

Problem Definition

Problem 21. Evaluate f_x and f_y at the point.

$$f(x, y) = 3x^2 + xy - y^2 \quad (2, 1)$$

Solution Step 1:

The two partial derivatives are

$$\frac{\partial f}{\partial x} = f_x = 3(2x) + (1)y - 0 = 6x + y$$

and

$$\frac{\partial f}{\partial y} = f_y = 0 + x(1) - 2y = x - 2y$$

Solution Step 2:

The partials evaluated at $(2, 1)$ are:

$$f_x(2, 1) = 6(2) + (1) = 13$$

and

$$f_y(2, 1) = (2) - 2(1) = 0$$