LaTeX and Gnuplot: the Gamma function

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The gamma function is defined as:

$$\Gamma(n) = (n-1)! \ . \tag{1}$$

where n is a positive integer. It can also be defined for a complex number with a positive real part:

$$\Gamma(z) = \int_0^\infty x^{z-1} e^{-x} dx, \qquad \Re(z) > 0 \tag{2}$$

It is an extension of the factorial function, taking complex and real number arguments. There are no points at which the Gamma function is equal to zero, but it does diverge at $x = 0, \quad -1, \quad -2, \quad -3, \quad -4, \quad$ ... it which it is not anaytical.

The Gamma function

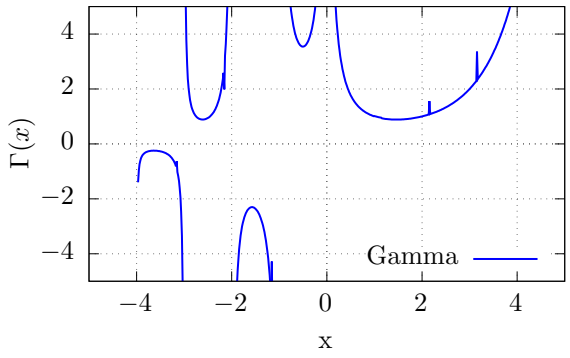

Figure 1: Gamma function