Study guide for quiz 04

Quiz problems include both the lecture contents and homework problems.

1. Section 14.2: Review and memorize definitions of limit (page 816 and page 823, in polar coordinates) and continuity (using ε and δ) for functions of two or more variables. Review related examples in section 14.2 and understand the reasons for the examples where the limit does not exist.

   Note that in equation (1), page 816, "$|r| < \delta$" should be "$0 < |r| < \delta$" instead.

2. Section 14.3: Study how to evaluate $\dfrac{\partial f}{\partial x}, \dfrac{\partial f}{\partial y}$ at (x_0, y_0) when $f(x, y)$ is given explicitly, and $\dfrac{\partial z}{\partial x}, \dfrac{\partial z}{\partial y}$ at (x_0, y_0, z_0) when $z(x, y)$ is given implicitly by $F(x, y, z) = 0$.

3. Section 14.3: Study the definition of differentiability for functions of two or more variables in section 14.3. Study the relation of differentiability with the tangent plan, with linear approximations, and why existence of partial derivatives and directional derivatives at point does not imply differentiability at a point.

4. Section 14.3: Study why differentiability at a point implies continuity at that point. Try to find a function of two variables that is continuous at a point but not differentiable there.