Instructions: Only one section will be graded for correctness. The rest will graded on completion. You will get 50% for completing the homework assignment with an honest effort and 50% for the graded problem. You may work with one other student. If you do, please only turn in one copy with both of your names on it. Be sure to show all work.

1: Maximizing Utility

Let a consumer's utility function be defined as: $U(x, y) = x^{\frac{1}{3}} y^{\frac{2}{3}}$. The price for good x is equal to two dollars. Likewise, the price of good y is three dollars. Finally, this consumer has an income of 100.

(a) Use the MRS formula method to solve for the quantity of x demanded by this consumer.

(b) How much of this person's income is spent on good y?

(c) Now, use the Lagrangian method to solve for the quantity of x. Also, find λ.

(d) Finally, use the maximization via substitution method to find x.

2: Uncertainty

(a) You role a normal six sided dice. What is the expected value of that role?

(b) Emma's utility function, holding prices constant, can be expressed in terms of her income: $U = I^2$. Is Emma risk loving, risk neutral, or risk adverse. Why? Show with a specific example.

3: Income and Substitution Effects

Autumn's utility curve is defined as: $U(c, s) = c^{\frac{1}{2}} s^{\frac{1}{2}}$, where c is the consumption of cars and s is the consumption of shoes. The price of car is set at \$2 while the price of shoes is \$4. Autumn has 20 dollars to spend on consumption.

(a) Draw this budget constraint.

(b) Find the equilibrium point. Draw it and the IC on the graph.

(c) Assume the price of cars increases to that of the price of shoes. Find the change in the consumption of cars.

(d) What is the utility level in this new equilibrium?

(e) From your answer in part c, how much of this change is the income effect? How much is the substitution effect? (Hint: Graphing may help.)

(f) From parts a through e, are cars and shoes complements, substitutes, or neither? Why?

4: Consumer Demand Functions

(a) Find the demand for y in terms of just prices using the utility function $U(x, y) = [x^2 + y^2]^{\frac{1}{2}}$.

(b) Is y an inferior or normal good?

(c) Are x and y substitutes or complements?

(d) Let $P_x = 1$ and $P_y = 2$. What is the price elasticity of demand for y at equilibrium?

(e) Find the cross price elasticity of demand for y. (Hint: Use P_x as your cross price.)