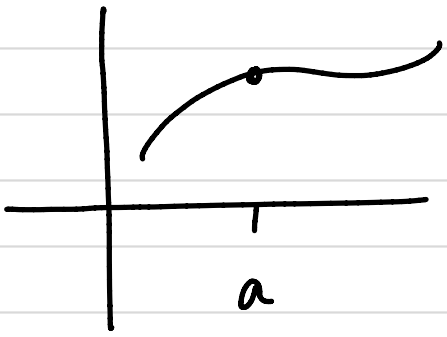
§ 2.5 Continuity

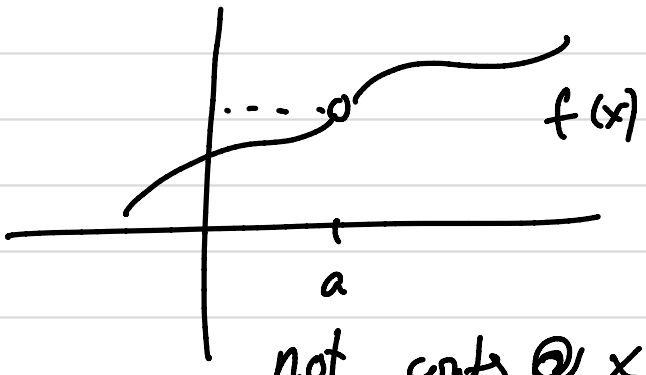
- definition
- how to use it
- what the consequences are

def : $f(x)$ is continuous at $x = a$ if

1. $f(a)$ exists.
2. $\lim_{x \to a} f(x)$ exists and
3. $\lim_{x \to a} f(x) = L$

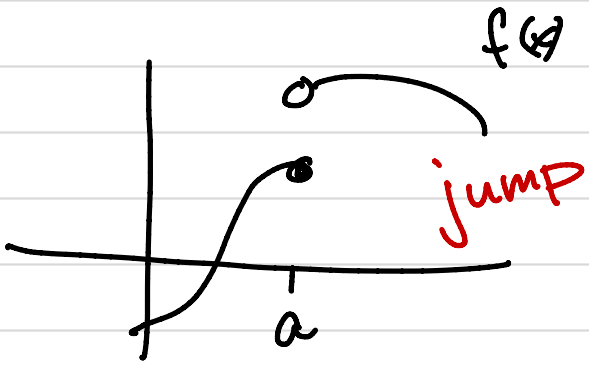


conts @ $x=a$

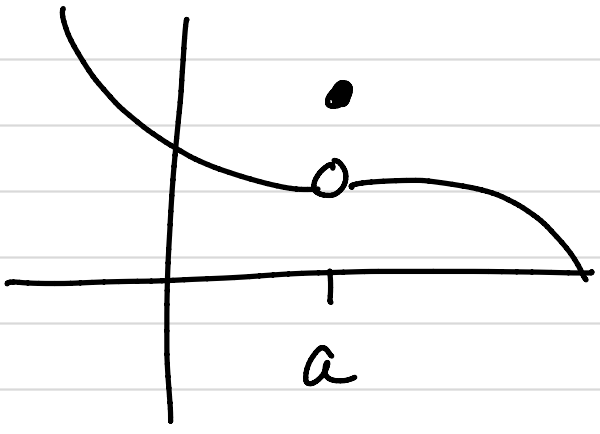


not conts @ $x=a$
violates ①

removable

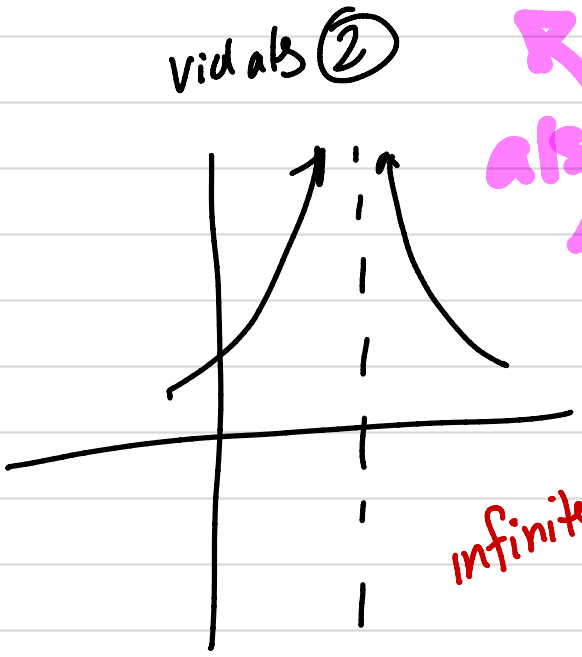


not conts @ $x=a$



not conts @ $x=a$

violates ③



#1 #2 on sheet

Consequences:

If $f(x)$ is continuous at $x=a$, then $\lim_{x \to a} f(x) = f(a)$.

Name some conts fcns: ...

So $\lim_{x \to 3.7} \sqrt[3]{\sin(e^x+4) + x^2}$

#3 on paper, #4.

IVThm: (If) $f(x)$ is continuous on $[a,b]$ and N is between the y-values $f(a)$ and $f(b)$

(then) $\exists$ x-value c in (a,b) so that

$$f(c) = N.$$

Picture

#5