

ANSWERS: Quiz #2
APEC 3001
Applied Microeconomics:
Consumers, Producers, and Markets
(Summer 2006)
Instructor: Hurley

Name:

Please show all the work you do to solve a problem.

1. What does it mean to say an individual's preferences satisfy the property of transitivity?
(1.5 Points)

Answer: If an individual is asked to compare pairs of any three bundles, say (i), (ii), and (iii), and he responds with (i) is more satisfying than (ii) and (ii) is more satisfying than (iii), then he must also respond with (i) is more satisfying than (iii).

2. What is the price elasticity of demand and how does total revenue from the sale of a good change when the price increases and the demand for the good is elastic?
(1.5 Points)

Answer: The price elasticity of demand is the percentage change in quantity demanded divided by the percentage change in price: $h = \frac{\Delta Q_D}{\Delta P} \frac{P}{Q_D}$. For an elastic good, a one percent increase in price decreases the quantity demanded by more than one percent. Therefore, the revenue gained from increasing the price will be lower than the revenue lost from selling less product, resulting in a net loss in total revenue.

3. Suppose Stacy's marginal rate of substitution is $MRS = MU_H/MU_F = F/H$ where F is the pounds of food and H is square feet of housing per month. Income is \$1,800 a month, the price of food (P_F) is \$15 a pound, and the price of housing (P_H) is \$45 per square foot. Which of the following statements must be true about the consumption bundle consisting of $F = 54$ and $H = 18$? (2.5 Points)
- Stacy can increase satisfaction by consuming more housing and less food.
 - Stacy can increase satisfaction by consuming more food and less housing.
 - Stacy can increase satisfaction by consuming more food and more housing.
 - This is Stacy's best feasible consumption bundle.

Answer: c. To solve this problem we need to check two things: (i) that Stacy is on her budget constraint and (ii) that $MRS = P_H/P_F$. Let us start with (ii). $MRS = 54/18 = 3$. $P_H/P_F = 45/15 = 3$. Since $MRS = P_H/P_F$, this is the right mix of food and housing. But, what about Stacy's budget? Expenditures on food are $\$15 \times 54 = \810 . Expenditures on housing are $\$45 \times 18 = \810 . So, total expenditures are $\$810 + \$810 = \$1,620$, which does not fully exhaust Stacy's income. If Stacy increases her consumption of housing and decreases her consumption of food, her satisfaction could increase or decrease, which rules out a. If Stacy increases her consumption of food and decreases her consumption of housing, her satisfaction could increase or decrease, which rules out b. d. is ruled out because Stacy has not exhausted all her income. But she can afford to increase expenditures on both food and housing, which more is better says must increase her satisfaction,

4. Suppose the demand for chicken is $Q = 2,000 + 2M - 250P$ where M is monthly income. Which of the following statements must be true if monthly income is \$1,000 and the price of chicken is \$4? (2.5 Points)
- Chicken is an inferior good.
 - Chicken is a necessity good.
 - Chicken is a luxury good.
 - There is not information to classify chicken as an inferior, necessity, or luxury good.

Answer: b. To determine if chicken is a luxury, necessity, or inferior good, we need to calculate the income elasticity of demand: $e = \frac{\Delta Q}{\Delta M} \frac{M}{Q}$. To calculate this elasticity, we need to know $\Delta Q/\Delta M$, from above we see this quantity if 2. We also need to know M, which is \$1,000 by assumption. Finally, we need Q, which is $2,000 + 2 \times 1,000 - 250 \times 4 = 3,000$. Therefore, we have enough information to classify the good ruling out d. Plugging this information into our formula yields $e = 2 \times 1,000/3,000$ or $2/3$. The income elasticity of an inferior goods is negative, which rules out a. The income elasticity of a luxury good is positive and greater than 1, which rules out c. The income elasticity of a necessity is positive and less than 1, which gives us b.

5. The figure below illustrates the best feasible bundle of hamburger (H_0) and relish (R_0) given current income and prices (i.e. the budget constraint labeled M_0). (8 Points)
- Illustrate how a decrease in the price of hamburgers changes the budget constraint (label the new budget constraint M_1). Illustrate the new best feasible bundle of hamburger and relish (label the new bundle H_1 and R_1).
 - Illustrate the substitution and income effects?
 - Given the way you have drawn your figure, is hamburger a normal or inferior good? Is relish a normal or inferior good?
 - Given the way you have drawn your figure, is relish a complement or substitute for hamburger?

Answer:

- See below.
- From below, the substitution effect is $H' - H_0 > 0$ for hamburger and $R' - R_0 < 0$ for relish. The income effect is $H_1 - H' > 0$ for hamburger and $R_1 - R' > 0$ for relish.
- The income effect for both hamburger and relish are positive. Since a price decrease increases real purchasing power, it is as if we have more income. Therefore, both hamburger and relish are normal goods.
- The price of hamburger decreased and the consumption of relish increased. Therefore, relish is a complement to hamburger. Another way to see this is to note that the consumption of hamburger and relish increased. Since they moved in the same direction they are complements.

