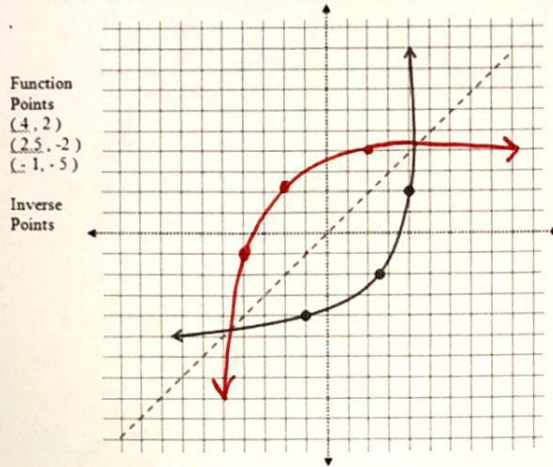


1-7

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. Use a separate sheet of notebook paper if necessary:

a) $f(x) = 15x - 1$

$$f^{-1}(x) = \frac{x+1}{15}$$

e) $f(x) = \frac{7x+5}{4}$

$$f^{-1}(x) = \frac{4x-5}{7}$$

b) $y = \sqrt{x-3} + 2$

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

f) $f(x) = 2\sqrt[3]{x+3} - 6$

$$f^{-1}(x) = \left(\frac{x+6}{2}\right)^2 - 3$$

c) $f(x) = (x-2)^2$

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

g) $f(x) = 4(x+8)^2 - 5$

$$f^{-1}(x) = \pm\sqrt{\frac{x+5}{4}} - 8$$

d) $f(x) = \sqrt{x-4}$

$$f^{-1}(x) = x^2 + 4$$

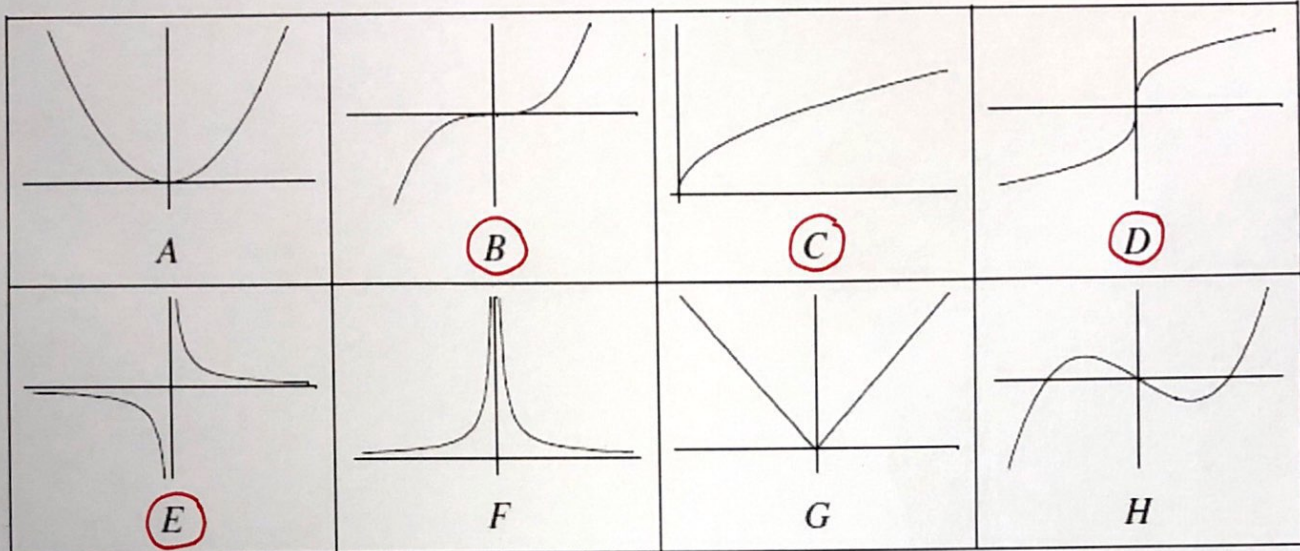
h) $f(x) = 4\sqrt{x+7} + 5$

$$f^{-1}(x) = \left(\frac{x-5}{4}\right)^2 - 7$$

HORIZONTAL LINE TEST:

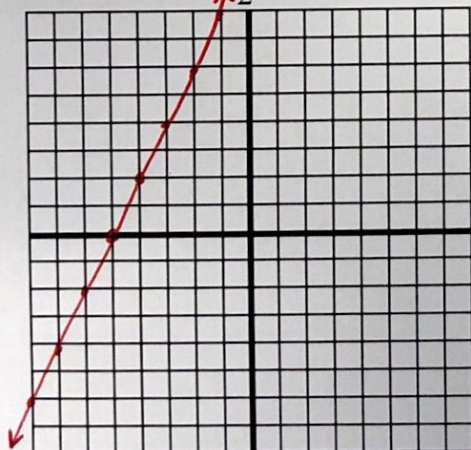
The horizontal line test is a test used to determine if a function's inverse is also a function. If a horizontal line intersects a function's graph more than once, then the function's inverse is not a function.

Which of the following functions would have inverses that are a function? **EXPLAIN WHY!**



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

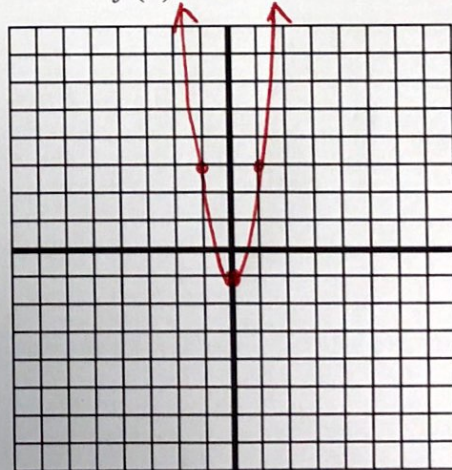


Horizontal Line Test:

Is the inverse of $f(x)$ a function? **YES**

$f^{-1}(x) = 2x + 10$

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



Horizontal Line Test:

Is the inverse of $f(x)$ a function? **NO**

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