

MA633 Partial Differential Equations II

Spring 2012

Problem Set 4

March 2, 2012

DUE: Wednesday, 21 March 2012

- (1) Problem 1, page 305 of Evans, on the completion of the Hölder spaces.
- (2) Problem 14, page 307 of Evans, on the function $\log \log(1 + \|x\|^{-1})$. Show that it is in $W^{1,n}(B(0,1))$ but not in $L^\infty(B(0,1))$ for $n > 1$.
- (3) Problem 19, page 308 of Evans, on the condition $Du = 0$ a. e. for $u \in H^1(U)$ implies u is a. e. constant.
- (4) Problems 20-21, page 309 of Evans, on $H^s(\mathbb{R}^n)$, regularity and the Fourier transform.