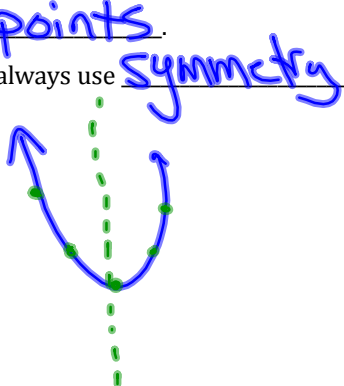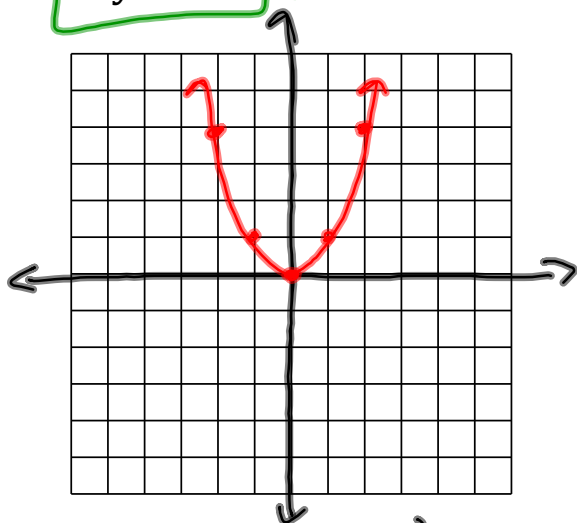# Algebra Ch. 9

Algebra 9-1: Quadratic Equations y = ax²

Graph without a calculator.

1. Make a ___table___. Put _X_ in one column and _y_ in the other. Pick _X_-values and find their corresponding _y_ values. Remember to use _PEMDAS_ or order of operations when finding values.

2. Plot the _points_.

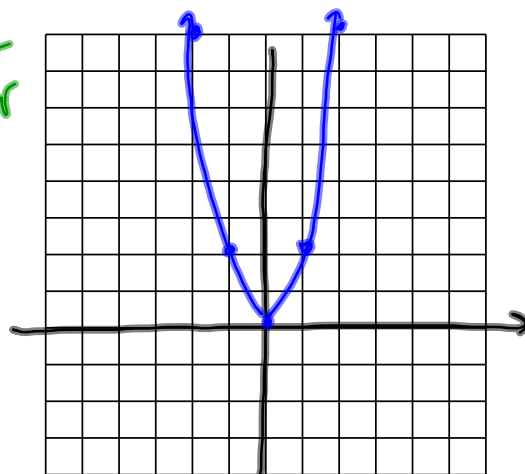3. You can always use _symmetry_ to help plot points.

1. $y = x^2$ Parent

$y = x^2$

x	y
-2	4
-1	1
0	0
1	1
2	4

$y = (-2)^2 = 4$
$y = (-1)^2 = 1$
$y = (0)^2 = 0$
$y = (1)^2 = 1$
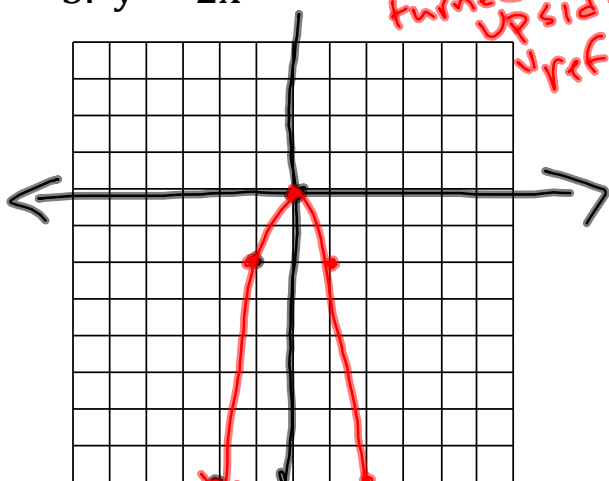$y = (2)^2 = 4$

2. $y = 2x^2$

The "2" made it narrower

$y = 2x^2$

x	y
-2	8
-1	2
0	0
1	2
2	8

$y = 2(-2)^2 = 8$
$y = 2(-1)^2 = 2$
$y = 2(0)^2 = 0$
$y = 2(1)^2 = 2$
$y = 2(2)^2 = 8$

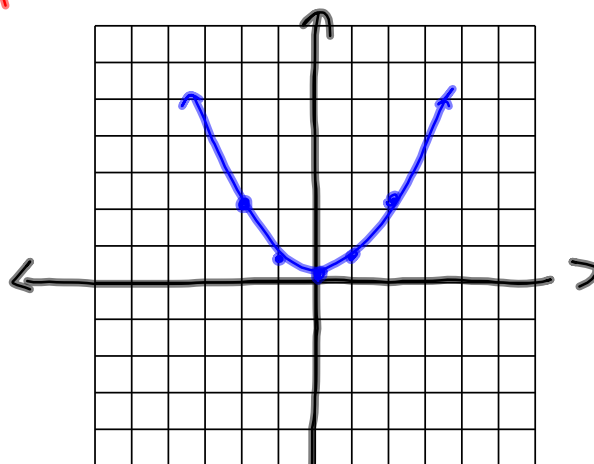3. $y = -2x^2$

the "−" turned it upside down, "reflection"

$y = -2x^2$

x	y
-2	-8
-1	-2
0	0
1	-2
2	

$y = -2(-2)^2 = -8$
$y = -2(-1)^2 = -2$
$y = -2(0)^2 = 0$
$y = -2(1)^2 = -2$
$y = -2(2)^2 = -8$

4. $y = (1/2)x^2$

wider

$y = \frac{1}{2}x^2$

x	y
-2	2
-1	.5
0	0
1	.5
2	2

$y = \frac{1}{2}(-2)^2$
$y = \frac{1}{2}(-1)^2$
$y = \frac{1}{2}(0)^2$
$y = \frac{1}{2}(1)^2$
$y = \frac{1}{2}(2)^2 =$

A $\underline{parabola}$ **is created when** $\underline{X \text{ is to the second power}}$.

X^2

Note
$y = mx+b$ line
$y = b^x$ curve exponential
$y = x^2$ parabola

On the graph to the right, label/draw the following:

Parabola

Axis of Symmetry $\qquad X = \boxed{}$ ← a number

Vertex (x, y)

Maximum $\qquad$ maximum

Minimum $\qquad$ minimum

Opening up

Opening down

Vertex $(0,0)$
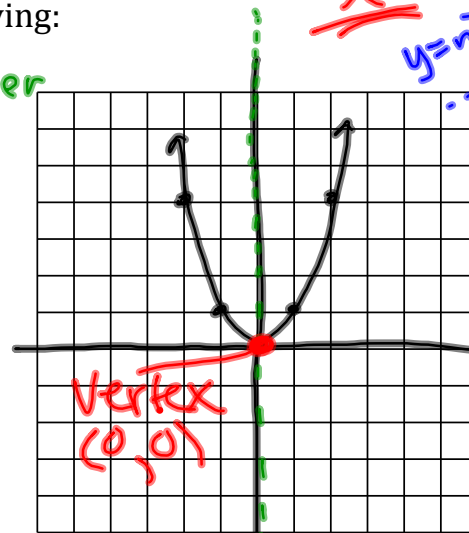
$X = 0$ (Axis of Sym)

*When an object is dropped use $\underline{d = 16t^2}$, where d = $\underline{distance}$ in feet and

t = $\underline{time}$ in seconds.

Assignment 9-1

3-6, 9-21, skip 16, 3 graphs