Intermediate Microeconomics 301

First Mid-Term

Friday, February 22, 2002

Time: 50 minutes.

Instructions. To obtain credit, you must give arguments to support your answer. The numbers in brackets at the start of each question are the numbers of points the questions are worth.

Exercise 1 [40]:

1. Consider a consumer who can choose between wheat and corn (goods are substitutes).
   (a) What happens to the demanded amount of corn if the price of wheat increases?
   (b) What happens to the demanded amount of wheat if the price of corn decreases?
   (c) What happens to the demanded amount of wheat if the income increases?

2. Imagine now that it is possible to get the demand curve for corn in the United State (aggregate demand function of consumers). It is

   \[ P = 24 - 2Q_D \]

   where \( P \) is the farm price of corn (in dollar per bushels) and \( Q_D \) is the quantity of corn demanded (in billion of bushels), and the supply curve for corn in the United States is

   \[ P = -6 + 4Q_S \]

   where \( Q_S \) is the quantity of corn supplied (in billion of bushels).
   (a) What is the equilibrium price of corn? What is the equilibrium quantity of corn sold? (Numerical resolution and Graph)
   (b) What is the price elasticity of demand? At price \( P = \$2 \). Is it elastic, inelastic? Explain.

Exercise 2 [30]: Jacob’s utility function is

   \[ U = 10XY^2 \]

The price of \( X \) is \( p_X = \$10 \) and the price of \( Y \) is \( p_Y = \$5 \), and his income is \( m = \$150 \). What is his optimal consumption bundle? Show in a graph.

Exercise 3 [30]: Connie Consumer has a monthly income of $200, which she allocates between two goods: potatoes and meat.

a. Suppose meat costs $4 per pound and potatoes costs $2 per pound. Draw her budget constraint.

b. Suppose also that her utility function is given by the equation \( U(M, P) = M + P \). What combination of meat and potatoes should she buy to maximize her utility? (hint: meat and potatoes are perfect substitutes)

c. An outbreak of potato rot raises the price of potatoes to $5 per pound. What does her budget constraint look like now? What combination of meat and potatoes maximizes her utility?