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 $f^{-1}$. 
Given $g$ is the inverse of $f(x) = x^5 - x^3 + 4x$, find $g'(4)$.

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 $g'(1)$.

On Beyond Average: Find the inverse of $f(x) = \sqrt{x} - 1$. 