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 \((-\frac{\pi}{2}, \frac{\pi}{2})\). If \( g = f^{-1} \), find \( g'(1) \).

**On Your Own**: 4.2 #11,12,14,17,21,25,29,30,40