TUTORATO DEL
16/12/2022

1) Calcolare i seguenti integrali

(i) $\displaystyle\int \frac{x}{x^3-3x+2}\,dx$

(ii) $\displaystyle\int \frac{1}{x^4-2x^3}\,dx$

(iii) $\displaystyle\int \frac{1}{2\sin x - \cos x + 5}\,dx$

(iv) $\displaystyle\int \frac{1}{x^4-1}\,dx$

(v) $\displaystyle\int \frac{1}{4x^2+12x+12}\,dx$

(vi) $\displaystyle\int \frac{1}{x^4+1}\,dx$

(vii) $\displaystyle\int \frac{2x+1}{x^2+3}\,dx$

(viii) $\displaystyle\int \frac{x^4}{x^4+5x^2+4}\,dx$

(ix) $\displaystyle\int \log x\,dx$

(x) $\displaystyle\int \frac{\sin^2 x}{1+\sin^2 x}\,dx$

2) Calcolare i seguenti limiti

(i) $\displaystyle\lim_{x\to 0} \frac{x^2+e^x-1-x}{3x^2}$

(ii) $\displaystyle\lim_{x\to+\infty} x^3 \left[\log\left(1+\frac{1}{x}\right)-\frac{1}{x}+\frac{1}{2x^2}\right]$

(iii) $\displaystyle\lim_{x\to 0} \frac{1-\cos x}{e^{2x}-1-2x}$

(iv) $\lim\limits_{x \to 0} \dfrac{\sqrt[4]{1-4x^2+x^4} - 1 + x^2}{x^4}$

(v) $\lim\limits_{x \to 0} \dfrac{1-e^{-x^2} + x^3 \sin\left(\frac{1}{x}\right)}{x^2}$

3) Studia le seguenti funzioni

(i) $f(x) = \dfrac{\log x}{x}$

(ii) $f(x) = \left|\dfrac{x}{x+1}\right|$