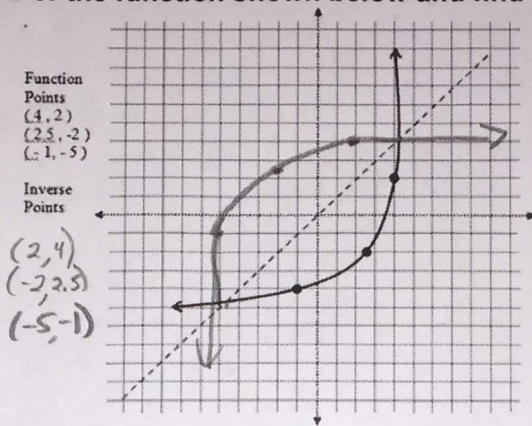


1-7

Homework

Introduction to Inverse Functions

1) Graph the inverse of the function shown below and find the inverse points.

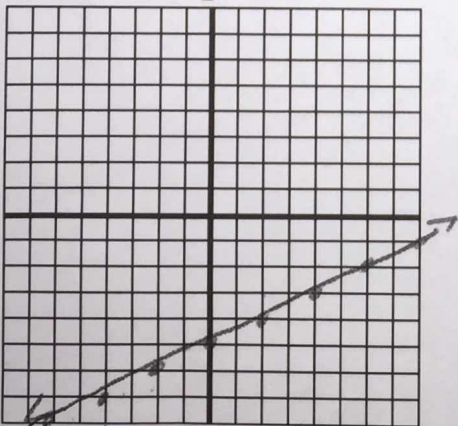


2) Find the algebraic inverse for each of the following:

a) $f(x) = 15x - 1$	$y = 15x - 1 \rightarrow 15y = x + 1$ $x = 15y - 1 \rightarrow y = \frac{x+1}{15}$ $f^{-1}(x) = \frac{x+1}{15}$
b) $y = \sqrt{x-3} + 2$	$x = \sqrt{y-2} + 2 \rightarrow (x-2)^2 = y-3$ $x-2 = \sqrt{y-3} \rightarrow y = (x-2)^2 + 3$ $f^{-1}(x) = (x-2)^2 + 3$
c) $f(x) = (x-2)^2$	$y = (x-2)^2 \rightarrow \pm\sqrt{x} = y-2$ $x = (y-2)^2 \rightarrow 2 \pm \sqrt{x} = y$ $f^{-1}(x) = 2 \pm \sqrt{x}$
d) $f(x) = \sqrt{x-4}$	$y = \sqrt{x-4} \rightarrow x^2 = y-4$ $x = \sqrt{y-4} \rightarrow x^2 + 4 = y$ $f^{-1}(x) = x^2 + 4$
e) $f(x) = \frac{7x+5}{4}$	$y = \frac{7x+5}{4} \rightarrow 4y = 7x+5$ $x = \frac{7y+5}{4} \rightarrow 4x-5 = 7y$ $f^{-1}(x) = \frac{4x-5}{7}$

3) Sketch the graphs of the following functions. Apply the Horizontal Line Test to determine if the function has an inverse function. Determine the inverse and graph it.

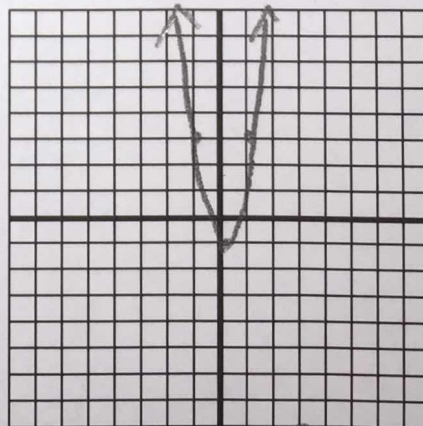
A. $f(x) = \frac{1}{2}x - 5$



Horizontal Line Test: passes
 Is the inverse of $f(x)$ a function? yes

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

B. $f(x) = 4x^2 - 1$



Horizontal Line Test: fails
 Is the inverse of $f(x)$ a function? no

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

$x = 4y^2 - 1$
 $\sqrt{\frac{x+1}{4}}$