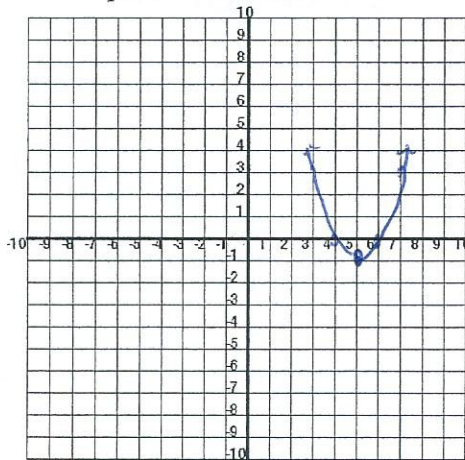


Quadratic functions Review

In each of the problems below you are given a quadratic function. Answer the questions that follow and graph the function. (Should be able to do without a calculator).

1) $y = x^2 - 10x + 24$

Graph the function below



Does the parabola open up or down?

up

What is the y-intercept of the parabola?

(0, 24)

What is the x-intercept/factored form of the equation?

$y = (x - 4)(x - 6)$

What are the x-intercepts?

(4, 0), (6, 0)

What is the axis of symmetry?

$x = 5$

What is the vertex of the equation?

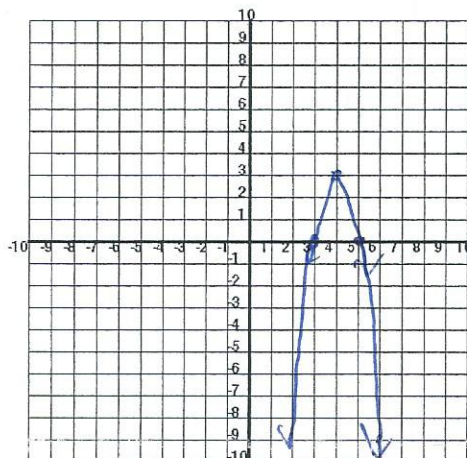
(5, -1)

What are the zeros of the equation?

4, 6

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

Graph the function below



Does the parabola open up or down?

down

What is the standard form of the quadratic?

$-3(x - 4)(x - 4) + 3$

$y = -3x^2 + 24x - 45$

What is the y-intercept of the parabola?

(0, -45)

What is the vertex of the equation?

(4, 3)

What is the axis of symmetry?

$x = 4$

What is the x-intercept form of the equation?

$-3(x^2 - 8x + 15) = -3(x - 5)(x - 3)$

What are the x-intercepts?

(5, 0) (3, 0)

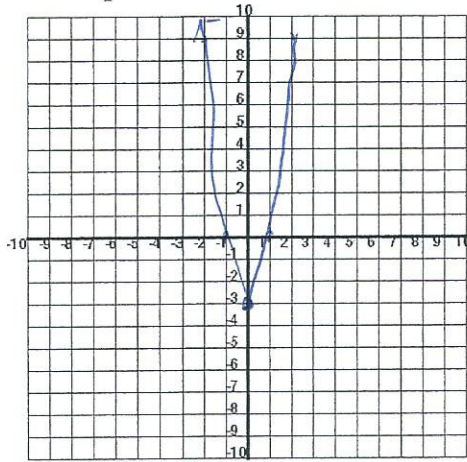
$$-3(x^2 - 8x + 16) + 3$$

$$-3x^2 + 24x - 48 + 3$$

$$y = -3x^2 + 24x - 45$$

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

Graph the function below



Does the parabola open up or down?

up

What is the y-intercept of the parabola?

(0, -3)

What is the axis of symmetry?

$x = 0$

What is the x-intercept form of the equation?

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

What are the zeros of the equation?

-1, 1

What are the x-intercepts?

(-1, 0) (1, 0)

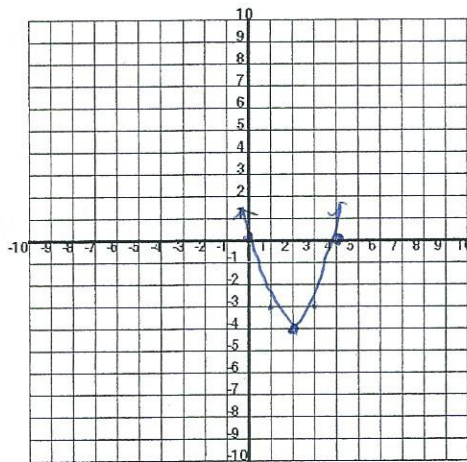
What is the vertex?

(0, -3)

$$y = 3(x-0)^2 - 3$$

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

Graph the function below



Does the parabola open up or down?

up

What is the y-intercept of the parabola?

(0, 0)

What is the x-intercept/factored form of the equation?

$$x(x-4)$$

What is the axis of symmetry?

$$x = 2$$

$$\frac{4+0}{2} = 2$$

What is the vertex of the equation?

(2, -4)

What are the x-intercepts?

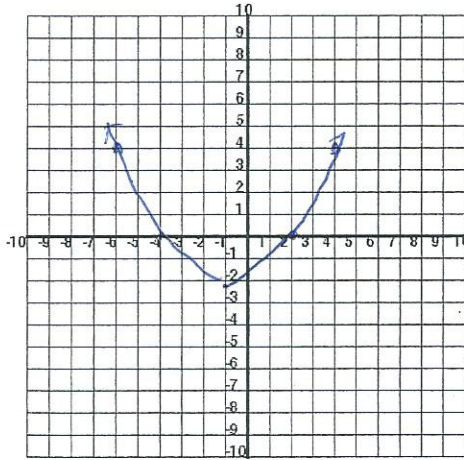
(0, 0) (4, 0)

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

Does the parabola open up or down?

up

Graph the function below



What are the x-intercepts?

$(-4, 0)$ $(2, 0)$

What is the standard form of the parabola?

$$\frac{1}{4}(x^2 + 2x - 8) = \frac{1}{4}x^2 + \frac{1}{2}x - 2$$

What is the y-intercept of the quadratic?

$(0, -2)$

What is the axis of symmetry?

$$\frac{-4+2}{2} = \frac{-2}{2} = -1 \quad x = -1$$

What is the vertex of the equation?

$(-1, -\frac{9}{4})$

$$\frac{1}{4}((-1+4)(-1-2))$$

$$\frac{1}{4}(3)(-3) = -\frac{9}{4}$$

6) Change the function from standard form into vertex form, and then state the vertex.

$$y = (-2x^2 - 20x) - 47$$

$$-2(x^2 + 10x) - 47$$

$$\downarrow$$

$$\left(\frac{10}{2}\right)^2$$

$$-2(x^2 + 10x + 25) - 47$$

$$-2(x^2 + 10x + 25) + 50 - 47$$

$$y = -2(x+5)^2 + 3$$

Vertex
 $(-5, 3)$

$$h = \frac{-b}{2a}$$

$$h = \frac{-(-20)}{2(-2)} = \frac{20}{-4} = -5$$

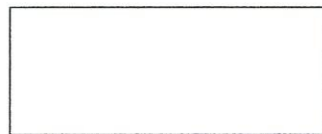
7) Find the lengths of each of the sides of the fence below, given that the area is 20 yards squared.

$$20 = (x)(x+8)$$

$$20 = x^2 + 8x$$

$$0 = x^2 + 8x - 20$$

$$(x+10)(x-2) \quad x = -10, 2$$



x

x+8

$$-2(-5)^2 - 20(-5)$$

$$-50 + 100 - 47$$

$$3$$

can't be -10
so x = 2

sides are 2 & 10

8) Find the zeros/roots of the equation below.

$$f(x) = x^2 - 7x + 12$$

$$f(x) = (x-4)(x-3)$$

$$x = 4, 3$$