Mar. 8, 2017

Sect. 5-1

Inverse Fncts.

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"Opposite" Fncts

If f & g are inverses

$f(a) = b$

$g(b) = a$

$$g(f(x)) = x$$

$$f(g(x)) = x$$

This is the test for inverse

$$(f \circ g)(x) = x = (g \circ f)(x)$$

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

Are f & g inverses? (Y or N)

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

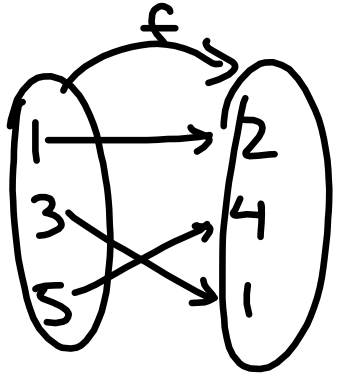
$$= x + 1 - 1 = x$$

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

$$= \frac{2x}{2} = x$$

Yes, f & g are inverses.

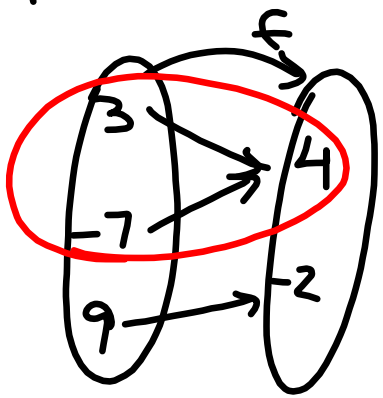
Not every fnct. has an inverse



f is one-to-one

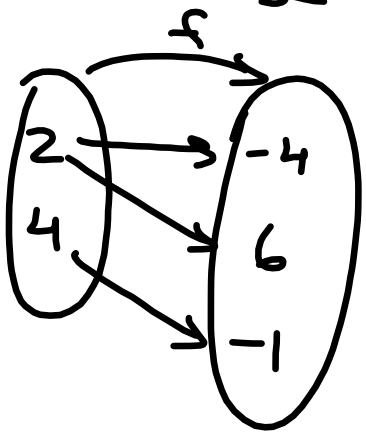
f is 1-1

f has an inverse



f is not 1-1

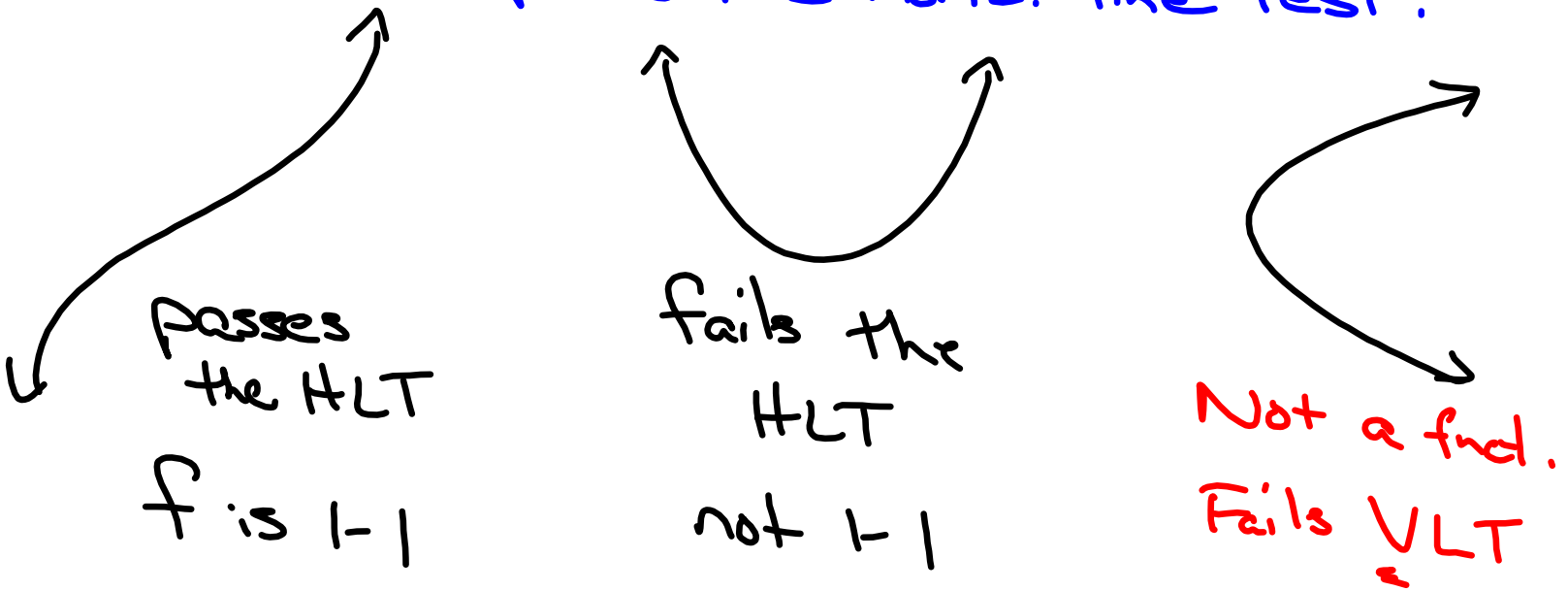
f has no inverse



Not a fnct.

Does it have an inverse?
Is it 1-1?

Does it pass the horiz. line test?



Finding Inverse Fncts

Notation

Given $f(x)$

the inverse: $f^{-1}(x)$

"eff inverse"

Given $f(x) = 2x - 5$ Find $f^{-1}(x)$

$y = 2x - 5$

$x = 2y - 5$

$x + 5 = 2y$

$y = \frac{x+5}{2}$

$f^{-1}(x) = \frac{x+5}{2}$

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

$$y = x^3 - 1$$

$$x = y^3 - 1$$

$$x + 1 = y^3$$

$$y = \sqrt[3]{x+1}$$

$$f^{-1}(x) = \sqrt[3]{x+1}$$