

Answer on Question#38134, Engineering, Other

Question:

What is the most common formula for gamma function and when we can use it??

Answer:

The gamma function is defined for all complex numbers except the negative integers and zero. For complex numbers with a positive real part, it is defined via a convergent improper integral:

$$\Gamma(t) = \int_0^{\infty} x^{t-1} e^{-x} dx$$

Using integration by parts, we see that the gamma function satisfies the functional equation:

$$\Gamma(t + 1) = t \Gamma(t)$$

Combining this with $\Gamma(1) = 1$, we get:

$$\Gamma(n) = (n - 1)!$$