# LIMITI NOTEVOLI

## -SUCCESSIONI

- $\lim_n \frac{1}{n} = 0$
- $\lim_n e^n = \begin{cases} +\infty & \text{se } e>1 \\ 0 & \text{se } 0<e<1 \end{cases}$
- $\lim_n \log_e n = \begin{cases} +\infty & \text{se } e>1 \\ -\infty & \text{se } 0<e<1 \end{cases}$
- $\lim_n n^\alpha = \begin{cases} +\infty & \text{se } \alpha>0 \\ 0 & \text{se } \alpha<0 \\ 1 & \text{se } \alpha=0 \end{cases}$
- $\lim_n c = c$
- $\lim_n \sin \frac{1}{n} = 0$
- $\lim_n \cos \frac{1}{n} = 1$
- $\lim_n n \sin \frac{1}{n} = 1$ $\quad \frac{\sin \frac{1}{n}}{\frac{1}{n}}$
- $\lim_n \sin a_n = 0$
- $\lim_n \cos a_n = 1$
- $\lim_n \frac{\sin a_n}{a_n} = 1$

$\Big\}$ $a_n \to 0$ , $a_n > 0$

- $e^{b_n} \to \begin{cases} +\infty & \text{se } e>1 \\ 0 & \text{se } 0<e<1 \end{cases}$ $\Rightarrow$ se $b_n \to +\infty$
- $e^{b_n} \to \begin{cases} 0 & \text{se } e>1 \\ +\infty & \text{se } 0<e<1 \end{cases}$ $\Rightarrow$ se $b_n \to -\infty$

- $\log_a b_n \to \begin{cases} -\infty & a>1 \\ +\infty & 0<a<1 \end{cases} \to b_n \to 0$
- $\log_a b_n \to \begin{cases} +\infty & a>1 \\ -\infty & 0<a<1 \end{cases} \to b_n \to +\infty$
- $\lim_n \left(1+\frac{1}{n}\right)^n = e$
- $\lim_n \left(1+\frac{1}{n}\right)^{n+1} = e$
- $\lim_n \left(1-\frac{1}{n}\right)^n = \frac{1}{e}$
- $\lim_n \left(1+\frac{\alpha}{n}\right)^n = e^\alpha$
- $\lim_n \sqrt[n]{n} = 1$
- $\lim_n \frac{e^{\frac{1}{n}}-1}{\frac{1}{n}} = 1$
- $\lim_n \frac{\log_a\left(1+\frac{1}{n}\right)}{\frac{1}{n}} = \log_a e$
- $\lim_n n^2\left(1-\cos\frac{1}{n}\right) = \frac{1}{2}$
- $\lim_n n\left(1-\cos\frac{1}{n}\right) = 0$
- $\lim_n \sqrt[n]{n^\alpha} = 1 \quad \to \alpha \in \mathbb{R}$
- $\lim_n \frac{\sqrt[n]{n!}}{n} = \frac{1}{e}$
- $\lim_n \frac{n}{n-1} = 1$

# LIMITI NOTEVOLI

## - LIMITI DI FUNZIONI

- $\lim_{x \to 0} \frac{1}{x^2} = +\infty$
- $\lim_{x \to +\infty} \operatorname{arctg} x = \frac{\pi}{2}$
- $\lim_{x \to +\infty} x^n = +\infty$
- $\lim_{x \to +\infty} e^x = +\infty$
- $\lim_{x \to +\infty} a^x = +\infty \quad a > 1$
- $\lim_{x \to +\infty} \log_a x = +\infty \quad a > 1$
- $\lim_{x \to +\infty} (-x) = +\infty$
- $\lim_{x \to +\infty} \log_a x = -\infty \quad 0 < a < 1$
- $\lim_{x \to -\infty} a^x = 0 \quad a > 1$
- $\lim_{x \to -\infty} e^x = 0$
- $\lim_{x \to -\infty} x^n = \begin{cases} +\infty & \text{se } n \text{ pari} \\ -\infty & \text{se } n \text{ dispari} \end{cases}$
- $\lim_{x \to +\infty} \frac{\cos x}{x} = 0$
- $\lim_{x \to +\infty} \frac{1}{x} = 0$
- $\lim_{x \to 0} \frac{\sin x}{x} = 1$
- $\lim_{x \to 0} \sin x = 0$
- $\lim_{x \to 0} \cos x = 1$
- $\lim_{x \to +\infty} \frac{\operatorname{arctg} x}{x} = 0$

- $\lim_{x \to 0} \frac{1-\cos x}{x^2} = \frac{1}{2}$
- $\lim_{x \to 0} \frac{1-\cos x}{x} = 0$
- $\lim_{x \to 0} \frac{\operatorname{tg} x}{x} = 1$
- $\lim_{x \to 0} \frac{\operatorname{arcsin} x}{x} = 1$
- $\lim_{x \to 0} \frac{\operatorname{arctg} x}{x} = 1$
- $\lim_{x \to 0} \frac{\log(1+x)}{x} = 1$
- $\lim_{x \to \pm\infty} \left(1 + \frac{1}{x}\right)^x = e$
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