**Question 1.**

Suppose that artichokes are produced according to the production function , where q represents pounds of artichokes produced per hour, K is the number of acres of land devoted to artichoke production, and L represents the number of workers hired each hour to pick artichokes.

1. Does this production function exhibit increasing, constant, or decreasing returns to scale?

Graph the isoquants for q=100 and q=200. Calculate the capital and labor input for capital only, labor only, and a mixed production.

1. What does the form of this production function assume about the substitutability of L for K?
2. Give one reason why this production function is probably not a very reasonable one.

**Question 2.**

A firm producing hockey sticks has a production function given by:

In the short run, the firm’s amount of capital is fixed at K=100. The rental rate for K is and the wage rate for is .

1. Calculate the firm’s short-run total cost function. Calculate the short-run average cost function. Express both in output unit q.
2. The firm’s short-run marginal cost function is given by . What are the STC, SAC, and SMC for the firm if it produces 25 hockey sticks? Fifty hockey sticks? One hundred? Two hundred?
3. Graph the SAC and the SMC curves for the firm. Indicate the points found in part b?
4. Where does the SMC curve intersect the SAC curve? (Efficient scale).
5. Calculate the long run cost minimizing K and L input levels If the firm in producing 200 hockey sticks.