2-2 Notes One-to-One & Inverse Name ________________________
Pre-Calculus

I. One-to-One Functions

- must be a function
- for every range element (y) there must be exactly 1 corresponding domain element (x)
- passes the horizontal line test
- ex. y = x

*** if a function is 1-1 it's inverse is also 1-1 ***

A. Use the graph of the function to determine if the functions are 1-1.

1. $f(x) = x^2$

2. $g(x) = x^3$

II. Inverses

We can find the inverse…

- of coordinates by switching the x and y values.
- graphically by reflecting the graph over the line y = x
- algebraically by switching x and y then solving for y.

*** the range of f(x) is the domain of $f^{-1}(x)$ ***

A. Find the inverse of the following relations

3. {(1, 8), (2, -1), (-4, 11)}

inverse:

is it a function? if so, is it 1-1?

is the inverse a function? if so, is it 1-1?

4. {(2, 3), (-4, 7), (9, 3)}

inverse:

is it a function? if so, is it 1-1?

is the inverse a function? if so, is it 1-1?

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

5. $f(x) = x - 12$

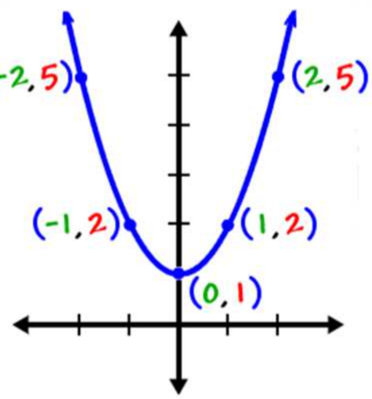
6. $f(x) = 4x - 7$

7. $f(x) = x^2 + 16$

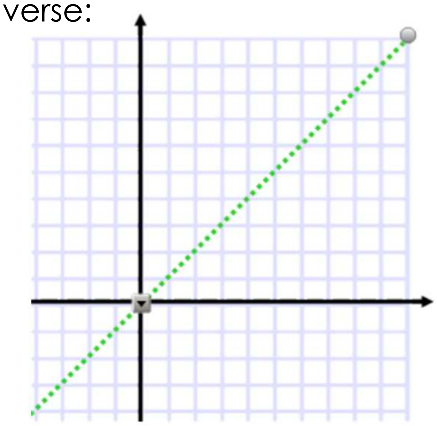
8. $f(x) = \frac{x+4}{x-4}$

C. Find the inverse from a graph.

9.



inverse:



Is it a function?
if so, 1-1?

What is the domain of f(x)?

range?

Is the inverse a function?
if so, 1-1?

What is the domain of $f^{-1}(x)$?

range?

D. Find the domain and range of f(x)

10. $f(x) = 2x - 3$

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

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

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

12. $f(x) = x^3 + 1$ $f^{-1}(x) =$

13. $f(x) = x^2 + 9$, $x \geq 0$ $f^{-1}(x) =$

E. Are these functions inverses of each other?

**** If $(f \circ g)(x) = x$ and $(g \circ f)(x) = x$ then $f(x)$ and $g(x)$ are inverses of each other. ****

14. $f(x) = 2x – 3$ & $g(x) = ½ x - 3$