

Esercizi sui limiti

$$\lim_{x \rightarrow 0} \frac{\text{sen}^2 2x}{x^2} \quad \lim_{x \rightarrow 0} \frac{1 - \cos 3x}{4x^2} \quad \lim_{x \rightarrow 0} \frac{3x \operatorname{tg} x}{\cos 2x - 1} \quad \lim_{x \rightarrow 0} \frac{2\text{sen}x + 3x}{\text{sen}3x - x}$$

$$\lim_{x \rightarrow 0} \frac{1 - \cos\sqrt{x} - \text{sen}\sqrt{x}}{2x} \quad \lim_{x \rightarrow 0} \frac{x + x^2}{3x + \text{sen}x} \quad \lim_{x \rightarrow 0} \frac{\text{sen}2x + x}{x + 3\text{sen}x} \quad \lim_{x \rightarrow 0} \frac{1 + \cos(x + \pi)}{\text{sen}2x}$$

$$\lim_{x \rightarrow 0^+} \ln(\operatorname{tg} x) - \ln(2x) \quad \lim_{x \rightarrow 0^+} \ln(\text{sen}^2 x) - \ln(\cos x - 1) \quad \lim_{x \rightarrow 0} \frac{\text{sen}x - \operatorname{tg} x}{3x^2}$$

$$\lim_{x \rightarrow 0^+} \frac{e^{\text{sen}x} - 1}{2x} \quad \lim_{x \rightarrow 0^+} \frac{e^x - \cos x}{\text{sen}2x} \quad \lim_{x \rightarrow 0} \left(\frac{x}{\text{sen}2x} \right)^{x+2}$$

$$\lim_{x \rightarrow +\infty} \left(\frac{x+1}{x-1} \right)^{3x} \quad \lim_{x \rightarrow \infty} \left(\frac{x}{x+1} \right)^{3x+2} \quad \lim_{x \rightarrow 0} \frac{e^{\text{sen}x} - \cos x}{2\operatorname{tg} x}$$

$$\lim_{x \rightarrow 0^+} \frac{\sqrt{x}}{e^{\sqrt{4x}} - 1} \quad \lim_{x \rightarrow 0^+} (1 + 3x)^{\frac{1}{x}} \quad \lim_{x \rightarrow 0} \frac{1 - \cos x}{e^{2+x} - e^{2x}}$$

$$\lim_{x \rightarrow 0^+} \frac{3 \ln(1+2x)}{\operatorname{arcsen}(3x)} \quad \lim_{x \rightarrow 0} \frac{e^{x^2} + \cos x - 2}{\text{sen}^2 x} \quad \lim_{x \rightarrow +\infty} \left(x \ln \frac{2x+1}{2x} \right)$$

$$\lim_{x \rightarrow +\infty} 2x [\ln(x^2 + 3) - 2\ln x] \quad \lim_{x \rightarrow 0} \frac{\text{sen}2x + \text{sen}x}{\ln(x+1)}$$

$$\lim_{x \rightarrow +\infty} \frac{\sqrt{x+5} - \sqrt{x+2}}{2} \quad \lim_{x \rightarrow +\infty} \frac{x+1}{|x|-1} \quad \lim_{x \rightarrow -\infty} \left(\frac{x+2}{x+4} \right)^2$$

$$\lim_{x \rightarrow \infty} x \operatorname{sen} \left(\frac{1}{x} \right) \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{(2x - \pi) \cos x}{x(1 - \text{sen}x)} \quad \lim_{x \rightarrow 2} \frac{\text{sen}(\pi x)}{x-2} \quad \lim_{x \rightarrow 2} \frac{x^2 - 4x + 4}{1 - \sqrt{\cos(x-2)}}$$

$$\lim_{x \rightarrow +\infty} \frac{2}{\sqrt{x+3} - \sqrt{x}} \quad \lim_{x \rightarrow \frac{\pi}{2}^+} \operatorname{arctg} \left(\frac{\cos x}{1 - \text{sen}x} \right)$$

Dire per quali valori di a è continua la funzione:

$$f(x) = \begin{cases} 2x^2 - ax + 1 & \text{per } x \leq -1 \\ \frac{ax-1}{x+2} & \text{per } x > -1 \end{cases} \quad f(x) = \begin{cases} x^2 + 2ax + a & \text{per } x \geq 0 \\ \sqrt{x+2} & \text{per } x < 0 \end{cases}$$

$$f(x) = \begin{cases} ae^x & \text{per } x \geq 0 \\ x^2 - a + 2 & \text{per } x < 0 \end{cases}$$

Dire per quali valori di a e b è continua la funzione:

$$f(x) = \begin{cases} e^x - 1 & \text{per } x \leq 0 \\ 2ax^2 - bx & \text{per } x > 0 \end{cases} \quad f(x) = \begin{cases} a(x+2) & \text{per } -2 \leq x \leq 0 \\ \ln(bx+1) + 2b & \text{per } x < 0 \end{cases}$$

Limiti utilizzando il confronto tra infiniti e infinitesimi

$$\lim_{x \rightarrow 0^+} \frac{\ln(1+x^2) + \cos x - e^{x^3}}{x^2 \operatorname{sen} \sqrt{x} - x^3 \cos x}$$

$$\lim_{x \rightarrow 0} \frac{\cos x + \ln(1+x^2) - e^{x^2}}{x^2 \cos x + x \operatorname{sen} x}$$

$$\lim_{x \rightarrow 0} \frac{x \operatorname{arcsen} x + e^{2x} + 1}{\cos x + \ln(1+x)^2 + \operatorname{tg}^2 2x - 1}$$

$$\lim_{x \rightarrow 0^+} \frac{\ln(1+\sqrt{x}) + \operatorname{arctg} x^2 + 2x}{e^x + \operatorname{sen}^2 x - \cos x}$$

$$\lim_{x \rightarrow 0^+} \frac{\sqrt{x} \operatorname{sen} \sqrt{x} + e^{2x} - 2 + \cos x}{\cos x \ln(1+3x) + x^2 + \operatorname{tg} 2x}$$

$$\lim_{x \rightarrow +\infty} \frac{\ln(1+x^{10}) + 10x^2 - 3x + 2}{3x^2 - 4x - 1}$$

$$\lim_{x \rightarrow +\infty} \frac{x^2 - \ln(1+x)^3 + 3^x}{4x + 6x^{10} + 2^{2x}}$$