

# Lezione 16: Limiti notevoli - Esercizi

## INDICE

### LIMITI NOTEVOLI:

**I° GRUPPO**  $\lim_{x \rightarrow \pm \infty} \left(1 + \frac{1}{x}\right)^x = e$     $\lim_{x \rightarrow 0} (1+x)^{\frac{1}{x}} = e$     $\lim_{x \rightarrow 0} \frac{\ln(1+x)}{x} = 1$

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

**II° GRUPPO**  $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$     $\lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$     $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}$

$\lim_{x \rightarrow 0} \frac{\cos x - \sin x}{x^3} = \frac{1}{2}$     $\lim_{x \rightarrow 0} \frac{\arctan x}{x} = 1$     $\lim_{x \rightarrow 0} \frac{\arcsin x}{x} = 1$

## ESERCIZI

**A**  $\lim_{x \rightarrow +0} \sin x$

**B**  $\lim_{x \rightarrow 0} \frac{1}{x}$

**C**  $\lim_{x \rightarrow 0^+} \frac{1}{x}$

$\lim_{x \rightarrow +0} \frac{\ln(\arctan x)}{x}$

**D**  $\lim_{x \rightarrow +\infty} \frac{\sin x}{x}$

**E**  $\lim_{x \rightarrow +\infty} \frac{\arctan(\tan x)}{x}$

**F**  $\lim_{x \rightarrow +\infty} \left(1 + \frac{\sin x}{x}\right)^x$

**G**  $\lim_{x \rightarrow 0} \frac{\sin 3x}{\sqrt{1+x} - 1}$

**H**  $\lim_{x \rightarrow 0} \frac{\cos(\sin x) - 1}{(e^{3x} - 1) \ln(1+4x)}$

**I**  $\lim_{x \rightarrow 0} \frac{\sqrt{1+x^2} - \cos x}{e^{x^2} - e^x}$

**J**  $\lim_{x \rightarrow 1} \frac{4^x - 2^{x+1}}{\ln x}$

**K**  $\lim_{x \rightarrow +\infty} |\sin(\sin x)|^x$

**L**  $\lim_{x \rightarrow +0} |\cos(\cos x)|^x$

**M**  $\lim_{x \rightarrow -\frac{\pi}{2}} \frac{\sin x + 1}{\cos 4x - 1}$

**N**  $\lim_{x \rightarrow +\infty} \left(\cos \frac{1}{x}\right)^{x^2}$

**O**  $\lim_{x \rightarrow 0^+} \left(\frac{\pi}{2} + \arctan(\ln x)\right) \cdot \ln \frac{1}{x}$

**P**  $\lim_{x \rightarrow 0^-} \frac{\tan x - \sin(x+x^2)}{e^{x^2} - \cos x + e^{\frac{1}{x}}}$

**Q**  $\lim_{x \rightarrow +\infty} |\sin x \cdot \cos \sqrt{x^2+1}|^x$