

1.3 a. Continuity

Continuous function: no breaks, holes, or gaps

if $f(x)$ is continuous at c , the function must approach c from the left & the right.

Limit: approaching a value, without necessarily reaching it

$$\lim_{x \rightarrow c} f(x) = L$$

"The Limit of $f(x)$ as x approaches c is L "

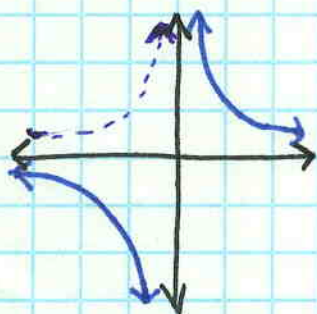
(from both directions)

Limit is a y -value

Discontinuous Functions \rightarrow have some sort of "break" or discontinuity

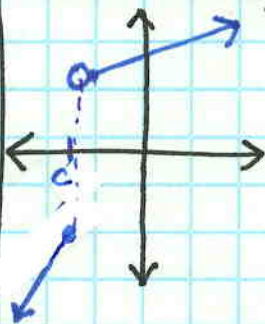
Types of Discontinuity

infinite discontinuity



$f(x)$ has an infinite discontinuity at $x=c$ if the function increases or decreases infinitely as $x \rightarrow c$ from the left and right
* non-removable

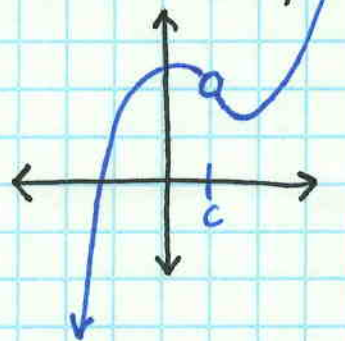
jump discontinuity



$f(x)$ has a jump discontinuity at $x=c$ if the left & right limit exist, but approach 2 different values

* non-removable

removable discontinuity



$f(x)$ has a removable discontinuity if the function is continuous everywhere, except at $x=c$.

* the limit of $f(x)$ at c exists