

Study Guide for Exam 2

14.2: Limits and continuity of functions of several variables. Be able to evaluate limits, be able to check for continuity.

14.3: Partial derivatives, know what partial derivatives are, be able to compute them.

14.4: Differentiability. Know definition of differentiability, be able to write down an equation for the tangent plane. Know how to estimate a function using the tangent plane (linear approximation)

14.5: Gradient and directional derivatives. Know the geometric meaning of the gradient. Be able to compute directional derivatives.

14.6: Chain rule. Know the chain rule in several variables and be able to apply it to compute derivatives.

14.7: Optimization in several variables. Know what are critical points. Be able to find local minima and maxima. Know the second derivative test. Know what is a global maximum/minimum, and be able to find a global maximum/minimum of a function on a closed bounded domain (note that the maximum/minimum could be at the boundary).

14.8: Lagrange multipliers. Be able to find max/min of a function subject to a constraint. Be able to do this in 2 or 3 variables. Do not worry about more than one constraint.

15.1: Integration in two variables. Know what is an integral, know how to evaluate simple integrals (such as linear functions and constants) without using iterated integrals. Know how to estimate an integral using a partition. Know linearity of integral. Know Fubini's theorem, and be able to evaluate integrals over rectangles using iterated integrals.

15.2: Integration over more general regions. Know the definitions. Be able to integrate over (horizontally/vertically) simple regions. Know that you can split an integral over a region by subdividing it into several regions. Know how to change the order of integration and how to describe a region in two ways if possible.