ECON2103 Microeconomics

Chapter 4 Exercises

1.

a. Orange juice and apple juice are known to be perfect substitutes. Draw the appropriate price-consumption curve (for a variable price of orange juice) and income-consumption curve.
b. Left shoes and right shoes are perfect complements. Draw the appropriate price-consumption and income-consumption curves.

2. Each week, Bill, Mary, and Jane select the quantity of two goods, x_1 and x_2, that they will consume in order to maximize their respective utilities. They each spend their entire weekly income on these two goods.

a. Suppose you are given the following information about the choices that Bill makes over a three-week period:

	x_1	x_2	P_1	P_2	I
Week 1	10	20	2	1	40
Week 2	7	19	3	1	40
Week 3	8	31	3	1	55

Did Bill's utility increase or decrease between week 1 and week 2? Between week 1 and week 3? Explain using a graph to support your answer.

b. Now consider the following information about the choices that Mary makes:

	x_1	x_2	P_1	P_2	I
Week 1	10	20	2	1	40
Week 2	6	14	2	2	40
Week 3	20	10	2	2	60

Did Mary's utility increase or decrease between week 1 and week 3? Does Mary consider both goods to be normal goods? Explain.

c. Finally, examine the following information about Jane's choices:

	x_1	x_2	P_1	P_2	I
Week 1	12	24	2	1	48
Week 2	16	32	1	1	48
Week 3	12	24	1	1	36

Draw a budget line-indifference curve graph that illustrates Jane's three chosen bundles. What can you say about Jane's preferences in this case? Identify the income and substitution effects that result from a change in the price of good x_1.

3. The director of a theater company in a small college town is considering changing the way he prices tickets. He has hired an economic consulting firm to estimate the demand for tickets. The firm has classified people who go to the theater into two groups, and has come up with two demand functions. The demand curves for the general public ($\boldsymbol{Q_{gp}}$) and students ($\boldsymbol{Q_s}$) are given below:

$$\boldsymbol{Q_{gp} = 500 - 5P}$$
$$\boldsymbol{Q_s = 200 - 4P}$$

   a. Graph the two demand curves on one graph, with P on the vertical axis and Q on the horizontal axis. If the current price of tickets is $35, identify the quantity demanded by each group.
   b. Find the price elasticity of demand for each group at the current price and quantity.
   c. Is the director maximizing the revenue he collects from ticket sales by charging $35 for each ticket? Explain.
   d. What price should he charge each group if he wants to maximize revenue collected from ticket sales?

4. By observing an individual's behavior in the situations outlined below, determine the relevant income elasticities of demand for each good (i.e., whether it is normal or inferior). If you cannot determine the income elasticity, what additional information do you need?

   a. Bill spends all his income on books and coffee. He finds $20 while rummaging through a used paperback bin at the bookstore. He immediately buys a new hardcover book of poetry.
   b. Bill loses $10 he was going to use to buy a double espresso. He decides to sell his

new book at a discount to a friend and use the money to buy coffee.

c. Being bohemian becomes the latest teen fad. As a result, coffee and book prices rise by 25%. Bill lowers his consumption of both goods by the same percentage.

d. Bill drops out of art school and gets an M.B.A. instead. He stops reading books and drinking coffee. Now he reads The Wall Street Journal and drinks bottled mineral water.

5. Suppose the income elasticity of demand for food is 0.5 and the price elasticity of demand is −1.0. Suppose also that Felicia spends $10,000 a year on food, the price of food is $2, and that her income is $25,000.

   a. If a sales tax on food caused the price of food to increase to $2.50, what would happen to her consumption of food? (*Hint*: Because a large price change is involved, you should assume that the price elasticity measures an arc elasticity, rather than a point elasticity.)

   b. Suppose that Felicia gets a tax rebate of $2500 to ease the effect of the sales tax. What would her consumption of food be now?

   c. Is she better or worse off when given a rebate equal to the sales tax payments? Draw a graph and explain.

6. Suppose you are in charge of a toll bridge that costs essentially nothing to operate. The demand for bridge crossings Q is given by $\boldsymbol{P = 15 - \frac{1}{2}Q.}$

   a. Draw the demand curve for bridge crossings.

   b. How many people would cross the bridge if there were no toll?

   c. What is the loss of consumer surplus associated with a bridge toll of $5?

   d. The toll-bridge operator is considering an increase in the toll to $7. At this higher price, how many people would cross the bridge? Would the toll-bridge revenue increase or decrease? What does your answer tell you about the elasticity of demand?

   e. Find the lost consumer surplus associated with the increase in the price of the toll from $5 to $7.