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Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

7121086852

GEOGRAPHY **0460/41**

Paper 4 Alternative to Coursework **May/June 2019**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Calculator
Protractor
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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Write your answer to each question in the space provided.
If additional space is required, you should use the lined pages at the end of the booklet. The question number(s) must be clearly shown.

Answer **all** questions.

The Insert contains Figs. 1.1 and 1.4 and Tables 1.2 and 1.3 for Question 1, and Tables 2.1, 2.2 and 2.3 and Fig. 2.2 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.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **16** printed pages and **1** Insert.

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1 Students who lived in Campania, a farming region of Italy, did fieldwork to investigate the land use on a local farm.

(a) The farmer gave the students a map of the farm which showed the main field boundaries. The students were then given permission to investigate and draw a map to show the different ways that the fields were being used. Their map is shown in Fig. 1.1 (Insert).

(i) Use the map key to **identify the land use** in the two fields described below.

Description	Land use
a large field located 200 m east of the farmhouse	
a field located 300 m north-north west of the farmhouse	

[2]

(ii) The students did not recognise some of the crops growing in the fields. Suggest how they could solve this problem to complete their map.

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..... [2]

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(iii) From their map, the students estimated the area used for different types of farming. The results are shown in Table 1.1 below.

Table 1.1

Land use on the farm

Land use	Area (ha)	Percentage of farm area (%)
Wheat	14	24.6
Olives	11	19.3
Oranges	10	17.5
Sheep	7	12.3
Potatoes	6	10.5
Cattle	4	7.0
Tomatoes	2	3.5
Beans	2	3.5
Onions	1	1.8
Total		100

Calculate the total area of the farm.

.....hectares (ha) [1]

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(iv) The students plotted the area of each land use on a bar graph, and the percentage of the total farm area in each land use on a pie graph. These are shown in Figs. 1.2 and 1.3 below.

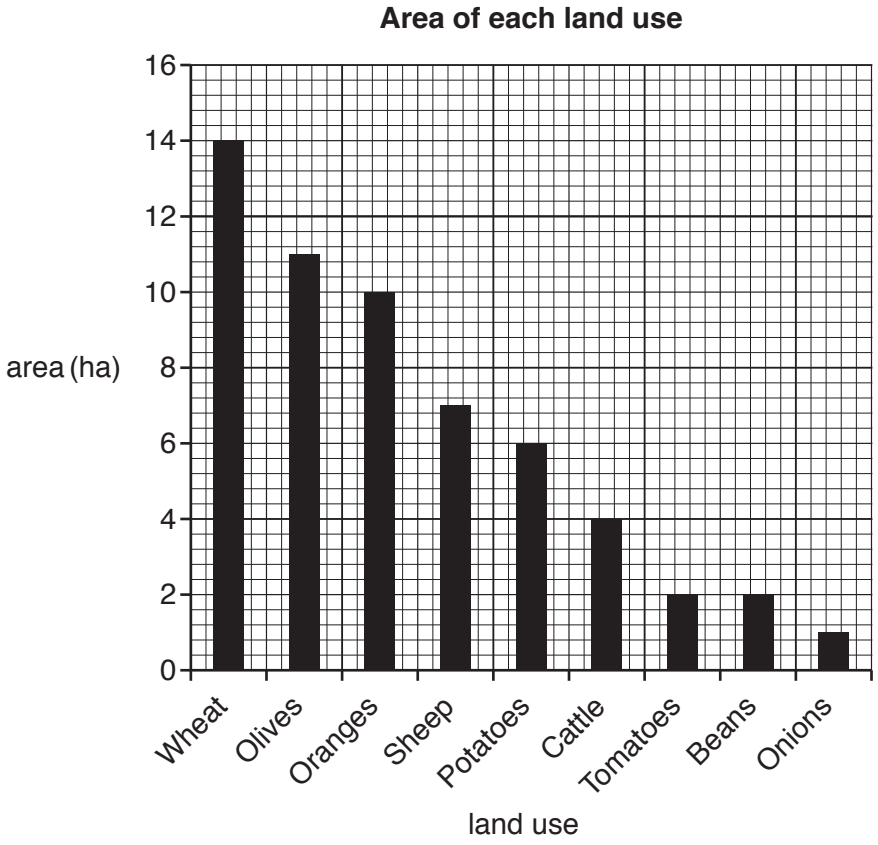

Fig. 1.2

Percentage of total farm area in each land use

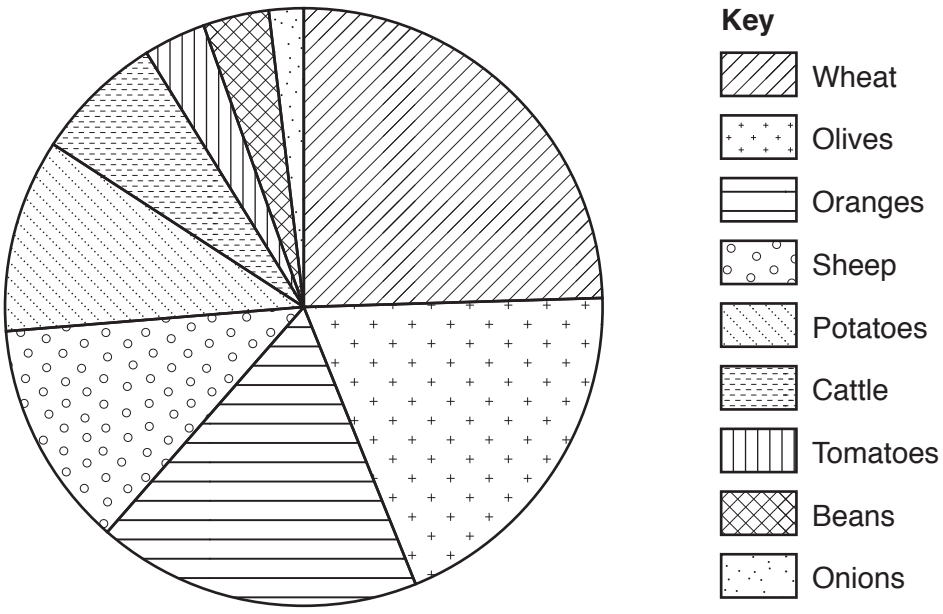

Fig. 1.3

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Give **one** advantage of each graph to show the data.

Bar graph .....

.....

Pie graph .....

..... [2]

The students decided to investigate two hypotheses:

Hypothesis 1: *The land use changes as land gets higher and steeper*.

Hypothesis 2: *There is a **positive** relationship between the size of fields and the amount of labour needed for different land uses*.

(b) To investigate **Hypothesis 1** the students needed to find out the height and steepness of slope in different fields. To do this they followed two paths up the hillside from the road on which the farmhouse was located. When they came to each different field they did two fieldwork tasks which are described below.

The paths and fieldwork locations are shown on Fig. 1.1 (Insert).

(i) They recorded the height of the land using their cell (mobile) phone. The application is shown in Fig. 1.4 (Insert). Which piece of information below would the students record? Tick your choice.

	Tick (✓)
altitude	
latitude	
longitude	

[1]

(ii) They measured the angle of slope along each path. Suggest what equipment they would use and how they would do this task.

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..... [4]

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(iii) Table 1.2 (Insert) shows the results of their fieldwork. The students made the conclusion that **Hypothesis 1:** *The land use changes as land gets higher and steeper* was true. Use evidence from Table 1.2 and Fig. 1.1 to support this decision.

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..... [3]

(iv) Suggest **two** reasons why the land use changes as the land gets higher and steeper.

1 .....

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2 .....

..... [2]

(c) To test **Hypothesis 2:** *There is a **positive** relationship between the size of fields and the amount of labour needed for different land uses*, the students obtained some secondary data from the farmer. This is shown in Table 1.3 (Insert).

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(i) Use the data in Table 1.3 to **plot the average field size and labour needed** for wheat and olives on Fig. 1.5 below. Label the two land uses. [2]

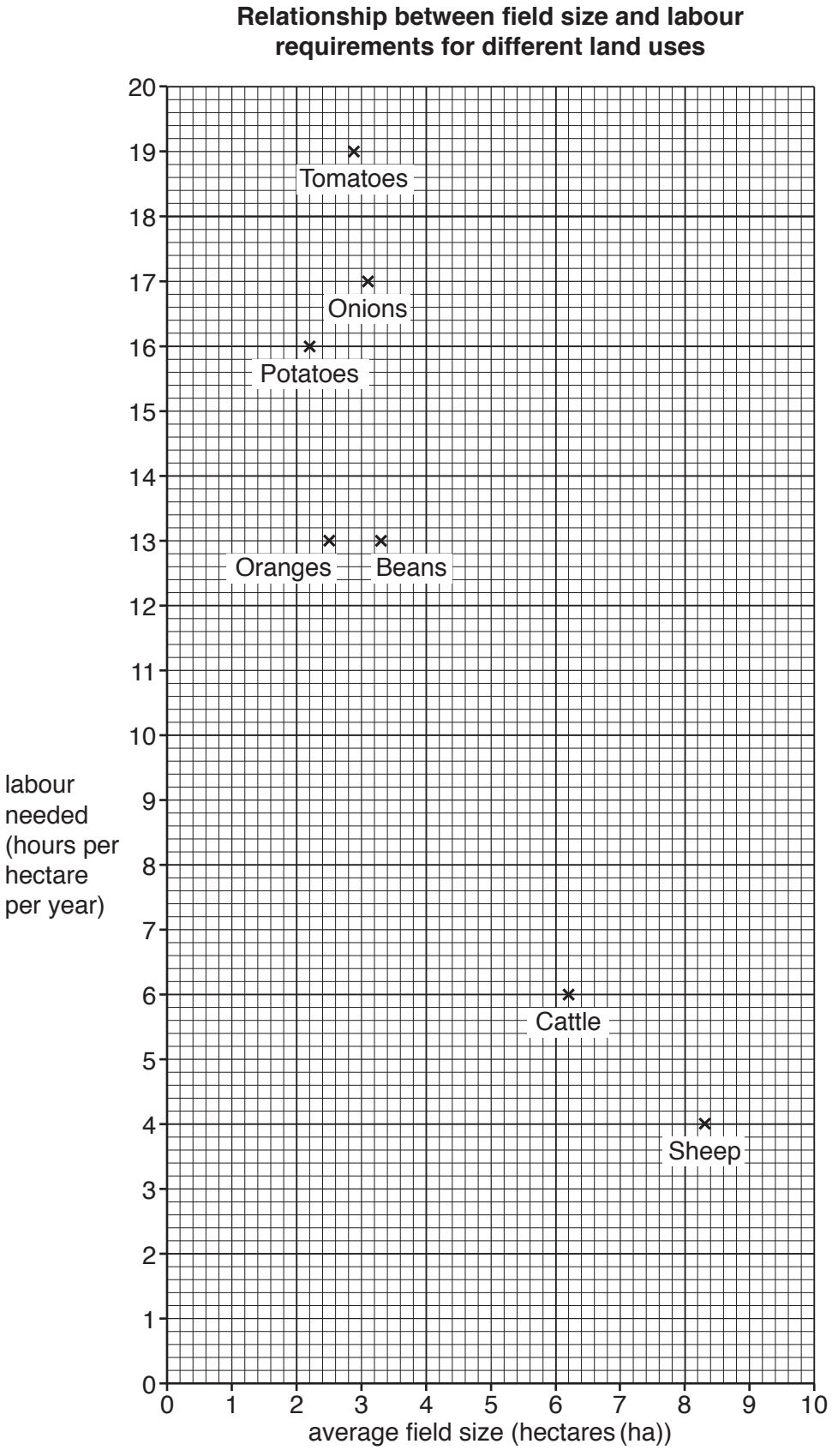

Fig. 1.5

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(ii) **Draw a best-fit line** onto Fig. 1.5. [1]

(iii) What is your conclusion about **Hypothesis 2:** *There is a **positive** relationship between the size of fields and the amount of labour needed for different land uses*? Support your conclusion with evidence from Table 1.3 and Fig. 1.5.

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..... [4]

(d) **(i)** Labour is a human input of farming. Give **two** other human (economic and/or social) inputs on a farm such as this.

1 .....

2 ..... [2]

(ii) The steepness and height of the land are natural inputs which affect how the land is used. Give **one** other natural input which affects land use.

..... [1]

(e) To extend their investigation the students wanted to find out more about the processes which took place on the farm. Describe ways that they could do this.

.....

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..... [3]

[Total: 30]

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2 Students investigated how the cross section and velocity of a local river changed downstream. They did fieldwork at five sites along the river.

The two hypotheses which the students tested were:

Hypothesis 1: *The wetted perimeter of the river channel increases* ***at each site*** *downstream*.

The wetted perimeter is the part of the river channel cross section which is in contact with the water.

Hypothesis 2: *River velocity (speed of flow) increases downstream*.

(a) Before beginning their fieldwork, the students discussed the fieldwork tasks they needed to do.

(i) Suggest **three** factors the students should have considered in choosing their fieldwork sites.

1 .....

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2 .....

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3 .....

..... [3]

(ii) Suggest how the students could prepare for the fieldwork tasks before making their measurements so that their results would be as accurate as possible.

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..... [2]

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(b) To investigate **Hypothesis 1:** *The wetted perimeter of the river channel increases* ***at each site*** *downstream*, two groups of students used different fieldwork methods.
Group A measured the width of the river channel and the depth of the river at points across the channel to calculate the wetted perimeter.
Group B measured the wetted perimeter in the river channel itself.

(i) Describe how group A would measure the width of the channel and the depth at different points across the channel.

width of river channel .....

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.....

.....

depth of river channel.....

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..... [4]

(ii) Group A's measurements for one site are shown in Table 2.1 (Insert).
Use these results to **complete the cross section and shade in the river channel** on Fig. 2.1 below. [2]

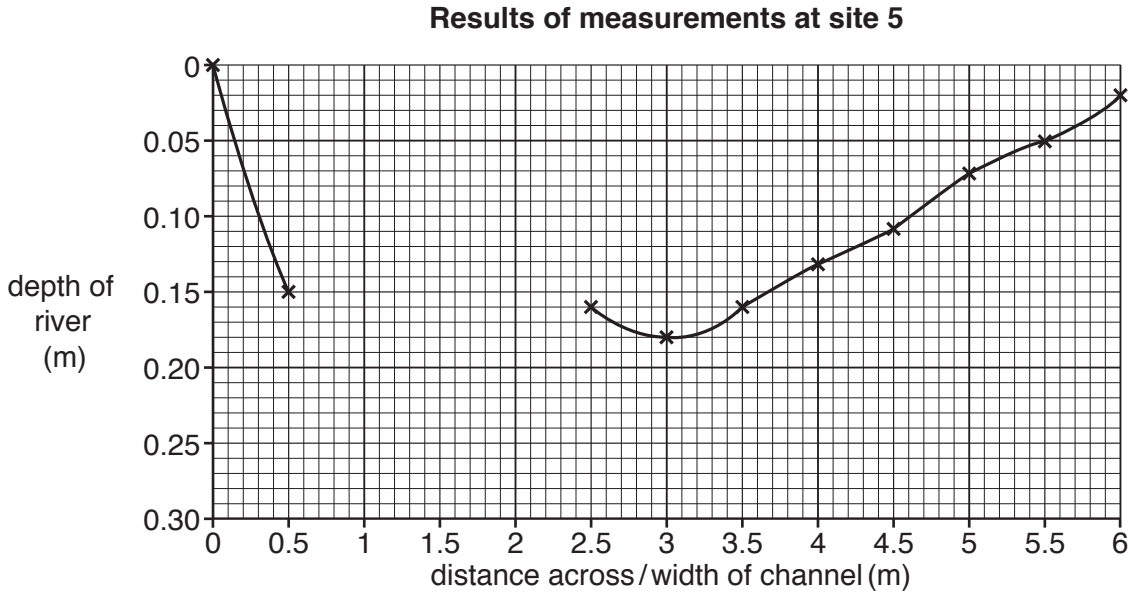

Fig. 2.1

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(iii) The method used by group B is shown in Fig. 2.2 (Insert). Suggest **two** difficulties of this method of measuring the wetted perimeter of the channel.

1 .....

.....

2 .....

..... [2]

(iv) Table 2.2 (Insert) shows the results obtained by groups A and B. What conclusions did the students in groups A and B make about **Hypothesis 1:** *The wetted perimeter of the river channel increases* ***at each site*** *downstream*?
Use evidence from Table 2.2 to support the conclusions.

Group A .....

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Group B .....

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..... [4]

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(c) To investigate **Hypothesis 2:** *River velocity (speed of flow) increases downstream*, the students measured the velocity at each site.

(i) Describe **one** method to measure river velocity.

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..... [4]

(ii) The students' measurements are shown in Table 2.3 (Insert). **Plot the result for site 5** on Fig. 2.3 below. [1]

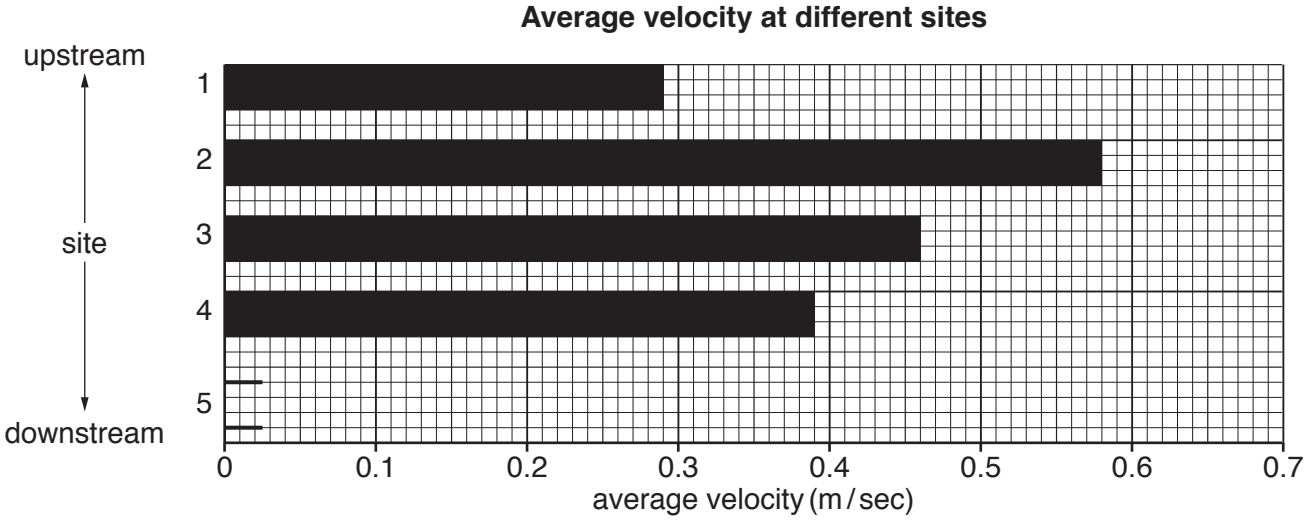

Fig. 2.3

(iii) The students' conclusion was that their results partially supported **Hypothesis 2:** *River velocity (speed of flow) increases downstream*. Give **two** pieces of evidence from Fig. 2.3 and Table 2.3 to explain why they reached this conclusion. Support each piece of evidence with data.

1 .....

.....

2 .....

..... [2]

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(d) A student in group A read in textbooks that the wetted perimeter of the river channel creates friction, so the longer the wetted perimeter, the more friction there will be between the channel and the river. Friction slows down the velocity of the river.

(i) The student plotted her results of the wetted perimeter and velocity measurements on a scatter graph, Fig. 2.4 below.

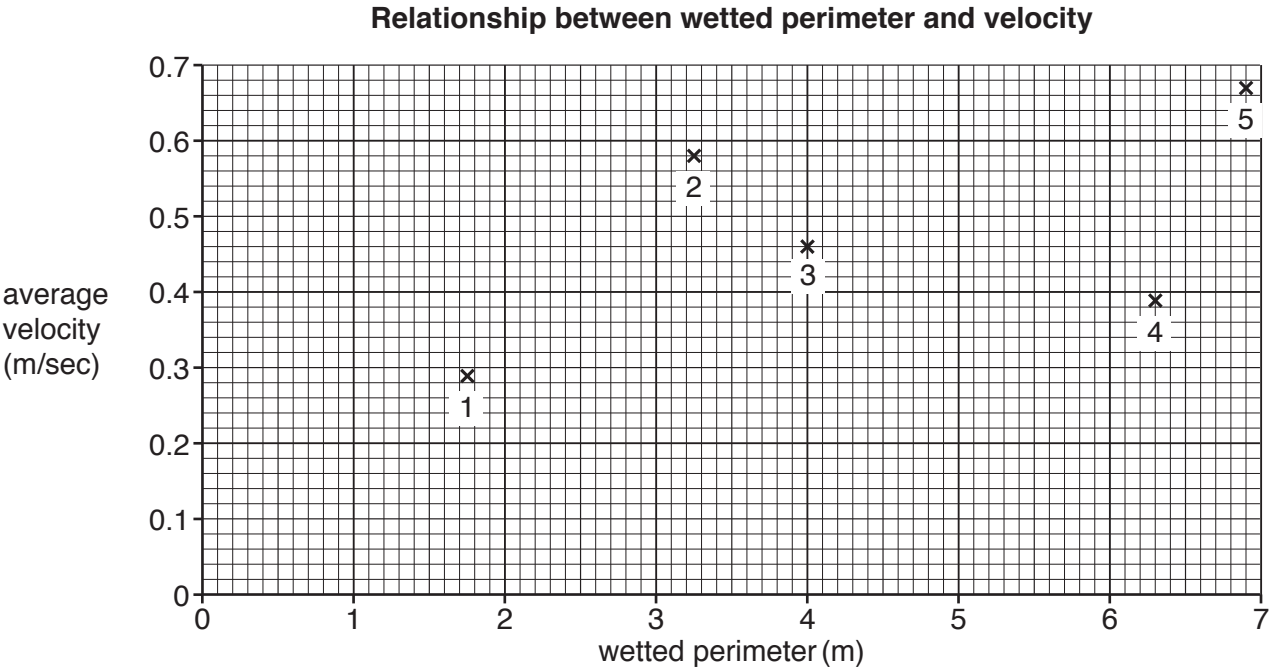

Fig. 2.4

Which **one** of the following are the student's results for **site 2**?
Tick (✓) your answer.

Wetted perimeter (m)	Average velocity (m/sec)	Tick (✓)
3.0	0.52	
3.25	0.58	
3.5	0.61	

[1]

(ii) The student decided that the results showed a partial relationship between the length of the wetted perimeter and river velocity. Support this decision with data from Fig. 2.4.

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..... [3]

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(iii) The wetted perimeter is one factor which affects a river's velocity. Give **two** other factors which also affect the velocity.

1 .....

.....

2 .....

..... [2]

[Total: 30]

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Additional Pages

If you use the following lined pages to complete the answer(s) to any question(s), the question number(s) must be clearly shown.

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