Problem Set #6     Bruce Brown, Economics 1 (Microeconomic Principles), SMC

1) Assume Bob makes trinkets with only his labor (ignore any other inputs). He can make 3 trinkets per hour (one every 20 minutes), and his time is worth $12 per hour.

a) Draw the production function, the total cost curve and per unit cost curves – average total cost (ATC) and marginal cost (MC) for trinkets.

b) What is the height of the production function when L (labor time) = 1, 2, and 3 hours? What is the height of the Total Cost curve when Q = 3, 6, and 9 trinkets? What are MC and ATC when Q = 3, 6, and 9?

c) Show the effect of an improvement in technology that allows Bob to make 6 trinkets per hour (one every 10 minutes), on the production function, total cost curve, and the unit cost curves (MC & ATC).

d) If Bob’s value of time increased, how would the production function, total cost curve, and unit cost curves shift?

2) a) In a (perfectly) competitive market, what are the assumptions regarding: i) the number and size of firms; ii) differences in the good produced by different firms; and iii) entry and exit from the market?

b) What is Marginal Revenue for the firm and why?

c) What does the individual firms demand curve look like?

d) What is the firm’s short run supply curve, and how do we find the industry supply?

e) Draw the ATC, AVC and MC curves for a firm that is making a loss, and then for a firm making positive economic profits.

f) In long run equilibrium, at what point on its ATC and MC curves does a competitive profit maximizing firm operate?

g) How does a market adjust to an increase in demand for the product? That is, graphically show the change in short run and long run equilibrium (with industry supply and demand curves), and the short and long run optimum of a typical firm.

h) What is the condition for allocative efficiency? How can we graphically show that, in our model, competitive profit maximizing firms are allocatively efficient (what is the relation to MC of the firm, and cost of production for society)?

   Note: There are other types of efficiency, e.g., productive efficiency (firms produce a given level of output in the least cost manner = they are on their ATC curve), and technical efficiency, firms use the cost minimizing combination of inputs. We assume both these other types of efficiency exist.

i) Compare “diseconomies of scale” (sometimes called “decreasing returns to scale”); and “diminishing marginal product”.
