

Funciones especiales - Facultad de Matemáticas

Funciones Hipergeométricas - Ejercicios

1. Demostrar que si $\gamma > c > 0$, entonces:

$$\frac{\Gamma(\gamma)}{\Gamma(c)\Gamma(\gamma-c)} \int_0^1 t^{c-1}(1-t)^{\gamma-c-1} {}_2F_1(\alpha, \beta; c; xt) dt = {}_2F_1(\alpha, \beta; \gamma; x)$$

2. Demostrar que:

$$\int_0^\infty e^{-st} {}_1F_1(\alpha; \gamma; t) dt = \frac{1}{s} {}_2F_1(\alpha, 1; \gamma; \frac{1}{s})$$

3. Deducir, para $\mu + \nu > 0$, la siguiente igualdad

$$\int_0^\infty J_\nu(at) t^{\mu-1} e^{-p^2 t^2} dt = \frac{\Gamma(\frac{\mu+\nu}{2})(\frac{a}{2p})^\nu}{2p^\mu \Gamma(\nu+1)} {}_1F_1(\frac{\mu+\nu}{2}; \nu+1; -\frac{a^2}{4p^2})$$