MATH 261 Quiz 5 Name: .
Section:

Show all work. 5 points each.

1) Find the directional derivative of $f(x, y) = 5xy^2 - 4x^3y$ at the point $P(1, 2)$ in the direction of$\mathbf{u} = \langle \frac{5}{13}, \frac{12}{13} \rangle$.

2) Find the critical point(s) of $f(x, y) = 9 - 2x + 4y - x^2 - 4y^2$ and apply the second derivative test to determine if it is a local max, a local min or a saddle point.