Gamma function

Defn $$\Gamma(a) = \int_0^\infty t^{a-1} e^{-t}\, dt$$

$\Gamma(\cdot)$ is defined everywhere except at $a = 0, -1, -2, \ldots$

Properties

$\Gamma(n+1) = n!$, n is a positive integer

$\Gamma(a+1) = a\,\Gamma(a)$, a any real number

$\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$

$\Gamma(1) = 1$