Directional Derivatives

The rate of change of f in the u direction.

The Directional Derivatives of $f(x,y) = x^2 + xy^2$ in the direction $i - j$ a the point $(1,1)$.

$$\lim_{s \to 0} \frac{(1 - s\frac{1}{\sqrt{2}})^2 + (1 - s\frac{1}{\sqrt{2}})^2(1 + s\frac{1}{\sqrt{2}})) - 2}{s} = \frac{1}{\sqrt{2}}$$