

4.2-Inverse Functions and Their Derivatives

Definitions:

f is a *one-to-one function* if and only if

If f is one-to-one, the *inverse* of f is a function f^{-1} such that

If (a, b) is on the graph of $y = f(x)$, then

If f is one-to-one and differentiable at $x = g(a)$ and $g = f^{-1}$, then

Examples:

Find the inverse of $f(x) = \sqrt{3x - 2}$

Given $f(x) = \frac{3-x}{1-x}$, find f^{-1}

Given $g(x)$ is the inverse of $f(x) = x + x^2 + e^x$, find $g'(1)$

The function $f(x) = \tan x$ is one-to-one on the interval $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$. If $g = f^{-1}$, find $g'(1)$.