

6.1 - Inverse Functions

6.1a

Definition: (one-to-one)

A function f is one-to-one if $f(x_2) \neq f(x_1)$ whenever $x_2 \neq x_1$.

Description of inverse functions

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

6.1b

Theorems (statement and proof):

If f is one-to-one and continuous on $[a, b]$, then f^{-1} is also continuous.

[illegible]



$$(f^{-1})'(a) = \frac{1}{f'(f^{-1}(a))}$$

6.1c

Exercises:

If $f(x) = x^5 + x^3 + x$, find $f^{-1}(3)$ and $f(f^{-1}(2))$.

Find $(f^{-1})'(a)$ for $f(x) = x^3 + 3 \sin x + 2 \cos x$ and $a = 2$.

6.1d

Exercise:

Let $f(x) = \sqrt{x-2}$ and $a = 2$.

a) Show that f is one-to-one

Find $(f^{-1})'(a) = \frac{1}{f'(f^{-1}(a))}$
