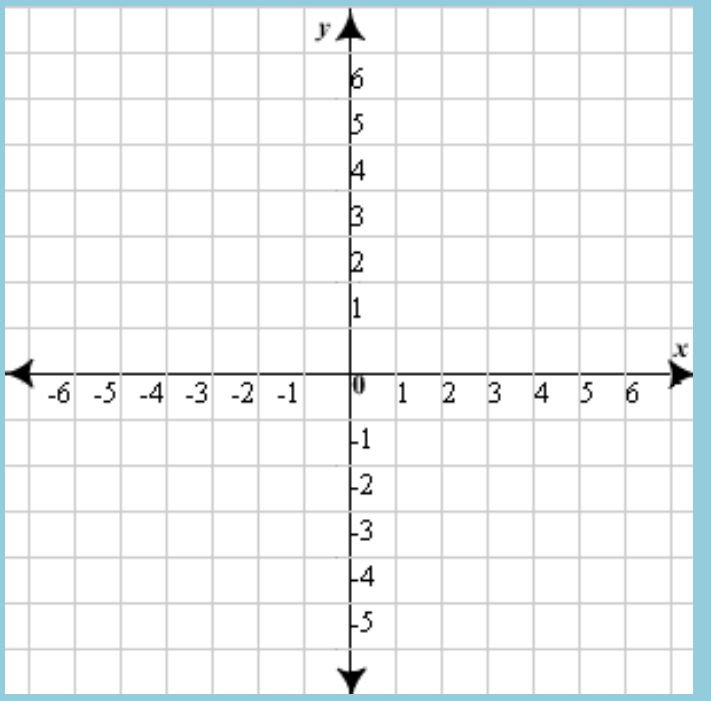
WELCOME

Chapter 16 Section 3:

Inverse Functions Graphically & Algebraically

WARM-UP

- Graph: $f(x) = |x| - 2$



- Evaluate the piecewise function:

$$f(x) = \begin{cases} x + 2 & \text{if } x \leq -2 \\ -2x - 3 & \text{if } x > -2 \end{cases}$$

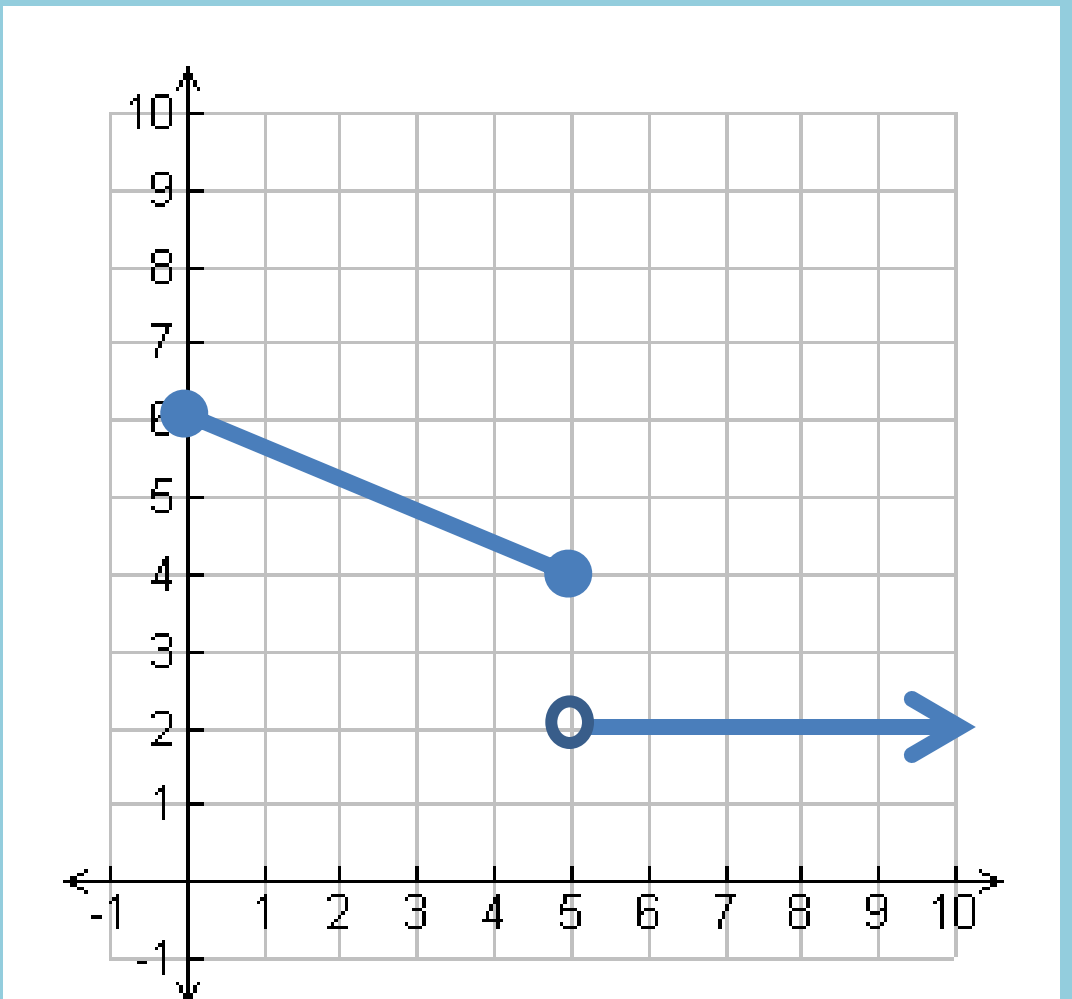
$f(-3) =$ $f(5) =$

Chap 16 Sect 3: Learning Targets

- Write piecewise functions
- Understand what an inverse is, inverse of a function and what it represents.
- Find the inverse of a function Algebraically.
- Find the inverse using a graph.

Writing Piecewise Functions

We can write a piecewise function by breaking the graph into intervals of constant change and finding their equation.



Inverse

“Undoing,” or working backwards to return to the original state or position is referred to as the inverse.

Put in Box -> Close Box -> Wrap Box -> Give Box

Take out of Box <- Open Box <- Un-Wrap <- Take Box

What is a Function? $f(x)$

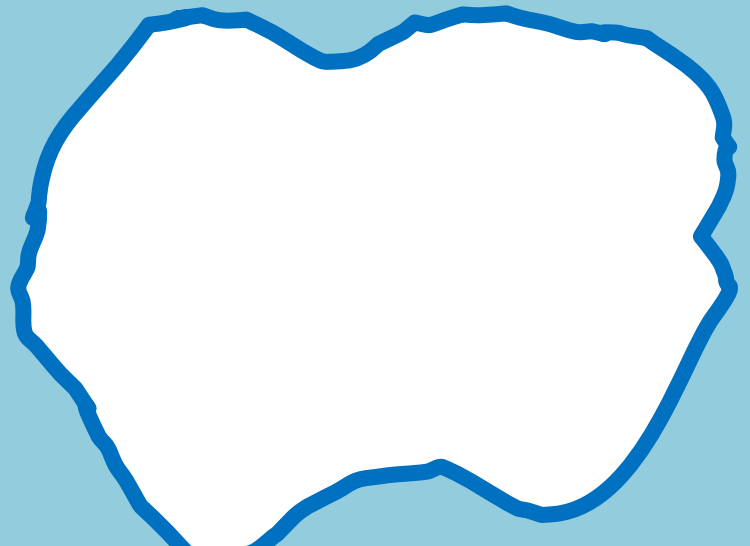
A function is an operation on the x inputs in the domain that creates the possible f(x) outputs in the range.

$$f(x) = -2x + 4$$

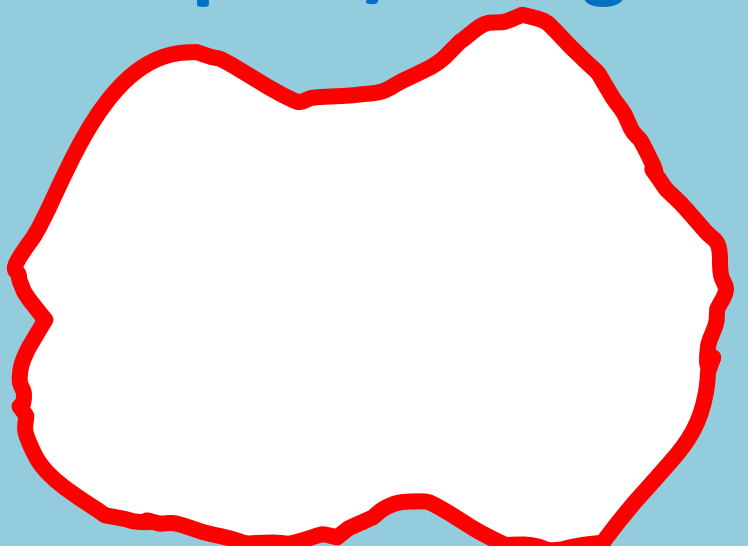
$$f(3) =$$

$$f(1) =$$

Inputs/ Domain



Outputs/ Range



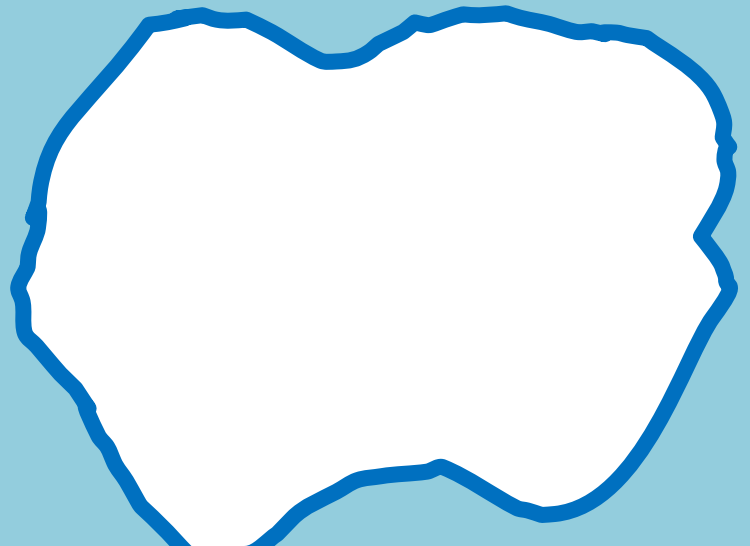
Inverse Function $f^{-1}(x)$

Undoes original function, It takes the output of a function and does operations to arrive back at the original input.

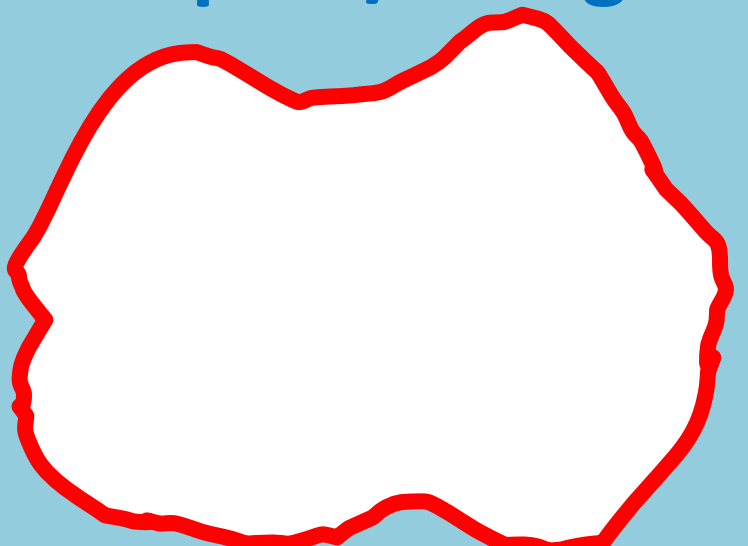
$$f(x) = -2x + 4$$

$$f^{-1}(x) = \frac{x - 4}{-2}$$

Inputs/ Domain



Outputs/ Range



Find the Inverse Algebraically

$f(x) = -2x + 4$

Step 1:

Replace *f*(*x*) with *y*.

Step 2:

Switch the *x* and *y* variable

Step 3:

Solve for *y*.

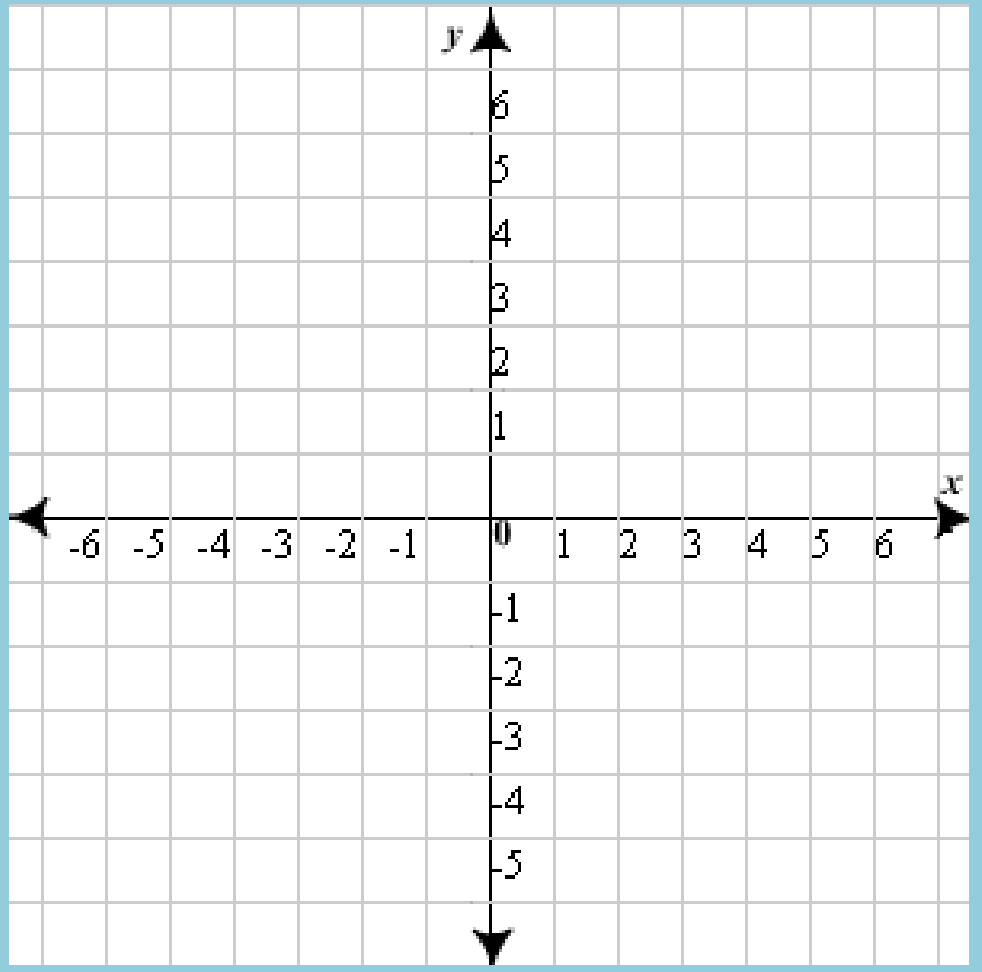
Step 4:

If *y* function, replace w/ $f^{-1}(x)$

Find the Inverse Graphically

The graph of any function's inverse is the reflection of the original function over the line $y = x$

$f(x) = -2x + 4$



$f^{-1}(x) = \dfrac{x - 4}{-2}$