Discussion questions: Week 3

1. Provide a definition of the following terms:
   a) Inverse demand function
   b) Engel curve

2. Are the following statements true or false? Fully explain your answers.
   a) The elasticity of demand is the same as the slope of the demand curve.
   b) The cross-price elasticity will always be positive.
   c) Income elasticity of between zero and unity means a good is inferior.
   d) The supply of apartments is more inelastic in the short run than the long run.

3. Using two or three sentences only, explain briefly how you would distinguish:
   a) Whether a good is inferior or normal.
   b) Whether a good is a necessity or a luxury.
   c) Whether any two given goods are substitutes or complements.

4. A vegetable fibre is traded in a competitive world market, and the world price is $9 per kilo. Unlimited quantities are available for import into the Namibia at this price. The Namibian domestic supply and demand for various price levels are shown as follows:

<table>
<thead>
<tr>
<th>Price</th>
<th>Namibia Supply (Million kg)</th>
<th>Namibia Demand (Million kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
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<td>18</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>14</td>
<td>2</td>
</tr>
</tbody>
</table>

   a) What is the equation for demand? What is the equation for supply?
   b) At a price of $9, what is the price elasticity of demand? What is it at a price of $12?
   c) What is the price elasticity of supply at $9? At $12?
   d) In a free market, what will be the Namibian price and level of fibre imports?
5. Assume that Brad’s budget doubles (i.e. his income rises from £20 to £40). Also assume that the price of pizzas doubles, while the price of beer remains constant. Draw a graph to show what Brad’s budget would be when his income doubles. Label the point where the budget line hits the x-axis (horizontal axis) as M and where the budget line hits the y-axis (vertical axis) as N. Clearly show the number of pizzas and the number of beers Brad buys when his budget line changes.

6. Consider the following individuals and their respective utility functions. Tom’s utility function is \( U(x, y) = xy \). Jerry’s utility function is \( U(x, y) = 500xy + 1000 \). Bart’s utility function is \( U(x, y) = xy(1 - xy) \). Homer’s utility function is \( U(x, y) = -1/(10 + 2xy) \). Marge’s utility function is \( U(x, y) = xy + 2000 \). Lisa’s utility function is \( U(x, y) = 0.5xy - 5000 \). Maggie’s utility function is \( U(x, y) = x/y \). Moe’s utility function is \( U(x, y) = -xy \).

a) Whose preferences are the same as Tom?

b) Who has the same indifference curves as Tom?

c) Why are the answers to (a) and (b) different?

7. Andrew is passionate about fine wine. He is particularly fond of good Bordeaux wines, especially Médoc. Assume that prices of all other goods are constant.

Andrew’s demand for high quality Médoc is given by:

\[ Q_{M} = 0.02Y - 2P_{M} \]

where \( Y \) is Andrew’s income, \( Q_{M} \) is the quantity of wine demanded and \( P_{M} \) is the price of wine. Assume that Andrew’s income (\( Y \)) equals £7000 and the price of a good bottle of Médoc is £30.

a) What will be the quantity of Médoc that Andrew will buy (number of bottles)?

b) Assume that the price of a bottle of Médoc rises to £40. What income would Andrew need to exactly afford to buy the same number of bottles of Médoc as before and the same amount of other goods that he purchased before the price rise?

c) At the new price of £40 and his new income, how many bottles of Médoc will Andrew demand?

d) At his original income of £7000 and the new price of £40, how many bottles of Médoc will he buy?

e) When the price of Médoc rose from £30 to £40 per bottle, Andrew’s demand declined by 20. Determine the reduction in demand due to (i) the substitution effect and the (ii) reduction in demand due to the income effect.

8. Suppose the market demand curve for a product is given by \( Q_d = 1000 - 10P \) and the market supply curve is given by \( Q_s = -50 + 25P \).

a) What are the equilibrium price and quantity?

b) What is the Inverse Form of the demand curve?

c) At the market equilibrium, what is the price elasticity of demand?

d) Suppose the price in this market is $25. What is the amount of excess demand?
9. If \( x \) is an inferior good and the price of \( x \) rises
   a) The substitution effect will induce the consumer to purchase more \( x \) and the income effect will induce the consumer to purchase more \( x \).
   b) The substitution effect will induce the consumer to purchase more \( x \) and the income effect will induce the consumer to purchase less \( x \).
   c) The substitution effect will induce the consumer to purchase less \( x \) and the income effect will induce the consumer to purchase more \( x \).
   d) The substitution effect will induce the consumer to purchase less \( x \) and the income effect will induce the consumer to purchase less \( x \).

10. Margaret has a savings deposit that she receives after her retirement equaling £500,000. She uses this money to buy a medium-sized house costing £250,000. However, the following events occur after her purchase:
   a) The day after she purchases her house, the price of all houses doubles and this includes the house she just purchased.
   b) The day after she purchases her house, the price of all houses falls by half (reduces by 50%), including the house Margaret bought just the day previously.

Demonstrate that both these events lead to an increase in Margaret’s utility.

11. Suppose you are planning to conduct a study of the running shoe market. List the factors that you believe would cause changes in the demand for running shoes. In each case, note whether the relationship would be positive (direct) or negative (inverse). Also list the factors that you believe would affect the supply, again noting the nature of the relationship.

12. In each case below, identify the effect on the demand curve for steak (a normal good).
   a) An increase in the price of lamb.
   b) A decrease in the population.
   c) An increase in consumer income.
   d) A decrease in the price of steak sauce.
   e) An increase in advertising by chicken producers.

13. In each case below, identify the effect on the supply curve for coal.
   a) The development of a new, lower cost mining technique.
   b) An increase in wages paid to coal miners.
   c) The imposition of a $2 per ton tax on coal.
   d) The government imposes a ban on all imports of coal.
   e) A new government regulation requiring air purifiers in all work areas.
14. In a competitive labor market, demand for workers is \( Q_D = 10,000 - 100W \), and supply is \( Q_S = 2,000 + 1,900W \), where \( Q \) is the quantity of workers employed and \( W \) is the hourly wage. What is the initial equilibrium wage and employment level? Suppose that the government decides that $5 per hour is the minimum allowable wage in any market. How would this new minimum wage alter this market? What would the new employment level be? What would happen to total payments to labor? Would there be any excess supply of labor? If so, how much?

15. For each sentence below describing changes in the tangerine market, note whether the statement is true, false, or uncertain, and explain your answer. You will find it helpful to draw a graph for each case.
   a) If consumer income increases and worker wages fall, quantity will rise and prices will fall.
   b) If orange prices decrease and taxes on citrus fruits decrease, quantity will fall and prices will rise.
   c) If the price of canning machinery (a complement) increases and the growing season is unusually cold, quantity and price will both fall.

16. If demand for show tickets is described by the equation \( Q_D = 100 - p \), and supply is \( Q_S = 20 + p \), find the equilibrium price and quantity. How would your answer change if the supply curve shifted to \( Q'_S = 10 + p \) due to increases in actor salaries?

17. Suppose the demand for onion ice cream was described by the equation \( Q_D = 20 - p \), and the supply was described by \( Q_S = -40 + p \). What are the equilibrium price and quantity? Show your answer using a graph.

18. If demand for toy drums is described by the equation \( Q_D = 300 - 5p \), and supply is \( Q_S = 60 + 3p \), find the equilibrium price and quantity. How would your answer change if a decrease in consumer income shifted the demand curve to \( Q'_D = 220 - 5p \)?

19. A new chemical cleaning solution is introduced to the market. Initially, demand is \( Q_D = 1,000 - 2p \) and supply is \( Q_S = 100 + p \). Determine the equilibrium price and quantity. The government then decides that no more than 300 units of this product should be sold per period, and imposes a quota at that level. How does this quota affect the equilibrium price and quantity? Show the solution using a graph and calculate the numerical answer.

20. Demand for park visits is \( Q^*_D = 10,000 - 100P \). If park visits are free, how many visitors will attend? How will your answer change if the park adds a $20.00 admission fee? Show using a graph.

21. A firm introduces a new model of MP3 player, which can play both audio and video files. The price is the same as that of a previous model that can only play audio files. What would happen to the market of the previous model? What if the new model is more expensive than the previous one?

22. In a competitive labor market, demand for workers is \( Q_D = 9,900 - 100W \), and supply is \( Q_S = 2,000 + 1,900W \), where \( Q \) is the quantity of workers employed and \( W \) is the hourly wage. Suppose the government decides to impose a wage ceiling of $3 per hour. What would the equilibrium be in this labor market?

23. New York requires all taxis to be licensed, and limits the number of licenses available. Suppose the market is currently in equilibrium. If the city no longer requires licenses, what will happen to the equilibrium price and quantity supplied? Why?