

ECON 310
Fall 2007
Nazarov
Midterm exam II

Questions 1-5, 40 points

The Tar Heel Press produce memo pads in its local shop. The company can rent its equipment and hire workers at competitive rates. Equipment needed for this operation can be rented at \$30 per hour, and labor can be hired at \$15 worker hour. The company has allocated \$300,000 for the initial run of memo pads. The production function using available technology can be expressed as:

$$Q = K^{0.5}L^{0.5}$$

where Q represents memo pads (boxes per hour), K denotes capital input (units per hour), and L denotes labor unit (units of worker time per hour). The marginal products of labor and capital are as follows:

$$MPL = \frac{1}{2}K^{0.5}L^{-0.5}$$

$$MPK = \frac{1}{2}K^{-0.5}L^{0.5}$$

1. Find the optimum capital level K .(5 points)
2. Find the quantity produced Q .(5 points)

Assume that the Press desires to double its output in the short run. It may increase its number of workers, but capital must remain fixed (at the level that was calculated in question 1).

3. Calculate the new level of labor, L . (5 points)

Assume that the Press desires to double its output in the long-run.

4. Calculate the new level of labor, L . (10 points)

5. Graphically show the difference between the Press's short-run and long-run expansion paths. Explain difference with several sentences. (15 points)

Questions 10-15, 40 points

Assume that the supply and demand in Kazakhstan for steel can be defined as:

$$Q_d = c - 2P$$

$$Q_s = 3P$$

where Q_d and Q_s are the quantity demanded and supplied, P is the price.

Assume that no international trade occurs (i.e. the country is in autarky) and assume that the producers surplus is 6.

10. Find c , the intercept of the demand schedule. (5 points)

Now assume that Kazakhstan engages in international trade. The country can export or import as much steel as it would like at the world price of 4.

11. Find the quantity of steel exported (+) or imported (-). (5 points)

12. Find the change in total surplus that occurs due to international trade. (5 points)

Now assume that due to some random factors the world price of steel falls to 3.

13. Find the quantity of steel exported (+) or imported (-). (5 points)

14. Find the change in total surplus that occurs due to the change in the world price of steel (compare total surplus when the price is 4 with total surplus when the price is 3). (10 points)

15. Graphically identify the gains and/or losses in welfare that occur due to the change in the world price. Your answer should specifically identify changes in consumer surplus, producer surplus, and/or government revenue. It may be helpful for you to label area in your graph as A,B, etc. (15 points)