

DERIVATA DEL LOGARITMO IN BASE a

$$D(\log_a x) = \frac{1}{x} \log_a e$$

$$\lim_{h \rightarrow 0} \frac{\log_a(x+h) - \log_a x}{h} = \lim_{h \rightarrow 0} \frac{\log_a \left(\frac{x+h}{x} \right)}{h} =$$

$$= \lim_{h \rightarrow 0} \frac{1}{h} \log_a \left(1 + \frac{h}{x} \right) = \lim_{h \rightarrow 0} \log_a \left[\left(1 + \frac{h}{x} \right)^{\frac{x}{h}} \right] \stackrel{1}{\underset{1}{\rightarrow}}$$

$$= \lim_{h \rightarrow 0} \frac{1}{x} \log_a \left(1 + \frac{h}{x} \right)^{\frac{x}{h}} = \frac{1}{x} \log_a e$$

\downarrow
L'ordine $\rightarrow 0$