

Vector Calculus

Homework Set 7

Due Wednesday, 9 March 2005

Course Web Site: <http://www.math.sfu.ca/~ralfw/math252/>

Textbook: **Davis and Snider** “*Introduction to Vector Analysis*”

Reading: Sections 3.10–3.11, 4.1

Some of these questions were originally assigned for Homework Set 6

Problems to study (for practice; you do not need to hand these in):

- Section 3.10 (pp.169–170): 6, 7, 11, 14
- Section 3.11 (pp.180–182): 4, 6, 8, 10
- Section 4.1 (pp.190–192): 2, 4, 7, 8, 20

Problems to hand in:

- *Section 3.10 (pp.169–170): 9, 10, 12, 13*
- *Section 3.11 (pp.180–182): 3, 7, 9, 11, 12, 13, 14*
- *Section 4.1 (pp.190–192): 3, 6, 14*

Notes:

1. There is a typographical error in problem 12 of Section 3.10: the last term should be $r \cos \theta \mathbf{e}_\theta$.
2. Compare the ease of calculating the divergence of the inverse-square force field $\mathbf{F}(\mathbf{R}) = \mathbf{R}/R^3$ in spherical coordinates (problem 13 of Section 3.10, for $n = -2$) with the same calculation in Cartesian coordinates (problem 4 of Section 3.4; see note 1 of Homework Set 4).