



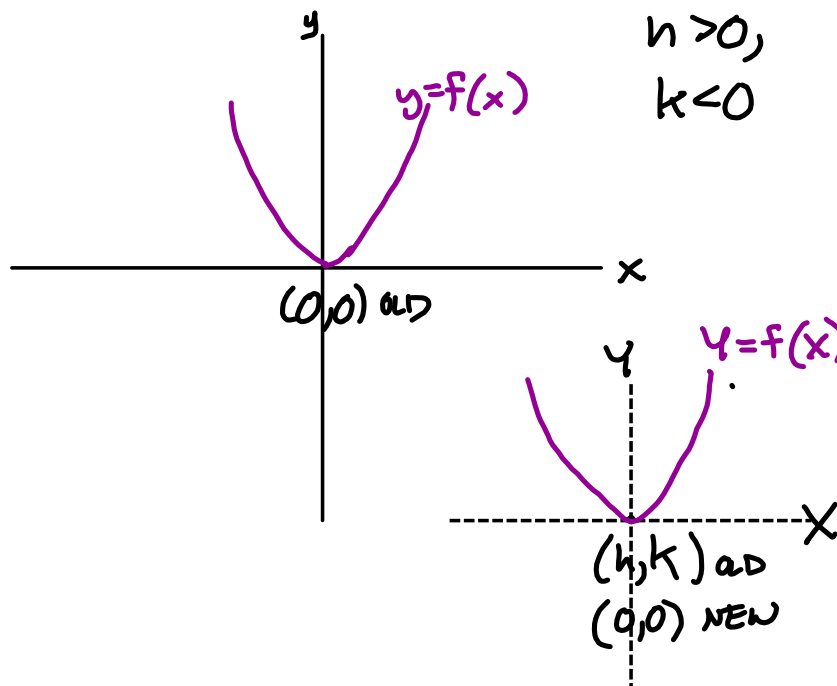
The Math Dawg

Horizontal and Vertical Reflections of Functions Using $f(x)$ Notation

Jul 17-1:49 PM

Review Translation of Axes

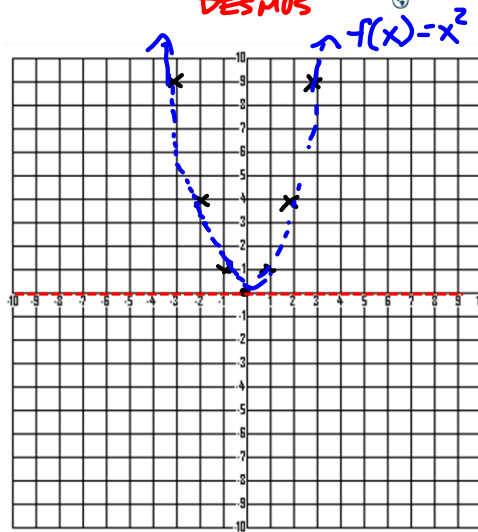
IN THIS
EXAMPLE
 $h > 0$,
 $k < 0$



Vertical Reflections over a Horizontal Line $y = k$

VERIFY WITH
DESMOS

<https://www.desmos.com/calculator>



EXAMPLE:
REFLECT
 $f(x)$ OVER
1) THE X-AXIS
 $y=0$
AND WRITE
IN FUNCTION
NOTATION.
CALL THE
NEW
FUNCTION
 $g(x)$.

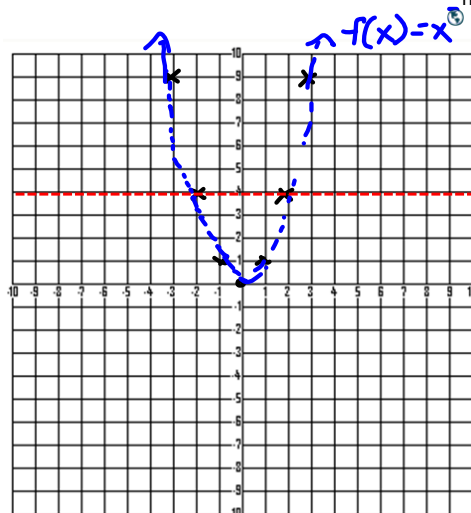
$$g(x) =$$

$$(x, y) \rightarrow (\quad , \quad)$$

Vertical Reflections over a Horizontal Line $y = k$

VERIFY WITH DESMOS

<https://www.desmos.com/calculator>



EXAMPLE:
REFLECT
 $f(x)$ OVER
1) THE LINE
 $y=4$
AND WRITE
IN FUNCTION
NOTATION.
CALL THE
NEW
FUNCTION
 $g(x)$.

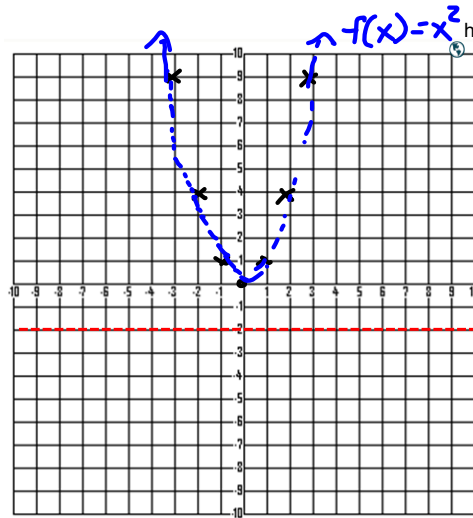
$$g(x) =$$

$$(x, y) \rightarrow (\quad , \quad)$$

Vertical Reflections over a Horizontal Line $y = k$

VERIFY WITH
DESMOS

<https://www.desmos.com/calculator>



EXAMPLE:

REFLECT

$f(x)$ OVER

1) THE LINE
 $y = -2$

AND WRITE
IN FUNCTION
NOTATION.

CALL THE
NEW
FUNCTION
 $g(x)$.

$$g(x) =$$

$$(x, y) \rightarrow (\quad , \quad)$$

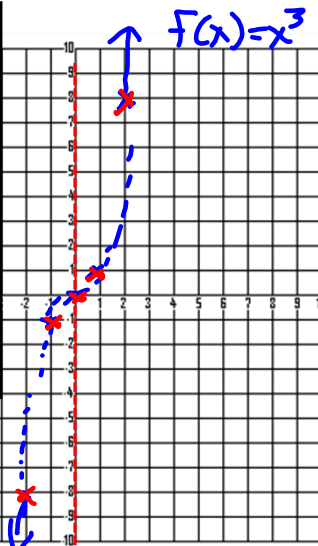
Horizontal Reflections over the Line

$x = h$

VERIFY WITH
DESMOS

<https://www.desmos.com/calculator>

x	$f(x)$	$-x$	$f(-x)$
-2		2	
-1		1	
0		0	
1		-1	
2		-2	



EXAMPLE:

REFLECT

$f(x)$ OVER

THE y -AXIS,

$x = 0$

AND WRITE
IN FUNCTION
NOTATION.

CALL THE
NEW FUNCTION
 $g(x)$

$$g(x) =$$

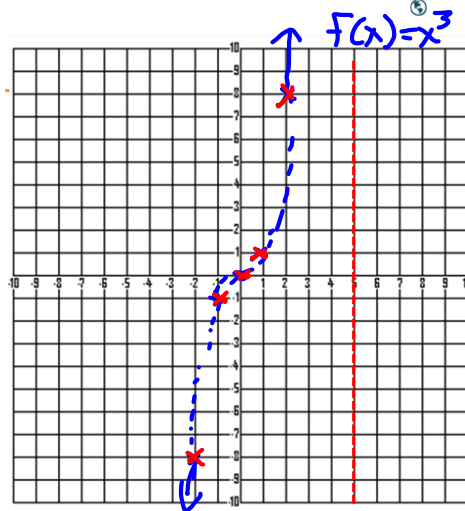
$$(x, y) \rightarrow (\quad , \quad)$$

Horizontal Reflections over the Line

$x = h$

VERIFY WITH DESMOS

<https://www.desmos.com/calculator>



EXAMPLE:

REFLECT
 $f(x)$ OVER
THE LINE
 $x = 5$

AND WRITE
IN FUNCTION
NOTATION.
CALL THE
NEW FUNCTION
 $g(x)$

$$g(x) =$$

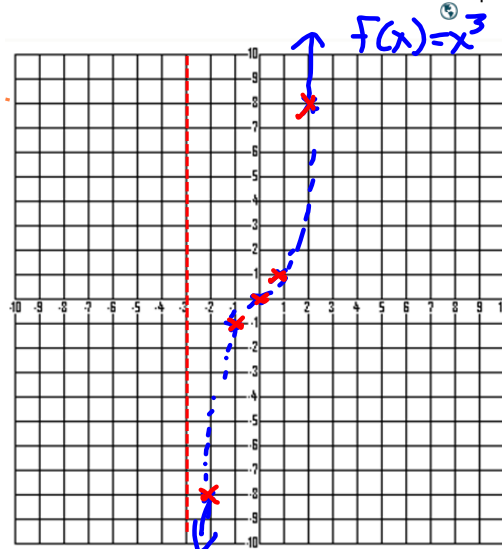
$$(x, y) \rightarrow (\text{---}, \text{---})$$

Horizontal Reflections over the Line

$x = h$

VERIFY WITH DESMOS

<https://www.desmos.com/calculator>



EXAMPLE:

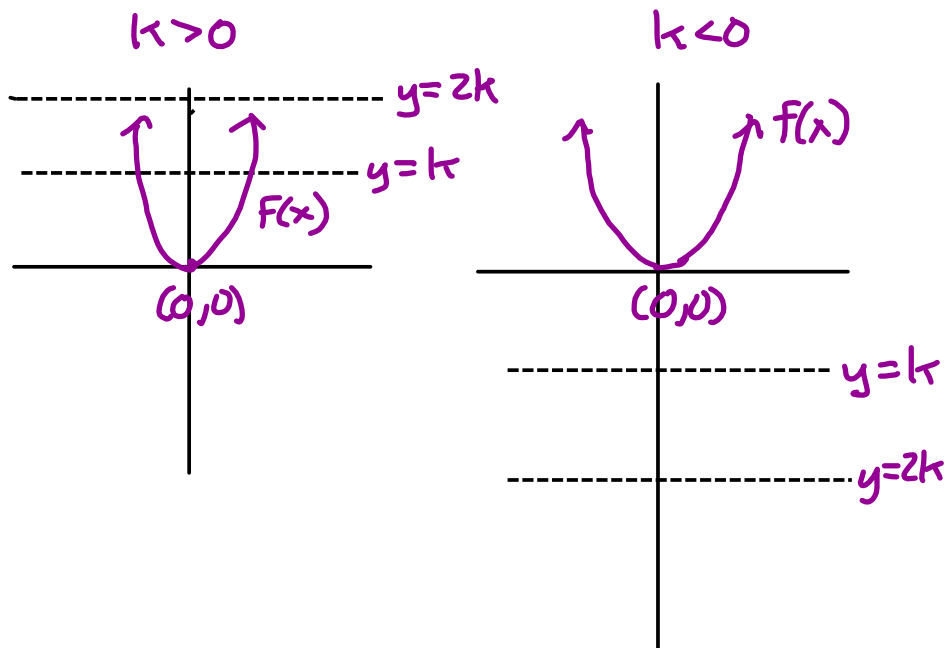
REFLECT
 $f(x)$ OVER
THE LINE
 $x = -3$

AND WRITE
IN FUNCTION
NOTATION.
CALL THE
NEW FUNCTION
 $g(x)$

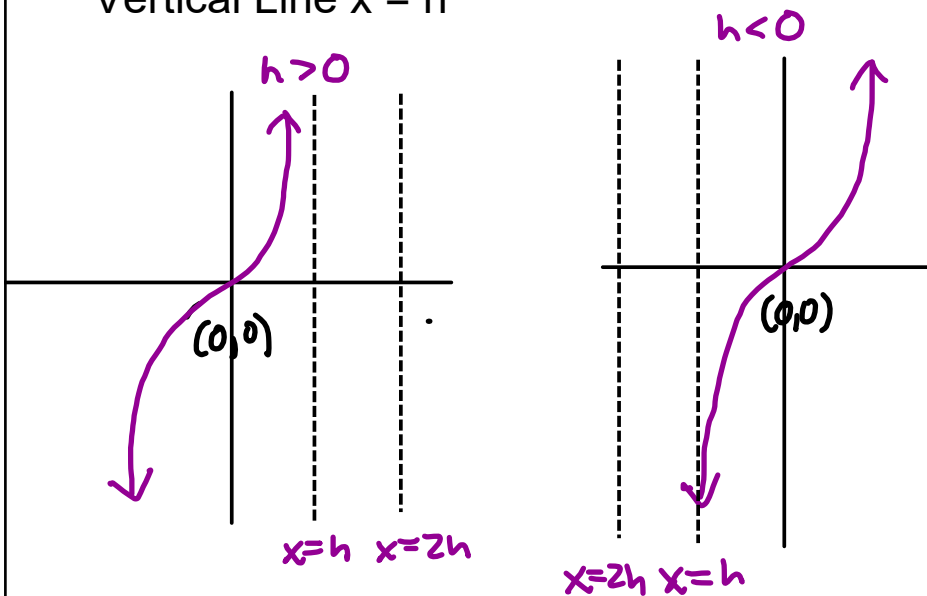
$$g(x) =$$

$$(x, y) \rightarrow (\text{---}, \text{---})$$

Generalization Vertical Reflection over Horizontal Line $y = k$



Generalization Horizontal Reflection over Vertical Line $x = h$



Summary

Vertical reflections over a horizontal line $y = k$

IF $f(x)$ IS THE FUNCTION
THE REFLECTED FUNCTION $g(x)$ IS

$$g(x) = -f(x) + 2k$$

EXAMPLE: LET $f(x) = \sqrt{x}$. WRITE THE
FUNCTION $g(x)$ THAT REFLECTS
 $f(x)$ OVER $y = -5$

<https://www.desmos.com/calculator>

Horizontal reflections over the line $x = h$

IF $f(x)$ IS THE FUNCTION THE
REFLECTED FUNCTION IS

$$g(x) = f(-x + 2h)$$

EXAMPLE: LET $f(x) = x^3$. WRITE THE
FUNCTION $g(x)$ THAT
REFLECTS $f(x)$ OVER THE
LINE $x = -7$

<https://www.desmos.com/calculator>