Aula 12 - 14.6/17

Daniel Cavalcanti Vilela de Salis - 123.145

$$\nabla h = \frac{\partial h}{\partial r} i + \frac{\partial h}{\partial s} + \frac{\partial h}{\partial t} k$$

$$\nabla h = \left(\frac{3}{3r+6s+9t}\right) i + \left(\frac{6}{3r+6s+9t}\right) j + \left(\frac{9}{3r+6s+9t}\right) k$$

$$\nabla h(1,1,1) = \left(\frac{3}{18}\right) i + \left(\frac{6}{18} j\right) + \left(\frac{9}{18}\right) k = \frac{1}{6} i + \frac{1}{3} j + \frac{1}{2} k$$

$$u = \frac{v}{\|v\|} = \frac{4i+12j+6k}{\sqrt{4^2+12^2+6^2}} = \frac{1}{14}(4i+12j+6k)$$

$$D_u h(1,1,1) = \nabla h(1,1,1) \cdot u$$

$$D_u h(1,1,1) = \left(\frac{1}{6} i + \frac{1}{3} j + \frac{1}{2} k\right) \cdot \frac{(4i+12j+6k)}{14} \cdot \frac{1}{14}$$

$$D_u h(1,1,1) = \frac{1}{14}\left(\frac{4}{6} + \frac{12}{3} + \frac{6}{2}\right) = \frac{23}{42}$$