

$$f^{-1}(x) = \{(-8, 3)(4, 2)(5, -6)\}$$

DRILL

inverse

① Find the inverse of  $f(x) = \{(3, -8)(2, 4)(-6, 5)\}$

② Find the inverse of

$$f^{-1}(x) = \frac{x-16}{4}$$

③ what is your favorite movie?

$$f(x) = 4x + 16$$

$$y = 4x + 16$$

$$x = \frac{y-16}{4}$$

$$\frac{x-16}{4} = \frac{y}{4}$$

$$\frac{x-16}{4} = y$$

Ex:

$$f(x) = 4x^2 - 8$$

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

$$\begin{array}{r} x = 4x^2 - 8 \\ +8 \qquad \qquad +8 \\ \hline \end{array}$$

$$\begin{array}{l} \frac{x+8}{4} = \frac{4x^2}{4} \\ \sqrt{\frac{x+8}{4}} = \sqrt{x^2} \end{array}$$

Find  $f^{-1}(x)$

Replace  $f(x)$  with "y"

Switch "x" & "y"

$$y = \sqrt{\frac{x+8}{4}}$$

$$f^{-1}(x) = \sqrt{\frac{x+8}{4}}$$

Ex: Find  $f^{-1}(x)$  of  $f(x) = \sqrt{x-1} + 3$

①  $y = \sqrt{x-1} + 3$

②  $x = \sqrt{y-1} + 3$   
~~-3~~ ~~-3~~

$(x-3)^2 = \sqrt{y-1}$

$(x-3)^2 = y-1$   
~~+1~~ ~~+1~~

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

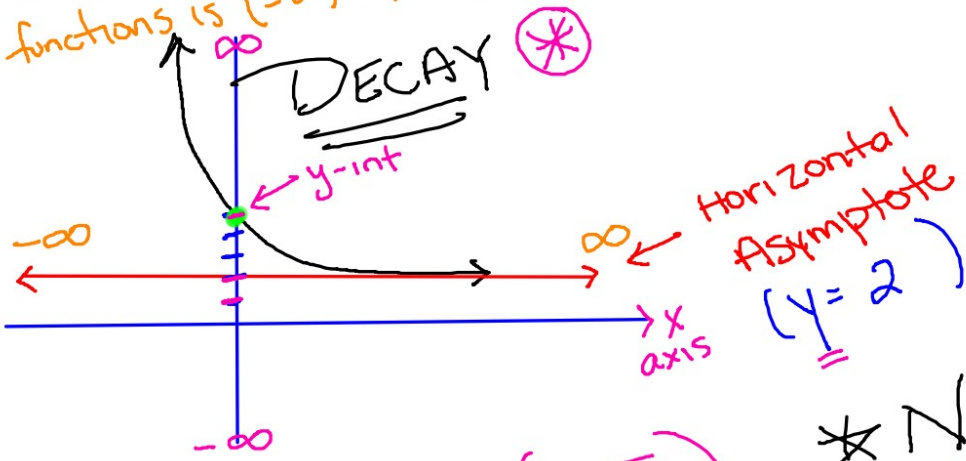
⊛  $f^{-1}(x) = (x-3)^2 + 1$  ⊛

$(x-3)(x-3) + 1$   
 $= x^2 - 3x - 3x + 9 + 1$

⊛  $f^{-1}(x) = x^2 - 6x + 10$  ⊛

\* The domain for all exponential functions is  $(-\infty, \infty)$

## Exponential Growth / Decay



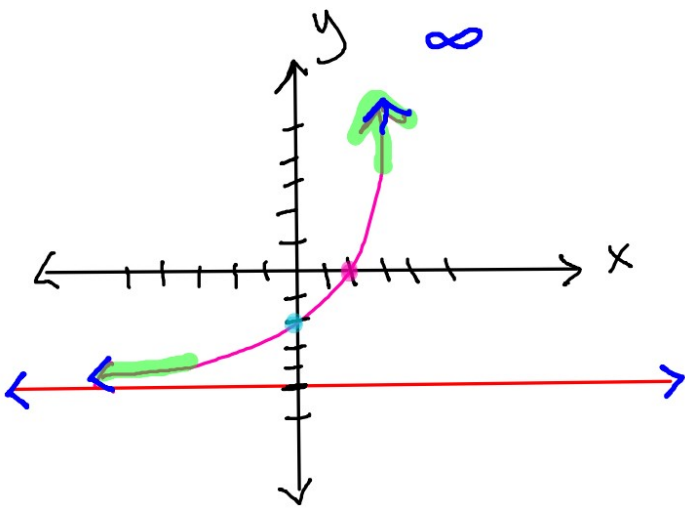
\* Asymptote: line a graph approaches but never intersects.

\* No x-intercepts \*

y-intercept:  $(0, 5)$

$>, < \quad ( ) \neq$   
 $\geq, \leq \quad [ ] =$

(x-values) Domain:  $(-\infty, \infty)$  ✓  
 (y-values) Range:  $(\underline{2}, \infty)$



- Growth or Decay
- y-int:  $(0, -2)$
- x-int:  $(2, 0)$
- Asymptote:  $y = -5$  ←  
Horizontal
- Domain:  $(-\infty, \infty)$
- Range:  $(-5, \infty)$