

Math 53 Homework 12

Due **Tuesday 11/22/11** in section

(The problems in parentheses are for extra practice and optional. Only turn in the underlined problems.)

Note:

- This assignment is somewhat shorter than most, but it *will* be due right after midterm 2.
- Most of the problems relative to the divergence theorem (Wednesday 11/16) can be done already after Monday's lecture, you'll just need to read (and understand) the statement of the divergence theorem on p. 1099.

Monday 11/14: Surface integrals and flux

- **Read:** section 16.7.
- **Work:** 16.7: 14, (15), 17, (18), 19, (21), 22, 23, (25), 27, (29), (30).

Problem 1 below.

Wednesday 11/16: The divergence theorem

- **Read:** section 16.9.
- **Work:** 16.9: (1), 2, (3), 4, (5), 7, 11, (13).

Friday 11/18: Review for midterm 2

Monday 11/21: MIDTERM 2

Problem 1. (Surface area on the sphere.)

a) What percentage, rounded to the nearest percent, of the Earth's surface is north of Berkeley? The latitude here is 38° . (Latitude is related to the spherical angle ϕ by the formula: $\alpha = 90^\circ - \phi$)

b) Find the average latitude of all points in the Southern Hemisphere.

Optional: Identify a city whose latitude is within one degree of the average.