

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

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

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