

Section 4.1: Inverse Functions

Video 1

A function is a **One-to-One function** if each x -value corresponds to only 1 y -value, and each y -value corresponds to only 1 x -value.

If $f(a) = f(b)$, then $a = b$.

If $a \neq b$, then $f(a) \neq f(b)$.

1) Is the function $f(x)$ a one-to-one function?

a) $f(x) = 2x - 9$

b) $f(x) = \sqrt{16 - x^2}$

Video 2

A function is a **One-to-One function** if every horizontal line intersects the graph of the function at most once.

2) Use the horizontal line test to determine if the function $f(x)$ a one-to-one function?

a) $f(x) = 2x - 9$

b) $f(x) = \sqrt{16 - x^2}$

Video 3

3) Use the definition to determine if the two functions $f(x)$ and $g(x)$ are inverses of each other.

a) $f(x) = 2x + 8$ $g(x) = \frac{1}{2}x - 4$

b) $f(x) = \frac{1}{x+6}$ $g(x) = \frac{1+6x}{x}$

Video 4

To find the inverse function $f^{-1}(x)$ for a one-to-one function $f(x)$:

1. Replace $f(x)$ by y .
2. Switch x and y .
3. Solve for y .
4. Replace y by $f^{-1}(x)$.

4) Find $f^{-1}(x)$ for the given function $f(x)$.

a) $f(x) = 3x - 15$

b) $f(x) = x^2 - 4$ $(x \geq 0)$

c) $f(x) = (x+4)^3 - 7$

Video 5

5) Find the inverse of the rational function $f(x) = \frac{2x-3}{5x+4}$.