Trig3.4

*Alg 1 Ch. 4

Determine inverses of relations and functions*

Graphs functions and their inverses

domain $(3,5) \rightarrow (5,3)$

range $(a,b) \rightarrow (b,a)$

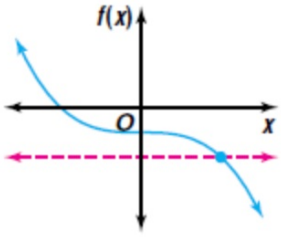
line of symmetry (y=x) $y = x \rightarrow y = 1x + 0$

inverse function (x,y)....(y,x)

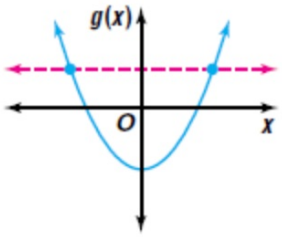
vertical line test (VLT) is it a fn?

horizontal line test (HLT) $\longleftrightarrow$ is inv. a fn?

Inverse Relations	Two relations are inverse relations if and only if one relation contains the element (b, a) whenever the other relation contains the element (a, b).

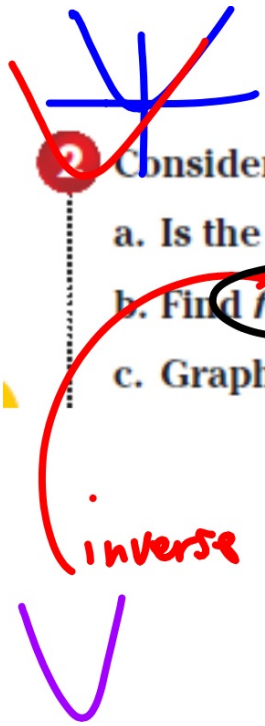


The inverse of f(x) is a function.



The inverse of g(x) is not a function.

VLT
HLT



2. Consider $f(x) = (x + 3)^2 - 5$.

a. Is the inverse of $f(x)$ a function? no

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

c. Graph $f(x)$ and $f^{-1}(x)$ using a graphing calculator.

inverse

$y = (x+3)^2 - 5$

$x = (y+3)^2 - 5$

$+5 \qquad +5$

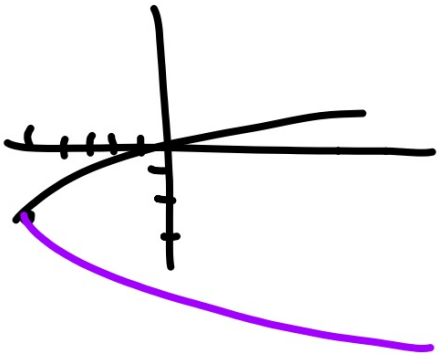
$x+5 = (y+3)^2$

$\pm\sqrt{x+5} = y+3$

$-3 \qquad -3$

$-3 \pm \sqrt{x+5} = y$

$f^{-1}(x) = \pm\sqrt{x+5} - 3$

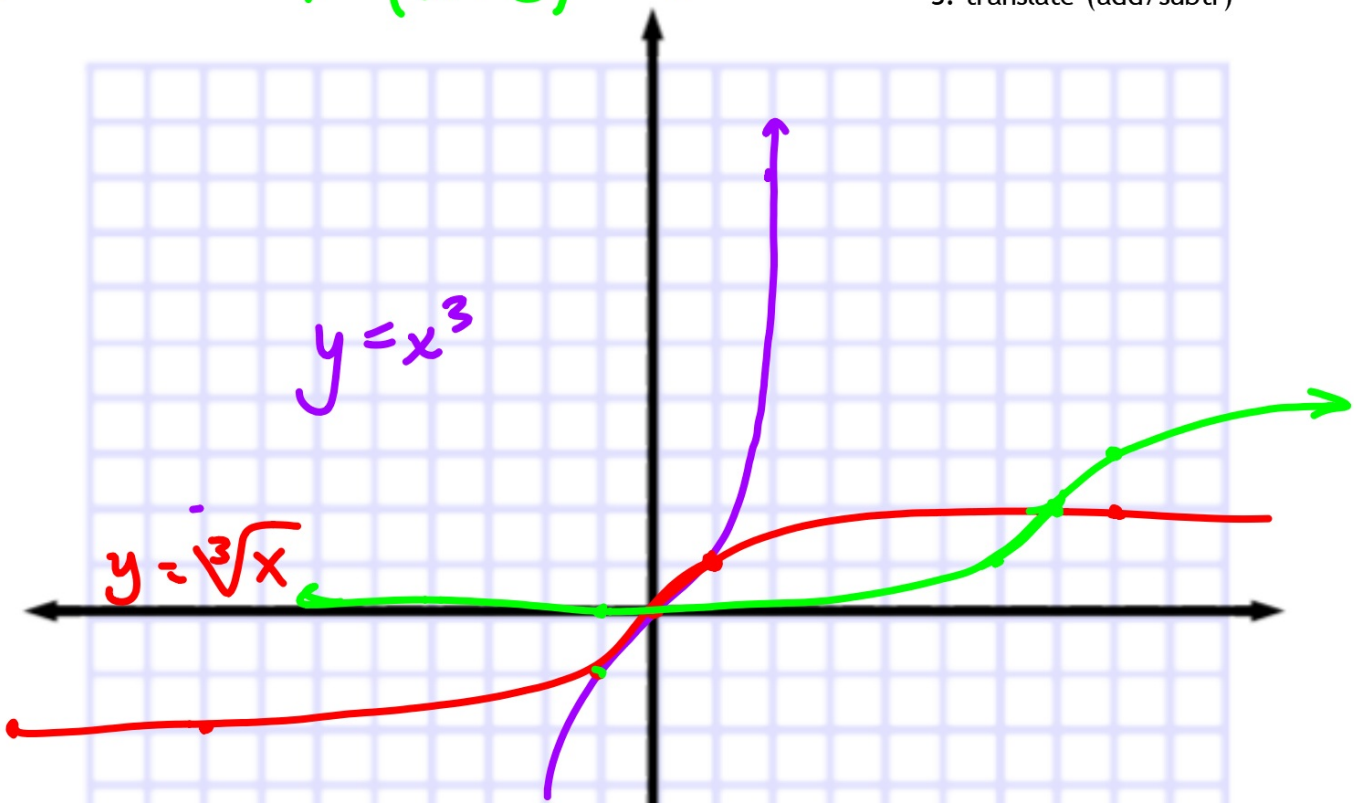


3 Graph $y = 2 + \sqrt[3]{x - 7}$.

$y = x^3$

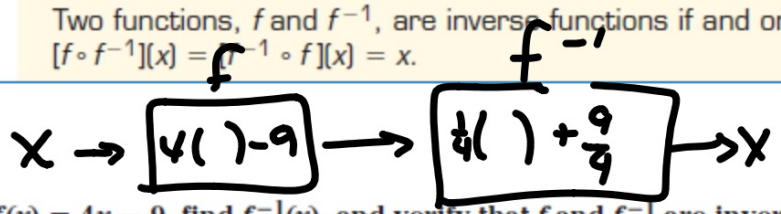
$7 + (x + 2)$

Order of operations:
1. parent (cubic)
2. reflect (y=x)
3. translate (add/subtr)



Composition functions (from alg2)

Inverse Functions	Two functions, f and f^{-1}, are inverse functions if and only if $[f \circ f^{-1}](x) = [f^{-1} \circ f](x) = x$.



5 Given $f(x) = 4x - 9$, find $f^{-1}(x)$, and verify that f and f^{-1} are inverse functions.

$y = 4x - 9$

$x = 4y - 9$

$\frac{x}{4} + \frac{9}{4} = \frac{4y}{4}$

$y = \frac{1}{4}x + \frac{9}{4}$

15-37 odd p. 151

What would we expect to see?

Verify by using composition: