Full Name:
Student Number:
Department:

QUIZ 4

1: Let $f(x, y) = x^2 e^y$.

(a) (2 pts) Find $f_x(1, 0)$ and $f_y(1, 0)$.

(b) (2 pts) Write an equation of the tangent plane to the surface $z = f(x, y)$ at the point $(1, 0, 1)$.

(c) (3 pts) Find a unit vector $\mathbf{u}$ for which the directional derivative $D_{\mathbf{u}}f(1, 0)$ has its largest possible value.

(d) (3 pts) Calculate the directional derivative $D_{\mathbf{u}}f(1, 0)$ in the direction of $\mathbf{u} = \frac{3}{5}\mathbf{i} - \frac{4}{5}\mathbf{j}$.