

1 4.2: Inverse Functions

functions vs. **one-to-one functions**:

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 $x = g(a)$, where $g = f^{-1}$, then

Examples:

Show $f(x) = \frac{2-x}{2+x}$ is one-to-one and find f^{-1} .

TRUE OR FALSE? The inverse of $f(x) = \sqrt{x-1}$ is $g(x) = x^2 + 1$. Explain.

Given g is the inverse of $f(x) = x^5 - x^3 + 4x$, find $g'(4)$.

(On your own): 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 $g'(1)$.