

MATH 203 WORKSHEET #7

(1) Find the partial derivatives of the following functions.

(a) $f(x, y) = x^2 + e^{7y} - 143$

(b) $u = 2s + 5t + 8$

(c) $f(x, y) = x^5 - 5x^3y + 3y^4$

(d) $z = \frac{x}{y}$

(e) $z = x - y + 2xe^{y^2}$

(f) $r = 2^{st} + (s - 5t)^8$

(2) Find the tangent plane at the indicated point.

(a) $z = 5x^2 + 3y + xy$ at $(x_0, y_0) = (1, 2)$

(b) $z = x \ln y$ at $(x_0, y_0) = (4, 2)$

(c) $z = x + \frac{x}{y+1}$ at $(x_0, y_0) = (2, 1)$

(3) Find where these functions have a minimum. (In general, there are tests to determine whether a stationary point is a maximum, minimum or saddle point. For now, trust me, these are minima.)

(a) $z = x^2 + y^2 - 5y$

(b) $z = x^2 + x + y^2 - 4y$

(c) $z = 2x^2 - 2xy + y^2 - 2x$

(d) $z = x^2 - 4xy + 4y^2 - 11$