

Professor Wallace

Homework #7

Problem 1: For each of the following claims, please state if it is true, false or ambiguous. Then argue why you believe that the claim is true, false or ambiguous.

- (1) I decide to get an MBA and quit my job as an accountant. My explicit cost to go to graduate school is the sum of tuition and forgone salaries that I would have earned as an accountant.
- (2) My production function uses only two inputs and these inputs are perfect complements, therefore my production function exhibits Constant Return to Scale (CRS)
- (3) John owns a sandwich cart on the Capitol Square. Each sandwich has two slices of bread, a slice of cheese and a slice of ham. I can say that my production function is a Cobb-Douglas.
- (4) I am in the short-run and the amount of capital is fixed. I pay my workers a salary of \$20. The marginal product of labor (MPL) is increasing; therefore the marginal cost is increasing.
- (5) In the long run I use an equal amount of capital and labor to produce basketball shoes. Capital and labor have the same price per unit. After the cost of capital doubled I use only labor. My input must be a perfect substitute.

Problem 2: Roger, David, Nick and Richard own a coffee shop called “The Wall” on Regent Street. The production function uses only two inputs: Labor (L) and Capital (K). The following chart displays the relevant information about production:

K	L	Q	MPL	APL
4	0	0	-	-
4	1	3		
4	2			4
4	3		7	
4	4		13	
4	5			9
4	6			10
4	7		10	
4	8	72		
4	9			8
4	10		-2	

- (1) Is “The Wall” in the long run or in the short run?
- (2) Calculate the total product of labor (Q), the marginal product of labor (MPL) and the average product of labor (APL) for each quantity of labor.
- (3) Draw on the same graph the MPL and the APL. Which of the two curves is flatter? What is the intuition behind this result?
- (4) Find the quantity of labor that maximizes the MPL.
- (5) Explain the intuition behind the MPL becoming negative.

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Problem 3: Phillip decides to produce handcrafted watches in his basement. He sells them at local fair each month. He hires local high school student to help him out with the production. The following chart displays the relevant information about cost and revenue:

L	Q	TC	ATC	MC	Total Revenue (TRN)	Marginal Revenue (MRN)	Average Revenue (ARN)	PROFIT
0	0	200	-	-	-	-	-	-
1	4	240	60		80			-160
2	14			4				
3	22			5				
4	26							
5	28	400						
6	29			40				

- (1) Assuming there is a unique wage in the market. What is it?
- (2) Calculate the total cost (TC), the average total cost (ATC) and the marginal cost (MC) for each quantity of labor.
- (3) Draw on the same graph the ATC and MC curves.
- (4) Assuming there is a unique price in the market. What is it?
- (5) Calculate the total revenue (TRN), the average revenue (ARN), and the marginal revenue (MRN), for each quantity of Labor.
- (6) Calculate the Profit for each quantity of labor.
- (7) For a low level of production Philip is losing money, explain why this is happening.
- (8) When the MC is minimized? When are the profit maximized? Are they the same? What is the intuition behind it?
- (9) Draw on the same graph the ARV and MRV curves together with the ATC and the MC. Comment the graphs in the lights of the previous answer.