ECO 101A: Tutorial # 6

Date: 21/02/2017

1. You manage a plant that mass-produces engines by teams of workers using assembly machines. The technology is summarized by the production function q = 5 KL, where q is the number of engines per week, K is the number of assembly machines, and L is the number of labor teams. Each assembly machine rents for r = $10,000 per week, and each team costs w = $5000 per week. Engine costs are given by the cost of labor teams and machines, plus $2000 per engine for raw materials. Your plant has a fixed installation of 5 assembly machines as part of its design.

   a) What is the cost function for your plant—namely, how much would it cost to produce q engines? What are average and marginal costs for producing q engines?

   b) How many teams are required to produce 250 engines? What is the average cost per engine?

   c) You are asked to make recommendations for the design of a new production facility. What capital/labor (K/L) ratio should the new plant accommodate if it wants to minimize the total cost of producing at any level of output q?

2. Assume that an entrepreneur's short run total cost function is $C = Q^3 - 10\ Q^2 + 17\ Q + 66$.

   a) Determine the output level at which she maximizes profit if p = 5.

   b) Compute output elasticity of cost at that output level.