

INTEGRALE EULERIENE

[1] Integrala gamma

$$\Gamma(a) = \int_0^{\infty} x^{a-1} \cdot e^{-x} dx, \quad a > 0$$

Proprietati

- 1) $\Gamma(1) = 1$
- 2) $\Gamma(a) = (a-1) \cdot \Gamma(a-1) \quad \forall a > 1$
- 3) $\Gamma(n) = (n-1)!$ $\forall n \in \mathbb{N}^*$
- 4) $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$

[3] Integrala Euler-Poisson

$$\int_0^{\infty} e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$$

[2] Integrala beta

$$\beta(a, b) = \int_0^1 x^{a-1} \cdot (1-x)^{b-1} dx, \quad a > 0, b > 0$$

Proprietati

- 1) $\beta(a, b) = \beta(b, a) \quad \forall a, b > 0$
- 2) $\beta(a, b) = \frac{\Gamma(a) \cdot \Gamma(b)}{\Gamma(a+b)} \quad \forall a, b > 0$
- 3) $\beta(a, b) = \int_0^{\infty} \frac{x^{a-1}}{(1+x)^{a+b}} dx, \quad \forall a, b > 0$
- 4) Dacă $a+b=1$ atunci: $\beta(a, b) = \frac{\pi}{\sin(a\pi)}$