INTEGRALE EULERIENE

1 Integrala gama

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

Proprietăți

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

2 Integrala beta

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

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

3 Integrala Euler-Poisson

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