KANSAS STATE UNIVERSITY
Economic Analysis For Business

Problem Set 1 — Economics 815
Professor D. Weisman — Spring 2002

1. This question concerns findings of an article entitled "The Demand For Illicit Drugs" that appeared in the July 1999 issue of *Economic Inquiry*. Suppose that the demand for cocaine is given by $Q^C = 36 - 3P^C - 1J$, where Q^C and P^C are the quantity and price of cocaine, respectively, and J is the average amount of jail time served for conviction of cocaine use. Let the supply of cocaine be given by $Q^C = 1P^C$.

   a) Determine the equilibrium price and quantity of cocaine when J = 4?

   b) Illustrate your results in part a) graphically. Make sure that you clearly indicate the vertical and horizontal intercepts for the demand function as well as the equilibrium outcome.

   c) Let the demand for marijuana be given by $Q^M = 100 - 2P^M - P^C - F$, where Q^M and P^M are the quantity and price of marijuana, respectively, and F is the dollar amount of the fine assessed upon conviction of marijuana use. Let the supply of marijuana be given by $Q^M = 2P^M$. Determine the equilibrium price and quantity of marijuana when F = 4? What is the cross-elasticity of the demand for marijuana with respect to the price of cocaine in equilibrium? [Note: assume that your findings in part a continue to hold.]

   d) What effect does a change in the average jail time for conviction of cocaine use (J) have on the equilibrium price of marijuana? Provide an economic interpretation for your findings?

2. The equilibrium price and quantity in a market are given by $P^0 = 6$ and $Q^0 = 24$.

   a) Find the equation of the linear demand curve if the price elasticity is equal to -2 at the market equilibrium?

   b) Find the equation of the linear supply curve if 36 units of the good are supplied at a price of 12?

3. The quantity demanded is 16 when the market price is 4. The consumers' surplus generated in this market at this price and quantity is 64. What is the equation of the linear inverse demand curve, P(Q) = a - bQ, consistent with this information?

4. Suppose that a 5 percent increase in price results in a 10 percent decrease in quantity demanded. What is the implied price elasticity of demand? How should price be changed, if at all, to maximize revenue?

5. You have been hired as an economic consultant to advise Giddy-Up Graphics on pricing strategies to increase profitability. Giddy-Up sells two products, A and B. The constant unit cost of product A is identically zero and the constant unit cost of product B is equal to 4. You estimate that the demand function for product A is given by $Q^A = 16 - P^A$; and the demand function for product B is given by $Q^B = 100/P^B$. How would you advise Giddy-Up regarding their pricing strategies? What is the maximum attainable level of profits? [Assume that Giddy-Up is restricted to charging a single uniform price for each product.]

6. The City Council in Manhattan is giving consideration to implementing price ceilings on rental units based on the number of bedrooms in the unit. The demand function for rental units (on a single bedroom equivalent basis) is given by $Q^D = 120 - 4P$ and the supply function is given by $Q^S = 2P$, where P is price in tens of dollars and Q is quantity in hundreds of units. The Council is giving consideration to imposing a ceiling price of $P^{max} = 16$. Suppose that the Council's objective is to protect consumer interests. How would you advise them on the merits of this particular policy? What position would the Manhattan Builders Association likely take on the issue of ceiling prices for rental units? Why?