

Why limits: $\frac{0}{0}$, $\frac{1}{0} \rightarrow \pm \infty$
job (one sided)

instantaneous rates of change. $\frac{\Delta x}{\Delta t}$

Many functions have DSP (direct substitution property) on their domains.

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

"continuity"

- polynomials
- roots
- rational functions (beware $\frac{x}{0}$)
- trig
- exponential

Limits don't care about one point:

$$\lim_{x \rightarrow 0} \frac{x^2 - x}{x} = \lim_{x \rightarrow 0} x - 1$$

$x=0$ is bad

$$= 0 - 1$$

$$= -1$$