IB Economics – Competitive Markets: Demand and Supply

1.3: Market Equilibrium

IB Economics: www.IBDeconomics.com

1.3 MARKET EQUILIBRIUM: STUDENT LEARNING ACTIVITY

Answer the questions that follow.

1. DEFINITIONS

Define the following terms: **[10 marks]**

Market equilibrium
Linear function
Demand schedule
Supply schedule
Production
Quantity demanded
Quantity supplied
Disequilibrium
Demand curve
Demand
Derived demand
Determinants of demand
Normal goods

Producer
Equilibrium quantity
Capital goods
Productivity
Profit
Supply
Demand function
Market clears
Excess demand
Excess supply
Surplus
Shortage

2. SHORT-ANSWER QUESTIONS

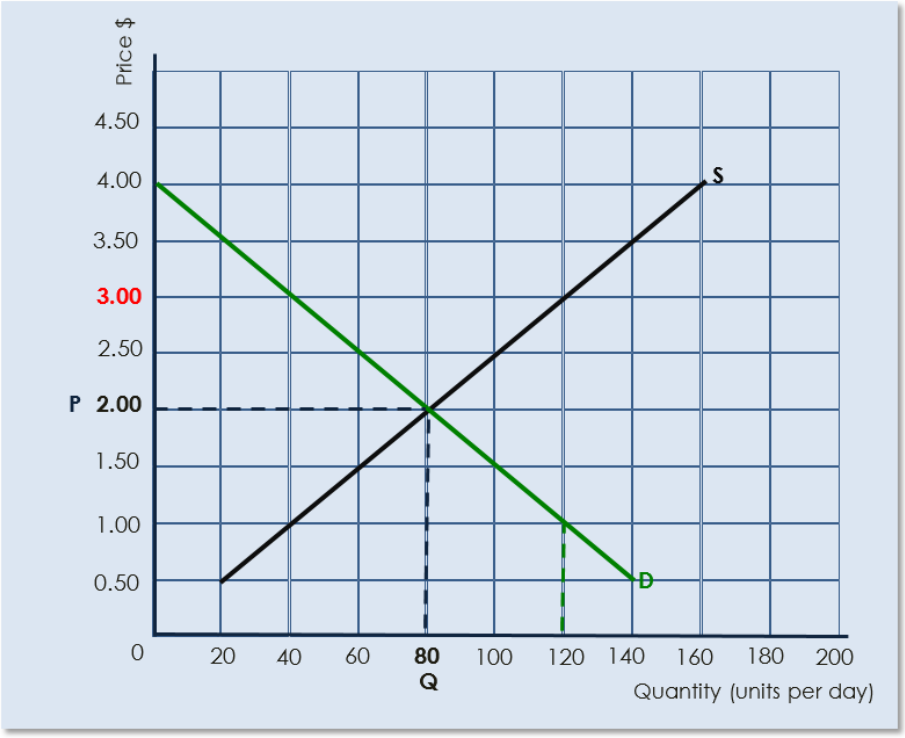


Figure 1

1. In Figure 1 above, state if there is a surplus (excess supply) or a shortage (excess demand), and identify the amount if the price is: **[5 marks]**
   i. $1.00
   ii. $1.50
   iii. $2.00
   iv. $2.50
   v. $3.00

2. Use the supply and demand model to illustrate: **[6 marks]**
   i. Equilibrium market price **and** quantity
   ii. Two disequilibrium prices **and** quantities
   iii. Excess demand **and** excess supply

3. Explain the meaning of 'market equilibrium'. **[4 marks]**

4. Explain how 'market forces' achieve equilibrium price in the market. **[4 marks]**

5. Using the supply and demand model, sketch the effects of: **[10 marks]**
   i. Freezing weather in Ecuador destroys the banana crop.
   ii. The incredibly high sugar content of fizzy drinks has been reported on in the mass media.
   iii. New technology in the manufacturing of smartphones is introduced.
   iv. An increase in the price of milk affects businesses producing cheese.
   v. A decrease in the price of lamb effects the market for beef.

6. In a competitive market for good X (a normal good), use the supply and demand model to draw changes in demand or supply making clear how the initial market disequilibrium is created, and how the price will change to clear the market and restore market equilibrium. **[20 marks]**
   i. Consumer incomes decrease in a recession.
   ii. The price of related good Y (competitive supply) increases.
   iii. Wage rates increase.
   iv. Price of substitute good Z increases.
   v. High profits in the industry attract an increasing number of new firms to produce good X.
   vi. The price of related good A (joint supply) decreases.
   vii. The price of the complement good B decreases.
   viii. Successful advertising campaign is running that promotes the health benefits of good X.
   ix. The price of raw materials used to produce good X decrease.
   x. Productivity increases.

7. Regarding good A, answer the following questions. **[10 marks]**
   i. Plot the supply and demand curves from the following information.

Price ($)	QS (millions per month)	QD (millions per month)
10.00	100	60
9.00	90	70
8.00	80	80
7.00	70	90
6.00	60	100

   ii. Label the supply and demand functions.
   iii. Identify the market equilibrium price and quantity.
   iv. Draw and identify the surplus or shortage that exists in the market at $9.

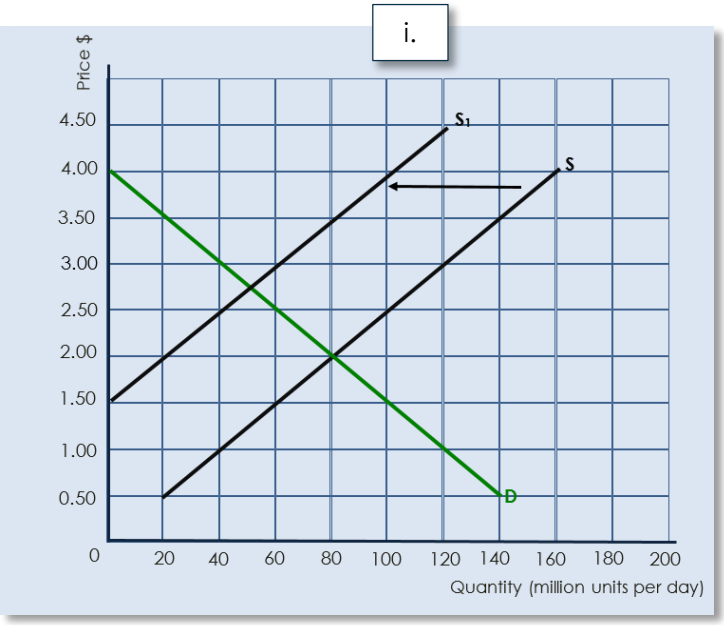
8. Distinguish between 'excess supply' and 'excess demand'. **[4 marks]**

9. Using examples and illustrations, explain how the forces of supply **and** demand can create price increases **and** price decreases in a competitive market: **[8 marks]**

10. In the four supply and demand diagrams below, draw and calculate the initial surplus or shortage that exists before market forces restore equilibrium in the market. **[12 marks]**

11.

i.



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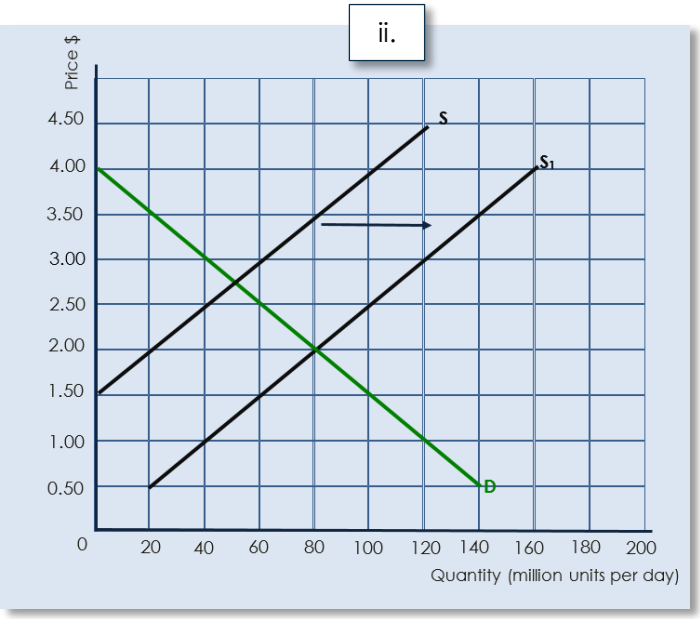

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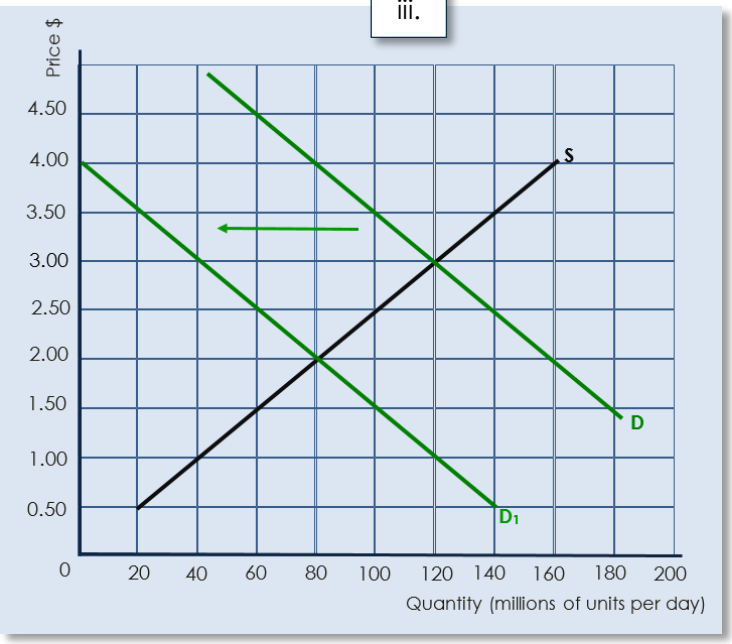

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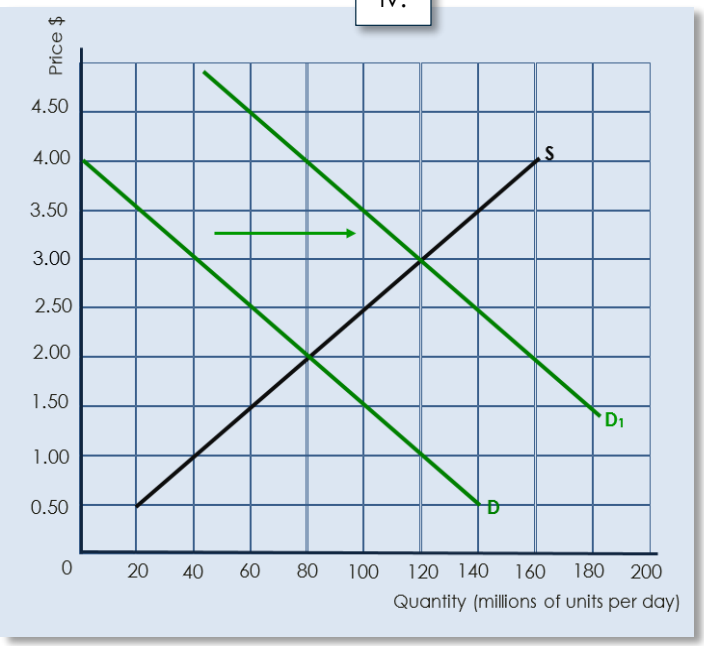

3. MULTICHOICE QUESTIONS

Choose the best answer to each question. **[40 marks]**

1. What happens in the market for mountain bikes when there is an increase in demand?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

2. What happens in the market for mountain bikes when productivity in factories improves?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

3. What happens in the market for mountain bikes when new production technology is used?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

4. What happens in the market for mountain bikes when there is an increase in supply?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

5. What happens in the market for mountain bikes when mountain bikes gain in popularity?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

6. What happens in the market for mountain bikes when there is a strong advertising campaign for MBs?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

7. What happens in the market for mountain bikes when there is a strong advertising campaign for BMXs?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

8. What happens in the market for mountain bikes when there is a decrease in demand?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

9. What happens in the market for mountain bikes when the price of a complement falls?
   a. The demand curve shifts left
   b. The demand curve shifts right
   c. The supply curve shifts left
   d. The supply curve shifts right

10. What happens in the market for mountain bikes when a tariff is placed on MBs?
    a. The demand curve shifts left
    b. The demand curve shifts right
    c. The supply curve shifts left
    d. The supply curve shifts right

11. What happens in the market for mountain bikes when there is a decrease in supply?
    a. The demand curve shifts left
    b. The demand curve shifts right
    c. The supply curve shifts left
    d. The supply curve shifts right

12. What happens in the market for mountain bikes when costs of production increase?
    a. The demand curve shifts left
    b. The demand curve shifts right
    c. The supply curve shifts left
    d. The supply curve shifts right

13. What happens in the market for mountain bikes when the price of a substitute falls?
    a. The demand curve shifts left
    b. The demand curve shifts right
    c. The supply curve shifts left
    d. The supply curve shifts right

14. What happens in the market for mountain bikes when the price of a related good (competitive supply) increases?
    a. The demand curve shifts left
    b. The demand curve shifts right
    c. The supply curve shifts left
    d. The supply curve shifts right

15. Excess demand is best characterised as:
    a. A surplus where QS<QD
    b. A shortage where QD<QS
    c. A surplus where QS<QD
    d. A shortage where QD<QS

16. Excess supply is best characterised as:
    a. A surplus where QS<QD
    b. A shortage where QD<QS
    c. A surplus where QS<QD
    d. A shortage where QD<QS

17. What happens in the market for mountain bikes when there is an increase in demand?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

18. What happens in the market for mountain bikes when productivity in factories improves?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

19. What happens in the market for mountain bikes when new production technology is used?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

20. What happens in the market for mountain bikes when there is an increase in supply?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

21. What happens in the market for mountain bikes when mountain bikes gain in popularity?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

22. In the market for corn supply shifts and the price increases, there has been:
    a. An increase in direct tax
    b. An increase in the cost of fertiliser
    c. A decrease in farmer income
    d. Favourable weather in summer

23. What happens in the market for mountain bikes when there is a strong advertising campaign for MBs?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

24. What happens in the market for mountain bikes when there is a strong advertising campaign for BMXs?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

25. What happens in the market for mountain bikes when there is a decrease in demand?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

26. What happens in the market for mountain bikes when the price of a complement falls?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

27. If the market price is set above equilibrium price:
    e. Market price will rise
    f. Market price will falls
    g. Quantity supplied and demanded increases
    h. There is excess demand

28. What happens in the market for mountain bikes when a tariff is placed on MBs?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

29. What happens in the market for mountain bikes when there is a decrease in supply?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

30. What happens in the market for mountain bikes when costs of production increase?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

31. What happens in the market for mountain bikes when the price of a substitute falls?
    a. Price increases, QD and QS increases
    b. Price increases, QD and QS decreases
    c. Price decreases, QD and QS increases
    d. Price decreases, QD and QS decreases

32. What happens in the market for mountain bikes when the price of a related good (competitive supply) increases?
    i. Price increases, QD and QS increases
    j. Price increases, QD and QS decreases
    k. Price decreases, QD and QS increases
    l. Price decreases, QD and QS decreases

33. Which does not apply to equilibrium price?
    a. It is affected by supply and demand
    b. Price doesn't have a tendency to change
    c. It exists when there is excess supply or excess demand
    d. Consumers and producers trade at the same price

34. When the supply of Good A increases, there is a temporary:
    a. Shortage, and the market price will rise
    b. Shortage, and the market price will fall
    c. Surplus, and the market price will rise
    d. Surplus, and the market price will fall

35. When the supply of Good A decreases, there is a temporary:
    a. Shortage, and the market price will rise
    b. Shortage, and the market price will fall
    c. Surplus, and the market price will rise
    d. Surplus, and the market price will fall

36. When the demand for Good A increases, there is a temporary:
    a. Shortage, and the market price will rise
    b. Shortage, and the market price will fall
    c. Surplus, and the market price will rise
    d. Surplus, and the market price will fall

37. When the demand for Good A decreases, there is a temporary:
    a. Shortage, and the market price will rise
    b. Shortage, and the market price will fall
    c. Surplus, and the market price will rise
    d. Surplus, and the market price will fall

38. Excess demand is best characterised as:
    a. A surplus where QS<QD
    b. A shortage where QD<QS
    c. A surplus where QS<QD
    d. A shortage where QD<QS

39. Excess supply is best characterised as:
    a. A surplus where QS<QD
    b. A shortage where QD<QS
    c. A surplus where QS<QD
    d. A shortage where QD<QS

40. If the price of a good is set above equilibrium price there will be:
    a. Excess supply of the good or service
    b. Further price increases
    c. A shortage of the good or service
    d. A decrease in demand

1.3: Market Equilibrium

4. TRUE OR FALSE?

Indicate whether the following statements are true or false. **[15 marks]**

1. Market equilibrium occurs when quantity demanded equals quantity supplied.
2. Market equilibrium is always in the same position.
3. A market will tend towards equilibrium.
4. A shortage or surplus is still possible at the market equilibrium.
5. Market equilibrium occurs when quantity demanded does not equal quantity supplied.
6. A market will not tend toward equilibrium.
7. A shortage or surplus is not possible at market equilibrium.
8. A market must be a place where buyers and sellers meet to sell and buy goods and services.
9. Whenever buyers and sellers interact to exchange goods and services it is a market.
10. A market price above equilibrium acts as a signal for businesses to increase profits and maximise profits.
11. If the price of a good or a service is above equilibrium there will be excess demand.
12. Disequilibrium occurs where quantity supplies equals quantity demanded.
13. If the price of a good or a service is below equilibrium there will be excess supply.
14. Where quantity supplied equals quantity demanded there is no surplus or shortage in the market.
15. Excess supply occurs when the price is too low and quantity supplied is greater than quantity demanded.

5. SUPPLY AND DEMAND FUNCTIONS **HL**

1. Given the following supply and demand functions: QD = 500 – 50P and QS = -300 +100P, calculate the equilibrium price and quantity. **[2 marks]**

2. Given the following supply and demand functions: QD = 650 – 20P and QS = -300 +15P, calculate: **[4 marks]**
   i. Equilibrium price
   ii. Equilibrium quantity
   iii. Excess demand (shortage) or excess supply (surplus) where price = $20
   iv. Excess demand (shortage) or excess supply (surplus) where price = $32

3. Given the following supply and demand functions: QD = 500 – 2P and QS = -100 + 2P: **[10 marks]**
   i. Calculate the equilibrium price and quantity.
   ii. Use a supply and demand schedule to calculate the quantity supplied and demanded functions across the price range: $50 to $200.
   iii. Using the information from (ii), plot the demand and supply curves.
   iv. On your graph in (iii), identify the equilibrium price and quantity.
   v. At prices, P=$85, P=$125, P=$170 and P=$190, determine whether there is excess supply or demand, and calculate the amount of excess supply or demand in each case.
   vi. Explain how excess supply **and** excess demand are eliminated to achieve market equilibrium.

4. Given the supply and demand function in question 3 above, a successful advertising campaign has increased demand by 300 more units per week. **[10 marks]**
   i. State the new demand function.
   ii. Plot the change in demand on your graph above.
   iii. Draw **and** calculate the excess demand (shortage) or excess supply (surplus).
   iv. Calculate the new equilibrium price and quantity.
   v. Explain the role of firms trying to maximise profits in restoring the market to equilibrium again.

5. Given the following supply and demand functions: QD = 27 – 0.7 and QS = -5 + 0.9P: **[15 marks]**
   i. Calculate the equilibrium price and quantity.
   ii. Plot the supply and demand functions, identifying equilibrium price and quantity on your graph.
   iii. At prices, P=$30, P=$25, P=$15 and P=$10, determine whether there is excess supply or demand, and calculate the amount of excess supply or demand in each case.
   iv. State the new demand function if the slope of the demand function changes to -0.9.
   v. In terms of consumer responsiveness to price changes, outline the effect of this slope change on the steepness of the demand curve.
   vi. State the new supply function if the slope of the demand function changes to 0.7.
   vii. In terms of businesses' responsiveness to price changes, outline the effect of this slope change on the steepness of the supply curve.

6. MULTIPLE CHOICE QUESTIONS **HL**

Choose the appropriate response. **[12 marks]**

1. If demand and supply are given by the following equations: QD = 50 – 10P and QS = -100 + 40P, the equilibrium price will be:
   a. 3
   b. 5
   c. 10
   d. 5

2. If demand and supply are given by the following equations: QD = 50 – 10P and QS = -100 + 40P, the equilibrium quantity will be:
   a. 20
   b. 10
   c. 5
   d. 5

3. If demand and supply are given by the following equations: QD = 15 – 5P and QS = -10 + 5P, the equilibrium price will be:
   a. 0
   b. 2.5
   c. 5
   d. 10

4. If demand and supply are given by the following equations: QD = 15 – 5P and QS = -10 + 5P, the equilibrium price will be:
   a. 5
   b. 0
   c. 2.5
   d. 7.5

5. The supply of apple juice changes from QS = -1000 + 50P to QS = -1000 + 100P, we can say that
   a. Supply is 0 at a price of $25
   b. Supply has become more sensitive to price
   c. Supply has become less sensitive to price
   d. The supply curve has shifted to the left

6. The demand for apple juice changes from QD = 50 – 10P to QD = 50 – 5P, we can say that:
   a. Demand is 0 at a price of $10
   b. Demand has become more sensitive to price
   c. Demand has become less sensitive to price
   d. The demand curve has shifted to the right

7. The supply of apple juice changes from QS = -1000 + 50P to QS = -500 + 50P, we can say that
   a. Supply has become more sensitive to price
   b. Supply has become less sensitive to price
   c. The supply curve has shifted to the right
   d. The supply curve has shifted to the left

8. The demand for apple juice changes from QD = 50 – 10P to QD = 30 – 10P, we can say that:
   a. Demand has become for sensitive to price
   b. Demand has become less sensitive to price
   c. The demand curve has shifted to the right
   d. The demand curve has shifted to the left

9. Initially QD = 600 – 50P and QS = -200 + 150P.
   a. P = $1
   b. P = $2
   c. P = $3
   d. None of these

10. Initially QD = 600 – 50P and QS = -200 + 150P.
    a. Q = 100
    b. Q = 200
    c. Q = 400
    d. None of these

11. Initially QD = 600 – 50P and QS = -200 + 150P, then supply changes to QS = -400 + 150P, the new market price is:
    a. P = $3
    b. P = $4
    c. P = $5
    d. None of these

12. Initially QD = 600 – 50P and QS = -200 + 150P, then supply changes to QS = -400 + 150P, the new market quantity is:
    a. 650
    b. 550
    c. 450
    d. None of these