ECON2103 Microeconomics

Chapter 3 Exercises

1. Draw indifference curves that represent the following individuals' preferences for hamburgers and soft drinks. Indicate the direction in which the individuals' satisfaction (or utility) is increasing.
   a. Joe has convex preferences and dislikes both hamburgers and soft drinks.
   b. Jane loves hamburgers and dislikes soft drinks. If she is served a soft drink, she will pour it down the drain rather than drink it.
   c. Bob loves hamburgers and dislikes soft drinks. If he is served a soft drink, he will drink it to be polite.
   d. Molly loves hamburgers and soft drinks, but insists on consuming exactly one soft drink for every two hamburgers that she eats.
   e. Bill likes hamburgers, but neither likes nor dislikes soft drinks.
   f. Mary always gets twice as much satisfaction from an extra hamburger as she does from an extra soft drink.

2. Suppose that Bridget and Erin spend their incomes on two goods, food (F) and clothing (C). Bridget's preferences are represented by the utility function $U(F,C)=10FC$, while Erin's preferences are represented by the utility function $U(F,C)=0.20F^2C^2$.
   a. With food on the horizontal axis and clothing on the vertical axis, identify on a graph the set of points that give Bridget the same level of utility as the bundle (10,5). Do the same for Erin on a separate graph.
   b. On the same two graphs, identify the set of bundles that give Bridget and Erin the same level of utility as the bundle (15,8).
   c. Do you think Bridget and Erin have the same preferences or different preferences? Explain.

3. Debra usually buys a soft drink when she goes to a movie theater, where she has a choice of three sizes: the 8-ounce drink costs $1.50, the 12-ounce drink $2.00, and the 16-ounce drink $2.25. Describe the budget constraint that Debra faces when deciding how many ounces of the drink to purchase. (Assume that Debra can costlessly dispose of any of the soft drink that she does not want.)

4. Brenda wants to buy a new car and has a budget of $25,000. She has just found a magazine that assigns each car an index for styling and an index for gas mileage. Each index runs from 1 to 10, with 10 representing either the most styling or the best gas mileage. While looking at the list of cars, Brenda observes that on average, as the style index increases by one unit, the price of the car increases by $5000. She also observes that as the gas-mileage index rises by one unit, the price of the car increases by $2500.

    a. Illustrate the various combinations of style (S) and gas mileage (G) that Brenda could select with her $25,000 budget. Place gas mileage on the horizontal axis.

    b. Suppose Brenda's preferences are such that she always receives three times as much satisfaction from an extra unit of styling as she does from gas mileage. What type of car will Brenda choose?

    c. Suppose that Brenda's marginal rate of substitution (of gas mileage for styling) is equal to $S/(4G)$. What value of each index would she like to have in her car?

    d. Suppose that Brenda's marginal rate of substitution (of gas mileage for styling) is equal to $(3S)/G$. What value of each index would she like to have in her car?

5. Jane receives utility from days spent traveling on vacation domestically (D) and days spent traveling on vacation in a foreign country (F), as given by the utility function $U(D,F) = 10DF$. In addition, the price of a day spent traveling domestically is $100, the price of a day spent traveling in a foreign country is $400, and Jane's annual travel budget is $4000.

    a. Illustrate the indifference curve associated with a utility of 800 and the indifference curve associated with a utility of 1200.

    b. Graph Jane's budget line on the same graph.

    c. Can Jane afford any of the bundles that give her a utility of 800? What about a utility of 1200?

    d. Find Jane's utility-maximizing choice of days spent traveling domestically and days spent in a foreign country.