

Economics 150A - Labor Economics Assignment #3

Due Date: Thursday, May 15

Answer the following questions. You may hand-write mathematical answers and diagrams, but ALL text must be typed. I will not mark handwritten answers, they will receive a grade of 0. You **must** defend all answers mathematically or graphically.

Please clearly circle, highlight, or mark the final answer for each part.

Question 1

A manager is trying to decide how many workers to hire. His factory has the following production function: $Q=100L^{1/2}K^{1/4}$. The price of output is \$10 the wage rate is \$100, and the rental rate for capital is \$100 per unit.

- (a) What is the short-run (i.e. you must pay the capital cost whether or not you produce anything) profit maximizing level of labor demand if $k=100$?
 - a. What is the profit maximizing level of short-run labor demand if the price of output falls to \$5?
 - b. What is the profit maximizing level of short-run labor demand if the wage falls to \$50?
 - c. What is the profit maximizing level of short-run labor demand if short-run $k=10000$?

- (b) What is the long-run profit maximizing level of labor demand?
 - a. What is the profit maximizing level of long-run labor demand if the price of output falls to \$5?
 - b. What is the profit maximizing level of long-run labor demand if the wage falls to \$50?
 - c. What is the profit maximizing level of long-run labor demand if short-run $k=10000$?

Question 2

Laura (of Luke and Laura's Itty-Bitty Drink Umbrella Inc.) is trying to decide how many workers to hire. The Itty-Bitty Drink Umbrella production function is given by: $Q=6L^{1/3}K^{1/2}$. The price of output is p , the wage rate is w , and the rental rate for capital is r .

- (a) In the short-run, while capital is fixed, what is the profit maximizing level of labor demand?

- (b) In the long-run, when Laura can choose both labor and capital levels to maximize profits, what is the profit maximizing level of labor demand?

- (c) In the long-run, when Laura can choose both labor and capital levels to maximize profits, what is the profit maximizing level of capital demand?
- (d) Is labor demand more elastic in the long-run or the short-run, and WHY? Show the math and explain why your answer in words.