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ECON 102 Wooten – Final Exam – Practice Exam Solutions

1. No

What will Firm #1 do if Firm #2 chooses left? Select bottom because  $20 > 16$ .

		Firm #2	
		Left	Right
Firm #1	Top	#1) 16 #2) 28	
	Bottom	#1) 20 #2) 16	

What will Firm #1 do if Firm #2 chooses right? Select top because  $32 > 28$ .

		Firm #2	
		Left	Right
Firm #1	Top		#1) 32 #2) 36
	Bottom		#1) 28 #2) 24

Firm #1 does not have a dominant strategy. Firm #1 will go bottom if Firm #2 goes left; however, Firm #1 will go top if Firm #2 goes right.

2. Yes, Right

What will Firm #2 do if Firm #1 chooses top? Select right because  $36 > 28$ .

		Firm #2	
		Left	Right
Firm #1	Top	#1) 16 #2) 28	#1) 32 #2) 36
	Bottom		

What will Firm #2 do if Firm #1 chooses bottom? Select right because  $24 > 16$ .

		Firm #2	
		Left	Right
Firm #1	Top		
	Bottom	#1) 20 #2) 16	#1) 28 #2) 24

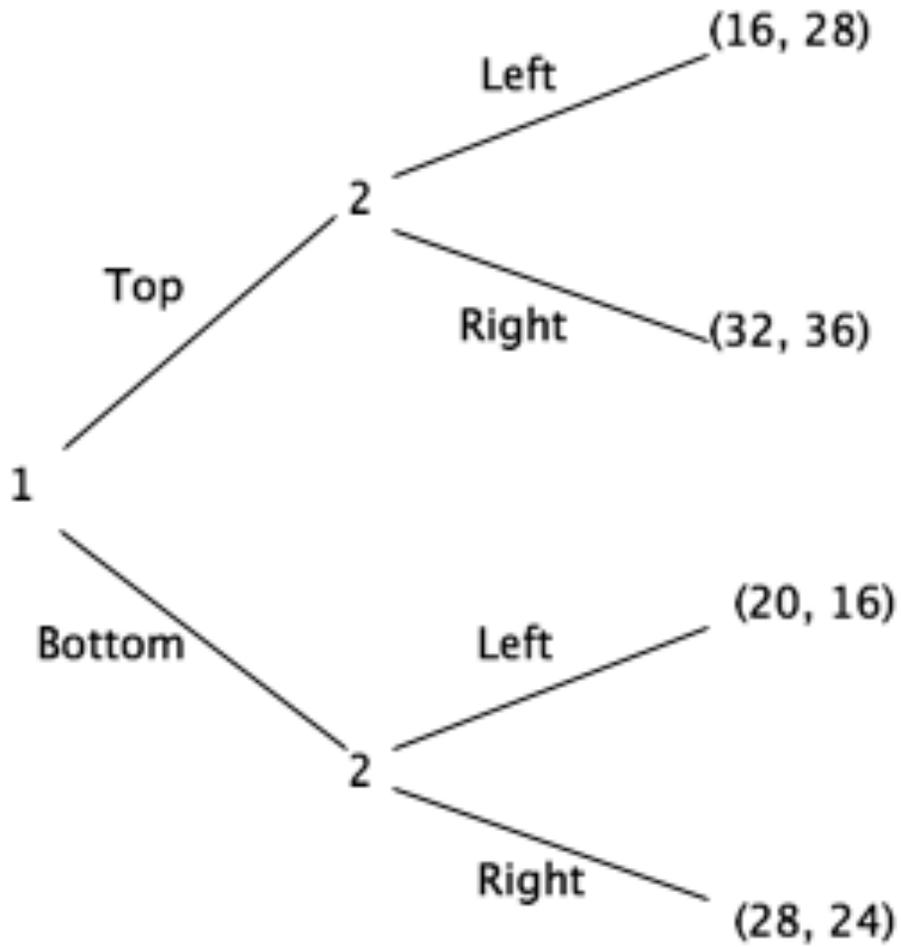
Firm #2 has a dominate strategy to select right. Firm #2 will choose right when Firm #1 chooses top or bottom.

3. Top-Right

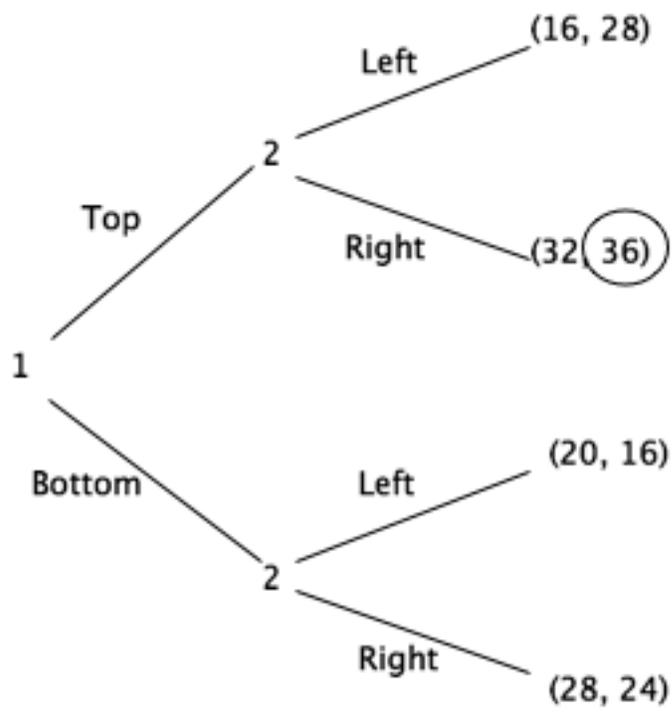
		Firm #2	
		Left	Right
Firm #1	Top	#1) 16 #2) 28	#1) 32 #2) 36
	Bottom	#1) 20 #2) 16	#1) 28 #2) 24

#### 4. Top-Right

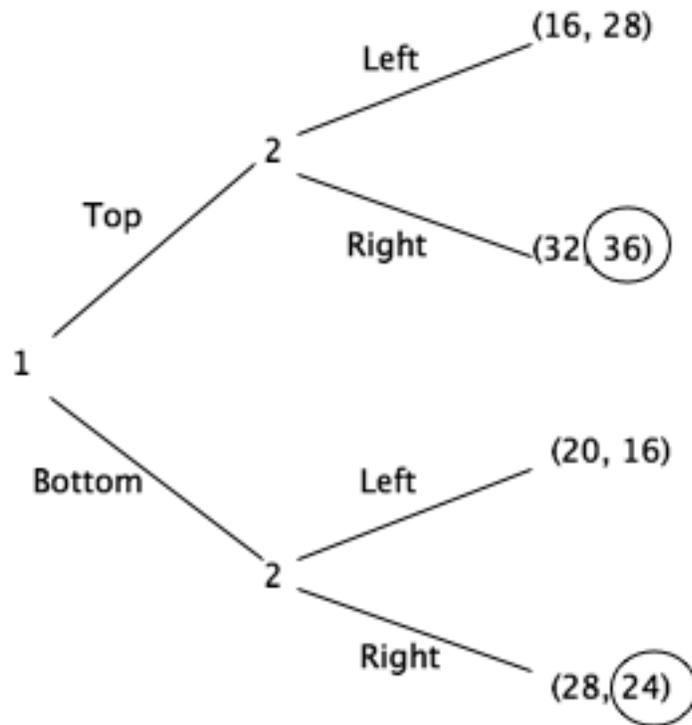
First, you need to turn the table into a decision tree where Firm #1 goes first.



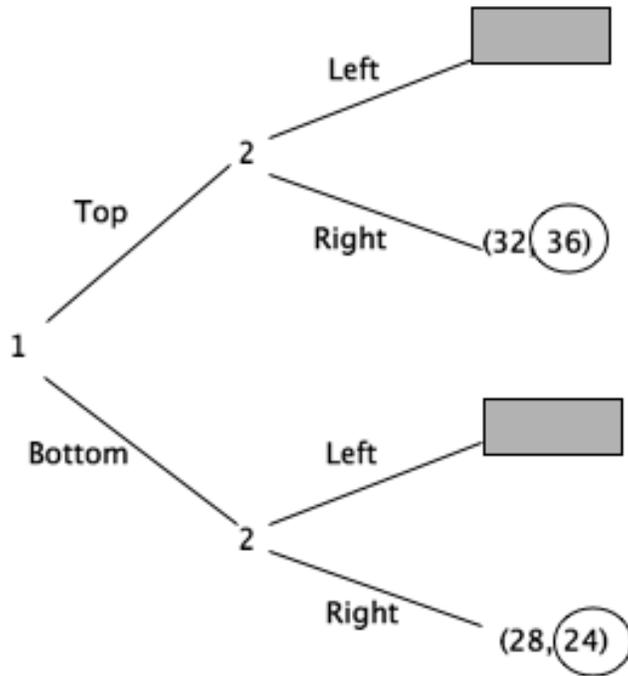
What will Firm #2 do if Firm #1 selects top? Firm #2 will select right because  $36 > 28$ .



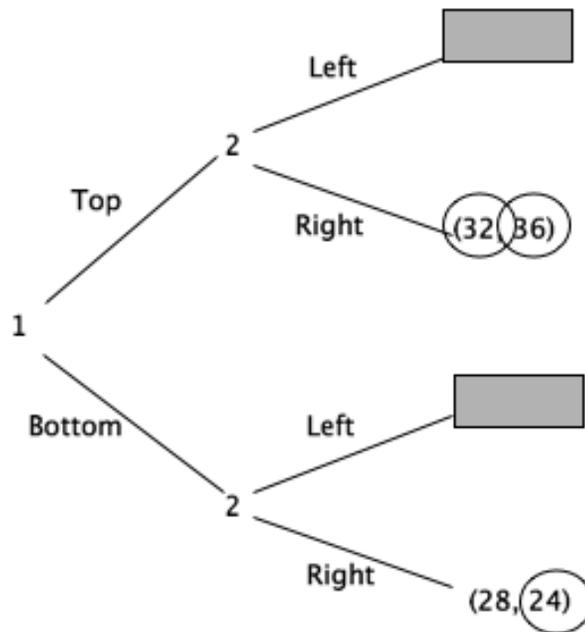
What will Firm #2 do if Firm #1 select bottom? Firm #2 will select right because  $24 > 16$ .



**Firm #1 knows that Firm #2 will always select right** – This means that top-left and bottom-left are not possible options for Firm #1.



**Firm #1 will select top because  $32 > 28$**  – Firm #1 selects the highest payoff based on the knowledge that top-left and bottom-left are not possible outcomes.



5. The players agree to cooperate at first. Then for each subsequent period, players will do what their opponent did in the previous period.

6. 3 Gatorade and 2 Ice Cream

We were given the total utility of Gatorade and ice cream in the table provided; however, we need to solve for marginal utility to answer the question. Marginal utility is the change in total utility when consuming an additional unit. Then we need to find marginal utility per dollar by dividing marginal utility by the price of Gatorade and ice cream.

Units of Gatorade	Total Utility Gatorade	Marginal Utility Gatorade	Marginal Utility per Dollar	Quantity of Ice Cream	Total Utility Ice Cream	Marginal Utility Ice Cream	Marginal Utility per Dollar
1	40	40	$40 / 2 = 20$	1	66	66	$66 / 3 = 22$
2	72	32	$32 / 2 = 16$	2	108	42	$42 / 3 = 14$
3	96	24	$24 / 2 = 12$	3	132	24	$24 / 3 = 8$
4	116	20	$20 / 2 = 10$	4	141	9	$9 / 3 = 3$

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 1<sup>st</sup> Gatorade or your 2<sup>nd</sup> ice cream. Often people will jump to comparing the 2<sup>nd</sup> Gatorade to the 2<sup>nd</sup> ice cream; however, you have not purchased your 1<sup>st</sup> Gatorade yet so you need to decide if you want to purchase your 1<sup>st</sup> 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 1<sup>st</sup> Gatorade because your 1<sup>st</sup> 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 2<sup>nd</sup> Gatorade to purchasing your 2<sup>nd</sup> ice cream because you have purchased 1 Gatorade and 1 ice cream at this point. Your 2<sup>nd</sup> Gatorade gives you more utility per dollar spent so you will purchase a 2<sup>nd</sup> 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 2<sup>nd</sup> ice cream because your second ice cream gave you more utility per dollar than your 3<sup>rd</sup> 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 3<sup>rd</sup> Gatorade. Your third Gatorade gives you more utility per dollar than your 3<sup>rd</sup> 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 3<sup>rd</sup> 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.

7. All the following are examples of irrational consumer behavior

- **Misperceptions of opportunity costs** – It is important that opportunity costs are correctly accounted for
- **Overconfidence** – Individuals often overestimate their abilities
- **Unrealistic expectations about future behavior** – People are overconfident about the future
- **Counting dollars unequally** – Individuals use “mental accounting” that leads them to value some dollars more than others even though all dollars have equal value
- **Loss aversion** – When individuals are overly sensitive to losing money
- **Status quo bias** – A tendency to avoid making decisions
- **Taking sunk costs into account** – Sunk costs are irrelevant to future decision making

8. Automobiles, Athletic footwear, and Cigarettes

9. C – Strategic dependence. The actions of one firm, will directly impact the actions of the other firms in the market.

10. If American charges \$420 for tickets to NYC, the airline will be able to sell 2,000 tickets.  
Total profit will be \$640,000.

$$\text{Profit} = (\$420 - \$100) \times 2,000 = \$640,000$$

If American charges \$135 for tickets to NYC, the airline will be able to sell 3,000 tickets.  
Total profit will be \$105,000.

$$\text{Profit} = (\$135 - \$100) \times 3,000 = \$105,000$$

If American is able to charge the different customer groups different prices based on their willingness to pay, the total profit will be \$675,000.

$$\text{Profit} = (\$420 - \$100)(2,000) + (\$135 - \$100)(1,000) = \$675,000$$

American will sell as many tickets as it can to the business travelers because they are willing to purchase tickets at the higher price. Business travelers are willing to purchase 2,000 tickets at a price of \$420. The airline still has 1,000 unsold seats at a price of \$420 that it can sell to students for \$135 per ticket. So, the airline will sell the remaining 1,000 tickets to students because the price students are willing to pay is greater than the airlines marginal cost per passenger.

In this example, business travelers have inelastic demand and students have elastic demand.

Business travelers are less sensitive than students to changes in price.

11. The following three conditions must hold true for a firm to be able to price discriminate

1. The firm must face a downward sloping demand curve
2. The firm must be able to easily and cheaply identify buyers or groups of buyers with predictably different elasticities of demand
3. No arbitrage, it must be difficult to resell the good

12. Perfect price discrimination is considered to be efficient because the last unit is sold at the point where  $P = MC$ .

Perfect price discrimination converts what was consumer surplus or DWL into producer surplus. There is no DWL with perfect price discrimination.

13. 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 ice cream = 15

14. Less X, More Y

We are not currently optimizing consumption because the bang for the buck for X and Y are not equal. We should buy less of good X and more of good Y until the marginal utility per dollar is equal for the two goods.

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

Band for the buck Y =  $8 / \$2 = 4$  utils per dollar

15. More X, Less Y

We are not currently optimizing consumption because the bang for the buck for X and Y are not equal. We should buy more of good X and less of good Y until the marginal utility per dollar is equal for the two goods.

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

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

16. No change in consumption

We are currently optimizing consumption because the bang for the buck for X and Y are equal.

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

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

17. 4 utils

Ice Cream			
Quantity	Total Utility	Marginal Utility	Marginal Utility per Dollar
0	0	-	
1	120	120	
2	200	80	
3	260	60	
4	280	20	
5	284	4	
6	284	0	

Gatorade			
Quantity	Total Utility	Marginal Utility	Marginal Utility per Dollar
0	0	-	
1	400	400	
2	800	400	
3	1,000	200	
4	1,100	100	
5	1,150	50	
6	1,160	10	

18. 200 utils

19. 3 Gatorade and 3 ice cream

Ice Cream			
Quantity	Total Utility	Marginal Utility	Marginal Utility per Dollar
0	0	-	
1	120	120	30
2	200	80	20
3	260	60	15
4	280	20	5
5	284	4	1
6	284	0	0

Gatorade			
Quantity	Total Utility	Marginal Utility	Marginal Utility per Dollar
0	0	-	
1	400	400	40
2	800	400	40
3	1,000	200	20
4	1,100	100	10
5	1,150	50	5
6	1,160	10	1

20. 6 Gatorade and 5 ice cream

Ice Cream			
Quantity	Total Utility	Marginal Utility	Marginal Utility per Dollar
0	0	-	
1	120	120	30
2	200	80	20
3	260	60	15
4	280	20	5
5	284	4	1
6	284	0	0

Gatorade			
Quantity	Total Utility	Marginal Utility	Marginal Utility per Dollar
0	0	-	
1	400	400	40
2	800	400	40
3	1,000	200	20
4	1,100	100	10
5	1,150	50	5
6	1,160	10	1

21. The price of Gatorade is five times as much as ice cream. We no longer know the price of Gatorade and ice cream; however, we do know the marginal utility of four units for each.

$$\text{MU 4}^{\text{th}} \text{ ice cream} = 20$$

$$\text{MU 4}^{\text{th}} \text{ Gatorade} = 100$$

Gatorade must cost 5 times as much as ice cream. If the price of Gatorade is 5 times more than the price of ice cream, the MU per dollar will be equal for Gatorade and ice cream.

22. 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.

23. Price = Marginal Cost = \$22

Quantity at Price of \$22 =  $170 - 5 \cdot (22) = 60$

Entry fee = Entire area below the demand curve and above marginal cost

Entry Fee =  $\frac{1}{2} \cdot (170 - 22) \cdot 60 = \$4,440$

24. It is rare that a monopolist will know its exact number of customers and amount of fixed costs prior to setting price.

25. B – The difference between the amount an individual is willing to pay for a good and what the individual actually has to pay for the good.

26. B – Price discrimination will give the monopolist higher profits than a single price for all customers

27. A monopolist will increase price and decrease quantity to maximize profits when compared to perfect competition because a monopolist will produce where  $MR = MC$

