Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE
General Certificate of Education
Advanced Subsidiary/Advanced

CYD-BWYLLGOR ADDYSG CYMRU
Tystysgrif Addysg Gyffredinol
Uwch Gyfrannol/Uwch

443/01

GEOGRAPHY – UNIT GG3a

INVESTIGATIVE GEOGRAPHY

A. PHYSICAL GEOGRAPHY INVESTIGATION
B. HUMAN GEOGRAPHY INVESTIGATION

P.M. FRIDAY, 18 May 2007

(1½ hours)

For Examiner's use only	
Section A	
Section B	
Total	

ADDITIONAL MATERIALS

In addition to this examination paper, you will need a calculator.

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions in the spaces provided.

Your answers should be confined to the lined spaces provided. The lined sheets at the back of the book may only be used if you have made substantial deletions in your answers.

INFORMATION FOR CANDIDATES

You are reminded that marking will take into account the quality of communication used in your answers.

The number of marks is given in brackets at the end of each question or part-question.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

SECTION A. PHYSICAL GEOGRAPHY INVESTIGATION

A study of how channel characteristics vary with changing discharge

A group of students wanted to carry out fieldwork on a local river. They wanted to investigate the relationships between discharge and the width, depth and velocity along a stretch of the river. The group chose a stretch approximately 1 km long. One tributary joined the main channel along this stretch.

1. *(a)* Why is it useful, for some investigative studies, to set up a hypothesis? [2]

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(b) Explain why the students needed to check on local weather forecasts before this study. [2]

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2. They decided to take twelve sets of measurements of width, depth and average velocity along their chosen stretch of river. They knew that the formula for calculating discharge was

$Q = A \times V$

where Q = discharge
A = cross-section area of the channel (where cross-section area is width × average depth)
V = mean velocity

Table 1 below shows the data that were recorded at the cross-section at **Site 1**. Velocity was measured using the float method while the width and depth were recorded using a tape and a metre rule. **Diagram 1** on **page 3** shows the cross section that one of the students drew up from these width and depth data.

Data for cross-section at Site 1

Width of cross-section = 4.20 metres								
Distance from left bank (cms)	50	100	150	200	250	300	350	400
Depth (cms)	6	9	24	46	58	68	61	16
Mean velocity = 0.85 metres per second								

Table 1

Channel cross-section at Site 1

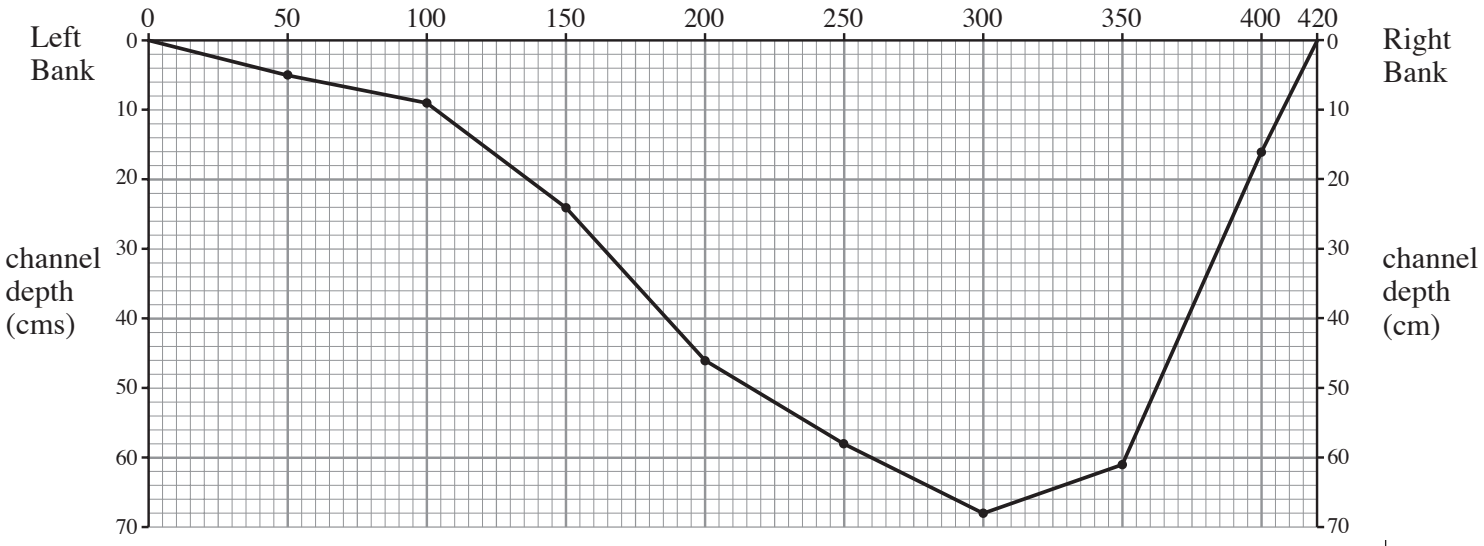

Diagram 1

(a) (i) Describe the sampling method used for the depth readings. [2]

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(ii) Suggest why **Diagram 1** may not be an accurate representation of the actual cross-section. [2]

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(b) For **Site 1**, from **Table 1** calculate

(i) the mean depth; [1]

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(ii) the cross-sectional area; [1]

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(iii) discharge. [1]

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Turn over.

3. **Table 2** below shows eleven of the twelve sets of data that were collected. Complete the data for **Site 1** from your calculations in **Question 2**.

Upstream

Downstream

Site number	Mean depth (m)	Width (m)	Cross sectional area	Mean velocity (m per second)	Discharge (cu.m/sec) (cumecs)
1		4.2		0·85	
2	0·28	5.3	1.48	0.88	1.31
3	0·36	4.1	1.47	0.94	1.39
4	0·39	4.2	1.63	0.86	1.41
5	0·54	3.1	1.67	0.99	1.66
6	0·42	4.1	1.72	0.91	1.57
7	0·39	4.0	1.56	1.08	1.68
8	0·48	3.2	1.53	1.15	1.77
9	0·53	3.1	1.64	1.14	1.87
10	0·81	1.9	1.53	1.26	1.94
11	0·72	2.1	1.51	1.36	2.06
12	0·84	1.9	1.59	1.43	2.28

Table 2

(a) State which site number has a discharge value which seems to be anomalous. Explain why it may be considered as anomalous. [2]

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(b) Between which two sites is it most likely that the tributary has joined the main channel? [1]

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(c) Apart from site number and relative distance downstream, **Table 2** includes data for five channel variables. Using some of these data, one of the students drew **Graphs 1-3** on **page 6**.

(i) Draw a 'line of best fit' on **Graph 2**. [1]

(ii) Compare the relationships shown in the three graphs. [4]

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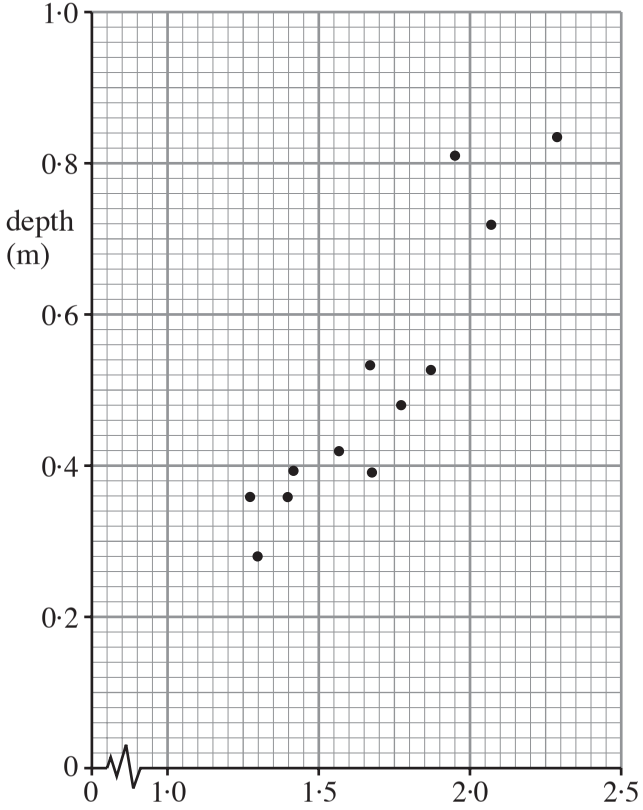
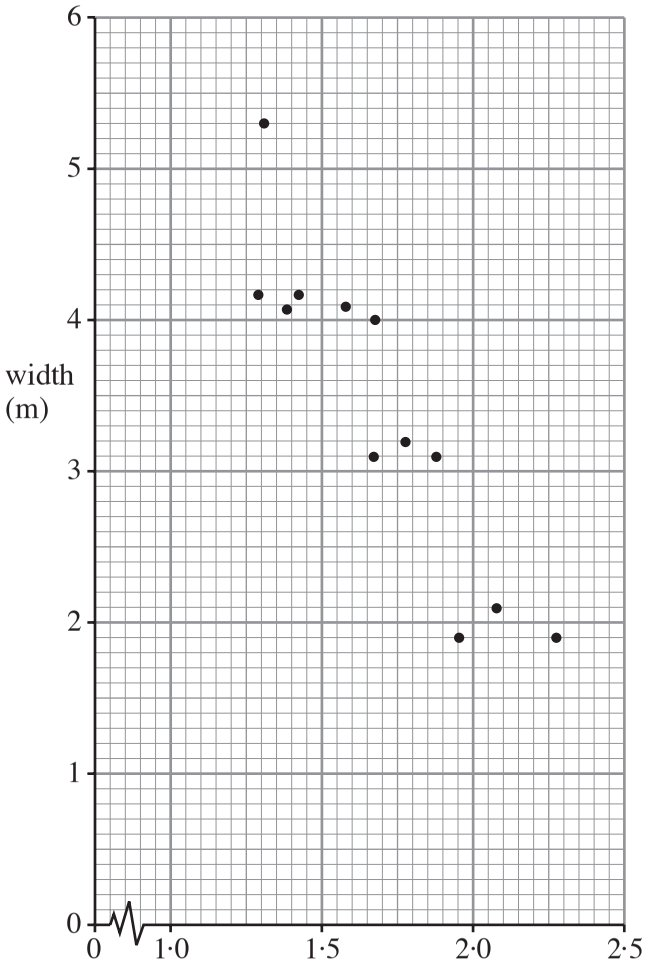
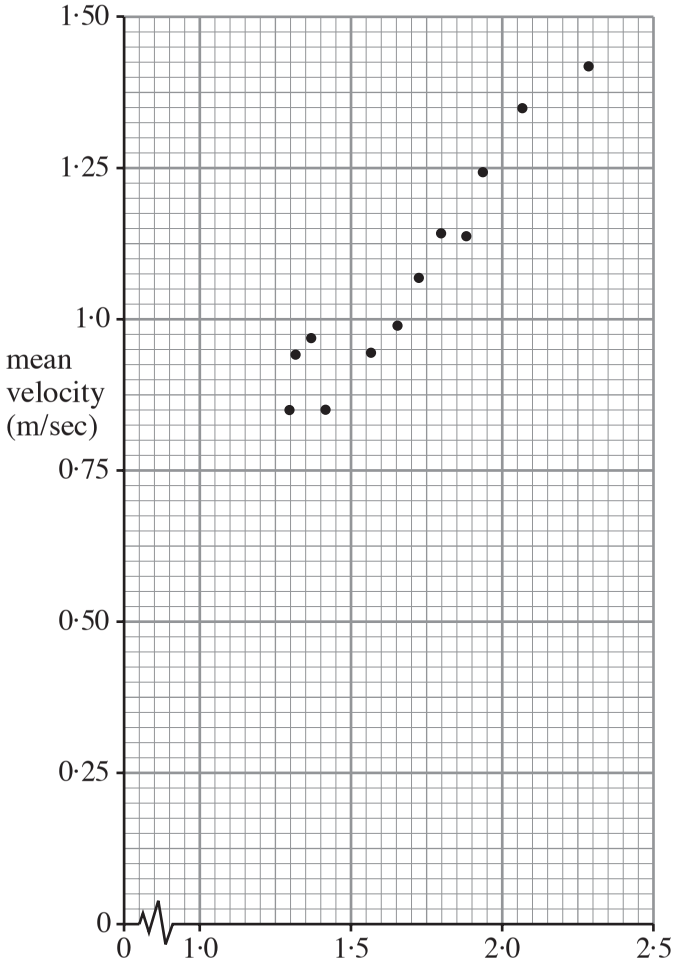


GRAPH 1



GRAPH 2



GRAPH 3

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4. Describe and justify what other statistical test or tests could have been used to help investigate these relationships. [6]

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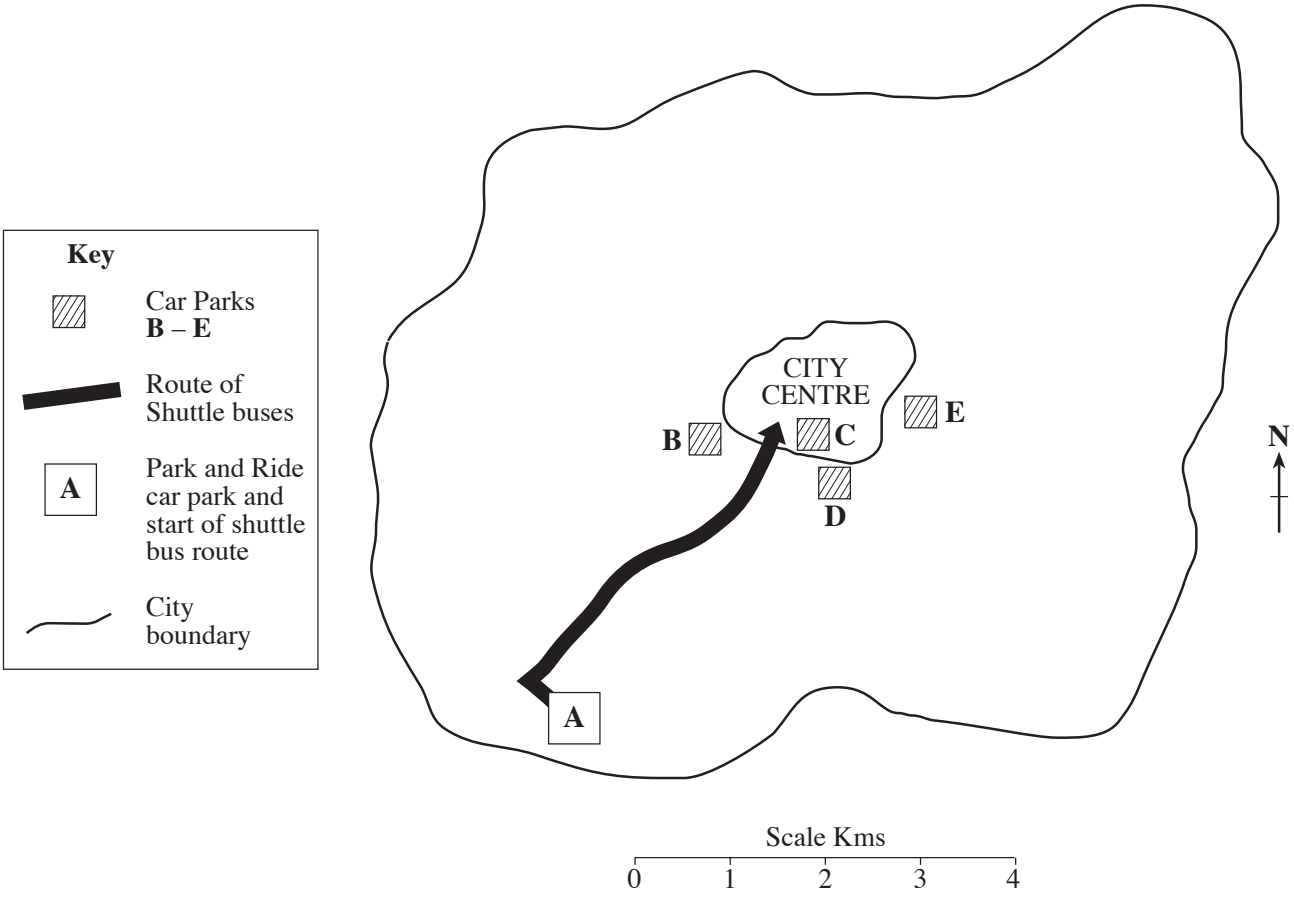
SECTION B. HUMAN GEOGRAPHY INVESTIGATION

A study of Park and Ride scheme

A student wanted to see if a park and ride scheme, being run as an experiment for six months by his local city council, was proving to be successful. The aim of the scheme was to help improve the city's living and working environment. If successful, the city council intended to begin other park and ride schemes in different areas of the city. The experimental pilot had only been running for four weeks when he began his fieldwork investigations.

Map 1, below, shows the location of the scheme, with its car park, the shuttle bus route to the city centre and the position of some car parks close to the city centre.

The Park and Ride Scheme



Map 1

1. *(a)* Apart from the City Council, state **two** groups or organisations that would be interested in knowing the results of this study. [2]

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(b) Suggest why the City Council decided to run this first park and ride scheme as an experiment **and** over a period of six months. [3]

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2. The student carried out a questionnaire survey of 100 people as they waited for the shuttle buses in the car park between 7 a.m. and 11 a.m. He wanted to get his information from a representative sample. He also counted the number of passengers on each bus as it left for the city centre. The frequency of the bus service was every 10 minutes.

(a) Explain what is meant by the term '*representative sample*' when applied to a questionnaire survey. [2]

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(b) Explain how the student might have obtained a stratified sample of respondents for this questionnaire survey. [3]

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3. **Table 1** sets out the questions that the student asked and the responses that were received.

Question	
1. Where have you come from today?	Responses to these two questions can be found on **Diagram 1**.
2. How far have you travelled to get to this car park?	

3. How frequently do you use this Park and Ride?	Rarely	Occasionally	Frequently	Every day
	12	31	38	19

4. Why are you going into the city centre today?	Work	Education	Shopping	Leisure	Other
	38	20	24	10	8

5. How would you rate the scheme?	Not very good	Satisfactory	Good	Excellent
	4	22	51	23

Table 1

(a) Suggest **one** other question which might have been useful to ask. Explain why it would have been a worthwhile question. [2]

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(b) Apart from naming a village or suburb or street, state another way of recording where the people have come from. [1]

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(c) Suggest **two** reasons why he needed to continue his questionnaire survey at the Park and Ride car park until 11 a.m. [2]

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4. **Diagram 1** below shows the distances and directions from which the 100 people who were interviewed came.

Graph 1, opposite, showing the information from **Diagram 1**, is only partly completed. Complete the graph and label both the horizontal and vertical axes. [4]

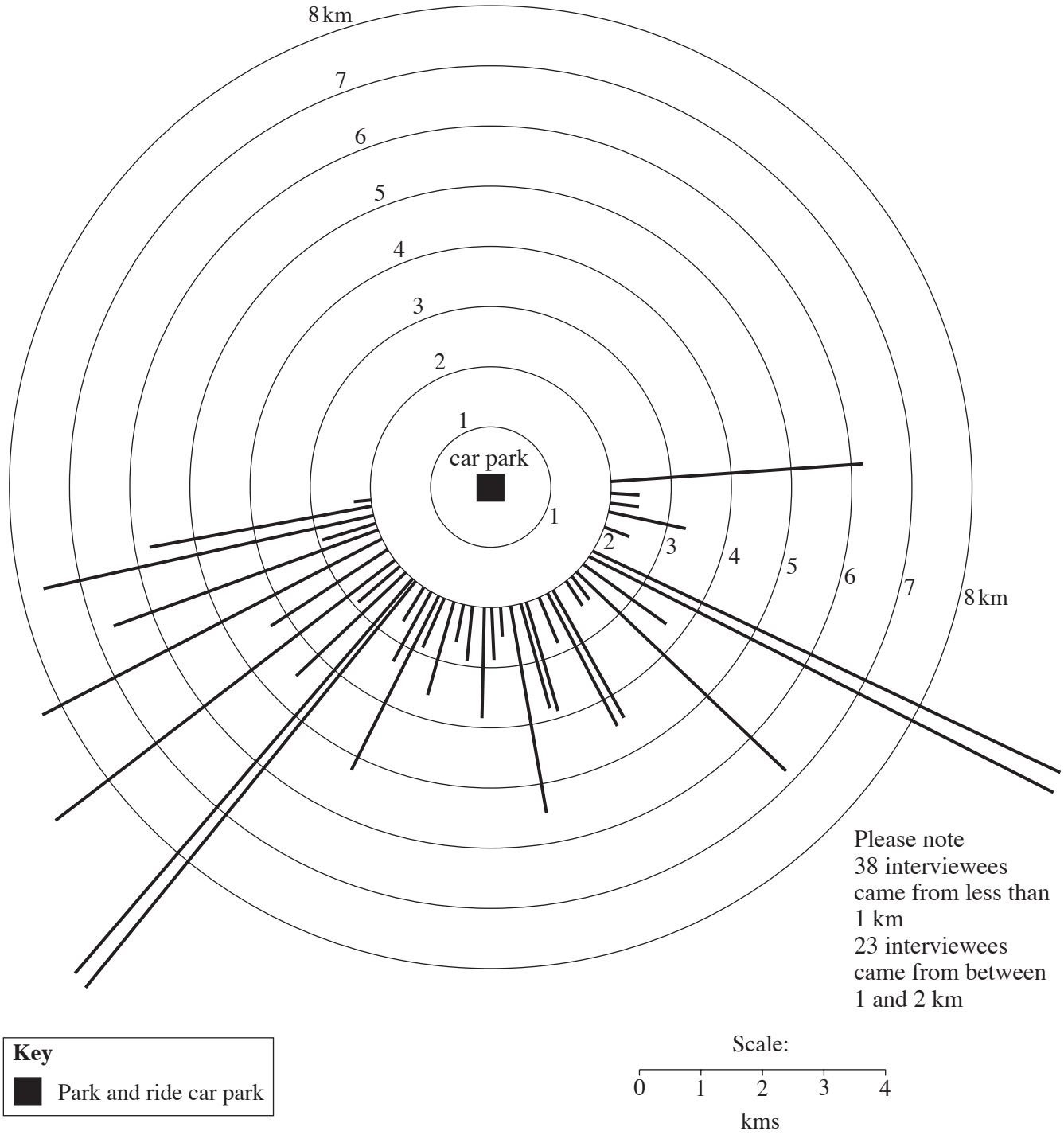
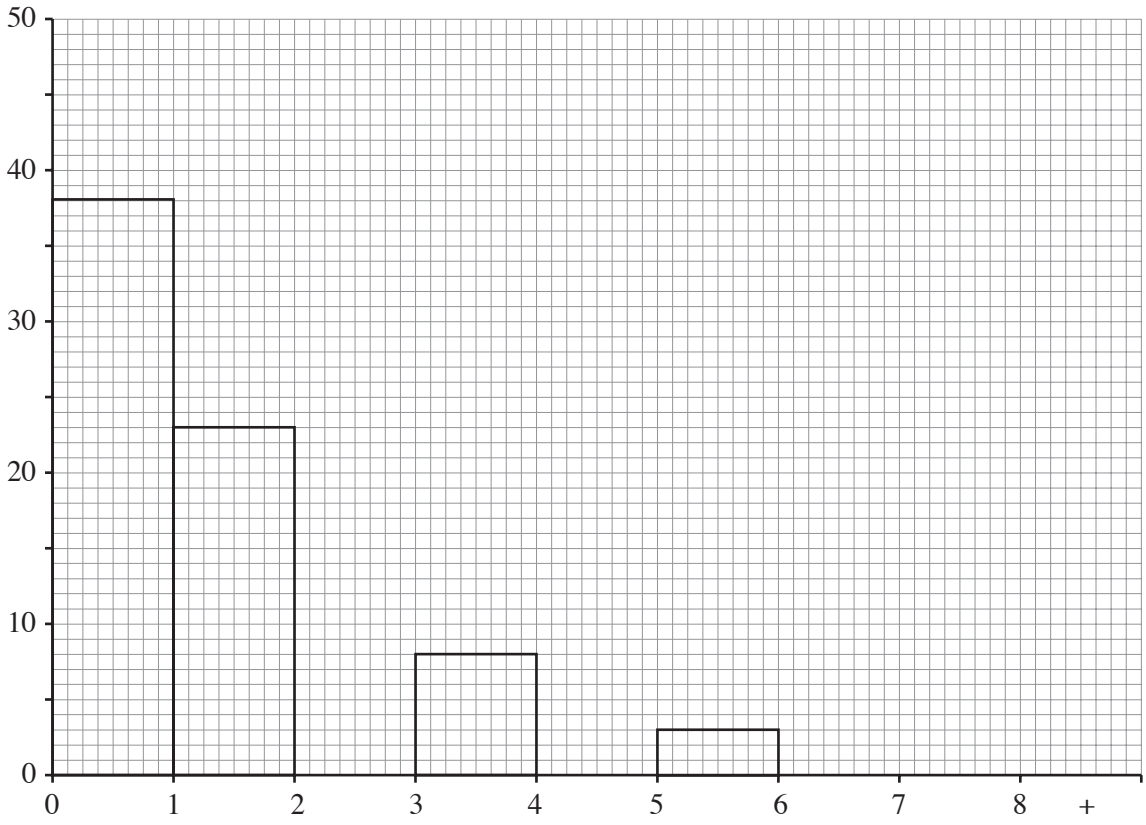


Diagram 1



Graph 1

Question continues

Turn over.

5. The student gained much information from the fieldwork that he carried out at the Park and Ride car park. However, there was other information that he could have obtained in order to reach a firmer conclusion on the relative success of the pilot scheme.

Suggest what information from other sources and locations could have helped him in reaching this firmer conclusion. Explain how this information could have been gathered. [6]