

MATH 2E Prep: Partial Derivatives

1. Find the first partial derivatives of the function $f(x, y) = \frac{x}{y}$, then find a point $P(a, b)$ such that

$$\frac{\partial f}{\partial x}(a, b) = \frac{\partial f}{\partial y}(a, b) = \frac{1}{2}.$$

2. Find the first partial derivatives of the function $w = \ln(x + 2y + 3z)$.
3. Find the gradient of the function $f(x, y, z) = \frac{xz}{x^2 + y^2}$, and evaluate the gradient at the point $Q = (1, 1, 0)$