

Mathematics 210 Calculus III Final Exam Study Sheet

DISCLAIMER: The fact that an item is not included in this sheet does not mean that it will not appear on the final!

Calculators will not be allowed on the exam.

No formulas will be provided. In particular, you are expected to know the formulas for finding arc length of a curve, surface area of the graph of a function, how to compute cross products and determinants.

Things to know and to know how to do:

- (1) How to find equations of lines and planes; how to find the equation of the tangent plane to the graph of a function; how to approximate functions using the tangent plane (linear) approximation.
- (2) How to compute velocity, speed and acceleration. How to compute arc length.
- (3) How to compute partial derivatives; how to compute them using the Chain Rule.
- (4) How to compute directional derivatives and gradients.
- (5) How to find maximum and minimum values; how to use Lagrange Multipliers.
- (6) How to find and classify critical points of functions of several variables.
- (7) How to compute double and triple integrals in rectangular, polar and cylindrical coordinate systems; how to change the order of integration.
- (8) How to find surface area, and volumes; how to compute line integrals.
- (9) How to change variables in multiple integrals.
- (10) Statement of the Fundamental Theorem for Line Integrals and how to use it.
- (11) Statement of Green's, Stokes', and the Divergence Theorems and how to use them.