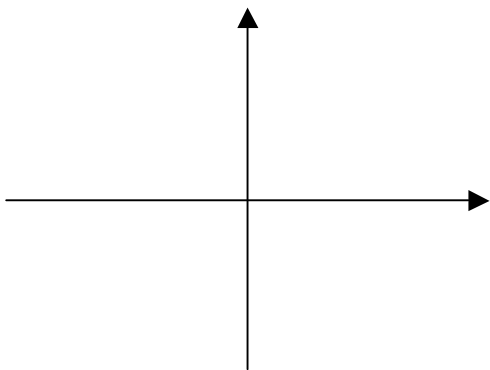


Corsi di Laurea in Scienze P.A. e Igiene S.A.
A.A. 2003/2004

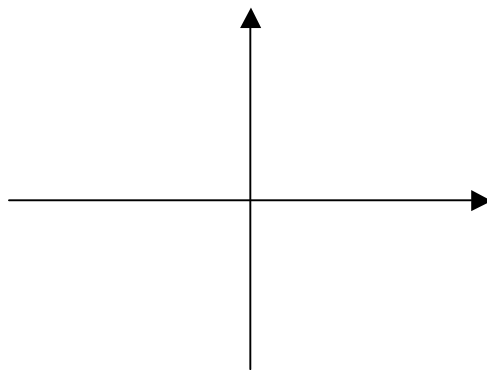
Matematica

Esercizi del 12 febbraio 2004

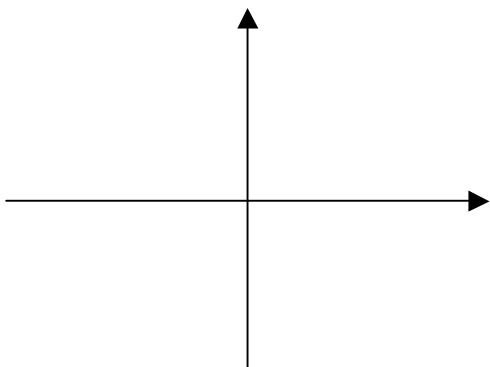
Esercizio 1. Rappresentare graficamente le informazioni fornite dai seguenti limiti:



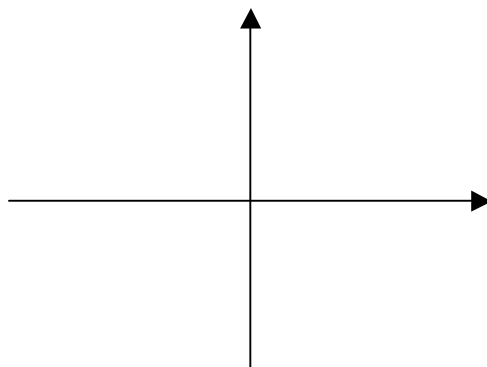
$$\lim_{x \rightarrow 3} f(x) = 2$$



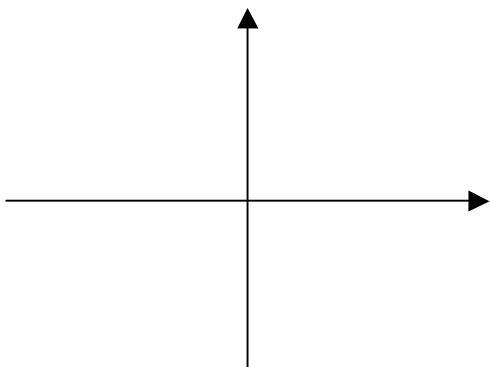
$$\lim_{y \rightarrow -\infty} f(y) = -1$$



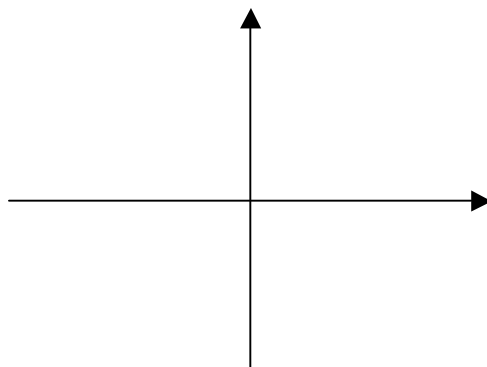
$$\lim_{t \rightarrow +\infty} f(t) = -\infty$$



$$\lim_{x \rightarrow (-2)^+} f(x) = +\infty$$



$$\lim_{z \rightarrow 2^-} f(z) = -\infty$$



$$\lim_{w \rightarrow 1^+} f(w) = 2, \quad \lim_{w \rightarrow 1^-} f(w) = 3$$

Esercizio 2. Calcolare il valore dei seguenti limiti (di funzioni continue):

$$\begin{aligned} \lim_{z \rightarrow -1} (z^3 + 3z - 5), \quad \lim_{x \rightarrow 0} \frac{5 - \operatorname{sen} x}{\sqrt{x+5}}, \quad \lim_{w \rightarrow 4} \sqrt{\frac{w+3}{w-3}}, \\ \lim_{x \rightarrow 2} \frac{x - 3x^2 + 1}{x^2 - 3x + 5}, \quad \lim_{y \rightarrow 1} (3^{2y+1} - 5 \operatorname{arctg} y), \quad \lim_{y \rightarrow -1} \frac{4|y-3| + \sqrt{5+y}}{y + \ln(2+y)}, \\ \lim_{t \rightarrow \pi} \frac{t - 3 \operatorname{sen} t}{2 \cos t + 1}, \quad \lim_{x \rightarrow 2} \frac{\arcsen(1/x) - \arccos(x/2)}{x^2 - x}, \quad \lim_{w \rightarrow 2} \frac{\operatorname{sen}(\pi \cos(\pi w))}{3w - \operatorname{arctg}(w-2)}. \end{aligned}$$

Esercizio 3. Calcolare il valore dei seguenti limiti (forme non indeterminate):

$$\begin{aligned} \lim_{w \rightarrow +\infty} (e^w + w^7), \quad \lim_{x \rightarrow -\infty} \left(\frac{4}{x^2} - 3^x \right), \quad \lim_{t \rightarrow +\infty} 5^t \ln(t^2 + t), \\ \lim_{t \rightarrow 0^+} 5^t \ln(t^2 + t), \quad \lim_{y \rightarrow +\infty} (y^3 2^{3y+1}), \quad \lim_{x \rightarrow +\infty} \frac{\operatorname{arctg} x}{x^2 + 1}. \end{aligned}$$

Esercizio 4. Calcolare ove possibile il valore dei seguenti limiti (forma $\frac{L}{0}$), calcolando eventualmente i relativi limiti destro e sinistro:

$$\begin{aligned} \lim_{x \rightarrow 0} \frac{2x-3}{x^2}, \quad \lim_{t \rightarrow 1} \frac{t^2+4}{t-1}, \quad \lim_{y \rightarrow -2} \frac{2y^2-3y-4}{(y+2)^2}, \\ \lim_{z \rightarrow 1} \frac{5z-1}{\ln z}, \quad \lim_{w \rightarrow \pi} \frac{3-2 \cos w}{\operatorname{sen} w}, \quad \lim_{x \rightarrow 1} \frac{1+3x}{x^2-3x+2}. \end{aligned}$$

Esercizio 5. Calcolare il valore dei seguenti limiti (polinomi, funzioni razionali):

$$\begin{aligned} \lim_{t \rightarrow +\infty} (3t^2 - 12t + 5), \quad \lim_{y \rightarrow +\infty} (3 + y^2 - 4y^2), \quad \lim_{x \rightarrow -\infty} (7x^2 - x^3 + 2x - 1), \\ \lim_{x \rightarrow +\infty} \frac{7x^2 + x - 1}{x^3 + 1}, \quad \lim_{z \rightarrow -\infty} \frac{2z^3 + z - 5}{3z^2 - z + 2}, \quad \lim_{x \rightarrow +\infty} \frac{3x - x^2 + 1}{3x^2 - 2x + 2}, \\ \lim_{w \rightarrow -\infty} \frac{4w^3 + w^2 - 2}{3w^3 - 5w}, \quad \lim_{s \rightarrow +\infty} \frac{4 + 5s}{3s^2 + 1}, \quad \lim_{x \rightarrow +\infty} \frac{4x^3 - 5}{x^2 + 2x - 1}. \end{aligned}$$