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GEOGRAPHY **0460/43**

Paper 4 Alternative to Coursework **May/June 2023**

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. Any blank pages are indicated.

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1 Students carried out fieldwork at Sheringham in eastern England. They wanted to investigate the effect of groynes on longshore drift and the impact of groynes and other sea defences on the coastline.

(a) Before they began their fieldwork, the students assessed some possible hazards they might come across and how to manage them. Their decisions are shown in Table 1.1.

Table 1.1

Risk assessment of possible hazards

hazard	likelihood	severity	risk	management
slipping or falling on the beach	4	2	8	
cliff collapse	3	5	15	Stay away from the base and top of the cliffs.
drowning in the sea	1	5	5	Beware of sea currents and do not go into the sea when it is rough.
hypothermia from getting cold and wet	4	3	12	
sharp pebbles or objects	3	3	9	Be careful when handling objects and do not throw pebbles.
getting lost or separated from others	2	3	6	

likelihood of encountering hazard: 1 (little chance) to 5 (greatest chance)
severity of hazard: 1 (not likely to be dangerous) to 5 (very dangerous)
risk = likelihood of encountering hazard × severity of hazard

(i) Which **one** of the possible hazards did the students think would have the greatest risk?

..... [1]

(ii) Suggest different ways to reduce the risk of each of the following hazards during fieldwork:

slipping or falling on the beach

.....

.....

hypothermia from getting cold and wet

.....

.....

getting lost or separated from others

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..... [3]

(b) The cliffs shown in Fig. 1.1 (Insert) are being eroded by the sea at a rate of two metres per year.

(i) Use arrows to match the processes of sea erosion with the correct definitions in the table below. One has been completed for you.

process	definition
attrition	Particles carried by the waves crash against each other and are broken up.
corrasion (abrasion)	Acids in the seawater dissolve chalk and limestone cliffs.
hydraulic action	Particles carried by the waves are thrown at the cliffs and erode them.
solution (corrosion)	Waves trap and compress air in cracks in the cliff which causes the rocks to break apart.

[2]

(ii) Suggest **two** reasons why the cliffs are being eroded quickly.

1 .....

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2 .....

..... [2]

(c) The process of longshore drift is shown in Fig. 1.2 (Insert). Describe and explain how longshore drift occurs.

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..... [4]

(d) Groynes at Sheringham are shown in Fig. 1.3 (Insert). Which **one** of the following statements about the groynes is correct? Tick (✓) your answer.

	tick (✓)
They are made of concrete.	
They go along the beach parallel to the sea.	
They stop waves breaking on the beach.	
They go down the beach into the sea.	

[1]

The students tested the following hypotheses through fieldwork.

Hypothesis 1: *Groynes reduce the effect of longshore drift.*

Hypothesis 2: *The coastal defences at Sheringham have a negative impact on the coastline.*

(e) The method the students used to investigate **Hypothesis 1** is described in Fig. 1.4 (Insert).

(i) The results of the students' measurements are shown in Table 1.2 (Insert). **Plot the results at 12 m along the groyne** on Fig. 1.5. [2]

Results of students' measurements

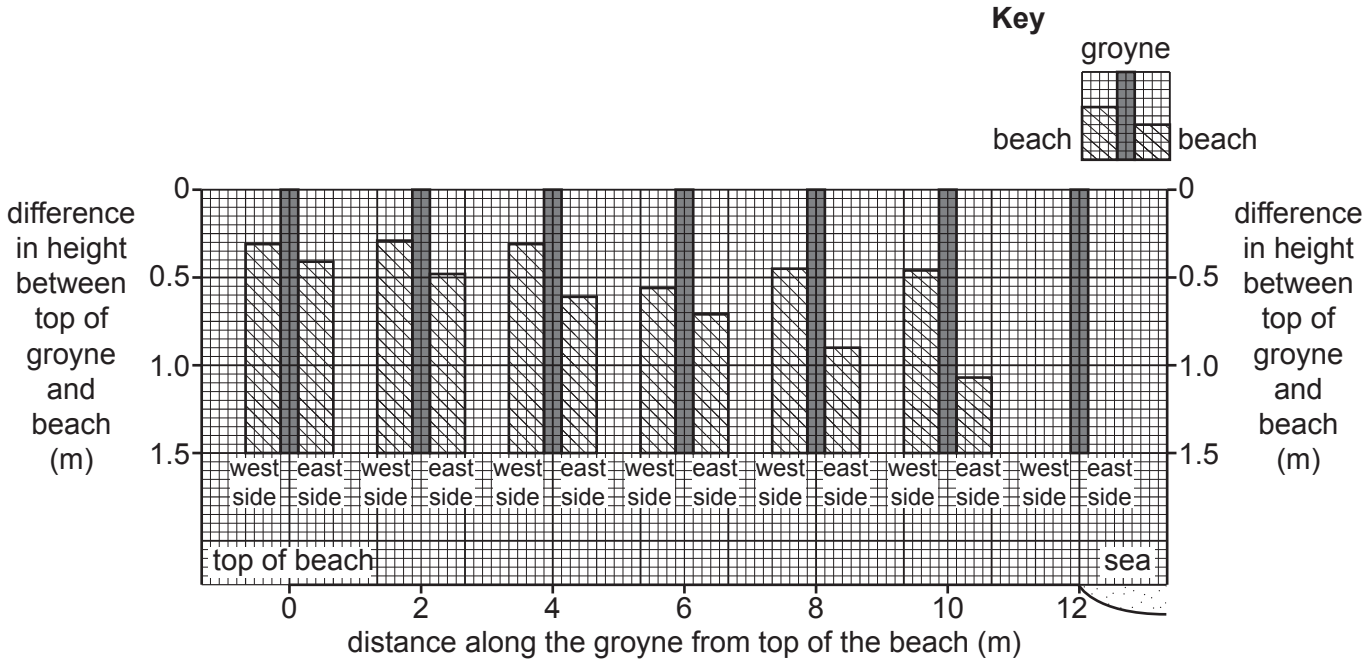


Fig. 1.5

(ii) Which **one** of the following statements about longshore drift at Sheringham is correct? Choose your answer by referring to Fig. 1.5 and Table 1.2.

	tick (✓)
Longshore drift is from east to west.	
Longshore drift is from west to east.	
Longshore drift is from north to south.	
Longshore drift is from south to north.	

[1]

(iii) The students' conclusion was that **Hypothesis 1:** *Groynes reduce the effect of longshore drift* was **true**. Use evidence from Fig. 1.5 and Table 1.2 to support this conclusion.

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..... [2]

(iv) Suggest **two** ways that the students could have improved the reliability of their fieldwork method.

1 .....

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2 .....

..... [2]

(f) To investigate **Hypothesis 2:** *The coastal defences at Sheringham have a negative impact on the coastline*, the students looked at three coastal defences in the local area. The groyne, rip rap and sea wall are shown in Fig. 1.6 (Insert).

(i) They did a bi-polar survey of the defences to assess each one. Their recording form is shown in Fig. 1.7 (Insert).
Describe how the students would organise and carry out their bi-polar survey.

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..... [4]

(ii) The results of their fieldwork are shown in Table 1.3 (Insert). Use these results **to plot the score** of the attractiveness of the groyne on Fig. 1.8, page 7. [1]

(iii) Calculate the total score for the sea wall and **write your answer on Fig. 1.8**. [1]

(iv) Which conclusion would the students make about **Hypothesis 2:** *The coastal defences at Sheringham have a negative impact on the coastline*? Tick (✓) your decision.

	tick (✓)
The hypothesis is completely true.	
The hypothesis is partly true.	
The hypothesis is false.	

Use evidence from Fig. 1.8 and Table 1.3 to support your decision.

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..... [4]

[Total: 30]

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Results of students' bi-polar survey

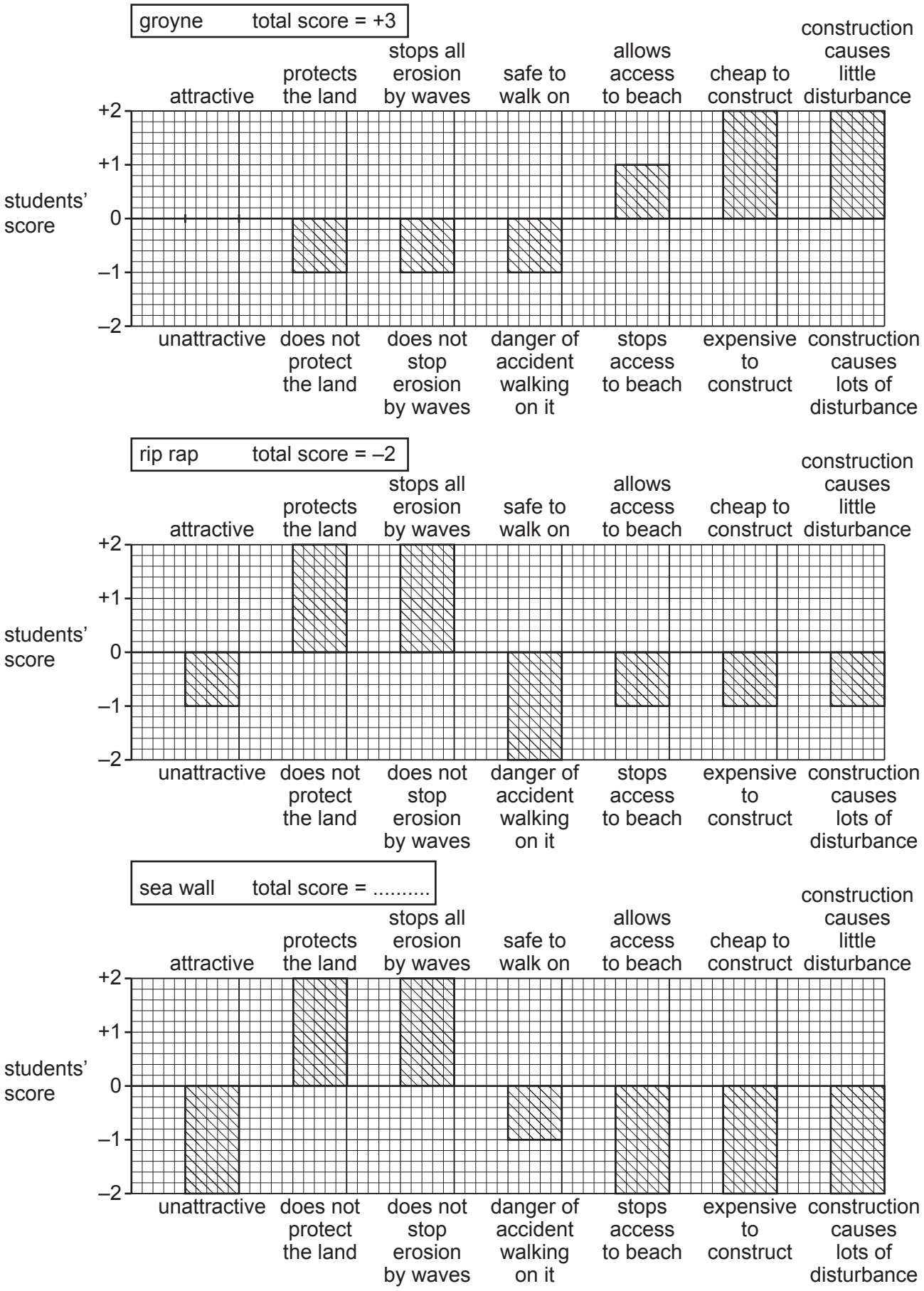


Fig. 1.8

2 Students in a class in Rio de Janeiro, Brazil did fieldwork to compare two shopping centres. Norte is located near to the centre of Rio and Barra is located south of the city. Both are big shopping centres with a large variety of shops and entertainment facilities.

They agreed to test the following hypotheses:

Hypothesis 1: *The sphere of influence of Barra is larger than that of Norte*.

Hypothesis 2: *People buy different types of goods from the two shopping centres*.

(a) (i) Which **one** of the following is the correct definition of 'sphere of influence'? Tick (✓) your choice.

definition	tick (✓)
area where people have migrated from	
area next to a particular service	
area served by a settlement or service	
area where people go to work in a town	
area around a town or shop	

[1]

(ii) Which **one** of the following is a low-order or convenience good? Circle your answer.

bread furniture jewellery mobile (cell) phone [1]

(iii) Which **one** of the following is a high-order or comparison good? Circle your answer.

fruit hair shampoo laptop computer magazine [1]

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(b) To investigate the hypotheses the students used a questionnaire at the two shopping centres. This is shown in Fig. 2.1 (Insert).

(i) To get information about **Hypothesis 1** one student wanted to include the question 'Where do you live?' in the questionnaire. Suggest **two** reasons why their teacher suggested this question should **not** be asked.

1 .....

.....

2 .....

..... [2]

(ii) When the teacher approved the questionnaire in Fig. 2.1, she advised the students how to use this questionnaire with people at the shopping centres. Suggest **three** pieces of advice she might give them.

1 .....

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2 .....

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3 .....

..... [3]

(c) The students plotted their results for question 1 in the questionnaire (*Which borough of Rio de Janeiro do you live in?*) on two choropleth maps, Fig. 2.2, page 11, and Fig. 2.3 (Insert).

(i) Use the results provided **to show the number of people** from Tijuca and Madureira going to the Barra shopping centre on Fig. 2.2. Identify Tijuca and Madureira by using the key. [2]

borough	number of people
Tijuca	10
Madureira	1

Key to boroughs

number	borough of Rio	number	borough of Rio
1	Guaratiba	14	São Cristóvão
2	Campo Grande	15	Ramos
3	Barra da Tijuca	16	Méier
4	Bangu	17	Inhaúma
5	Jacarepaguá	18	Vila Isabel
6	Lagoa	19	Caju
7	Tijuca	20	Penha
8	Copacabana	21	Irajá
9	Botafogo	22	Madureira
10	Santa Teresa	23	Pavuna
11	Rio Comprido	24	Anchieta
12	Centro	25	Ile da Governador
13	Portuaria		

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Number of people going to the Barra shopping centre

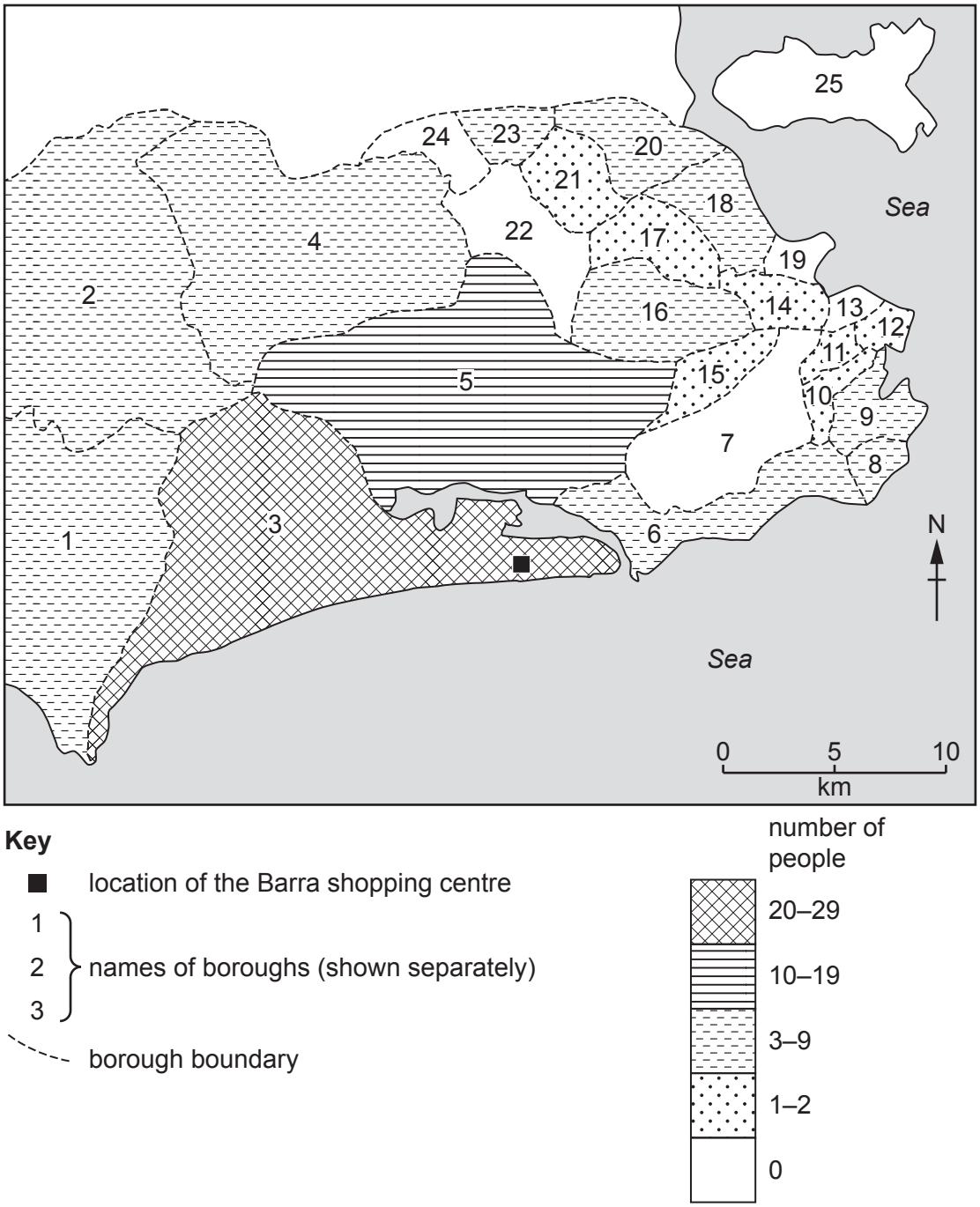


Fig. 2.2

(ii) Use Fig. 2.3 (Insert) to rank the following boroughs in order of the number of people going to the Norte shopping centre. Identify the boroughs by using the key on page 10.

Jacarepaguá Botafogo São Cristóvão Ramos

highest number of people	
↕	
↕	
lowest number of people	

[2]

(iii) Do the students' results shown in Figs. 2.2 and 2.3 support **Hypothesis 1:** *The sphere of influence of Barra is larger than that of Norte*? Use evidence to support your answer.

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..... [4]

(d) To investigate **Hypothesis 2:** *People buy different types of goods from the two shopping centres*, the students used the results from question 2 in the questionnaire (*Which one of the following do you buy most frequently when you come here to shop?*).

(i) The results of question 2 are shown in Table 2.1 (Insert). On Fig. 2.4, page 13, **plot the results** for clothes and shoes, and jewellery bought at Barra. [2]

(ii) What conclusion would the students make about **Hypothesis 2:** *People buy different types of goods from the two shopping centres*? Support your answer with data from Fig. 2.4 and Table 2.1.

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..... [3]

(iii) Suggest **two** reasons why people go to shopping centres like Barra and Norte to purchase high-order comparison goods.

1 .....

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2 .....

..... [2]

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Types of good bought most frequently

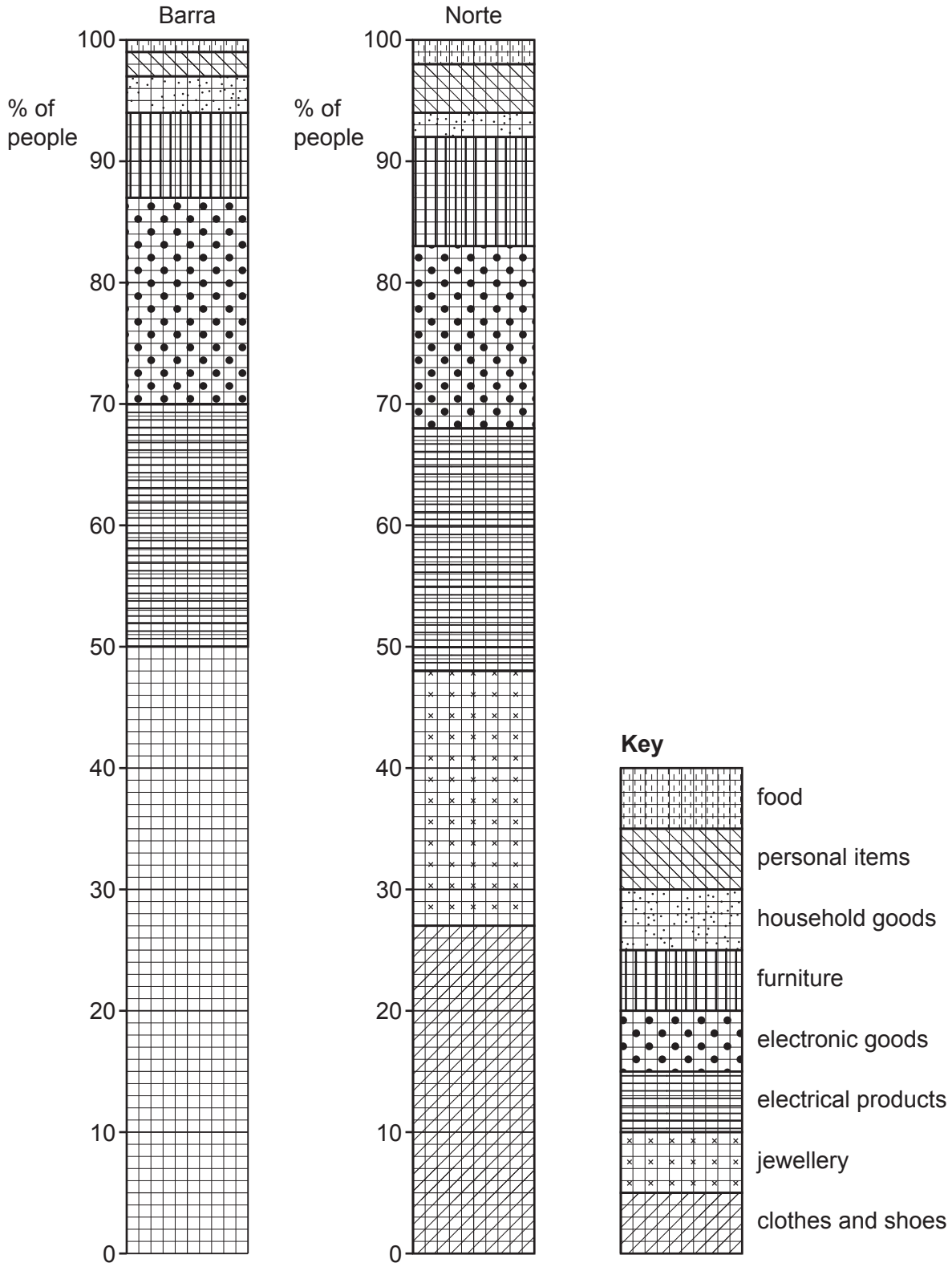


Fig. 2.4

(e) To extend her fieldwork one student wanted to investigate how long it took people to travel to the two shopping centres and what method of travel they used. To do this she asked questions 3 and 4 in the questionnaire shown in Fig. 2.1 (Insert).

(i) Her results from question 3 (*How long did your journey from home to the shopping centre take?*) are shown in Table 2.2 (Insert). **Complete the pie graph** for Barra on Fig. 2.5.

[2]

Journey times to the two shopping centres

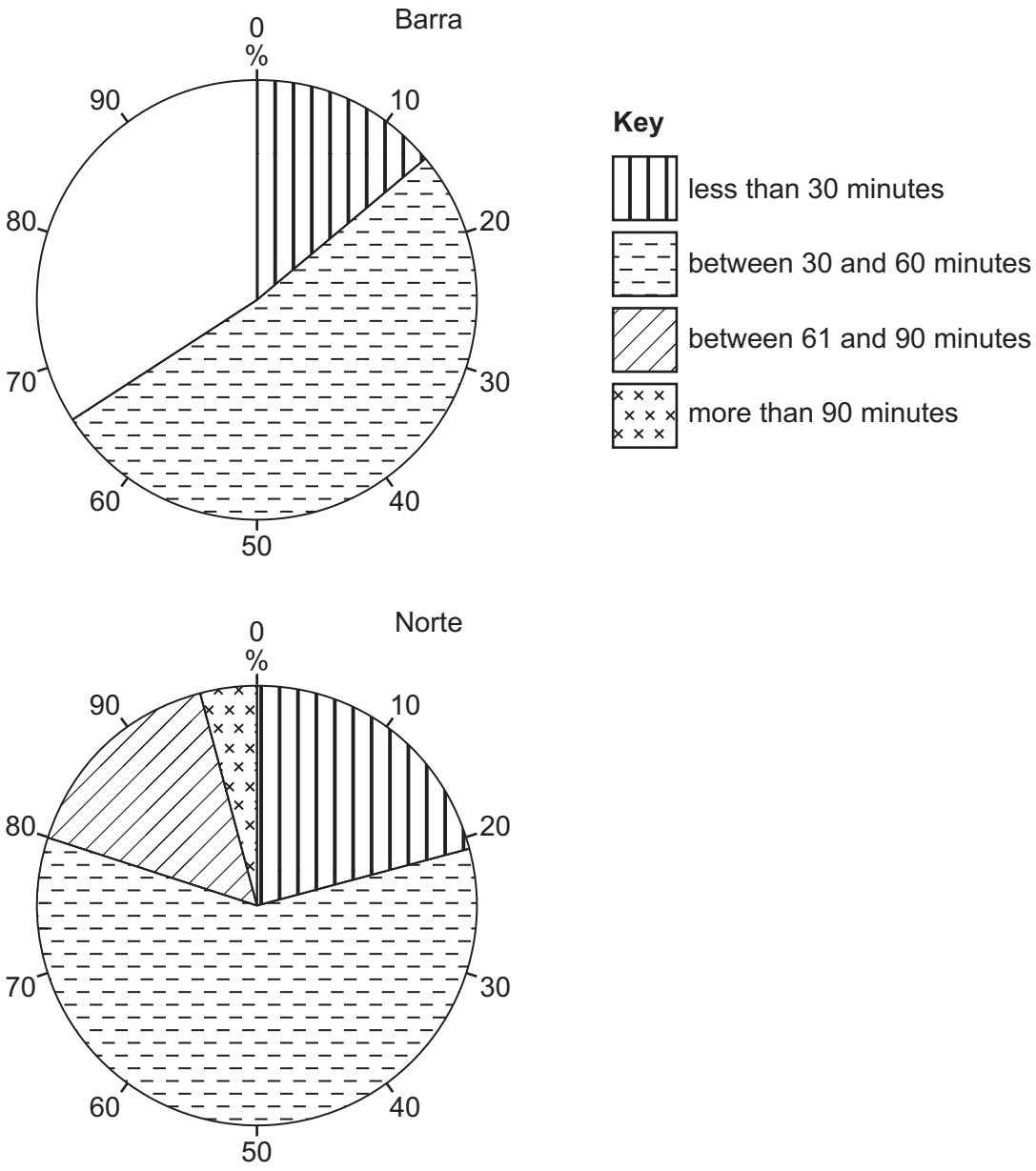


Fig. 2.5

(ii) The student's results for question 4 in the questionnaire (*How did you travel to the shopping centre today?*) are shown in Table 2.3 (Insert). Compare the percentages of people who travelled to the two shopping centres by car / motorbike and subway train. Do **not** use statistics in your answer.

car / motorbike

.....

.....

subway train

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..... [2]

(iii) Suggest **three** factors which may affect people's methods used to travel to shopping centres.

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2 .....

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3 .....

..... [3]

[Total: 30]

Additional pages

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

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