ECON 8010 **PROBLEM SET #2** **FALL 2009**

Due: September 24, 2009
Total Points: 40

(20) 1. Suppose that a profit-maximizing firm operates in perfectly competitive output and input markets, selling output at per-unit price p and buying capital and labor at per-unit prices r and w, respectively. Assume that the firm's technology is alternatively given by the production functions

a. $X(K,L) = K^{1/4}L^{3/4}$

b. $X(K,L) = K^{1/2} + L^{1/2}$

For each of these production functions, derive the firm's

labor-demand function, L*(r,w,p).

output-supply function, x*(r,w,p).

(20) 2. Suppose that the profit function for a firm is

$$\pi^*(p,w) = p[\log_e (p/w)] - p$$

where p is the per-unit price of output, and w is the per-unit price of labor. Use Hotelling's Lemma to derive the firm's

a. output-supply function x*(p,w).

b. labor-demand function L*(p,w).