

A SUP/INF

(1)

Trovare $\sup A$, $\inf A$, $\max A$ (se esiste), $\min A$ (se esiste) dei seguenti insiemi:

1) $A = \{x \in \mathbb{R} : x^2 - 3x + 2 \leq 0\} \cup \{x \in \mathbb{R} : |x - 2| < 1\}$

2) $A = \{x \in \mathbb{R} : x^2 - 5x < 0\} \cup \{x \in \mathbb{R} : x > 3\}$

3) $A = \{x \in \mathbb{R} : 5 \leq |x - 4| < 7\}$

4) $A = \{x \in \mathbb{R} : 3 < |x - 1| \leq 4\}$

5) $A = \{x \in \mathbb{R} : x(x+1) < 0\} \cup \left\{ \frac{1}{n(n+1)} : n \in \mathbb{N} \right\}$

B BINOMIO

1) Espandere $(1 - 2x)^4$

2) Calcolare $(1 + 2x)^{61} = 1 + \dots x + \dots x^2 + \dots$

3) Calcolare $(1 - 3x)^{99} = 1 + \dots x + \dots x^2 + \dots$

LIMITI DI SUCCESSIONI

2

$$\lim_{n \rightarrow \infty} \frac{10}{n^2} \quad \lim_{n \rightarrow \infty} \frac{(-1)^n}{n+4} \quad \lim_{n \rightarrow \infty} \frac{n}{n+1} \quad \lim_{n \rightarrow \infty} \left(\frac{2}{3}\right)^n$$

$$\lim_{n \rightarrow \infty} \frac{2n^2 + 4n + 7}{n^2 + 2n + 3} \quad \lim_{n \rightarrow \infty} \frac{3n+8}{5n-2} \quad \lim_{n \rightarrow \infty} \frac{2n^2 + 7n - 4}{6n^2 - n - 1}$$

$$\lim_{n \rightarrow \infty} \frac{n^2 + 7}{n^3} \quad \lim_{n \rightarrow \infty} \frac{n^3 + 2n}{n+3} \quad \lim_{n \rightarrow \infty} \frac{\sin(n)}{n+1}$$

$$\lim_{n \rightarrow \infty} \frac{\sin(n) + (-1)^n}{n^2 + 4} \quad \lim_{n \rightarrow \infty} \sqrt{\frac{n+2}{3n+4}} \quad \lim_{n \rightarrow \infty} \frac{n^2 + \sqrt{n+2}}{\sqrt{n^4 + 7}}$$

$$\lim_{n \rightarrow \infty} \frac{(\sqrt{n+3} - \sqrt{n-1})}{\sqrt{n}}$$

$$\lim_{n \rightarrow \infty} (\sqrt{n^2 + 2n + 4} - \sqrt{n^2 - 3n + 7})$$

$$\lim_{n \rightarrow \infty} (\sqrt{n^2 + 2n + 4} - \sqrt{n^2 + 2n - 1}) \cdot n$$

$$\lim_{n \rightarrow \infty} \frac{n^2 + 2^n}{3n^2 - 2^{n+1}} \quad \lim_{n \rightarrow \infty} \frac{n^5 + 2^{2n+1} - 3^{n+1}}{n + 3^{n-2} - 4^n}$$

$$\lim_{n \rightarrow \infty} \sqrt[n]{n^2 + 2n} \quad \lim_{n \rightarrow \infty} \sqrt[n]{\frac{n^2 - 1}{n^3 + 2n}} \quad \lim_{n \rightarrow \infty} \sqrt[n]{2^n + 3^n}$$

$$\lim_{n \rightarrow \infty} \sqrt[n]{3^n - 2^n} \quad \lim_{n \rightarrow \infty} \sqrt[n+1]{3^{2n+1} - 2^{3n+1}}$$

(3)

$$\lim_{n \rightarrow -\infty} \left(\frac{n+2}{n} \right)^{3n} \quad \lim_{n \rightarrow -\infty} \left(\frac{n-3}{n+4} \right)^{2n+5}$$

$$\lim_{n \rightarrow \infty} \left(\frac{2n+4}{2n-3} \right)^{n^2+n-1} \quad \lim_{n \rightarrow \infty} \left(\frac{2n-1}{n+3} \right)^n \quad \lim_{n \rightarrow \infty} \left(\frac{n+2}{2n+1} \right)^{3n+2}$$

$$\lim_{n \rightarrow \infty} \frac{3n^5 + \sin(n+7)}{1 + \cos(n^2) - n^5} \quad \lim_{n \rightarrow -\infty} \frac{1 + \sin n}{2 + \cos n}$$

LIMITI DI FUNZIONI

$$\lim_{x \rightarrow +\infty} \frac{x^2 + 3x + 4}{2x^3 + 7x - 2} \quad \lim_{x \rightarrow -\infty} \frac{3x^3 + 2}{2x^2 - 7}$$

$$\lim_{x \rightarrow +\infty} \frac{3x^4 + 1}{4x^4 + x} \quad \lim_{x \rightarrow -\infty} \frac{2x^2 - x}{3x^2 + 4}$$

$$\lim_{x \rightarrow 0} \frac{x^3 + 4x - 5}{x^2 - 1} \quad \lim_{x \rightarrow 1} \frac{x^3 + 4x - 5}{x^2 - 1}$$

$$\lim_{x \rightarrow 2} \frac{3x^4 - 8x^3 + 16}{x^3 - 3x^2 + 4} \quad \lim_{x \rightarrow 1} \frac{x^2 - 3x + 2}{x^2 - 4x + 3}$$

④

$$\lim_{x \rightarrow +\infty} \frac{x}{\sqrt{x^2+1}} \quad \lim_{x \rightarrow -\infty} \frac{x}{\sqrt{x^2+1}}$$

$$\lim_{x \rightarrow +\infty} (\sqrt{x+4} - \sqrt{x}) \sqrt{x} \quad \lim_{x \rightarrow -\infty} (\sqrt{x^2+3x+2} + x)$$

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

$$\lim_{x \rightarrow 0} \frac{\sin 2x}{x} \quad \lim_{x \rightarrow 0} \frac{\cos 3x - \cos 5x}{x^2}$$

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} \quad \lim_{x \rightarrow 0} \frac{\operatorname{tg} 2x}{\operatorname{tg} 5x} \cdot 7x^2$$

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x}{x} \quad \lim_{x \rightarrow 1} (x-1) \operatorname{cotg} \pi x$$

$$\lim_{x \rightarrow 0} \frac{3x^3 + 2 \operatorname{tg}^2 x}{2x^4 - 3 \sin^2 x} \quad \lim_{x \rightarrow +\infty} \frac{3x^3 + 2 \cos^2 x}{2x^3 + 3 \sin^2 x}$$

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\operatorname{cotg} x}{x - \frac{\pi}{2}} \quad \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 + \cos 2x}{(x - \frac{\pi}{2})^2}$$

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

$\lim_{x \rightarrow 0} \frac{\log_e(1+x)}{x}$ $\lim_{x \rightarrow 0} \frac{2^x - 1}{x}$

$\lim_{x \rightarrow 0} (1+3x)^{2/x}$ $\lim_{x \rightarrow +\infty} (1+3x)^{\frac{2}{x}}$

$\lim_{x \rightarrow 0} x^x$ (difficile)

$\lim_{x \rightarrow 0} \left(3 - \frac{6+x}{3} \right)^{\frac{\operatorname{tg} \frac{\pi(6+x)}{12}}{12}}$ (mostro)

$\lim_{x \rightarrow 0} (\cos x)^{1/x^2}$ $\lim_{x \rightarrow \frac{\pi}{4}} (\operatorname{tg} x)^{\operatorname{tg} 2x}$