



Homework 1

Due September 11 – turn in AFTER the end of the lecture in piles by group number

Homework must be submitted in the lecture on the due day. Submissions in any other way or time will be ignored with no exceptions. Your name and your group number must be clearly visible on the top right corner of your paper. Submit your assignment in a professional way: in A4 sheets, neatly written and clean. Multiple sheets must be stapled together. Do not use plastic folders. Failure to meet any of the above requirements will be penalized with a 50% reduction in your score. Show your work in a sufficient manner.

1. A company produces olive oil using three inputs: olives, workers and hydraulic presses.
 - (a) There are 3 different scales of hydraulic presses that achieve their maximum efficiency at 10, 20 and 30 tons of olive oil, respectively. Of course, the larger the scale, the more expensive the press costs for the company to lease. If the company expects production to be between 22 and 28 tons, which press should it lease? Explain why. [10p]
 - (b) In (a) the firm thinks about the S-R or the L-R? How can you tell? [5p]
 - (c) If the prices of presses increase in the S-R period, how is the expected production going to be affected? [5p]
 - (d) 3 of the company's employees have three-year contracts with the company. The other 4 employees are hired with no contract. How many employees does this firm have? [JK]
 - (e) According to (d), if the company decides to lay off employees, is it thinking in the L-R or S-R period? Explain your answer. [10p]
2. If we double the price of inputs to a firm, then does its cost function double at every level of output? Prove if the statement is true or false. [20p]
3. A competitive market is made up of 153 identical firms. The total cost function of each firm is given by

$$C = 1 + 225q^2.$$

The market demand in this industry is

$$Q = (100 - p) \frac{34}{525}.$$

- (a) Is this a S-R or a L-R cost curve? How do you know? [5p]
 - (b) Calculate the equilibrium in this market. [10p]
 - (c) Find the profit for each firm. [5p]
 - (d) Explain what exactly is going to happen in the L-R. [10p]
4. A foreign employee is hired by a Moscow firm and looks for an apartment. The demand curve for housing for this employee is

$$q = 120 - 0.04p,$$

where p is the rent in rubles per m^2 and q is the area in m^2 of housing. The current price in the market is 1000 rubles per m^2 per month. However the firm offers to the employee a company apartment of 50 m^2 for 30,000 rubles a month. Find the employee's CS if she takes the company apartment and if she rents another apartment. What will she do? [20p]