Intermediate Microeconomic Theory
ECN 100B, Fall 2019
Professor Brendan Price

Section Problems #3
(Week of Monday, October 14)

Living on the edge

Skyfall, Inc. is a monopoly supplier of skydiving lessons in a remote desert town. Skyfall faces demand $p_L(Q_L) = 24 - Q_L$ from locals and demand $p_T(Q_T) = 36 - Q_T$ from tourists. Skyfall faces costs $C(Q_L, Q_T) = 12Q_L + 12Q_T$.

    a. Suppose that Skyfall can engage in group price discrimination (it's easy to tell who's a tourist). Find Q_L^* and Q_T^*. Then find the prices p_L^* and p_T^* as well as Skyfall's profits.

A travel agency sues Skyfall for unfairly discriminating against tourists. As part of a legal settlement, Skyfall agrees to charge the same price for all customers.

    b. Calculate the market demand curve $Q(p)$. (Hint: you will need to describe this curve "piecewise", using one equation for $p < 24$ and another for $p \geq 24$.)

    c. Suppose that Skyfall decides to set a price $p \geq 24$ (high enough that no locals buy). If Skyfall pursues this strategy, what price will it charge, and what are its profits?

    d. Now suppose that Skyfall sets a price $p < 24$ (low enough that both groups buy). Under this strategy, what price will Skyfall charge, and what are its profits?

    e. Compare Skyfall's profits under the "candidate" prices you identified in parts c and d. What will Skyfall charge? Who is better off under uniform monopoly pricing than under group price discrimination? Who is worse off?

Living in the moment

A bakery makes bread according to the Cobb-Douglas production function $q(L, K) = \sqrt{LK}$. It sells loaves of bread in a competitive product market at price $p = 4$. In the short run, the bakery's capital stock is fixed at $K = 200$, so that its production function simplifies to

$$q(L) = \sqrt{200L}$$

The bakery hires workers in a competitive labor market, where the market wage is 10.

    a. Compute the bakery's optimal (short-run) choice of labor, L^*. Then compute its (short-run) physical output q^*.

    b. What is the *marginal physical product of labor* at the optimum (when $L = L^*$)? What is the *marginal revenue product of labor* at the optimum?