

1. _____/20	4. _____/24
2. _____/20	5. _____/10
3. _____/20	
Total: _____/94	

Name: _____
 Team: _____
 Graded by: _____

Unit 3: Costs of Production and Perfect Competition Problem Set #3

1. Explain an example that demonstrates the “real world” application of each of the following. Define the terms in your own words and use examples that clearly demonstrate your understanding of each concept.
 - a. The Law of Diminishing Marginal Returns (____/5)
 - b. Fixed Costs, Variable Costs, and Total Cost (____/5)
 - c. Accounting Profit and Economic Profit (____/5)
 - d. Economies of Scale and Diseconomies of Scale (____/5)
2. Productivity and Costs
 - a. Complete the worksheet “Production Function for Tony’s Hat Store” (____/5)
 - b. Complete worksheet titled “Cost and Competitive Market Supply” (____/5)
 - c. Explain the relationship between the marginal product curve and the marginal cost curve. In your response, explain why the marginal cost curve is “U” shaped using numerical examples. (____/5)
3. Below is information regarding Cory’s Surfboard Inc. Complete the table and do the following (____/5):
 - a. On a large graph, plot the MC, AFC, AVC, and ATC curves from this data (____/5)
 - b. EXPLAIN what would happen to each of Cory’s per unit cost curves if the price of Styrofoam blanks (a variable input) increases. How would the cost curves change if there were an increase in his rent (a fixed input)? Explain why the results are different. (____/5)
 - c. If the market for surfboards was perfectly competitive and the market price was \$150, how many surfboards should Cory make and how much profit will he make for EACH surfboard? Draw the firms demand on your graph in a. Explain how you got your answer. (____/5)

Total Product	Variable Costs (TVC)	Total Cost (TC)	Average Fixed Cost (AFC)	Average Variable Cost (AVC)	Average Total Cost (ATC)	Marginal Cost (MC)
0	\$0	\$100				
1	60					
2	90					
3	130					
4	180					
5	250					
6	340					
7	490					
8	680					
4. Complete the following practice FRQs:
 Take Home FRQs (____/24)
5. Assume that apples are an inferior good. Draw a perfectly competitive market for apples and a firm selling apples in the long run equilibrium where price is \$10 and the firm’s equilibrium quantity is 50. Explain the following situations graphically and in words (Draw and label side-by-side graphs for each).
 - a. EXPLAIN what happens in the short-run if incomes increases by 15%? (____/5)
 - b. EXPLAIN the process by which this market returns to the long-run equilibrium (____/5)

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Bestmilk, a typical profit-maximizing dairy firm, is operating in a constant-cost, perfectly competitive industry that is in long-run equilibrium.

- (a) Draw correctly labeled side-by-side graphs for the dairy market and for Bestmilk and show each of the following.
 - (i) Price and output for the industry
 - (ii) Price and output for Bestmilk
- (b) Assume that milk is a normal good and that consumer income falls. Assume that Bestmilk continues to produce. On your graphs in part (a), show the effect of the decrease in income on each of the following in the short run.
 - (i) Price and output for the industry
 - (ii) Price and output for Bestmilk
 - (iii) Area of loss or profit for Bestmilk
- (c) Following the decrease in consumer income, what must be true for Bestmilk to continue to produce in the short run?
- (d) Assume that the industry adjusts to a new long-run equilibrium. Compare the following between the initial and the new long-run equilibrium.
 - (i) Price in the industry
 - (ii) Output of a typical firm
 - (iii) The number of firms in the dairy industry

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- I. J & P Company operates in a perfectly competitive market for smoke alarms. J & P is currently earning short-run positive economic profits.
 - (a) Using correctly labeled side-by-side graphs for the smoke alarm market and J & P Company, indicate each of the following for both the market and the J & P Company.
 - (i) Price
 - (ii) Output
 - (b) In the graph in part (a) for J & P, indicate the area of economic profits that J & P Company is earning in the short run.
 - (c) Using a new set of correctly labeled side-by-side graphs for the smoke alarm market and J & P Company, show what will happen in the long run to each of the following.
 - (i) Long-run equilibrium price and quantity in the market
 - (ii) Long-run equilibrium price and quantity for J & P Company
 - (d) Assume that purchases of smoke alarms create positive externalities. Draw a correctly labeled graph of the smoke alarm market.
 - (i) Label the market equilibrium quantity as Q_m .
 - (ii) Label the socially optimum equilibrium quantity as Q_s .
 - (e) Identify one government policy that could be implemented to encourage the industry to produce the socially optimum level of smoke alarms.

1. ____/40	4. ____/5
2. ____/10	5. ____/5
3. ____/10	6. ____/20
Total: ____/95	

Name: _____

Team: _____

Unit 4: Imperfect Competition Problem Set #4

In considering the market behavior of a monopolist, students identify and examine the sources of monopoly power and understand the relationship between the monopolist's demand curve and its marginal revenue curve. Students learn how the monopoly's total revenue changes along its demand curve as price varies. Having learned the behavior of monopolies and perfect competition, students should compare a monopolist's price, level of output, and profit with those of a firm operating in a perfectly competitive market. By paying particular attention to the concept of allocative efficiency, students learn how and why competitive firms achieve an efficient allocation of resources, whereas monopolists do not. The concept of deadweight loss is a good device to show the efficiency loss due to monopoly. The model of price discrimination provides another dimension of monopoly behavior that students need to learn and understand.

1. Practice FRQs (____/40)
2. Complete the following worksheets:
 - a. Market Structures Venn Diagram (____/10)
3. Use the chart to complete the following:
 - a. Explain why demand equals marginal revenue for perfectly competitive firms but marginal revenue is less than the demand curve for all imperfectly competitive firms. Use a SPECIFIC numerical example from the chart in your explanation. (____/5)
 - b. On a large graph, PLOT the demand and marginal revenue curves. On a new graph below, plot the Total Revenue. Use the total revenue test to EXPLAIN the elastic and inelastic range of the demand curve. Be sure to identify the elastic and inelastic ranges. (____/5)

Price	Quantity Demanded	Total Revenue	Marginal Revenue
\$11.00	0		
10	1		
9	2		
8	3		
7	4		
6	5		
5	6		
4	7		
3	8		
2	9		

4. Monopolistic Competition

Draw a monopolistically competitive firm in long-run equilibrium. Explain why the firm is not allocatively efficient or productively efficiency. Define excess capacity and identify it on the graph (____/10)

5. Oligopolies

Complete the following questions:

		City Wheels	
		Maintain Fare	Lower Fare
Easy Ride	Maintain Fare	\$150, \$180	\$130, \$120
	Lower Fare	\$120, \$130	\$140, \$110

- (a) If Easy Ride chooses to maintain its current fare, which strategy is better for City Wheels? Explain.
- (b) Is there a dominant strategy for Easy Ride? Explain.
- (c) Assume that the companies must make their decisions simultaneously and do not cooperate. What will be the daily profit for each firm?
- (d) If these two firms could cooperate, which strategy would each firm choose?
- (e) Suppose that the local government decides to provide a subsidy of \$40 per day to the bus companies. However, only a company that agrees to lower its fare is eligible to receive the subsidy. Draw a new payoff matrix to reflect the change in government policy.

6. Unit Study Guides

Complete the following study guides:

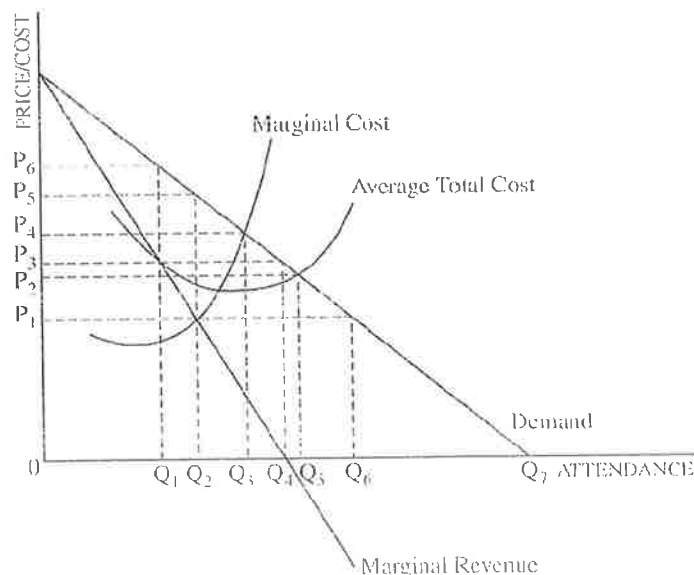
- a. Unit 3: Production Costs and Perfect Competition (____/10)
- b. Unit 4: Imperfect Competition (____/10)

Name: _____

Team: _____

Problem Set FRQs

1. Market structures differ from one another in many respects. Consider two profit-maximizing firms that earn short-run economic profits. One is a perfectly competitive firm and the other is a monopoly.
 - (a) For each firm, draw a correctly labeled graph showing the following.
 - (i) Price
 - (ii) Quantity of output
 - (iii) Area of economic profits
 - (b) For each firm, explain the relationship between price and marginal revenue.
 - (c) For each firm, explain how the economic profits would most likely change in the long run.
 - (d) Label the area that represents the deadweight loss on the graph for the monopoly firm drawn in (a). Explain what this deadweight loss represents.



Name: _____

Team: _____

2. There is one art museum on the island of Watsonia. The museum's demand and cost curves are shown in the graph above. The museum currently relies on an admission charge for some of its funding. Its directors are debating about how to set the admission charge.

(a) Using the labeling of the graph above, identify the price and quantity associated with the following objectives.

(i) The museum maximizes its profit.

(ii) The museum maximizes its total revenue.

(iii) The museum maximizes the sum of consumer and producer surplus.

(iv) The museum maximizes its attendance, as long as it breaks even.

(b) When the attendance is Q_1 , is the demand price elastic, inelastic, or unit elastic? Explain.

3. Assume that a profit-maximizing firm in a monopolistically competitive industry is in long-run equilibrium.

(a) Draw a correctly labeled graph that shows the profit-maximizing firm's price and output.

(b) Assume that the city in which this industry operates eliminates the business license fee (a fixed cost) for all firms in this industry. How does the elimination of the license fee affect each of the following for the individual firm in the short run? Explain your answers.

(i) Output

(ii) Economic profits

Name: _____
 Team: _____

Unit 3: Costs of Production and Perfect Competition

Production and the Law of Diminishing Marginal Returns*

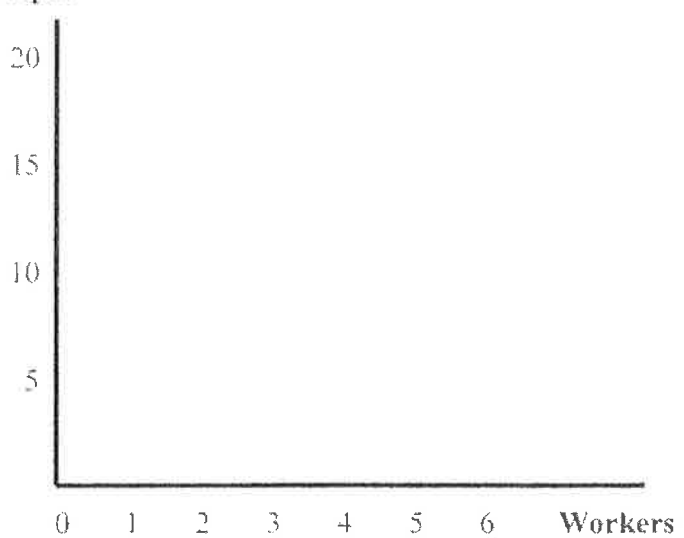
Calculate MP. Plot TP and MP on Graph

Number of Workers	Total Product	Marginal Product
0	0	
1	5	
2	15	
3	19	
4	20	
5	20	
6	18	

Define the Law of Diminishing Marginal Returns

After which worker does diminishing marginal returns set in?

Output



Identify the three stages of returns: increasing, decreasing, and negative marginal returns

Revenue and Costs* (Define the following)

Total Revenue-

Accounting Profit-

Economic Profit-

Normal Profit-

Fixed Cost (FC)-

Variable Cost (VC)-

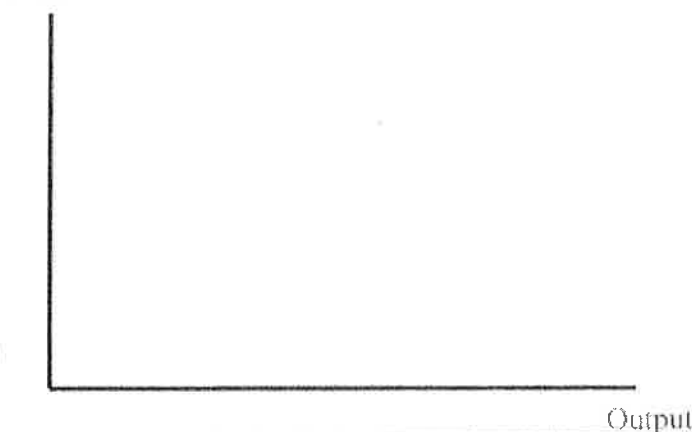
Total Cost (TC)-

Marginal Cost (MC)-

Short Run Cost Curves* (at least one fixed resource)

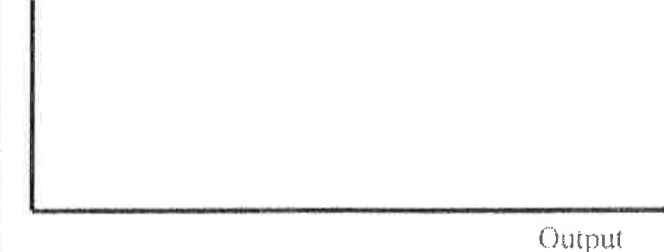
Draw and Label ATC, AVC, and MC

Costs



Long-Run Cost Curves (all resources are variable)

Costs



Economies of Scale-

Diseconomies of Scale-

Name: _____
 Team: _____

Calculating ATC, AVC, AFC, and MC

Fill in the blanks for a firm producing boxes of oranges :

Output (box)	Variable Cost	Total Cost	AVC	AFC	ATC	MC
0	\$0	\$10	-	-	-	-
1	20					
2	30					
3	60			3.33	23.3	
4	100			2.5	27.5	

Assume this firm is in a perfectly competitive market and the price is \$35 for each box.

1. How many boxes should they produce? Why?

2. Calculate the profit at that quantity.

Shut Down Point*

Shut Down Rule:

Short-Run Supply Curve:

Per-Unit vs. Lump-Sum*

1. A per unit tax shifts _____
 so quantity will _____.

2. A lump sum tax shifts _____
 so quantity will _____.

Graphing Perfect Competition*

Draw side-by-side graphs showing a perfectly competitive market and firm. Draw the firm making short-run profit

List (in order) what will happen in the long-run

Market

P _____ Q _____

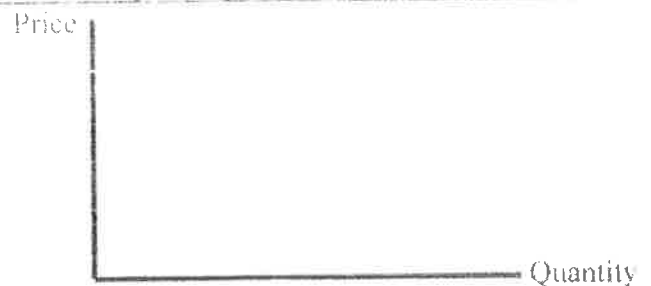
Firm

P _____ Q _____

Perfectly Competitive Firm Making a Loss



Perfectly Competitive Firm in Long-Run*



This firm has both type of efficiency:

- 1.
- 2.

*See videos on YouTube channel ACDCLeadership

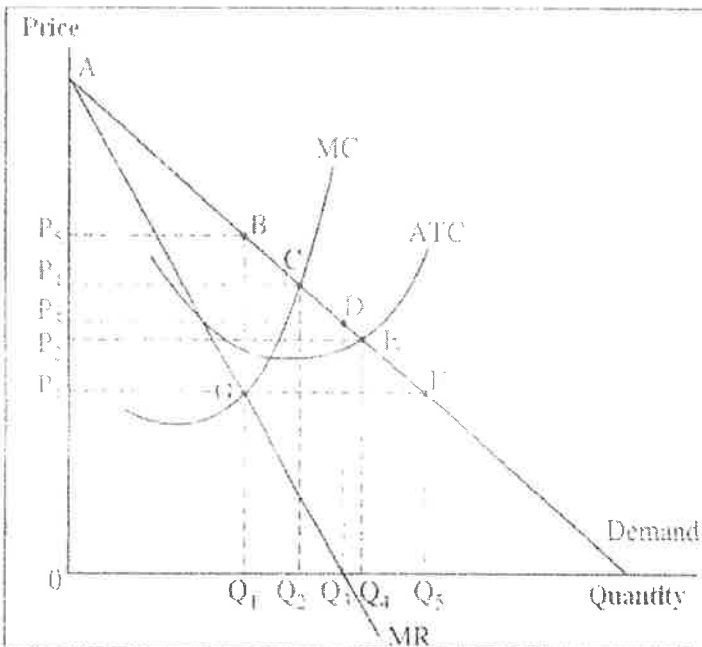
Name: _____
 Team: _____

Unit 4: Imperfect Competition

Characteristics of the Four Market Structures

Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Demand and Marginal Revenue*		Elastic and Inelastic Range*	
Why is demand greater than marginal revenue for all imperfectly competitive firms?		Price Quantity Total Revenue Quantity	
Why are monopolies inefficient?			
1. 2. 3.			
Monopoly Graph (profit)*			
Draw and label a Monopoly making profit			
Price Quantity			
Monopoly Graph (loss)		Price Discriminating Monopoly*	
Draw and label a Monopoly making profit		Draw and label a price discriminating monopoly	
Price Quantity		Price Quantity	

Name: _____
 Team: _____



Monopoly Practice*

For a Competitive Market

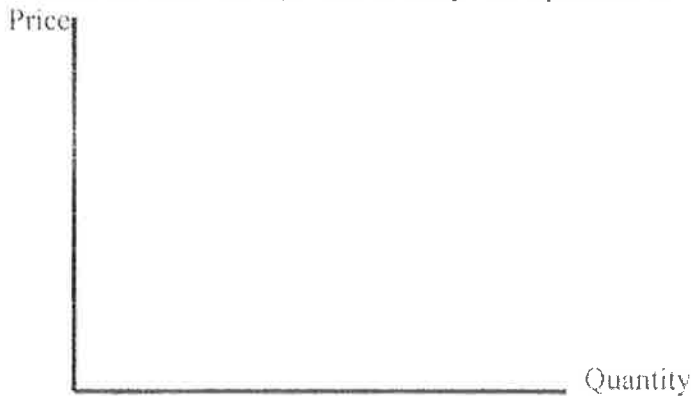
1. P and Q
2. Consumer Surplus

For a Monopoly

3. P and Q Unregulated
4. P and Q Socially Optimal
5. P and Q Fair Return
6. Consumer Surplus
7. Dead Weight Loss
8. Q where TR is Maximized
9. Q if it price discriminates
10. Elastic Range of the Demand Curve
11. Per unit tax causes P _____ and Q _____
12. Lump sum subsidy causes P _____ and Q _____

Monopolistic Competition*

Draw a Mono. Comp. firm in long-run equilibrium



Excess Capacity (define below and label on graph)

If a monopolistically competitive firm is making a profit in the short-run, what will happen to the demand and number of firms in the long run?

Oligopoly

1. If David decides to advertise now and Lindsey decides to do it later, what is David's expected profit?
2. What is Lindsey's dominant strategy?
3. What is David's dominant strategy?
4. If both owners have the information but do not actively collude, what will be the outcome?

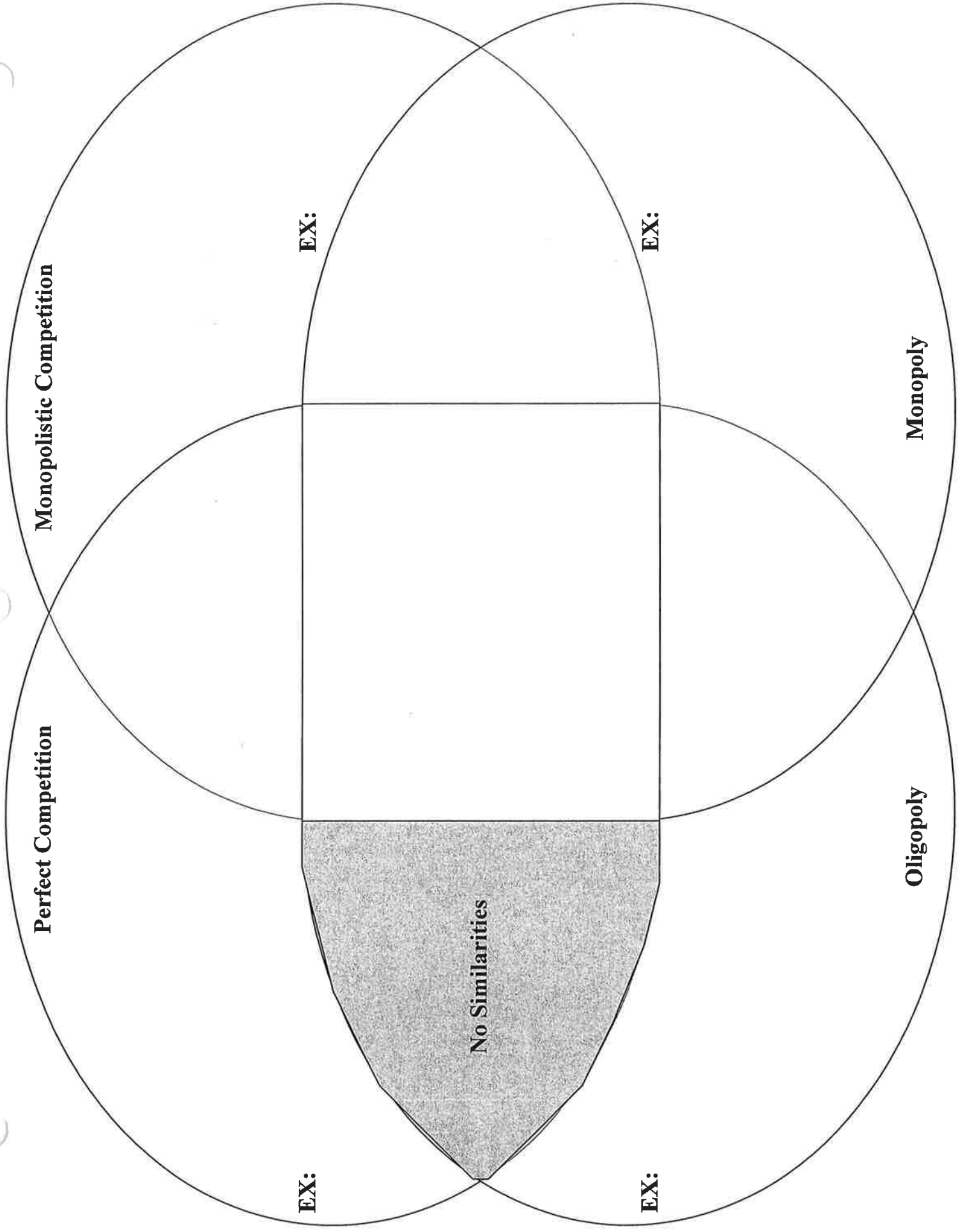
Assume the advertising company offers a deal that increases the profit for both owners by \$2,000 but only if they advertise later. Based on these changes:

5. What is Lindsey's dominant strategy?
6. What is David's dominant strategy?

Assume that two business owners are deciding between advertising now and advertising later. The chart shows expected profit with Lindsey's on the left

		David	
		Now	Later
Lindsey	Now	\$5,000, \$4,000	\$3,000, \$3,500
	Later	\$900, \$1,000	\$1,500, \$1,800

*See videos on YouTube channel ACDCLeadership



1. ____/15
 2. ____/17
 3. ____/12
 4. ____/21
 Total: ____/65

Name: _____
 Team: _____

AP Microeconomics Unit V: The Factor (Resource) Market Problem Set #5

1. (____/15) Define the term and explain a situation that demonstrates the ‘real world’ application of each of the following. Make sure your example clearly demonstrates your understanding of each concept.
 - a. Derived Demand (____/5)
 - b. Marginal Revenue Product (MRP) and Marginal Resource Cost (MRC) (____/5)
 - c. Monopsony (____/5)
2. (____/17) Use the chart regarding a perfectly competitive Yo-Yo factory to complete the following:
 - a. Fully explain why the number of yo-yos produced increases at a decreasing rate as more workers are hired. Identify and explain the three stages of returns. (____/5)
 - b. Explain how a firm decides how many workers to hire. If the wage was constant at \$25 per day, how many workers should be hired? Explain how you got your answer. (____/5)
 - c. Assume there is an increase in demand of yo-yos and they are now \$3 each. Explain how the level of employment be affected. How many workers should be hired? Why did it change? (____/5)
 - d. Complete the chart below. (____/2)

Number of Workers	Output (Quantity)	Marginal Product	Price of Yo-Yos	Total Revenue	Marginal Revenue Product
0	0	-----	\$2		----
1	20				
2	50				
3	70				
4	85				
5	95				
6	100				
7	103				
8	104				
9	100				

3. (____/12) Complete the attached 2 page worksheet entitled, “How Wages are Determined in Competitive Labor Markets.” Make sure to use complete sentences AND fully explain your answers.
4. (____/21) Complete the attached practice FRQs.
 - a. FRQ #1 (____/8)
 - b. FRQ#2 (____/13)

1. P & L is a profit-maximizing shirt-manufacturing firm. The firm can sell all the shirts it can produce to retailers at a price of \$20 each. P & L can hire all of the workers it wants at a market wage of \$120 per day per worker. The table below shows the firm's short-run production function.

Number of Workers	Number of Shirts per Day
0	0
1	10
2	25
3	45
4	60
5	72
6	80
7	85
8	82

- In what kind of market structure does this firm sell its output? How can you tell?
- In what kind of market structure does this firm hire its workers? How can you tell?
- Calculate the marginal revenue product of the third worker. Show your work.
- How many workers should the firm hire to maximize profit? Explain.

2.

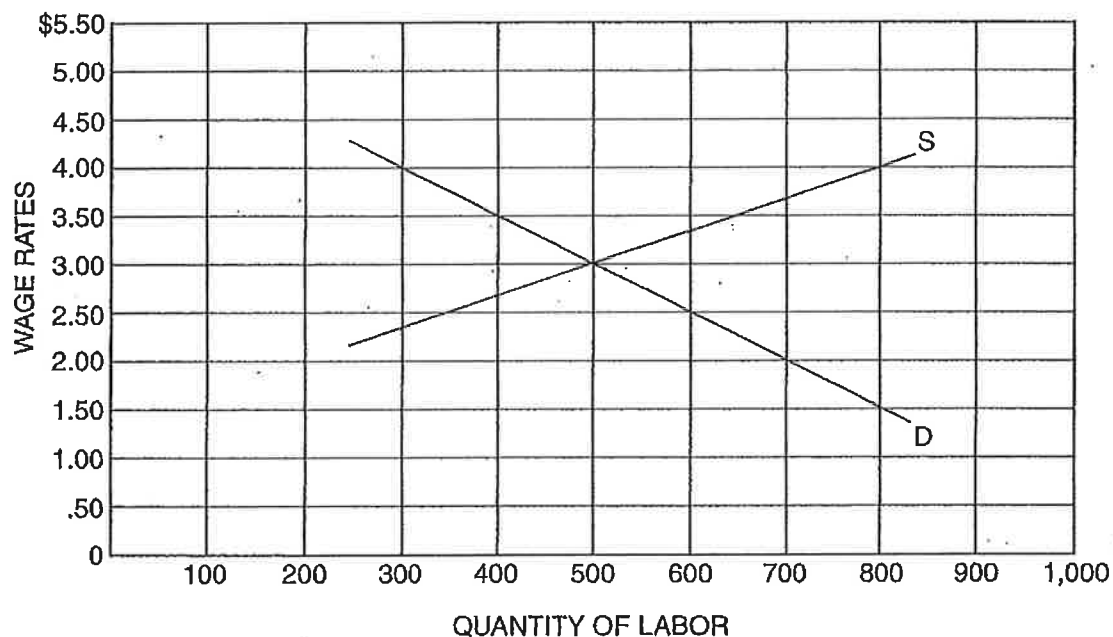
Petsall Corporation is a profit-maximizing monopolist. It sells a patented rabies vaccine for pets and earns economic profits.

- Draw a correctly labeled graph that shows each of the following for Petsall.
 - Output and price of the vaccine
 - Area of economic profits
- Assume that Petsall hires its production workers in a perfectly competitive labor market at the wage rate of \$20 per hour.
 - State the marginal conditions for hiring the profit-maximizing amount of labor.
 - Draw a correctly labeled graph that shows the labor supply and demand curves for Petsall and indicate the profit-maximizing quantity of labor.
- Suppose that the market wage rate now falls to \$15 per hour. Show on your diagram in (b) (ii) how each of the following would be affected.
 - The supply of labor to Petsall
 - The amount of labor Petsall would hire
- Given the lower wage rate in (c), indicate how each of the following would change.
 - Total fixed cost
 - Marginal cost
 - Price of the product

How Wages Are Determined in Competitive Labor Markets



Figure 48.1
Wages and Labor



Use Figure 48.1, which shows the supply and demand curves for a perfectly competitive labor market in a perfectly competitive product market, to answer these questions:

1. What two factors affect the demand for labor?
2. How does marginal revenue product affect the demand for labor?
3. Why is the demand curve for labor downward sloping?

Adapted from Robert W. Pulsinelli and Roger LeRoy Miller, *Student Learning Guide to Accompany Economics Today*, 8th edition (New York: HarperCollins College Publishers, 1994).

4. What determines the market supply of labor?
5. Why is the market supply curve for labor upward sloping?
6. What is the equilibrium wage in this labor market? _____
7. How many workers will be hired in this labor market? _____
8. If a minimum-wage law raises the minimum wage to \$4.00 an hour, what quantity of labor will be supplied? _____
9. At a minimum wage of \$4.00 an hour, what quantity of labor will be demanded? _____
10. How many workers would be laid off or would lose their jobs because of this minimum wage?

11. How many workers entered the labor force seeking a job because of this minimum wage?

12. If the demand for labor were more inelastic, would more or fewer workers lose their jobs because of this minimum wage? _____
13. Would skilled or unskilled workers be more likely to lose their jobs because of a minimum-wage law? _____
14. Who benefits from the minimum wage?
15. Who is hurt by the minimum wage?
16. Do you favor a higher minimum wage? Why or why not?

- | | |
|----------------|------------|
| 1. ____/10 | 4. ____/15 |
| 2. ____/20 | 5. ____/25 |
| 3. ____/10 | |
| Total: ____/80 | |

Name: _____
Team: _____

Unit 6: Market Failures and the Role of the Government

Problem Set #6

1. Public Goods

- Identify and explain the two characteristics of public goods. Give and explain examples. (____/5)
- Explain why the public sector and not the private sector provides public goods. (____/5)

2. Externalities

- (____/10) Assume excessively large SUVs include spillover costs that are not borne by the initial consumer but rather society as a whole.
 - Explain two negative externalities associated with SUVs. Who pays the external costs?
 - Use a supply and demand graph to illustrate a negative externality. Identify the current price and output and the socially optimal price and output.
 - Use MSB and MSC to explain if SUVs are being overproduced or under produced by the free market. Explain why the free market failed?
 - Explain what the government must do to fix this negative externality. Draw on a new graph.
- (____/10) Assume the creation of city parks has spillover benefits that improve society as a whole.
 - Explain two positive externalities associated with making more parks. Who receives the external benefits?
 - Use a supply and demand graph to illustrate a positive externality. Identify the current price and output and the socially optimal price and output.
 - Use MSB and MSC to explain if parks are being overproduced or under produced by the free market. Explain why the free market failed?
 - Explain what the government must do to fix the positive externality. Draw on a new graph.

3. Antitrust Laws

- Explain the purpose of antitrust policies. In your response, explain why monopolies are inefficient compared to perfect competition. Draw a monopoly and explain the difference between regulating at the socially optimal price and regulating at the fair return price (____/5)
- Explain if the government should tax or subsidize a monopoly to get them to produce the socially optimal quantity. Make sure your answer clearly explains why. (____/5)

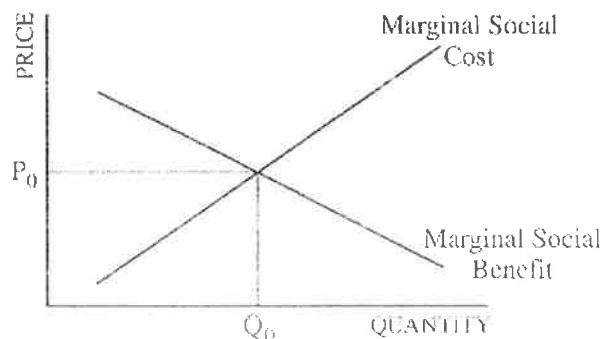
4. Redistribution of Income

- Define and give examples of each type of tax: Progressive, Proportional, and Regressive. (____/5)
- The average family income in America in 2001 was \$66,863. Identify why this is misleading and explain why the Lorenz Curve is an effective way to measure income distribution. Draw the curve to illustrate your point. (____/10)

5. (____/25) Practice FRQs

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2. The graph below shows the price (P_0) and quantity (Q_0) at which there is an efficient allocation of resources.



However, in some cases the market fails to allocate resources efficiently.

- (a) Assume the chemical industry is polluting the air.

- (i) Using marginal benefit and marginal cost analysis, explain how the chemical industry is misallocating resources.
- (ii) Identify one policy or action the government could take to correct this market failure.

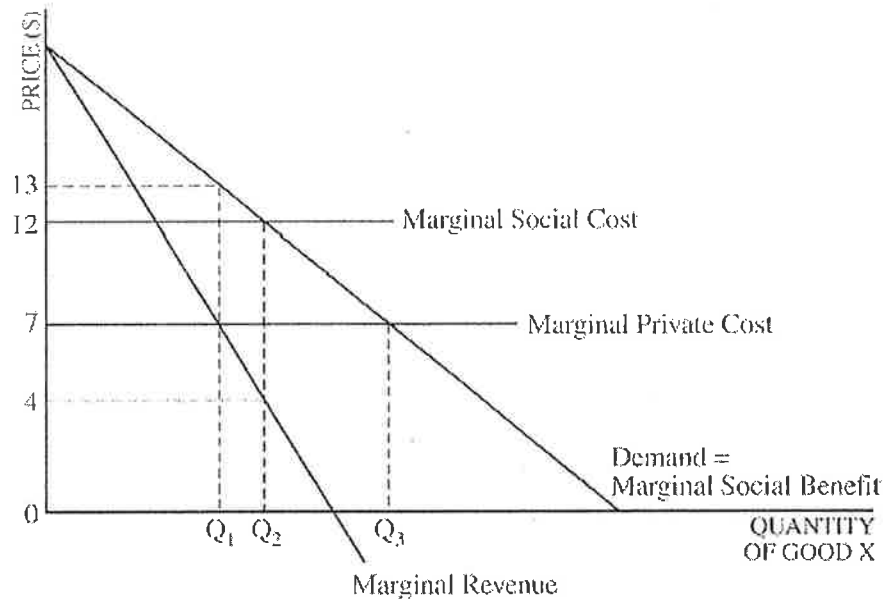
- (b) Assume it is difficult to exclude nonpayers from enjoying the benefits of national defense.

- (i) Using marginal benefit and marginal cost analysis, explain how the private market will fail to produce the efficient level of national defense.
- (ii) Identify one policy or action the government could take to correct this market failure.

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2. The government has decided to take action to reduce the pollution caused by the chemical industry. This industry is composed of profit-maximizing, perfectly competitive firms.

- (a) Identify one policy that the government could implement to reduce pollution.
- (b) Explain the effect the policy you identified in part (a) would have on each of the following for the firms in the chemical industry.
 - (i) Marginal cost
 - (ii) Output
 - (iii) Price
- (c) Explain the effect of the policy you identified in part (a) on the efficiency of the allocation of society's resources.



1. The production of good X creates an externality. The following questions are based on the graph above, which shows the marginal revenue, marginal social benefit, marginal private cost, and marginal social cost associated with the production of good X.
 - (a) Is the externality positive or negative? Explain.
 - (b) Using labeling from the graph above, identify the socially optimum output. Explain how you determined your answer.
 - (c) Suppose that good X is produced by a profit-maximizing monopoly. Answer each of the following.
 - (i) Using labeling from the graph above, identify the unregulated firm's output. Explain how you determined your answer.
 - (ii) To produce the socially optimum output, indicate whether the government should tax or subsidize the firm.
 - (iii) Calculate the dollar value of the needed per-unit tax or subsidy.
 - (d) Suppose that good X is produced in a perfectly competitive industry. Answer each of the following.
 - (i) Using labeling from the graph on the previous page, identify equilibrium output in the absence of regulation. Explain how you determined your answer.
 - (ii) To produce the socially optimum output, indicate whether the government should tax or subsidize the firms in the industry.
 - (iii) Calculate the dollar value of the needed per-unit tax or subsidy.

Name: _____

Team: _____

Microeconomics Review Study Guide

Draw the Following:

1. Perfectly competitive industry. Label equilibrium, and consumers and producers surplus

2. Perfectly competitive industry. Label price and quantity for a price floor and a price ceiling.

3. Draw an inelastic demand curve and show what happens to total revenue when price falls.

4. Draw an elastic demand curve and show what happens to total revenue when price falls.

Identify Five Characteristics of each:

Perfect Competition

Monopolistic Competition

Oligopoly

Monopoly

5. Draw a perfectly competitive industry and firm at P_e . Initially show the firm making a profit. Show what will happen in both the industry and firm in the long run.

Name: _____
Team: _____

Draw the Following:

6. Draw a monopolistically competitive firm in long run equilibrium.

7. Draw a Monopoly making a profit. Label unregulated, socially optimal, and fair-return price.

8. Draw a perfectly competitive labor industry and firm at W_e . Identify the quantity of workers that the firm will hire.

9. Draw a positive externality and identify over or underallocation

10. Draw a negative externality and identify over or underallocation .

11. Draw and label the Circular Flow Model below:

