UNIVERSITY OF CAMBRIDGE INTERNATIONAL EX
International General Certificate of Secondary Educati

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CAN NUMBER

2298283288

GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **May/June 2013**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Calculator
Ruler

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

The Insert contains Fig. 1 and Table 5 for Question 1, and Photographs A and B and Table 9 for Question 2.
The Insert is **not** required by the Examiner.
Sketch maps and diagrams should be drawn whenever they serve to illustrate an answer.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Q1	
Q2	
Total	

This document consists of **13** printed pages, **3** blank pages and **1** Insert.

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1 A class of students were studying traffic flow at a busy road ju
sketch map of the road junction is shown in Fig. 1 (Insert).

The students wanted to investigate the following hypotheses:

Hypothesis 1: *Traffic flow changes during the day.*

Hypothesis 2: *Traffic congestion occurs at all sites going towards junction.*

The students chose eight sites to do traffic surveys. These are sh

They agreed to do four separate counts lasting one hour at the following times:

08.00 to 09.00
11.00 to 12.00
14.00 to 15.00
17.00 to 18.00

(a) (i) Describe how the students would organise the traffic survey. Refer to their planning and recording.

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.....[4]

(ii) Suggest **three** difficulties which the students might have had when doing their traffic survey.

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2 .....

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3 .....

.....[3]

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(b) The results of the students' traffic survey at site 3 are shown i

Table 1

Traffic survey results for site 3

Time of survey	bikes / motor bikes	cars	vans / minibuses	lorri bu	
08.00 to 09.00	8	101	38	1	
11.00 to 12.00	6	107	27	18	
14.00 to 15.00	4	73	29	20	126
17.00 to 18.00	2	41	22	10	75

(i) Complete Table 1 by calculating the total number of vehicles counted between 11.00 and 12.00. [1]

(ii) Use the data in Table 1 to complete the divided bar graph for the traffic survey results between 11.00 and 12.00 on Fig. 2 below. [2]

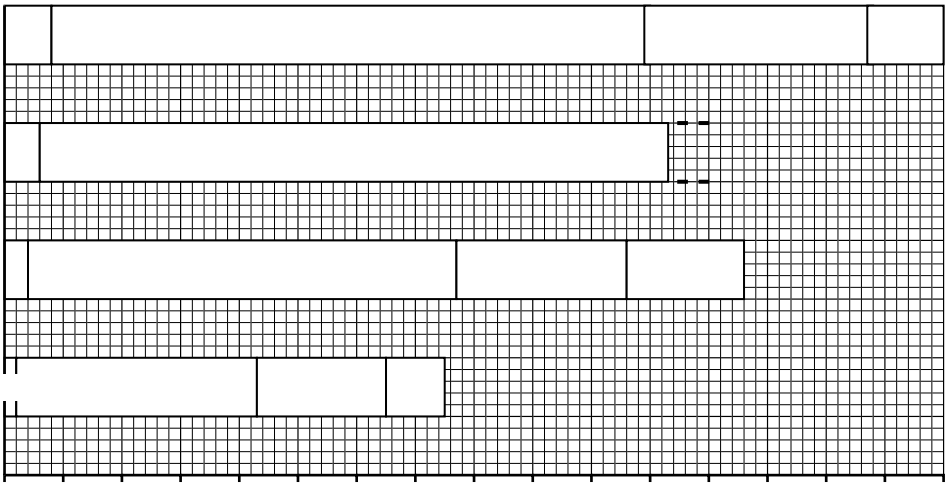


Fig. 2

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(iii) Which **one** of the following types of graph would also be survey results between 11.00 and 12.00?

Circle your answer below.

pie chart line graph scatt

(iv) What conclusion would the students at site 3 make ab *flow changes during the day*?

Support your decision with evidence from Table 1 and Fi

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.....[4]

(v) Suggest how traffic flows between 08.00 and 09.00 might be different at site 7 from those at site 3 which are shown in Table 1. Look at Fig. 1 (Insert) to help you to answer.

Number of vehicles .....

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Type of vehicles .....

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.....[2]

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(c) To test **Hypothesis 2:** *Traffic congestion occurs at all sites from the road junction*, the students used their results to calc for each site. The index is shown in Table 2 below.

Table 2

Index of traffic flow

vehicle type	number of points allocate
bike / motor bike	0.5
car	1.0
van / minibus	2.0
lorry / bus	3.0

*more points were allocated to vehicles causing more congestion

The results of using this index between 08.00 and 09.00 at site 3 are shown in Table 3 below.

Table 3

Index of traffic flow for site 3 between 08.00 and 09.00

vehicle type	bikes / motor bikes	cars	vans / minibuses	lorries / buses
number counted	8	101	38	13
points	0.5	1.0	2.0	3.0
Index score	**4**	**101**	**76**	**39**

Total index score between 08.00 and 09.00 at site 3 = **220**

(i) Calculate the index scores for site 3 between 11.00 and 12.00 in Table 4 below. [2]

Table 4

Index score of traffic flow for site 3 between 11.00 and 12.00

vehicle type	bikes / motor bikes	cars	vans / minibuses	lorries / buses
number counted	6	107	27	18
points	0.5	1.0	2.0	3.0
Index score		**107**	**54**	

Total index score between 11.00 and 12.00 at site 3 = **218**

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(ii) The results of the index of traffic flow for all 8 survey (Insert).

The students decided to show their results in a line gr data in Table 5 to complete the line for site 1.

Index of traffic flow at survey sites

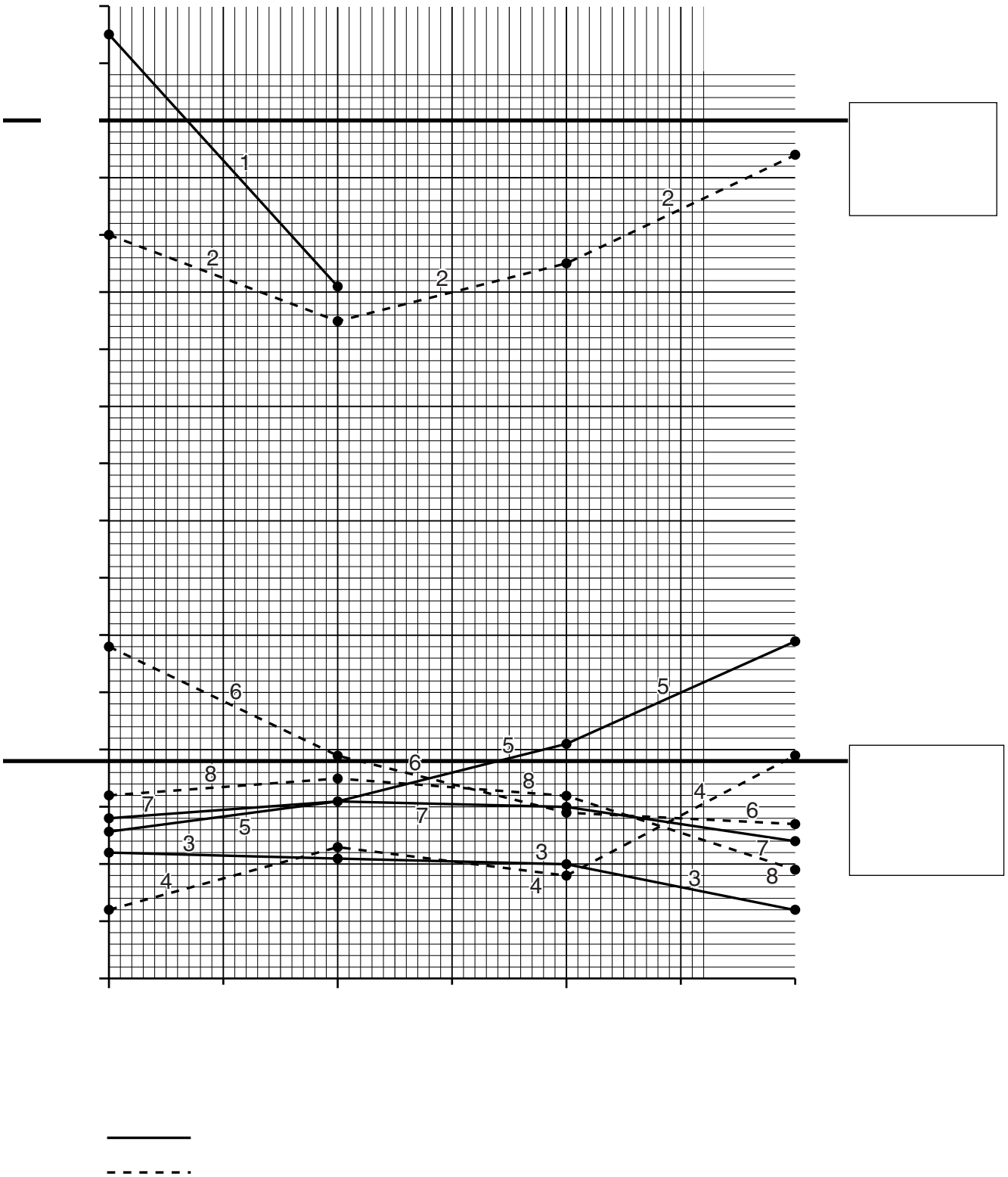


Fig. 3

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(iii) Fig. 3 shows the level above which traffic flow is classified level indicates the traffic flow index above which traffic d

What conclusion would the students make about **Hypot** *occurs at all sites going towards and away from the roa* Fig. 3 to support your answer.

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(d) There is a plan to build a new shopping area at the location shown on Fig. 1 (Insert). Give **two** effects this development might have on traffic at sites 5 and 6.

1 .....

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2 .....

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(e) Suggest **three** ways to reduce traffic congestion in urban areas.

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3 .....

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[Total: 30 marks]

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2 Two groups of students were investigating the characteristics of a 15 km from its source to the sea. They wanted to investigate possi velocity (speed of flow) downstream. They carried out their field course of the river.

They decided to test the following hypotheses:

Hypothesis 1: *Velocity increases as the river bed slopes more st*

Hypothesis 2: *Velocity increases as the wetted perimeter of the r*

(a) Before they began the fieldwork their teacher spoke to them about safety in and around the river. Suggest **two** pieces of advice their teacher could have given them.

1 .....

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2 .....

.....[2]

(b) First the students used a floating object to measure velocity over a distance of 10 metres. The results from Group A at site 1 are shown in Fig. 4 below.

River recording sheet

Study site: 1 Group A

Measuring velocity

Time for a floating object to travel 10 metres:

Test 1	48 seconds
Test 2	71 seconds
Test 3	59 seconds
Test 4	61 seconds
Test 5	43 seconds

Fig. 4

(i) Name **three** different pieces of equipment the group would use to carry out their fieldwork at this site.

1 .....

2 .....

3 .....[3]

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(ii) Calculate the average velocity at site 1 using the results

Show your working and your answer in the box below.

Study site: 1 Group A

Average (mean) length of time to float 10 metre

$$\text{Average velocity} = \frac{\text{distance}}{\text{average time}}$$

Average velocity = metres per second

(iii) When they had completed their measurements at site 1 the two groups compared their results. These results are shown in Table 6 below.

Table 6

Times for a floating object to travel 10 metres at site 1

	Group A	Group B
Test 1	48 seconds	38 seconds
Test 2	71 seconds	27 seconds
Test 3	59 seconds	49 seconds
Test 4	61 seconds	29 seconds
Test 5	43 seconds	31 seconds

Suggest **two** reasons why the results obtained by the two groups were different.

1 .....

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2 .....

.....[2]

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(iv) At each site the students also measured the downstre river bed using a clinometer and ranging poles. Photog measurement being taken.

Describe how the students measured the downstream sl

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(v) The downstream slope and average velocity results which group B obtained at the five sampling sites are shown in Table 7 below.

Table 7

Results of group B

site	gradient (degrees)	average velocity (m/s)
nearest source 1	8	0.29
2	6	0.43
3	5	0.37
4	3	0.46
5 nearest mouth	1	0.47

What conclusion would the students have made about **Hypothesis 1:** *Velocity increases as the river bed slopes more steeply*?

Use evidence from Table 7 to support the conclusion.

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.....[3]

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(c) To investigate **Hypothesis 2:** *Velocity increases as the we channel increases*, the students needed to measure the widt the depth of the river at each site.

(i) Complete Fig. 5 below to identify the **two** different pie measure the width of the river.

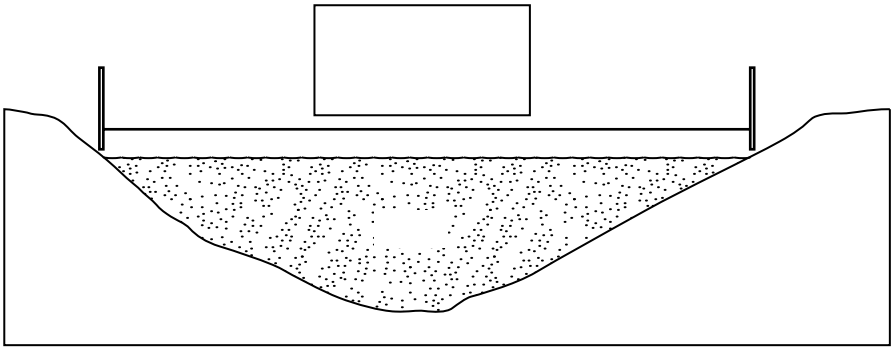


Fig. 5

(ii) The students measured the depth of the river every 0.5 m across the channel.

Their results for site 1 are shown in Table 8, below.

Table 8

Results for site 1

Distance across channel (m)	0.5	1.0	1.5	2.0	2.5	3.0
Depth of river (m)	0.18	0.20	0.25	0.40	0.30	0.20

Use these results to complete Fig. 6 below, the cross-section of the channel at site 1. [2]

Cross-section of channel at site 1

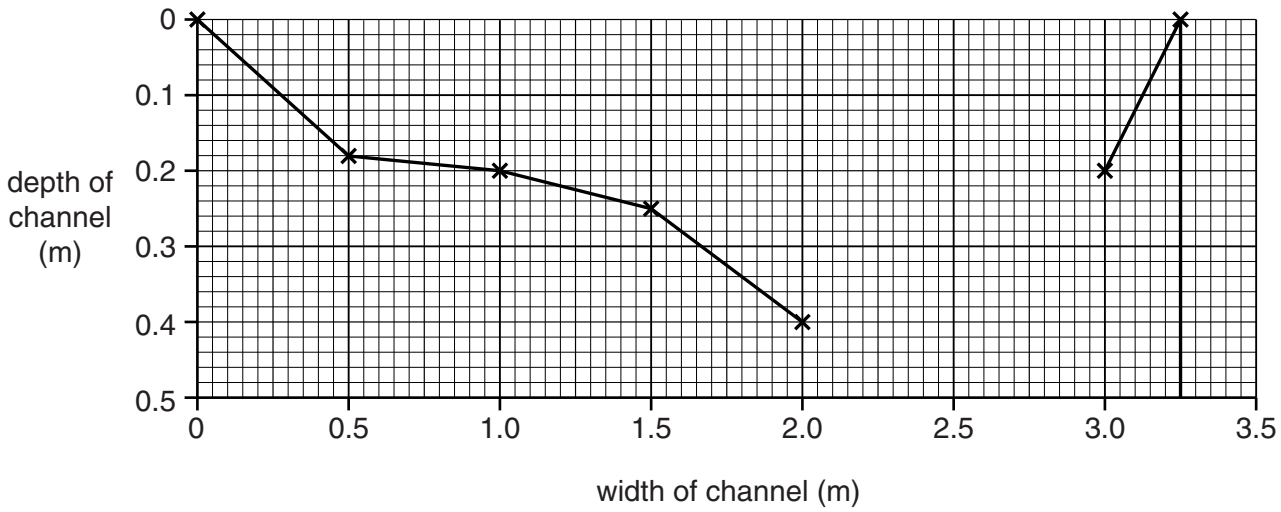


Fig. 6

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(iii) Photograph B (Insert) shows how students measured river. The wetted perimeter is the part of the channel cr touches.

Their method is described in Fig. 7, below, which is pa notebook.

Extract from fieldwork notebook

Measuring the wetted perimeter
The tape measure was placed along the bed of the river, starting and finishing at water level on both banks.
To make the method more accurate a student walked along it to cross the river.

Fig. 7

The students' results are shown in Table 9 (Insert). Use these results to complete Fig. 8 below by plotting the result for site 1. [1]

Scatter graph of length of wetted perimeter and average velocity

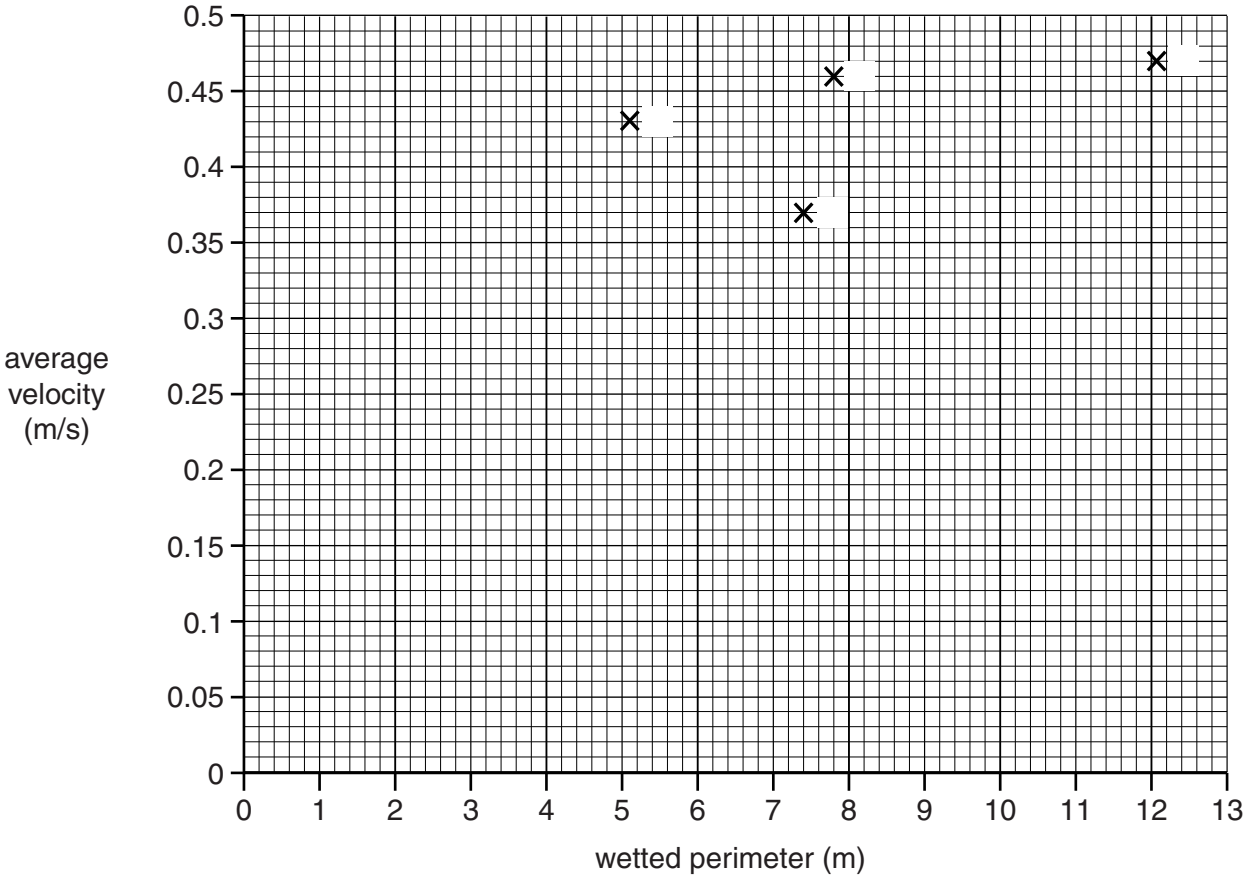


Fig. 8

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(iv) Do their results support **Hypothesis 2:** *Velocity increas of the river channel increases*? Support your conclusion and Fig. 8.

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(v) Suggest **two** disadvantages of their method for measuring the wetted perimeter in a large river.

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2 .....

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(d) To extend their fieldwork the students investigated the impact of people on the river. State **one** impact people may have on a river. Describe how the impact could be investigated.

Impact of people

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Investigation

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.....[4]

[Total: 30 marks]

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