K.I.M. LIMITI *a cura di Padovan Claudio (v. 1.00)*

Legenda

$$\boldsymbol{p} > 0, p \in \mathbb{R} \qquad \boldsymbol{q} < 0, q \in \mathbb{R}$$

1-Condizioni generali:

$$-\infty < x < +\infty, x \in \mathbb{R}$$

2-Addizioni

$$x + (+\infty) = (+\infty) + x = +\infty \qquad x + (-\infty) = (-\infty) + x = -\infty$$
$$(+\infty) + (+\infty) = +\infty \qquad (-\infty) + (-\infty) = -\infty$$

3-Moltiplicazioni

$$p \cdot (+\infty) = (+\infty) \cdot p = +\infty \qquad p \cdot (-\infty) = (-\infty) \cdot p = -\infty$$
$$q \cdot (+\infty) = (+\infty) \cdot q = -\infty \qquad q \cdot (-\infty) = (-\infty) \cdot q = +\infty$$
$$(+\infty) \cdot (+\infty) = +\infty \qquad (-\infty) \cdot (-\infty) = +\infty$$
$$(+\infty) \cdot (-\infty) = (-\infty) \cdot (+\infty) = -\infty$$

4-Divisioni

$$\frac{p}{+\infty} = 0^+ \qquad \frac{p}{-\infty} = 0^- \qquad \frac{q}{+\infty} = 0^- \qquad \frac{q}{-\infty} = 0^+$$
$$\frac{+\infty}{p} = +\infty \qquad \frac{-\infty}{p} = -\infty \qquad \frac{+\infty}{q} = -\infty \qquad \frac{-\infty}{q} = +\infty$$
$$\frac{0^+}{+\infty} = 0^+ \qquad \frac{0^+}{-\infty} = 0^- \qquad \frac{0^-}{+\infty} = 0^- \qquad \frac{0^-}{-\infty} = 0^+$$
$$\frac{+\infty}{0^+} = +\infty \qquad \frac{-\infty}{0^+} = -\infty \qquad \frac{+\infty}{0^-} = -\infty \qquad \frac{-\infty}{0^-} = +\infty$$
$$\frac{p}{0^+} = +\infty \qquad \frac{p}{0^-} = -\infty \qquad \frac{q}{0^+} = -\infty \qquad \frac{q}{0^-} = +\infty$$

5-Esponenziali

$$(+\infty)^p = +\infty \qquad (+\infty)^q = 0^+$$
$$(0^+)^{+\infty} = 0^+ \qquad (0^+)^{-\infty} = +\infty$$
$$(+\infty)^{+\infty} = +\infty \qquad (+\infty)^{-\infty} = 0^+$$

$$p^{+\infty} = \begin{cases} +\infty, se\ p > 1 \\ 0^+, se\ 0 < p < 1 \end{cases} \qquad p^{-\infty} = \begin{cases} 0^+, se\ p > 1 \\ +\infty, se\ 0 < p < 1 \end{cases}$$

6-Logaritmi

$$\log_p(+\infty) = \begin{cases} +\infty, se\ p > 1 \\ -\infty, se\ 0 < p < 1 \end{cases} \qquad \log_p(0^+) = \begin{cases} -\infty, se\ p > 1 \\ +\infty, se\ 0 < p < 1 \end{cases}$$
$$\log_{+\infty}(p) = \begin{cases} 0^+, se\ p > 1 \\ 0^-, se\ 0 < p < 1 \end{cases}$$

7-Forme di indecisione $\frac{0}{0}$ $\frac{\infty}{\infty}$ $\infty - \infty$ $0 \cdot \infty$ ∞^0 1^∞

8-REGOLE PER IL CALCOLO DEI LIMITI

a. $\lim_a c \cdot f(x) = c \cdot \lim_a f(x), con\ c \neq 0$
b. $\lim_a\{f(x) \pm g(x)\} = \lim_a f(x) \pm \lim_a g(x)$
c. $\lim_a\{f(x) \cdot g(x)\} = \lim_a f(x) \pm \lim_a g(x)$
d. $\lim_a\{f(x)\}^h = \{\lim_a f(x)\}^h$
e. $\lim_a \frac{1}{f(x)} = \frac{1}{\lim_a f(x)}, con\ f(x) \neq 0$
f. $\lim_a \frac{f(x)}{g(x)} = \frac{\lim_a f(x)}{\lim_a g(x)}, con\ g(x) \neq 0$
g. $\lim_a\{f(x)\}^{g(x)} = \{\lim_a f(x)\}^{\lim_a g(x)}$
h. $\lim_a\{\log_{g(x)} f(x)\} = \log_{\lim_a g(x)}\{\lim_a f(x)\}$
i. $\lim_a|f(x)| = |\lim_a f(x)|$