# ECON 203
# Midterm on Consumer Theory

Be sure to show your work for all answers, even if the work is simple.

This exam will begin at 17:40 and end at 19:20

1. *(19 points)* **Honor Statement:** Please read and sign the following statement:

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   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

2. *(22 points total)* About the Slutsky equation.

   (a) *(8 points)* Write down the Slutsky equation in elasticity form, defining each term.

   (b) *(4 points)* What are *Giffen Goods*? Using the Slutsky equation explain how they can exist. Are there any real world examples of Giffen Goods?

A common goal of governments is to increase the consumption of one good or a class of goods—like lunch, bread, or margarine. The rest of the question is about how to do this.

(c) *(3 points)* One method they might want to use is to subsidize everyone's income. Explain how this might reduce the consumption of the good in question.

(d) *(3 points)* A second method would be to give them a small amount of the good for free. Explain how this might reduce the consumption of the good in question.

(e) *(4 points)* A final method would be to subsidize the price of that good. Using the slutsky equation explain how this method is always superior to the last two.

3. *(13 points total)* About *strict monotonicity* or *more is better*

   (a) *(3 points)* Define this assumption using words or symbols.

   (b) *(4 points)* Give an example that makes it obvious that this is a very bad assumption about human preferences.

   (c) *(2 points)* If it is such a bad assumption about human preferences, why do we make this assumption?

   (d) *(4 points)* Show what it rules out in indifference curves. Explain why.

4. *(34 points total)* Consider the utility function: $u(F,C) = -8\frac{1}{F^2} - \frac{1}{C^2}$. **NOTE:** There is significant partial credit to be gained for someone who can not answer all of the question.

   (a) *(5 points)* Establish this utility function is strictly monotone for $F > 0$ and $C > 0$, what does this tell us about someone maximizing this over a budget set: $p_f F + p_c C \leq I$.

   (b) *(2 points)* Establish this utility function is convex for $F > 0$ and $C > 0$.

   (c) *(2 points)* For utility maximization it is equivalent to $u(F,C) = \frac{1}{8\frac{1}{F^2}+\frac{1}{C^2}}$ for $F > 0$, $C > 0$.

   Now you will solve the problem of maximizing $u(F,C) = -8\frac{1}{F^2} - \frac{1}{C^2}$ over the budget set $p_f F + p_c C \leq I$ where $p_f > 0$, $p_c > 0$ and $I > 0$.

   (d) *(2 points)* Set up the objective function.

   (e) *(4 points)* Find the first order conditions.

(f) *(4 points)* Solve for the Bang for the Buck's and then find a function for $C$ in terms of prices and $F$.

(g) *(3 points)* Find the demand curve for $F$.

(h) *(6 points)* Establish the elasticity of food with respect to income is one ($e_f(I) = 1$). Why is this a problem? Why might it be a desirable characteristic for analysis of the behavior of rich and poor people?

(i) *(6 points)* Now find the demand curve for $C$ using two different methods and that the results are the same either way.

5. *(12 points)* Write down, explain, and give a real world example of two of the three (or four) great insights of rationality.

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4. *(34 points total)* Consider the utility function: $u(F,C) = -9\frac{1}{F} - \frac{1}{C}$. **NOTE:** There is significant partial credit to be gained for someone who can not answer all of the question.

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