LIMITE DI FUNZIONI

$$f : x \in A \subseteq \mathbb{R} \longrightarrow y = f(x) \in \mathbb{R}$$

$$\forall \ x_0, \ell \in \overline{\mathbb{R}} \quad : \quad x_0 \in D(A)$$

$$\lim_{x \to x_0} f(x) = \ell \overset{\text{DEF}}{\iff} \forall J(\ell), \exists I(x_0) : f\left(A \cap I - \{x_0\}\right) \subseteq J$$

$\ell \in \mathbb{R}$ CONVERGENTE

$\ell = +\infty$ DIVERGENTE POSITIVAMENTE

$\ell = -\infty$ DIVERGENTE NEGATIVAMENTE

$$x_0^- \quad , \quad x_0^+$$

$$\ell^- \quad , \quad \ell^+$$

$x_0 \in \mathbb{R}$, $\ell \in \mathbb{R}$

$$\lim_{x \to x_0} f(x) = \ell \iff \begin{bmatrix} \forall \varepsilon > 0, \exists \delta > 0 : \forall x \in A : x \in]x_0 - \delta, x_0[\cup]x_0, x_0 + \delta[, \\ \ell - \varepsilon < f(x) < \ell + \varepsilon \end{bmatrix}$$

TEOREMA 1.-

$$\lim_{x \to x_0} f(x) = \ell \iff \lim_{x \to x_0^-} f(x) = \ell = \lim_{x \to x_0^+} f(x)$$