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### 0.1 Intermediate value theorem

Take a real function  $f(x)$  on closed interval  $[a, b]$ , continuous on  $[a, b]$ .

IVT says that for all numbers  $u$  between  $f(a)$  and  $f(b)$ , there is a corresponding value  $c$  in  $[a, b]$  such that  $f(c) = u$ .

That is:

$$\forall u \in [\min(f(a), f(b)), \max(f(a), f(b))] \exists c \in [a, b] (f(c) = u)$$