1 Continuous Functions

Definition 1.1 A function $f\colon \mathbb{R} \to \mathbb{R}$ is called **continuous** at $x \in \mathbb{R}$, iff for all $\epsilon > 0$ there is a $\delta > 0$, such that $|f(x) - f(y)| < \epsilon$ for all $|x - y| < \delta$. It is called **continuous on** a set $S \subseteq \mathbb{R}$, iff is is continous at all $x \in S$, the set of all such functions is denoted with $\mathcal{C}^0(S, T)$, if $f(S) \subseteq T$.