MATH 550 (Section 1) University of South Carolina
D. Meade Fall 1996

Homework Problems for Chapter 6
Change of Variables and Applications of Integration

Section	Page	Problems
6.1	357	# 1, 2, 3*, 4, 6*
6.2	372	# 1, 3a*, 4a, 6, 7, 9, 11*, 13, 14, 21, 23, 24, 25, 29*, 32
6.3	384	# 1, 3, 5*, 6, 9*, 12*, 18
Review	392	# 1, 3*, 4, 9*, 12, 14*, 19, 22, 27

Notes

- The main theme of this chapter is seeing the choice of an appropriate change of coordinates can simplify the evaluation of multiple integrals. While polar, cylindrical, and spherical coordinates are the most common, it will be important that you develop a general understanding of the general ideas involved in change of coordinates. (A good question along these lines is "Why is $dA = r\ dr\ d\theta$, in polar coordinates?) The first section provides the general theory, the second applies this to the actual evaluation of integrals, and the third section considers applications of integrals that often benefit from changes of variables.
- Be sure you understand the notation that is used to define and analyze a change of coordinates.
- Problems marked with an asterisk (*) will be collected and graded. In general, problems will be due the Monday following the lecture in which the section was discussed.
- These problems have been selected as the minimum amount of work that you should be doing for this course. Some problems will be straightforward computations; some will require the construction of a logical argument using the terminology and concepts discussed in class; some problems will require you to expand your knowledge (with given information) and apply this to a new setting.
- If you need more practice, there are many other problems in the text that are similar to the ones I have assigned.
- Be sure you know how to do all of these problems. Do not hesitate to ask questions – in class, by e-mail, or during office hours.