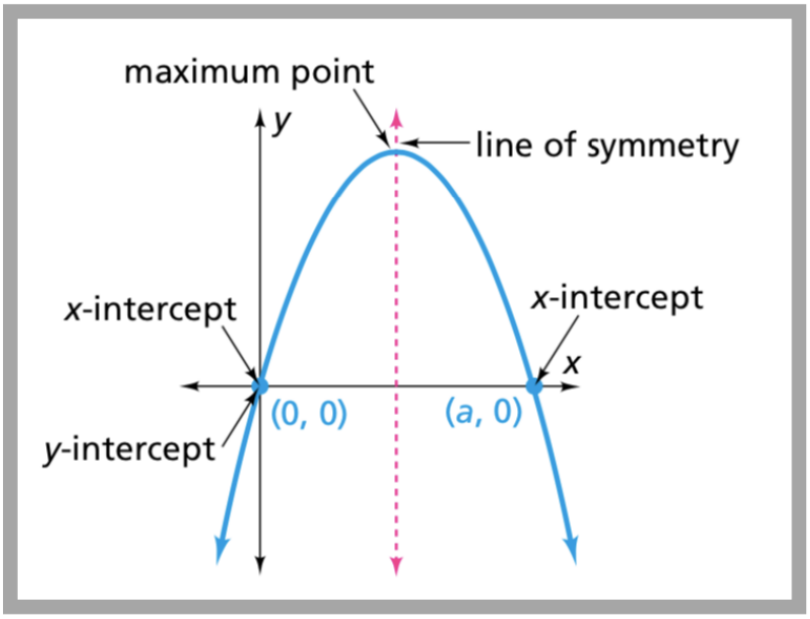
Graphing Parabolas



We can easily graph a parabola if we can find 4 key features.

- y-intercept
- x-intercept(s)
- Line of Symmetry (LOS)
- Vertex

All of these features can be found from the equation!

Let's find the key features for

$$y = x^2 + 2x - 8$$

It helps to have both the expanded and factored forms of the equation.

$x^2 + 2x - 8$

a:

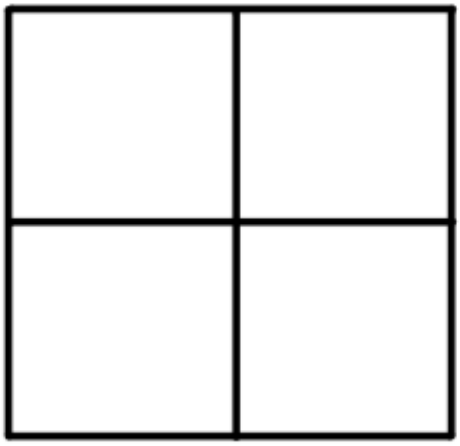
b:

c:

ac:

Factors of -8	Sums

$x^2 + 2x - 8$



How do we find the y-intercept?

The y-intercept is the value of y when ...

Using expanded form:

$y = x^2 + 2x - 8$

Using factored form:

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

y-intercept:

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

$$y = (x + m)(x + n)$$

How do we find the x-intercept(s)?

The x-intercept is the value of x when …

Using expanded form:

$y = x^2 + 2x - 8$

Using factored form:

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

How do we do this?

Zero Product Property

If (a)(b) = 0, either a=0, b=0, or both a and b are equal to zero.

Using factored form:

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

x-intercepts:

Best form for finding x-intercepts?

How do we find the Line of Symmetry?

The line of symmetry (LOS) is

We need to find the x-value _____

in between the _____.

Line of Symmetry:

How do we find the vertex?

We know the vertex is a point on the

To find the coordinates of the vertex we can use our equation and substitute in the _____ for the value of _____ and solve for _____.

Using factored form:

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

Using expanded form:

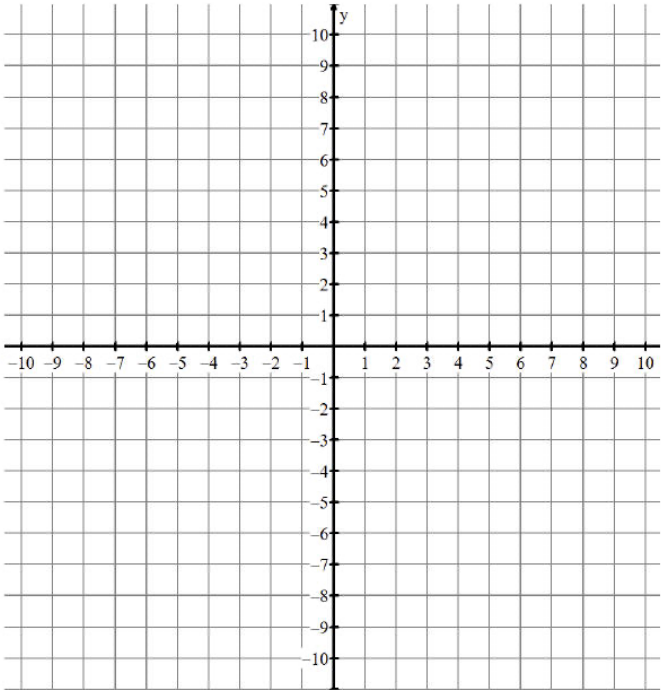
$y = x^2 + 2x - 8$

Vertex:

Let's graph our parabola!

y-intercept: x-intercepts:

Line of Symmetry: Vertex:



2 Additional Points:

For Homework:

Find the key features for the following equations and graph the parabolas. Do all your work in your notebook.

1. $y = x^2 + 8x + 12$

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