Recall:

Def: The graph of all quadratic equations is the U-shaped curve called a **parabola**.

Def: The **Vertex** of any parabola is the so called “turn around point”. It is the place where the parabola reaches its maximum or minimum value.

## The Graph of

Let us call the form , **Vertex Form** of a quadratic function, since it readily shows us that the vertex will always be at .

Now recall that if we replace the in with this will correspond with a horizontal shift to the right units. If we add a number to that function, this will correspond with a vertical shift up or down by units.

So consider the functions

These are all the same graphs, however is easiest to sketch than the others because it readily shows off its horizontal and vertical shifts.

Can you think of a way to make the function appear in Vertex Form? What processes must we do to accomplish this form?

Ex:

Find the vertex form of the function . Then find the vertex, then sketch it.

So the vertex is

or use vertex form

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The Vertex of a Parabola

The vertex of a parabola given by is

* The -coordinate of the vertex is
* The -coordinate of the vertex is
* The axis of symmetry is

## Finding x and y intercepts

Recall that an **x-intercept** is the point where a curve or graph intercepts the x axis.

Also that a **y-intercept** is the point where a curve or graph intercepts the y axis.

They all have a y value of

What do all x-intercepts have in common? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

They all have a x value of

What do all y-intercepts have in common? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Set and find x.

So what do we do to find the x-intercepts? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Set and find .

And what do we do to find the y-intercepts? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ex: Find the x and y intercepts of the function

X intercepts: Let y=0:

So the x intercepts are

Y intercepts: Let x=0:

So the y intercept is