

## Continuous Function

A function  $f : X \rightarrow Y$  between topological spaces is said to be **continuous** if for every open set  $V \subseteq Y$ , the preimage  $f^{-1}(V)$  is an open set in  $X$ .

Equivalently, a function  $f : \mathbb{R} \rightarrow \mathbb{R}$  is continuous at a point  $c$  if for every  $\varepsilon > 0$  there exists a  $\delta > 0$  such that

$$|x - c| < \delta \implies |f(x) - f(c)| < \varepsilon \quad (1)$$

for all  $x$  in the domain of  $f$ .