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ECON 102 Boyle – Exam 2 – Practice Exam Solutions

1. C – Diminishing marginal utility because the reason we don't use our cell phones constantly during free minute periods is because we get less and less value out of each additional minute we use. Eventually we don't get enough value to continue using our cell phones even though they are free to use.

2. C – Positive 0.75. You know the goods are substitutes because the cross price elasticity is positive.

$$E_{xy} = \frac{\% \Delta Qd \text{ for good } x}{\% \Delta P \text{ for good } y} = \frac{30\%}{40\%} = 0.75$$

3. D – The pollution your car puts into the air because this is a cost absorbed by society.

4. C – You can tell he began to experience negative marginal utility because he ate so much that his total utility started to decrease when he got sick.

5. C – The marginal utility of good A divided by the price of good A should equal the marginal utility of good B divided by the price of good B.

6. B – An assumption of consumer choice is that one good CAN be substituted for another.

7. D – The law of diminishing marginal utility because it predicts that you will get less value from the 2nd day than you did from the 1st day.

8. A – 10

Marginal utility from 6th beet = Total utility from 6 beets – Total utility from 5 beets = 110 – 100 = 10

9. C – 15

For this problem you need to use the equation the following equation to solve for the marginal utility of ice cream.

$$\frac{(MU \text{ of good } A)}{(Price \text{ of good } A)} = \frac{(MU \text{ of good } B)}{(Price \text{ of good } B)}$$

$$\frac{10}{\$2} = \frac{MU \text{ ice cream}}{\$3}$$

$$MU \text{ ice cream} = 15$$

10. B – We should buy less of good X and more of good Y

$$\text{Bang for the buck } X = 10 / \$5 = 2 \text{ utils per dollar}$$

$$\text{Bang for the buck } Y = 8 / \$2 = 4 \text{ utils per dollar}$$

11. A – We should buy more of good X and less of good Y

$$\text{Bang for the buck } X = 4 / \$10 = 0.4 \text{ utils per dollar spent}$$

$$\text{Bang for the buck } Y = 5 / \$25 = 0.2 \text{ utils per dollar spent}$$

12. D – We should keep our spending the way it is.

$$\text{Bang for the buck } X = 150 / \$75 = 2 \text{ utils per dollar}$$

$$\text{Bang for the buck } Y = 250 / \$125 = 2 \text{ utils per dollar}$$

13. B – You should disagree with your friend because raising prices will only increase revenues when demand is inelastic.

14. A – Negative externalities because when companies are forced to pay for the cost of negative externalities they are generating the company's supply curve will shift to the left and the company will reduce its level of production.

15. A – Relatively elastic because your friend is sensitive to changes in price due to a limited budget.
16. B – Upperclassmen have inelastic demand because they are already most of the way through their degree so at that point they are going to do what is needed to complete the program. When you have customers with inelastic demand and you increase price, revenue will increase.
17. B – Economic profits will always be less than or equal to accounting profits because economic profits are calculated the same way as accounting profits. The only difference is that opportunity costs are subtracted from economic profits; however, opportunity costs are not subtracted from accounting profits.
18. B – It is inelastic because total revenue increased when price increased.
19. B – Demand is inelastic when there are no substitutes available.
20. A – Demand becomes more elastic as time passes.
21. B – To maximize profit.
22. C – National defense because everyone in the country is protected by national defense whether or not they pay for it, and everyone can enjoy national defense at the same time without taking enjoyment away from others.
23. D – Cable TV is excludable because you have to pay for cable TV service to use it. However, it is non-rival because everyone that pays for cable TV can enjoy it at the same time.
24. A – Inelastic because we are generally not sensitive to changes in prices of goods that make up a small percent of our income.
25. A – Demand for candy bars is inelastic because they are a small percent of your budget.
26. C – Inelastic because there are few substitutes.

27. B – The cost of someone's rent or mortgage is typically a large percent of their overall income so people will be sensitive to changes in the cost of housing.

28. D – 5

$$E_p = \frac{Qd2 - Qd1}{(Qd1 + Qd2)/2} \div \frac{P2 - P1}{(P1 + P2)/2}$$

$$E_p = \frac{0 - 10}{(10 + 0)/2} \div \frac{6 - 4}{(4 + 6)/2} = -5$$

$$|E_p| = 5$$

29. A – Consumers are not going to be sensitive to changes in price related to a once in a lifetime experience. If the price of plane tickets to get to your best friends wedding increase, you are still going to go to the wedding.

30. B – It will always be negative. The law of demand tells us that price and quantity move in inverse directions. When talking about price elasticity of demand in this class, we typically express it in terms of absolute value since price elasticity of demand is always negative.

31. A – Elastic

32. C – Inelastic because there are a few substitutes

33. B – You will be more sensitive to price changes in items that are a large percent of your budget

34. A – Demand for unique experiences is inelastic for the same reason demand for once in a lifetime experiences is inelastic.

35. C – Immediate run demand. Demand becomes more elastic as time passes. So demand is more inelastic in the short run when a price change occurs, which is the immediate run. The immediate run is even sooner than the short run.

36. C – Everyone can use a natural disaster warning system at the same time, and it is hard to exclude people from using it if they don't pay for it

37. A – Many close substitutes exist for the good

38. B – Demand is perfect inelastic

39. B – Perfectly elastic would be completely horizontal

40. D – Perfectly inelastic would be completely vertical

41. C – Increases by 30%

When a good is a luxury, it means that income elasticity of demand is greater than 1.

$$E_i = \frac{\% \Delta Q_d}{\% \Delta I}$$

You have been asked to solve for the percent change in Q_d . You were given that income increased by 20%, so you know the percentage change in I . You do not know the exact value of income elasticity; however, you know that it has to be greater than 1 since the good is a luxury. You can plug in any value greater than 1 for income elasticity and you will find that the percent change in Q_d will be greater than 20%. If you plug in 1.5 you will get the answer, increase by 30%. The percent change in Q_d will only go up by 30% if the income elasticity is exactly 1.5; however, it isn't possible to get any of the other values as answers using a number greater than 1 for income elasticity.

$$1.5 = \frac{\% \Delta Q_d}{0.20}$$

$$\% \Delta Q_d = 0.30 = 30\%$$

Another way to think about this is that when a good is a luxury, the percent change in Q_d will be more dramatic than the percent change in income.

42. A – They are substitutes because goods are substitutes when cross-price elasticity is positive.

43. B – The subsidy is less than the external benefit of the flu shots.

Short Answer

1. 1.5 Elastic

$$E_P = \frac{60-100}{(100+60)/2} \div \frac{7-5}{(5+7)/2} = -1.5$$

$$|E_P| = 1.5$$

2. 0.15 Inelastic

$$E_P = \frac{190-200}{(190+200)/2} \div \frac{14-10}{(14+10)/2} = -0.15$$

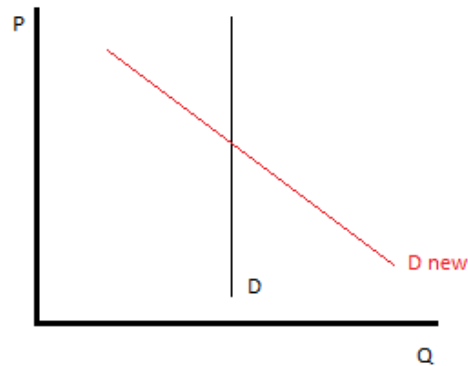
$$|E_P| = 0.15$$

3. 1 Unit elastic

$$E_P = \frac{2,000 - 1,000}{(2,000 + 1,000)/2} \div \frac{25 - 50}{(25+50)/2} = -1$$

$$|E_P| = 1$$

4. This problem is testing to make sure that you know that demand will become more elastic as more and more time passes. The current demand curve is a perfectly inelastic demand curve. We know this because the curve is a completely vertical. As demand becomes more elastic, the demand curve will become more horizontal. All you need to do is draw a downward sloping demand curve that is more horizontal than the current demand curve.



5. 3 Gatorade and 2 Ice Cream

The first decision that you need to make is if you want your first purchase to be Gatorade or ice cream. You can use the equal marginal principle equation to determine which will give you more utility per dollar spent.

$$1^{\text{st}} \text{ Gatorade} = 40 / \$2 = 20$$

$$1^{\text{st}} \text{ ice cream} = 66 / \$3 = 22$$

Your first purchase will be ice cream because ice cream gives you 22 utility points per dollar spent and Gatorade only gives you 20 utility points per dollar spent. You have a total budget of \$12 and you just spent \$3 on ice cream so you still have \$9 to spend.

The next step of the problem is the spot where people most commonly make mistakes. You can now either buy your 1st Gatorade or your 2nd ice cream. Often people will jump to comparing the 2nd Gatorade to the 2nd ice cream; however, you have not purchased your 1st Gatorade yet so you need to decide if you want to purchase your 1st Gatorade or your second ice cream.

$$1^{\text{st}} \text{ Gatorade} = 40 / \$2 = 20$$

$$2^{\text{nd}} \text{ ice cream} = 42 / 3 = 14$$

You will purchase your 1st Gatorade because your 1st Gatorade gives you 20 utility points per dollar and your second ice cream only gives you 14 utility points per dollar. You just spent \$2 on Gatorade so you have \$7 left to spend (\$9 - \$2 = \$7).

$$2^{\text{nd}} \text{ Gatorade} = 32 / \$2 = 16$$

$$2^{\text{nd}} \text{ ice cream} = 42 / 3 = 14$$

In this step you are comparing purchasing your 2nd Gatorade to purchasing your 2nd ice cream because you have purchased 1 Gatorade and 1 ice cream at this point. Your 2nd Gatorade gives you more utility per dollar spent so you will purchase a 2nd Gatorade for \$2 so you have \$5 left to spend (\$7 - \$2 = \$5).

$$3^{\text{rd}} \text{ Gatorade} = 24 / \$2 = 12$$

$$2^{\text{nd}} \text{ ice cream} = 42 / 3 = 14$$

You purchased a 2nd ice cream because your second ice cream gave you more utility per dollar than your 3rd Gatorade. You just spent \$3 on ice cream so you have \$2 left to spend (\$5 - \$3 = \$2).

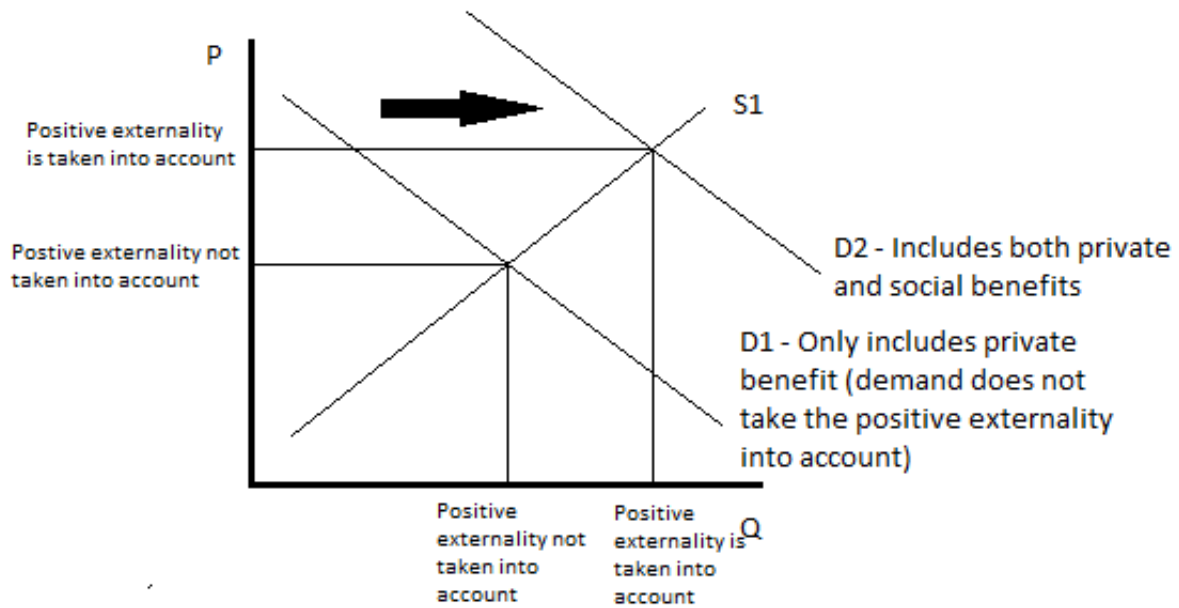
$$3^{\text{rd}} \text{ Gatorade} = 24 / \$2 = 12$$

$$3^{\text{rd}} \text{ ice cream} = 24 / \$3 = 8$$

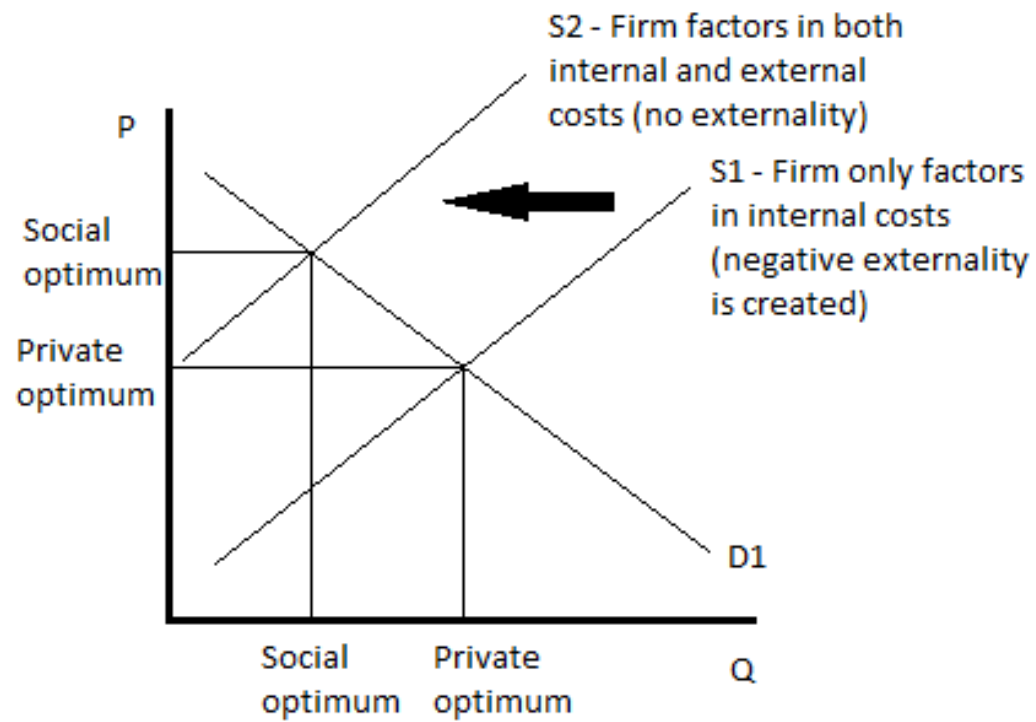
You will use your last \$2 to purchase your 3rd Gatorade. Your third Gatorade gives you more utility per dollar than your 3rd ice cream. Additionally, you knew your last purchase would have to be on Gatorade because you only had \$2 left so you couldn't afford to purchase a 3rd ice cream anyways. You spent your last \$2 on your third Gatorade so you have now spent your entire budget.

You will purchase 3 Gatorade and 2 ice creams with your budget of \$12.

6. Both the socially optimal price and quantity are greater than the market price and quantity.



7. The socially optimal quantity is less than the market quantity; however, the socially optimal price is greater than the market price.



8. 1/7, Inelastic

$$Q_{d1} = 15$$

$$Q_{d2} = 13$$

$$P_1 = \$1$$

$$P_2 = \$3$$

$$E_P = \frac{13-15}{(15+13)/2} \div \frac{\$3-\$1}{(\$1+\$3)/2}$$

$$E_P = \frac{-2}{14} \div \frac{\$2}{2}$$

$$E_P = \frac{-2}{14} = \frac{-1}{7}$$

$$|E_P| = \frac{1}{7}$$

The price elasticity of demand is inelastic because it is between 0 and 1.

9. 1, Unit Elastic

$$Q_{s1} = 2$$

$$Q_{s2} = 6$$

$$P_1 = \$1$$

$$P_2 = \$3$$

$$E_s = \frac{6-2}{(2+6)/2} \div \frac{\$3-\$1}{(\$1+\$3)/2}$$

$$E_s = \frac{4}{4} \div \frac{\$2}{2}$$

$$E_s = 1$$

The price elasticity of supply is unit elastic because it is equal to 1.

10. 9/23, Inelastic

$$Q_{d1} = 12$$

$$Q_{d2} = 11$$

$$P_1 = \$4$$

$$P_2 = \$5$$

$$E_P = \frac{11-12}{(12+11)/2} \div \frac{\$5-\$4}{(\$4+\$5)/2}$$

$$E_P = \frac{-1}{11.5} \div \frac{\$1}{4.5}$$

$$E_P = \frac{-4.5}{11.5} = \frac{-9}{23}$$

$$|E_P| = \frac{9}{23}$$

The price elasticity of demand is inelastic because it is between 0 and 1.

11. 1, Unit elastic

$$Q_{s1} = 8$$

$$Q_{s2} = 10$$

$$P_1 = \$4$$

$$P_2 = \$5$$

$$E_s = \frac{10-8}{(8+10)/2} \div \frac{\$5-\$4}{(\$4+\$5)/2}$$

$$E_s = \frac{2}{9} \div \frac{\$1}{4.5}$$

$$E_s = 1$$

The price elasticity of supply is unit elastic because it is equal to 1.

12. The increased price of football tickets will cause us to consume fewer football tickets. However, it is ambiguous if we will consume more or less tacos.

Income effect – Since the price of football tickets has increased, it is as if your income decreased. The increased price of football tickets has made you poorer so you will consume less of both tacos and football tickets.

Income effect = Less tacos and Less football tickets

Substitution effect – The increased price of the football tickets has caused tacos to become relatively cheaper than football tickets. This means you will consume more tacos and less football tickets.

Substitution effect = More tacos and Less football tickets

We can see that the increased price of football tickets will cause us to consume fewer football tickets. However, it is ambiguous if we will consume more or less tacos.