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 L_1 lies in the plane $y = b$. Line L_2 lies in the plane $x = a$.