

MSUM Math Club
Problem of the Fortnight¹
September 22, 2009

Background necessary to complete this problem: Calculus II, Discrete Math.

Let

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

For $n \geq 0$, show that $\Gamma(n + 1) = n!$.

¹Solutions to the Problem of the Fortnight© must be submitted no later than 13 days after the problem is introduced unless otherwise specified by the Math Club Advisor. Only one solution per person. Solutions will be graded out of 10 points. The person with the solution with the most points will earn the title Math Master for the fortnight. In the event of a tie, the winners will share the title of Math Master for the fortnight and share the Möbius Band. Void where prohibited. You must be a student at MSUM to be eligible. Only humans may submit solutions. Solutions submitted by extra terrestrial entities will be automatically disqualified. Solutions submitted by unicorns will also automatically be disqualified.