# INTEGRALE EULERIENE

## 1 Integrala gama

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

Proprietăți

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

## 2 Integrala beta

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

Proprietăți

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

## 3 Integrala Euler-Poisson

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