IBDP

ECONOMICS

The command terms you can expect to encounter on HL paper 3, and look at what is expected of students in questions of each type.

Command terms to expect on paper 3:

- Calculate: "Obtain a numerical answer showing the relevant stages in the working."
- Construct: "Display information in a diagrammatic or logical form."
- Derive: "Manipulate a mathematical relationship to give a new equation or relationship."
- Determine: "Obtain the only possible answer."
- Draw: "Represent by means of a labelled, accurate diagram or graph, using a pencil. A ruler (straight edge) should be used for straight lines. Diagrams should be drawn to scale. Graphs should have points correctly plotted (if appropriate) and joined in a straight line or smooth curve.
- Identify: "Provide an answer from a number of possibilities."
- Label: "Add labels to a diagram."
- Plot: "Mark the position of points on a diagram."
- Show: "Give the steps in a calculation or derivation."
- Show that: "Obtain the required result (possibly using information given) without the formality of proof. "Show that" questions do not generally require the use of a calculator."
- Sketch: "Represent by means of a diagram or graph (labelled as appropriate). The sketch should give a general idea of the required shape or relationship, and should include relevant features."
- Solve: "Obtain the answer(s) using algebraic and/or numerical and/or graphical methods."

Calculations you may be required to make:

Section 1 Microeconomics

1.1 Markets

Demand:

1. Explain a demand function (equation) of the form $Qd = a - bP$.

2. Plot a demand curve from a linear function (eg. $Qd = 60 - 5P$).

3. Identify the slope of the demand curve as the slope of the demand function $Qd = a - bP$, that is $-b$ (the coefficient of P).

4. Outline why, if the "a" term changes, there will be a shift of the demand curve.

5. Outline how a change in "b" affects the steepness of the demand curve.

Supply:

1. Explain a supply function (equation) of the form $Qs = c + dP$.

2. Plot a supply curve from a linear function (eg, $Qs = -30 + 20 P$).

3. Identify the slope of the supply curve as the slope of the supply function $Qs = c + dP$, that is d (the coefficient of P).

4. Outline why, if the "c" term changes, there will be a shift of the supply curve.

5. Outline how a change in "d" affects the steepness of the supply curve.

Equilibrium:

1. Calculate the equilibrium price and equilibrium quantity from linear demand and supply functions.

HOW TO: Set the demand and supply equations equal to one another and solve for P. Once you know the equilibrium price, plug it into either equation to find the quantity.

2. Plot demand and supply curves from linear functions, and identify the equilibrium price and equilibrium quantity.

HOW TO:

- Find the q-intercept of demand (this is the 'a' variable)
- Find the p-intercept of both demand and supply (set Q = 0 and solve for P in both equations)
- Draw the demand curve by connecting the q-intercept and the p-intercept of demand
- Find the equilibrium price
- Plot the supply curve by connecting the p-intercept of supply and the equilibrium price.

- Draw dotted lines over to the equilibrium price and down to the equilibrium quantity.

3. State the quantity of excess demand or excess supply in the above diagrams.

HOW TO: There will only be an excess demand or supply if the question asks how a price OTHER THAN the equilibrium would affect the market. See the section on price controls below for more.

1.2 Elasticities:

1. Calculate PED using the following equation: PED=% change in Qd% change in P

2. Calculate PED between two designated points on a demand curve using the PED equation above.

3. Calculate XED using the following equation: XED = % change in Qd of good X% change in price of good Y

4. Calculate YED using the following equation: YED=% change in Qd% change in income

5. Calculate PES using the following equation: PES=% change in Qs% change in price

1.3 Government Intervention

Taxes

1. Plot demand and supply curves for a product from linear functions and then illustrate the effects of a specific tax.

2. Calculate the effects of the imposition of a specific tax on the market (on price, quantity, consumer expenditure, producer revenue, government revenue, consumer surplus and producer surplus).

HOW TO: A tax takes money AWAY from the seller of a product. So to calculate the effect of the tax in a supply equation you must subtract the amount of the tax from the price the seller receives.

For example: assume the supply of pencils is represented by Qs = -10 + 3P, and a $2 per unit tax is places on pencils. The new supply equation is: Qs = -10 + 3(P-2). Simplified, this gives us Qs = -16 + 3P. This is the new supply equation. Graphically, the supply curve has shifted leftwards by 6 units, or "upwards" by $2.

Subsidies

1. Plot demand and supply curves for a product from linear functions and then illustrate and/or calculate the effects of the provision of a subsidy on the market (on price, quantity,

consumer expenditure, producer revenue, government expenditure, consumer surplus and producer surplus).

HOW TO: A subsidy is like a "tax in reverse". It is a payment to the seller ABOVE what consumers pay, so it's added to the price in the supply equation.

Assume pencil producers receive a \$2 subsidy per pencil. With an original supply equation of $Qs = -10 + 3P$, the new supply is: $-10 + 3(P+2)$. Simplified, this gives us $Qs = -4+3P$. The supply curve has shifted rightward by 6 units, or down by \$2.

Price controls:

1. Calculate possible effects from the price ceiling diagram, including the resulting shortage and the change in consumer expenditure (which is equal to the change in firm revenue).

2. Calculate possible effects from the price floor diagram, including the resulting surplus, the change in consumer expenditure, the change in producer revenue, and government expenditure to purchase the surplus.

HOW TO: Simply plug the price floor or ceiling into the demand and supply equations to find the quantities that would be supplied and demanded. If there's an effective price floor, the Qs should be greater than the Qd, meaning there's a surplus. If there's a price ceiling, Qd should be greater than Qs, meaning there's a shortage.

1.5 Theory of the Firm

Costs

1. Calculate total, average and marginal product from a set of data and/or diagrams.

HOW TO: Total product is the output of workers as the number of workers increases.

Average product is the "output per worker" = TP/# of workers

Marginal product is the "output of the last worker" = Change in total product / change in the number of workers.

2. Calculate total fixed costs, total variable costs, total costs, average fixed costs, average variable costs, average total costs and marginal costs from a set of data and/or diagrams.

HOW TO: TFC is constant as output increases. It is the firm's total cost when output = 0.

TVC increases as output increases, at first at a decreasing rate (due to increasing returns), and then at an increasing rate (due to diminishing marginal returns).

TC = TVC + TFC. If you know the firm's fixed costs and its variable costs, TC can easily be calculated.

AFC = TFC / Q of output. AFC falls as output increases as the firm "spreads its overhead". Graphically, it is the distance between AVC and ATC.

AVC = TVC / Quantity of output. AVC falls at first due to increasing returns and then increases due to diminishing returns. MC and AVC should intersect at the lowest point of AVC

ATC = AFC + AVC, or TC / Quantity of output. ATC lies ABOVE the AVC curve (since it includes the average fixed costs), and will intersect MC at its lowest point.

MC = the change in TC / the change in output. It is the cost of the last unit produced. MC sloped down when a firm's workers experience increasing returns and upwards once the firm experiences diminishing marginal returns.

Revenues:

1. Calculate total revenue, average revenue and marginal revenue from a set of data and/or diagrams.

HOW TO: Total revenue (TR) = price X quantity.

Average revenue (AR) is simply the price of the good. The demand curve can be labelled "D=AR=P" to help you remember this.

Marginal revenue (MR) = the change in total revenue divided by the change in quantity. This is the change in total revenue resulting from the last unit sold. For a PC firm, MR is constant and equal to the market price (since the firm is a price taker and can sell additional units for the same price.) But for an imperfectly competitive firm, MR is lower than price beyond the first unit of output, since the firm must lower its price to sell additional units of output. MR fall twice as steeply as the D=AR=P curve in an imperfect competitor diagram.

Profit:

1. Calculate different profit levels from a set of data and/or diagrams.

HOW TO: Economic profit is usually found by the following equation. Profit = (P-ATC)Q. Find the per-unit profit (P-ATC) and multiply it by the quantity of output (Q).

If you are given total revenue (TR) and total cost (TC) data, than economic profit = TR-TC.

If ATC>P or if TC>TR, then the firm's profit is negative, and it is earning losses.

Perfect Competition:

1. Calculate the short run shutdown price and the breakeven price from a set of data

HOW TO: A firm should shut down if the price in the market is lower than the firm's minimum average variable cost. At this point, the firm's total losses are greater than its total fixed costs, so it will LOSE LESS by shutting down!

A firm will break even when the price in the market equals the firm's minimum ATC, or if the TR = TC (see above). Economic profits = 0.

Monopoly:

1. Calculate from a set of data and/or diagrams the revenue maximizing level of output.

HOW TO: Total revenue is maximized when MR=0. If you have a table you can calculate the change in TR at each level of output, and when this equals zero, the firm would be maximizing its total revenues. Anything beyond this level of output, MR will be negative and the firm's revenues will begin to fall.

Section 2 Macroeconomics

2.1 GDP

1. Calculate nominal GDP from sets of national income data, using the expenditure approach.

HOW TO: Nominal GDP is the quantity of output in a particular year multiplied by the prices in that year.

2. Calculate GNP/GNI from data

HOW TO: The difference between GDP and GNP is that you must SUBTRACT the value of output produced in a nation by companies based in other nations, but you must ADD the value of output produced in other nations by companies based in the nation you are calculating GNP for.

3. Calculate real GDP, using a price deflator.

HOW TO: Real GDP is the value of a nation's output in a particular year measured using the prices from a base year. So you must multiply the quantity from the year in question by the prices from the base year (which should be provided).

If you are not given price and quantity data, rather you are given the GDP deflator price index, you can divide the nominal GDP for a particular by the GDP deflator for that year, and multiply by 100 to get the real GDP.

If you know the nominal GDP and the real GDP and are asked to calculate the GDP deflator, you simply divide the nominal by the real and multiply by 100.

If you have two years' GDP deflators, and are asked to calculate the inflation between those years, you simply find the percentage change in the GDP deflator price indexes between the years given.

2.2 AD / AS

1. Calculate the multiplier using either of the following formulae: k=11-MPC or 1MRl=(MPS+MRT+MPM)

2. Use the multiplier to calculate the effect on GDP of a change in an injection in investment, government spending or exports.

HOW TO: If you know the MPC, you can estimate the effect of any change in spending in the economy on total GDP. For example. Assume the MPC = 0.8 and Net exports increase by $100 million. Calculate the total change in GDP.

k = 1/(1-0.8) = 5.

Now multiply the change in net exports by the multiplier: $100 million X 5 = $500 million

GDP will increase by $500 million as a result of the increase in net exports of $100 million.

2.3 Macroeconomic Objectives

1. Calculate the unemployment rate from a set of data.

HOW TO: The unemployment rate is the proportion of the labor force that is unemployed. This means they are actively seeking work but unable to find it.

You may be given a table showing the number of people in different groups, like college students, retirees, people looking for jobs, people who have given up looking for jobs, part time workers, full time workers, etc… You will have to calculate the unemployment rate from this information.

NOTE: People who are working part time but want to work full time ARE EMPLOYED. People who have given up looking for jobs are DISCOURAGED WORKERS and are no longer considered unemployed, rather, they have dropped out of the labor force. Discouraged workers are not accounted for in unemployment data.

2. Construct a weighted price index, using a set of data provided.

HOW TO: Refer to pages 303 – 305 in the textbook (Pearson Baccalaureate Economics) for a worked solution to this type of problem. It's not difficult math, you just have to know how to do it.

3. Calculate the inflation rate from a set of data.

HOW TO: The inflation rate = (CPI year 2 – CPI year 1)/CPI year 1. It is the rate of change in the CPI between two years. You do NOT always simply take the CPI and calculate the rate of change since it was 100. This would tell you how much inflation there was since the base year, but inflation is usually measured between two years.

4. Calculate the rate of economic growth from a set of data.

HOW TO: The rate of economic growth is the percentage change in the real GDP between two periods. = (GDP year 2 – GDP year 1)/GDP year 1

5. Calculate the marginal rate of tax and the average rate of tax from a set of data.

HOW TO: Refer to pages 361 – 362 in the text. The important thing here is to take your time and do the math very carefully.

The difference between the marginal rate and the average rates is as follows:

Assume the marginal tax rates for Country S are:

Income:

0-20,000 – 5%

20,001 – 50,000 – 15%

50,001 – 100,000 – 25%

100,001 – above – 35%

Assume an individual earns $75,000. Calculate:

> The amount of tax he will pay:
> He will pay 5% on the first 20,000. 20,000 x 0.05 = $1,000
> He will pay 15% on the NEXT 30,000 (up to $50,000). 30,000 x 0.15 = $4,500
> He will pay 25% on the NEXT $25,000 (the income he earns between $50,000 and $75,000). 25,000 x 0.25 = $6,250.
> Total tax paid = 1,000+4,500+6,250 = $11,750
> His average tax rate: This is his total tax liability divided by his income = $11,750 / $75,000 = 0.1567 x 100 = 15.67%.

You may also be given data on a INDIRECT taxes, which are taxes on consumption (such as a VAT). You may be told that the same individual consumes $45,000 of his income, of which 8% was paid in consumption taxes. Calculate the percentage of his income paid in indirect taxes:

$45,000 x 0.08 = $3,600 paid in indirect taxes.

$3,600 / $75,000 = 0.048 x 100 = 4.8% of his income paid in indirect taxes.

Section 3 International Economics

3.1 Free trade:

1. Calculate opportunity costs from a set of data in order to identify comparative advantage.

HOW TO: You may be given a production possibilities table OR a production possibilities curve for two countries. With either of these, you can calculate the opportunity costs of the countries for the two goods shown and determine comparative advantage.

For example: Assume Country S and Country I can produce the following amounts of wine and cheese on a single hectare of land

Country S: 4 barrels of wine and 5 tons of cheese
Country I: 8 barrels of wine and 8 tons of cheese

If the two countries were to specialize and trade, who should produce what?

In country S: 4w = 5c so 1w = 1.25c.
5c = 4w, so 1c = 0.8w
In country I: 8w = 8c, so 1w=1c

In Country S, 1 ton of cheese costs only 0.8 ton of wine, while 1 barrel of wine costs 1.25 cheeses. In Country I cheese "costs" more (1 ton of wine), while wine "costs" less (only 1 ton of cheese).

So Country S should specialize in cheese, because it is cheaper, and Country I in wine. The two countries can then trade and enjoy the foreign produced good at a lower opportunity cost than they could have achieved domestically.

3.2 Protectionism:

1. Calculate from diagrams the effects of imposing a tariff on imported goods on different stakeholders, including domestic producers, foreign producers, consumers and the government.

HOW TO: If you are comfortable with the tariff diagram and can identify the different areas identified above, then you simply find the AREA of those shapes on the graph to determine the costs, benefits, and revenues necessary.

2. Calculate from diagrams the effects of setting a quota on foreign producers on different stakeholders, including domestic producers, foreign producers, consumers and the government.

HOW TO: Same as for tariffs. Once you are familiar with the graph, simply find the areas representing the impact on each of the stakeholders.

3. Calculate from diagrams the effects of giving a subsidy to domestic producers on different stakeholders, including domestic producers, foreign producers, consumers and the government.

HOW TO: Calculate the areas on a graph! EASY!

3.3. Exchange Rates:

1. Calculate the value of one currency in terms of another currency.

HOW TO: If you know the price of one currency in terms of another, you can quickly find the price of the other.

For example. If 1 euro = 1.2 CHF, then 1 CHF = 1/1.2 euro, or 0.83 Euro. The price of one currency is the inverse of the price of the other.

2. Calculate the exchange rate for linear demand and supply functions.

HOW TO: If you can calculate equilibrium price and quantity for a good using linear equations, then finding the equilibrium exchange rate is easy. Given the equations for two currencies, simply set them equal to each other and find the equilibrium.

Example: Assume the demand for Euros in Switzerland is represented by the equation $Qd = 10 - 2P$, where P is the exchange rate of the Euro in CHF.

Supply of Euros in Switzerland is represented by the equation $Qs = -3 + 4P$ where P is the exchange rate of the Euro in CHF.

3. Calculate the equilibrium exchange rate of the Euro in Switzerland.

Set the demand and supply equal to one another: $8 - 4P = -4 + 6P$, and solve for P.

$12 = 10P$.

$P = 12/10 = 1.2$ CHF / Euro

4. Plot demand and supply curves for a currency from linear functions and identify the equilibrium exchange rate.

HOW TO: This is the same as plotting linear demand and supply equations for any good.

Find the q-intercept of demand (this is the 'a' variable)
Find the p-intercept of both demand and supply (set Q = 0 and solve for P in both equations)

Draw the demand curve by connecting the q-intercept and the p-intercept
Find the equilibrium price (or exchange rate in this case).
Plot the supply curve by connecting the p-intercept of supply and the equilibrium exchange rate.
Draw dotted lines over to the equilibrium exchange rate and down to the equilibrium quantity.

5. Using exchange rates, calculate the price of a good in different currencies.

HOW TO: If you know the price of a good in one currency and you know the exchange rate between that currency and another, you can always find the price of the good in the other currency.

For example: A hotel room in London costs 250 British Pounds per night. The British Pound exchange rate in Switzerland is 1.5 CHF / pound. How much does the London hotel room cost in CHF?

Convert the room's price to CHF. So, 250 x 1.5 = 375 CHF per night.

6. Calculate the changes in the value of a currency from a set of data.

HOW TO: Consider the following. A London hotel room that costs 250 pounds per night used to cost 375 CHF. Following a change in the exchange rate, the same room now costs 400 CHF. Calculate the new exchange rate of British Pounds in Switzerland.

The old exchange rate was: 375 / 250 = 1.5 CHF / GBP. The new exchange rate, therefore, is 400 / 250 = 1.6 CHF / GBP

3.4 Balance of Payments:

1. Calculate elements of the balance of payments from a set of data.

HOW TO: You must know the components of a nation's current and financial accounts, and be able to determine from a set of payments data which type falls into which category, and whether it counts as a credit or a debit.