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Overview

Microeconomics is the branch of economics that analyzes the market behavior of consumers and firms in an attempt to understand the decision-making process of firms and households. Microeconomics is concerned with the interaction between individual buyers and sellers and the factors that influence the choices made by buyers and sellers. In particular, microeconomics focuses on patterns of supply and demand and the determinations of price and output in individual markets.

This textbook is an interactive workbook that will help student master the basic concepts of microeconomics that they would encounter in a microeconomics class. The workbook consists of seven chapters where the student will be required to perform basic fundamental exercises using pencil and eraser to help them master the basic concepts of supply and demand, shifts in supply and demand, equilibrium, elasticity, externalities, public finance, tax systems, consumer choice, production and costs topics such as total and marginal revenue.

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Chapter 1 – Supply & Demand

In the world of economics, behaviors of buyers and sellers are important. Buyers determine the demand side of the market; they include consumers who purchase goods and services. Sellers on the other hand determine the supply side of the market; they produce and sell goods and services. The interface between buyers and sellers determines what the market prices will be and amounts that will be supplied to the market through the forces of supply and demand.

The lessons of supply and demand can be applied to many different types of problems. The law of demand states that when the price of a good or service falls the quantity demanded increases and when the price of a good or service rises the quantity demanded decreases as long as all things remain equal, ceteris paribus. The formula used to determine how this happens is shown below.

\[ P \uparrow \Rightarrow Q_D \downarrow \text{ and } P \downarrow \Rightarrow Q_D \uparrow \]

This chapter will contain a series of four working exercises with various scenarios to help reinforce the student’s understanding on how supply and demand work. These exercises include the topics:

- Supply Schedules
- Supply Curves
- Demand Curves
- Demand Shifts
- Supply Shifts
Exercise 1

This exercise is designed to help reinforce the student’s understanding of the topic of Supply and Demand. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

Firms supplying goods want to maximize their profits; the higher the price of their product per unit the greater the profitability. When price is low and expenses high companies are less profitable and they will generally produce less. The following is individual supply information for Frank and Company. At $5.00 per pound Frank and Company would be able to supply seven hundred pounds of coffee per month, the rest of the producers 5300, at $4.00 supply of six hundred pounds; the rest of the producers 4400, at $3.00 supply of five hundred pounds, the rest of the producers 3500, and at $2.00 two hundred pounds, the rest of the producers 2800. Any price $2.00 or less company will lose money. In the space to the right create Supply Schedule for Franks and Company and a Market Supply Schedule.

Scenario 2

Using the blank graph to the right create an Individual Supply Curve for Frank and Company based on the information provided above in Scenario 1.
Scenario 3

Using the blank graph to the right to create a Market Supply Curve based on the information provided above in the in Scenario 1.
Exercise 2

This exercise is designed to help reinforce the student’s understanding of the topic of Supply and Demand. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

The following provides Jonathan’s Soup Kitchen supply demands for peanuts that he would serve each month at his church’s soup kitchen before dinner in the upcoming year.

At $6.00 per pound Jonathan’s Soup Kitchen would be able to purchase five pounds of peanuts per month, at $5.00 six pounds; at $4.00 eight pounds; at $3.00 ten pounds; and at $1.00 twelve pounds. In the space to the right create Jonathan’s Soup Kitchen Demand Schedule for Peanuts.

Scenario 2

Using the blank graph to the right and the information provided in Scenario #1, create an Individual Demand Curve for Jonathan’s Soup Kitchen peanut requirements for the upcoming month.
Scenario 3

What would be the Market Supply Schedule if the remaining churches in the Jonathan's Soup Kitchen geographical area were to purchase fifty pounds at $6.00 per pound; sixty pounds at $5.00 per pound; seventy pounds at $4.00 per pound; eighty pounds at $3.00 per pound; and one hundred pounds at $1.00 per pound? In the space to the right, create a Market Demand Schedule for Peanuts.

Make sure that you include all market information as you need to create a complete schedule.

Scenario 4

Using the blank graph to the right, create a Market Demand Curve for peanuts based on the information provided in the above in Scenario #3.
Scenario 5

Use the graph to the right to answer each of the following questions. In the spaces provided indicate whether the movement is a shift or change in demand/supply.

1. A movement from A to B represents _________ in _________.
2. A movement from A to T represents a _________ in _________.
3. A movement from B to A represents _________ in _________.
4. A movement from T to A represents a _________ in _________.

Scenario 6

Use the graph to the right to answer each of the following questions. In the spaces provided indicate whether the movement is a shift or change in demand/supply.

1. A movement from C to D represents _________ in _________.
2. A movement from Z to C represents a _________ in _________.
3. A movement from D to C represents _________ in _________.
4. A movement from C to Z represents a _________ in _________.

Exercise 3

This exercise is designed to help reinforce the student’s understanding of the topic of Shifts in Supply and Demand. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

Use the blank graph to the right to help determine the possible Shift In Demand if the taste for Starbucks coffee was changed but did not improve its taste in fact it was worse. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.

Scenario 2

Use the blank graph to the right to help determine the possible Shift In Demand if income increases and you are dealing with a normal good. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.
**Scenario 3**

Use the blank graph to the right to help determine the possible *Shift In Demand* if income increases and you are dealing with an inferior good. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.

**Scenario 4**

Use the blank graph to the right to help determine the possible *Shift In Demand* for a high end product in Detroit if there is a major layoff at the Ford Plant. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.
Scenario 5

Use the blank graph to the right to help determine the possible *Shift In Demand* if the number of buyers increases in a particular market. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.

---

Scenario 6

Use the blank graph to the right to help determine the possible *Shift In Demand* if a future price increase is expected. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.
Scenario 7

Use the blank graph to the right to help determine the possible *Shift In Demand* for a product if the taste was changed to improve it. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.

Scenario 8

Use the blank graph to the right to help determine the possible *Shift In Demand* for a product if there was an expected change in weather causing snowfall in Florida. Show the direction of your movement using → arrow for positive shifts and ← arrow for negative shifts. Also draw the new demand curve. Briefly explain why this might happen.
Exercise 4

This exercise is designed to help reinforce the student’s understanding of the topic of supply shifts. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

The Orange Patch Farm (OPF) is a grower of oranges and pumpkins. The following provides what Orange Patch Farm would supply for orange juice based on the following prices. At $1.00 per gallon OPF would supply ten thousand gallons of orange juice per season, at $1.50 per gallon OPF would supply fifteen thousand gallons of orange juice per season, at $2.00 per gallon OPF would supply twenty thousand gallons of orange juice per season, and at $3.00 per gallon OPF would supply thirty thousand gallons of orange juice per season. Create an OPF Individual Supply Curve to the right.

Scenario 2

The following provides what Other Producers (OP) would supply for orange juice based on the following prices. At $1.00 per gallon OP would supply a hundred thousand gallons of orange juice per season, at $1.50 per gallon OP would supply one hundred and fifty thousand gallons of orange juice per season, at $2.00 per gallon OP would supply two hundred thousand gallons of orange juice per season, at $3.00 per gallon OP would supply three hundred thousand gallons of orange juice per season. In the space to the right create a Market Supply Schedule for OJ.
Chapter 2 - Equilibrium

As determinants of supply or demand change due to factors such as input prices, prices of similar products, the number of suppliers in a market, consumer expectations, and and changes in technology, the supply/demand curves will shift which cause changes in the equilibrium price and equilibrium quantity. Shifts could be positive shift which would move and supply or demand curve to the right or a negative shift which would move and supply or demand curve to the left. Some shifts could be a combination of large and small together which could cause changes to equilibrium.

This chapter will contain a series of two working exercises with various scenarios to help reinforce the student’s understanding on how equilibrium works. These exercises include the topics:

- Combined Shifts
- Simultaneous Changes in Supply and Demand
- Equilibrium Quantity and Demand
Exercise 1

This exercise is designed to help reinforce the student’s understanding of the topic of shifts in equilibrium. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

Use the diagram to the right to illustrate your answer.

1. Using the graph show simultaneous changes in supply and demand by using a LARGE increase in supply and a SMALL increase in demand.

   A. Describe what happens to the price?
      Answer: ____________________

   B. Describe what happens to the quantity?
      Answer: ____________________

Scenario 2

Use the diagram to the right to illustrate your answer.

1. Using the graph show simultaneous changes in supply and demand, with a SMALL increase in supply and a LARGE increase in demand.

   A. Describe what happens to the price?
      Answer: ____________________

   B. Describe what happens to the quantity?
      Answer: ____________________
Scenario 3

Use the diagram to the right to illustrate your answer.

1. Using the graph show simultaneous changes in supply and demand, with a LARGE decrease in supply and a SMALL decrease in demand.

   A. Describe what happens to the price?
      Answer: ________________

   B. Describe what happens to the quantity?
      Answer: ________________

Scenario 4

Use the diagram to the right to illustrate your answer.

1. Using the graph show simultaneous changes in supply and demand with a SMALL decrease in supply and a LARGE decrease in demand.

   A. Describe what happens to the price?
      Answer: ________________

   B. Describe what happens to the quantity?
      Answer: ________________
Scenario 5

Use the diagram to the right to illustrate your answer.

1. Using the graph show simultaneous changes in supply and demand with a SMALL decrease in supply and a SMALL decrease in demand.

A. Describe what happens to the price?
   Answer: ________________________

B. Describe what happens to the quantity?
   Answer: ________________________

Scenario 6

Use the diagram to the right to illustrate your answer.

1. Using the graph show simultaneous changes in supply and demand with a SMALL decrease in supply and a NO CHANGE in demand.

A. Describe what happens to the price?
   Answer: ________________________

B. Describe what happens to the quantity?
   Answer: ________________________
This exercise is designed to help reinforce the student’s understanding of the topic of shifts in equilibrium. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. **Do not use pen!**

---

**Scenario 1**

The diagram to the right shows the supply and demand curves for SUV’s in a particular geographical area. Assume that all SUV’s sell for the same market-determined price. The diagram shows factors that might cause a shift in the supply and demand curves.

What would be the equilibrium price of an SUV in this market be?

________ per sedan

What would be the equilibrium quantity for SUV’s bought and sold?

________ per month

---

**Scenario 2**

Suppose that the price of an SUV was $35,000.

In this case, there would be ____________ which would exert ____________ pressure on prices.

A. Shortage (excess demand) of 100 SUV’s per month; upward
B. Shortage (excess demand) of 400 SUV’s per month; upward
C. Surplus (excess supply) of 400 SUV’s per month; downward
D. Shortage (excess supply) of 500 SUV’s per month; downward

How much was the demand? __________

---

**Scenario 3**

Suppose that the price of an SUV was $15,000.

In this case, there would be ____________ which would exert ____________ pressure on prices.

A. Shortage (excess demand) of 400 SUV’s per month; upward
B. Shortage (excess demand) of 300 SUV’s per month; upward
C. Surplus (excess demand) of 500 SUV’s per month; downward
D. Surplus (excess supply) of 500 SUV’s per month; downward
How much was supplied? __________

Scenario 4

Suppose that the price of an SUV was $40,000.
In this case, there would be __________ which would exert __________ pressure on prices.
   A. Shortage (excess demand) of 100 SUV’s per month; upward
   B. Shortage (excess demand) of 300 SUV’s per month; upward
   C. Surplus (excess demand) of 500 SUV’s per month; downward
   D. Surplus (excess supply) of 600 SUV’s per month; downward
How much was the demand? __________

Scenario 5

Suppose that the price of an SUV was $20,000.
In this case, there would be __________ which would exert __________ pressure on prices.
   A. Shortage (excess demand) of 100 SUV’s per month; upward
   B. Shortage (excess demand) of 200 SUV’s per month; upward
   C. Surplus (excess demand) of 500 SUV’s per month; downward
   D. Surplus (excess supply) of 600 SUV’s per month; downward
How much was supplied? __________

Scenario 6

The diagram to the right shows the supply and demand curves for oil. Assume that everything is equal, what price will equilibrate the market price for oil?
$ __________ per barrel
The result in equilibration is the Quantity supplied __________ and the Surplus is equal to __________
Chapter 3 – Elasticity

The lessons on the importance of elasticity illustrate how it can have an effect on price and how price increases and decreases can have an impact on quantity demand and how it could effect a firm’s total revenue.

The price elasticity of demand measures the responsiveness of quantity demanded to a change in price. Price elasticity is defined as the percentage change in quantity demanded divided by the percentage change in price. To determine this price elasticity of demand (ED) = percentage change in quantity demanded / percentage change in price.

\[
ED = \frac{\text{Percent Change in Quantity Demanded}}{\text{Percent Change in Price}}
\]

Note that, following the law of demand, price and quantity demanded show an inverse relationship. For this reason, the price elasticity of demand is, in theory, always negative. But in practice and for simplicity, this quantity is always expressed in absolute value terms—that is, as a positive number.

This chapter will contain a series of five working exercises with various scenarios to help reinforce the student’s understanding on how elasticity works. These exercises include the topics:

- Elastic Supply and Demand Curves
- Inelastic Supply and Demand Curves
- The Percent Changes of Price
- The Percent Changes in Quantity Demanded
- Elasticity Of Demand
Exercise 1

This exercise is designed to help reinforce the student’s understanding of the topic of elasticity. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

Refer to the illustration to the right. Which of the graphs best illustrates an elastic demand curve? Circle the letter of your choice.

A. Graph A
B. Graph B
C. Graph C
D. Graph D

Scenario 2

Refer to the illustration to the right. Which of the graphs best illustrates a perfectly elastic demand curve? Circle the letter of your choice.

A. Graph A
B. Graph B
C. Graph C
D. Graph D
Scenario 3

Refer to the illustration to the right. Which of the graphs best illustrates a perfectly inelastic demand curve? Circle the letter of your choice.

A. Graph A  
B. Graph B  
C. Graph C  
D. Graph D

Scenario 4

Using the Figure to the right, calculate the Total Revenue when a) the price is $9.00; b) the price is $8.00; c) the price is $2.00; and d) the price is $1.00. Use the space below to show your formulas and results.
Exercise 2

This exercise is designed to help reinforce the student’s understanding of the topic of elasticity. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

The illustration to the right shows the demand for a good. Use the information below and the illustration to the right to solve the following scenarios.

Table 1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P4</td>
<td>$15.00</td>
</tr>
<tr>
<td>P3</td>
<td>10.00</td>
</tr>
<tr>
<td>P2</td>
<td>6.00</td>
</tr>
<tr>
<td>P1</td>
<td>5.00</td>
</tr>
<tr>
<td>Q1</td>
<td>3.0</td>
</tr>
<tr>
<td>Q2</td>
<td>4.0</td>
</tr>
<tr>
<td>Q3</td>
<td>6.0</td>
</tr>
<tr>
<td>Q4</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Consider the points between X and Y.
The price changes by __________ %
The quantity demanded changes by __________ %
The elasticity of demand is __________
This is considered to be __________

Scenario 2

Use the information from Table 1 and the illustration above to help solve this scenario. Consider the points between Y and Z. The price changes by approximately __________ % and the quantity demanded changes by approximately __________ %. In this region the demand is __________.

Scenario 3

Use the information from Table 1 and the illustration above to help solve this scenario. Consider the points between Z and S. The price changes by approximately __________ % and the quantity demanded changes by approximately __________ %. In this region the elasticity of demand is __________ and is therefore considered to be __________.
The diagram illustrated to the right shows the weekly demand schedule and prices for DVD rentals. Use the information provided to help solve the following scenarios.

Suppose that the cost of DVD rentals were lowered from $4.00 to $3.00.

A. Describe what would happen to total revenue?

B. Describe what would happen to quantity?

C. Describe what the % changes for price and quantity demanded? Use the midpoint to determine answer.

D. Is the demand elastic or inelastic? Use the midpoint to determine answer.

Use the diagram used above to help solve the following scenario. Suppose that the cost of DVD rentals were lowered from $3.00 to $2.00.

A. Describe what would happen to total revenue?

B. Describe what would happen to quantity?

C. Describe what the % changes for price and quantity demanded? Use the midpoint to determine answer.

D. Is the demand elastic or inelastic? Use the midpoint to determine answer.
Exercise 3

This exercise is designed to help reinforce the student’s understanding of the topic of elasticity. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. **Do not use pen!**

Scenario 1

Using a Slope equal to -1;

1. Calculate the % change in price.
2. Calculate the % change in quantity.
3. Calculate the % elasticity of demand.
4. Show the translations of different values of elasticity.
5. Plot the elasticity numbers.

Note the elasticity numbers as you move down the demand curve and show where it is Perfectly Elastic and Perfectly Inelastic.

<table>
<thead>
<tr>
<th>P</th>
<th>Q</th>
<th>% (\Delta P)</th>
<th>% (\Delta Q)</th>
<th>(Ed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 → 9</td>
<td>0 → 1</td>
<td>_____%</td>
<td>_____%</td>
<td>_____</td>
</tr>
<tr>
<td>9 → 8</td>
<td>1 → 2</td>
<td>_____%</td>
<td>_____%</td>
<td>_____</td>
</tr>
</tbody>
</table>
Exercise 4

This exercise is designed to help reinforce the student’s understanding of the topic of elasticity as it effects revenue. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

For most supply and demand curves price elasticity along a curve varies. With most goods we can refer to any particular point or section of a demand or supply curve. At each various point along the curve your elasticity varies. Use the figure to the right to show how elasticity varies along the linear curve by graphing elasticity and graphing the total revenues as it relates to the curve.

1. Where are the elastic points of the Demand Curve? Show this on your graph.
2. Where are the inelastic points of the Demand Curve? Show this on your graph.
3. At what point is it unit elastic? Show this on your graph.

NOTE: Keep in mind Elastic: $E_D > 1$,
Inelastic: $E_D < 1$, Unit Elastic: $E_D = 1$.

What happens to $E_D$ if the price changes from $16 to $18? Change from $4 to $6?
Exercise 5

This exercise is designed to help reinforce the student’s understanding of the topic of elasticity. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake.

Do not use pen!

Scenario 1

1. Use the illustration to the right to determine the following:
   A. What is the % change when the price decreases from $25.00 to $15.00? __________
   B. What is the % change for quantity when the price decreases from $25.00 to $15.00? __________
   C. What is \( E_D \) when the price decreases? __________
   D. What is the Total Revenue? __________
   E. Is demand Elastic or Inelastic? __________

Formula using the Midpoint:

\[
ED = \frac{\text{Percent Change in Quantity Demanded}}{\text{Percent Change in Price}} = \frac{\Delta Q_D / Q_{AVE}}{\Delta P / P_{AVE}}
\]

2. Determine the following using the midpoint formula from above?
   A. What is the ED? ______________
   B. Is demand Elastic or Inelastic? ______________

3. What determination would you make based on your findings?
Chapter 4 – Externalities

Externalities are common in virtually every area of economic activity. They are defined spill-over effects arising from the production and/or consumption of goods and services for which no appropriate compensation is paid. Externalities can cause market failure if the price mechanism does not take into account the full social costs and social benefits of production and consumption.

This chapter will contain a working exercises with various scenarios to help reinforce the student’s understanding of externalities and its effects. These exercises include the topics:

- Private Costs
- Social Costs
- Market Equilibrium
- Efficient Equilibrium
Exercise 1

This exercise is designed to help reinforce the student’s understanding of the topic of externality. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler if necessary so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake.

**Do not use pen!**

Indicate what kind of an externality the following activities create. In the space to the right of each scenario indicate a positive externality, a negative externality, or no externality at all.

<table>
<thead>
<tr>
<th>Positive/ Negative/ None</th>
<th>1. You purchase and drink a bottled water in the hallway during a break from class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. College students are required and can get a free smallpox vaccine shot</td>
</tr>
<tr>
<td></td>
<td>3. At a theater, an audience member’s cell phone rings loudly with a text message</td>
</tr>
<tr>
<td></td>
<td>4. A group of college students gather to clean up trash along a stretch of highway</td>
</tr>
<tr>
<td></td>
<td>5. A next door neighbor has parties and plays loud music while you try to sleep</td>
</tr>
<tr>
<td></td>
<td>6. A biological corporation dumps medical waste into a local water reservoir</td>
</tr>
<tr>
<td></td>
<td>7. The free display of fireworks over the Charles River on the Fourth of July celebration</td>
</tr>
<tr>
<td></td>
<td>8. The seller of an automobile knows that the vehicle he is selling was in a major accident and it is nearly impossible to get the vehicle in perfect alignment, this is known as __________________.</td>
</tr>
</tbody>
</table>

**Scenario #1**

Consider the illustration to the right that shows the market for steel production. The initial private supply curve does not account for the external costs for the production of steel. Identify at least three negative external spillover effects associated with the production of steel.

A. __________________
B. __________________
C. __________________

What are some of the issues associated at the intersection at the **private** supply and demand equilibrium?

![Graph](image)

Use the graph above to solve the following scenarios. The initial private supply curve does not account for the external costs of steel production.

1. Draw a dotted line on the graph to indicate the actual private costs and output in the steel market.
2. Draw a solid line on the graph to show the ideal social supply and demand output level.
3. What is Efficient Equilibrium? __________________.
4. How might the government force manufacturers to internalize (bear) the full costs of steel production?
A. Regulate steel consumption  
B. Subsidize steel production  
C. Tax steel production

**Scenario #2**

The graph to the right shows the demand for private value gasoline. It also shows the private supply cost of producing gas and the social cost associated with producing and consuming gas. Examine the costs and benefits in the market for gasoline. Since external costs exist in the consumption of gasoline, the social cost of a gallon of gasoline exceeds the private cost. According to the graph if the government does not intervene the equilibrium price of a gallon of gasoline would be _________-

If the government does not intervene in the market for gasoline drivers will consume _______________ gallons of gasoline.

If the government does intervene in the market for gasoline and impose a tax the equilibrium price of a gallon of gasoline would be _______________ the tax on a gallon of gasoline would be _______________ and drivers will consume _______________ gallons of gasoline.

    Social Cost = _______________  
    Market Equilibrium = _______________  
    Efficient Equilibrium = _______________

In graph above highlight the Deadweight Loss due to production.
The government can sometimes improve economic well-being by remedying externalities through pollution taxes, regulation and subsidies, and providing public goods.

In this chapter, we will see how the government obtains revenues through taxation to provide these goods and services. We also examine the different types of taxation. The last section of the chapter is on public choice economics, the application of economic principles to politics.

This chapter will contain exercises with various scenarios to help reinforce the student’s understanding of some of the various ways government generate revenue to provide goods and services to the public, and a cap and trade system for controlling externalities using a regulation approach. These exercises include the topics:

- Flat Tax System
- Cap and Trade
This exercise is designed to help reinforce the student’s understanding the way government could collect taxes using a flat tax collection system. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: This exercise should be done using pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

**Scenario 1**

Consider the following Flat Tax problem. Suppose a flat tax plan would allow all individuals to deduct a standard allowance of $25,000 from their wages. If the flat tax rate was 15% and the individual made a salary of $27,660.00 what would be the Marginal Tax Rate percentage after the stipulated standard allowance? How much taxes would be paid on a salary of $37,660?

Answer: \[ \text{___________________}\% \]
\[ \text{
$\text{______________}$ \]

Use the space to the right to solve your problem. What are some of the issues opponents feel of a flat tax versus our current tax system?

A. \[ \text{________________________________} \]
B. \[ \text{________________________________} \]
C. \[ \text{________________________________} \]

**Scenario 2**

Consider the following Flat Tax problem. Suppose a flat tax plan would allow all individuals to deduct a standard allowance of $20,000 from their wages. If the flat tax rate was 15% and the individual made a salary of $125,600, what would be the Marginal Tax Rate percentage after the stipulated standard allowance? How much taxes would be paid on a salary of $125,600?

Answer: \[ \text{___________________}\% \]
\[ \text{
$\text{______________}$ \]

Consider the following Flat Tax problem. Suppose a flat tax plan would allow all individuals to deduct a standard allowance of $20,000 from their wages. If the flat tax rate was 15% and the individual made a salary of $61,000, what would be the Marginal Tax Rate percentage after the stipulated standard allowance? How much taxes would be paid on a salary of $61,000?

Answer: ________________%

$_______________

Consider the following Flat Tax problem. Suppose a flat tax plan would allow all individuals to deduct a standard allowance of $25,000 from their wages. If the flat tax rate was 15% and the individual made a salary of $1,000,000, what would be the Marginal Tax Rate percentage after the stipulated standard allowance? How much taxes would be paid on a salary of $1,000,000?

Answer: ________________%

$_______________

In your opinion who would benefit from a flat tax system? Why?
Exercise 2

This exercise is designed to help reinforce the student’s understanding of the topic of Cap and Trade that could be used by government to help regulate and control pollution. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through each scenario in this exercise make sure that you complete all parts of each scenario so that you can contrast and compare that three options being covered. This exercise should be done using pencil and eraser so that you can make changes if you make a mistake.

Do not use pen!

### Scenario 1

**Cap and Trade: Option 1**

The government’s goal would be to reduce pollution by 120 units. With this option the government gives each firm 40 non-tradable permits. The burden is then on each firm to reduce pollution to meet the government goal. Use the information to the right to determine what is the total cost to reduce pollution?

NOTE: Economists are only concerned about efficiency. Based on your findings are there any incentives for firms to reduce pollution with this option?

<table>
<thead>
<tr>
<th>Firm</th>
<th>Initial Pollution</th>
<th>Cost/Unit to Reduce</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>70 Units</td>
<td>$20</td>
</tr>
<tr>
<td>B</td>
<td>80 Units</td>
<td>$25</td>
</tr>
<tr>
<td>C</td>
<td>50 Units</td>
<td>$10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Firm</th>
<th>Need to Reduce</th>
<th>Cost to Reduce</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total system cleanup cost = $

### Scenario 2

**Cap and Trade: Option 2**

In this option the government’s goal would again be to reduce pollution by 120 units. In this option the government would give each firm 40 tradable permits. Think about what each firm has to do to comply with the government restrictions. Because each firm could trade their permits, complete what you think the market outcomes would be in the table to the right.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Initial Pollution</th>
<th>Cost/Unit to Reduce</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>70 Units</td>
<td>$20</td>
</tr>
<tr>
<td>B</td>
<td>80 Units</td>
<td>$25</td>
</tr>
<tr>
<td>C</td>
<td>50 Units</td>
<td>$10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Firm</th>
<th>Market Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>
**Scenario 3**

Using the tables to the right determine who you think is going to buy and who is going to sell rather than reduce pollution?

<table>
<thead>
<tr>
<th>Permit</th>
<th>Who is willing to buy; how many?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price &lt; $10</td>
<td></td>
</tr>
<tr>
<td>Price &lt; $20</td>
<td></td>
</tr>
<tr>
<td>Price &lt; $25</td>
<td></td>
</tr>
<tr>
<td>Price &gt; $25</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Permit</th>
<th>Who is willing to sell; how many?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price &lt; $10</td>
<td></td>
</tr>
<tr>
<td>Price &lt; $20</td>
<td></td>
</tr>
<tr>
<td>Price &lt; $25</td>
<td></td>
</tr>
<tr>
<td>Price &gt; $25</td>
<td></td>
</tr>
</tbody>
</table>

**Scenario #4**

**Cap and Trade: Option 3**

In this option the government’s goal again is to reduce pollution by 120 units! In this option the government will auction off 120 permits, running what’s known as a 2nd price auction. That means the firm with highest bid pays the amount of the second highest bid. Using the tables to the right, determine how each company would bid on permits to determine the best way to reduce pollution.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Initial Pollution</th>
<th>Cost/Unit to Reduce</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>70 Units</td>
<td>$20</td>
</tr>
<tr>
<td>B</td>
<td>80 Units</td>
<td>$25</td>
</tr>
<tr>
<td>C</td>
<td>50 Units</td>
<td>$10</td>
</tr>
</tbody>
</table>

**Scenario #5**

In the table below complete how you think each firm would react to this government option and determine what the total cleanup costs to the system would be.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Permit Cost</th>
<th>Cleanup Costs</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total system cleanup cost = $
Chapter 6 – Consumer Choice

In this chapter, we focus on how consumers allocate their income between various combinations of goods. This decision involves trade-offs because if you buy more of one good, you may not be able to afford as much of another good. How do consumers choose certain combinations of goods with their fixed available budget desires and fulfill desires for more than one combinations of goods? We address these questions in this chapter to strengthen our understanding of the law of demand.

This chapter will contain exercises with various scenarios to help reinforce the student’s understanding of some of the various ways consumer choices are made. These exercises include the topics:

- Total Utility
- Marginal Utility
Exercise 1

This exercise is designed to help reinforce the student’s understanding of the topic of consumer choice based on total and marginal utility. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

Scenario 1

Steven plays a lot of basketball with his friends. Table 1 to the right contains information on Steven's utility from eating energy bars while playing basketball with his friends.

<table>
<thead>
<tr>
<th>Energy Bars</th>
<th>Total Utility (Utils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>42</td>
</tr>
</tbody>
</table>

Table 1

Using the graph to the right and the information in Table 1 plot Steven’s total utility (TU) curve for eating his first six energy bars while playing basketball on the graph to the right. Plot the line segments to connect the points. Remember to plot from left to right.
Using the graph to the right and the information in Table 1 plot Steven's marginal utility (MU) curve from eating his first six energy bars while playing basketball. Plot the line segments to connect the points. Remember to plot from left to right and to plot between integers.

For Steven increasing the eating of energy bars results in __________ marginal utility.
Exercise 2

This exercise is designed to help reinforce the student’s understanding of the topic of consumer choice based on total and marginal utility. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through this exercise make sure that you label all parts of your diagrams to avoid mistakes. This exercise should be done using a ruler so that your lines are accurate and pencil and eraser so that you can make changes if you make a mistake. Do not use pen!

<table>
<thead>
<tr>
<th>Milk (Glasses/Day)</th>
<th>Total Utility (Utils/Day)</th>
<th>Marginal Utility (Utils/Glass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>54</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>63</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

Table 1

Scenario 1

Ralph enjoys drinking milk because it will make him grow up to be big and strong. Table 1 to the right contains the utility from drinking milk. Fill-in the missing utils.

Scenario 2

Using the graph to the right, plot Ralphs Total Utility curve if he consumes 0, 1, 2, 3, 4, 5, 6, or 7 glasses of milk per day.
Scenario 3

Using the graph to the right and the information in Table 1, plot Ralph's Marginal Utility curve from consuming 7 glasses of milk per day. Remember to plot from left to right.

Scenario 4

Ray enjoys going out to eat sushi at Tokyo and lobster at Legal Seafood. The graph to the right shows two indifferent curves for eating sushi and lobster. With Ray's initial budget shown at T1 (Point X), he chooses eating sushi four times a month and lobster four times per month. A shift of the budget line to T2 (Point Y) shows eating sushi and lobster five times per month.

Of the following options below, circle the choices that could have caused the shift from T1 to T2?

A. The price of lobster and sushi decreased proportionally and income stayed the same
B. Price of lobster increased and income and price of sushi stayed the same
C. Price of sushi decreased and income and price of lobster stayed the same
D. Income increased and the price of lobster and sushi stayed the same
Exercise 3

This exercise is designed to help reinforce the student’s understanding of the topic of consumer choice based on marginal utility. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through this exercise make sure that you total all parts of your diagrams to avoid mistakes. Do not use pen!

**Scenario 1**

Ralph is faced with having to make a decision of choosing between mini pizzas and smoothies. They are priced at $2.00 for mini pizzas and $1.00 for smoothies. The marginal utility derived from each of the two good is outlined in Table 1 and Table 2.

Ralph’s lunch budget for each week is $11.00.

If Ralph had no budget constraints, what would be the maximum marginal utility he could receive by consuming both products?

How much would that cost him?

Ralph however as you know does have a budget. With that in mind, what is the best way for him to spend his budget and get the best bang for the buck of mini pizzas and smoothie purchases?

Use the following formula to determine how Ralph should spend his money.

\[ \frac{MU_{MP}}{PM} = \frac{MU_{S}}{P_{S}} \]

Table 1

<table>
<thead>
<tr>
<th>Marginal Utility from the last Mini Pizza (MP)</th>
<th>Quantity of Mini Pizza’s (MP) consumed/week</th>
<th>( \frac{MU_{MP}}{P_{MP}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Marginal Utility from the last Smoothie</th>
<th>Quantity of Smoothies consumed/week</th>
<th>( \frac{MU_{S}}{P_{S}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: Remember economic decisions are made at the marginal level.
Chapter 7 – Production and Costs

Production and costs refers to the output of goods and services produced by businesses within a market. This production creates the supply that allows our needs and wants to be satisfied. To simplify the idea of the production function, economists create a number of time periods for analysis. Topics generally concentrated on when dealing with production and costs are marginal revenue and marginal profit.

Marginal revenue is the increase in revenue that results from the sale of one additional unit of output. Marginal revenue is calculated by dividing the change in total revenue by the change in output quantity. While marginal revenue can remain constant over a certain level of output, it follows the law of diminishing returns and will eventually slow down, as the output level increases.

Marginal profit is the term used to refer to the difference between the marginal cost and the marginal revenue for producing one additional unit of production.

This chapter will contain exercises with various scenarios to help reinforce the student’s understanding of the key topics of production and costs and how it would affect revenue and profit. These exercises include the topics:

- Marginal Revenue
- Marginal Costs
- Total Revenue
- Profit
Exercise 1

This exercise is designed to help reinforce the student’s understanding of the topic of fixed costs, variable costs, implicit costs, and explicit costs. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: Fill-in the answer for each of the following questions in the spaces provided. This exercise should be done using a pencil and eraser so that you can make changes if you make a mistake. 

Do not use pen!

Questions

1. Profits are defined as __________ minus __________.

2. The cost of producing a good is measured by the worth of the __________ alternative that was given up to obtain the resource.

3. Explicit costs are input costs that require a(n) __________ payment.

4. Whenever we talk about cost—explicit or implicit—we are talking about __________ cost.

5. Economists generally assume that the ultimate goal of a firm is to __________ profits.

6. Accounting profits equal actual revenues minus actual expenditures of cash explicit costs, so they do not include __________ costs.

7. Economists consider a zero economic profit a normal profit because it means that the firm is covering both __________ and __________ costs—the total opportunity cost of its resources.

8. __________ are costs that have already been incurred and cannot be recovered.

9. Because it takes more time to vary some inputs than others, we must distinguish between the __________ run and the __________ run.

10. The long run is a period of time in which the firm can adjust __________ inputs.
Lesson #2

This exercise is designed to help reinforce the student’s understanding of the topic of Cost and Revenue Calculation in a competitive market. This exercise can be used in conjunction with any economics textbook that addresses this topic.

NOTE: As you are working through this exercise make sure that you complete all parts of your diagrams to avoid mistakes. Do not use pen!

## Scenario 1

Look at the profit maximization in Table 1 below. Compare columns 2 and 3—the calculations of total revenue and total cost, respectively. Calculate the profit, marginal revenue, marginal cost, and change in profit levels using the formulas available in each heading.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Total Revenue</th>
<th>Total Costs</th>
<th>Profit (TR-TC)</th>
<th>Marginal Revenue (ΔTR/ΔQ)</th>
<th>Marginal Costs (ΔTC/ΔQ)</th>
<th>Change in Profit (MR-MC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$ 0</td>
<td>$ 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1

Complete each of the following questions in the spaces provided.

A. What happens to the marginal costs?

B. What happens to the change in profits?

C. At what quantity levels are profits maximized?

D. What are the maximum profits?
Use the graph to the right and the information established in Table 1 above to plot Marginal Revenue, Marginal Costs, Profit, and Change in Profit.

A. Based on your findings in Table 1 and your graph to the right, what would the best plan for production be?