

Sept. 26, 2013

Sect. 3-2a

Transformations of Graphs
Shifts (L/R/U/D)
Stretching / Compressing
Reflections

Vertical Shifts

$$y = x^2$$

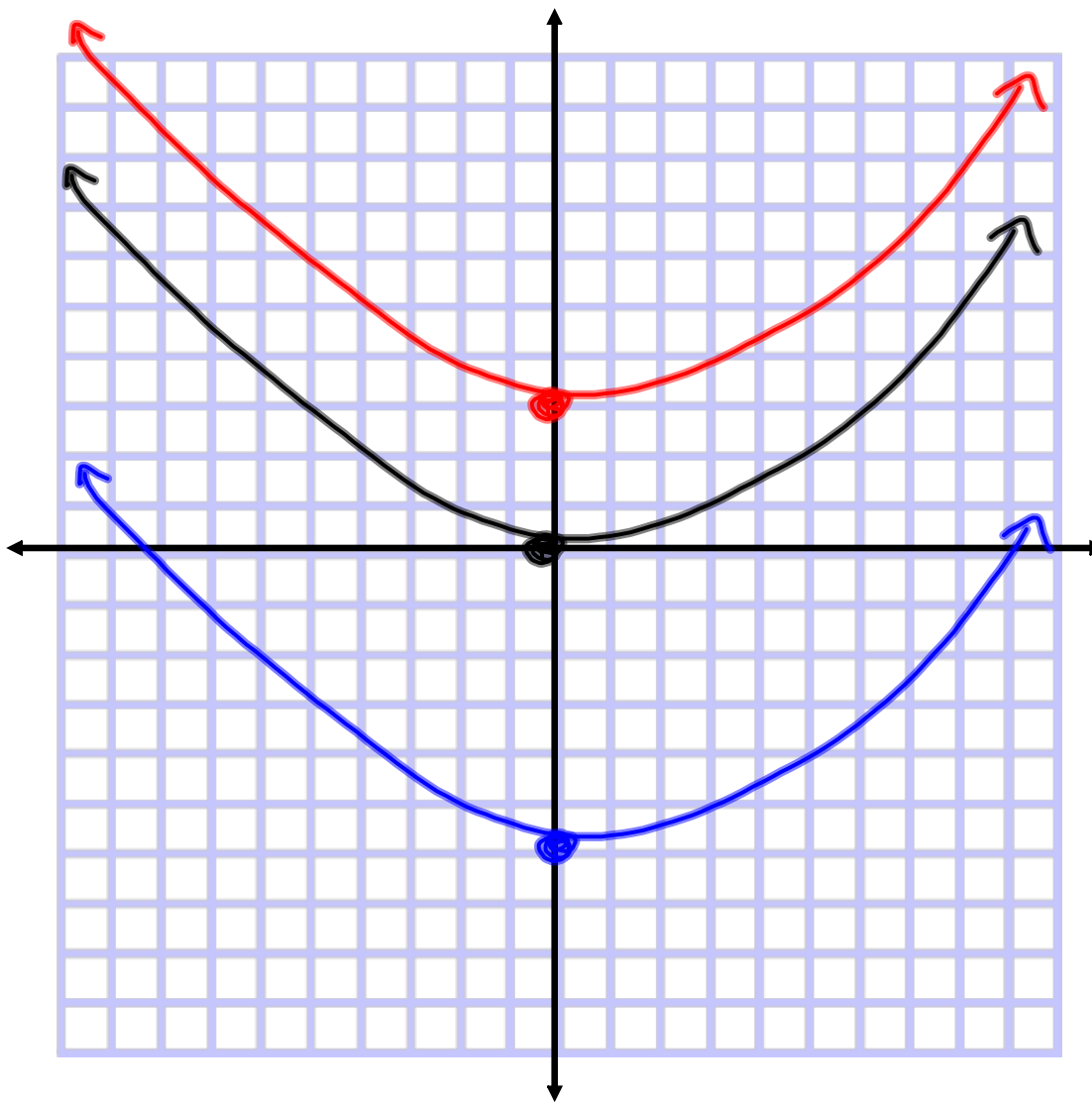
Parent

$$y = x^2 - 6$$

Down 6

$$y = x^2 + 3$$

Up 3



$$f(x) = |x|$$

Parent

$$g(x) = |x| - 4$$

D 4

$$h(x) = |x| + 7$$

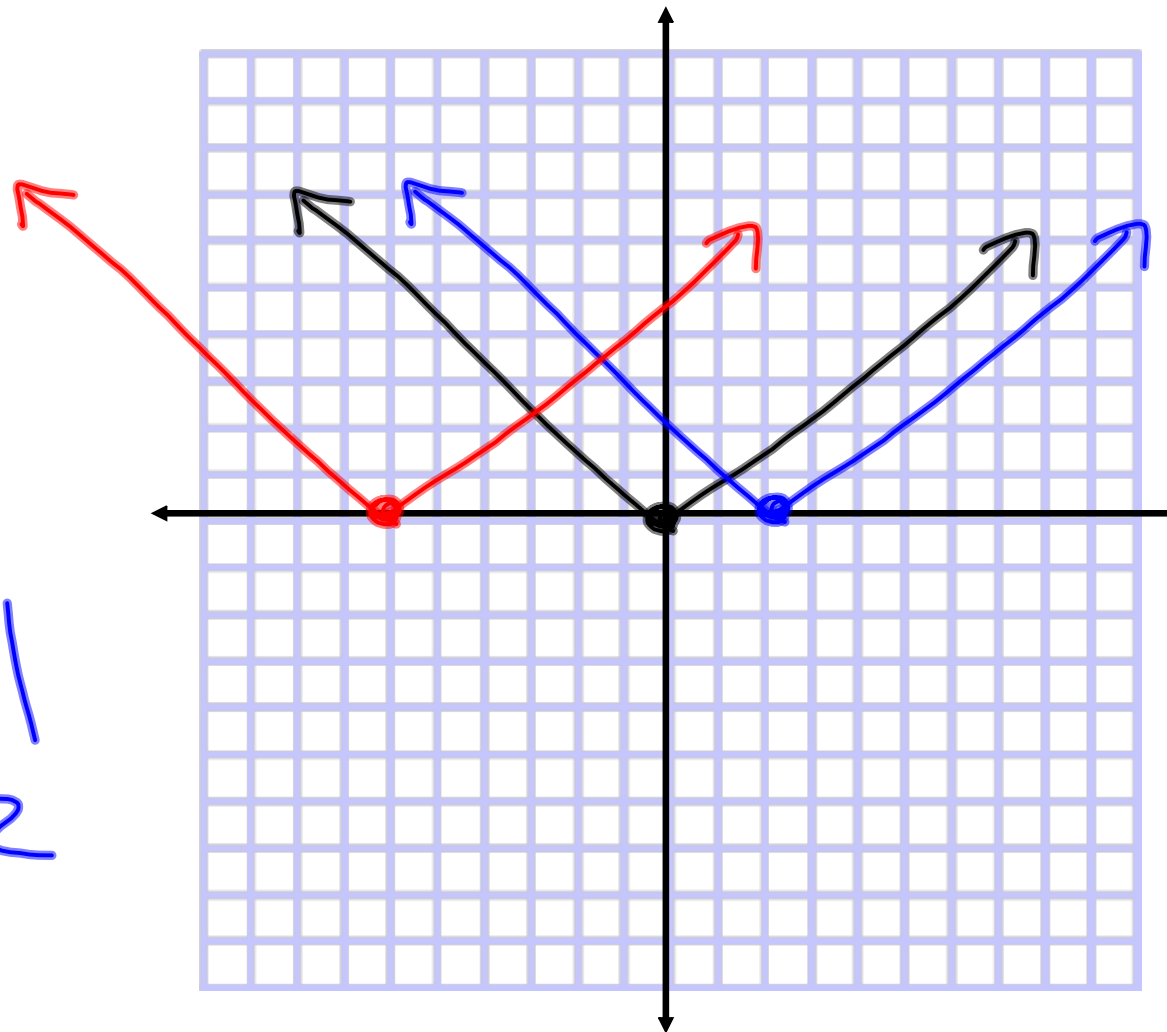
u 7

Horizontal Shifts

$y = |x|$
Parent

$y = |x+6|$
Left 6

$y = |x-2|$
Right 2



$$f(x) = x^2$$

Parent

$$g(x) = (x + 5)^2$$

L 5

$$h(x) = (x - 1)^2$$

R 1

Vertical shifts are
"outside" shifts. And
are as they appear.

Horizontal shifts are
"inside" shifts. And
they appear opposite.

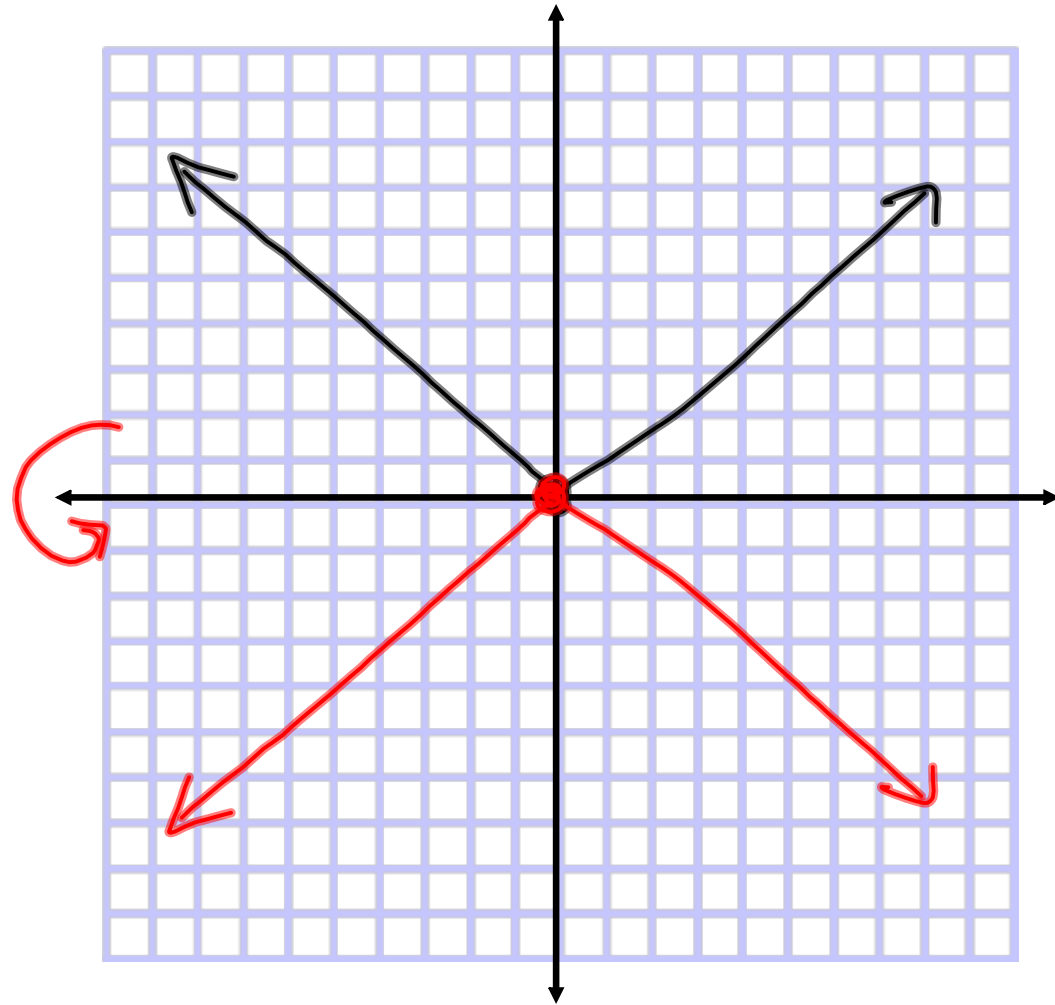
Reflections

$$y = |x|$$

Parent

$$y = -|x|$$

Flop

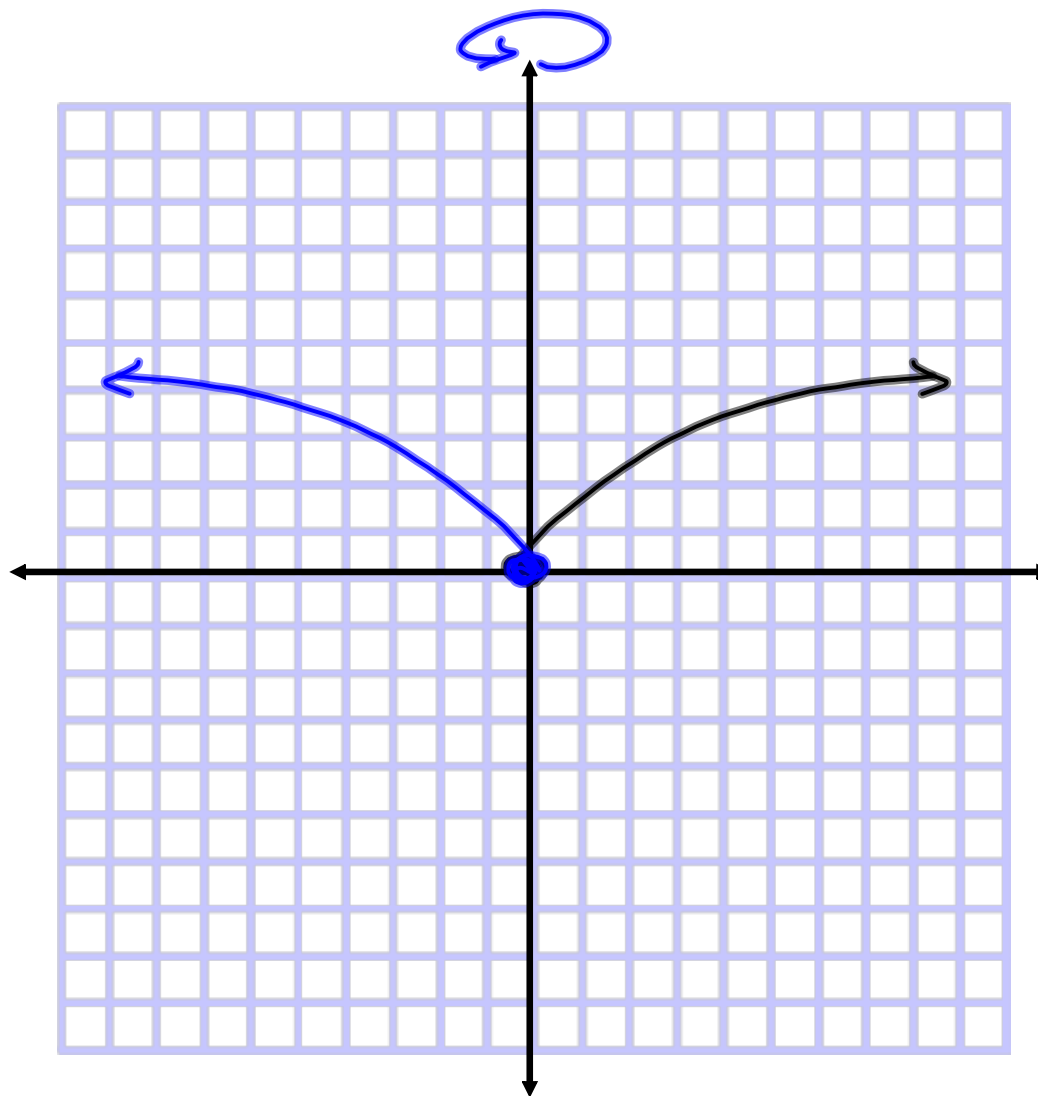


$$y = \sqrt{x}$$

Parent

$$y = \sqrt{-x}$$

Flip



Outside negatives are
vertical reflections.
(over x-axis)

Inside negatives are
horizontal reflections.
(over y-axis)

Stretching/Compressing
(Shrinking)

$$f(x) = x^2$$

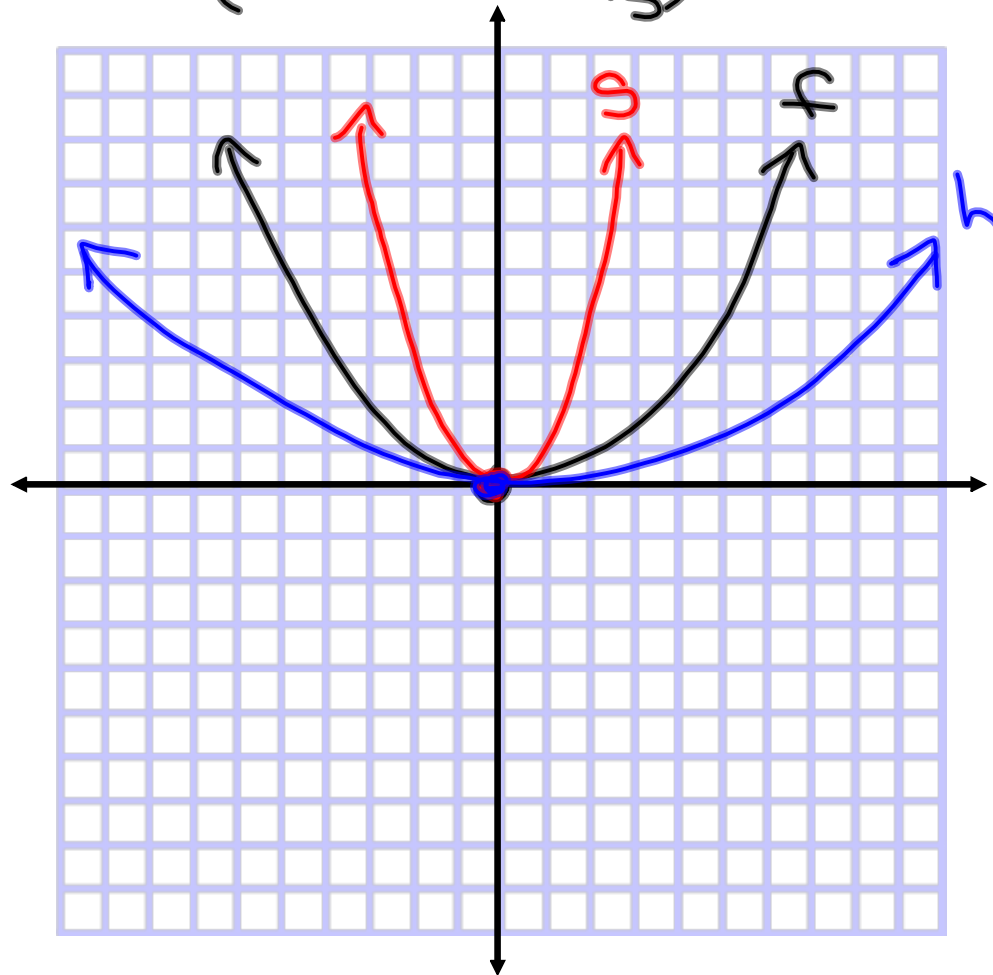
Parent

$$g(x) = 3x^2$$

Stretch

$$h(x) = \frac{1}{2}x^2$$

Compress



$$f(x) = 1x^2$$

Parent

$$g(x) = ax^2$$

If $|a| > 1$, then stretched.

$$h(x) = ax^2$$

If $|a| < 1$, then compressed.