

MAY 21/09

## INVERSE FUNCTIONS

YOU CAN PROVE THAT 2 FUNCTIONS  
ARE INVERSES BY USING THE  
COMPOSITION OF FUNCTIONS

$$\text{IF } f(f^{-1}(x)) = x \quad \text{AND}$$

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

THEY ARE INVERSES

$$\text{EG. } f(x) = 2x - 1$$

$$y = 2x - 1$$

$$x = \frac{y + 1}{2}$$

$$\frac{x+1}{2} = \frac{y}{2}$$

$$y = \frac{x+1}{2}$$

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

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

$$= x$$

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

$$= x$$

$$\therefore f^{-1}(x) = \frac{x+1}{2} \text{ IS THE}$$

INVERSE OF  $f(x) = 2x - 1$

FIND THE INVERSE

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

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

$$yx = x-1$$

$$yx - x = -1$$

$$\frac{x(\cancel{y-1})}{(\cancel{y-1})} = \frac{-1}{(y-1)}$$

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

TO FIND  $f^{-1}$  SWITCH  $x$  AND  $y$

$$y = \frac{-1}{x-1} \quad f^{-1}(x) = \frac{-1}{x-1}$$