

Total time: 10 minutes.

Problem 1 (2+2+2=6 points). Let $f(x, y) = x^2y - \sin x$. Calculate:

$$f_x = 2xy - \cos x, \quad f_y = x^2, \quad f_{yy} = 0$$

Problem 2 (4 points). Find the tangent plane to $z = x^2 + 3xy$ at $(1, 2, 7)$.

$$f_x = 2x + 3y, \quad f_y = 3x$$
$$f_x(1, 2) = 8, \quad f_y(1, 2) = 3$$

Equation of tangent plane:

$$z = 7 + 8(x - 1) + 3(y - 2)$$