

A Note on Limits

It is very important to know the difference between the quantities

$$f(a)$$

and

$$\lim_{x \rightarrow a} f(x)$$

$f(a)$ stands for the y -value of the function $f(x)$ when x is EXACTLY equal to a .

$\lim_{x \rightarrow a} f(x)$ refers to the limiting y -values of the function $f(x)$ when x gets CLOSER to a , but NOT EQUAL to a .

Usually, $\lim_{x \rightarrow a} f(x) \neq f(a)$. But, if they are equal, the most interesting thing happens: If $\lim_{x \rightarrow a} f(x) = f(a)$, then the graph of $y = f(x)$ is not broken at $x = a$. the the graph is CONTINUOUS at $x = a$.