# 1 | The Limit Notation

## 1.1 | Single-Sided Limits

["What is $y$ approaching when $x$ approaches $a$ from the right $(+)$?"]Right Single-Sided Limit{$\lim_{x\to a^+} f(x)$}
["What is $y$ approaching when $x$ approaches $a$ from the left $(-)$?"]Left Single-Sided Limit{$\lim_{x\to a^-} f(x)$}
**Watch!** If both the left and right single-sided limit exists and is the same, the Double-Sided Limit exists.

## 1.2 | Double-sided Limits

["What is $y$ approaching when $x$ approaches $a$?" This exists only if $\lim_{x\to a^-} f(x) = \lim_{x\to a^+} f(x)$ ]{Left Single-Sided Limit}{$\lim_{x\to a} f(x)$} **Vocab!** When the Double-Sided Limit does not exist, it is called *DOES NOT EXIST!*. It is not! ~~$undefined$~~