Intermediate Microeconomics 301
First Mid-Term
Thursday, February 19, 2004

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 [20]: If demand for show tickets is described by the equation \( Q_D = 100 - p \), and supply is \( Q_S = 20 + p \), find the equilibrium price and quantity. How would your answer change if the supply curve shifted to \( Q'_S = 10 + p \) due to increases in actor salaries?

Exercise 2 [20]: If the market demand curve for triple-scoop ice cream cones is \( Q_D = 60 - 8p \), use the derivative formula for elasticities to calculate the elasticity of demand when \( p = \$4.00 \). Give the definition of the elasticity.

Exercise 3 [30]: Confirm that if a consumer’s utility function is described by \( U = 2X + Z \), and prices are \( p_X = 2 \) and \( p_Z = 1 \), there is no unique utility maximizing solution regardless of income level. What does this tell you about \( X \) and \( Z \) as commodities? (Hint: draw a graph showing a budget constraint and indifference curve using the information provided.)

Exercise 4 [30]: Beth’s utility function is

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U = 5XY
\]

The price of \( X \) is \( p_X = \$5 \) and the price of \( Y \) is \( p_Y = \$1 \), and his income is \( m = \$50 \). What is her optimal consumption bundle? Show in a graph.