

Quiz 6 Calculus III Fall 2015

Names:.....

Solve the following problems. Each problem is worth 5 points. Show work and explain.

Q1.(a) Find the equation of (a) the tangent plane and (b) the normal line to the surface

$$xyz^2 = 6 \text{ at } P_0(3, 2, 1).$$

Q1.(b) Are there any points on the hyperboloid $x^2 - y^2 - z^2 = 1$ where the tangent plane is **parallel** to the plane $z = x + y$?

(over)

Q2.(a) The radius r of a circular cone is decreasing at a rate of 2 in/sec while its height h is increasing at a rate of 1.5 in/sec. At what rate is volume of the cone changing when the radius is 60in and the height is 80in?

Q2.(b) Find all the critical points of the function: $f(x, y) = xy - 2x - 2y - x^2 - y^2$.