

Place your name on the back of this sheet of paper and nowhere else. Staple your answers on the front of this sheet of paper. Failure to follow these directions will cost you 1 point. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

1) (20 points) Suppose that the production function is given by  $Q = K^{1/3}L^{1/3}$ . The wage rate is \$4/L and the rental rate is \$1/K. Find the cost minimizing capital and labor for a given level of output  $Q$ . Use that to find the TC, ATC, and MC equations. Show all work.

2A) (20 points) Suppose the Cournot industry demand curve is written as  $P = 51 - (Q_1 + Q_2)$ . Each firm's total cost curve is given by  $TC_i = 10 + Q_i/2 + Q_i^2/4$ . Find the profit equation and use it to find each firm's best response function. Use that to find both the price, quantity sold, and profits for each firm.

2B) (20 points) Use the answer to Part 2A to find the Von Stackleberg price, quantities for each firm, and the profits for each.

3A) (20 points) Suppose the Cournot industry demand curve is written as  $P = 101 - \frac{1}{2}(Q_1 + Q_2)$ . Each firm's total cost curve is given by  $TC_i = 10 + Q_i + \frac{1}{2}Q_i^2$ . Find the profit equation and use it to find each firm's best response function. Use that to find both the price, quantity sold, and profits for each firm.

3B) (20 points) Use the answer to Part 3A to find the Von Stackleberg price, quantities for each firm, and the profits for each.