

The Gamma function is defined as

$$\Gamma(x) := \lim_{n \rightarrow \infty} \frac{n! n^x}{x(x+1) \cdots (x+n)}$$

There holds the Weierstraßproduct representation

$$\frac{1}{\Gamma(x)} = x \cdot e^{Cx} \cdot \prod_{k=1}^{\infty} \left(1 + \frac{x}{k}\right) e^{-x/k} \text{ with } C := \lim_{n \rightarrow \infty} \left(\sum_{k=1}^n \frac{1}{k} - \ln n\right)$$