Study guide for quiz 07

Quiz problems include both the lecture contents and homework problems.

1. 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 $F(x, y, z) = 0$.

2. Section 14.3:

   Study the definition of differentiability for functions of two or more variables in section 14.3. Study why the four statements (1)-(4) on page 1 of Lecture 15 are identical (see also problem 2 of homework 07).

3. Section 14.3:

   Study why "existence of partial derivatives at a point" does not imply "differentiability at a point" (find a counter example). Does this contradict Theorem 3?

4. Section 14.3:

   Study why differentiability at a point implies continuity at that point (study the proof of Theorem 4). Try to find a function of two variables that is continuous at a point but not differentiable at that point.

5. Section 14.3:

   The proofs of Theorem 2 and Theorem 3 are in Appendix 9. They will not appear in any exam in this course.