Math 211 Homework 4

88.4 3 i

90.5 6 i (note: the point is wrong here! Use $(1, 2, -9)$ instead)/ii/iii (just find the plane not the line), 8 iv (note: linearization means the tangent plane)

93.4 2 i/iv, 3 i/iv, 5, 19 (replace coordinate planes with $xy$-plane), 20

More parametrization practice:

(1) Consider the two surfaces $z = xy$ and $z = x - y$. Their intersection is a curve (a one dimensional object) in $\mathbb{R}^3$. Give a parametric equation $r(t) : \mathbb{R} \to \mathbb{R}^3$ that describes this intersection.

(2) Consider the surface $x^2 + y^2 = 4$ in $\mathbb{R}^3$. Note that this surface is in three dimensions, but since $z$ is not constrained, it is an infinite cylinder. Using the parametrization of the circle, give a parametrization $r(t) : \mathbb{R}^2 \to \mathbb{R}^3$ of this surface.