

## Some results on the gamma function for negative integers.

### ABSTRACT

The Gamma function  $\Gamma(s)(-r)$  is defined by  $\Gamma(s)(-r) = N - \lim_{\epsilon \rightarrow 0} \int_{\epsilon}^{\infty} t^{-r-1} \ln s t e^{-t} dt$  for  $r, s = 0, 1, 2, \dots$ , where  $N$  is the neutrix having domain  $N' = \{\epsilon : 0 < \epsilon < \infty\}$  with negligible functions finite linear sums of the functions  $\epsilon^{\lambda} \ln s - \epsilon, \ln s \epsilon : \lambda < 0, s = 1, 2, \dots$  and all functions which converge to zero in the normal sense as  $\epsilon \rightarrow 0$ . In the classical sense Gamma functions is not defined for the negative integer. In this study, it is proved that for  $r = 1, 2, \dots$ , where  $\varphi(r) = \sum_{i=1}^r 1/i$ . Further results are also proved.

**Keyword:** Gamma function; Neutrix; Neutrix limit.