

Warm-Up

Perform the operation:

$$1. \quad h(x) = 3x + 5 \\ g(x) = 2x + 2 \quad \boxed{8}$$

Find $(h - g)(5)$

$$2. \quad f(n) = -n^2 + n \\ g(n) = -4n - 5$$

Find $(f \circ g)(n)$

Determine the Inverse Function

$$3. \quad g(x) = -2x + 5 \quad g^{-1} = \frac{x-5}{-2}$$

$$4. \quad h(x) = \frac{x+4}{3} \quad g^{-1}(x)$$

Objective

Today we will...

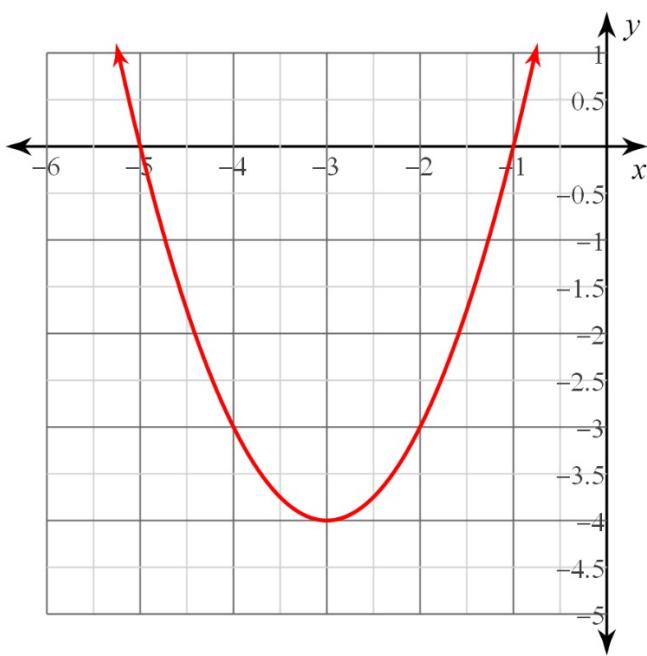
- Describe the Domain and Range of a function

Zeros/Solutions/Roots

Vs.

X-Intercepts

$$y = x^2 + 6x + 5$$



Zeros: $x = -1 \quad x = -5$
 $\{-1, -5\}$

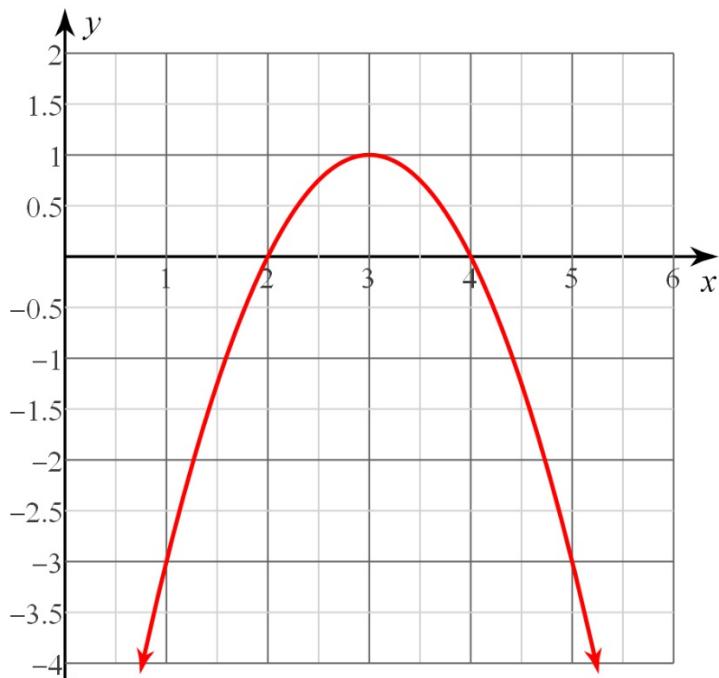
X-Intercepts:

$(-1, 0)$

$(-5, 0)$

Factors: $(x+1)(x+5)$

$$y = -x^2 + 6x - 8$$



Zeros:

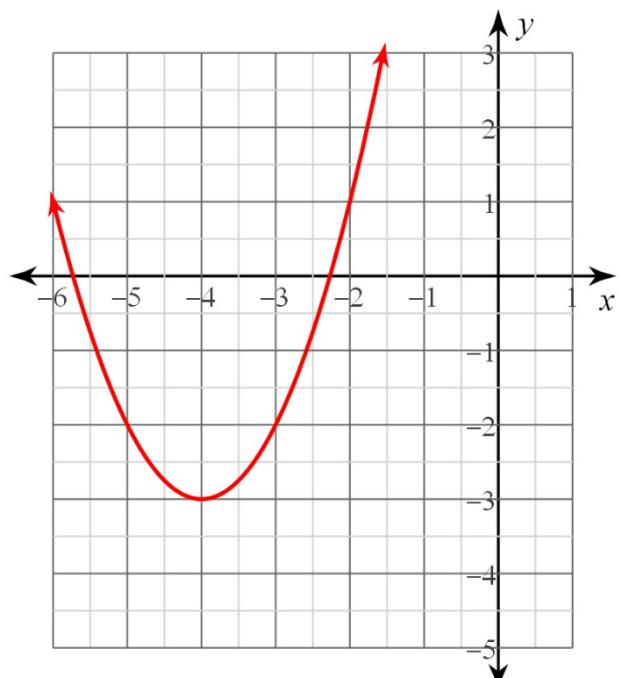
$$\begin{aligned}x &= 2 \\x &= 4\end{aligned}$$

X-Intercepts:

$$\begin{cases}(4, 0) \\(2, 0)\end{cases}$$

Factors: $(x-4)(x-2)=0$

$$y = (x + 4)^2 - 3$$

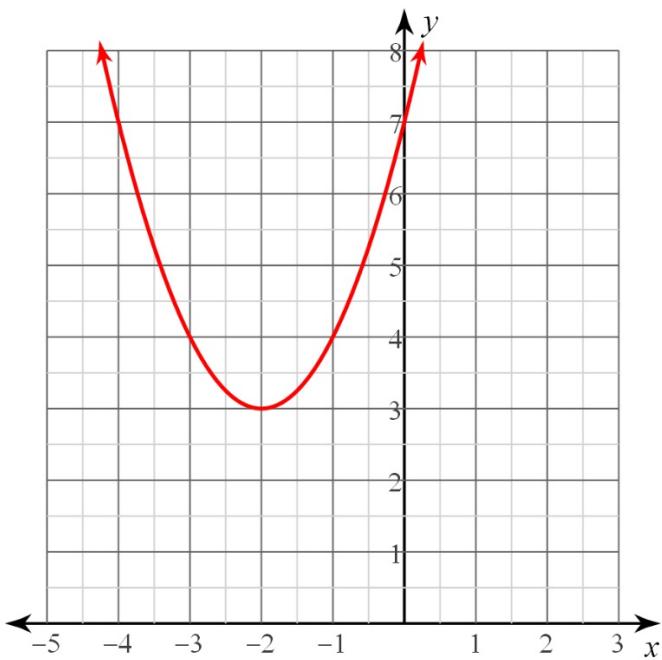


Zeros:

X-Intercepts:

Factors:

$$y = x^2 + 4x + 7$$



Zeros: Use Quad Formula

to find

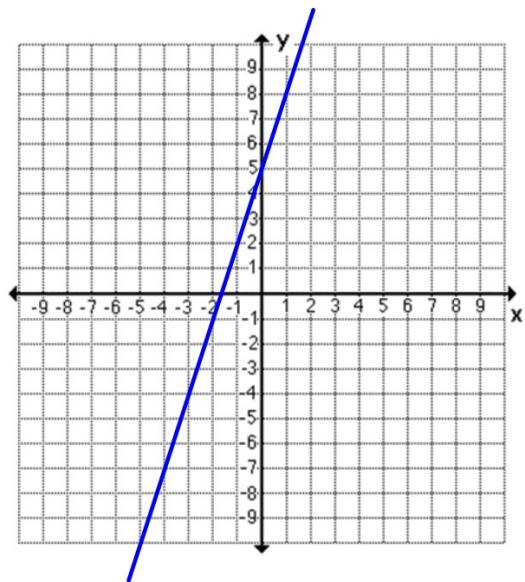
X-Intercepts:

None

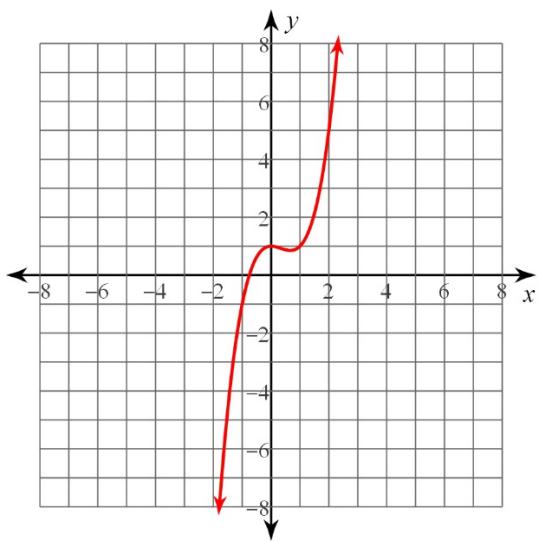
Factors: None

Quick Review

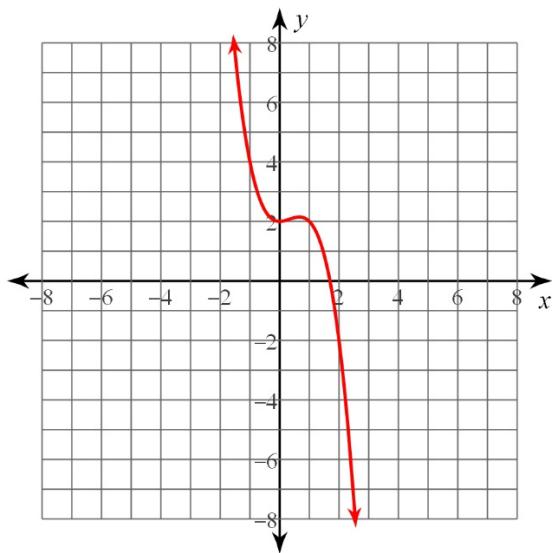
$$f(x) = 3x + 5$$



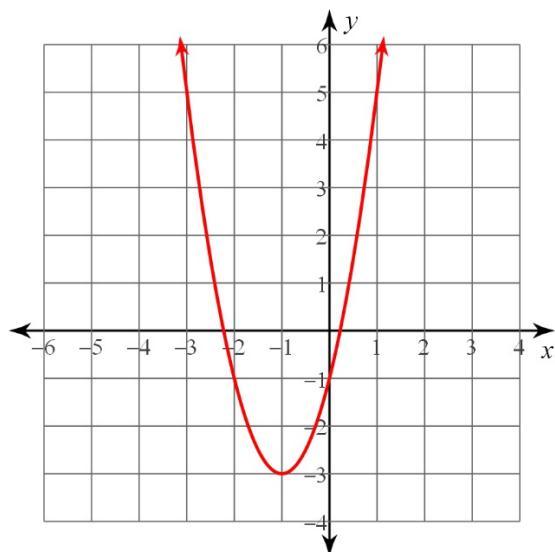
$$f(x) = x^3 - x^2 + 1$$



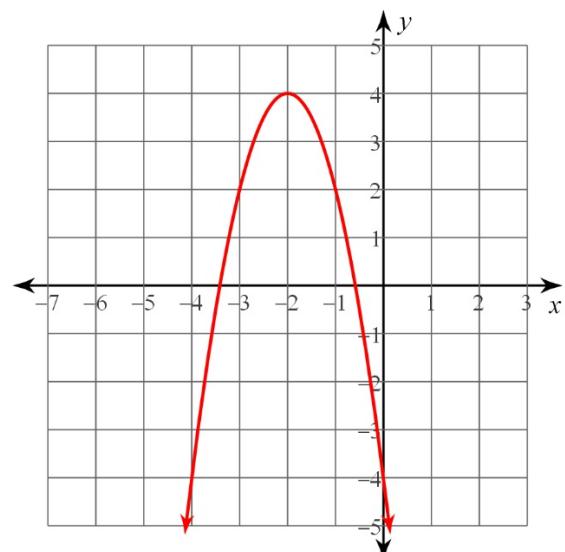
$$f(x) = -x^3 + x^2 + 2$$



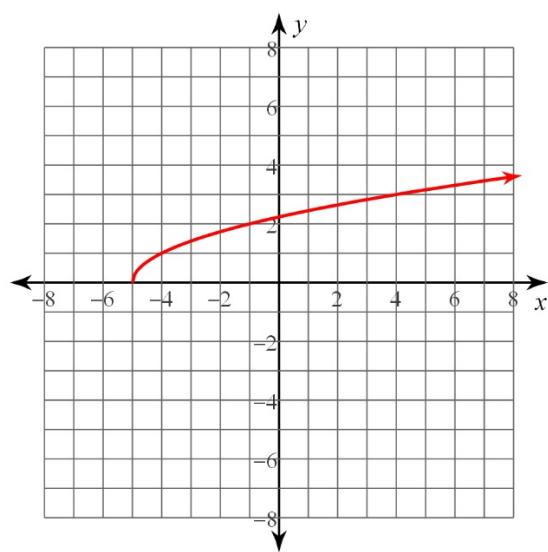
$$y = 2x^2 + 4x - 1$$



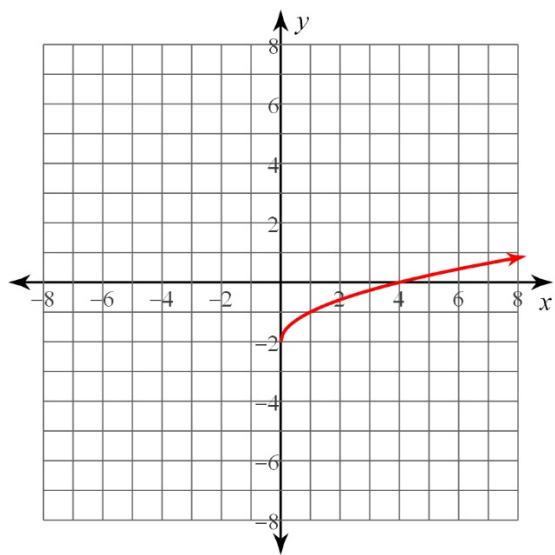
$$y = -2x^2 - 8x - 4$$



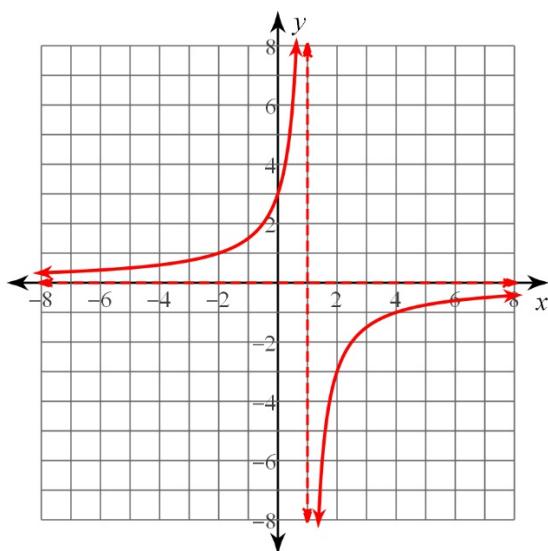
$$y = \sqrt{x + 5}$$



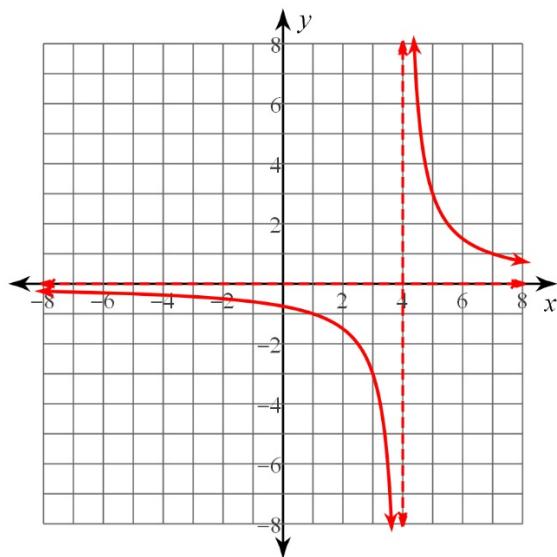
$$y = \sqrt{x} - 2$$



$$f(x) = -\frac{3}{x-1}$$



$$f(x) = \frac{3}{x-4}$$



Domain and Range

Domain: Values of x that are the possible inputs

Range: Values of y that are the outputs

On a graph

Look at which values of x and y have points associated

Notation

[] Brackets: Closed [Exists]

() Parenthesis: Open (Does not exist)

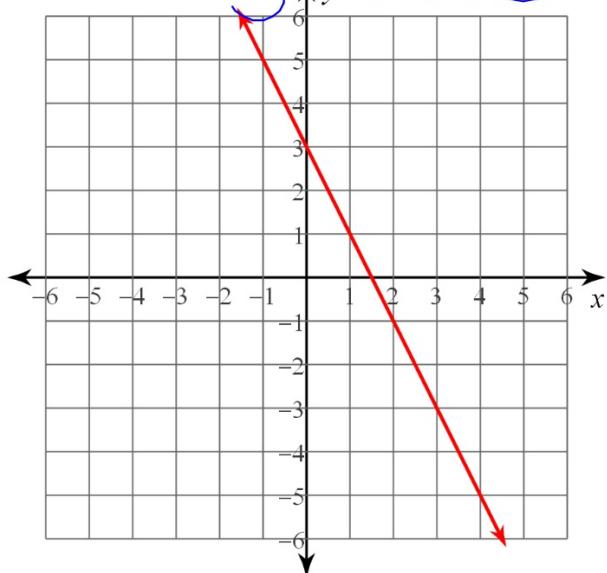
∞ : Infinity (always use parenthesis)

Domain: Describe from left to right $(-\infty \rightarrow \infty)$

Range: Describe from bottom to top

$$2x + y = 3$$

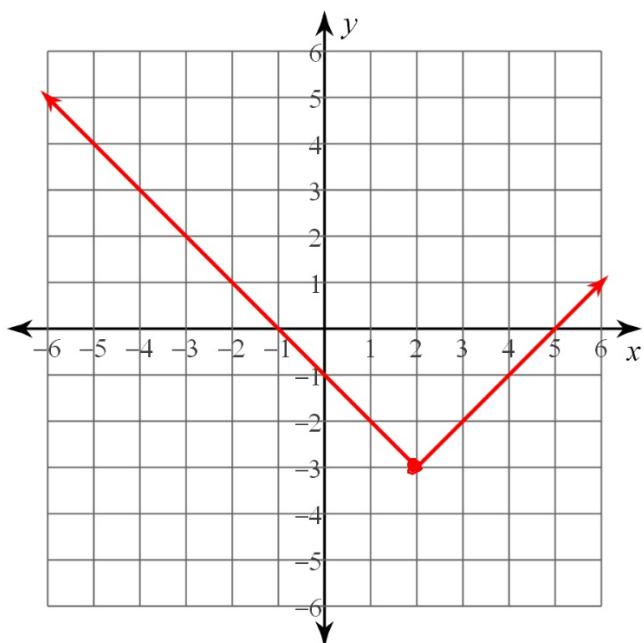
$$y = -2x + 3$$



Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

$$y = |x - 2| - 3$$



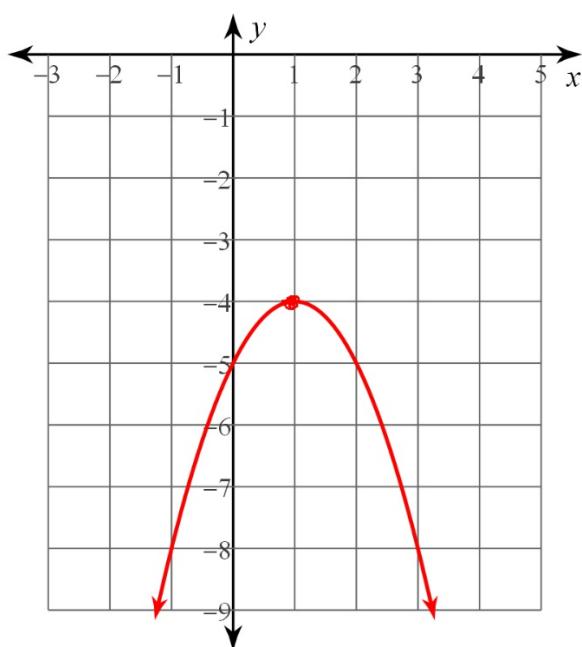
Domain:

$$(-\infty, \infty)$$

Range:

$$[-3, \infty)$$

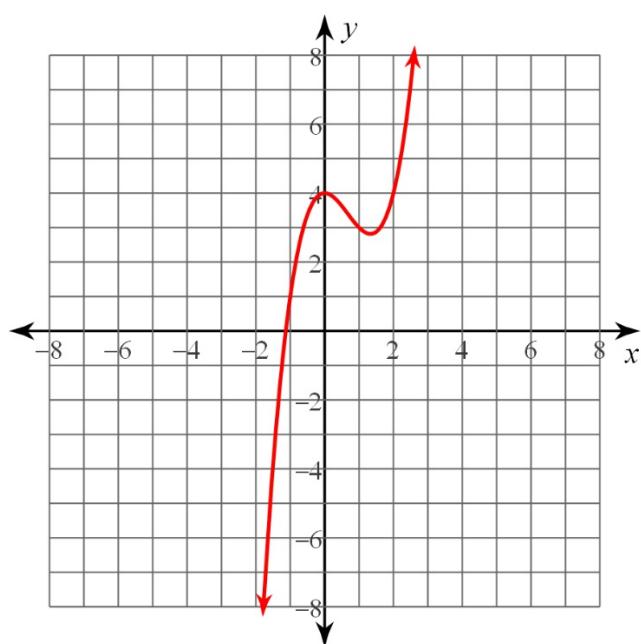
$$y = -x^2 + 2x - 5$$



Domain:
 $(-\infty, \infty)$

Range:
 $(-\infty, -4]$

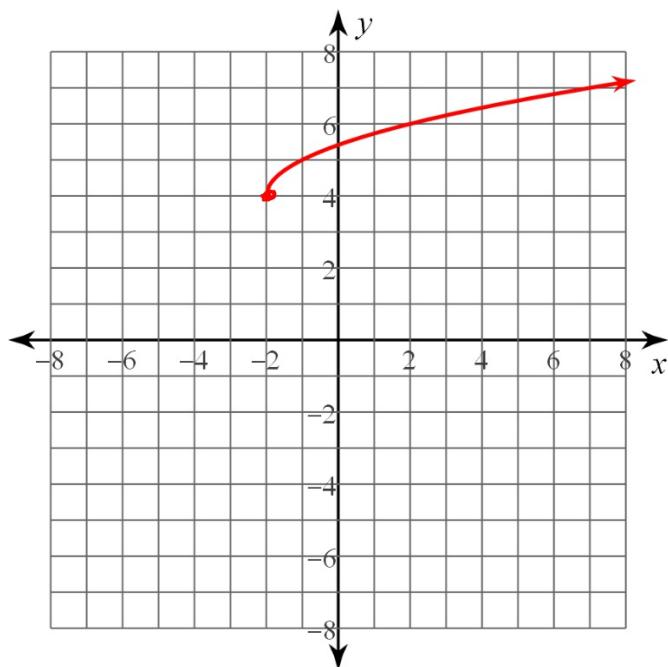
$$f(x) = x^3 - 2x^2 + 4$$



Domain:
 $(-\infty, \infty)$

Range:
 $(-\infty, \infty)$

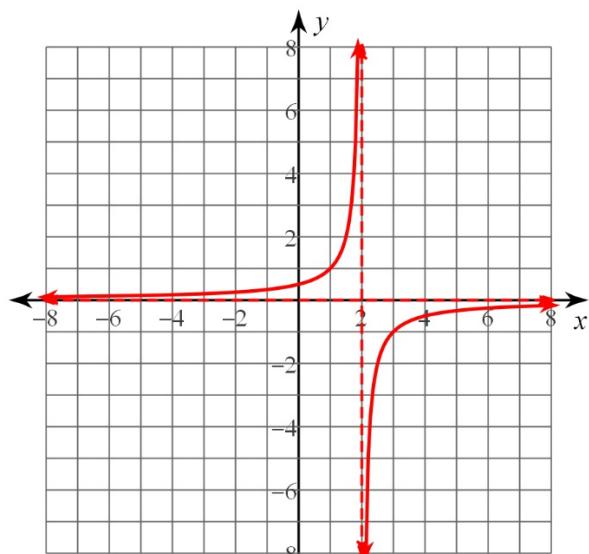
$$y = \sqrt{x + 2} + 4$$



Domain:
 $[-2, \infty)$

Range:
 $[4, \infty)$

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



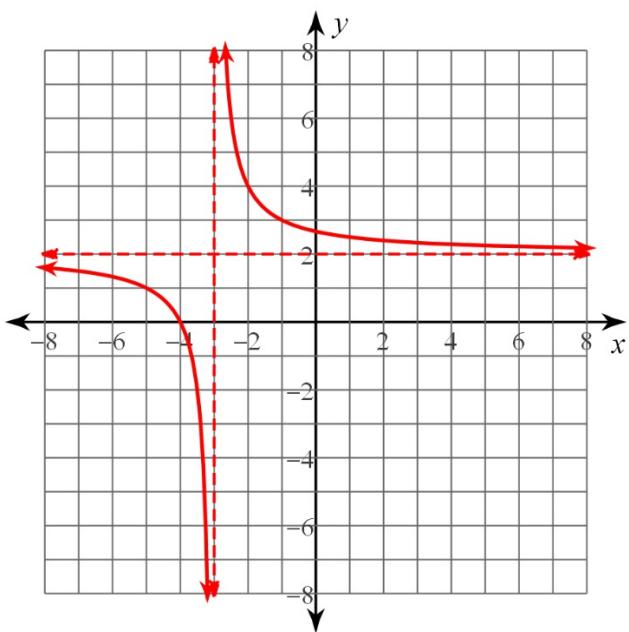
Domain:

$$(-\infty, 2) \cup (2, \infty)$$

Range:

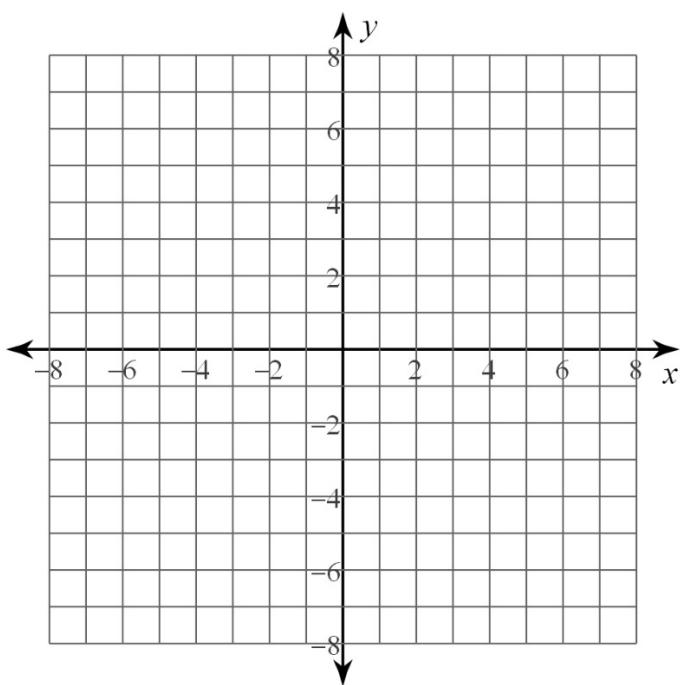
$$(-\infty, 0) \cup (0, \infty)$$

$$f(x) = \frac{2x + 8}{x + 3}$$



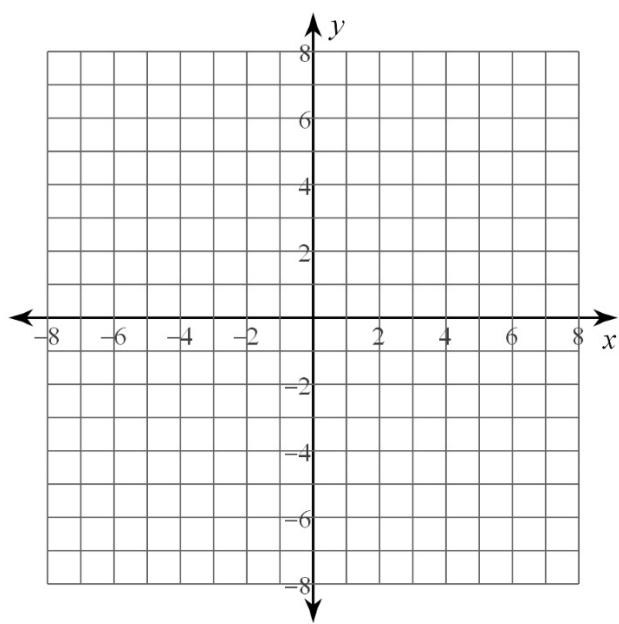
Domain:
 $(-\infty, -3) \cup (-3, \infty)$

Range:
 $(-\infty, 2) \cup (2, \infty)$



Domain:

Range:



Domain:

Range:

Wrap -Up

- How do we find the inverse of a function graphically?
- What kind of reflection is the Inverse?
- How can we determine if the inverse is a function?
- What is the Domain? Range?
- How do they relate to the graph?

