

Formulario Analisi C

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1 Serie note

- Serie geometrica

$$\sum_{n=0}^{\infty} q^n = \frac{1}{1-q}$$

converge se $|q| < 1$

- Serie armonica generalizzata

$$\sum_{n=1}^{+\infty} \left(\frac{1}{n}\right)^{\alpha}$$

converge se $\alpha > 1$

- Serie

$$\sum_{n=2}^{+\infty} \frac{1}{n^{\alpha} \cdot (\log n)^{\beta}}$$

converge se $\alpha > 1, \forall \beta$ oppure $\alpha = 1, \beta > 1$

2 Sviluppi di Taylor

$$\frac{1}{1-x} = \sum_{n=0}^{+\infty} x^n \quad \text{per } |x| < 1$$

$$e^x = \sum_{n=0}^{+\infty} \frac{x^n}{n!}$$

$$\log(1+x) = \sum_{n=1}^{+\infty} (-1)^{n+1} \cdot \frac{x^n}{n} \quad \text{per } -1 < x \leq 1$$

$$\sin(x) = \sum_{n=0}^{+\infty} (-1)^n \cdot \frac{x^{2n+1}}{(2n+1)!}$$

$$\cos(x) = \sum_{n=0}^{+\infty} (-1)^n \cdot \frac{x^{2n}}{(2n)!}$$

$$\sinh(x) = \sum_{n=0}^{+\infty} \frac{x^{2n+1}}{(2n+1)!}$$

$$\cosh(x) = \sum_{n=0}^{+\infty} \frac{x^{2n}}{(2n)!}$$

$$\arctan(x) = \sum_{n=0}^{+\infty} (-1)^n \cdot \frac{x^{2n+1}}{2n+1} \quad \text{per } |x| \leq 1$$

$$\operatorname{arctanh}(x) = \sum_{n=0}^{+\infty} \frac{x^{2n+1}}{2n+1}$$

3 Integrali impropri notevoli

$$\int_0^1 \left(\frac{1}{x}\right)^\alpha \quad \text{converge se } \alpha < 1$$

$$\int_1^{+\infty} \left(\frac{1}{x}\right)^\alpha \quad \text{converge se } \alpha > 1$$

$$\int_0^{\frac{1}{2}} \frac{1}{x^\alpha \cdot |\log x|^\beta} dx \quad \text{converge se } \alpha < 1 \quad \forall \beta$$

$$\text{oppure } \alpha = 1 \quad \beta > 1$$

$$\int_{a>1}^{+\infty} \frac{1}{x^\alpha \cdot |\log x|^\beta} dx \quad \text{converge se } \alpha > 1 \quad \forall \beta$$

$$\text{oppure } \alpha = 1 \quad \beta > 1$$