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Economics

Higher level

Paper 3

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International Baccalaureate
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Notes for examiners:

1. **Whenever relevant, carry over marks must be awarded. If a candidate makes an error in calculation, but then uses the incorrect figure appropriately and accurately in later question parts, then the candidate may be fully rewarded. This is the "own-figure rule" and you should put OFR on the script where you are rewarding this. To do this you will need to use the on-page comment annotation tool (T).**

2. **Alternative approaches may be taken in responses to the [4] questions that use A02 command terms. If this is the case and the alternative approaches are valid, then full credit should be given.**

1. (a)   Define the term *monopoly power*.   **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*Vague definition.* The idea that the firm faces a negatively sloped demand curve **OR** that it arises when one firm dominates the market.	**1**
2	*Accurate definition.* The ability of a firm to set the price.	**2**

(b)   Using the figures provided in **Table 1**, calculate the monthly level of profits Firm A is making at the current level of output, Q'.   **[3]**

Total revenues $= 140 \times 150\,000 = \$21\,000\,000$ **[1]**

Total costs $= 60 \times 150\,000 = \$9\,000\,000$ **[1]**

$\pi = \text{TR} - \text{TC} = 21\,000\,000 - 9\,000\,000 = \$12\,000\,000$ **[1]**

OR

$\pi = (\text{AR} - \text{AC}) \times Q = (140 - 60) \times 150\,000 = \$12\,000\,000$ **[3]**

*Any valid working is sufficient for **[1]**.*

OFR applies for the final figure (assuming that at least either TR or TC is calculated correctly).

*An answer of $12\,000\,000$ or $12\,000\,000$ or 12 million without any valid working is sufficient for **[1]** only.*

(c)   Using the relationship $P = AR > MR > AC > MC$ and/or figures provided in **Table 1**:

    (i)   State the reason Firm A cannot be a perfect competitor.   **[1]**

        Price (or average revenue) is greater than (or is not equal to) marginal
        revenue.   **[1]**

        An answer which indicates that $P > MR$ is sufficient for ***[1]***.

    (ii)   Determine whether Firm A should increase or decrease its level of output in
        order to maximize profits. You **must** give a reason for your choice.   **[2]**

| Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*Correct answer with incorrect reasoning.* This firm should increase its level of output.	**1**
2	*Accurate answer.* Since $MR > MC$ (or $\$80 > \$50$), this firm should increase its level of output.	**2**

    (iii)   Determine whether total revenue collected will increase, decrease or
        remain unchanged if Firm A increases its level of output. You **must** give a
        reason for your choice.   **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*Correct answer without a valid reason provided.* Total revenue will increase.	**1**
2	*Accurate answer.* Total revenue will increase because marginal revenue is positive **OR** the idea that increasing output by one unit will add ($80.00) to total revenue and thus total revenue will increase.	**2**

(iv) Describe how average cost will be affected if Firm A increases its level of output. **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*Correct answer without a valid reason provided.* Average cost will decrease.	**1**
2	*Accurate answer.* Average cost will decrease since marginal cost is lower than average cost. Therefore, producing an additional unit of output will reduce average cost.	**2**

(v) Determine whether Firm A is productively efficient at the current level of output. You **must** give a reason for your choice. **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*Correct answer with no valid reason provided.* The firm is not productively efficient.	**1**
2	*Accurate answer.* The firm is not productively efficient, because $AC > MC$ so AC is not at a minimum.	**2**

(d) Explain why allocative efficiency is achieved, in the absence of externalities, at a level of output where price (average revenue) is equal to marginal cost. **[4]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.* For the idea that welfare loss is zero **OR** that social (community) surplus (sum of consumer surplus and producer surplus) is maximized. For a vague reference to surplus or benefit, **[1]** may be awarded.	**1–2**
2	*The written response is accurate.* For explaining that as long as price is greater than MC, output should continue to be increased until MB (price) equals MC, because as a result social (community) surplus will be higher **OR** for explaining that all units valued more than they cost to produce are indeed produced up until the point where price equals marginal cost for the last unit produced. Some marginal analysis is required for **[4]**. A response which explains that price is the value placed by society on a product, while MC is the (marginal) cost, and when they are equal, community surplus is maximized, may be awarded **[3]**.	**3–4**

(e) On the following axes, sketch a fully labelled diagram showing the level of output
     Q' for which the relationship $P = AR > MR > AC > MC$ is true. The use of figures
     provided in **Table 1** is **not** required.   **[3]**
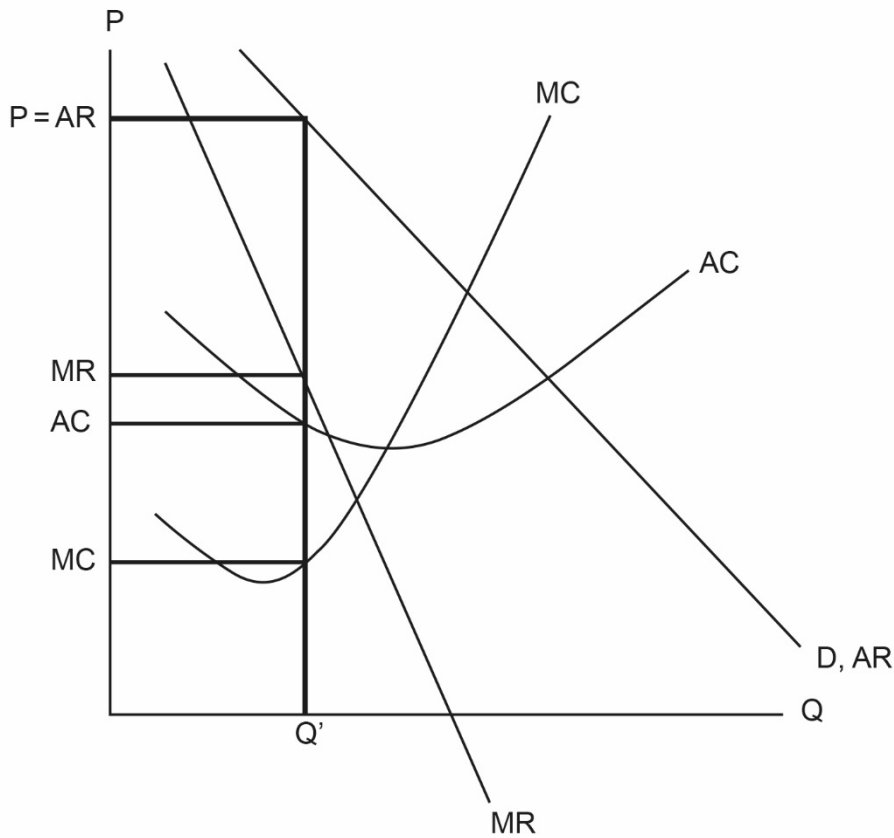
For an accurately drawn diagram of a firm with monopoly power.   **[1]**

The AR curve must be downward sloping and MR must below AR. The MC and
AC curves must have the appropriate shapes, and MC should intersect AC at or
close to the minimum. However, it is not necessary for MR to be twice as steep
as AR.

For accurate labelling of axes and all curves.   **[1]**
N.B. The labels P = AR, MR, AC and MC on the vertical axis are not necessary.

For identifying the level of output that satisfies the relationship.   **[1]**

(f)   Using the profit figures in the payoff matrix, explain why strategic
      interdependence will lead both firms to cut price.   **[4]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*Vague explanation.* Award **[1]** for each of the following points: • for a vague explanation that the level of profits attained by their decision depends on the decision made by the rival firm • profit will be higher if it cuts price.	**1–2**
2	*Accurate explanation.* For an explanation that uses correctly the figures showing that the level of profits attained by any decision (strategy) depends on the decision (strategy) the rival firm makes **and** that if Firm B "maintains price" then Firm A can earn more by cutting price as $24 million > $18 million, while if Firm B 'cuts price' then Firm A will also cut price, as again profits will be greater ($8 million > $3 million). So Firm A will cut price, no matter which strategy Firm B chooses, and vice-versa. Award **[3]** for a response which demonstrates some understanding of strategic interdependence, makes some reference to the data and incorporates the points above. For example, a response which explains that one firm might seek to cut price in order to earn greater profit/market share, causing the other firm to do the same (with some data incorporated). Award **[4]** for a response which demonstrates clear understanding, by a precise use of the data, that whatever decision is taken by B, A can earn more by cutting price (as outlined above).	**3–4**

2. (a) Assuming that there are no restrictions on the importing of bananas into Country A:

    (i) State the quantity of bananas which will be purchased each month in Country A. **[1]**

        400 000 kg **[1]**

    (ii) Calculate the monthly expenditure on bananas imported into Country A. **[1]**

        $350\,000 \times \$3 = \$1\,050\,000$ **[1]**

        An answer of $1 050 000 or $1.05 million without any valid working is sufficient for ***[1]***.

    (iii) Calculate the domestic producer surplus. **[1]**

        $0.5 \times 50\,000 \times 1 = \$25\,000$ **[1]**

        An answer of $25 000 without any valid working is sufficient for ***[1]***.

(b) (i) Identify the price which would be paid by consumers in Country A per kg of bananas following the imposition of the quota. **[1]**

$5 **[1]**

(ii) Identify the quantity of bananas which would be purchased in Country A per month following the imposition of the quota. **[1]**

300 000 kg **[1]**

OFR applies if (b)(i) is incorrect eg $5.50 for (b)(i) would lead to 275 000 kg for (b)(ii).

(iii) Calculate the change in revenue earned by domestic producers of bananas in Country A as a result of the quota. **[3]**

Initial revenue $= 3 \times 50\,000 = 150\,000$ **[1]**

Final revenue $= 5 \times 150\,000 = 750\,000$ **[1]**

N.B. For the marks above, it is not necessary to specify the initial and final revenue – a candidate may simply write $(5 \times 150\,000) - (3 \times 50\,000)$ and be fully rewarded.

Change in revenue $= 750\,000 - 150\,000 = \$600\,000$ **[1]**

OFR applies within part (iii) if at least one of the revenue figures is calculated correctly.
OFR may also be applied if a candidate has identified the price(s) incorrectly in (a)(ii) or (b)(i).

N.B. Some candidates may annotate the diagram – and use to show revenues – these annotations can be seen and rewarded by looking at the script in full response mode.

One example of OFR might be: P = $5.50 and so final revenue would be $5.5 \times 175\,000 = \$962\,500$, so the change would be $962\,500 - 150\,000 = \$812\,500$.

Another example of OFR might be if a candidate identifies the new price as $3, rather than $5, then the change in revenue could be $3 \times 150\,000 - 3 \times 50\,000 = \$300\,000$.

(c)   With reference to the diagram, explain why the welfare loss from the imposition of
      the quota is likely to be greater than the welfare loss resulting from a tariff of $2
      per kg.   **[4]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.*	**1–2**

For explaining that the impact on price and quantity of consumption and
imports would be identical to that of the quota, but the welfare loss would
be greater with a quota.
P = $5, imported quantity = 150 000 kg, Qd = 300 000 kg.

If the result of the tariff (price, Qd, imports) is identified correctly award **[1]**.
OR
If **one** welfare loss is identified accurately, award **[1]**.

A response which indicates that the foregone tariff revenue is the reason
for the difference, but with little/no accurate supporting evidence, should be
awarded **[2]**.

| 2 | *The written response is accurate.* | **3–4** |

For explaining that the welfare loss is likely to be greater for the quota,
because, even though the impact on price and quantity is the same in this
diagram in the case of a $2 tariff, the government does not necessarily
benefit in terms of revenue from a quota.

A response which explains that price, quantity (and imports) would be the
same with a tariff or quota, but that there would be no tariff revenue with the
quota so welfare loss would be greater **without reference to the diagram**
should be awarded **[3]**.

N.B. Some candidates may annotate the diagram – these annotations can
be seen and rewarded by looking at the script in full response mode.

(d) (i) Outline the reason why a fall in the price of the dollar should lead to an
          increase in the quantity of dollars demanded.   **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.* If there is no reference to exports and the answer relies on the general law of demand, award **[0]**.	**0**
1	*There is limited understanding.* For stating that more exports would be sold at a lower exchange rate.	**1**
2	*There is clear understanding.* For explaining that more exports would be sold at a lower exchange rate and that as a result more dollars would be demanded in order to purchase these exports.	**2**

(ii) Assume that the dollar/yen exchange rate is in equilibrium. Using the
     functions above, calculate the cost, in dollars, of a motorbike which costs
     ¥552 640.   **[3]**

$$1900 - 18P = 580 + 12P$$

$$1320 = 30P$$
$$P = ¥44 \text{ (or P = 44)}$$ **[2]**

Any valid working is sufficient for *[1]*.
An answer of ¥44 or 44 without any valid working is sufficient for *[1]*.

The bike will cost $\dfrac{552\,640}{44} = \$12560$ **[1]**

OFR applies if the exchange rate calculated is incorrect.

(e) (i) Using examples from **Table 1**, outline the difference between debit items and credit items in the balance of payments. **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*Vague distinction.* The idea that debits are negative and credits are positive.	**1**
2	*Accurate distinction.* A clear statement that debit items signify currency outflows while credit items signify currency inflows, with an accurate example of each from the table.	**2**

(ii) Calculate the current account balance from the data given in **Table 1**. **[2]**

Current account balance = exports of goods and services − imports of goods and services + net income + net current transfers

$= 3240 + 1928 - 3519 - 1590 - 456 - 488$ **[1]**

$= -\$885\,\text{billion}$ **[1]**

*Valid working is sufficient for **[1]**. Working should not be considered valid if items from the financial or capital accounts are included. The minimum requirement for valid working is that the elements $3240 + 1928 - 3519 - 1590$ are present and correct.*

*An answer of $-\$885$ billion or -885 without any valid working is sufficient for **[1]** only.*

(iii)   Explain **two** implications of a rising current account surplus.   **[4]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.*	
	For providing **one** implication without explanation.	**1**
	For providing **two** implications without explanation *OR* for providing **one** implication with explanation.	**2**
2	*The written response is accurate.*	
	For providing **one** implication without explanation **and one** implication with explanation.	**3**
	For providing **two** implications with explanation.	**4**

Implications include:

- appreciation of the currency as the demand for the currency has increased relative to its supply
- reduced export competitiveness as the currency strengthens
- reduced domestic spending as a result of increased exports or reduced imports
- worsening relations with countries who suffer a corresponding deficit on their current accounts
- a rising deficit on the financial/capital accounts
- as X>M, AD will increase, possibly leading to inflation and/or growth.

N.B. An explanation that AD will increase should be awarded **[1]** only.

3. (a) (i) Fernando earns \$35 000 in 2015. Calculate his average rate of tax. **[2]**

$(0 \times 10\,000) + (0.1 \times 10\,000) + (0.2 \times 15\,000) = 4000$ **[1]**

$$\frac{4000}{35\,000} \times 100$$

$= 11.43\,\%$ or 11.43 **[1]**

N.B. *The % sign is not necessary as the question asks for the "rate".*

*Any valid working is sufficient for **[1]**.*
*An answer of 11.43 % or 11.43 without any valid working is sufficient for **[1]** only.*

A candidate who calculates the tax paid as \$3999.7 should be fully rewarded.

(ii) Maki, who earns \$70 000 in 2015, pays an average rate of tax of 27.14 %. Using the figures provided in **Table 1**, outline why her average tax rate is higher than that of Fernando. **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*There is limited understanding.* For the idea that her income is subject to higher marginal tax rates and so her average tax rate is higher **OR** Maki's average tax rate is higher than Fernando's because her income falls into a higher tax bracket and she therefore has a higher marginal tax rate.	**1**
2	*There is clear understanding.* For explaining that Maki's marginal tax rate (60 %) is higher than her average rate (27.14 %), which causes the average tax rate to be higher when income is higher. Therefore, since Maki earns twice as much as Fernando, her average tax rate is higher. Alternatively, candidates may explain, using figures to support their answer, that Maki earns twice as much income as Fernando and pays more than twice as much tax.	**2**

(iii)   Outline **one** potential advantage and **one** potential disadvantage of a
        progressive tax system.   **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.* For providing one advantage **OR** one disadvantage.	**1**
2	*The written response is clear.* For providing one advantage **AND** one disadvantage.	**2**

The potential advantages are:
- incomes are to some extent redistributed to become more equal
- improvement in equity
- less inequality in income distribution may improve social cohesion
- larger tax revenues may be raised.

The potential disadvantages are:
- incentives to work or to invest may be reduced
- there may be a misallocation of (labour or human capital) resources
- high income earners may leave the country
- more incentives for tax evasion.

(iv)   Fernando receives a pay rise in 2016. His total income rises to $43\,000$.
        Calculate the percentage of his additional income which must be paid as
        tax.   **[3]**

Rise in income $= 43\,000 - 35\,000 = \$8000$

New tax payment $= (0.1 \times 10\,000) + (0.2 \times 20\,000) + (0.4 \times 3000) = \$6200$ **[1]**

Original tax payment $= \$4000$
Rise in tax $= 6200 - 4000 = \$2200$ **[1]**

OFR applies if part (a)(i) has been answered incorrectly.

$$\frac{2200}{8000} \times 100$$
$$= 27.5\,\%$$ **[1]**

*An answer of 27.5 %, 27.5, 0.275 or 0.28 without any valid working is
worth [1].*
Any valid alternative approach should be fully rewarded.
Any valid working is worth [1].

OFR applies if the rise in tax has been calculated incorrectly.

(b) Country Z implements a 10 % sales tax in 2016. Explain why an indirect tax is unlikely to be used as a mechanism to promote equity. **[4]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.* For the idea that indirect taxes are inequitable because lower income earners are affected more.	**1–2**
2	*The written response is accurate.* For explaining that indirect taxes are inequitable because lower income earners are affected more **AND** that this is because the indirect tax paid will be identical for two individuals who buy the same item, so the higher income earner will pay a lower proportion of his income on the tax than the lower income earner. Therefore, the tax may be seen as unfair. The term "regressive" is not necessary, provided it is implied. A response which explains accurately that an indirect tax will lead to greater inequality may be awarded **[4]** – the link to equity is implied.	**3–4**

(c) (i) Calculate the percentage of income received by the highest 20 % in Country X. Enter your answer in **Table 2**. **[1]**

$100 - 3.0 - 6.8 - 12 - 20.1 = 58.10$ **[1]**

*An answer of 58.10 without any valid working is sufficient for **[1]**. Placing the result in the table is not necessary.*

(ii) Outline why Country X has a higher Gini coefficient, using the data in **Table 2**. **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.* Country X will have the higher Gini coefficient because the income distribution is more unequal.	**1**
2	*The written response is clear.* Country X will have the higher Gini coefficient, as the lowest 40 % of the income groups are only receiving 9.80 % of the country's total income, while the top 40 % are receiving almost 80 % of the total income. However, in Country Y, the lowest 40 % receive 25 % of the income, a higher share than in Country X, while the top 40 % receive 55 %, which is a lower share than in Country X. A response including some accurate and relevant reference to the data, with a resulting comment that the distribution of income is more unequal in Country X should be awarded **[2]**.	**2**

(iii) On the following axes, plot the Lorenz curve for Country Y. **[3]**
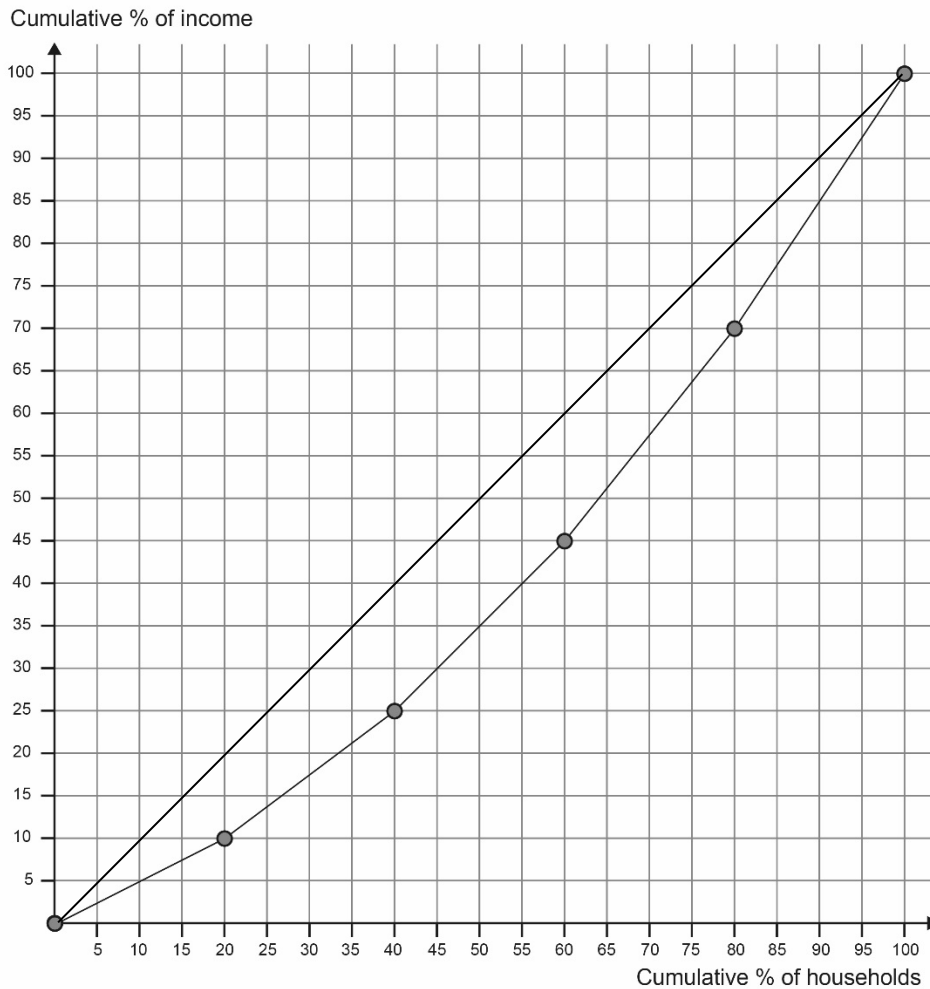
For correctly labelled axes. **[1]**
N.B. % of income/households/population are acceptable labels for the
axes. The scale only needs to be shown for 10, 20, 30 *etc.*

For drawing a Lorenz curve below the diagonal. **[1]**

For an accurately plotted Lorenz curve – *allow very minor discrepancies.* **[1]**

*(To be correct: 0 % at 0 %; 10 % on vertical axis at 20 % on horizontal,
25 % at 40 %, 45 % at 60 %, 70 % at 80 %, 100 % at 100 %.)*

N.B. A candidate might use a different scale from the one above – using
only a portion of the grid. Provided this is accurate and the plotting of points
is approximately correct, then the third mark may be awarded.

(iv)   Outline why the Gini coefficient must have a value between 0 and 1
        (or between 0 and 100).   **[2]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.* The Gini coefficient is measured by the area between the Lorenz curve and the diagonal divided by the total area beneath the diagonal (half square) **OR** that a Gini coefficient of 0 implies perfect equality (of income).	**1**
2	*The written response is clear.* The Gini coefficient is measured by the area between the Lorenz curve and the diagonal divided by the total area beneath the diagonal (half square). Therefore it can only yield any number between 0 and 1 (or between 0 and 100 when multiplied by 100). (Perfect equality would have a coefficient equal to zero, while perfect inequality would have a coefficient equal to 1 (or 100).)	**2**

(d)   Country X raises the level of transfer payments. Explain **two** reasons why this
       policy could help to break the poverty cycle.   **[4]**

Level		Marks
0	*The work does not reach a standard described by the descriptors below.*	**0**
1	*The written response is limited.* For providing **one** reason without explanation.	**1**
	For providing **two** reasons without explanations **OR** for providing **one** reason with explanation.	**2**
2	*The written response is accurate.* For providing **one** reason without explanation **and one** reason with explanation.	**3**
	For providing **two** reasons with explanations.	**4**

Reasons may include:
- the poorest will receive transfer payments, so they will be able to invest in human capital (education)
- the poorest will receive transfer payments, so they will be able to invest in human capital (health care)
- the poorest will receive transfer payments, so they will be able to invest in physical capital (housing, sanitation and small businesses)
- the poor will be able to save more, resulting in more investment
- any other reasonable response.

An explanation which accurately combines two points (*eg* health and education) rather than explaining each one separately may be awarded full marks.

The explanation might relate to the poverty cycle for a household or for the economy.