Econ 6401 – Fall 2003 Name_____
Midterm #2 – Dr. Rupp

Pledge (sign)_____
"I have neither given nor received assistance on this exam"

1. (16 pts) Draw **three** indifference curves where $I_3 > I_2 > I_1$ for the following situations, (put the first good on the horizontal axis):

    a. Billie Joe likes 2 beers with each slice of pizza.

    b. Kevin likes Krispy Kreme donuts and neither likes nor dislikes Dunkin' Donuts.

    c. Shelia likes Coke and Pepsi equally well.

    d. Jenna likes going to the movie theater twice as much as renting a video.

2. (20 pts) For the function $U(x,y) = (xy)^{0.5}$

   a. Does the consumer believe that more is better for each good?

   b. Is the marginal utility of x diminishing, constant, or increasing as the consumer buys more x?

   c. What is the $MRS_{x,y}$?

   d. Is $MRS_{x,y}$ diminishing, increasing, or constant as the consumer substitutes x for y along the indifference curve?

   e. Find the optimal consumption levels for X and Y if P_x = \$2 and P_y = \$1, and I = \$100.

3. (4 pts) Jenna likes going to Carmike12 movie theater twice as much as renting movies from Blockbuster. Her income is $42, Carmike12 charges $7, and Blockbuster charges $3. Find Jenna's optimal bundle.

4. (8 pts) A firm produces a product with two inputs: (K & L) with the following marginal products: MP_K = 4 and MP_L = 2. The rental price of capital and labor are, respectively, r = $2 and w = $4. Is this firm operating efficiently? If not, what would you advise the firm to do? Explain.

5. (4 pts) David likes to buy food (F) and clothing (C). His utility function U(F,C) = FC + 10F. His income is: I = $10. The price of food: P_F = $1 and price of clothing: P_C = $2. Find David's optimal basket.

6. (8 pts) Given the production function: $Q = 15KL^2 – L^3$ where K = capital and L = labor. Capital = 2.
   a. Find the amount of L that maximizes average product of labor.

   b. Find the amount of L where diminishing returns to labor begin.

7. (8 pts) For the production function: $Q = 2L^{0.5}K$
    a. Calculate the $MRTS_{L,K}$

    b. Does the isoquant exhibit diminishing $MRTS_{L,K}$? (Support your answer with a calculation)

8. (4 pts) Determine the returns to scale for this production function: $Q = K^{0.5} + L^{0.5}$

9. (12 pts) In the production function: Q = 4LK, the wage rate for labor = w and the rental price of capital= r

   a. Derive the expression for the capital input demand curve.

   b. Derive the expression for the labor input demand curve.

   c. Find TC as a function of Q, w, and r.

10. (4 pts) Given the production function: $Q = 4LK$, the price of labor = \$10 and the price of capital = \$1, find the cost minimizing combination of L and K to produce 100,000 units.

11. (12 pts) Total cost is a function of Q, where $TC(Q) = 100 - 1{,}000Q + 50Q^2$

    a. Calculate MC

    b. Calculate AVC

    c. Find the Q that minimizes total cost.