

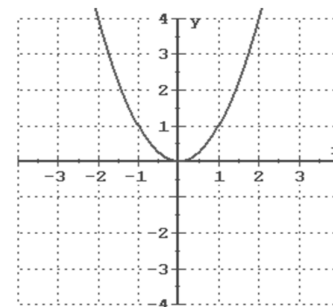
Transformations

9-29-2014

What is a Parent Graph?

When transforming functions, you need to know where to "start." The parent graph is the graph without any transformations (shifts).

For Quadratic Functions, the parent graph is $f(x) = x^2$



Vertex Form and Transformations:

$$f(x) = a(x - h)^2 + k$$

Shows 2 things:

- * If (-) graph reflects
- * If less than 1, graph will be wider. This is called a vertical shrink.
- * If greater than 1, graph will be thinner. This is called a vertical stretch.

Vertical Shift
* If (-) move down
* If (+) move up

Horizontal Shift
* If (-) move right
* If (+) move left

Example

$$f(x) = -5(x + 4)^2 - 6$$

- $a = -5$, therefore...
- * The graph reflects
 - * There is a vertical stretch meaning graph will get thinner.

$(x + 4)$ tells me:
* Graph moves left 4

-6 on the end tells me:
* Graph moves down 6

$$f(x) = a(x - h)^2 + k$$

Shows 2 things:

- * If (-) graph reflects
- * If less than 1, graph will be wider. This is called a vertical shrink.
- * If greater than 1, graph will be thinner. This is called a vertical stretch.

Horizontal Shift
* If (-) move right
* If (+) move left

Vertical Shift
* If (-) move down
* If (+) move up

Ex 1 $f(x) = 2(x + 3)^2 - 4$

Reflection? Yes / No

V.S. ?

H.S. ?

Dilation?

Ex 2 $f(x) = -(x - 6)^2 - 7$

Reflection? Yes / No

V.S. ?

H.S. ?

Dilation?

Ex 3 $f(x) = \frac{1}{2}(x + 8)^2 + 5$

Reflection? Yes / No

V.S. ?

H.S. ?

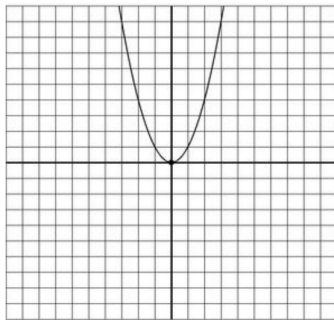
Dilation?

Transformations: Putting them Together

You Try:

Ex. 1 $y = -(x - 3)^2$

| x | f(x) |
|----|------|
| -3 | |
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |
| 3 | |



Reflection? Yes / No

Vertical Shift =

Horizontal Shift =

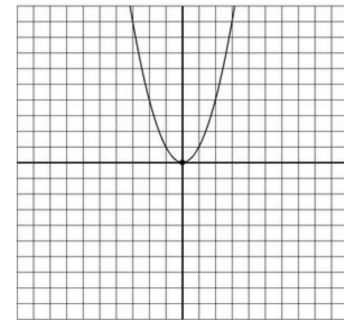
Dilation =

Transformations: Putting them Together

You Try:

Ex. 4 $y = \frac{1}{2}(x + 3)^2 - 4$

| x | f(x) |
|----|------|
| -3 | |
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |
| 3 | |



Reflection? Yes / No

Vertical Shift =

Horizontal Shift =

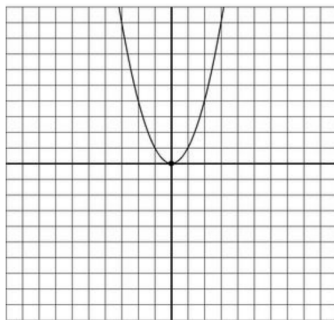
Dilation =

Transformations: Putting them Together

You Try:

Ex. 6 $y = -3(x - 4)^2 - 2$

| x | f(x) |
|----|------|
| -3 | |
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |
| 3 | |



Reflection? Yes / No

Vertical Shift =

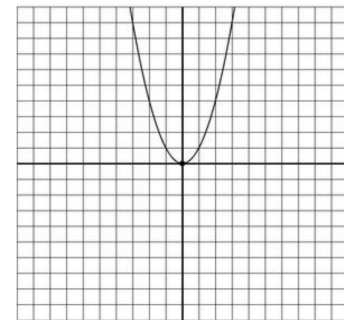
Horizontal Shift =

Dilation =

TOTD - Transformations: Putting them Together You Try:

$y = -2(x - 3)^2 + 1$

| x | f(x) |
|----|------|
| -3 | |
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |
| 3 | |



Reflection? Yes / No

Vertical Shift =

Horizontal Shift =

Dilation =