$5x-2y \le 75$

$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$S = Pe^{rt}$

$APY = (1 + \frac{r}{n})^n - 1$

Math 1090 ~ Business Algebra

Section 4.1 Inverse Functions

Objectives:
- Determine if a function has an inverse.
- Determine if two functions are inverses of each other.
- Find the inverse of a one-to-one function.

Inverse Functions

An inverse function basically "undoes" what the original function did to the input, x.

Notation: $f^{-1}(x)$ is read "f inverse of x."

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

Ex 1: Are these functions inverses of each other?

$$f(x) = 5x - 1 \qquad g(x) = \frac{x+1}{5}$$

Does every function have an inverse? No! A function that has an inverse must pass the <u>horizontal line test</u> (when graphed).

<u>One-to-one</u>: Every input has exactly one output and every output has exactly one input.

Graphically, an inverse function is the mirror image of the original function across the line, $y = x$.

Ex 2: Find the inverse of $f(x) = 4(x-1)^3$.

<u>Strategy to find an inverse of a function.</u>

a) "Pants" Technique

Ex 3: Find the inverse of $f(x) = \sqrt[3]{\dfrac{x+1}{2x+3}}$.

b) Standard Technique

Ex 4: Does $y = x^2$ have an inverse function? Can we restrict the domain so it does have an inverse function?

Ex 5: Are these inverses of each other? $f(x) = 2\sqrt{x} - 1$ $g(x) = \dfrac{1}{4}(x+1)^2$