

Fall 2015 Final Exam Review

Date _____ Period _____

Unit 2: Inverse Functions**Find the inverse of each function.**

1) $g(x) = x + 5$

2) $f(x) = 3x - 5$

3) $g(x) = 5x - 25$

4) $g(x) = 3x + 15$

5) $f(x) = -x - 5$

6) $g(x) = 2 + \frac{3}{4}x$

7) $f(x) = -2(x + 1)^3$

8) $g(x) = (x + 2)^3 - 2$

9) $f(x) = 2(x + 2)^3$

10) $f(x) = \sqrt[3]{x - 1} + 1$

11) $f(x) = -2 + 2x^3$

12) $g(x) = (x + 1)^5 + 1$

State if the given functions are inverses.

13) $f(n) = -2n - 8$
 $g(n) = -4 - \frac{1}{2}n$

14) $h(x) = 2x + 3$
 $f(x) = \frac{1}{2}x - \frac{3}{2}$

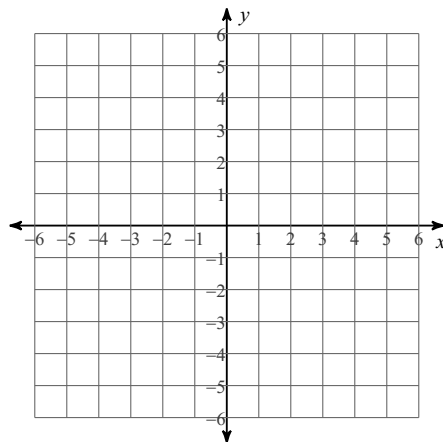
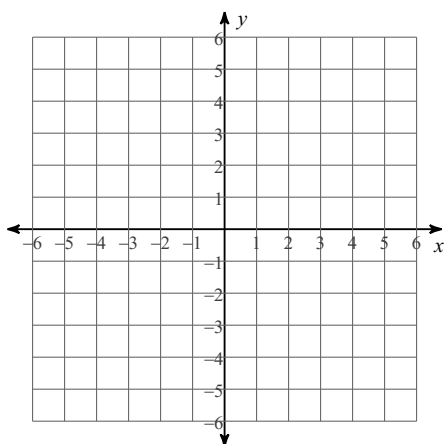
$$15) \begin{aligned} f(x) &= x^5 + 2 \\ g(x) &= -(x-1)^3 \end{aligned}$$

$$16) \begin{aligned} f(x) &= x^3 - 3 \\ g(x) &= \sqrt[3]{x+3} \end{aligned}$$

Find the inverse of each function. Then graph the function and its inverse.

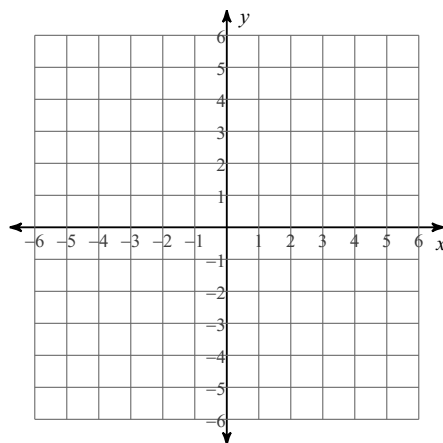
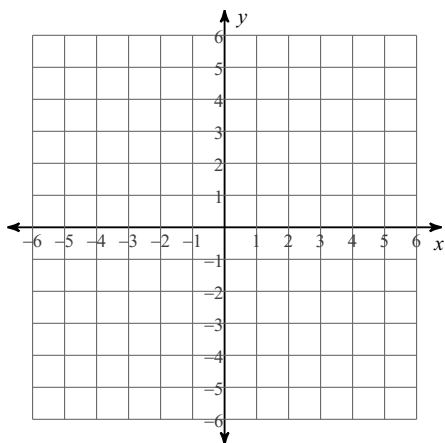
$$17) f(n) = \frac{1}{5}n$$

$$18) g(n) = n - 4$$

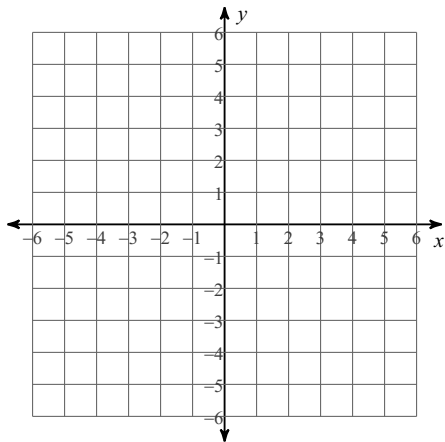


$$19) f(x) = \frac{-6+x}{2}$$

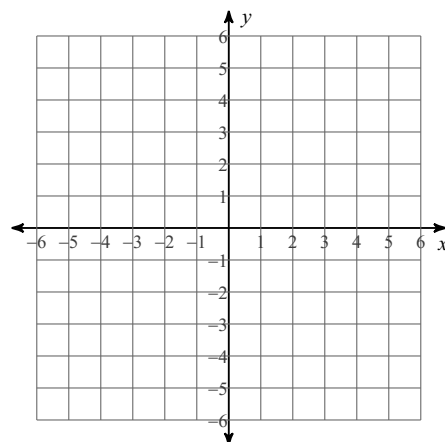
$$20) g(x) = -2 + \frac{1}{2}x$$



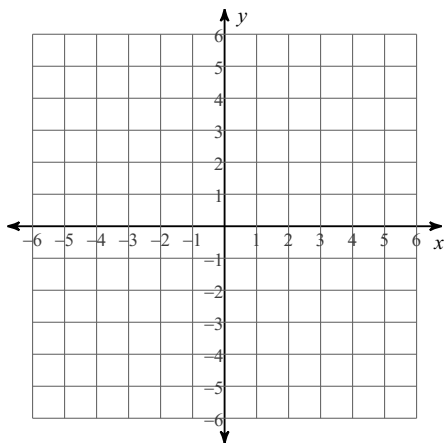
21) $f(x) = -x + 2$



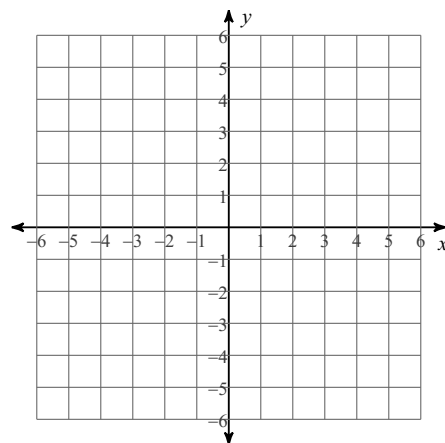
22) $f(n) = -\frac{1}{2}n - 2$



23) $g(x) = x + 2$



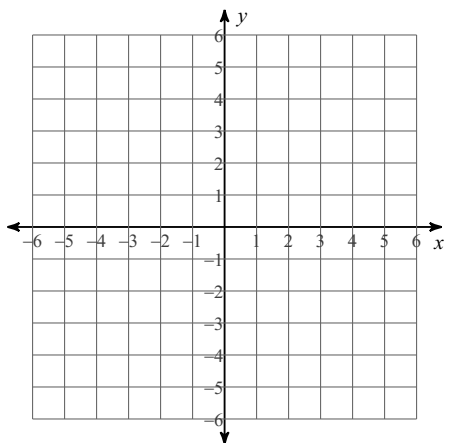
24) $f(x) = -5x$



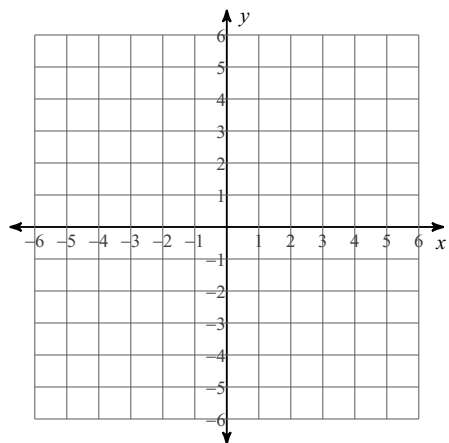
Unit 3: Absolute Value Functions

Graph each equation. State the vertex, intercepts, domain, range, and axis of symmetry for each graph.

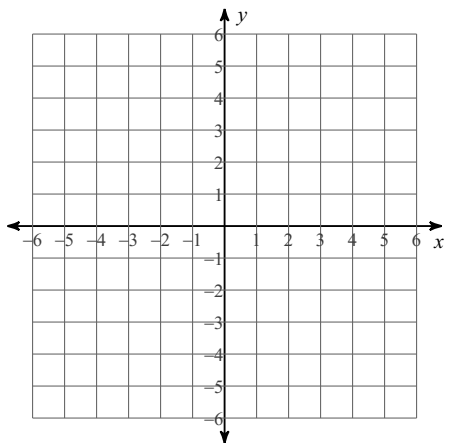
25) $y = 3|x + 4|$



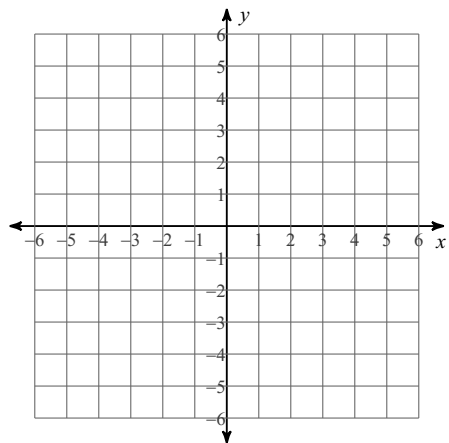
26) $y = -2|x| + 2$



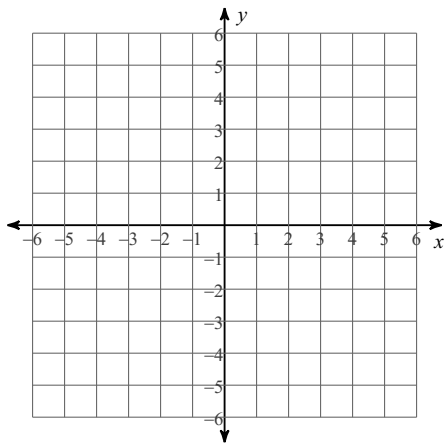
27) $y = 2|x + 4| - 3$



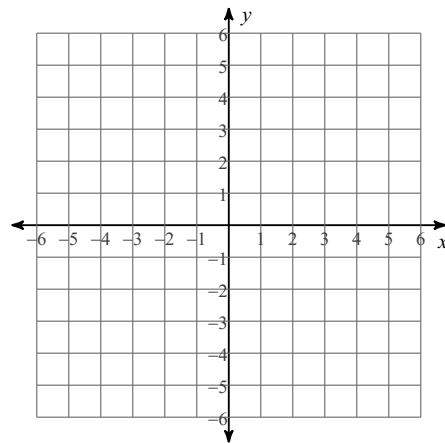
28) $y = -3|x + 1| + 4$



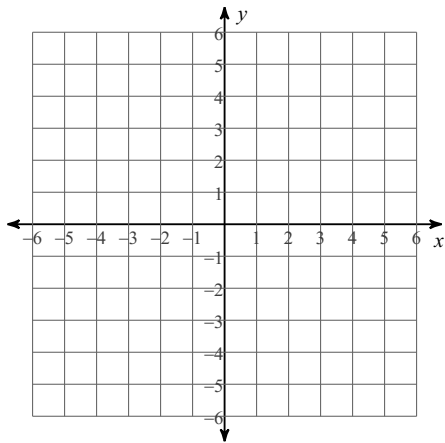
29) $y = 2|x + 1| + 1$



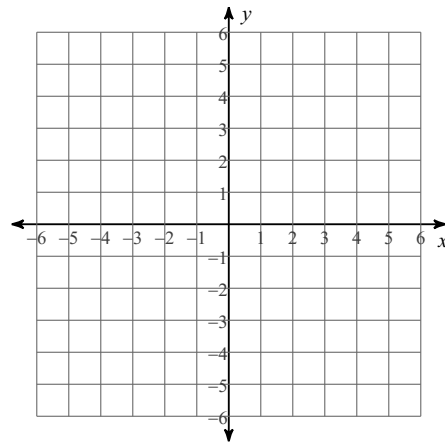
30) $y = -3|x - 1|$



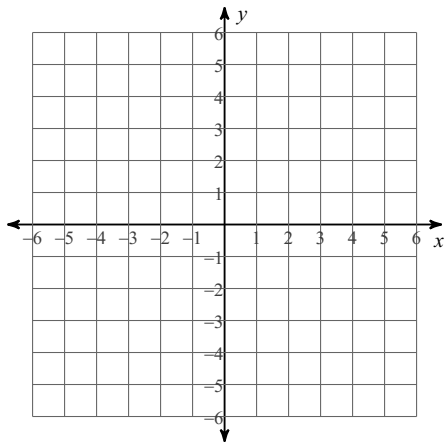
31) $y = -2|x - 2|$



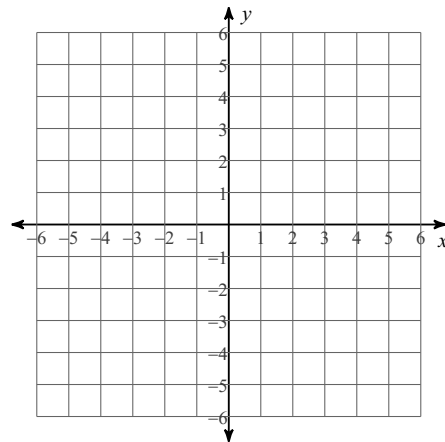
32) $y = -3|x - 3|$



33) $y = 3|x - 3| + 4$



34) $y = -2|x - 2| + 3$



Solve each equation.

35) $|8x + 5| - 4 = 73$

36) $|-3n - 5| + 9 = 13$

37) $-9|10r + 6| = -54$

38) $|8r - 6| - 6 = 20$

39) $-7 + |p + 4| = -5$

40) $|5 + n| + 2 = 12$

Solve each inequality.

41) $-5|10a + 4| \geq -30$

42) $3|10 + 10a| \leq 60$

43) $|-10 - 2b| + 3 > 13$

44) $|5n + 5| - 6 \leq 24$

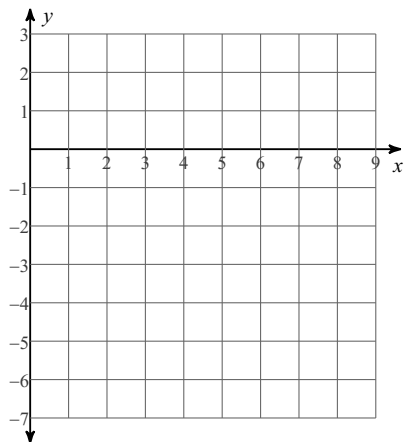
45) $|4k + 10| - 4 \geq 10$

46) $|a - 7| - 1 < 5$

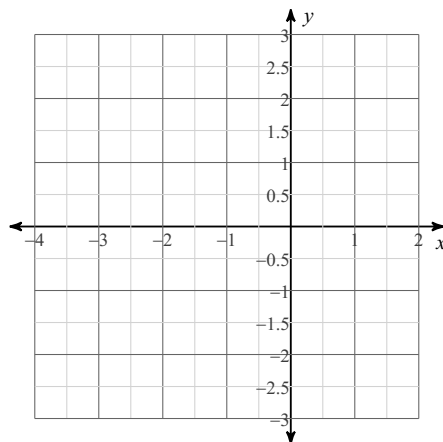
Unit 4: Quadratic Applications

Given the graph, state the vertex, equation of axis of symmetry, y-intercept, and the roots/solutions/zeros/x-intercepts of each graph. Then state the equation of the graph in standard form.

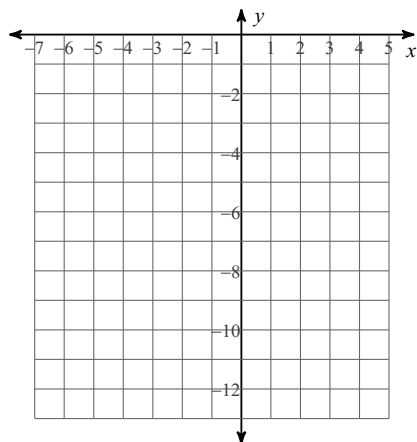
47) $y = -2x^2 + 16x - 30$



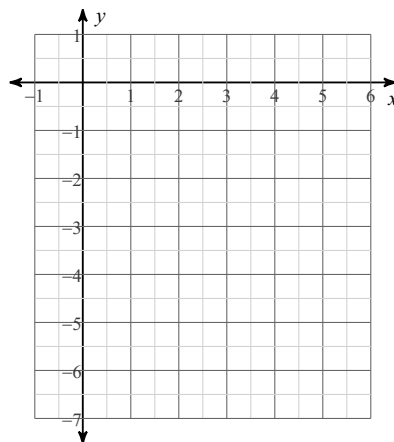
48) $y = -x^2 - 2x + 1$



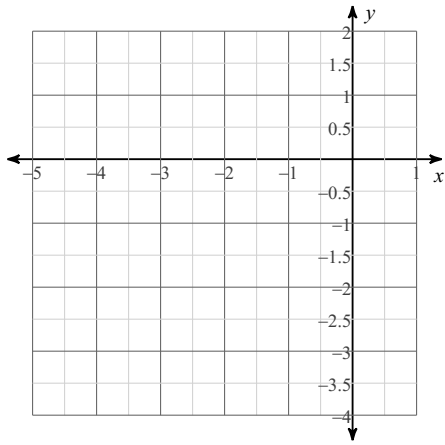
49) $y = -2x^2 - 4x - 6$



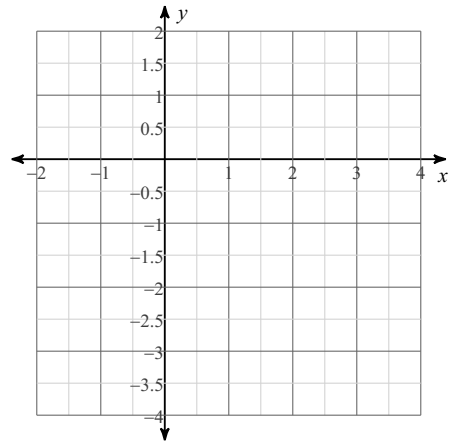
50) $y = -x^2 + 8x - 17$



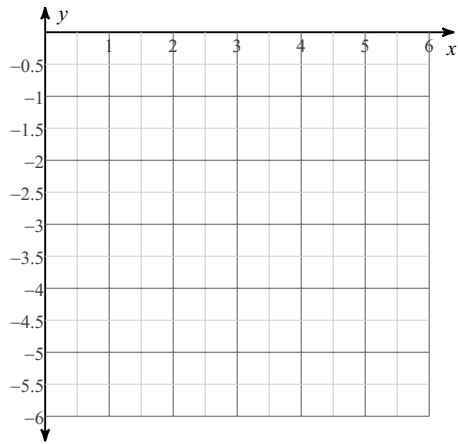
51) $y = -x^2 - 4x - 3$



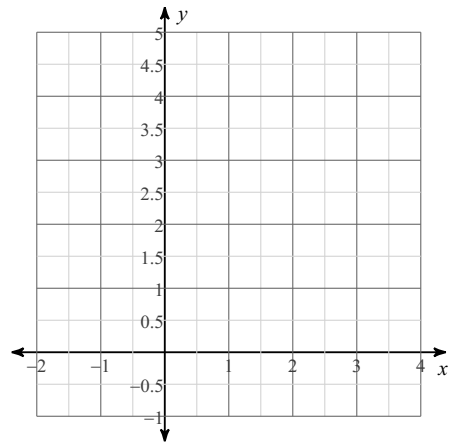
52) $y = -x^2 + 4x - 3$



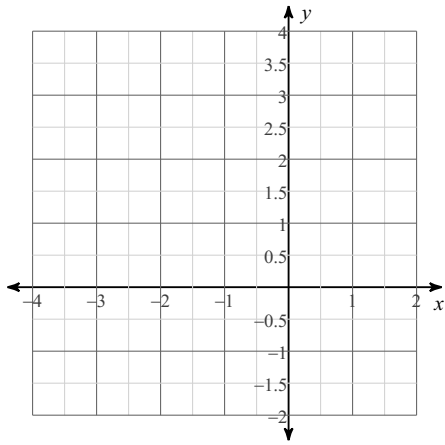
53) $y = -x^2 + 4x - 5$



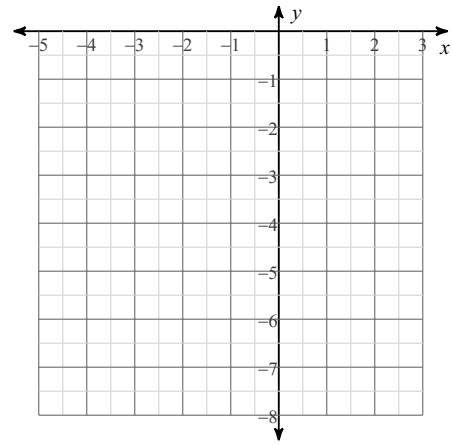
54) $y = -x^2 + 2x + 3$



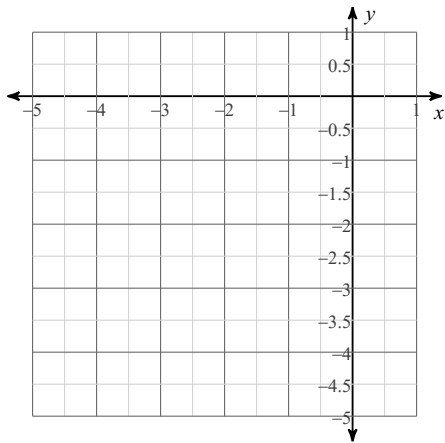
55) $y = x^2 + 2x$



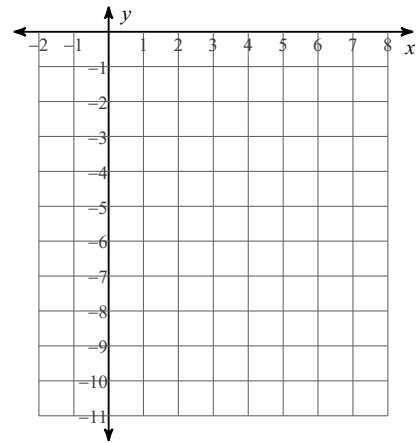
56) $y = -x^2 - 2x - 4$



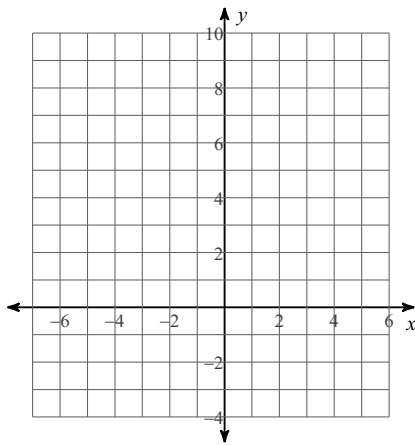
57) $y = (x + 1)^2 - 4$



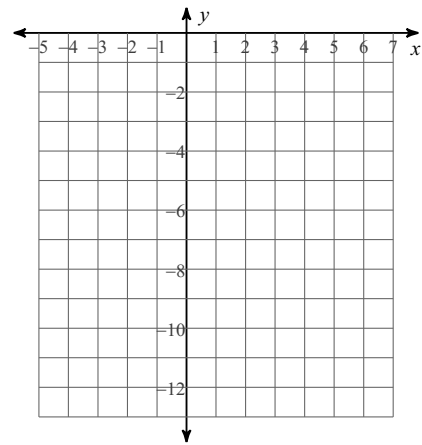
58) $y = -2(x - 1)^2 - 2$



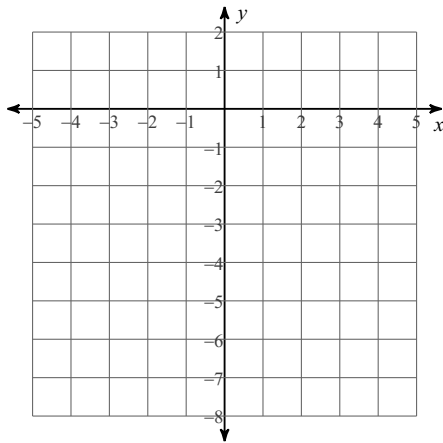
$$59) y = 3(x - 4)^2 - 3$$



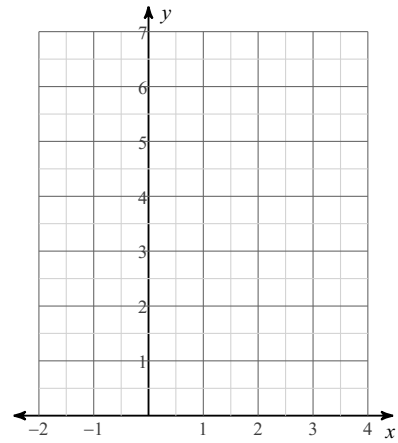
$$60) y = -2(x - 1)^2 - 4$$



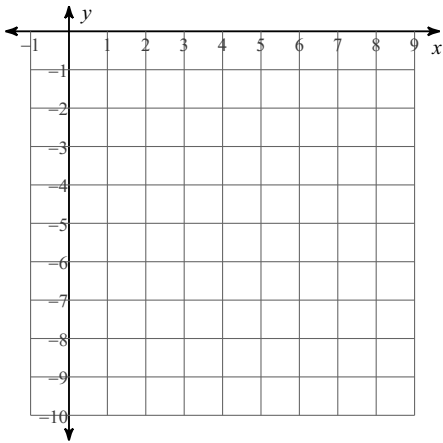
$$61) y = -2(x + 1)^2 + 1$$



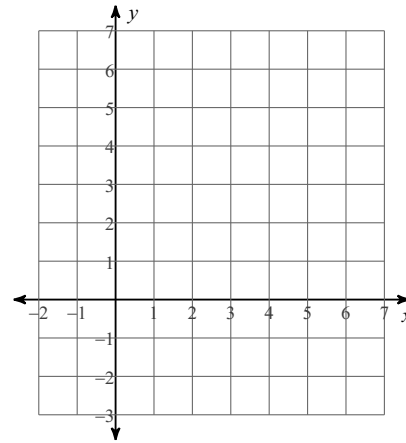
$$62) y = (x - 1)^2 + 2$$



$$63) y = -2(x - 1)^2 - 1$$



$$64) y = 2(x - 4)^2 - 2$$



Solve each equation by completing the square. (Transform equation from standard form to vertex form.)

$$65) x^2 - 14x + 40 = 0$$

$$66) 10p^2 + 20p - 80 = 0$$

$$67) k^2 - 4k - 21 = 0$$

$$68) 10n^2 - 20n - 30 = 0$$

$$69) 8p^2 + 16p + 6 = 0$$

$$70) 2n^2 - 12n - 80 = 0$$

$$71) k^2 - 8k - 48 = 0$$

$$72) p^2 + 4p - 32 = 0$$

73) $n^2 - 18n + 17 = 0$

74) $x^2 - 4x + 3 = 0$

Unit 5: Solving Quadratics**Simplify.**

75) $(-2 - 4i) + (4 + i)$

76) $(-7 - 5i) - (-2 - 8i)$

77) $(4 + 4i) + (4 + 6i)$

78) $(3i) + (-3 + 6i) - (i)$

79) $(-4 - 7i) + (4 + 2i)$

80) $(2i) - (2i) + (-6 - 4i)$

81) $(-2 + 3i)^2$

82) $(-1 + 4i)(-5 - 5i)$

83) $(-5 + i)(6 + 6i)$

84) $(6 - 2i)(8 - 6i)$

85) $(-7 - 2i)^2$

86) $(5 + 4i)(-5 + 8i)$

87) $\sqrt{392}$

88) $\sqrt{8}$

89) $\sqrt{-48}$

90) $\sqrt{63}$

91) $\sqrt{150}$

92) $\sqrt{-12}$

93) $\sqrt{-210}$

94) $\sqrt{72}$

95) $\sqrt{-32}$

96) $\sqrt{105}$

97) $\sqrt{512}$

98) $\sqrt{-144}$

Solve each equation by factoring.

99) $n^2 - 9 = 0$

100) $v^2 - 10v + 21 = 0$

101) $n^2 - 2n - 8 = 0$

102) $v^2 + 9v + 14 = 0$

103) $n^2 + n - 56 = 0$

104) $x^2 - 16x + 64 = 0$

$$105) r^2 - 12r + 32 = 0$$

$$106) p^2 - 6p - 16 = 0$$

$$107) n^2 + n - 20 = 0$$

$$108) n^2 - 15n + 56 = 0$$

$$109) 5x^2 + 3x - 8 = 0$$

$$110) 8k^2 + 46k - 12 = 0$$

$$111) 7n^2 + 24n - 16 = 0$$

$$112) 12x^2 - 102x + 180 = 0$$

$$113) 5x^2 + 7x = 0$$

$$114) 7n^2 - 39n + 20 = 0$$

$$115) 6n^2 - 41n - 7 = 0$$

$$116) 7n^2 + 5n = 0$$

$$117) 7b^2 + 6b - 16 = 0$$

$$118) 5x^2 - 9x - 2 = 0$$

Solve each equation with the quadratic formula.

$$119) b^2 - 49 = 0$$

$$120) 4m^2 + 6m - 4 = 0$$

$$121) 6r^2 - r - 51 = 0$$

$$122) 2a^2 + 8a - 24 = 0$$

$$123) x^2 - 10x - 8 = 0$$

$$124) n^2 + 7n + 11 = 0$$

$$125) 2b^2 + 7b - 7 = 0$$

$$126) 12r^2 - 6r - 11 = 0$$

$$127) -5b^2 - 4b - 7 = 0$$

$$128) 2x^2 - 2x + 9 = 0$$

$$129) 2n^2 + n + 5 = 0$$

$$130) 10a^2 + 5 = 0$$

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Unit 2: Inverse Functions**Find the inverse of each function.**

1) $g(x) = x + 5$

$g^{-1}(x) = x - 5$

2) $f(x) = 3x - 5$

$f^{-1}(x) = \frac{1}{3}x + \frac{5}{3}$

3) $g(x) = 5x - 25$

$g^{-1}(x) = 5 + \frac{1}{5}x$

4) $g(x) = 3x + 15$

$g^{-1}(x) = \frac{-15 + x}{3}$

5) $f(x) = -x - 5$

$f^{-1}(x) = -x - 5$

6) $g(x) = 2 + \frac{3}{4}x$

$g^{-1}(x) = \frac{4}{3}x - \frac{8}{3}$

7) $f(x) = -2(x + 1)^3$

$f^{-1}(x) = \frac{-2 - \sqrt[3]{4x}}{2}$

8) $g(x) = (x + 2)^3 - 2$

$g^{-1}(x) = \sqrt[3]{x + 2} - 2$

9) $f(x) = 2(x + 2)^3$

$f^{-1}(x) = \frac{-4 + \sqrt[3]{4x}}{2}$

10) $f(x) = \sqrt[3]{x - 1} + 1$

$f^{-1}(x) = (x - 1)^3 + 1$

11) $f(x) = -2 + 2x^3$

$f^{-1}(x) = \sqrt[3]{\frac{x + 2}{2}}$

12) $g(x) = (x + 1)^5 + 1$

$g^{-1}(x) = \sqrt[5]{x - 1} - 1$

State if the given functions are inverses.

13) $f(n) = -2n - 8$

$g(n) = -4 - \frac{1}{2}n$

Yes

14) $h(x) = 2x + 3$

$f(x) = \frac{1}{2}x - \frac{3}{2}$

Yes

$$15) \begin{aligned} f(x) &= x^5 + 2 \\ g(x) &= -(x-1)^3 \end{aligned}$$

No

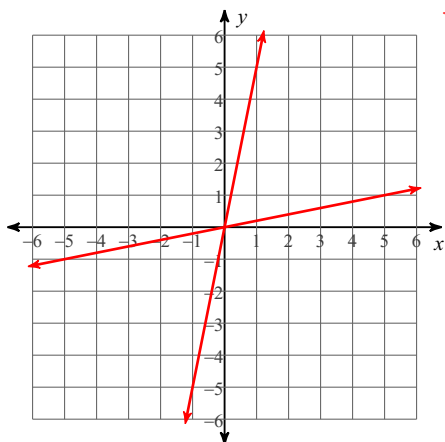
$$16) \begin{aligned} f(x) &= x^3 - 3 \\ g(x) &= \sqrt[3]{x+3} \end{aligned}$$

Yes

Find the inverse of each function. Then graph the function and its inverse.

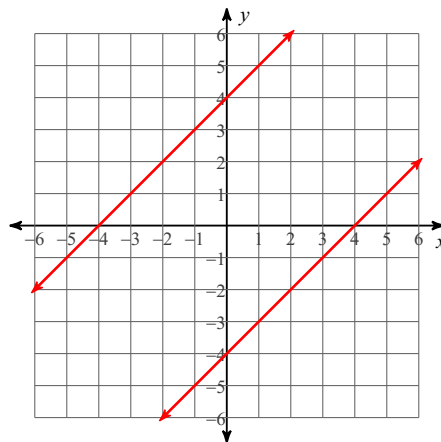
$$17) f(n) = \frac{1}{5}n$$

$$f^{-1}(n) = 5n$$



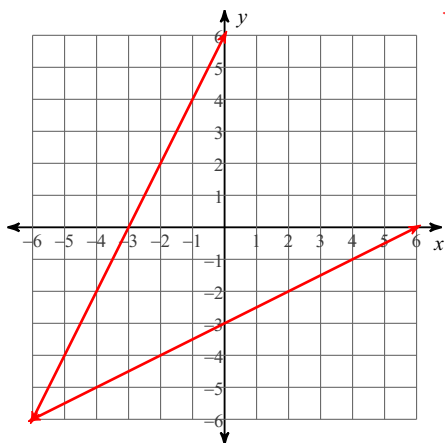
$$18) g(n) = n - 4$$

$$g^{-1}(n) = n + 4$$



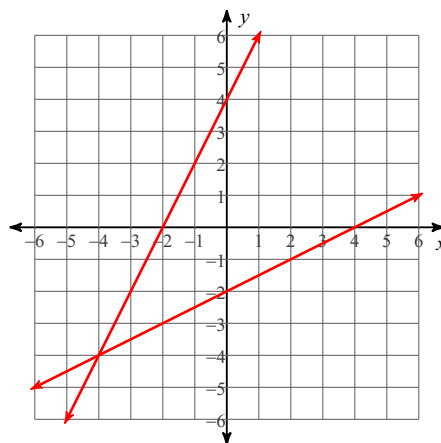
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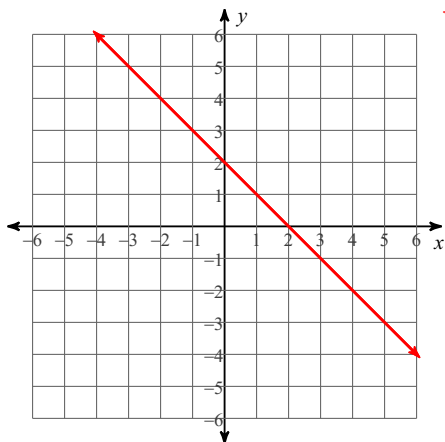
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$$g^{-1}(x) = 2x + 4$$



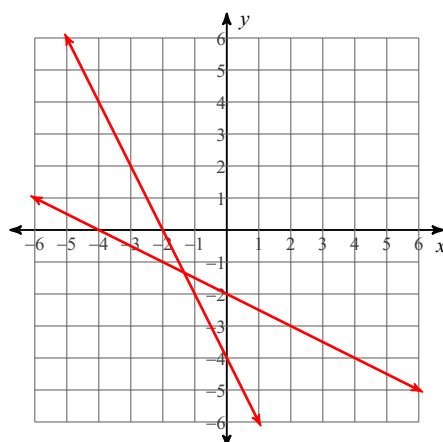
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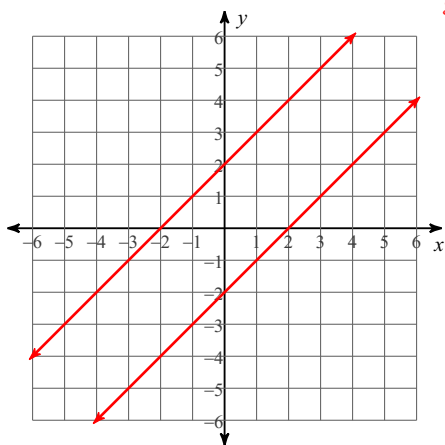
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$f^{-1}(n) = -2n - 4$



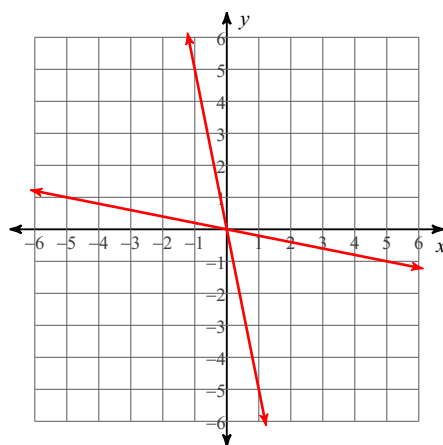
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$g^{-1}(x) = x - 2$



24) $f(x) = -5x$

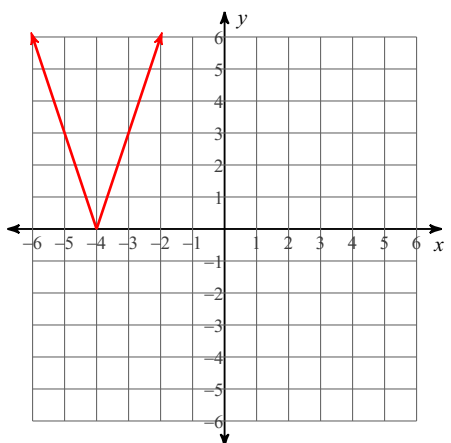
$f^{-1}(x) = -\frac{x}{5}$



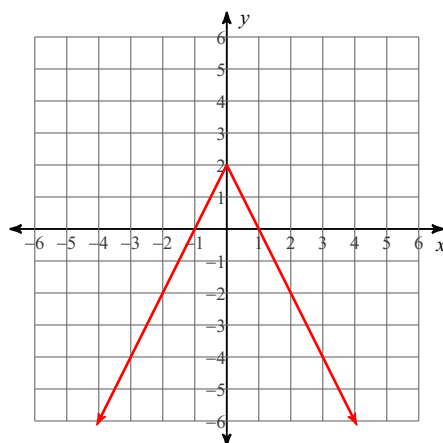
Unit 3: Absolute Value Functions

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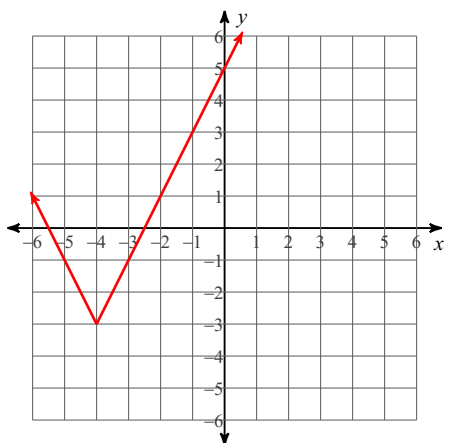
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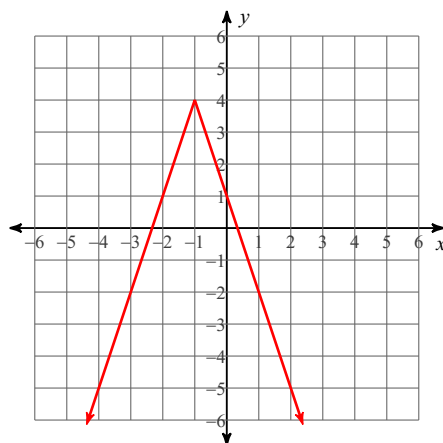
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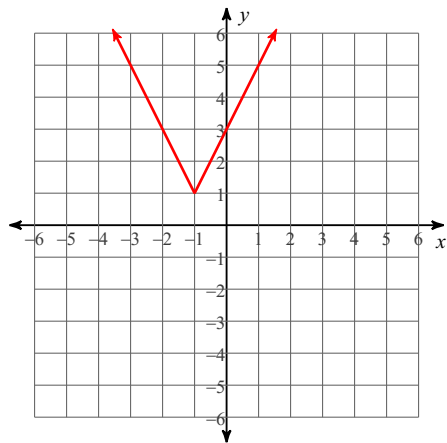
27) $y = 2|x + 4| - 3$



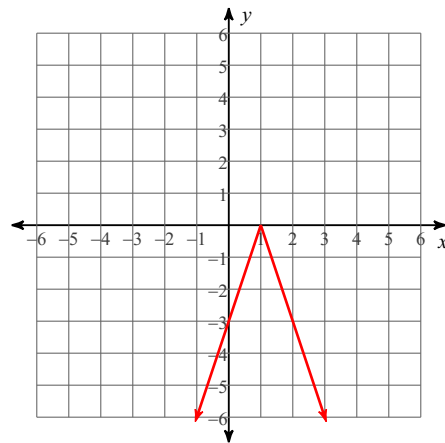
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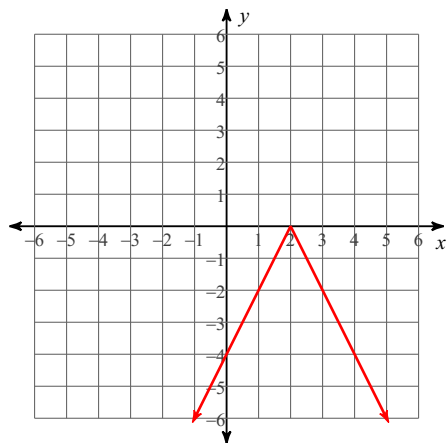
$$29) y = 2|x + 1| + 1$$



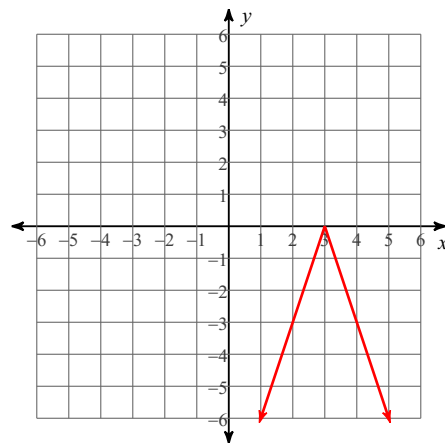
$$30) y = -3|x - 1|$$



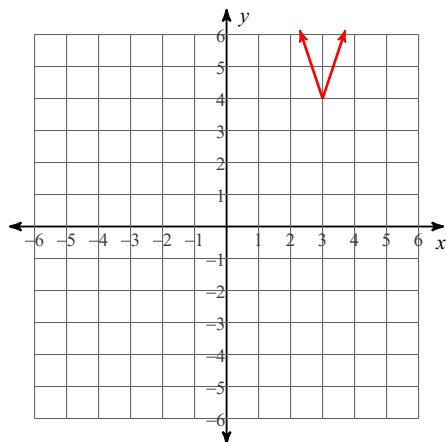
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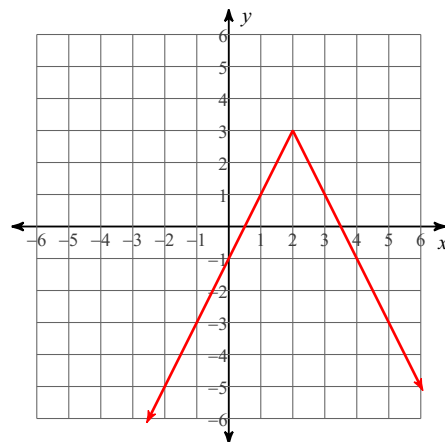
$$32) y = -3|x - 3|$$



$$33) y = 3|x - 3| + 4$$



$$34) y = -2|x - 2| + 3$$



Solve each equation.

35) $|8x + 5| - 4 = 73$

$$\left\{9, -\frac{41}{4}\right\}$$

36) $|-3n - 5| + 9 = 13$

$$\left\{-3, -\frac{1}{3}\right\}$$

37) $-9|10r + 6| = -54$

$$\left\{0, -\frac{6}{5}\right\}$$

38) $|8r - 6| - 6 = 20$

$$\left\{4, -\frac{5}{2}\right\}$$

39) $-7 + |p + 4| = -5$

$$\{-2, -6\}$$

40) $|5 + n| + 2 = 12$

$$\{5, -15\}$$

Solve each inequality.

41) $-5|10a + 4| \geq -30$

$$-1 \leq a \leq \frac{1}{5}$$

42) $3|10 + 10a| \leq 60$

$$-3 \leq a \leq 1$$

43) $|-10 - 2b| + 3 > 13$

$$b < -10 \text{ or } b > 0$$

44) $|5n + 5| - 6 \leq 24$

$$-7 \leq n \leq 5$$

45) $|4k + 10| - 4 \geq 10$

$$k \geq 1 \text{ or } k \leq -6$$

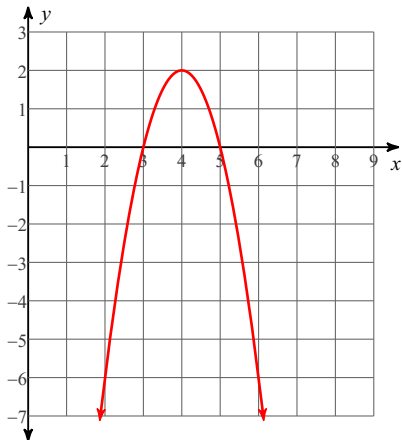
46) $|a - 7| - 1 < 5$

$$1 < a < 13$$

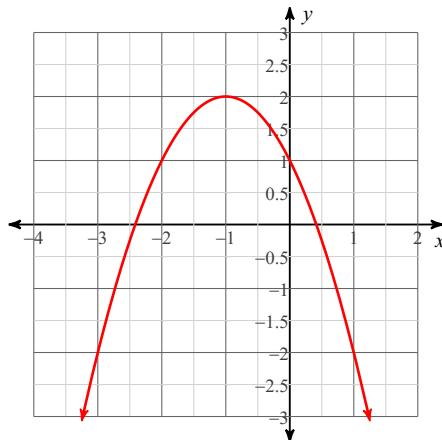
Unit 4: Quadratic Applications

Given the graph, state the vertex, equation of axis of symmetry, y-intercept, and the roots/solutions/zeros/x-intercepts of each graph. Then state the equation of the graph in standard form.

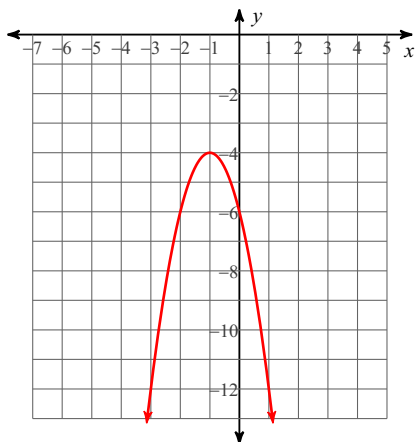
47) $y = -2x^2 + 16x - 30$



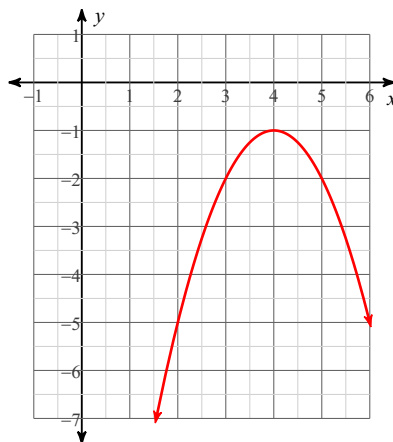
48) $y = -x^2 - 2x + 1$



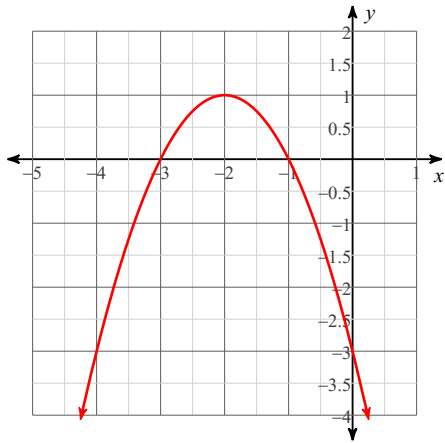
49) $y = -2x^2 - 4x - 6$



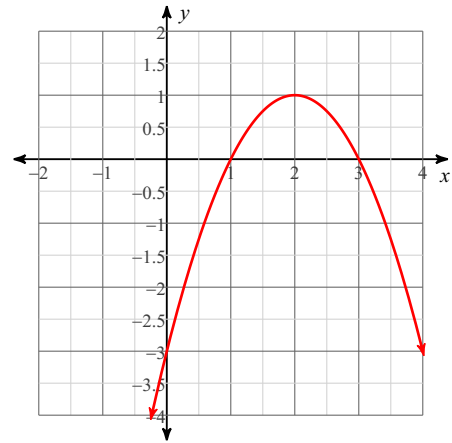
50) $y = -x^2 + 8x - 17$



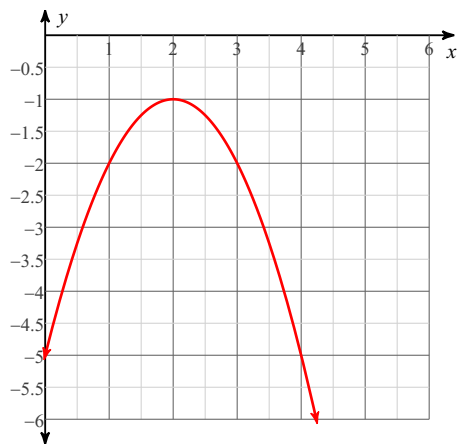
51) $y = -x^2 - 4x - 3$



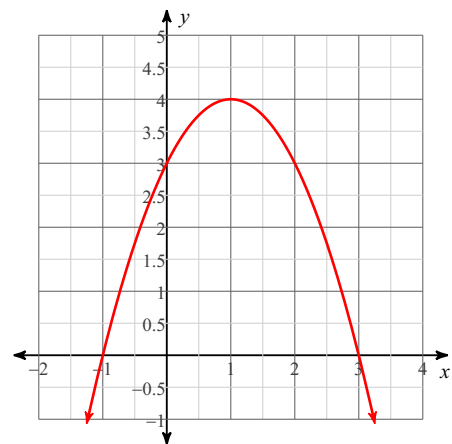
52) $y = -x^2 + 4x - 3$



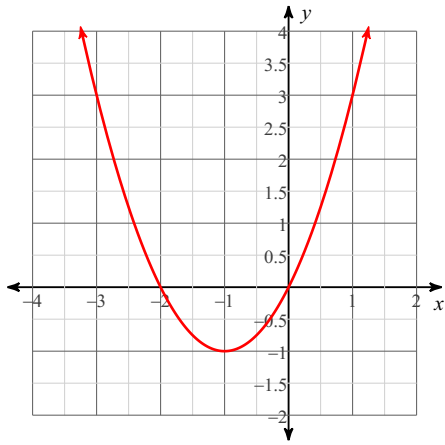
53) $y = -x^2 + 4x - 5$



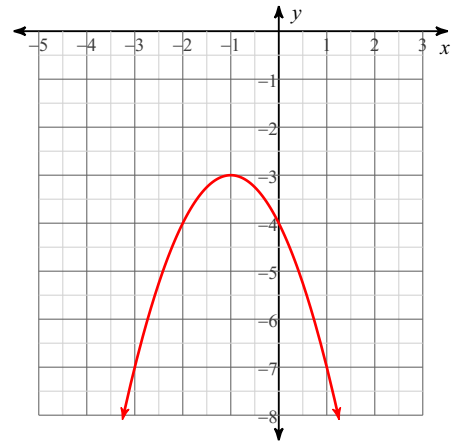
54) $y = -x^2 + 2x + 3$



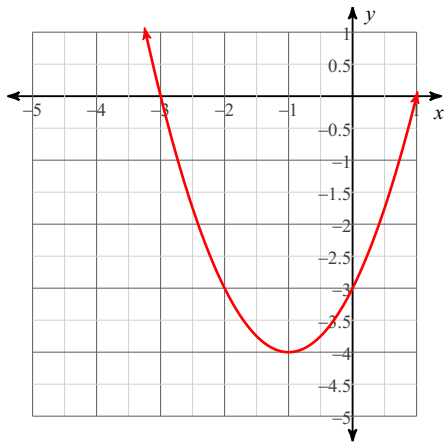
55) $y = x^2 + 2x$



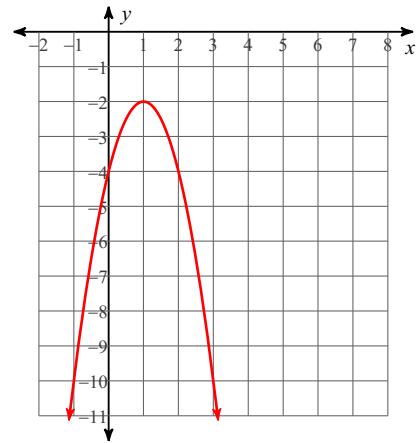
56) $y = -x^2 - 2x - 4$



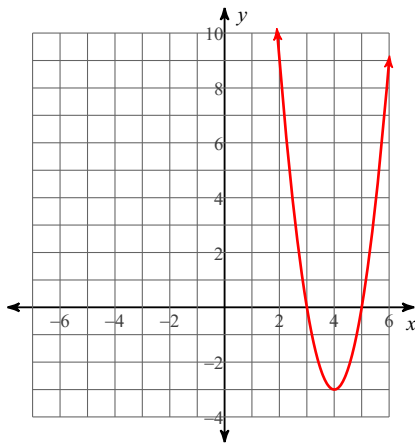
57) $y = (x + 1)^2 - 4$



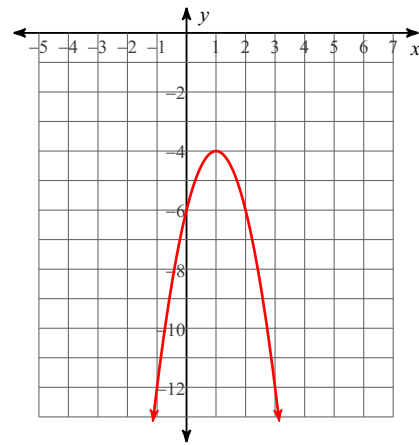
58) $y = -2(x - 1)^2 - 2$



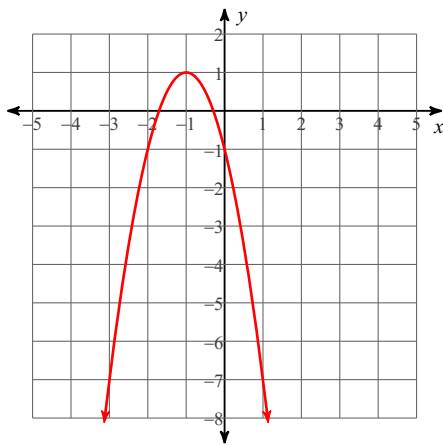
$$59) y = 3(x - 4)^2 - 3$$



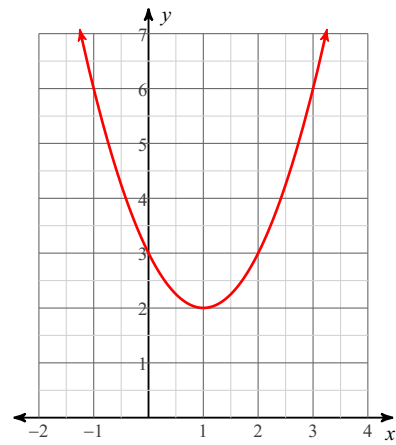
$$60) y = -2(x - 1)^2 - 4$$



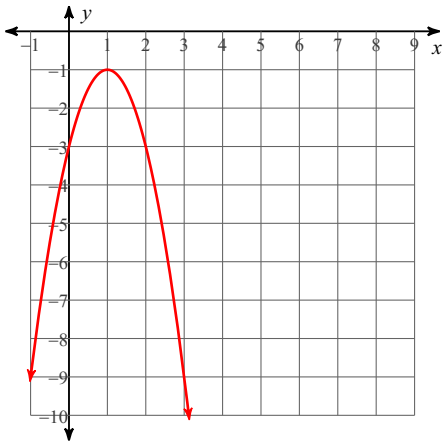
$$61) y = -2(x + 1)^2 + 1$$



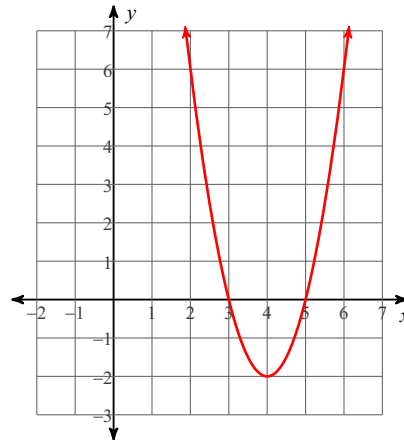
$$62) y = (x - 1)^2 + 2$$



$$63) y = -2(x - 1)^2 - 1$$



$$64) y = 2(x - 4)^2 - 2$$



Solve each equation by completing the square. (Transform equation from standard form to vertex form.)

$$65) x^2 - 14x + 40 = 0$$

$$\{10, 4\}$$

$$66) 10p^2 + 20p - 80 = 0$$

$$\{2, -4\}$$

$$67) k^2 - 4k - 21 = 0$$

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

$$68) 10n^2 - 20n - 30 = 0$$

$$\{3, -1\}$$

$$69) 8p^2 + 16p + 6 = 0$$

$$\left\{-\frac{1}{2}, -\frac{3}{2}\right\}$$

$$70) 2n^2 - 12n - 80 = 0$$

$$\{10, -4\}$$

$$71) k^2 - 8k - 48 = 0$$

$$\{12, -4\}$$

$$72) p^2 + 4p - 32 = 0$$

$$\{4, -8\}$$

73) $n^2 - 18n + 17 = 0$

$\{17, 1\}$

74) $x^2 - 4x + 3 = 0$

$\{3, 1\}$

Unit 5: Solving Quadratics**Simplify.**

75) $(-2 - 4i) + (4 + i)$

$2 - 3i$

76) $(-7 - 5i) - (-2 - 8i)$

$-5 + 3i$

77) $(4 + 4i) + (4 + 6i)$

$8 + 10i$

78) $(3i) + (-3 + 6i) - (i)$

$-3 + 8i$

79) $(-4 - 7i) + (4 + 2i)$

$-5i$

80) $(2i) - (2i) + (-6 - 4i)$

$-6 - 4i$

81) $(-2 + 3i)^2$

$-5 - 12i$

82) $(-1 + 4i)(-5 - 5i)$

$25 - 15i$

83) $(-5 + i)(6 + 6i)$

$-36 - 24i$

84) $(6 - 2i)(8 - 6i)$

$36 - 52i$

85) $(-7 - 2i)^2$

$45 + 28i$

86) $(5 + 4i)(-5 + 8i)$

$-57 + 20i$

87) $\sqrt{392}$

$14\sqrt{2}$

88) $\sqrt{8}$

$2\sqrt{2}$

$$89) \sqrt{-48}$$
$$4\sqrt{3}$$

$$90) \sqrt{63}$$
$$3\sqrt{7}$$

$$91) \sqrt{150}$$
$$5\sqrt{6}$$

$$92) \sqrt{-12}$$
$$2\sqrt{3}$$

$$93) \sqrt{-210}$$
$$\sqrt{210}$$

$$94) \sqrt{72}$$
$$6\sqrt{2}$$

$$95) \sqrt{-32}$$
$$4\sqrt{2}$$

$$96) \sqrt{105}$$
$$\sqrt{105}$$

$$97) \sqrt{512}$$
$$16\sqrt{2}$$

$$98) \sqrt{-144}$$
$$12$$

Solve each equation by factoring.

$$99) n^2 - 9 = 0$$
$$\{-3, 3\}$$

$$100) v^2 - 10v + 21 = 0$$
$$\{3, 7\}$$

$$101) n^2 - 2n - 8 = 0$$
$$\{-2, 4\}$$

$$102) v^2 + 9v + 14 = 0$$
$$\{-2, -7\}$$

$$103) n^2 + n - 56 = 0$$
$$\{7, -8\}$$

$$104) x^2 - 16x + 64 = 0$$
$$\{8\}$$

105) $r^2 - 12r + 32 = 0$

$\{8, 4\}$

106) $p^2 - 6p - 16 = 0$

$\{8, -2\}$

107) $n^2 + n - 20 = 0$

$\{4, -5\}$

108) $n^2 - 15n + 56 = 0$

$\{8, 7\}$

109) $5x^2 + 3x - 8 = 0$

$\left\{-\frac{8}{5}, 1\right\}$

110) $8k^2 + 46k - 12 = 0$

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

111) $7n^2 + 24n - 16 = 0$

$\left\{\frac{4}{7}, -4\right\}$

112) $12x^2 - 102x + 180 = 0$

$\left\{\frac{5}{2}, 6\right\}$

113) $5x^2 + 7x = 0$

$\left\{-\frac{7}{5}, 0\right\}$

114) $7n^2 - 39n + 20 = 0$

$\left\{\frac{4}{7}, 5\right\}$

115) $6n^2 - 41n - 7 = 0$

$\left\{-\frac{1}{6}, 7\right\}$

116) $7n^2 + 5n = 0$

$\left\{-\frac{5}{7}, 0\right\}$

117) $7b^2 + 6b - 16 = 0$

$\left\{\frac{8}{7}, -2\right\}$

118) $5x^2 - 9x - 2 = 0$

$\left\{-\frac{1}{5}, 2\right\}$

Solve each equation with the quadratic formula.

119) $b^2 - 49 = 0$

$\{7, -7\}$

120) $4m^2 + 6m - 4 = 0$

$\left\{\frac{1}{2}, -2\right\}$

$$121) 6r^2 - r - 51 = 0$$

$$\left\{3, -\frac{17}{6}\right\}$$

$$122) 2a^2 + 8a - 24 = 0$$

$$\{2, -6\}$$

$$123) x^2 - 10x - 8 = 0$$

$$\{5 + \sqrt{33}, 5 - \sqrt{33}\}$$

$$124) n^2 + 7n + 11 = 0$$

$$\left\{\frac{-7 + \sqrt{5}}{2}, \frac{-7 - \sqrt{5}}{2}\right\}$$

$$125) 2b^2 + 7b - 7 = 0$$

$$\left\{\frac{-7 + \sqrt{105}}{4}, \frac{-7 - \sqrt{105}}{4}\right\}$$

$$126) 12r^2 - 6r - 11 = 0$$

$$\left\{\frac{3 + \sqrt{141}}{12}, \frac{3 - \sqrt{141}}{12}\right\}$$

$$127) -5b^2 - 4b - 7 = 0$$

$$\left\{\frac{-2 - i\sqrt{31}}{5}, \frac{-2 + i\sqrt{31}}{5}\right\}$$

$$128) 2x^2 - 2x + 9 = 0$$

$$\left\{\frac{1 + i\sqrt{17}}{2}, \frac{1 - i\sqrt{17}}{2}\right\}$$

$$129) 2n^2 + n + 5 = 0$$

$$\left\{\frac{-1 + i\sqrt{39}}{4}, \frac{-1 - i\sqrt{39}}{4}\right\}$$

$$130) 10a^2 + 5 = 0$$

$$\left\{\frac{i\sqrt{2}}{2}, -\frac{i\sqrt{2}}{2}\right\}$$