

**Assignment #4**  
Economics 101 – Section 5  
Due Date: Thursday Feb 19, 2004

Instructions: Complete all questions and sub questions on separate sheets of paper. Make sure to include your name (first and last) and your student number on the first page of your assignment. Staple all sheets together and turn in to my office by the due date.

#1) a) The cross-price elasticity for electricity and the price of natural gas is 0.2 and the income elasticity of natural gas is 0.15.

a) What happens to the quantity of electricity demanded if the price of natural gas goes up by 2%? (Give a specific number if possible)

- The quantity of electricity demanded will increase by 0.4% ( $0.2 \times 2\%$ )

b) What happens to the quantity of natural gas demanded if the price of electricity goes up by 5%? (Give a specific number if possible)

- Cannot tell with information given

c) Is natural gas a substitute or complement for electricity?

- Substitute

d) What happens to the quantity of electricity demanded if income goes up by 10%? (Give a specific number if possible)

- **Cannot answer with the information given**

e) What happens to the quantity of natural demanded gas if income goes up by 10%? (Give a specific number if possible)

- **Quantity demanded will increase by 1.5%**

f) With respect to income, what type of good is electricity?

- Cannot answer without additional information.

g) With respect to income, what type of good is natural gas?

- a normal good since the income elasticity is greater than zero (more specifically it is a necessity since income elasticity for natural gas is greater than zero and less than 1)

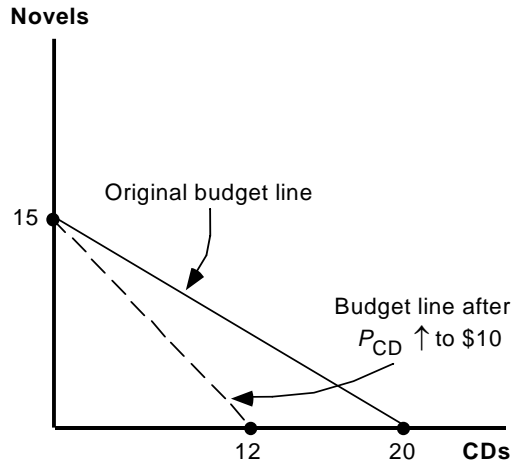
#2) Waldo is an english major. He has \$120 to spend on novels and used cds. Novels are \$8 each and used cds are \$5 each.

a) Draw his budget line.

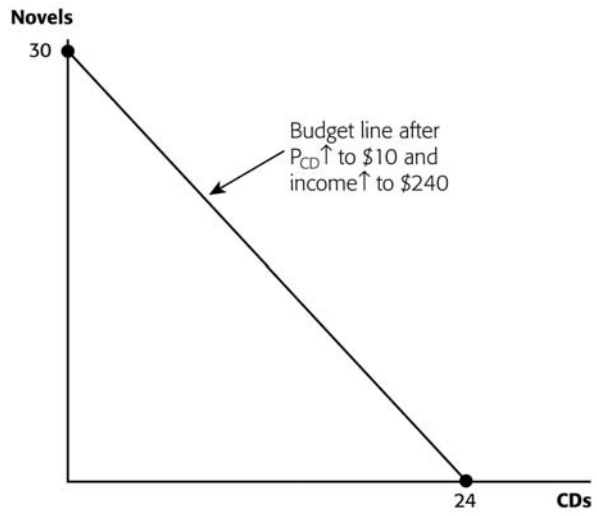
b) On the same graph as a), draw a second budget line showing what happens when the price of cds rises to \$10 each.

c) Using the same graph in b) draw a third budget line showing what happens when the price of cds is \$10 and income rises to \$240.

a, b)



c.



#3) Hezekiel likes beer and pizza. The following table represents his utility from consuming different levels of beer and pizza. The cost of pizza is \$1 per slice and the cost of beer is \$0.50 per can (the cheap stuff!) and he has a total of \$9 to spend on these goods.

Pizza				Beer			
Quantity	Utility	Marginal Utility (of last unit)	Marginal Utility per dollar spent (of last unit)	Quantity	Utility	Marginal Utility (of last unit)	Marginal Utility per dollar spent (of last unit)
4 Slices	115	-	-	5 Cans	63	-	-
5 Slices	135			6 Cans	75		
6 Slices	154			7 Cans	86		
7 Slices	171			8 Cans	96		

a) Using the above table fill in the marginal utility of each additional slice of pizza or beer.

b) Using the above table fill in the marginal utility of each additional can of beer consumed.

Pizza				Beer			
Quantity	Utility	Marginal Utility (of last unit)	Marginal Utility per dollar spent (of last unit)	Quantity	Utility	Marginal Utility (of last unit)	Marginal Utility per dollar spent (of last unit)
4 Slices	115	-	-	5 Cans	63	-	-
5 Slices	135	20	20	6 Cans	75	12	24
6 Slices	154	19	19	7 Cans	86	11	22
7 Slices	171	17	17	8 Cans	96	10	20

c) What quantity of beer and pizza will maximize Hezekiel's utility?

Note that utility is maximized when

$$\frac{MU_{\text{pizza}}}{P_{\text{pizza}}} = \frac{MU_{\text{Pepsi}}}{P_{\text{Pepsi}}}$$

This happens at 5 slices of pizza and 8 cans of beer. Also notice that he has used up all of his income.