

9.1 Quadratic Graphs

The simplest quadratic function looks like this $y = x^2$ or $f(x) = x^2$ and is the **quadratic parent function**

These graphs are called **PARABOLAS** because of their shape.

Parabola

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The **vertex** is the highest or lowest point of a parabola. It is called a **minimum** if it is the lowest point. It is called a **maximum** if it is the highest point.

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Identify the vertex. Tell whether it is a minimum or maximum.

Apr 25-10:13 AM

What is the difference?

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Order from widest to narrowest.

a) $y = 3x^2$ $y = 5x^2$ $y = \frac{3}{4}x^2$

$y = \frac{3}{4}x^2$, $y = 3x^2$, $y = 5x^2$

b) $f(x) = -x^2$ $f(x) = -3x^2$ $f(x) = 2x^2$

$f(x) = -x^2$, $f(x) = 2x^2$, $f(x) = -3x^2$

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What is the difference?

$y = x^2$
 $y = x^2 + 1$ up 1 vertex $(0,1)$
 $y = x^2 - 1$ down 1 vertex $(0,-1)$

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So, what is the vertex?

$y = x^2 + 5$ $(0,5)$
 $y = x^2 - 2$ $(0,-2)$
 $y = x^2 + 3$ $(0,3)$
 $y = -2x^2 + 4$ $(0,4)$
 $y = \frac{1}{2}x^2 - 6$ $(0,-6)$
 $y = 3x^2 + 12$ $(0,12)$

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Using the calculator to graph functions.
 Let's look at graphing $y = 3x^2$.

Step 1: Press the $y=$ button.

Step 2: Type in your equation. 3 x^2

Step 3: Press the GRAPH button.

Step 4: Press 2^{nd} GRAPH to get table.
 Use x values, -1, 0 1.

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Domain and Range for Parabolas

Domain: all real numbers

Range: $y \geq 0$

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Graph. Identify the domain and range.

$y = 2x^2$

x	y
-1	2
0	0
1	2

D: all real numbers
 R: $y \geq 0$

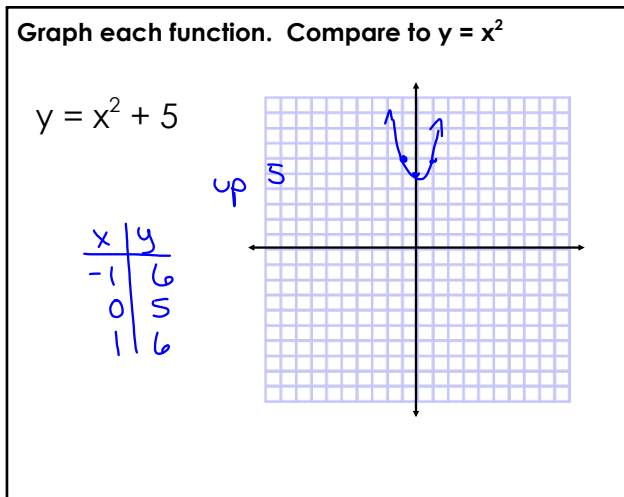
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$y = -\frac{1}{2}x^2$

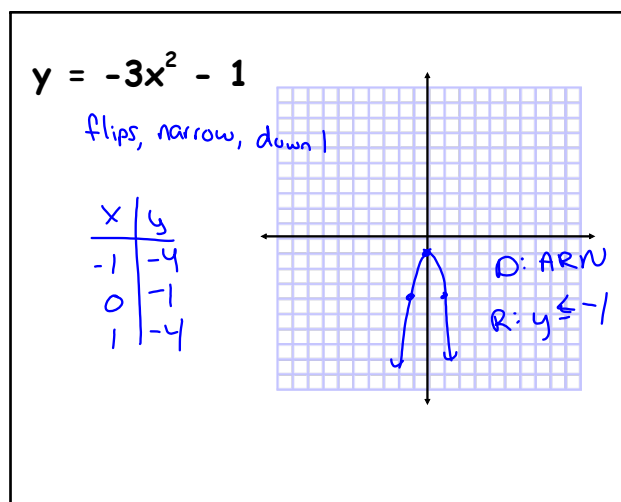
x	y
-2	-2
0	0
2	-2

D: ARN
 R: $y \leq 0$

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Classwork: p.574 #4 - 32 (4's)
on graph paper

Final Five

1. Graph $y = x^2 - 1$
2. Give the coordinates of the vertex.

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