Mathematics 5C
Some Answers and Hints to Worksheets 1 and 2 in Preparation for the Exam
Winter 2012, Kennedy

NAME: ____________________________
Website: http://math.ucsb.edu/~kgracekennedy/Winter2012_5C.html
Course Website: Linked from Professor Ye’s website.
CLAS Website: http://www.clas.ucsb.edu/staff/alex/

Worksheet 1

• Example problem: $-\frac{5}{16}$

1. $\frac{3\pi^2}{4}$
2. $\frac{4 \times 8^3}{3} = \frac{2048}{3} = 682.66\ldots$
3. $-\frac{3\pi}{2}$
4. zero (You have to work three integrals to solve this correctly.)
5. zero

Worksheet 2

1. $\frac{e^2 - 3}{2}$
2. zero, but for practice set up the problem by finding the parameterization of the sphere by changing to spherical coordinates.
3. $-\pi$
4. I meant to pick a function with curl zero, but it wasn’t. For practice write down the parameterization for the surface. (This is hard.)
5. $\frac{14\pi}{3}$
6. $\pi$
7. The divergence theorem applies to the problem where you integrate over the closed cylinder. With the divergence theorem, you only have to do one triple integral rather than three surface integrals.
8. You should get the same answers. From this problem you should note that you can sometimes check your work.