Advanced Microeconomics: Theories of value and distribution

Question set #4

(**Due on December 11, 2019**)

*General Instructions*: Read the questions carefully and make your answers as precise as possible. It is preferable that the answers are submitted as WORD or PDF files compatible with Windows OS. You can submit handwritten answers provided that they are (a) legible; (b) neatly written; and (c) scanned as a PDF file. **Do not submit photos of handwritten pages**.

1. Consider a 2-person, 2-commodity exchange economy. Index the consumers as and commodities as and . Each person has identical CES utility functions. Therefore, they have identical demand functions as described by equations (4.32) and (4.33) in Example 4.2 of the text (p.127). NOTE: Do NOT use the summation operator in your answer
   1. Derive the aggregate demand functions for and ; denote them as, respectively, and . **20 points**
   2. Write the equations describing the equilibrium conditions, using and to represent the aggregate endowments. **10 points**
   3. Solve for the equilibrium price ratio. **20 points**
2. A firm producing hockey sticks has a production function given by  In the short-run, the quantity of capital that the firm has is fixed at . The rental rate for is and the wage rate for is
   1. Calculate the firm’s short-run *total* cost function and *average* cost function. **5 points**
   2. Calculate the firm’s short-run *marginal* cost function. **2 points**
   3. Plot the short-run average and marginal cost functions for the following values of **7 points**
   4. At what level of does the short-run average and marginal cost curves intersect? **2 points**
   5. Explain why the short-run marginal cost curve will always intersect the short-run average curve at its lowest point. **7 points**

Suppose that the quantity of capital that the firm has is fixed at

* 1. Calculate the firm’s total cost function in terms of . **5 points**
  2. Given and , how should the quantity of capital chosen so as to minimize total cost? **7 points**
  3. Use your result from (g) to calculate the long-run total cost function. **5 points**
  4. For and , plot the long-run total cost function. Your plot should show that the long-run total cost curve is an envelope for the short-run cost curves derived in part (c) by examining values of of 100, 200 and 400. **10 points**