

Si risolvano, se esistono, i seguenti limiti

1. $\lim_{x \rightarrow -\infty} \frac{x^3 + x^2 - 1}{3x^2 - 1}; \quad [-\infty]$
2. $\lim_{x \rightarrow +\infty} \frac{x^2 + x + 3}{2x^2 - x}; \quad [1/2]$
3. $\lim_{x \rightarrow -\infty} \frac{x}{3x^4 + 2}; \quad [0]$
4. $\lim_{x \rightarrow -\infty} \sqrt{x^2 + 2x} + x; \quad [-1]$
5. $\lim_{x \rightarrow +\infty} \sqrt{x^2 - x} - x; \quad [-1/2]$
6. $\lim_{x \rightarrow +\infty} \log_2 \left(\frac{3x^2 + 2}{x^4} \right); \quad [-\infty]$
7. $\lim_{x \rightarrow +\infty} \arctan \left(\frac{x^2 + x}{x^2} \right); \quad [\pi/4]$
8. $\lim_{x \rightarrow 2} \frac{x + 1}{x - 2}; \quad [\text{non esiste}]$
9. $\lim_{x \rightarrow 3} \frac{x - 4}{x^2 - 3x}; \quad [\text{non esiste}]$
10. $\lim_{x \rightarrow 1} \frac{x}{(x - 1)^4}; \quad [+\infty]$
11. $\lim_{x \rightarrow 0} \frac{x + \sin x}{e^x - 1}; \quad [2]$
12. $\lim_{x \rightarrow 0} \frac{\log(3x^2 + 1)}{e^{x^2} - \cos x}; \quad [2]$
13. $\lim_{x \rightarrow 0} \frac{\tan(3x)}{\log_3(2x + 1)}; \quad [(3 \log 3)/2]$
14. $\lim_{x \rightarrow 0} \frac{2x + \tan x}{\arcsin x + 2x}; \quad [1]$
15. $\lim_{x \rightarrow 0} \frac{x \sin x}{1 - \cos(2x)}; \quad [1/2]$

Si studino i grafici qualitativi delle seguenti funzioni

1. $f(x) = \log\left(\frac{2x+1}{x-1}\right);$

2. $f(x) = \sqrt{x^2 - 3x + 2} - x;$

3. $f(x) = \frac{x^2 + x}{x - 1};$

4. $f(x) = e^{\frac{x+1}{x-1}};$

5. $f(x) = \frac{x^3}{x^2 - 1}.$