

The **HL**-only Paper 3 assesses the quantitative methods sections of the syllabus. The topics span the entirety of the course content, from the computation and plotting of linear demand and supply functions, to the calculation of elasticities and calculating the effects of a tariff.

- The exam is 1 hour in length (20% of your final mark)
- Answer two questions from a choice of three (25 marks per question)
- Each question will likely come from a different section of the syllabus
  - Microeconomics
  - Macroeconomics
  - International economics

## **Section I: Microeconomics- Questions**

### **Chapter 1.1: Competitive Markets- Supply & Demand**

#### **Question 1**

- a. In a demand function of the general form  $Q_D = a - bP$ , outline the meaning of the parameter **a** and of the parameter **-b**.
- b. Outline the meaning of the negative slope in this function.

**In the demand function  $Q_D = 35 - 5P$ ,  $Q_D$  represents quantity of good Z demanded per month in thousands of units, and P represents the price per unit of Z in \$.**

- c. Construct a graph of the corresponding demand curve.
- d. Calculate the values of  $Q_D$  when  $P = \$3$ , and  $P = \$4$ .
- e. Calculate the values of **P** when  $Q_D = 5$  thousand, and  $Q_D = 25$  thousand.
- f. Calculate the vertical and horizontal intercepts using the function.
- g. Identify the vertical and horizontal intercepts on your graph.
- h. Assume that due to an increase in income levels, 5 thousand fewer units of **Z** are demanded at each price. Determine the equation for the new demand function.
- i. Identify the vertical and horizontal intercepts of the new demand function in your graph and graph the new demand curve.
- j. Assume that due to a change in tastes, 10 thousand more units of **Z** are demanded at each price (relative to the initial demand function). Determine the equation for the new demand function.
- k. Draw the new demand curve on your graph.
- l. If the slope changes to  $-3$ , state the new demand function, and outline how the change in slope affects the steepness of the demand curve.
- m. Outline the relationship between an individual consumer's demand and market demand.

**Question 2**

- a. In a supply function of the general form  $Q_s = c + dP$ , outline the meaning of the parameter  $c$  and of the parameter  $d$ .
- b. Outline the meaning of the positive slope in this function.

**In the supply function  $Q_s = -10 + 10P$ ,  $Q_s$  represents quantity of good Z supplied per month in thousands of units, and P represents the price per unit of Z in \$.**

- c. Construct a graph of the corresponding supply curve, including only positive values for  $Q_s$ , up to the point where  $P = 5$ .
- d. Calculate the values of  $Q_s$  when  $P = \$3$  and  $P = \$4$ .
- e. Calculate the values of  $P$  when  $Q_s = 10$  thousand, and  $Q_s = 25$  thousand.
- f. Calculate the vertical and horizontal intercepts using the function; which of these does not appear in your graph?
- g. Identify on your graph the intercept with a positive value.
- h. Assume that due to a new technology, 5 thousand more units of Z are supplied at each price. Determine the new supply function.
- i. Calculate the new vertical and horizontal intercepts using the function.
- j. Graph the new supply curve, including only positive values for  $Q_s$ , up to the point where  $P = 4$ .
- k. Assume that due to a reduction in the number of firms in the industry, 5 thousand fewer units of Z are supplied at each price (relative to the initial supply function). Determine the new supply function.
- l. Draw the new supply curve on your graph.
- m. If the slope changes to +15, state the new supply function, and outline how the change in slope affects the steepness of the supply curve.
- n. Outline the relationship between an individual firm's supply and market supply.

**Question 3**

**In the demand function  $Q_D = 35 - 5P$  and the supply function  $Q_s = -10 + 10P$ ,  $Q_D$  and  $Q_s$  are quantities demanded and supplied per month in thousands of units of good Z, and P is price in \$.**

- a. Calculate the equilibrium price and quantity.
- b. Plot the demand and supply curves, and identify the equilibrium price and quantity on your graph.
- c. When  $P = 6$ , and  $P = 2$ , determine whether there is excess demand or excess supply, and calculate the amount of this in each case.
- d. Explain how excess demand and excess supply work to restore equilibrium in the market.
- e. Due to an increase in resource prices, 15 thousand fewer units of Z are supplied at each price. State the new supply equation and plot the new supply curve on your graph.
- f. Determine the new equilibrium price and quantity mathematically and on your graph.
- g. Explain how price works as a signal and incentive to restore equilibrium in the market following the decrease in supply.