Inverse Function Encyclopedia Article

Inverse Function

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Inverse Function

An inverse function is one which reverses the action of a previous function. That is, it takes the value from the previous function and returns it to its previous value for all values of that function. Many inverse **functions** are familiar --for example, if the function in question was y = 2x, it would be clear that z = y/2 would return z = x. Some functions are their own inverse--for example, y = 1/x results in z = 1/y as an inverse. Some functions lack inverses.

Other inverse functions present special problems. For example, cyclic functions like the **sine** and **cosine** function require a specified **interval**, since the sine and cosine will **range** between **zero** and one in exactly the same way from zero to **infinity** in both directions, positive and negative. In this case, a two **pi** interval is required to secure the desired inverse value. For other functions, there will only be two or three ranges that can be selected out of all numbers. For example, if one is taking the **square** root of a number, one must specify whether one wants the positive or negative value of the **square root**. This specification is what is necessary to make the inverse function a function, **mapping** on a one-to-one basis, rather than a mere number relation, which might have two or more valid results. In practical situations, it is usually clear which values apply.