1/29/14

objective: To find and graph inverse functions and to test for inverse functions.

Inverse Functions: two relations are inverse functions if and only if whenever one relation contains the element (a,b) and the other contains (b,a)

Example: Two relations A and B.

$A: \{(2,1), (4,-3), (5,1)\}$ $B: \{(1,2), (-3,4), (1,5)\}$

x and y switch or interchange

I. **How to find an inverse function:**

1.) re-write $f(x)$ as y.
2.) switch x and y (interchange)
3.) re-solve for y.
4.) re-write y as $f^{-1}(x)$

Example: $f(x) = 2x + 4$

$y = 2x + 4$

$x = 2y + 4$

$-4 \quad -4$

$\frac{x-4}{2} = \frac{2y}{2}$

$y = \frac{1x-4}{2}$ or $y = \frac{1}{2}x - 2$

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

Example 2: $f(x) = \frac{1}{2}x + 6$

$y = \frac{1}{2}x + 6$

$x = \frac{1}{2}(y) + 6$

$-6 \qquad -6$

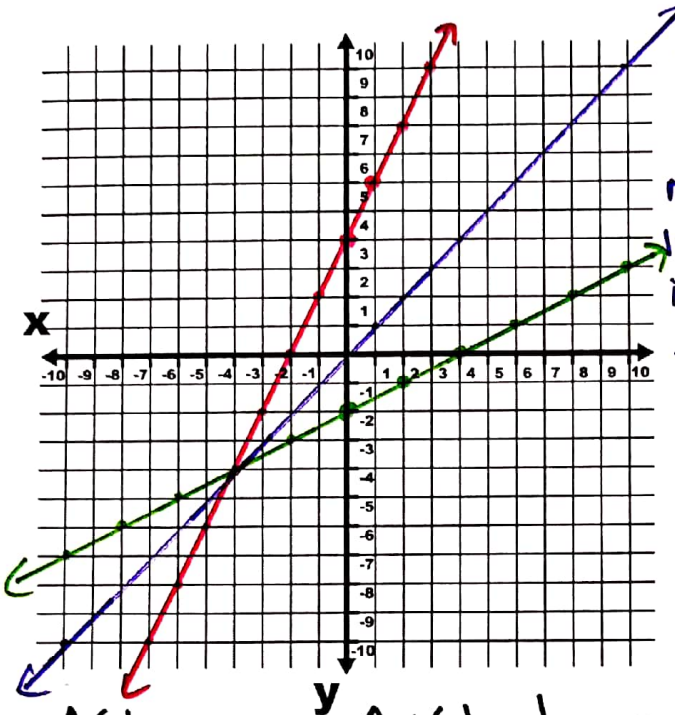
$2(x-6) = \left(\frac{1}{2}y\right)\cdot 2$ Multiply by reciprocal

$y = 2x - 12$

$f^{-1}(x) = 2x - 12$

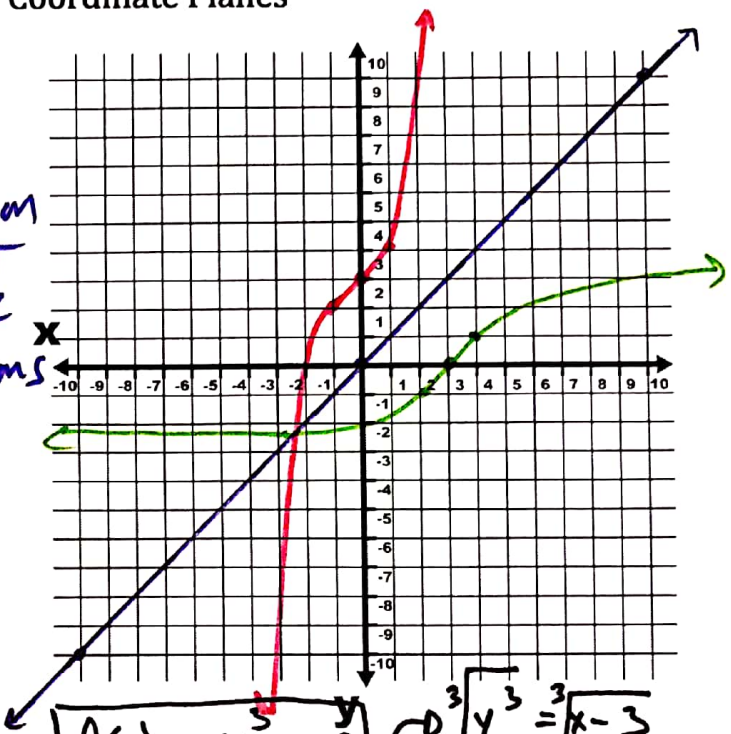
Name_____ Date_____ Per_____

Inverse Functions Notes: Coordinate Planes



$y = x$ reflection line for inverse functions

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



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

$y = x^3 + 3$

$x = y^3 + 3$

$-3 \quad -3$

$x - 3 = y^3$

$\sqrt[3]{y^3} = \sqrt[3]{x-3}$

$y = \sqrt[3]{x-3}$

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