Math 527 A1 Fall 2009

NAME: _____

Quiz 4

Problem 1. Let

$$f(x) = |x|^s := \left(x_1^2 + \cdots + x_n^2 \right)^{s/2}, \qquad s \in \mathbb{R}. \tag{1}$$

Consider the domains

$$\Omega = B_R, \qquad \Omega' = \mathbb{R}^n \backslash B_R. \tag{2}$$

- **(7 pts)** For which values of p, n, s is $f \in W^{1,p}(\Omega)$?

- **(3 pts)** For which values of p, n, s is $f \in W^{1,p}(\Omega')$

(Only consider $1 \leqslant p < \infty$).