Three randomly selected questions will be graded for credit. All graded questions are worth 10 points. Always show all your work, so that you can receive partial credit. An answer with no explanation will receive zero credit. Use extra pages if necessary, but make sure you clearly indicate where the rest of your answer is.

1. Andy collects baseball and football cards. The following graph shows a few of his indifference curves. The price of a pack of baseball cards is $1, the price of a pack of football cards is $1. Andy’s allowance is $11 a day. The price of baseball cards suddenly increases to $4. Assume that Andy can buy less than whole packs of cards.
   a. On the graph below, draw Andy’s original budget line and label it BC₀. Also put the label A on his chosen consumption bundle. Label his initial indifference curve I₀. Before the price change:

   Andy consumes __________ baseball cards and __________ football cards.

   ![Graph showing Andy's budget line and indifference curves before the price change.]

   b. On the graph, draw Andy’s actual budget line after the price change and label it BC₁. Label his actual consumption bundle after the price change C and the new indifference curve I₁. After the price change:

   Andy consumes __________ baseball cards and __________ football cards (these can be in fractions!!)

   ![Graph showing Andy's budget line and indifference curves after the price change.]

   c. On the graph, draw (as carefully as possible) Andy’s budget line that reflects the substitution effect and label it BCₕ. (Hint: Use the new price ratio to reach the initial indifference curve). Label this intermediate consumption point B. With the substitution effect ONLY:

   Andy consumes __________ baseball cards and __________ football cards.

   ![Graph showing Andy's budget line and indifference curves with the substitution effect.]

   d. Does the substitution effect of the increase in the price of baseball cards make him buy more or less baseball cards? How many more or less?
Draw 3 dashed horizontal lines (- - -) on your graph, one from A to the horizontal axis, one from B to the horizontal axis and one from C to the horizontal axis. Along the horizontal axis, label the income effect, the substitution effect and the total effect on the demand for baseball cards.

e. Fill in the blanks: The income effect of the increase in the price of baseball cards on Andy’s demand for baseball cards is the same as the effect of a(n) (increase, decrease) ____________ in his income of $______ per day. How do you know?

f. Does the income effect make him consume more baseball cards or less? How many more or less?

g. Can you tell whether football cards are a normal or inferior good? Can you tell whether baseball cards are a normal or inferior good? Why or why not?

h. On the following graph, using the information given above, plot two points on Andy’s Marshallian demand curve for baseball cards and connect them. Label this \( D_{\text{marshallian}} \).

h. On the above graph, using the information given above, plot two points and connect them on Andy’s Hicksian demand curve for baseball cards. Label this \( D_{\text{Hicksian}} \). Briefly explain the difference.
2. Critically evaluate the following statements and explain in what way are they true, false, or uncertain.

a. Suppose Kelly consumes only two goods, books-on-tape and coffee mugs and she has typical U-shaped, convex indifference curves. If the price of books-on-tape is $16 and the price of coffee mugs is $4 and Kelly’s marginal rate of substitution for books-on-tape in terms of coffee mugs is 5, she could increase her satisfaction by consuming fewer books-on-tape and more coffee mugs. (A graph is strongly advised.)

b. If the price of a good decreases and the quantity demanded increases, this implies that the good is normal.

c. For a budget spent entirely on two goods, an increase in the price of one will necessarily decrease consumption of both, unless at least one of the goods is inferior. Your answer is not complete without a diagram.
3. Martha likes consume goods in an extremely well-balanced manner. In fact, for new home decor item she buys, she insists on creating exactly 3 simple meals to go with it. Suppose she has an income of $240. The price of each home decor item is $10 per unit and the price of each meal is $10 per unit.

a. On the graph, draw Martha’s budget line, labeling it BC_0, and plot at least 3 indifference curves.

b. How many new home decor items will Martha demand in this situation? How many new meals? Show your answer graphically AND algebraically. (Hint: You have two equations and two unknowns. One equation tells the relationship between her consumption of home decor items and meals; the second equation is the budget constraint.)

c. Suppose the price of home decor items increases to $30 per unit. Graphically illustrate Martha’s new optimal consumption point (including budget constraint and indifference curve).

d. What is the substitution effect from this price change?

e. Are meals and home decor items inferior or normal? Explain.

f. Sketch Martha’s Marshallian and Hicksian demand curves from the information above.
4. Since losing his housekeeping job, Tony lives alone. He often has leftovers after cooking and he wraps them in aluminum foil. As far as he is concerned, 2 square feet of generic aluminum foil is equivalent to 1 square foot of Reynolds Wrap. That is, any job that can be done with 1 square foot of Reynolds Wrap requires 2 square feet of the generic brand to be done as well. Tony has $24 to spend on aluminum foil. A roll of Reynolds Wrap costs $3 and a roll of generic aluminum foil is $2.

a. Graphically illustrate Tony’s budget constraint and label it BC₀.

b. Show at least 3 of Tony’s indifference curves.

c. How much of each kind of aluminum foil will Tony use? Fully explain. Label this point A on the graph.

d. Suppose the price of Reynolds Wrap increases to $4/roll and the price of generic aluminum foil remains at $2/roll. Will he buy more generic aluminum? Carefully explain. If not, at what point will he buy more generic aluminum?

e. Return to the initial prices (Reynolds Wrap is $3/roll and generic aluminum foil is $2/roll). Suppose Tony receives a coupon from his grocery store for $6 that can be used only on rolls of generic aluminum foil. Explain graphically AND verbally how, if at all, this coupon will alter Tony’s decision, relative to part c.
f. Describe Tony’s demand function for Reynolds Wrap foil as a function of general prices and income. Let the prices of generic aluminum foil and Reynolds Wrap aluminum foil be $p_G$ and $p_{RW}$, and let income be $M$. **Using this notation**, fill in the blanks.

   If $p_{RW} > 2p_G$, then the number of Reynolds Wrap foil he will demand is ____________.

   If $p_{RW} < 2p_G$, then the number of Reynolds Wrap foil he will demand is ____________. (Hint: this answer should have letters in it).

   If $p_{RW} = _____p_G$, he will be indifferent between any affordable combinations. (Hint: a number fills this blank.)
5. Consider the following proposal to encourage energy conservation in East Lansing. Suppose that the city authorities placed a tax on each unit of electricity used by city residents. However, in order not to make people worse off the city gives each family a rebate check so that they can purchase the same combination of electricity and all other goods as before the tax was imposed.

a) Using an indifference curve diagram, illustrate the effect of the entire proposal on the consumption of electricity (x) and “all other goods” (y).

b) Will electricity consumption necessarily go down? Why or why not.

c) Would the tax alone assure a reduction in electricity? Why or why not?

d) Will consumers be better or worse off after the tax and rebate proposal? Explain.

e) Is there a way the government can get people to consume less electricity, make them no worse off than they were previously, and spend less money on rebates? Explain.
6. Suppose that you were considering offering a transfer of $300 a month to low income individuals. However, you are concerned about how they might use it – in particular, you want to reduce the opportunity for them to use the transfer for “social bads” - like alcohol, tobacco, and illicit drugs. To reduce the opportunity to use it on these “bads” you can either give them the transfer as a “Food Stamp” (which must be used to purchase food) or a “Rent Stamp” (which must be used to pay a rent or mortgage). Assume the average recipient spends a small portion of their monthly budget on food ($100) and a large portion of their monthly budget on rent ($600) in the absence of the transfer.

a. If you want to minimize how much they spend on “social bads” discuss whether it matters if the transfer is in the form of a Food Stamp rather than a Rent Stamp. Explain and support your answer using the figures provided.

b. Is a black market in vouchers like to emerge in both markets? How would this affect your answer?