

esponenziali e logaritmici

goniometrici

$$1) \lim_{x \rightarrow +\infty} \left(1 + \frac{1}{x}\right)^x = e$$

$$2) \lim_{x \rightarrow -\infty} \left(1 + \frac{1}{x}\right)^x = e$$

$$3) \lim_{x \rightarrow +\infty} \left(1 + \frac{a}{x}\right)^x = e^a$$

$$4) \lim_{x \rightarrow +\infty} \left(1 + \frac{a}{x}\right)^{nx} = e^{na}$$

$$5) \lim_{x \rightarrow -\infty} \left(1 - \frac{1}{x}\right)^x = \frac{1}{e}$$

$$6) \lim_{x \rightarrow 0} (1 + ax)^{\frac{1}{x}} = e^a$$

$$7) \lim_{x \rightarrow 0} \lg_a (1+x)^{\frac{1}{x}} = \frac{1}{\lg_e a}$$

$$8) \lim_{x \rightarrow 0} \frac{\lg_a (1+x)}{x} = \lg_a e = \frac{1}{\ln a}$$

$$9) \lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \ln a$$

$$10) \lim_{x \rightarrow 0} \frac{(1+x)^a - 1}{x} = a$$

$$11) \lim_{x \rightarrow 0} \frac{(1+x)^a - 1}{ax} = 1$$

$$1) \lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

$$2) \lim_{x \rightarrow 0} \frac{\sin ax}{bx} = \frac{a}{b}$$

$$3) \lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$$

$$4) \lim_{x \rightarrow 0} \frac{\tan ax}{bx} = \frac{a}{b}$$

$$5) \lim_{x \rightarrow 0} \frac{1 - \cos x}{x} = 0$$

$$6) \lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}$$

$$7) \lim_{x \rightarrow 0} \frac{\arcsin x}{x} = 1$$

$$8) \lim_{x \rightarrow 0} \frac{\arcsin ax}{bx} = \frac{a}{b}$$

$$9) \lim_{x \rightarrow 0} \frac{\arctg x}{x} = 1$$

$$10) \lim_{x \rightarrow 0} \frac{\arctg ax}{bx} = \frac{a}{b}$$

$$11) \lim_{x \rightarrow 0} \frac{\sinh x}{x} = 1$$

$$12) \lim_{x \rightarrow 0} x^r \lg_a x = 0 \quad \forall a \in R^+ - \{1\}, \forall r \in R^+$$

$$13) \lim_{x \rightarrow 0} \frac{\lg_a x}{x^r} = 0 \quad \forall a \in R^+ - \{1\}, \forall r \in R^+$$

$$14) \lim_{x \rightarrow +\infty} x^r a^x = \lim_{x \rightarrow +\infty} a^x \quad \forall a \in R^+ - \{1\}, \forall r \in R^+$$

$$15) \lim_{x \rightarrow -\infty} |x|^r a^x = \lim_{x \rightarrow -\infty} a^x \quad \forall a \in R^+ - \{1\}, \forall r \in R^+$$

$$16) \lim_{x \rightarrow +\infty} \frac{e^x}{x^r} = \lim_{x \rightarrow +\infty} a^x \quad \forall r \in R^+$$

$$17) \lim_{x \rightarrow +\infty} \frac{x^r}{e^x} = \lim_{x \rightarrow +\infty} a^x \quad \forall r \in R^+$$

$$18) \lim_{x \rightarrow -\infty} e^x x^r = 0 \quad \forall r \in R^+$$

$$12) \lim_{x \rightarrow 0} \frac{\text{settsenh } x}{x} = 1$$

$$13) \lim_{x \rightarrow 0} \frac{\text{tgh } x}{x} = 1$$

$$14) \lim_{x \rightarrow 0} \frac{\text{settgh } x}{x} = 1$$

$$15) \lim_{x \rightarrow 0} \frac{x - \sin x}{x^3} = \frac{1}{6}$$

$$16) \lim_{x \rightarrow 0} \frac{x - \arctg x}{x^3} = \frac{1}{3}$$