MA523 HOMEWORK

ASSIGNMENT 1 – due on Thursday, January 20, 2011

1. Solve Problem 1 on page 85 of Evans.

2. Solve Problem 2 on page 85 of Evans.

3. Find a radial solution to the biharmonic equation $\Delta^2 u = 0$ in dimension $n = 3$ (cf. Problem 4a on p. 102 in John). The biharmonic operator acts as

$$\Delta^2 u = \Delta(\Delta u) = \sum_{i=1}^{n} \frac{\partial^2}{\partial x_i x_i} \left( \sum_{j=1}^{n} \frac{\partial^2}{\partial x_j x_j} u \right).$$

4. Prove estimates (7) on p.22 of Evans.