

# HEDGEHOGS

WHY DON'T THEY JUST SHARE THE HEDGE?



Tuesday, September 6, 2016

- 1.4 HW Check
- 1.5 - Inverses Notes
- Review Quizzes

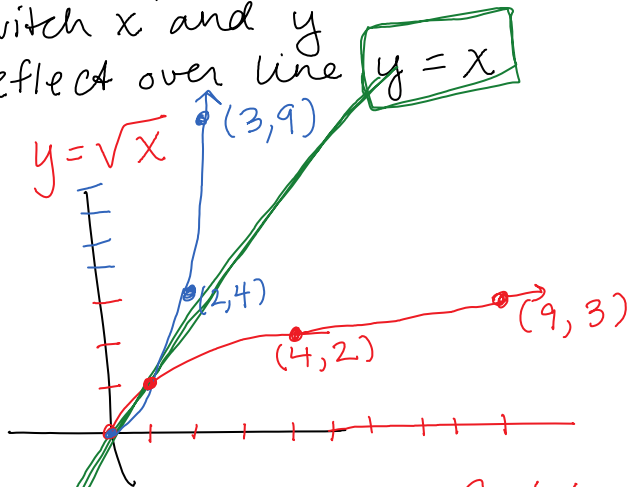
(21)  $f(x) = \frac{1}{2x}$      $g(x) = \frac{1}{3x}$

$f(g(x)) = \frac{1}{2(\frac{1}{3x})} = \frac{1}{\frac{2}{3x}} = 1 \cdot \frac{3x}{2} = \frac{3x}{2}$

Domain  
 $x \neq 0$      $(-\infty, 0) \cup (0, \infty)$

## 1.5 Inverses

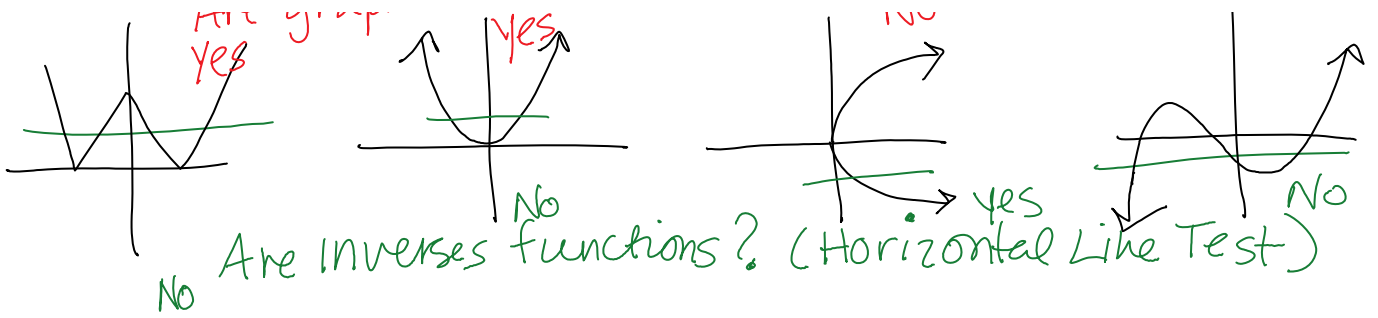
Inverse operations undo each other  
 switch x and y  
 reflect over line  $y = x$



inverse  
 $y = x^2$

Are graphs functions? (Vertical Line Test)

Yes    No    Yes



## Finding Inverses

①  $f(x) = 2x - 3$  find  $f^{-1}(x)$  ← "inverse"

$$y = 2x - 3$$

$$x = 2y - 3 \quad \leftarrow \text{switch } x \text{ and } y$$

$$x + 3 = 2y$$

$$\frac{x+3}{2} = y$$

$$\text{or } f^{-1}(x) = \frac{x+3}{2}$$

②  $f(x) = \sqrt{x-3}$  find  $f^{-1}(x)$  and domain of inverse

$$\text{Domain } [3, \infty)$$

$$\text{Range } [0, \infty)$$

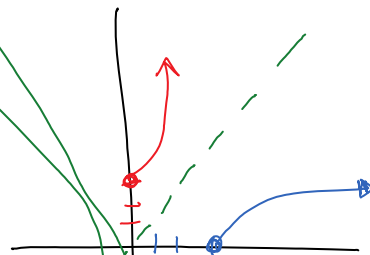
$$y = \sqrt{x-3}$$

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

$$x = y - 3$$

$$x^2 + 3 = y$$

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



$$\text{Domain } [0, \infty)$$

$$\text{Range } [3, \infty)$$

$$[3, \infty)$$

③  $f(x) = \frac{x+1}{x-3}$

$$\text{Domain } (-\infty, 3) \cup (3, \infty)$$

$$\text{Range } (-\infty, 1) \cup (1, \infty)$$

$$y = \frac{x+1}{x-3}$$

$$x = \frac{y+1}{y-3}$$

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

$$xy - 3x = y+1$$

$$xy - y = 3x + 1$$

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

$$y = \frac{3x+1}{x-1}$$

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

$$\text{Domain } (-\infty, 1) \cup (1, \infty)$$

$$\text{Range } (-\infty, 3) \cup (3, \infty)$$