

Quiz

a) $f(x) = x^2 + 3$

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

$= x^2 + 3$

$= f(x)$

EVEN
 $f(-x) = f(x)$

b) $f(x) = x^3 - 4x$

$f(-x) = (-x)^3 - 4(-x)$

$= -x^3 + 4x$

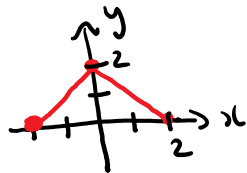
$= -(x^3 - 4x)$

$= -f(x)$

ODD
 $f(-x) = -f(x)$

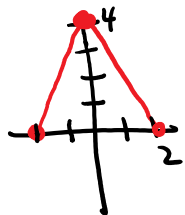
3.5 Cont'd

RECAP



$y = f(x)$

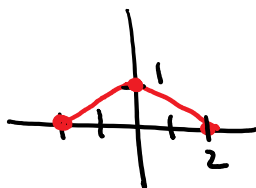
$y = 2f(x)$



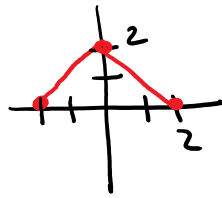
Vertical Stretch

$y = \frac{1}{2}f(x)$

Vertical Compression



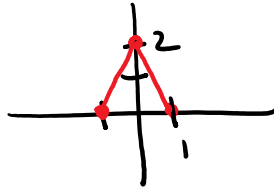
$$y = f(x)$$



$$f(x) = 0$$

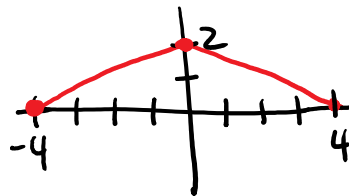
$$y = f(2x)$$

Horizontal
Compression



$$y = f\left(\frac{1}{2}x\right)$$

Horizontal
Stretch



Order of Operations:

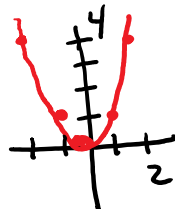
Do stretches/compressions/reflections before shifting

(Rephrased: Do shifting last) ←

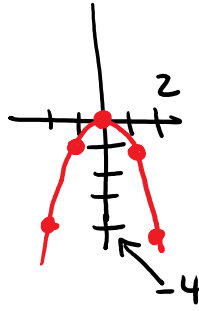
Rephrased: Do multiplication before addition

Ex: Graph $y = -x^2 + 2$ using transformations

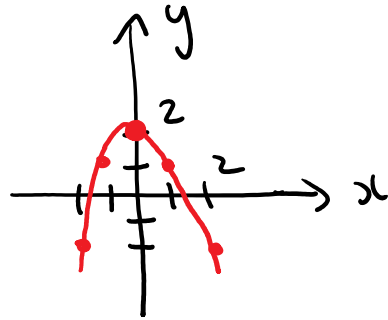
$$y = x^2$$



$$y = -x^2$$

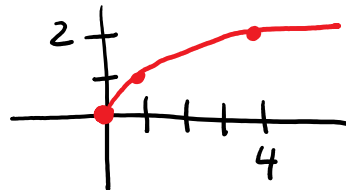


$$y = -x^2 + 2$$



Ex: Graph $y = \sqrt{-(x+3)} + 2$
using transformations

$$y = \sqrt{x}$$

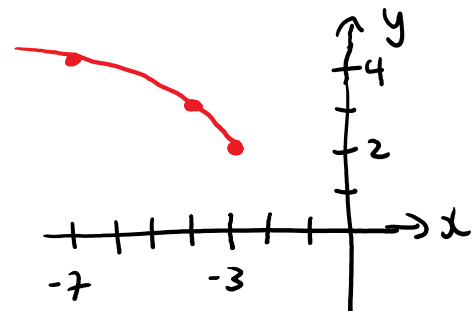


$$y = \sqrt{-x}$$



$$y = \sqrt{-(x+3)} + 2$$

$x \rightarrow x+3$ shift left 3 units
and shift up 2 units



Standard Form of a Function

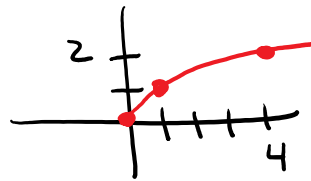
$$y = a f(b(x+c)) + d$$

must be factored

Ex: Graph $y = \sqrt{4x+4}$

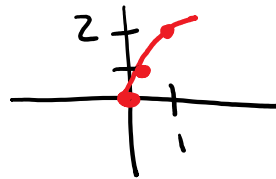
Rewrite $y = \sqrt{4(x+1)}$

$$y = \sqrt{x}$$



$$y = \sqrt{4x}$$

(Divide each x by 4)



$$y = \sqrt{4(x+1)}$$

Shift left by 1

