

**Definition 17.2.** [2DO] Let in the following  $A \subseteq \mathbb{R}$  be an open set.

By saying that  $f : A \rightarrow \mathbb{R}$  is differentiable we mean differentiable at any point.

Recall that, given  $k \geq 1$  integer,  $f$  is of class  $C^k$  if  $f$  is differentiable  $k$ -times and the  $k$ -th derivative  $f^{(k)}$  is continuous; and  $f$  is of class  $C^\infty$  if  $f$  is differentiable infinitely many times. (Sometimes we may write  $f \in C^k$  to signify that  $f$  is of class  $C^k$ , and  $f \in C^\infty$  if is of class  $C^\infty$ .)