The Geometric Interpretation of Partial Derivatives

Assume that z = f(x, y) is a function of two variables which represents a surface in three-dimensional space. Compute the partial derivatives z_x and z_y . Evaluate these partial derivatives at the point (a, b). Then

 z_x is the **slope** (measured along the x-axis) of line L_1 , which is *tangent* to the surface at the point (a, b, f(a, b)), and

 z_y is the **slope** (measured along the y-axis) of line L_2 , which is *tangent* to the surface at the point (a, b, f(a, b)).

NOTE: Line L₁ lies in the plane y = b. Line L₂ lies in the plane x = a.

