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Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

4058379708

GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **May/June 2020**

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.

This document has **20** pages. Blank pages are indicated.

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1 Students in the UK visited a local company which made electronic products. The company is located in an inner-city area. It employs two main groups of workers, one in research and development of new products and the other in assembly of components to make the products.

Some students decided to investigate where the employees lived and any disadvantages of living there in order to test the following hypotheses:

Hypothesis 1: *Research and development employees generally live in different parts of the urban area compared to the assembly work employees.*

Hypothesis 2: *Employees think that the journey to work is a main disadvantage of where they live.*

(a) Suggest **three** factors which may affect where people choose to live in an urban area.

1 .....

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2 .....

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3 .....

..... [3]

(b) **(i)** To collect data to test these hypotheses, the students produced a questionnaire. This is shown in Fig. 1.1 (Insert).
Describe a suitable method of selecting the employees to complete the questionnaire in order to get a fair, representative sample.

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..... [2]

(ii) Part of the recording sheet which the students used is shown in Fig. 1.2 (Insert). What is this method of recording results called?

..... [1]

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(c) The results for Question 1 in the questionnaire are shown in Table 1.1 (Insert).

One student showed the results of Question 1 on two different types of map. These are shown in Figs. 1.3 below and 1.4 on page 5.

Map showing where research and development employees live

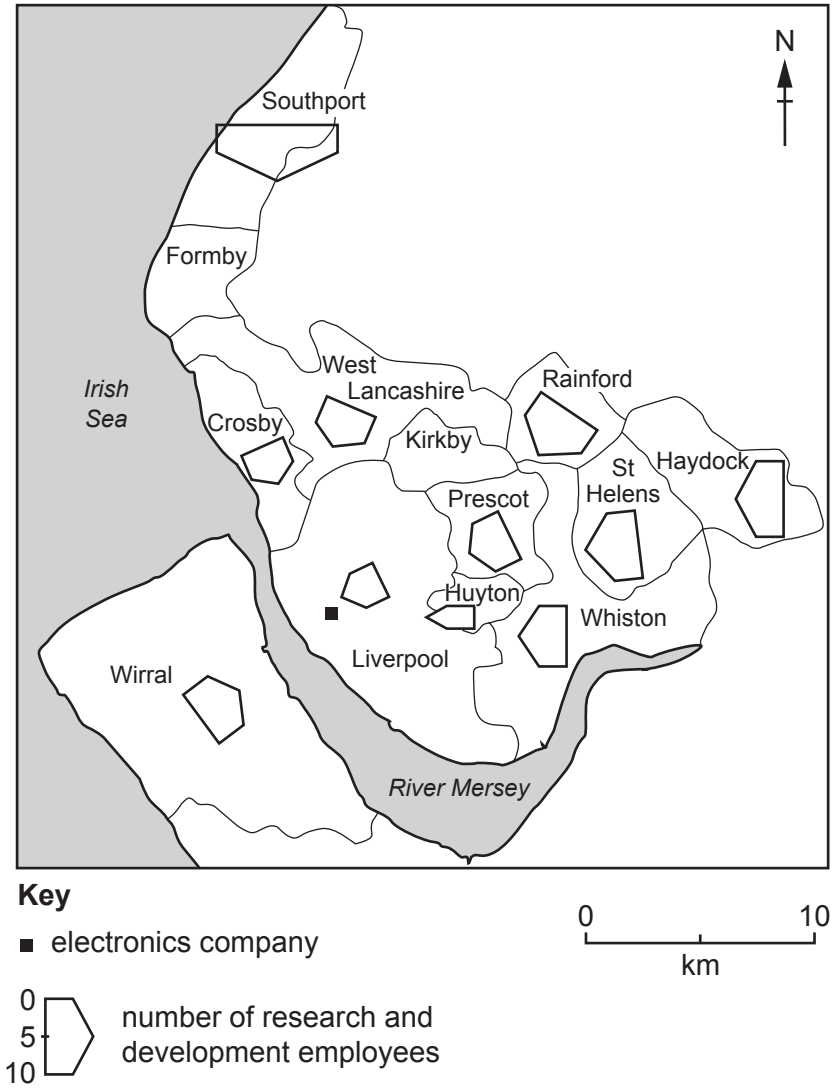

Fig. 1.3

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Map showing where assembly work employees live

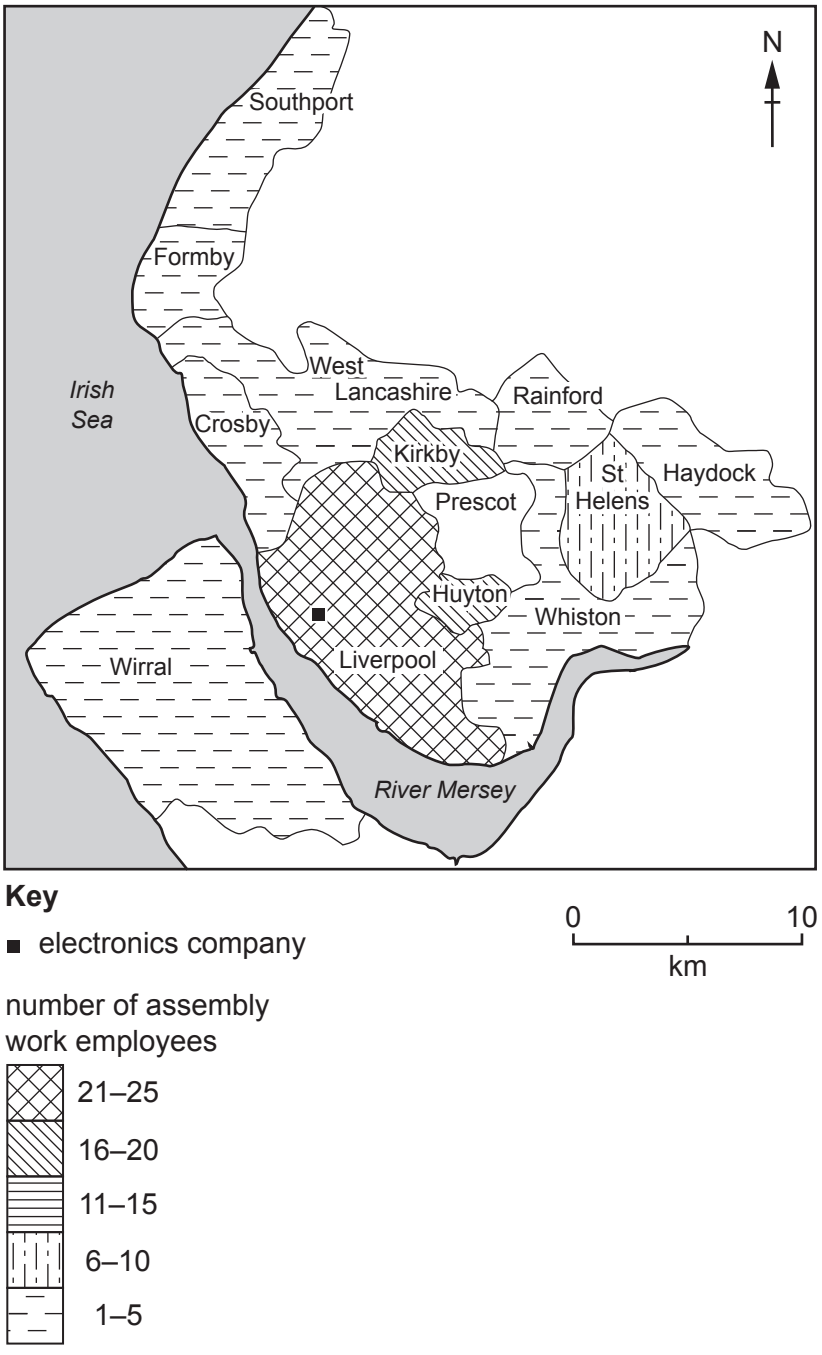

Fig. 1.4

(i) **Complete Fig. 1.3** to show the numbers of research and development employees living in Formby and Kirkby. [2]

(ii) **Complete Fig. 1.4** to show the number of assembly work employees living in Prescot. [1]

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(iii) Choose **either** Fig. 1.3 **or** Fig. 1.4 and circle your choice below. Name the type of map and give **two** advantages of this type of map for showing data.

Fig. 1.3 Fig. 1.4

Name of type of map

.....

Advantage 1

.....

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Advantage 2

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.....

[3]

(iv) Which **one** of the following would be another suitable method to display the results of Question 1 on a map of the urban area? Tick (✓) your choice.

	Tick (✓)
histogram	
kite diagram	
pictogram	

[1]

(v) Do you agree with **Hypothesis 1:** *Research and development employees generally live in different parts of the urban area compared to the assembly work employees*? Support your conclusion with data from Figs. 1.3 and 1.4 and Table 1.1.

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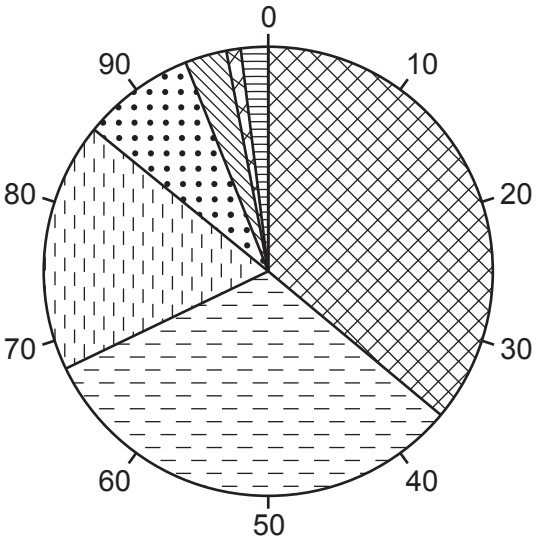
(d) Table 1.2 (Insert) shows the results of Question 2 in the questionnaire.

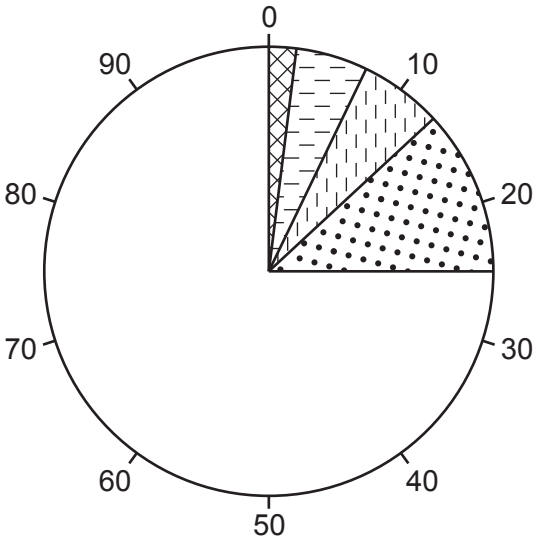
(i) Use the results from Table 1.2 to **complete Fig. 1.5** below. [3]

Results of Question 2

Research and development employees



Assembly work employees



Key

- The journey to work takes a long time
- Congested roads on the journey to work
- Overcrowded trains on the journey to work
- Noise from traffic and aircraft
- Social disorder, e.g. gangs, graffiti, vandalism
- No open spaces for recreation
- Poor schools

Fig. 1.5

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(ii) Which **one** of the conclusions below would the students make about **Hypothesis 2:** *Employees think that the journey to work is a main disadvantage of where they live*? Tick (✓) your choice and support your conclusion with evidence from Fig. 1.5 and Table 1.2.

	Tick (✓)
The hypothesis is true for both groups of employees.	
The hypothesis is true for one group of employees.	
The hypothesis is true for neither group of employees.	

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(e) Traffic congestion may affect people's journey to work.

(i) Suggest **two** other problems which traffic congestion may cause.

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2 .....

..... [2]

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(ii) Explain why traffic congestion occurs in urban areas.

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[Total: 30]

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2 A class of students in Nairobi was studying the processes which operate in a drainage basin. They learned that infiltration is affected by factors such as:

- how steeply the land slopes
- type of vegetation cover
- soil moisture content
- distance from a river or lake
- amount of human activity.

They did some fieldwork to investigate infiltration in an area close to Lake Naivasha in Kenya.

(a) Identify the correct definition of infiltration below. Tick (✓) your answer.

	Tick (✓)
volume of water flowing down a river	
water soaking through bedrock	
water soaking into the soil from the ground	
speed of water flowing down a river	
atmosphere absorbing water from the sea	

[1]

The students tested a variety of hypotheses. The two hypotheses chosen by one group were:

Hypothesis 1: *The rate of infiltration increases as you go further from the lake.*

Hypothesis 2: *The rate of infiltration is greater on steeper sloping land.*

(b) The class of students did their fieldwork along transect lines going down to the shore of the lake. The class was divided into three groups and each group worked on a different transect line. These are shown in Fig. 2.1 (Insert).

(i) To investigate **Hypothesis 1**, the students identified six fieldwork sites at increasing distances away from the lake. At each site they measured the rate (speed) of infiltration by using the equipment shown in Fig. 2.2 (Insert). Describe how the students measured infiltration.

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(ii) The students recorded the water level in the plastic tube every minute for 10 minutes. The results of the measurements along transect line **A** are shown in Table 2.1 (Insert). Use these results to **complete the measurements** for site 4 on transect **A** in Fig. 2.3 below. [2]

Results of students' measurements of water level at sites on transect A

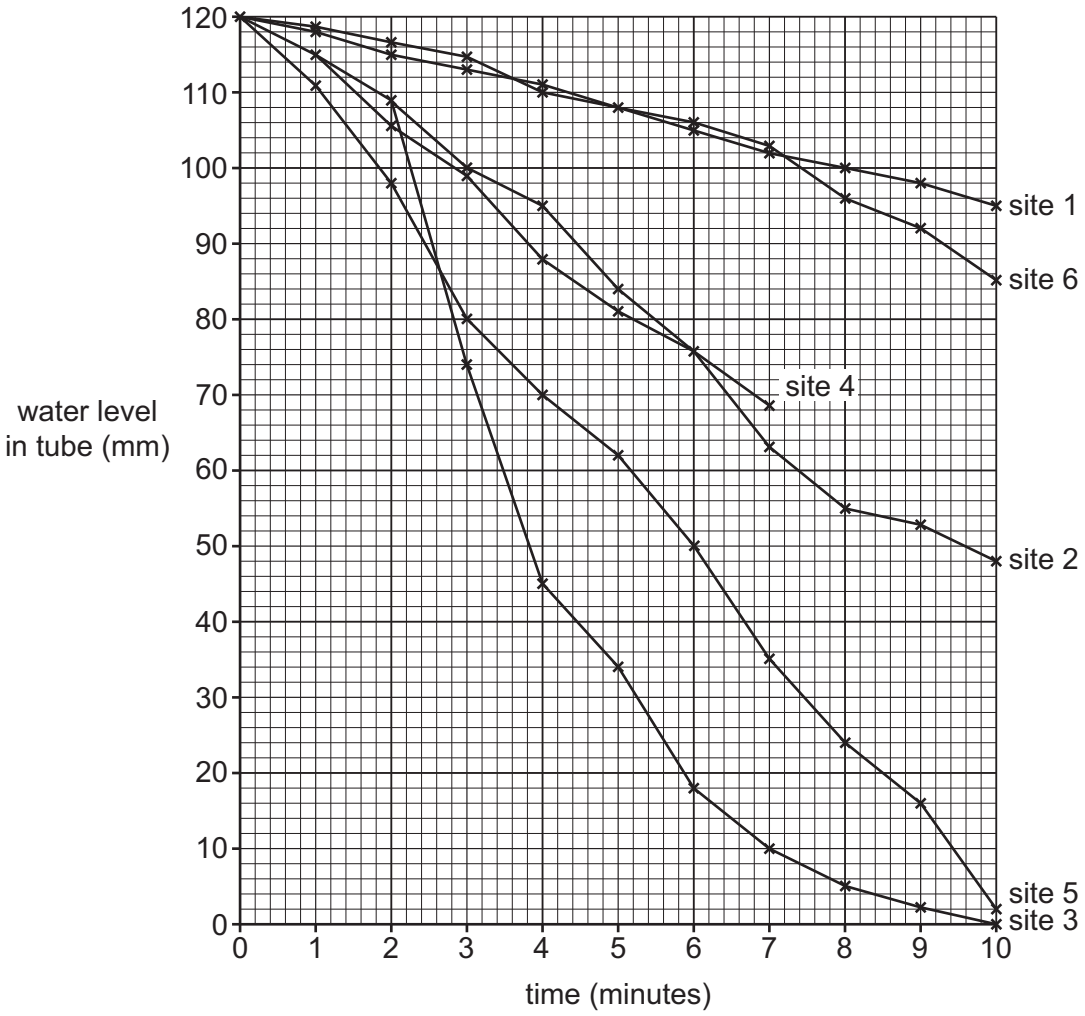

Fig. 2.3

(iii) Compare the fall in water level for site 1 and site 5 on transect **A**.

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..... [2]

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(iv) The students calculated the infiltration rate at each site. Use the data in Table 2.1 to show the calculation which produced the result for site 2 on transect **A** in the space below.

$$\text{Infiltration rate} = \frac{\text{fall in water level (mm)}}{\text{time}}$$

$$=$$

$$= 7.2 \text{ mm per min}$$

[2]

(v) The measurements of distance from the lake and infiltration rate at the different fieldwork sites on the three transect lines are shown in Table 2.2 (Insert). The students plotted these results on a graph, Fig. 2.4 on page 13. **Plot the results** at site 6 on transects **A** and **C**. [2]

(vi) Which transect line agrees with **Hypothesis 1:** *The rate of infiltration increases as you go further from the lake*? Tick (✓) your choice below and support your answer with evidence from Fig. 2.4 and Table 2.2.

transect line	Tick (✓)
A	
B	
C	

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..... [3]

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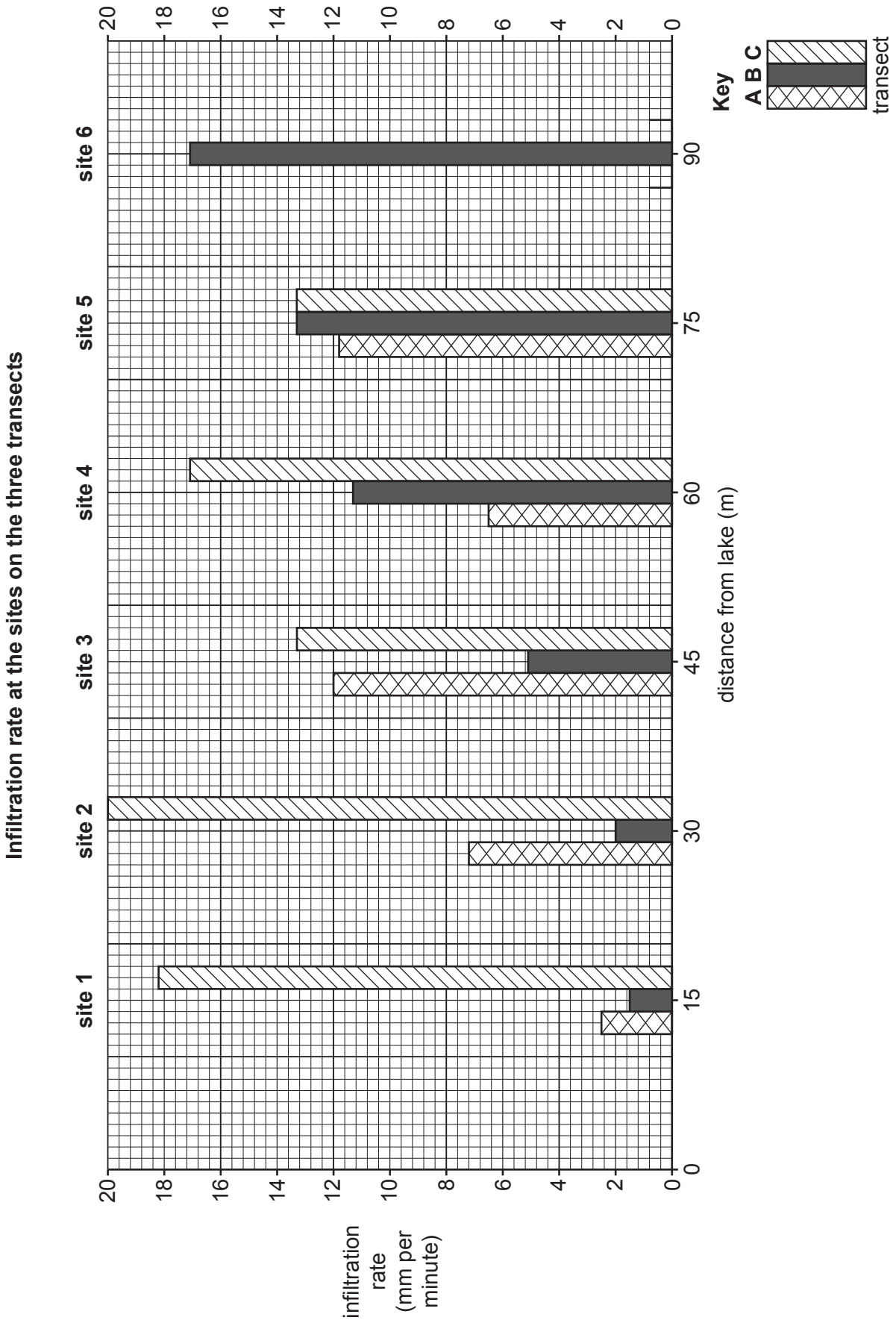
Infiltration rate at the sites on the three transects
infiltration rate (mm per minute)
0
2
4
6
8
10
12
14
16
18
20
site 1
site 2
site 3
site 4
site 5
site 6
0
15
30
45
60
75
90
distance from lake (m)
Key
A B C
transect

Fig. 2.4

(c) To investigate **Hypothesis 2:** *The rate of infiltration is greater on steeper sloping land*, the students measured the slope gradient at each site along the transect lines.

(i) Describe a method to measure the slope gradient. Refer to the equipment the students would use.

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(ii) The results for transect **C** are shown in Table 2.3 (Insert). Use this data **to plot the result** at site 6 in Fig. 2.5 below. [1]

Slope gradient and infiltration rate at sites on transect C

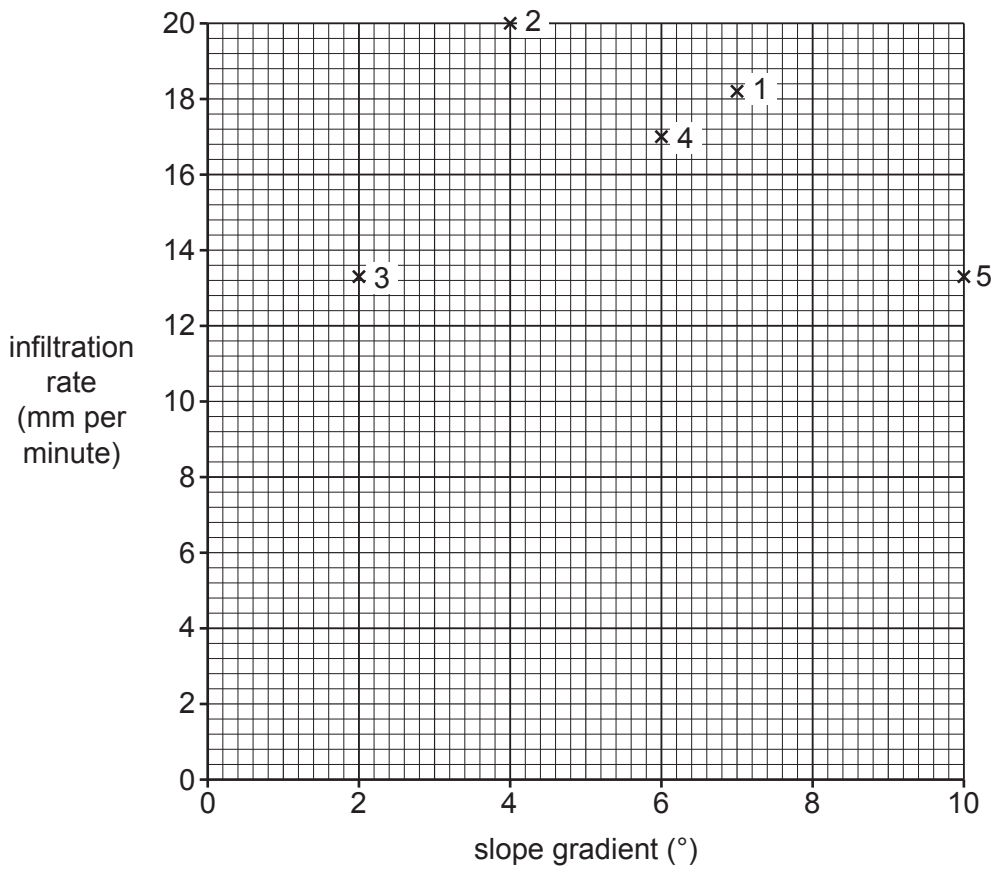

Fig. 2.5

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(iii) What conclusion would the students working on transect **C** make about **Hypothesis 2:** *The rate of infiltration is greater on steeper sloping land*?
Support your decision with evidence from Fig. 2.5 and Table 2.3.

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..... [3]

(d) Whilst doing their fieldwork, the students also recorded the vegetation found at each measuring site. Their results are shown in Table 2.4 (Insert). How do these results show that the infiltration rate is affected by vegetation?

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..... [3]

(e) The area around the lake where the students did their fieldwork is a popular tourist area. How might people walking in the area affect the infiltration rate? Explain why this would happen.

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..... [3]

[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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