Cambridge Assessment International Education

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GEOGRAPHY **0460/41**

Paper 4 Alternative to Coursework **October/November 2023**

1 hour 30 minutes

You must answer on the question paper.

You will need: Insert (enclosed) Ruler
Calculator
Protractor

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined pages at the end of this booklet; the question number or numbers must be clearly shown.

INFORMATION

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [ ].
- The insert contains additional resources referred to in the questions.

Definitions
MEDCs – More Economically Developed Countries
LEDCs – Less Economically Developed Countries

This document has **20** pages. Any blank pages are indicated.

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1 Students from a school in Singapore, a country in Southeast Asia, were studying tourism. Tourism is an important industry in Singapore. It contributes about 10% of the country's GDP (annual income) and employs more than one million workers.

(a) Fig. 1.1 (Insert) shows the number of international tourists visiting Singapore during 2018.

(i) Describe the variation in the number of international tourists during the year.
Use statistics in your answer.

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..... [3]

(ii) Suggest **two** reasons why the number of international tourists visiting Singapore varies during the year.

1 .....

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2 .....

..... [2]

(b) Fig. 1.2 shows the different ways that the tourist industry earned money.

Percentage share of tourist income

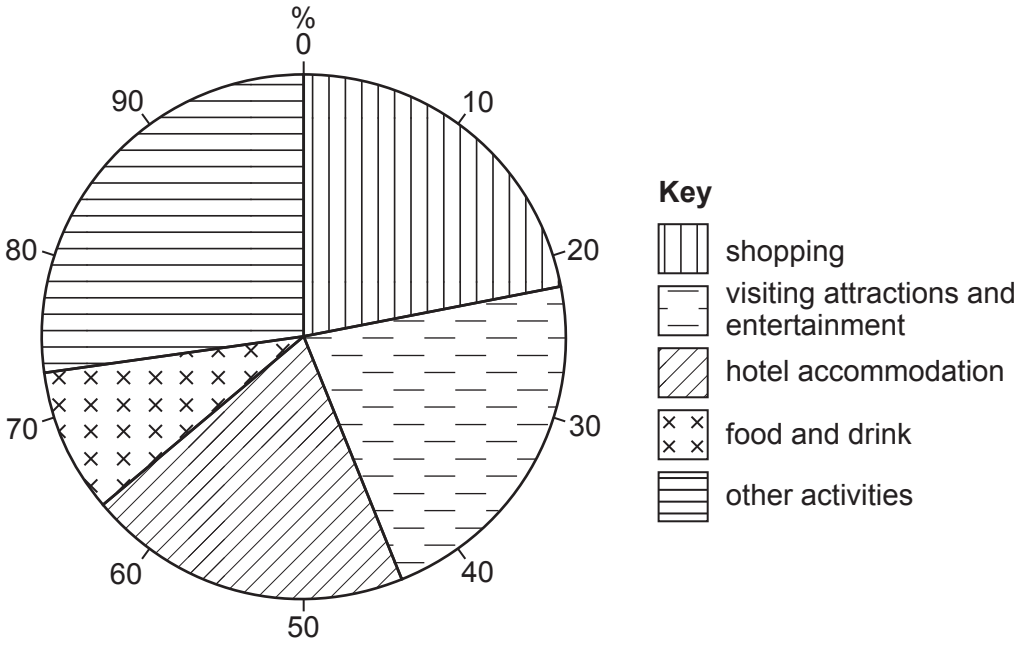


Fig. 1.2

(i) How would the students obtain the data shown in Fig. 1.2? Tick (✓) **one** answer. [1]

	tick (✓)
Ask owners of shops, hotels and tourist attractions.	
Look at the Singapore Tourism Board website.	
Use a questionnaire with international tourists.	
Interview a member of the Singapore government.	

(ii) Which sector of the tourist industry shown in Fig. 1.2 contributed the **least** amount of money?

..... [1]

(iii) What percentage of income from tourism came from visiting attractions and entertainment?

..... % [1]

(c) Singapore has many tourist attractions. Some of these are shown in Fig. 1.3 (Insert).

Describe the distribution of the tourist attractions shown in Fig. 1.3.

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..... [2]

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The students decided to investigate the following hypotheses:

Hypothesis 1: *Most tourists to Singapore come from Europe*.

Hypothesis 2: *People in different age groups prefer to visit different attractions in Singapore*.

(d) The students produced a questionnaire for tourists to complete to test their hypotheses. The questionnaire is shown in Fig. 1.4 (Insert).

Fig. 1.5 is an extract from one student's fieldwork diary which describes her method for selecting people to survey.

Sampling method The survey was done by random sampling. Description of the method I chose every tenth person who walked past me and asked them to complete my questionnaire.

Fig. 1.5

What is wrong with the student's description of her method? How should she describe the random sampling method?

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..... [3]

(e) The students used the answers to question 2 in the questionnaire (*Which country do you live in?*) to calculate the number of tourists coming from different continents. Their results are shown in Table 1.1 (Insert).

(i) **Plot the total number of tourists** coming from Asia on Fig. 1.6. [1]

Where tourists visiting Singapore come from

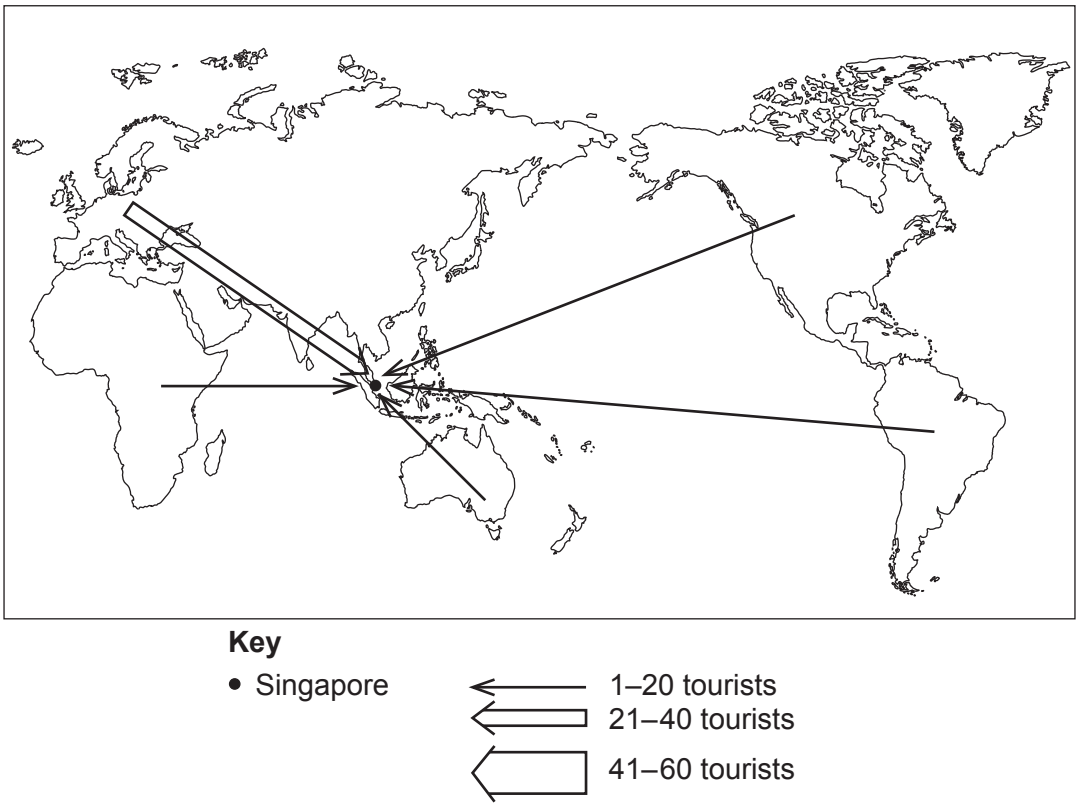


Fig. 1.6

(ii) Give **one** reason why Fig. 1.6 is a good method to show this information.

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..... [1]

(iii) What conclusion would the students make about **Hypothesis 1:** *Most tourists to Singapore come from Europe*? Support your decision with evidence from Fig. 1.6 and Table 1.1.

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..... [3]

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(f) To investigate **Hypothesis 2:** *People in different age groups prefer to visit different attractions in Singapore*, the students asked **20 tourists in each age group** to rank the five attractions they most like (question 3 in the questionnaire). The results for the under 20 age group are shown in Table 1.2 (Insert).

The students then used the following formula to give a score to each rank:

- rank 1 = 5 points
- rank 2 = 4 points
- rank 3 = 3 points
- rank 4 = 2 points
- rank 5 = 1 point.

(i) These calculations are shown in Table 1.3. Use the results in Table 1.2 (Insert) to **complete the scores** for Resorts World on Sentosa Island in Table 1.3. [2]

Table 1.3

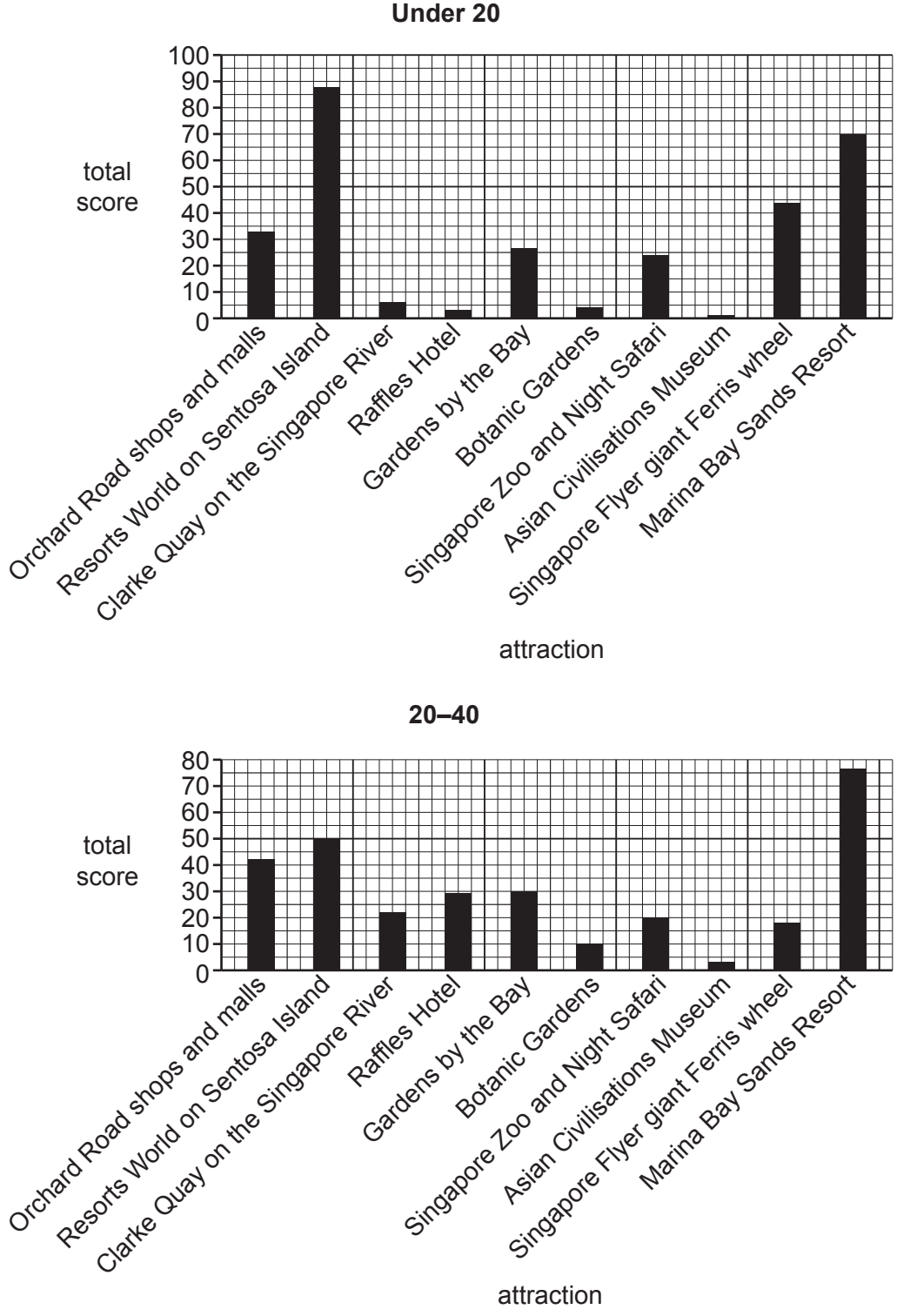
Under 20 age group calculated scores

attraction	rank 1 (number giving rank × 5 points)	rank 2 (number giving rank × 4 points)	rank 3 (number giving rank × 3 points)	rank 4 (number giving rank × 2 points)	rank 5 (number giving rank × 1 point)
Orchard Road shops and malls	10	4	12	6	1
Resorts World on Sentosa Island			6	0	0
Clarke Quay on the Singapore River	0	0	3	2	1
Raffles Hotel	0	0	0	2	1
Gardens by the Bay	5	0	9	10	3
Botanic Gardens	0	0	0	2	2
Singapore Zoo and Night Safari	5	4	6	4	5
Asian Civilisations Museum	0	0	0	0	1
Singapore Flyer giant Ferris wheel	15	8	6	10	5
Marina Bay Sands Resort	15	32	18	4	1

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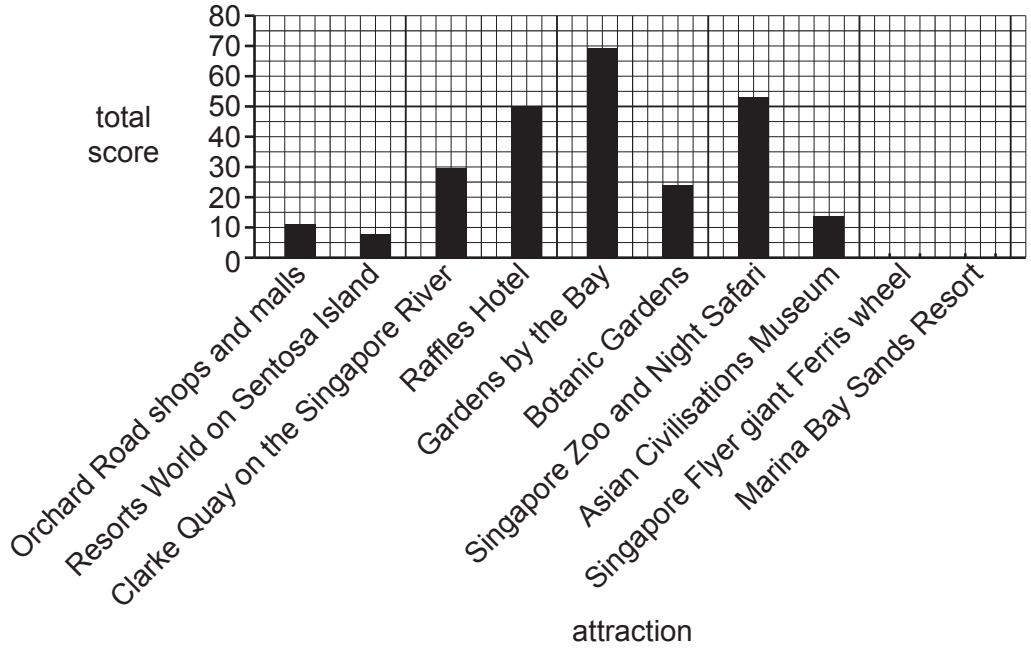
(ii) The total scores awarded by the different age groups for each attraction are shown in Table 1.4 (Insert). Use the results to **complete the graph** for the 41–60 age group on Fig. 1.7 by drawing the bars for the Singapore Flyer giant Ferris wheel and Marina Bay Sands Resort. [2]

Total scores given by each age group



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41–60



Over 60

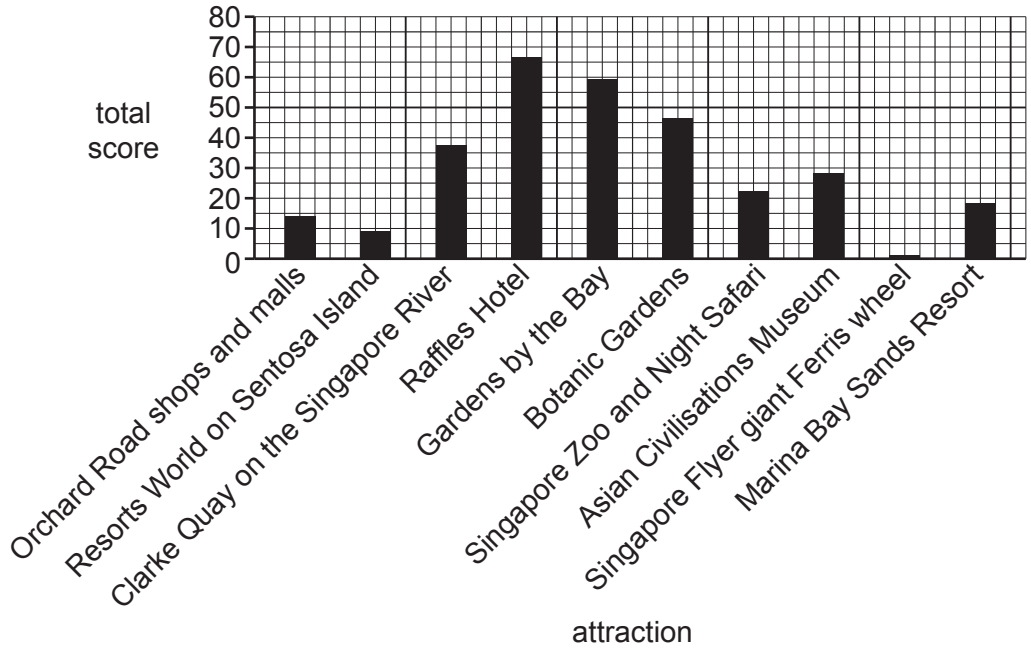


Fig. 1.7

(iii) Do the results support **Hypothesis 2:** *People in different age groups prefer to visit different attractions in Singapore*? Support your conclusion with evidence from Fig. 1.7 and Table 1.4.

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..... [4]

(g) Describe the impacts of large numbers of tourists visiting a country.

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..... [4]

[Total: 30]

2 Students were studying how a river changes downstream. They did fieldwork at five sites on a local river to investigate different characteristics of the river. The fieldwork sites are shown on Fig. 2.1 (Insert).

(a) Five river features are labelled **A**, **B**, **C**, **D** and **E** on Fig. 2.1. Match the following features to the correct label in the following table. One has been completed for you.

confluence meander mouth source tributary

label on Fig. 2.1	feature
A	mouth
B	
C	
D	
E	

[2]

The students decided to investigate the following hypotheses:

Hypothesis 1: *River discharge increases downstream*.

Hypothesis 2: *River meanders become larger downstream*.

(b) Which is the correct definition of *river discharge*? Tick (✓) your answer.

	tick (✓)
The largest size of rocks a river can transport at a particular point in its course.	
The volume of water which flows through a river channel in a given time.	
The speed at which water flows along a river in a straight line.	
The maximum amount of load a river can carry at a particular point in its course.	

[1]

(c) Before they began their fieldwork, the students discussed their tasks.

(i) Suggest **three** things the students should consider when choosing their five fieldwork sites.

1 .....

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2 .....

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3 .....

..... [3]

(ii) The students decided to do a pilot study at a site on the river. How would this help them to prepare for their fieldwork tasks?

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..... [2]

(d) To calculate river discharge at each site the students needed to measure river velocity and find out the area of the river cross-section.

(i) Describe a fieldwork method used to measure river velocity.

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..... [4]

(ii) To calculate the area of the river channel cross-section the students measured the width of the river channel and the depth of the river at points across the channel. Figs. 2.2 and 2.3 (Insert) show students doing these tasks.
Use Figs. 2.2 and 2.3 to describe how they made their measurements.

width of river channel

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depth of river

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..... [4]

(iii) The students calculated the average depth of the river. Table 2.1 shows the depth of the river at the different measuring points across the channel at site 3.

Table 2.1

Site 3 measurements

measuring point number	1	2	3	4	5	6	7	8	9	10
depth (m)	0.1	0.2	0.4	0.5	0.6	0.8	0.7	0.8	0.4	0.1

Use the results in Table 2.1 to calculate the average depth at site 3.

..... m [1]

(e) The students then calculated the area of the cross-section using their measurement of width and average depth of the river.
Using their data the students calculated the river discharge at each site. Discharge is calculated by the formula:

velocity × area of the river channel cross-section

(i) Their results are shown in Table 2.2 (Insert). Use these results to **complete the graph** on Fig. 2.4. [1]

River discharge

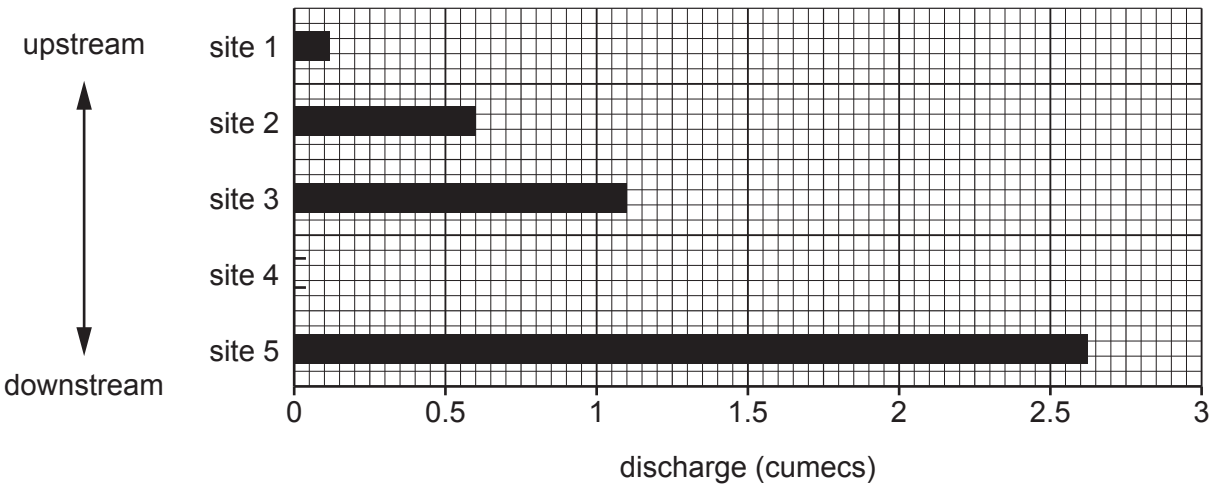


Fig. 2.4

(ii) What conclusion should the students make about **Hypothesis 1:** *River discharge increases downstream*? Use evidence from Fig. 2.4 and Table 2.2 to support the conclusion.

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..... [2]

(iii) Look again at Fig. 2.1 (Insert), and explain why discharge changes downstream.

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..... [2]

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(f) To investigate **Hypothesis 2:** *River meanders become larger downstream*, the students measured the sinuosity of the river at the five fieldwork sites.
Sinuosity is a measurement of how much a river meanders. A higher sinuosity score shows that the meanders on the river are larger.
Fig. 2.5 (Insert) shows how to calculate sinuosity.

(i) The results of the students' calculations are shown in Table 2.3 (Insert).
Use the results **to plot the sinuosity score** at site 4 on Fig. 2.6. [1]

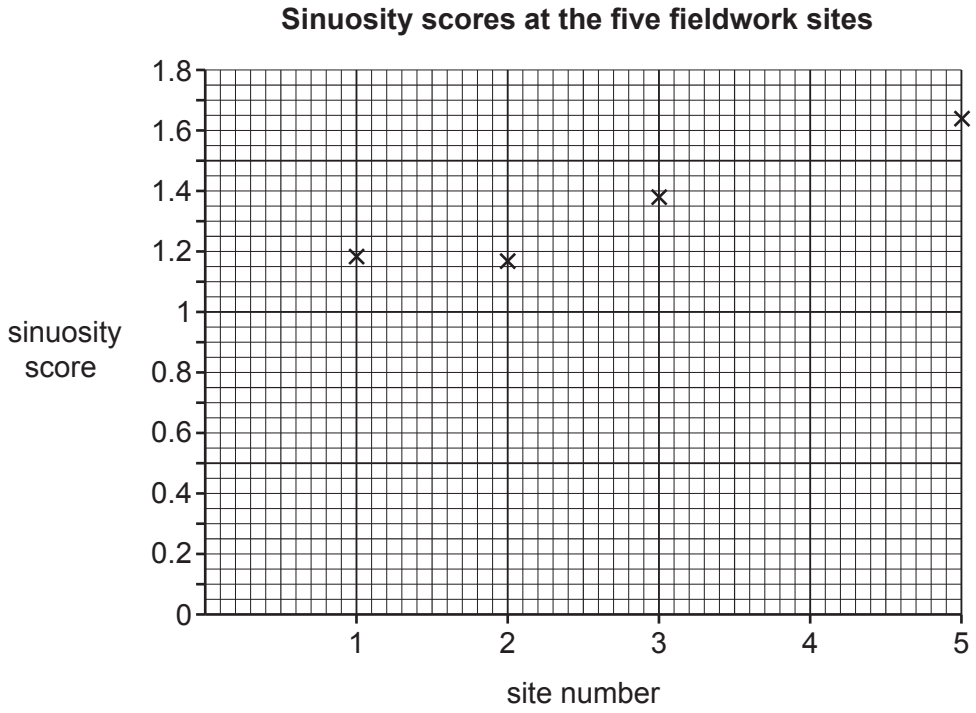


Fig. 2.6

(ii) Do the students' results support **Hypothesis 2:** *River meanders become larger downstream*? Tick (✓) your decision.

	tick (✓)
Hypothesis 2 is **true**, all meanders become larger downstream.	
Hypothesis 2 is **partly true**, meanders generally become larger downstream but there are exceptions.	
Hypothesis 2 is **false**, meanders become smaller downstream.	

Use evidence from Fig. 2.6 and Table 2.3 to support your decision.

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(g) Explain how river meanders such as the ones shown in Fig. 2.7 (Insert) become larger. You may use a diagram in your answer.

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[4]

[Total: 30]

Additional page

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