

Math 2415

Concept Quiz Questions on 14.6

1. Write down a formula for the gradient of a function of two variables.
2. State a formula for the directional derivative of $z = f(x, y)$ at a point $\mathbf{x}_0 = (x_0, y_0)$ in the direction of the vector $\mathbf{u} = (a, b)$. Your answer should involve the gradient of f .
3. Let $z = f(x, y)$ be the elevation of a hill. What is the direction of steepest ascent at a point $\mathbf{x}_0 = (x_0, y_0)$? State a formula for the rate of change of f in that direction.