

MATH 114 ASSIGNMENT 8, FALL 2015

Due in class on Friday, October 30

Announcement. Everything in the syllabus in chapters 12–15, plus 16.1, 16.5 and the beginning of 16.6, are included in the second midterm exam. The focus will be: max/min problems using critical points and perhaps also the relative critical points (Lagrange multiplier method) as candidates, multiple integrals unsigned line and surface integrals, including arc length and surface areas. So far we have discussed two methods for evaluating these integrals.

- Use Fubini theorem to convert a multiple integral into an iterated integral. The latter involves a choice; a good choice may help. You need to pay attention to the limits of integration when converting a multiple integral to an iterated integral. The latter is a matter of geometry, about how to describe a geometric body using successive projections.
- Change to a convenient coordinate system, such as polar, cylindrical and spherical coordinates, to take advantage of symmetry in the integrand or the geometric body for the integral.

When you do a problem you might want/need to combine these two methods.

Part 1. Read Thomas 15.7, 15.8, 16.1, 16.5, and the part of 16.6 before orientation of surfaces. Section 16.1 and the beginning of section 16.6 are about line and surface integrals of scalar valued functions. These are integrals without signs; they behave quite differently from signed integrals.

Part 2. Do and write up the following problems, from Thomas and old final exams.

15.7 Exercise 62

15.8 Exercise 20

16.1 Exercise 42

16.5 Exercise 24, 31

16.6 Exercise 16

F11 Math 114 Final Exam, Fall 2011, problems 8, 11, 13

S13 Math 114 Final Exam, Spring 2013, problem 10.

F13 Math 114 Final Exam, December 17, 2013, problem 10.

S14 Math 114 Final Exam, May 5, 2014, problems 10, 11.