

Name _____ last 4 PSU ID _____

Section 001 - MWF 11:15 am - 12:05 pm : 10 Sparks Building

Section 002 - MWF 2:30 – 3:20 pm : 102 Thomas Building

Spring 2013 Chuderewicz

YOU MUST USE THIS AS A TEMPLATE – THAT IS – MAKE SPACE FOR YOUR ANSWERS BY HITTING ENTER (you certainly don't need to type this assignment)– LEAVE THE QUESTIONS AS THEY ARE – AND **PLEASE STAPLE! NOTEBOOK PAPER** (OR ANY PAPER) **STAPLED TO THE BACK IS NOT ACCEPTABLE**. ALSO, PLEASE **PUT THE FIRST TWO LETTERS OF YOUR LAST NAME IN THE TOP RIGHT HAND CORNER** OF THIS PAGE SO THAT WE CAN ALPHABETIZE THESE EASILY. THANKS IN ADVANCE!

Economics 304

Homework #2 – The market for labor (Chapter 3)

Due Friday, 2/1 at the beginning of class – you must hand in homework in the section you are registered in - no late papers accepted!

Instructions: Please show all work or points will be taken off. Good luck!

1. (50 points total – 5 points for each of 8 parts plus 10 for diagram) The production technology of a firm is given in the table below.

Number of workers	Units of output	MPN
0	0	
1	48	
2	84	
3	108	
4	128	
5	143	
6	155	
7	165	

a. Define the marginal product of labor,, explain how it relates to the production function (with N on horizontal axis and Y on vertical axis) and find the marginal product of labor (MPN) for each level of employment (fill in the third column of table).

b. Assume that the price of a unit of output is \$8. Calculate the number of workers that will be hired if the nominal wage rate = \$168. Calculate the number of workers the firm will hire if the nominal wage is \$128. Calculate the number of workers that the firm will hire if the nominal wage is \$88.

Draw a production function and real labor demand curve vertically with the PF on top (like we do in class), labeling point A as the wage / price combo of \$168 / \$8, point B as the \$128 / \$8 combo, and point C as the \$88 / \$8 wage / price combo.

A correct and completely labeled diagram is worth 10 points

- c. What could cause wages to fall like this (name and support 2 reasons)?
- d. Why exactly does the firm's behavior change when the nominal wage changes, all else constant? Make sure you refer to the **profit maximizing condition** when answering this question.
- e. Let's return back to the initial conditions in the beginning of part b, with prices at \$8 and nominal wages at \$168 (point A). Now we let prices change and fall from \$8 to \$6, holding nominal wages constant at \$168. What could cause such a price change (name at least 2 reasons)?
- f. Locate this 'new' point as point D on your two diagrams. Similar to part d) why exactly does the firm's behavior change when prices fall from \$8 to \$6, all else constant? Again, make sure you refer to the **profit maximizing condition** when answering this question.
- g. Let's return to point A, the initial conditions where the nominal wage rate = \$168 and the price of a unit of output = \$8. Assume that a new technology increases the number of units of output that each worker can produce by 25%. Calculate the number of workers that the firm will hire and the number of units of output that will be produced (fill in the table below).

Number of workers	Units of output	MPN
0	0	
1		
2		
3		
4		
5		
6		
7		

Now locate this point as point E on both diagrams.

- h. Comment on the macroeconomic implications of this technology shock (as in assume many firms in the economy experience similar technology shocks) on prices (inflation), employment, economic growth, real wages, the stock market via the profit implications, and the budgetary implications for the Government (make sure you refer to each economic variable).

2. (50 points total – 5 for each of 8 parts and 10 for diagram) This is an old exam question and is in your packet ...I tweaked it a little.

For the new Real World State College season MTV is looking for Penn State students. Students are asked to produce “drama” as a part of their contract. The marginal productivity of labor curve is given by $MPN = 230 - 3N$.

The supply of Penn State students is given by $N_s = 30 + 3w$; where w is the real wage per hour.

2a) Compute equilibrium values for the real wage and employment.

Illustrate this equilibrium on a labor market diagram in real wage space. Please be sure you label the diagram completely and **label** this initial equilibrium point as **point A**.

A correct and completely labeled diagram is worth 10 points

2b) Now the Penn State student union successfully forces MTV to pay each student a minimum “happy valley living real wage” equal to 20.00 per hour. That is, 20.00 per hour is the effective real minimum wage. What is the level of employment now?

2c) Compare the number of people willing to work vs. the number of people MTV is willing to hire under this living wage program. What do we call the difference in these values when the quantity of labor supplied exceeds the quantity of labor demanded? Add these two points to your diagram and label these points as point(s) B. Make sure you identify the unemployed in your diagram.

2d) The intuition part 1: Why exactly did we move along the labor demand curve? In particular, why does the profit maximizing level of labor input change with the living wage program (make sure you write out the profit maximizing condition and explain why it has changed i.e., why does MTV rationally change their quantity demanded of labor the way they did)?

2e) The intuition part 2. We also experience a movement along the labor supply curve. Explain the intuition here as in why are more people are willing to work using and **explaining** the substitution and income effects associated with labor supply. Which effect dominates and what has happened to the price of leisure for those that are still working, given the living wage program?

2f) Suppose now that a new course offered by the Drama Department increases the productivity of each student (via an increase in **human capital!**) so that the NEW marginal product of labor equals $MPN = 290 - 3N$. Find the equilibrium ‘market’ clearing wage and level of employment. Please show all work below.

Please depict this new development on your **original diagram** labeling this new equilibrium point as point C. Be sure to label diagram completely.