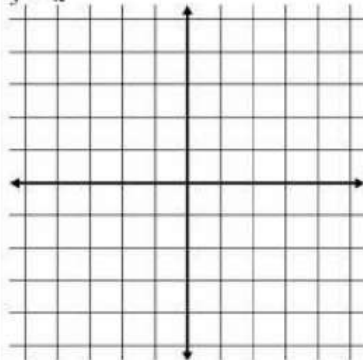


*PRE-CALCULUS: by Finney, Demana, Watts and Kennedy*  
*Chapter 1: Functions and Graphs* *1.5: Library of*  
*Functions and Inverses*

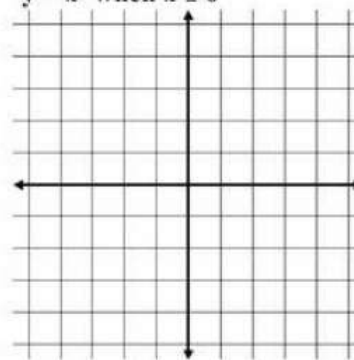
What you'll Learn About

Sketch a graph of the following functions and their inverses

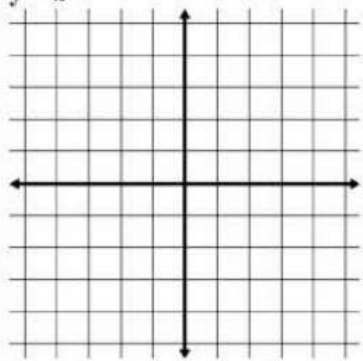
$y = x$



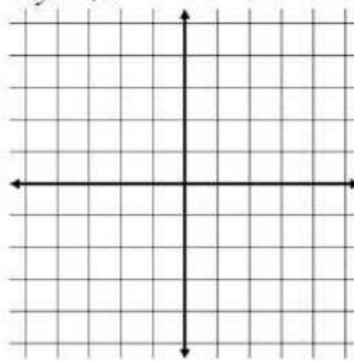
$y = x^2$  when  $x \geq 0$



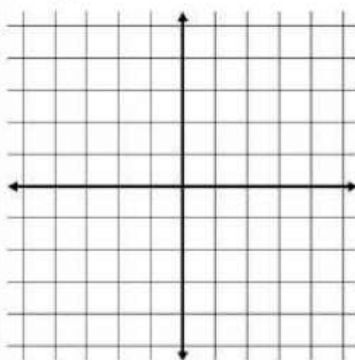
$y = x^3$



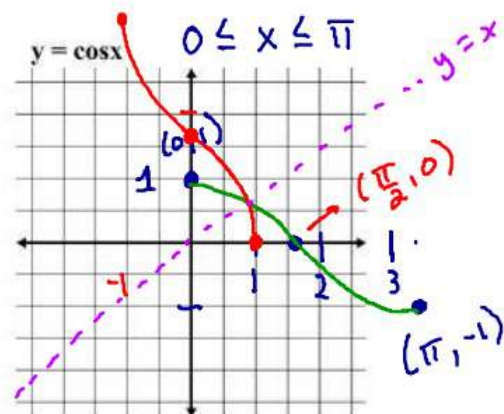
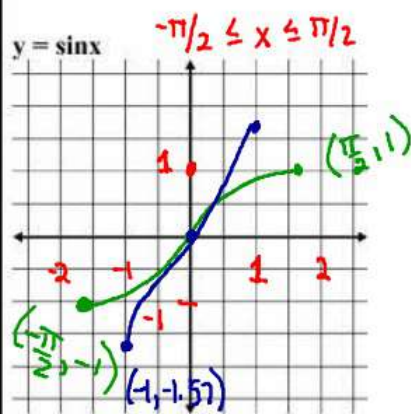
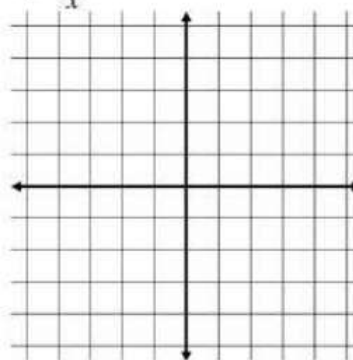
$y = \sqrt{x}$



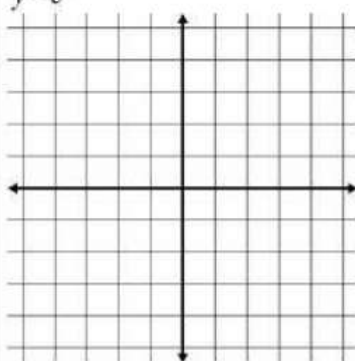
$$y = |x|$$



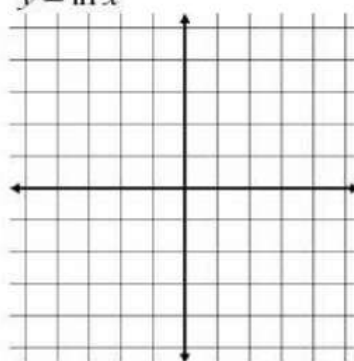
$$y = \frac{1}{x}$$



$$y = e^x$$



$$y = \ln x$$



What you'll Learn About

Transformations

shift  
up/down/left/right  
reflections  
compression/  
stretches

Inside do the  
opposite operation

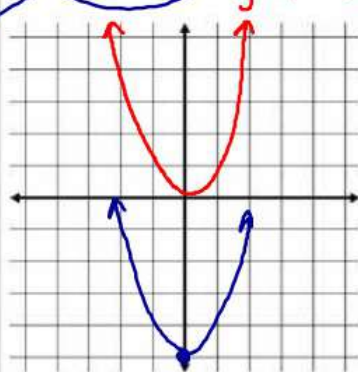
Outside do what  
it says

Describe how the graph of  $y = x^2$  can be transformed to the graph of the given equation.

A)  $y = x^2 - 5$

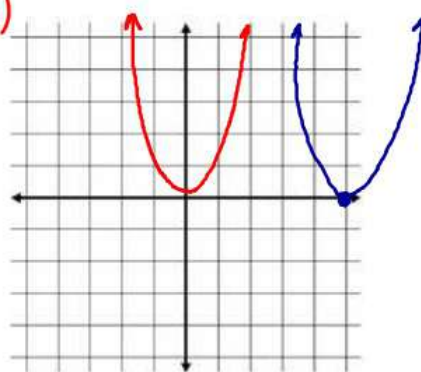
$y = x^2$  (Parent Function)

Down 5



B)  $y = (x - 5)^2$

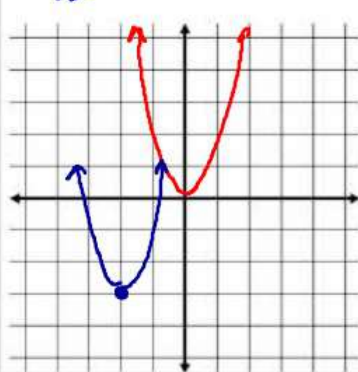
right 5



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

left 2

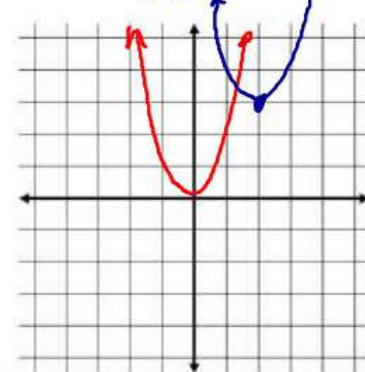
down 3



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

right 2

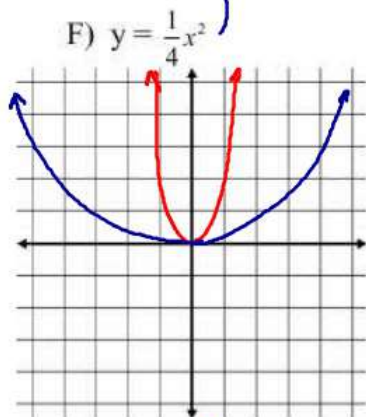
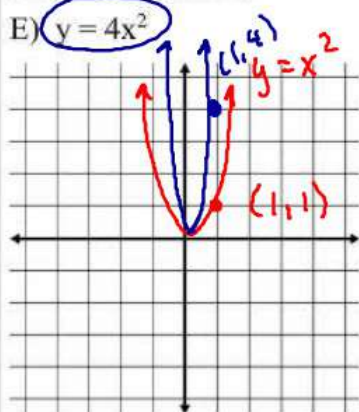
up 3



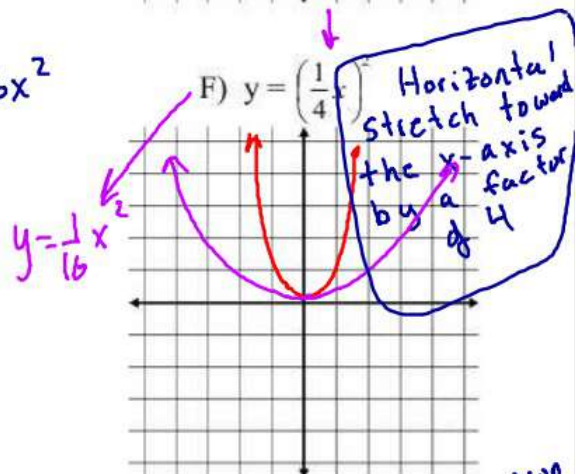
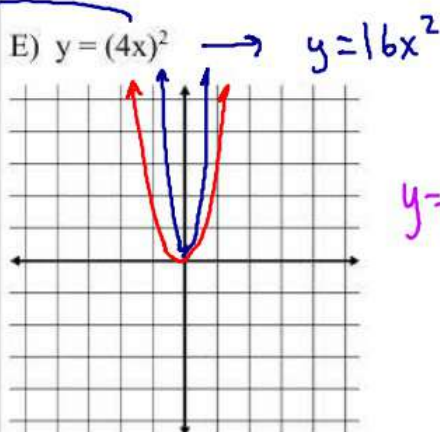
Vertical compression away from y-axis by a factor of  $\frac{1}{4}$

Vertical stretch toward the y-axis by a factor of 4

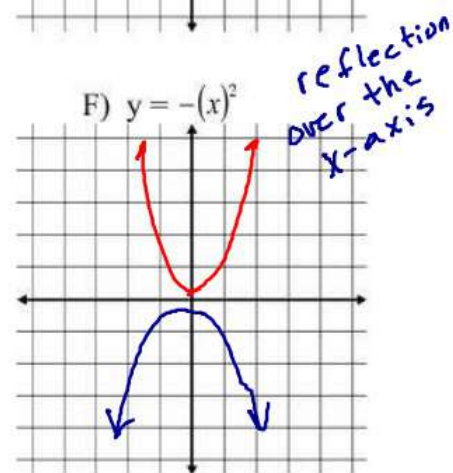
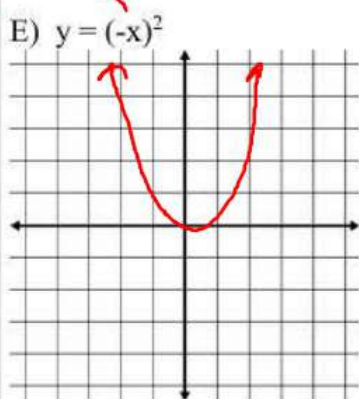
Describe how the graph of  $y = x^2$  can be transformed to the graph of the given equation.



Horizontal compression away from the x-axis by a factor of  $\frac{1}{4}$

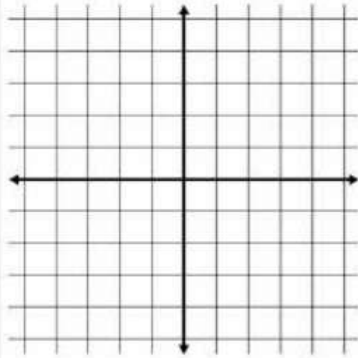


reflection over the y-axis

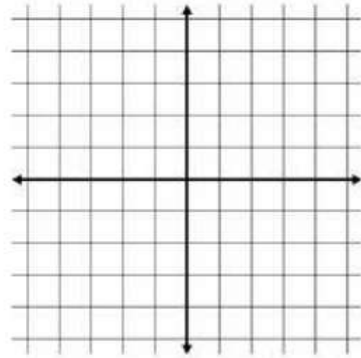


Describe how the graph of  $y = x^3$  can be transformed to the graph of the given equation.

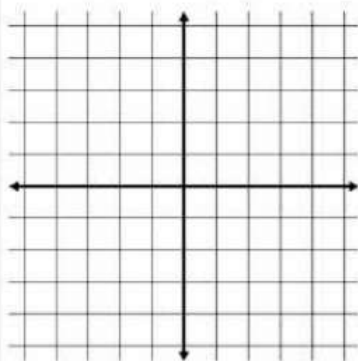
A)  $y = x^3 + 1$



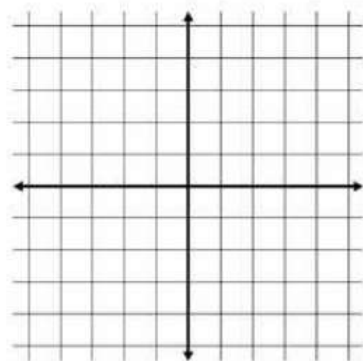
B)  $y = (x - 2)^3$



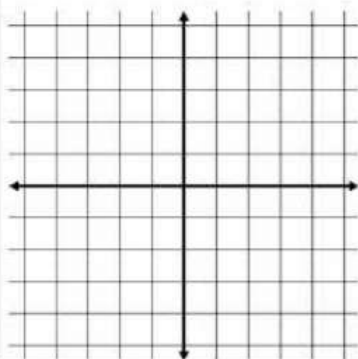
C)  $y = (x + 2)^3 - 3$



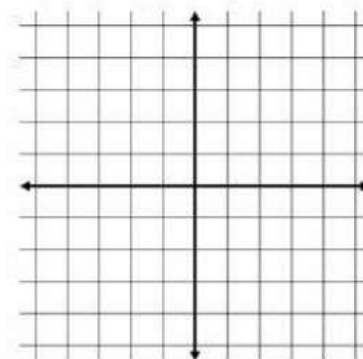
D)  $y = (x - 2)^3 + 3$



E)  $y = 4x^3$

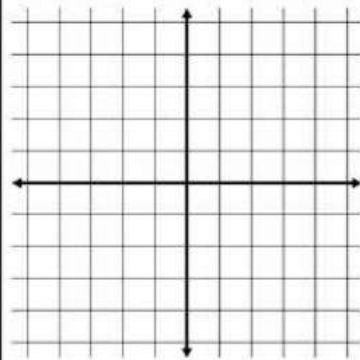


F)  $y = \frac{1}{4}x^3$

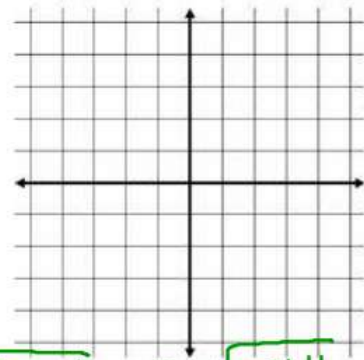


Describe how the graph of  $y = \sqrt{x}$  can be transformed to the graph of the given equation.

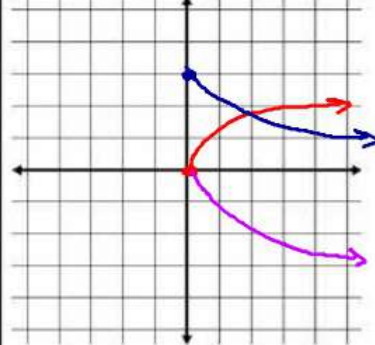
A)  $y = \sqrt{x} + 1$



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

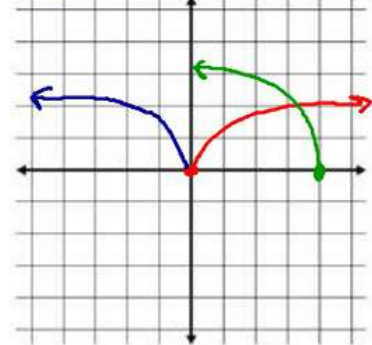


→ C)  $y = -\sqrt{x} + 3$



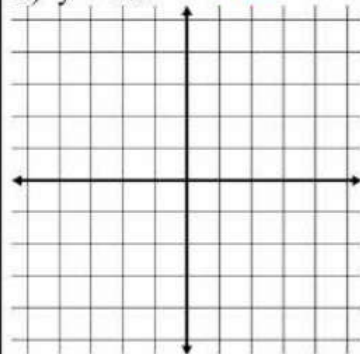
$y = \sqrt{-(x-4)}$   $y = \sqrt{-x+4}$

→ D)  $y = \sqrt{4-x}$



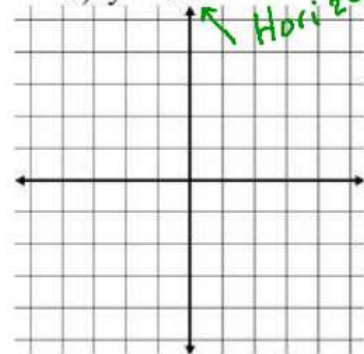
E)  $y = 2\sqrt{x}$

vertical



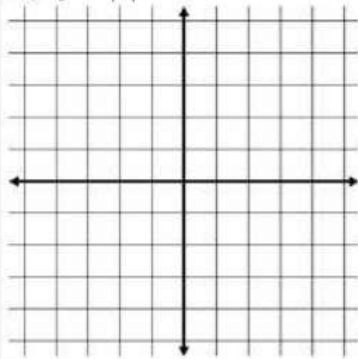
F)  $y = \sqrt{2x}$

Horizontal

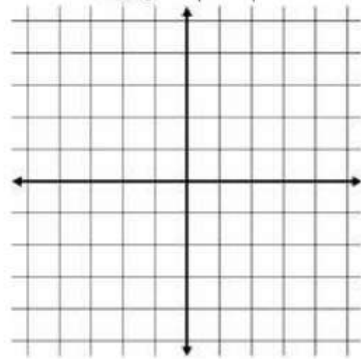


Describe how the graph of  $y = |x|$  can be transformed to the graph of the given equation.

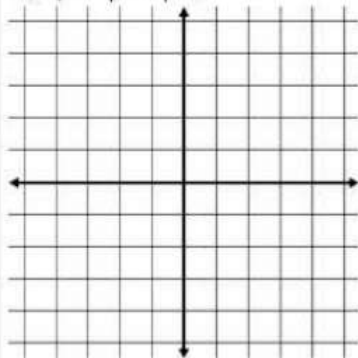
A)  $y = |x| + 1$



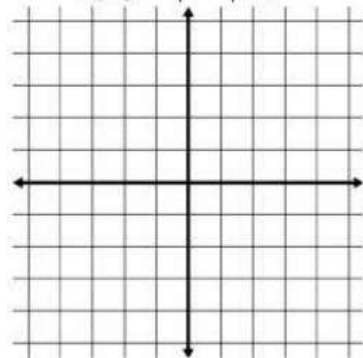
B)  $y = |x - 2|$



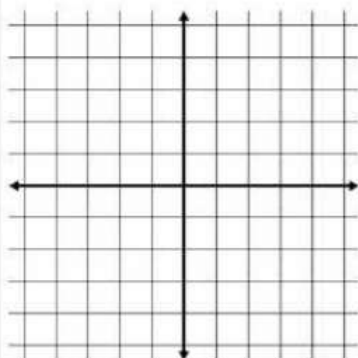
C)  $y = |x + 2| - 3$



D)  $y = |x - 2| + 3$



E)  $y = \frac{1}{2}|x|$



F)  $y = \left|\frac{1}{2}x\right|$

