**Question 1.**

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.

**Question 2.**

Consider a firm that is selling for a competitive market with p=$20 for each unit independent of how much the firm sells (firm is a price taker). The total cost function for the firms is given as 50 + 10q + 0.1q2

1. Derive the total revenue and marginal revenue functions.
2. Derive the fixed cost, variable cost, average total cost, and marginal cost function.
3. Write down the profit function, derive the first-order condition for profit maximization, and calculate the output that maximizes firm’s profit.