

Inverse Functions

Ok...let's get something straight right off the bat! Only 1-1 functions have Inverses. And, to find an inverse function we perform one step only and that is...solve for x . Here is an example.

Given the 1-1 function $y = 2x$, the inverse function is $x = \frac{y}{2}$ or $x = \frac{1}{2}y$. Some people suggest interchanging the x and y to get an answer of $y = \frac{x}{2}$ or $y = \frac{1}{2}x$. I do not recommend this as it will cause serious problems in calculus.

Of course, I am assuming you know what a 1-1 function is. It is one which passes both the vertical and horizontal line tests. Namely, each x produces exactly one y and each y comes from only one x .

Let's find the inverse of the 1-1 function $y = x^3$. This will simply be $x = \sqrt[3]{y}$.

Graphs of inverse functions will be symmetric with respect to the line $y = x$.

The inverse of $y = 2^x$ will be $x = \log_2 y$.

Can you explain why $y = x^2$ does not have an inverse?

What about the function $y = \sin x$? Do you think it has an inverse? Why?