

Section 9.7 Graphing Quadratic Inequalities

Assignment:

quadratic inequalities: **a quadratic function that includes inequality signs**

Graphing quadratic inequalities:

1. **Find the x-coordinate of the vertex and make a table of values**
2. **Graph (dotted or Solid?)** $\begin{matrix} < \text{ or } > \text{ dotted} \\ \leq \text{ or } \geq \text{ solid} \end{matrix}$
3. **Check and shade**

$$x = \frac{-b}{2a}$$

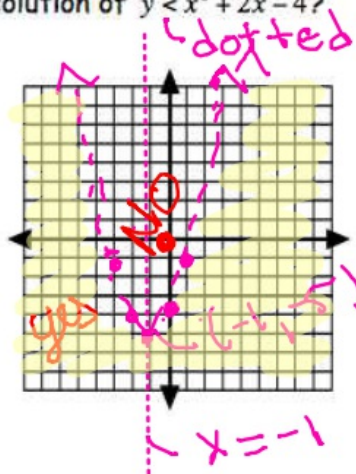
Examples:

1. Sketch the graph of $y = x^2 + 2x - 4$. Plot and label the points A(-1, -2), B(-2, -3), C(3, 0).

1. Tell whether each point lies inside or outside the parabola.

2. Which of these points is a solution of $y < x^2 + 2x - 4$?

x	$x^2 + 2x - 4$	y
1	$(1)^2 + 2(1) - 4$	-1
0	$0 + 0 - 4$	-4
-1	$(-1)^2 + 2(-1) - 4$	-5
-2	$(-2)^2 + 2(-2) - 4$	-4
-3	$(-3)^2 + 2(-3) - 4$	-1



$$a=1 \quad b=2 \quad c=-4$$

$$x = \frac{-2}{2(1)}$$

$$x = -1$$

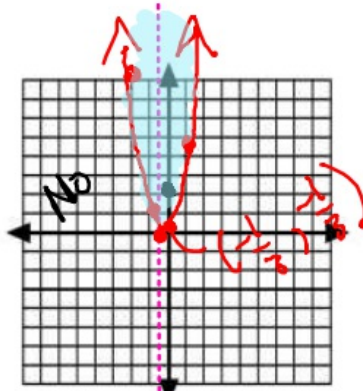
$$(0, 0)$$

$$0 < -4$$

None

2. Sketch the graph of $y \geq 3x^2 + 2x$

x	$3x^2 + 2x$	y
-2	$3(-2)^2 + 2(-2)$	8
-1	$3(-1)^2 + 2(-1)$	1
$-\frac{1}{3}$	$3(-\frac{1}{3})^2 + 2(-\frac{1}{3})$	$-\frac{1}{3}$
0	0 + 0	0
1	$3(1)^2 + 2(1)$	5



$a = 3$

$b = 2$ $c = 0$

$x = \frac{-b}{2a}$

$x = \frac{-2}{2(3)} = -\frac{1}{3}$

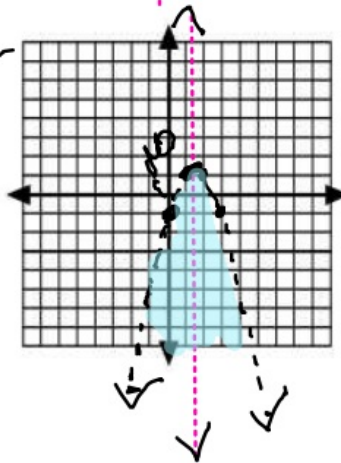
$(0, 2)$

$2 \geq 0 + 0$

$2 \geq 0$

3. Sketch the graph of $y < -x^2 + 3x - 1$

x	$-x^2 + 3x - 1$	y
0	0 + 0 - 1	-1
1	$-(1)^2 + 3(1) - 1$	1
1.5	$-(1.5)^2 + 3(1.5) - 1$	1.25
2	$-(2)^2 + 3(2) - 1$	1
3	$-(3)^2 + 3(3) - 1$	-1



dotted

$x = -\frac{1}{3}$

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

$x = \frac{-b}{2a}$

$x = \frac{-3}{2(-1)}$

$x = \frac{-3}{-2} =$

$x = 1.5$

$(0, 0)$

$0 < -1$
No

Section 9.8 Comparing Linear, Exponential, and Quadratic Models

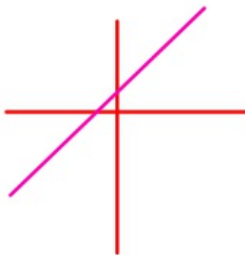
Assignment:

Linear Model

$$y = mx + b$$

$$y = 5x + 2$$

$$y = -4x$$

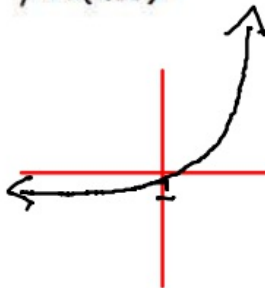


Exponential Model

$$y = C(1 \pm r)^t$$

$$y = 5^x$$

$$y = 2(1.03)^x$$

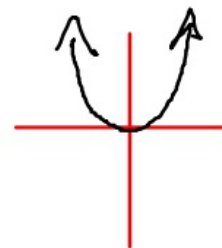


Quadratic Model

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

$$y = 4x^2 + 5x - 2$$

$$y = 3x^2 - 2$$



I. Fill in the blank.

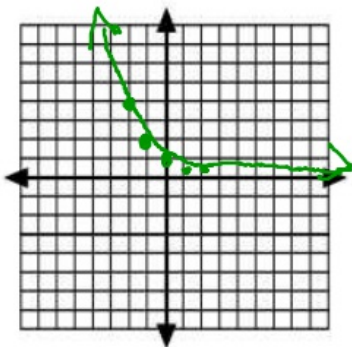
- In a linear model, the exponent on x is 1.
- In an exponential model, x is in the Exponent.
- In a quadratic model, the exponent on x is 2.

II. Plot the following points, then name the type of model that best fits the data.

- a. $(-2, 4)$, $(-1, 2)$, $(0, 1)$, $(1, \frac{1}{2})$, $(2, \frac{1}{4})$

- b. $(-2, 3)$, $(-1, 0)$, $(0, -1)$, $(1, 0)$, $(2, 3)$

Exp



Quads

