Practice Questions and Answers from Lesson I-4: Demand and Supply

The following questions practice these skills:
✓ Describe when demand or supply increases (shifts right) or decreases (shifts left).
✓ Identify a competitive equilibrium of demand and supply.
✓ Describe the equilibrium shifts when demand or supply increases or decreases.
✓ Describe how prices or gross substitutes or gross complements shift demand.
✓ Describe how input costs or production costs shift supply.
✓ Aggregate individual demand into market demand.
✓ Describe how effective price ceilings cause shortages.
✓ Compute some special demand curves and some special supply curves from verbal descriptions.

Question: A survey indicated that chocolate is Americans’ favorite ice cream flavor. For each of the following, indicate the possible effects on demand, supply, or both as well as equilibrium price and quantity of chocolate ice cream.

a. A severe drought in the Midwest causes dairy farmers to reduce the number of milk-producing cattle in their herds by a third. These dairy farmers supply cream that is used to manufacture chocolate ice cream.
b. A new report by the American Medical Association reveals that chocolate does, in fact, have significant health benefits.
c. The discovery of cheaper synthetic vanilla flavoring lowers the price of vanilla ice cream.
d. New technology for mixing and freezing ice cream lowers manufacturers’ costs of producing chocolate ice cream.

Answer to Question:
a. By reducing their herds, dairy farmers reduce the supply of cream, a leftward shift of the supply curve for cream. As a result, the market price of cream rises, raising the cost of producing a unit of chocolate ice cream. This results in a leftward shift of the supply curve for chocolate ice cream as ice-cream producers reduce the quantity of chocolate ice cream supplied at any given price. Ultimately, this leads to a rise in the equilibrium price and a fall in the equilibrium quantity.
b. Consumers will now demand more chocolate ice cream at any given price, represented by a rightward shift of the demand curve. As a result, both equilibrium price and quantity rise.
c. The price of a substitute (vanilla ice cream) has fallen, leading consumers to substitute it for chocolate ice cream. The demand for chocolate ice cream decreases, represented by a leftward shift of the demand curve. Both equilibrium price and quantity fall.
d. Because the cost of producing ice cream falls, manufacturers are willing to supply more units of chocolate ice cream at any given price. This is represented by a rightward shift of the supply curve and results in a fall in the equilibrium price and a rise in the equilibrium quantity.

Question: Show in a diagram the effect on the demand curve, the supply curve, the equilibrium price, and the equilibrium quantity of each of the following events.

a. The market for newspapers in your town
   Case 1: The salaries of journalists go up.
   Case 2: There is a big news event in your town, which is reported in the
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newspapers.

b. The market for St. Louis Rams cotton T-shirts
   Case 1: The Rams win the Super Bowl.
   Case 2: The price of cotton increases.

c. The market for bagels
   Case 1: People realize how fattening bagels are.
   Case 2: People have less time to make themselves a cooked breakfast.

a. The market for the Krugman and Wells economics textbook
   Case 1: Your professor makes it required reading for all of his or her students.
   Case 2: Printing costs for textbooks are lowered by the use of synthetic paper.

Answer to Question:

a. Case 1: Journalists are an input in the production of newspapers; an increase in their salaries will cause newspaper publishers to reduce the quantity supplied at any given price. This represents a leftward shift of the supply curve from $S_1$ to $S_2$ and results in a rise in the equilibrium price and a fall in the equilibrium quantity as the equilibrium changes from $E_1$ to $E_2$.

Case 2: Townspeople will wish to purchase more newspapers at any given price. This represents a rightward shift of the demand curve from $D_1$ to $D_2$ and leads to a rise in both the equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$.

b. Case 1: Fans will demand more St. Louis Rams memorabilia at any given price. This represents a rightward shift of the demand curve from $D_1$ to $D_2$ and leads to a rise in both the equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$. 
Case 2: Cotton is an input into T-shirts; an increase in its price will cause T-shirt manufacturers to reduce the quantity supplied at any given price, representing a leftward shift of the supply curve from $S_1$ to $S_2$. This leads to a rise in the equilibrium price and a fall in the equilibrium quantity as the equilibrium changes from $E_1$ to $E_2$.

Case 2: Consumers will demand more bagels (a substitute for cooked breakfasts) at any given price. This represents a rightward shift of the demand curve from $D_1$ to $D_2$ and leads to a rise in both the equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$.

d. Case 1: A greater quantity of textbooks will be demanded at any given price, representing a
rightward shift of the demand curve from $D_1$ to $D_2$. Equilibrium price and quantity will rise as the equilibrium changes from $E_1$ to $E_2$.

**Case 2:** The textbook publisher will offer more textbooks for sale at any given price, representing a rightward shift of the supply curve from $S_1$ to $S_2$. Equilibrium price will fall and equilibrium quantity will rise as the equilibrium changes from $E_1$ to $E_2$.

**Question:** The U.S. Department of Agriculture reported that in 1997 each person in the United States consumed an average of 41 gallons of soft drinks (nondiet) at an average price of $2 per gallon. Assume that, at a price of $1.50 per gallon, each individual consumer would demand 50 gallons of soft drinks. The U.S. population in 1997 was 267 million. From this information about the individual demand schedule, calculate the market demand schedule for soft drinks for the prices of $1.50 and $2 per gallon.

**Answer to Question:** The quantity demanded by an individual consumer at a price of $2 was 41 gallons, and there were 267 million consumers. Multiplying the quantity demanded at that price by each individual consumer gives us the market quantity demanded at that price: 267 million × 41 gallons = 10.9 billion gallons. Similarly, the market quantity demanded at a price of $1.50 would be 267 million × 50 gallons = 13.4 billion gallons.
Question: Suppose that the supply schedule of Maine lobsters is as follows:

<table>
<thead>
<tr>
<th>Price of lobster (per pound)</th>
<th>Quantity of lobster supplied (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25</td>
<td>800</td>
</tr>
<tr>
<td>$20</td>
<td>700</td>
</tr>
<tr>
<td>$15</td>
<td>600</td>
</tr>
<tr>
<td>$10</td>
<td>500</td>
</tr>
<tr>
<td>$5</td>
<td>400</td>
</tr>
</tbody>
</table>

Suppose that Maine lobsters can be sold only in the United States. The U.S. demand schedule for Maine lobsters is as follows:

<table>
<thead>
<tr>
<th>Price of lobster (per pound)</th>
<th>Quantity of lobster demanded (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25</td>
<td>200</td>
</tr>
<tr>
<td>$20</td>
<td>400</td>
</tr>
<tr>
<td>$15</td>
<td>600</td>
</tr>
<tr>
<td>$10</td>
<td>800</td>
</tr>
<tr>
<td>$5</td>
<td>1,000</td>
</tr>
</tbody>
</table>

a. Draw the demand curve and the supply curve for Maine lobsters. What are the equilibrium price and quantity of lobsters?

Now suppose that Maine lobsters can be sold in France. The French demand schedule for Maine lobsters is as follows:

<table>
<thead>
<tr>
<th>Price of lobster (per pound)</th>
<th>Quantity of lobster demanded (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25</td>
<td>100</td>
</tr>
<tr>
<td>$20</td>
<td>300</td>
</tr>
<tr>
<td>$15</td>
<td>500</td>
</tr>
<tr>
<td>$10</td>
<td>700</td>
</tr>
<tr>
<td>$5</td>
<td>900</td>
</tr>
</tbody>
</table>

b. What is the demand schedule for Maine lobsters now that French consumers can also buy them? Draw a supply and demand diagram that illustrates the new equilibrium price and quantity of lobsters. What will happen to the price at which fishermen can sell lobster? What will happen to the price paid by U.S. consumers? What will happen to the quantity consumed by U.S. consumers?

Answer to Question:

a. The equilibrium price of lobster is $15 per pound and the equilibrium quantity is 600 pounds, point $E$ in the accompanying diagram.

b. The new demand schedule is obtained by adding together, at any given price, the quantity
demanded by American consumers and the quantity demanded by French consumers, as shown in the accompanying table.

<table>
<thead>
<tr>
<th>Price of lobster (per pound)</th>
<th>Quantity of lobster demanded (U.S. plus French pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25</td>
<td>300</td>
</tr>
<tr>
<td>$20</td>
<td>700</td>
</tr>
<tr>
<td>$15</td>
<td>1,100</td>
</tr>
<tr>
<td>$10</td>
<td>1,500</td>
</tr>
<tr>
<td>$5</td>
<td>1,900</td>
</tr>
</tbody>
</table>

The new equilibrium price of lobster is $20 per pound and the new equilibrium quantity is 700 pounds, point $E$ in the accompanying diagram. The opportunity to sell to French consumers makes Maine fishermen better off: they sell more lobster and at a higher price than before. U.S. consumers, however, are made worse off: they must pay a higher price for lobster ($20 versus $15 per pound) and, as a result, consume less lobster (400 versus 600 pounds).

**Question:** Aaron Hank is a star hitter for the Bay City baseball team. He is close to breaking the major league record for home runs hit during one season, and it is widely anticipated that in the next game he will break that record. As a result, tickets for the team’s next game have been a hot commodity. But today it is announced that, due to a knee injury, he will not in fact play in the team’s next game. Assume that season ticket-holders are able to resell their tickets if they wish. Use supply and demand diagrams to explain the following.

a. Show the case in which this announcement results in a lower equilibrium price and a lower equilibrium quantity than before the announcement.

b. Show the case in which this announcement results in a lower equilibrium price and a higher equilibrium quantity than before the announcement.

c. What accounts for whether case a or case b occurs?

d. Suppose that a scalper had secretly learned before the announcement that Aaron Hank would not play in the next game. What actions do you think he would take?

**Answer to Question:**

a. Fewer fans want to attend the next game after the announcement is made. As a result, the demand curve will shift leftward from $D_1$ to $D_2$, as fewer tickets are demanded at any given price; other things equal, this results in a fall in both equilibrium price and quantity. In addition, the supply curve will shift rightward from $S_1$ to $S_2$, as more season ticket-holders are willing to sell tickets at any given price. Other things equal, this results in a fall in equilibrium price and a rise in equilibrium quantity. In this case, the leftward shift of the demand curve exceeds the rightward shift of the supply curve; as a result, equilibrium quantity falls, shown by the change of the equilibrium from $E_1$ to $E_2$. 
b. The supply and demand curves shift in the same manner as in part a, but in this case the rightward shift of the supply curve exceeds the leftward shift of the demand curve. Consequently, equilibrium quantity rises, shown by the change of the equilibrium from $E_1$ to $E_2$.

c. Case a (equilibrium quantity falls) occurs because the decrease in demand exceeds the increase in supply. Case b (equilibrium quantity rises) occurs because the increase in supply exceeds the decrease in demand.

d. A scalper who learns about the announcement secretly should take actions—such as lowering price somewhat—that ensure that he will sell all of his tickets before the announcement is made. He will do this because he knows a ticket will command a much lower price after the announcement. An expectation that the price will be lower in the future causes supply to increase today.

Question: In *Rolling Stone* magazine, several fans and rock stars, including Pearl Jam, were bemoaning the high price of concert tickets. One superstar argued, “It just isn’t worth $75 to see me play. No one should have to pay that much to go to a concert.” Assume this star sold out arenas around the country at an average ticket price of $75.

a. How would you evaluate the arguments that ticket prices are too high?

b. Suppose that due to this star’s protests, ticket prices were lowered to $50. In what sense is this price too low? Draw a diagram using supply and demand curves to support your argument.

c. Suppose Pearl Jam really wanted to bring down ticket prices. Since the band controls the supply of its services, what do you recommend they do? Explain using a supply and demand diagram.

d. Suppose the band’s next CD was a total dud. Do you think they would still have to worry about ticket prices being too high? Why or why not? Draw a supply and demand diagram to support your argument.

e. Suppose the group announced their next tour was going to be their last. What effect would this likely have on the demand for and price of tickets? Illustrate with a supply and demand diagram.

Answer to Question:

a. If markets are competitive, the ticket price is simply the equilibrium price: the price at which quantity supplied is equal to quantity demanded. No one is “made” to pay $75 to go to a concert: a potential
concert-goer will pay $75 if going to the concert seems worth that amount and will choose to do something else if it isn’t.

b. At $50 each, the quantity of tickets demanded exceeds the quantity of tickets supplied. There is a shortage of tickets at this price, shown by the difference between the quantity demanded at this price, \( Q_{D} \), and the quantity supplied at this price, \( Q_{S} \).

c. The band can lower the average price of a ticket by increasing supply: give more concerts. This is shown as a rightward shift of the supply curve from \( S_1 \) to \( S_2 \), resulting in a lower equilibrium price and a higher equilibrium quantity, shown by the change of the equilibrium from \( E_1 \) to \( E_2 \).

d. If the band’s CD is a total dud, the demand for concert tickets is likely to decrease. This represents a leftward shift of the demand curve from \( D_1 \) to \( D_2 \), resulting in a lower equilibrium price and quantity as the equilibrium changes from \( E_1 \) to \( E_2 \). This is likely to eliminate the worry that ticket prices are “too high.”

e. The announcement that this is the group’s last tour causes the demand for tickets to increase. This is represented by a rightward shift of the demand curve from \( D_1 \) to \( D_2 \), resulting in an increase in both the equilibrium price and quantity as the equilibrium changes from \( E_1 \) to \( E_2 \).
Practice Questions and Answers from Lesson I-4: Demand and Supply

Question: After several years of decline, the market for handmade acoustic guitars is making a comeback. These guitars are usually made in small workshops employing relatively few highly skilled luthiers. Assess the impact on the equilibrium price and quantity of handmade acoustic guitars as a result of each of the following events. In your answers indicate which curve(s) shift(s) and in which direction.

a. Environmentalists succeed in having the use of Brazilian rosewood banned in the United States, forcing luthiers to seek out alternative, more costly woods.

b. A foreign producer reengineers the guitar-making process and floods the market with identical guitars.

c. Music featuring handmade acoustic guitars makes a comeback as audiences tire of heavy metal and grunge music.

d. The country goes into a deep recession and the income of the average American falls sharply.

Answer to Question:

a. The cost of producing handmade acoustic guitars rises as more costly woods are used to construct them. This reduces supply, as luthiers offer fewer guitars at any given price. This is represented by a leftward shift of the supply curve and results in a rise in the equilibrium price and a fall in the equilibrium quantity.

b. This represents a rightward shift of the supply curve, resulting in a fall in the equilibrium price and a rise in the equilibrium quantity.

c. As more people demand music played on acoustic guitars, the demand for these guitars by musicians increases as well. (Acoustic guitars are an input into the production of this music.) This represents a rightward shift of the demand curve, leading to a higher equilibrium price and quantity.

d. If average American income falls sharply, then the demand for handmade acoustic guitars will decrease sharply as well because they are a normal good. This is represented by a leftward shift of the demand curve, leading to a lower equilibrium price and quantity.

Question: Demand twisters: Sketch and explain the demand relationship in each of the following statements.

a. I would never buy a Britney Spears CD! You couldn’t even give me one for nothing.

b. I generally buy a bit more coffee as the price falls. But once the price falls to $2 per pound, I’ll buy out the entire stock of the supermarket.

c. I spend more on orange juice even as the price rises. (Does this mean that I must be violating the law of demand?)

d. Due to a tuition rise, most students at a college find themselves with less disposable income. Almost
all of them eat more frequently at the school cafeteria and less often at restaurants, even though prices at the cafeteria have risen, too. (This one requires that you draw both the demand and the supply curves for school cafeteria meals.)

**Answer to Question:**

*a.* In this case the quantity demanded is zero regardless of the price. So this person’s demand curve for Britney Spears CDs is a vertical line at the quantity of zero—that is, a vertical line that lies on top of the vertical axis.

*b.* The person here has the typical downward-sloping demand curve for coffee until it reaches the price of $2 per pound, at which point it becomes horizontal, showing that he or she would buy a very large quantity at that price.

*c.* This person does not necessarily violate the law of demand: the quantity of orange juice demanded may in fact fall as price goes up. The likely explanation is the following: spending is price times the quantity demanded. Although price goes up, the total amount of money this person spends on orange juice rises because he or she does not reduce the quantity demanded enough to offset the increased cost per unit. This person will have a steep demand curve as shown in the diagram: quantity demanded falls as price rises, but the fall in quantity demanded is proportionately less than the rise in price.

*d.* Since students’ income has fallen, but the demand for cafeteria meals has increased, cafeteria
meals must be an inferior good. The rightward shift of the demand curve, from $D_1$ to $D_2$, results in an increase in the equilibrium price and quantity of cafeteria meals, as the equilibrium changes from $E_1$ to $E_2$.

Question: Will Shakespeare is a struggling playwright in sixteenth-century London. As the price he receives for writing a play increases, he is willing to write more plays. For the following situations, use a diagram to illustrate how each event affects the equilibrium price and quantity in the market for Shakespeare’s plays.

a. The playwright Christopher Marlowe, Shakespeare's chief rival, is killed in a bar brawl.
b. The bubonic plague, a deadly infectious disease, breaks out in London.
c. To celebrate the defeat of the Spanish Armada, Queen Elizabeth declares several weeks of festivities, which involves commissioning new plays.

Answer to Question:

a. The death of Marlowe means that the supply of a substitute good (Marlowe’s plays) has decreased, and so the price of Marlowe’s plays will rise. As a result, the demand for Shakespeare’s plays will increase, inducing a rightward shift of the demand curve in the market for Shakespeare’s plays from $D_1$ to $D_2$. As a result, equilibrium price and quantity will rise as the equilibrium changes from $E_1$ to $E_2$.

b. After the outbreak of the plague, fewer Londoners will wish to see Shakespeare’s plays to avoid contracting the illness, inducing a leftward shift of the demand curve from $D_1$ to $D_2$. Equilibrium price and quantity will fall as the equilibrium changes from $E_1$ to $E_2$. 
c. Queen Elizabeth’s commissions result in a greater quantity of Shakespeare’s plays demanded at any given price. This represents a rightward shift of the demand curve from $D_1$ to $D_2$, resulting in a higher equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$.

**Question:** The small town of Middling experiences a sudden doubling of the birth rate. After three years, the birth rate returns to normal. Use a diagram to illustrate the effect of these events on the following.

a. The market for an hour of babysitting services in Middling today
b. The market for an hour of babysitting services 14 years into the future, after the birth rate has returned to normal, by which time children born today are old enough to work as babysitters
c. The market for an hour of babysitting services 30 years into the future, when children born today are likely to be having children of their own

**Answer to Question:**

a. There are more babies today, so the demand for an hour of babysitting services has increased. This produces a rightward shift of the demand curve for babysitting services from $D_1$ to $D_2$, resulting in a rise in the equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$.

b. The children born today will cause an increase in the supply of babysitters available 14 years from now, when there will be a rightward shift of the supply curve for babysitting services from $S_1$ to $S_2$. This
will result in a lower equilibrium price and a higher equilibrium quantity as the equilibrium changes from $E_1$ to $E_2$.

c. It is likely that there will be an increase in the birth rate 30 years from now. Therefore, there will be an increase in the demand for babysitting services, shifting the demand curve rightward from $D_1$ to $D_2$. This will result in a higher equilibrium quantity and price as the equilibrium changes from $E_1$ to $E_2$.

Question: Use a diagram to illustrate how each of the following events affects the equilibrium price and quantity of pizza.

a. The price of mozzarella cheese rises.
b. The health hazards of hamburgers are widely publicized.
c. The price of tomato sauce falls.
d. The incomes of consumers rise and pizza is an inferior good.
e. Consumers expect the price of pizza to fall next week.

Answer to Question:

a. Mozzarella is an input in the production of pizza. Since the cost of an input has risen, pizza producers will reduce the quantity supplied at any given price, a leftward shift of the supply curve from $S_1$ to $S_2$. As a result, the equilibrium price of pizza will rise and the equilibrium quantity will fall as the equilibrium changes from $E_1$ to $E_2$. 
b. Consumers will substitute pizza in place of hamburgers, resulting in an increased demand for pizza at any given price. This generates a rightward shift of the demand curve from $D_1$ to $D_2$, leading to a rise in the equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$.

c. Tomato sauce is an input in the production of pizza. Since the cost of an input has fallen, pizza producers will increase the quantity supplied at any given price, a rightward shift of the supply curve from $S_1$ to $S_2$. As a result, the equilibrium price of pizza will fall and the equilibrium quantity will rise as the equilibrium changes from $E_1$ to $E_2$.

d. The demand for an inferior good decreases when the incomes of consumers rise. So a rise in consumer incomes produces a leftward shift of the demand curve from $D_1$ to $D_2$, resulting in a lower equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$. 
e. Consumers will delay their purchases of pizza today in anticipation of consuming more pizza next week. As a result, the demand curve shifts leftward from $D_1$ to $D_2$, resulting in a lower equilibrium price and quantity as the equilibrium changes from $E_1$ to $E_2$.

![Diagram showing demand and supply curves]

**Question:** Although he was a prolific artist, Pablo Picasso painted only 1,000 canvases during his “Blue Period.” Picasso is now dead, and all of his Blue Period works are currently on display in museums and private galleries throughout Europe and the United States.

**a.** Draw a supply curve for Picasso Blue Period works. Why is this supply curve different from ones you have seen?

**b.** Given the supply curve from part a, the price of a Picasso Blue Period work will be entirely dependent on what factor(s)? Draw a diagram showing how the equilibrium price of such a work is determined.

**c.** Suppose rich art collectors decide that it is essential to acquire Picasso Blue Period art for their collections. Show the impact of this on the market for these paintings.

**Answer to Question:**

**a.** There are no more Picasso Blue Period works available. Hence the supply curve is a vertical line at the quantity 1,000.

![Supply curve diagram]

**b.** Since supply is fixed, the price of a Picasso Blue Period work is entirely determined by demand. Any change in demand is fully reflected in a change in price.

![Demand and supply curve diagram]
c. This results in a rightward shift of the demand curve for these works from $D_1$ to $D_2$, and the equilibrium changes from $E_1$ to $E_2$. But since no more works are available, this increase in demand simply results in an increase in the equilibrium price.

**Question:** Draw the appropriate curve in each of the following cases. Is it like or unlike the curves you have seen so far? Explain.

a. The demand for cardiac bypass surgery, given that the government pays the full cost for any patient.

b. The demand for elective cosmetic plastic surgery, given that the patient pays the full cost.

c. The supply of reproductions of Rembrandt paintings.

**Answer to Question:**

a. Since the government pays the full cost of cardiac bypass surgery, the price paid by the patient is always zero. Consequently, the demand for surgery is constant, regardless of the price actually paid by the government. The quantity demanded is constant at the quantity that would be demanded by patients if the government, not the patient, pays for surgery. That is, it is a vertical line at the quantity that patients would demand if the price of surgery to them was zero.

b. In this case the patient must pay the cost of the surgery; so the quantity demanded is affected by price, and the demand curve has its usual downward-sloping shape.

c. The supply of Rembrandt reproductions is not fixed because they can be created by existing artists. So the supply curve of these reproductions has the familiar upward-sloping shape.
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![Graph showing the relationship between the price of a reproduction Rembrandt painting and the quantity of reproduction Rembrandt paintings.](image)