

Quadratic Functions

3.6

Standard Form

$$y = ax^2 + bx + c$$

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

$a = -1$ $b = 2$ $c = 3$

Axis of Symmetry: $x = \frac{-2}{2(-1)} = 1$

*Use the formula $x = 1$

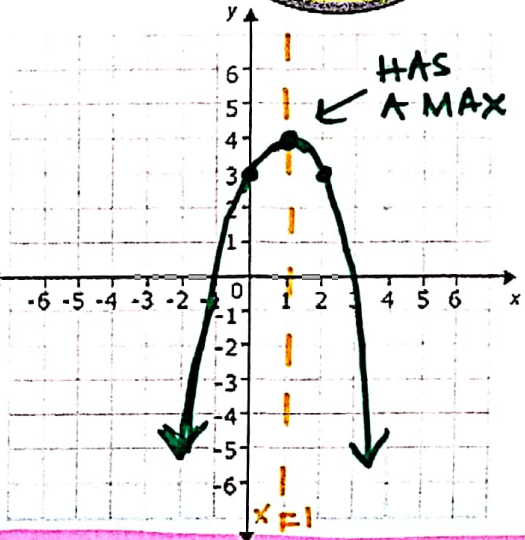
Vertex: $(1, 4)$

*If you know the axis of symmetry, just plug it back into the function to find y

Y-intercept: $(0, 3)$

*The y-intercept is when $x=0$

EASY TO FIND THE AXIS OF SYMMETRY:
 $x = \frac{-b}{2a}$



Vertex Form

$$y = a(x - h)^2 + k$$

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

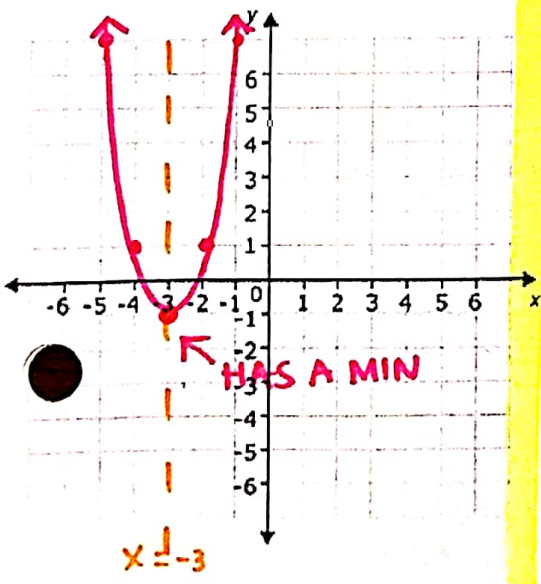
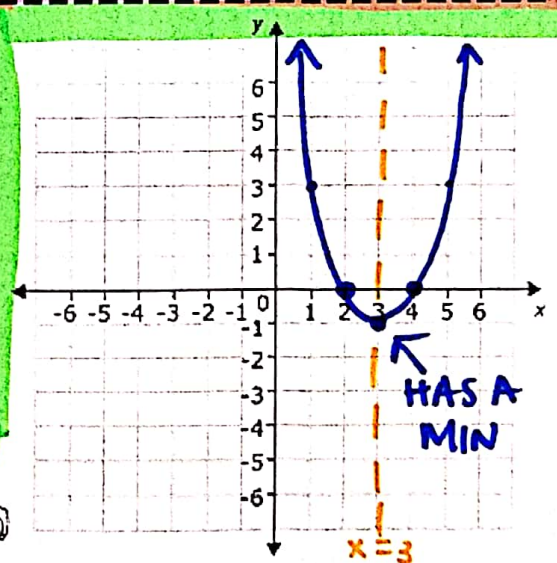
Axis of Symmetry: $x = -3$

*If you know the vertex, you also know the axis of symmetry $x = h$

Vertex: $(-3, -1)$

*Since vertex form is $-h$, make sure to flip the sign for the x-coordinate

EASY TO FIND THE VERTEX AT
 (h, k)



Factored Form

$$y = a(x - p)(x - q)$$

Example 3: $f(x) = (x - 4)(x - 2)$

Zeros: $4, 2$
roots, solutions & x-intercepts

Axis of Symmetry: $x = 3$

*Halfway between the zeros $\frac{p+q}{2}$

Vertex: $(3, -1)$

*If you know the A.O.S., you already know the x-coordinate

EASY TO FIND THE ZEROS AT
 $x=p$ or $x=q$

3.6 Graphing Quadratic Functions

Fill in the characteristics of the function and graph the function.

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

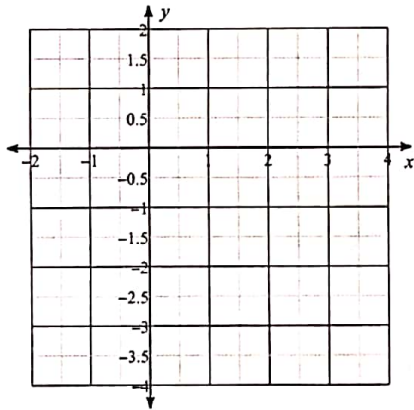
Vertex: _____ Max or Min _____

Axis of Symmetry: _____

x-intercepts: _____

y-intercept: _____

Domain: _____



2) $y = x^2 - 6x + 11$

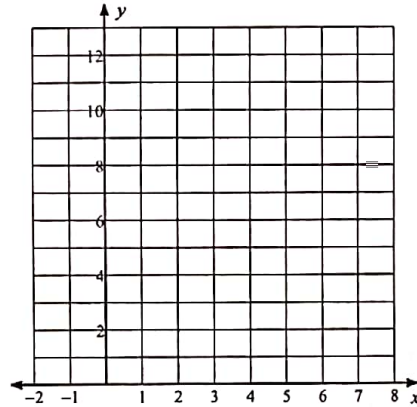
Vertex: _____ Max or Min _____

Axis of Symmetry: _____

x-intercepts: _____

y-intercept: _____

Domain: _____



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

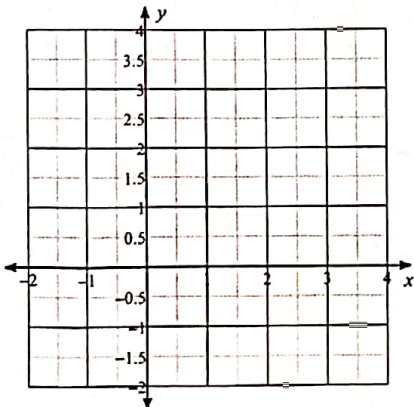
Vertex: _____ Max or Min _____

Axis of Symmetry: _____

x-intercepts: _____

y-intercept: _____

Domain: _____



4) $y = x^2 - 6x + 13$

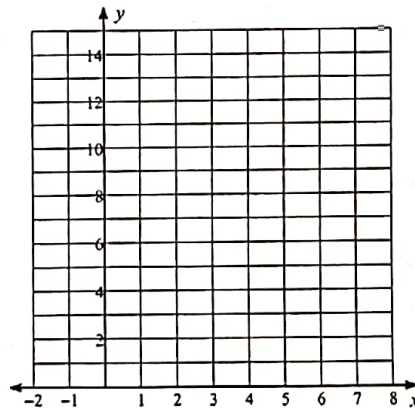
Vertex: _____ Max or Min _____

Axis of Symmetry: _____

x-intercepts: _____

y-intercept: _____

Domain: _____



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

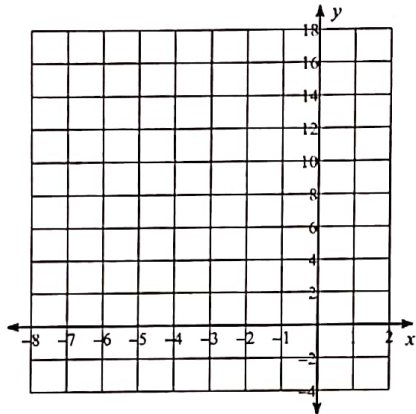
Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:



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

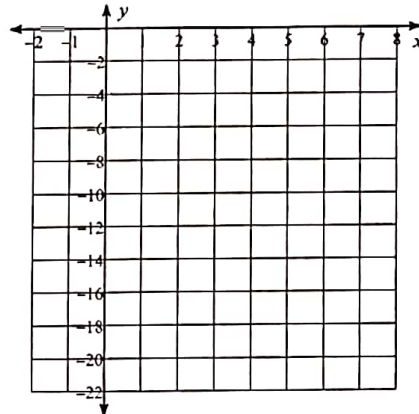
Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:



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

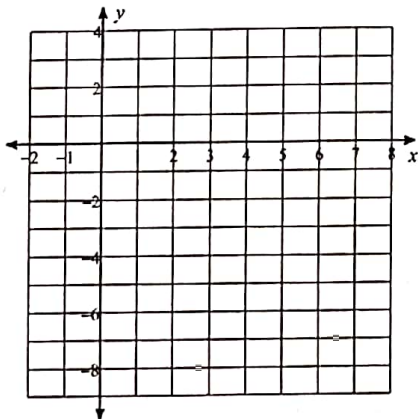
Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:



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

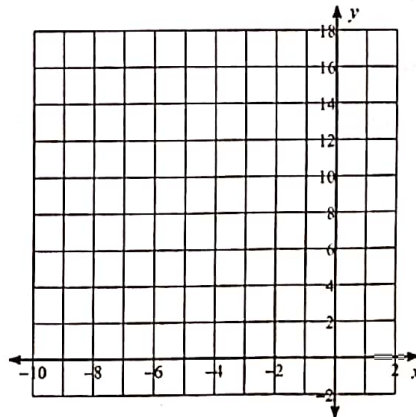
Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:



9) $y = 3(x - 2)(x - 4)$

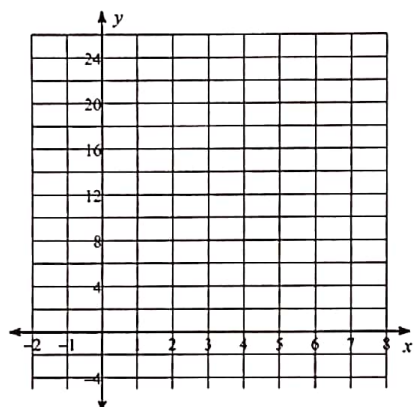
Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:



10) $y = -(x - 1)(x - 5)$

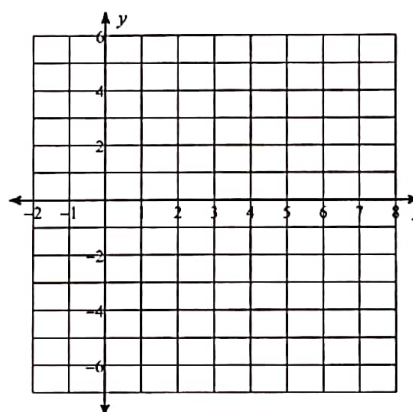
Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:



11) $y = -2(x + 2)(x - 4)$

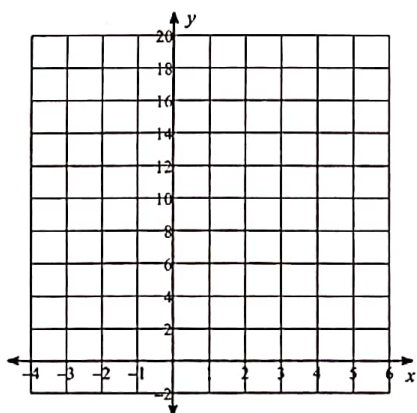
Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:



12) $y = (x + 1)(x + 3)$

Vertex: Max or Min

Axis of Symmetry:

x-intercepts:

y-intercept:

Domain:

