Exercises #2

Instructions

Exercises #2 are due on Wednesday, February 2nd.

Exercises may be presented for credit as a hard copy at the end of the class meeting on the due date, or may be submitted electronically on Blackboard by the following Monday. If submitted on Blackboard, exercises should be attached as a Portable Document Format (`*.pdf`) file. It is possible to convert handwritten work to `*.pdf` using scanner or a camera-equipped device with Microsoft Office Lens (Android, iOS, or Windows), Google Drive (Android), or Apple Notes (iOS).

Exercises are "collaborative and open book" assignments. You are encouraged to make use of help from your peers, textbook, notes, and me, but you must submit your own answers. There is no penalty for incorrect answers; the expectation is simply for you to progress as far as you can on each question. Complete answers with explanations will be provided in recitation.

Questions

2.E.1 Suppose $L = 3$, and consider the demand function defined by

$$x_1(p, w) = \frac{p_2}{p_1 + p_2 + p_3}\frac{w}{p_1},$$
$$x_2(p, w) = \frac{p_3}{p_1 + p_2 + p_3}\frac{w}{p_2},$$
$$x_3(p, w) = \frac{\beta p_1}{p_1 + p_2 + p_3}\frac{w}{p_3}.$$

Does this demand function satsify homogeneity of degree zero and Walras' law when $\beta = 1$? What about when $\beta \in (0, 1)$?

2.E.7 A consumer in a two-good economy has a demand function $x(p, w)$ that satisfied Walras' law. Her demand function for the first good is $x_1 = \alpha w/p_1$. Derive her demand function for the second good. Is her demand function homogeneous of degree zero?

2.F.3 You are given partial information about about a consumer's purchases. She consumes only two goods.

	Year 1		Year 2	
	Quantity	Price	Quantity	Price
Good 1	100	100	120	100
Good 2	100	100	?	80

Over what range of quantities of good 2 consumed in year 2 would you conclude:

(a) That her behavior is inconsistent (i.e., in contradiction with the weak axiom of revealed preference?)

(b) That the consumer's consumption bundle to year 1 is revealed preferred to that in year 2?

(c) That the consumer's consumption bundle to year 2 is revealed preferred to that in year 1?

2.F.16 Consider a setting where $L = 3$ and a consumer whose consumption set is $\mathbb{R}^3$. Suppose that her demand function $x(p, w)$ is

$$x_1(p, w) = \frac{p_2}{p_3},$$
$$x_2(p, w) = -\frac{p_1}{p_3},$$
$$x_3(p, w) = \frac{w}{p_3}.$$

(a) Show that $x(p, w)$ is homogeneous of degree zero and satisfies Walras' law.

(b) Show that $x(p, w)$ violates the weak axiom of revealed preference.

2.F.17 In an L-commodity world, a consumer's Walrasian demand function is

$$x_k(p, w) = \frac{w}{\left(\sum_{l=1}^{L} p_l\right)} \text{ for } k = 1, \ldots, L.$$

(a) Is this function homogeneous of degree zero in (p, w)?

(b) Does it satisfy Walras' law?

(c) Does it satisfy the the weak axiom of revealed preference?