



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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GEOGRAPHY

0460/04

Paper 4 Alternative to Coursework

May/June 2009

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 Table 1 and Fig. 2 for Question 1 and Fig. 4, Table 2 and Fig. 8 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 **11** printed pages, **1** blank page and **1** Insert.



- 1 Some students were studying traffic flow in and around a town centre. A map of the town centre studied is shown in Fig. 1.

Number of vehicles going into and out of a town centre

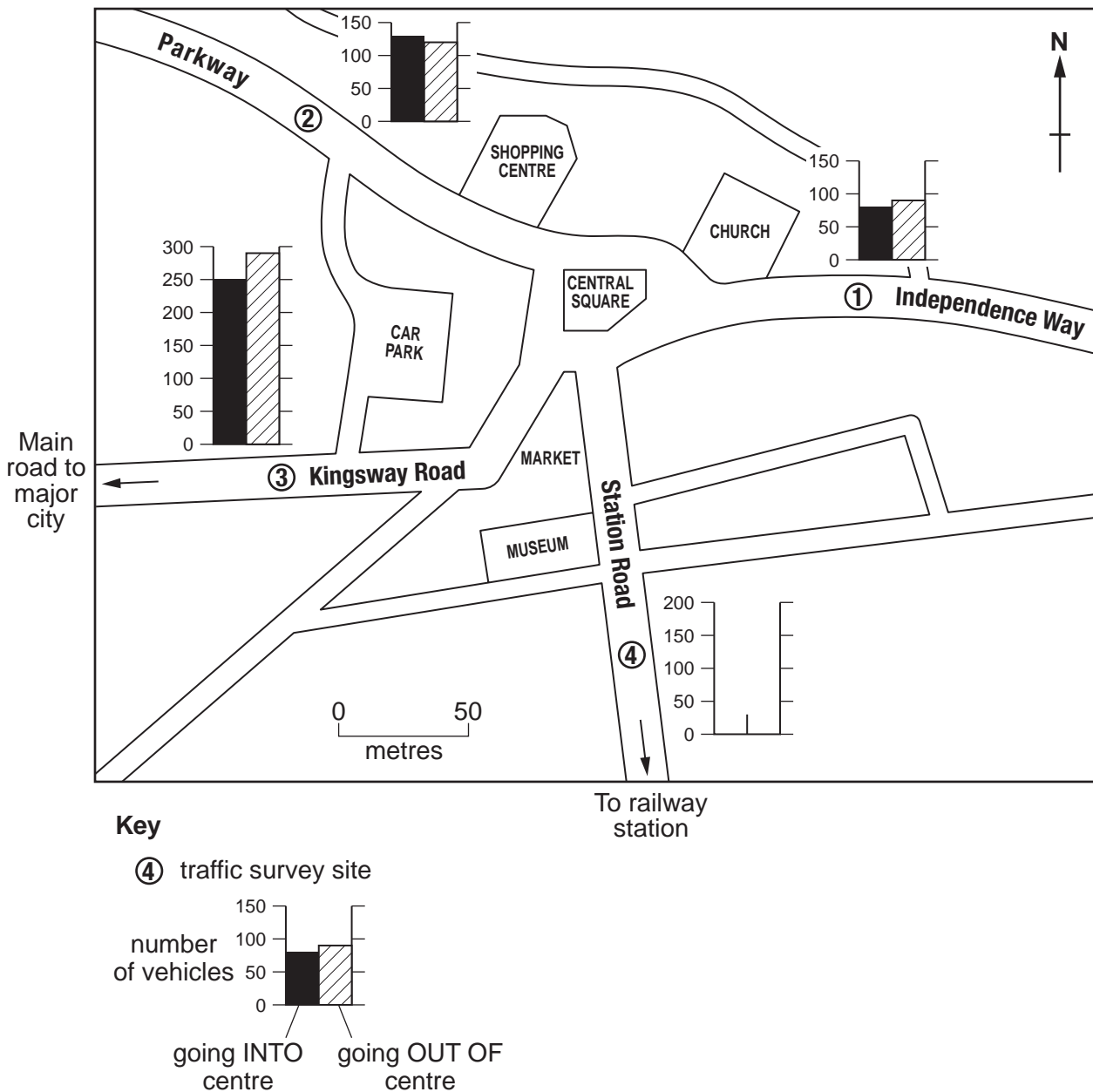


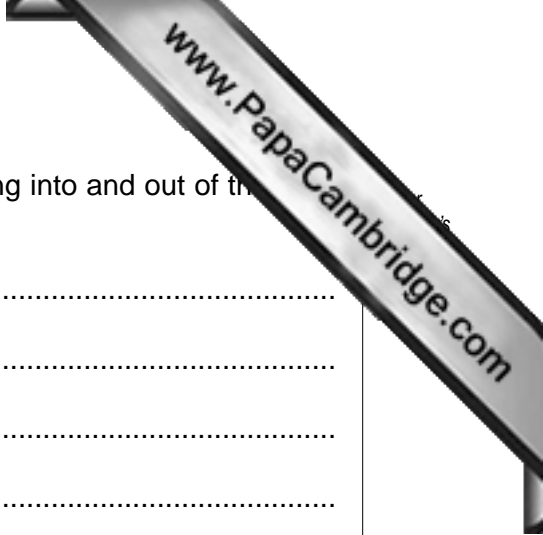
Fig. 1

The students decided to investigate the following hypotheses:

Hypothesis 1 *Traffic flows will vary in different directions from the town centre*

Hypothesis 2 *Traffic flows will vary at different times of the day*

Four sites were chosen to conduct traffic surveys. These are shown on Fig. 1. The students decided to do traffic counts three times during a weekday. The times chosen were 08.00, 12.30 and 17.00. They agreed to work in pairs, in order to count the number of vehicles travelling past the four survey sites. They decided that each traffic count would last for 10 minutes.



(iii) Describe the pattern of the total number of vehicles going into and out of the centre.

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(iv) What would be the students' conclusion to **Hypothesis 1**, based on their results? What reasons might the students give to support their conclusion?

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- (c) Look at Fig. 2 (Insert) and Fig. 3. They show the different traffic flows at 08.00 and 17.00 at the four survey sites.

Traffic flow at 17.00

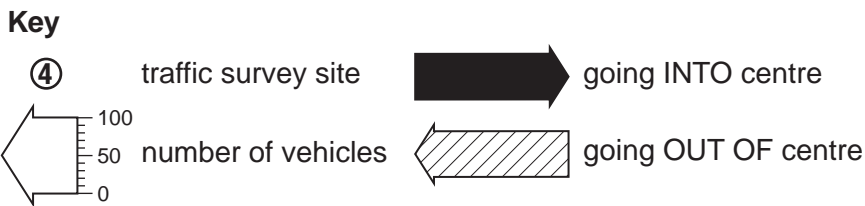
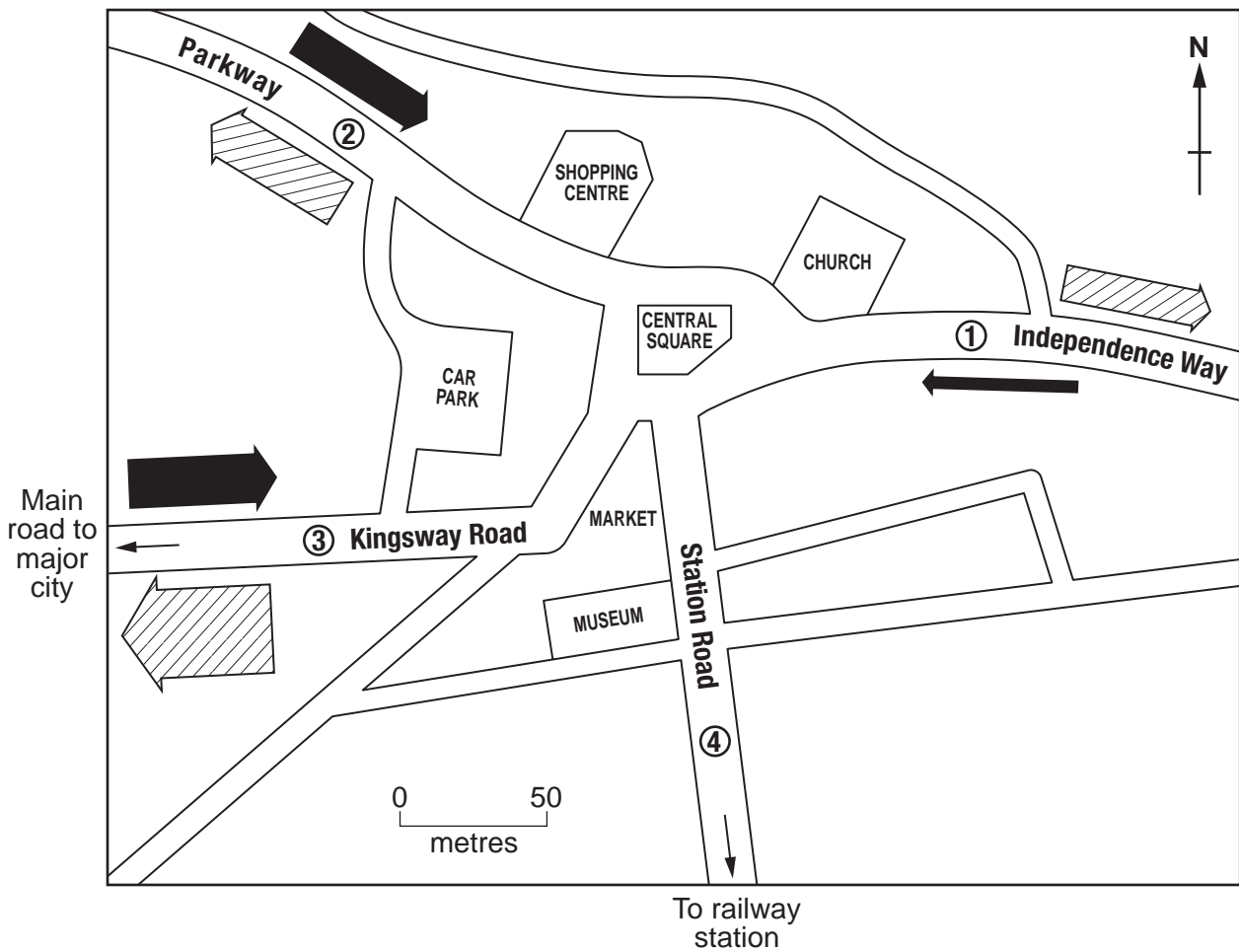


Fig. 3

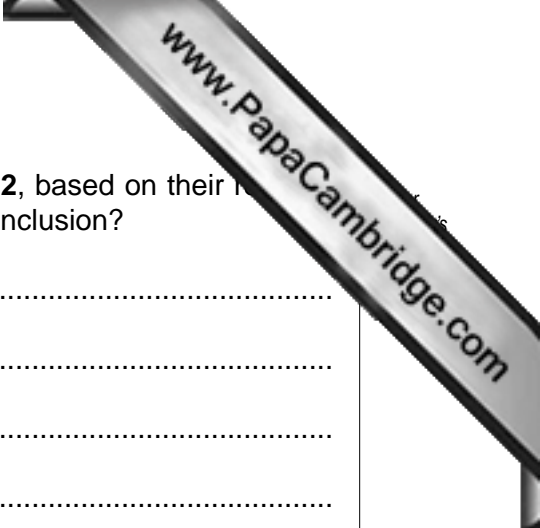
- (i) Use the data from Table 1 (Insert) to draw in the flow lines on Fig. 3, which show the number of vehicles travelling along Station Road at 17.00. [2]
- (ii) Use the information on Fig. 2 (Insert) and Fig. 3 to describe the variation in traffic at the two survey times of 08.00 and 17.00 along Independence Way.

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(iii) What would be the students' conclusion to **Hypothesis 2**, based on their results? What reasons might the students give to support their conclusion?

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(d) (i) Suggest improvements to the data collection methods used in the students' investigation.

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(ii) State **two** other features of traffic in towns that could be investigated at the four traffic survey sites.

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[Total: 30 marks]

- 2 A group of students studied how the characteristics of a river change downstream. A map of the river is shown in Fig. 4 (Insert). They wanted to see if the river was typical of rivers. To do this they decided to test the following hypotheses:

Hypothesis 1 *Velocity increases downstream*

Hypothesis 2 *Size and shape of the bedload changes downstream*

- (a) The students selected six sampling sites along the course of the river. The distance of each site from the river's source is shown in Table 2 (Insert). Suggest **three** factors the students should have considered in choosing the sampling sites.

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- (b) At each site, the students measured the velocity of the river. The results of this test for sampling site 1 are shown in Fig. 5.

River recording sheet – Sampling site 1

<p>Sampling site: 1</p> <p>Measurement of velocity</p> <p>Length of time for a small floating object to travel 10 metres;</p> <p>Test 1 17 seconds</p> <p>Test 2 23 seconds</p> <p>Test 3 20 seconds</p> <p>Mean length of time to float 10 metres = $\frac{60}{3}$ seconds = 20 seconds</p> <p>Velocity = $\frac{\text{distance}}{\text{time}}$</p> <p>= $\frac{10 \text{ metres}}{20 \text{ seconds}}$</p> <p>= 0.5 metres per second</p>
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Fig. 5

- (iii) The results which the students obtained at the sampling sites are shown in (Insert). Use these results to complete Fig. 7 to show how velocity changes downstream.

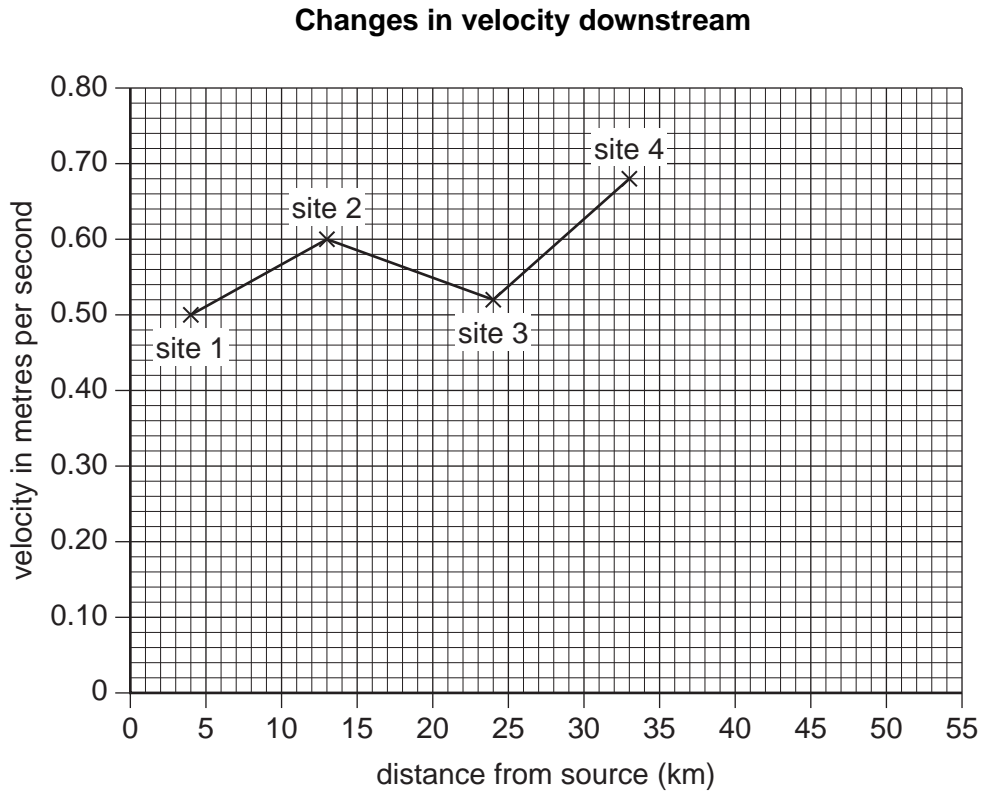


Fig. 7

[2]

- (iv) By looking at their results, what conclusion could the students make about **Hypothesis 1** (*Velocity increases downstream*)?

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 [2]

- (c) At each site, the students also sampled and measured stones on the river bed (bedload).

- (i) Describe a sampling technique they could use to get an accurate sample of bedload material.

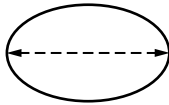
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 [2]



(ii) Having collected their sample, the students wanted to find out the size and 'roundness' of each stone. Using the equipment shown in Fig. 8 (Insert) they decided to make two simple measurements:

- the longest axis, as shown below



- the roundness of the stone

Describe how they made the measurements.

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(iii) The results of this investigation are shown in Table 2 (Insert). From these results, what conclusions could the students make about how the size and shape of bedload changes downstream (**Hypothesis 2 – Size and shape of the bedload changes downstream.**)?

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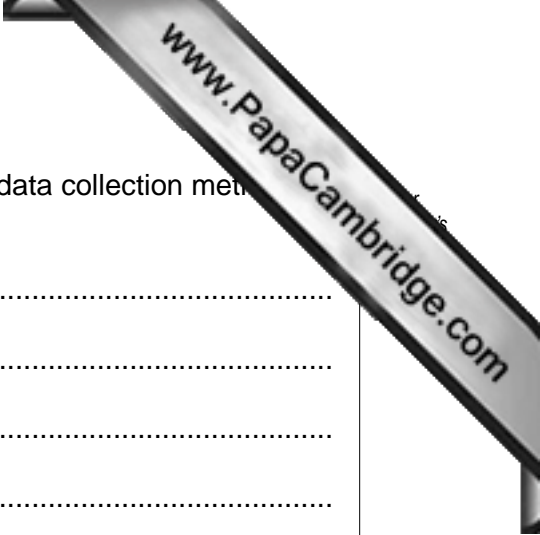
(iv) Explain why the size and shape of bedload changes downstream.

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(d) Suggest improvements the students could have made to the data collection method to make the results more reliable.

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(e) In order to extend their fieldwork, the students could have investigated the impact of people on the river. State **one** impact people could have had on a river. Describe how the impact could be investigated.

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[Total: 30 marks]

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