use the graph to the right.

29. Is the point (3, 1) a solution to the equation of this line?

30. Is the point (-2, 0) a solution to the equation of this line?

Convert the following equations to standard form with integer coefficients.

31. $y = \frac{1}{2}x - 4$ 32. $y = -\frac{2}{3}x + 1$

Given the following slope, what is the slope of a parallel line?

33. Given slope = $-\frac{3}{4}$ 34. Given slope = 5

Given the following slope, what is the slope of a perpendicular line?

35. Given slope = $-\frac{3}{4}$ 36. Given slope = 5

Write an equation of a line in *point-slope form* that goes through the given point and has the given slope.

37. (3, 5); m = 2   38. (6, 1) ; m = $\frac{1}{2}$

39. (– 1, 2); m = -3   40. (2, – 2); m = $-\frac{3}{4}$

Write an equation of a line in *slope-intercept form* that has the given y-intercept and the given slope.

41. y-intercept is -2 and the slope is $\frac{5}{8}$ 42. y-intercept is 13 and the slope is 4

Write an equation of a line in *slope-intercept form* that goes through the given point and has the given slope.

43. (0, 2); -2

44. (0, -5); $\frac{4}{3}$

Write an equation of a line in *slope-intercept form* that goes through the given point and has the given slope.

45. $(-3,4)$ and has a slope of 0

46. $(-3,4)$ and has an undefined slope

Write the equation of the line in *slope intercept form* that goes through the given points.

47. $(-3,4)$ and $(1,12)$

48. $(2,4)$ and $(-2,0)$

Write in equation of the line in *slope-intercept form* that goes through the given points and has the given slope.

49. $(-3,4)$ and has a slope of -2

50. $(-3,4)$ and $m=3$

51. Write the equation of the line that goes through $(0,0)$ and $m=3$.

52. Plot the following points on the given plane.

$(4,0)$ $(0,-4)$ $(-1,5)$ $(-5,-1)$
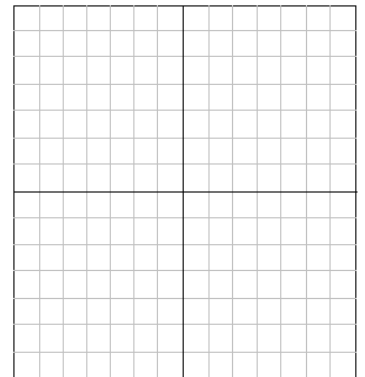
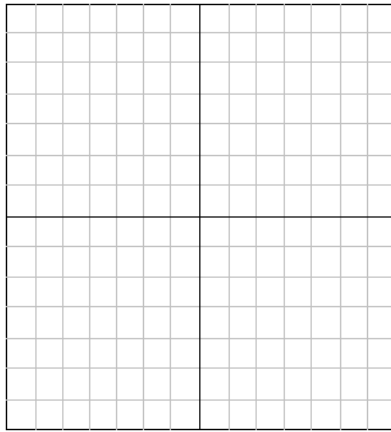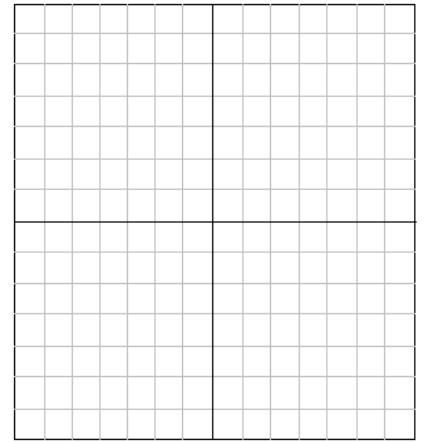Graph each of the following equations.
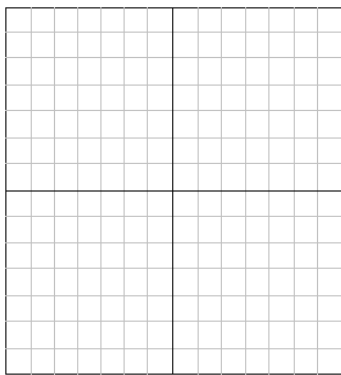
53. $y=-x$
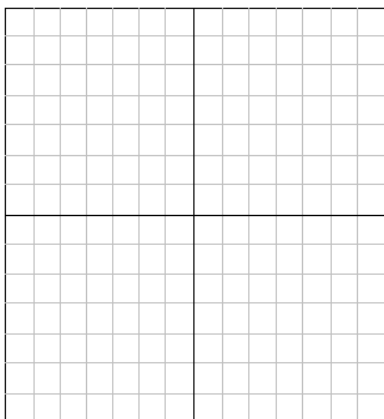
54. $y=3x$
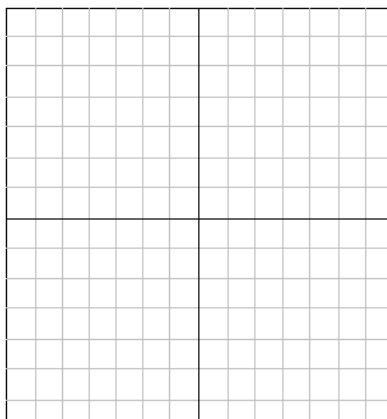
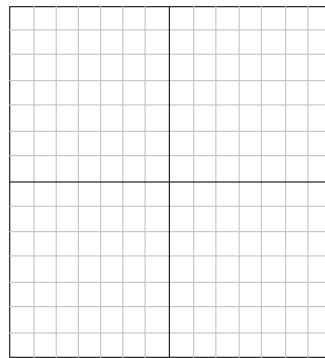55. $y=\frac{1}{3}x$
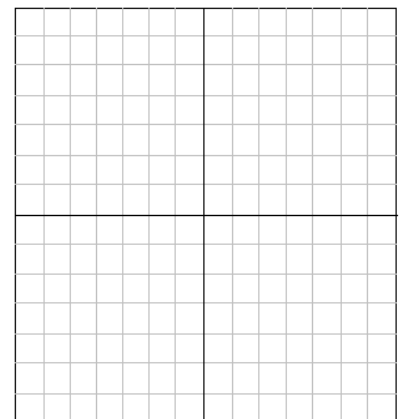
56. $y = \dfrac{3}{2}x$
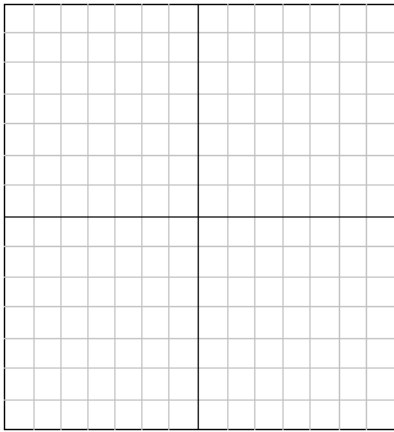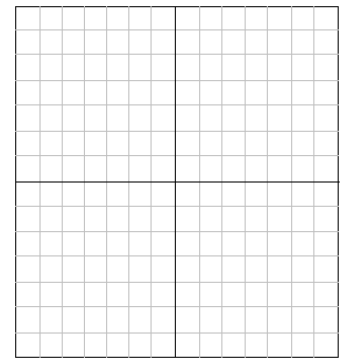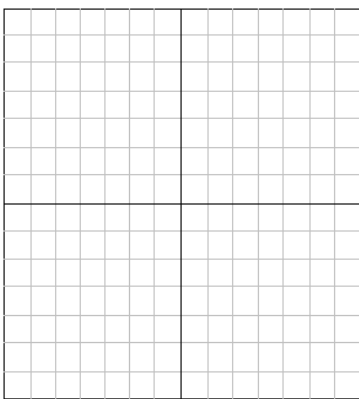
57. $y = \dfrac{2}{3}x + 4$
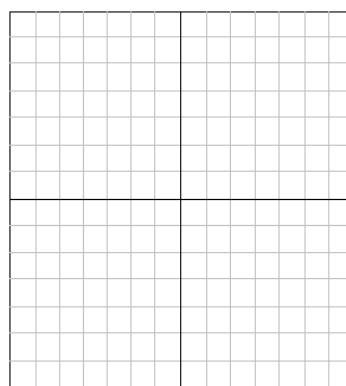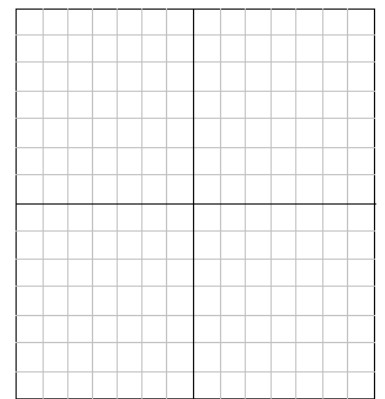
58. $3y = 9x - 6$
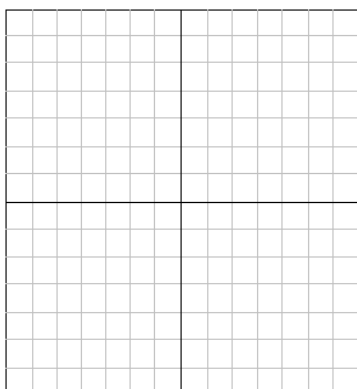
59. $y = -x + 3$

60. $y = x$

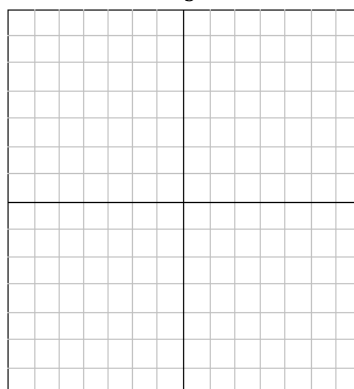61. $y = x + 3$

62. $y = x + 4$

63. $y = -\dfrac{2}{3}x + 3$
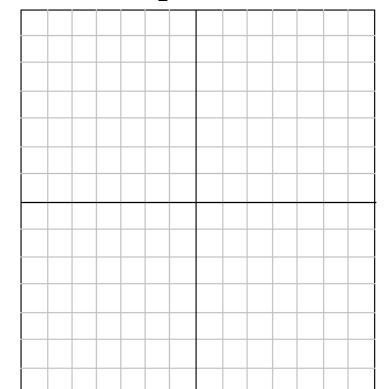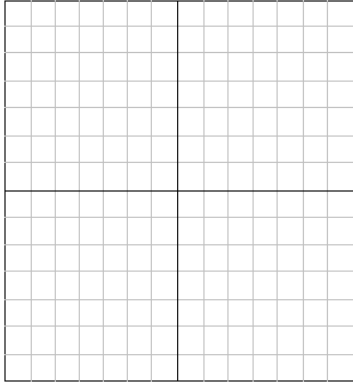
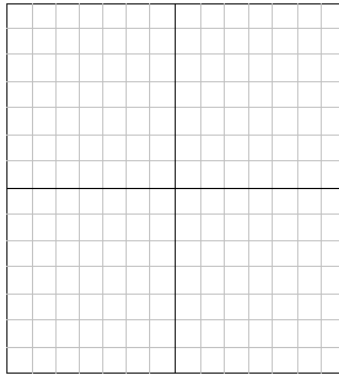64. $y = -\dfrac{1}{3}x + 4$

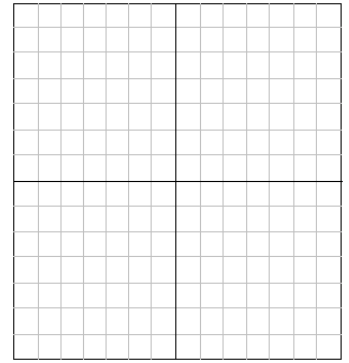64. $y = -3x$

66. $y = \frac{4}{3}x - 2$
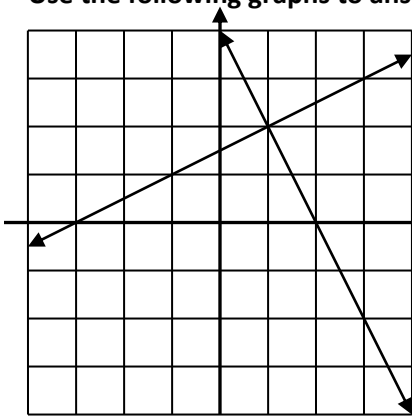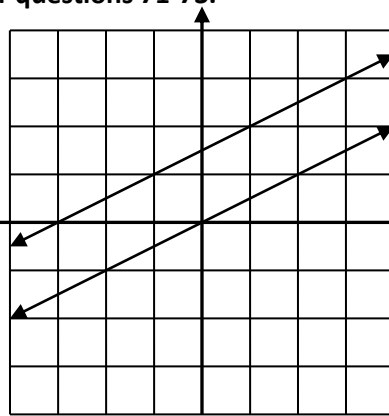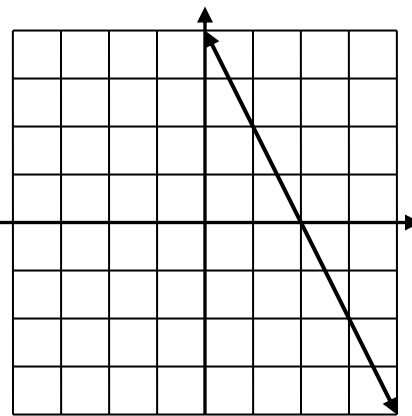
67. $y = \frac{3}{2}x - 4$

68. $x = 2$

69. $x = 5$

70. $y = 2$

Use the following graphs to answer questions 71-73.

Graph A

Graph B

Graph C

71. Which of the graphs above suggests one solution to the system of linear equations?

72. Which of the graphs above suggests no solutions to the system of linear equations?

73. Which of the graphs above suggests an infinite number of solutions to the system of linear equations?

74. When algebraically solving the system of linear equations represented in Graph A, one might get

    a. $x = 1,\ y = 2$ b. $2 = 2$ c. $2 = 3$ d.   none of these

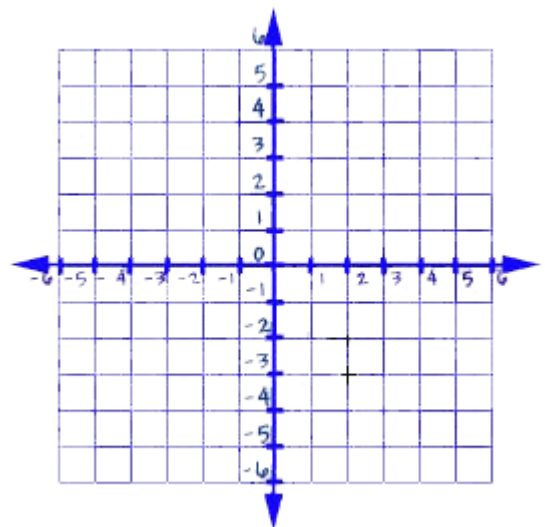75. When algebraically solving the system of linear equations represented in Graph B, one might get

    a. $x = 1,\ y = 2$ b. $2 = 2$ c.

    $2 = 3$ d.   none of these

76. When algebraically solving the system of linear equations represented in Graph C, one might get

    a. $x = 1,\ y = 2$ b. $2 = 2$

    c. $2 = 3$ d.   none of these

77. Graph the following equations $y = 3x + 4$ and $y = -3x - 2$ on the same plane.

Use the quadratic formula to solve each of the following equations.

78. $x^2 + 3x - 2 = 0$

79. $3x^2 + 6x - 6 = 0$

80. $2x^2 - 1 = 3x$

81. $4x^2 + 13x - 12 = 0$

Solve.

82. $-5 - a > 25$

83. $-7 + a < 21$

84. $-7a > 35$

85. $-3x < 15$

86. $25 \geq 5a$

87. $30 \leq 2x$

88. $\frac{a}{10} \leq -7$

89. $\frac{a}{5} \geq -9$

90. $-\frac{a}{5} \geq 3$

91. $-\frac{a}{3} \leq 4$

92. $-\frac{1}{7}a \leq 3$

93. $-\frac{1}{3}a \geq 2$

94. $4x + 5 \geq 5$

95. $5x \geq 10$

96. $x - 4 \geq 8$

97. $x - 7 \geq 3$

98. $a + 4 \leq 12$

99. $a + 7 \leq 21$

100. $5a > 20$

101. $4a > 40$

102. $-2x - 5 > 4x - 8$

103. $4x - 3 > 2x + 3$

104. $x + 5 \leq 3(x - 3)$

105. $-2x + 5 > -(3x + 2)$

Simplify the following radicals.

106. $\sqrt{36}$

107. $-\sqrt{81}$

108. $\sqrt{2 - 1}$

109. $\sqrt{-5 + 5}$

110. $\sqrt{48}$

111. $\sqrt{75}$

112. $\sqrt{45}$

113. $\sqrt{\dfrac{36}{81}}$
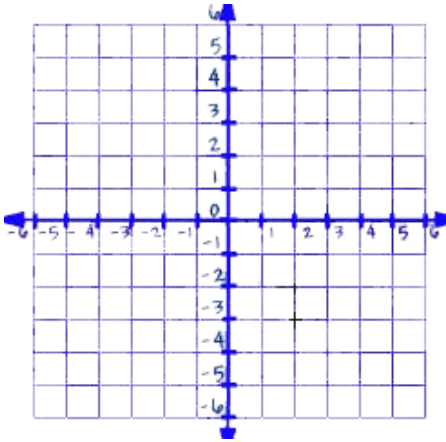
114. $\sqrt{\dfrac{2}{9}}$

115. $\sqrt{\dfrac{25}{100}}$

116. When graphing $y = x^2 - 5$, what is the x-coordinate of the vertex?

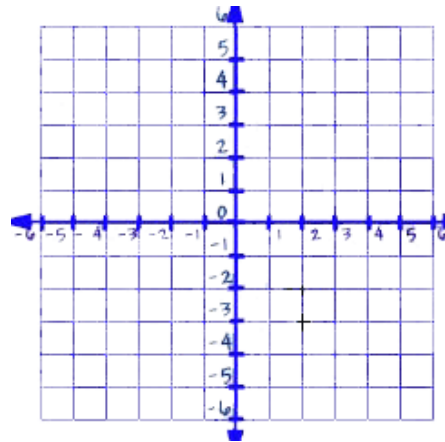117. When graphing $y = x^2 + 4$, what is the x-coordinate of the vertex?
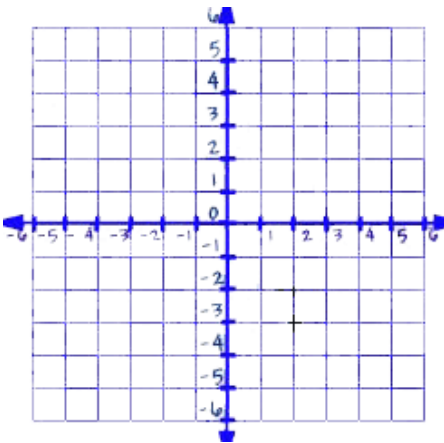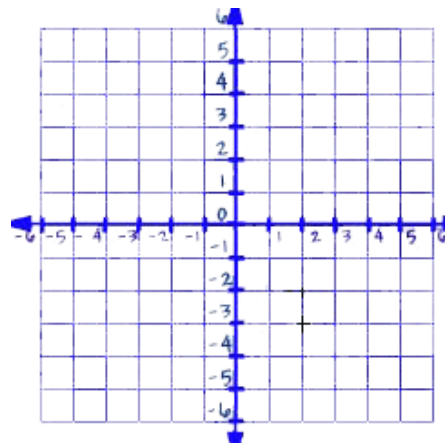
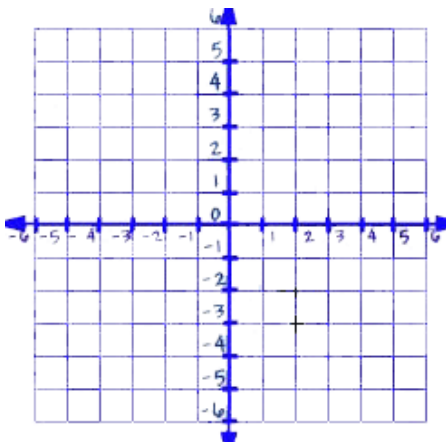**Graph the following equations.**
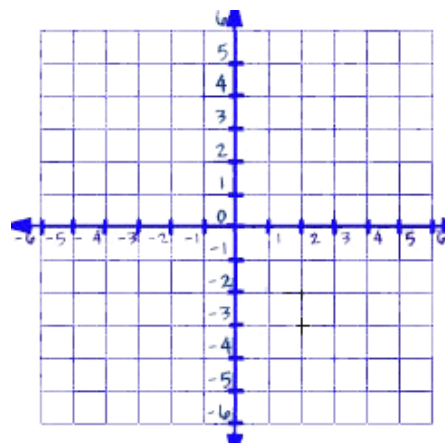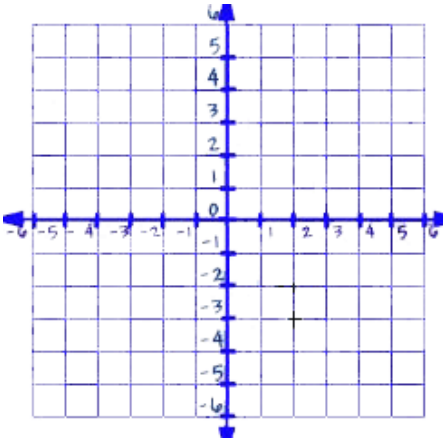
118. $y = x^2$

119. $y = x^2 + 4$

120. $y = x^2 - 4$
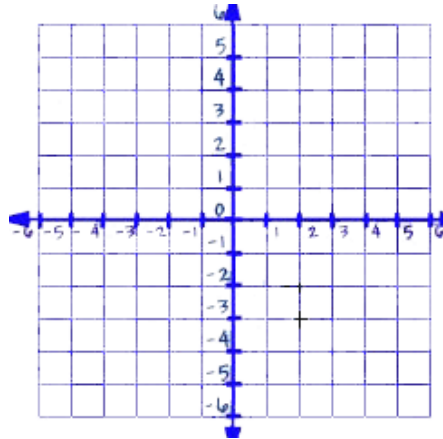
121. $y = (x+4)^2$
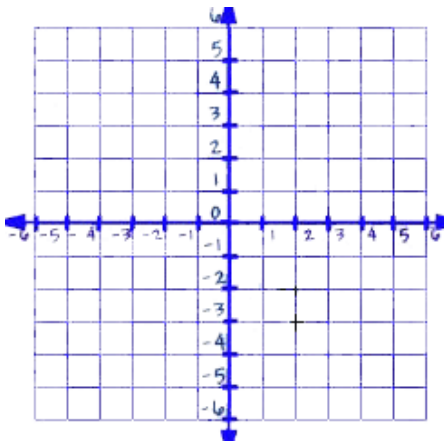
122. $y = (x-4)^2$

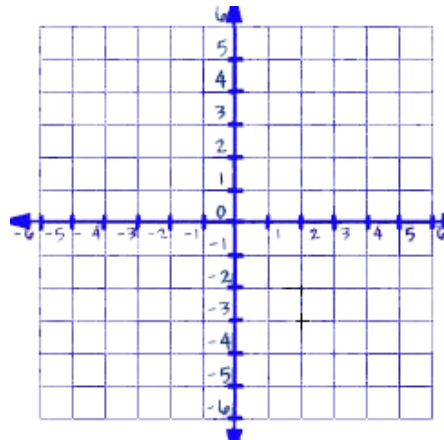123. $y = (x-4)^2 + 4$

124. $y = (x+4)^2 + 4$

125. $y = -x^2$

126. $y = 4x^2$

127. $y = \dfrac{1}{4}x^2$

128. Find the vertex for: $y = (x-7)^2 + 5$

129. Find the vertex for: $y = (x+1)^2 - 5$

130. Find the vertex for: $y = -2(x+5)^2 + 7$

131. Find the vertex for: $y = \dfrac{2}{3}(x+3)^2 - 18$

Express radicals in simplest form.

132. $3\sqrt{24}$

133. $9\sqrt{128}$

134. $\sqrt{3}\cdot\sqrt{3}$

135. $\sqrt{107}\cdot\sqrt{107}$

136. $\sqrt{6}\cdot\sqrt{12}$

137. $\sqrt{2}\cdot\sqrt{26}$

138. $6\sqrt{50}$

139. $\frac{1}{3}\sqrt{162}$

140.   When graphing $y = ax^2 + bx + c$, how do you calculate the x-coordinate of the vertex?

141.   After finding the x-coordinate of the vertex, how do you find the y-coordinate?

Find the x-coordinate of the vertex of the given equations.

142. $y = x^2 + 4x + 7$

143. $y = x^2 - 4x + 7$

144. $y = -x^2 - 16x + 1$

145. $y = -x^2 + 16x + 1$

146. $y = 3x^2 + 12x - 11$

147. $y = -2x^2 - 14x - 9$

148. $y = -2x^2 + 7x - 5$

149. $y = 15x^2 - 12x + 17$

150. $y = x^2 - 4$

151. $y = -7x^2$