

Nombre:

Tarea Cálculo Vectorial – 16 de Febrero 2015

1. Si $f(x, y) = ax^2 + 2cxy + by^2$, donde a, b , y c son constantes, hallar $f_x, f_y, f_{xx}, f_{yy}, f_{xy}$, y f_{yx}

2. Si $u = (Ar^n + Br^{-n}) \cos n\theta$, donde A, B y n son constantes, verificar que

$$\frac{\partial^2 u}{\partial r^2} + \frac{1}{r} \frac{\partial u}{\partial r} + \frac{\partial^2 u}{r^2 \partial \theta^2} = 0$$

3. Si $r^2 = x^2 + y^2 + z^2$, hallar $\partial r / \partial x, \partial r / \partial y, \partial r / \partial z$. Por tanto demostrar que

$$\frac{\partial^2}{\partial x^2} \left(\frac{1}{r} \right) + \frac{\partial^2}{\partial y^2} \left(\frac{1}{r} \right) + \frac{\partial^2}{\partial z^2} \left(\frac{1}{r} \right) = 0$$