Math 223 Exam 2 Topics

1. Given a function $f(x, y)$ and its domain, find all critical points in the interior of the domain and classify them using the Second Derivatives Test (page 646). See Section 11.7. For practice, do problems 23–28 in this section.

2. Given a function $f(x, y)$ and a constraint $g(x, y) = c$, find the maximum output of $f(x, y)$ subject to inputs (x, y) which satisfy the constraint using Lagrange Multipliers (page 653). See Section 11.8. The problem may be stated verbally, in which case you will have to formulate the appropriate function and constraint. For practice, do problems 23–37 in this section.

3. Given a double integral, exchange the order of integration. This involves expressing a Type I planar region as a Type II planar region or vice versa. See Section 12.2. For practice, do problems 31–42 in this section.

4. Evaluate a double integral in polar coordinates. The problem might be to evaluate a mass, in which case you will be given a description of a planar region and a mass density function in units in kilograms per square meter. See Section 12.3. For practice, do problems 23–26 in this section and problem 36 on page 724.

5. Evaluate a triple integral. The problem might be to evaluate a mass, in which case you will be given a description of a solid region and a mass density function in units of kilograms per cubic meter. Note that computing volume is the same as computing mass if the mass density function is equal to 1 and has no units associated with it. See Section 12.5. For practice, do problems 17–21 in this section. You may find that you will want to use cylindrical coordinates to evaluate the integral: see Section 12.6 and practice by doing problem 23 in this section.