

Slide your assignment under my office door by the time class is scheduled to end, i.e. 4:20.

Place your name on the back of this sheet of paper and nowhere else. Staple your answers face up on the front of this sheet of paper. Failure to follow these directions will cost you 10 points. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

Show all work for all questions.

1) (25 points) Suppose your production function is given by $Q = 4K^{1/3}L^{1/3}$. If the wage rate is \$4/L and the rental rate is \$4/K, then what is the total cost function as a function of Q? Calculate the MC and ATC. Prove that λ equals your marginal cost function.

2) (25 points) Suppose your production function is given by $Q = 8K^{1/4}L^{1/2}$. If the wage rate is \$8/L and the rental rate is \$4/K, then what is the total cost function as a function of Q? Calculate the MC and ATC. Prove that λ equals your marginal cost function.

3) (25 points) Suppose your production function is given by $Q = 9K^{1/2}L^{1/4}$. If the wage rate is \$9/L and the rental rate is \$2/K, then what is the total cost function as a function of Q? Calculate the MC and ATC. Prove that λ equals your marginal cost function.

4) (25 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 $TC_i = 10 + Q_i + \frac{1}{2}Q_i$. 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.