*Mathematics Journal  
10/3/11  
Limit Notation*

The notation used to signify a limit in Calculus is

A sample notation would be:

Assuming one knows what a limit in calculus is, the notation is rather simple to understand. Taking the definition of a limit to be the value f(x) gets arbitrarily close to as x approaches a given number from either side; we can explain the notation by saying 25 is the limit of the function *f(x)* as x approaches 8. I.e, as x approaches 8 from either side (7.8,7.9, 8.1, 8.2, etc.), *f(x)* gets arbitrarily close to 25.

*Mathematics Journal  
10/4/11  
Limit and Functional Value*

If the functional value of x when x = c is y it is not necessarily possible to determine that the limit of *f(x)* as x approaches c is equal to y. Functions can be defined as arbitrarily as desired and f(x) does not necessarily approach y as x approaches c. For example, if f(2) = 4 one might be tempted to conclude that f(x) = 2x or f(x) = x2 or f(x) = 4. In either case it would be true that limx🡪2f(x) =4 because as x approaches 2 f(x) approaches 4. However, an independent variable and its corresponding functional value do not necessarily determine the function. Continuing the previous example, f(x) might very well be defined as 4 if and only if x = 2 and -1 otherwise. In this case, the limit of f(x) as x approaches 2 is -1, *not* 4. The limit of f(x) as x approaches c is independent of the functional value f(c)

Conversely, the functional value f(c) is independent of the limit of f(x) as x approaches c. The previous example again suffices to demonstrate this; if the limit (as discussed) of f(x) as x approaches 2 is -1 but the function is defined to have f(x) = 4 when and only when x = 2, f(2) is 4, not -1 as the limit might suggest. It is therefore concluded that the functional value of f(c) is completely independent of the limit of f(x) as x approaches c, and *vice-versa*.