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0460/04

October/November 2008

1 hour 30 minutes

Additional Materials: Ruler

Write your Centre number, candidate number and name on all the work you hand in.
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 ON ANY BARCODES.

Answer **all** questions.

The Insert contains Fig. 4 for Question 1 and Table 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.

For Examiner's Use	
Q1	
Q2	
Total	

This document consists of **13** printed pages, **3** blank pages and **1** Insert.

- 1 Students were studying the range and sphere of influence of services in their settlement. They decided to investigate the local Market Hall and the Sports Centre. The aim of the fieldwork was to find which service had the greater range and sphere of influence.

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- (a) Study Fig. 1, which shows information about the Market Hall and the Sports Centre.

<u>Market Hall</u>	<u>Sports Centre</u>
• Sells local fruit and vegetables • Some clothes and electrical items sold • Open Monday to Saturday • 08.00–16.00 hours	• Activities include baseball, basketball, football, tennis • Open 7 days a week • 08.00–19.00 hours

Fig. 1

The teacher gave the students two hypotheses for the investigation:

- *'Visitors to the Market Hall live locally and walk there'.*
- *'Visitors to the Sports Centre live far away and come by car'.*

The teacher wanted the students to outline the reasons for the hypotheses. Complete the following statement by selecting from the words below.

cheap	work	longer	frequently	open	high
-------	------	--------	------------	------	------

Visitors to the Market Hall will buy fruit and vegetables at a price.

These will be bought

Visitors to the Sports Centre may come when not at and

will be prepared to travel longer distances to use the facilities because it is

..... every day.

[2]

- ### Method of transport question

(ii) The students used systematic sampling for the questionnaire. What is *systematic sampling*?

[1]

- Advantage 1
-
- Advantage 2
- [2]

- (c) Table 1 shows the results of the method of transport question for both the Market Hall and the Sports Centre.

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Table 1

Market Hall			Sports Centre		
(results of 225 visitors)	Method of transport	%	(results of 100 visitors)	Method of transport	%
	bicycle	20		bicycle	20
	bus	31		bus	20
	car	17		car	56
	walking	32		walking	4

Use Table 1 to complete the proportional bar graph for the Market Hall to show the methods of transport used by the visitors (Fig. 3). [4]

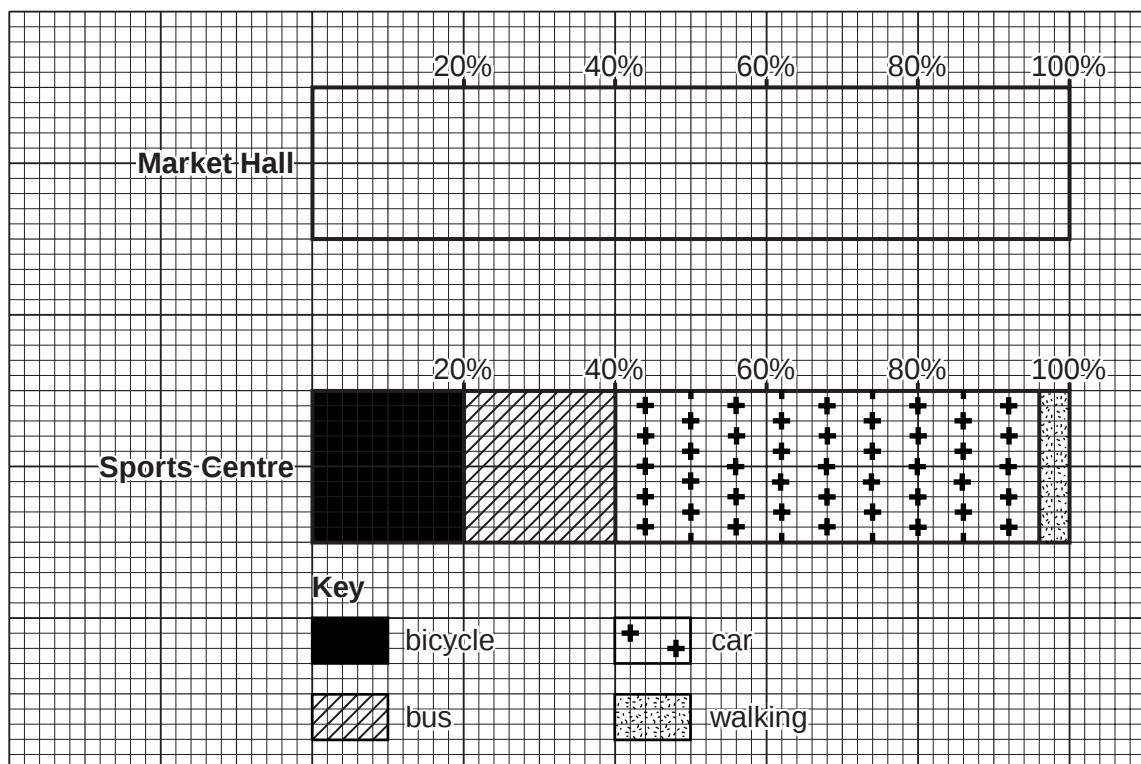


Fig. 3

(d) Study Fig. 4 (Insert), which shows the results of the Market Hall survey.

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- (i) The *range* is the maximum distance travelled to a service. State the range of the Market Hall.

.....[1]

- (ii) Describe the pattern of results for **each** transport type. You must refer to distances from the Market Hall.

bicycle

.....

.....

bus

.....

.....

car

.....

.....

walking

.....

.....[4]

- (iii) Suggest **two** reasons for this pattern.

Reason 1

.....

.....

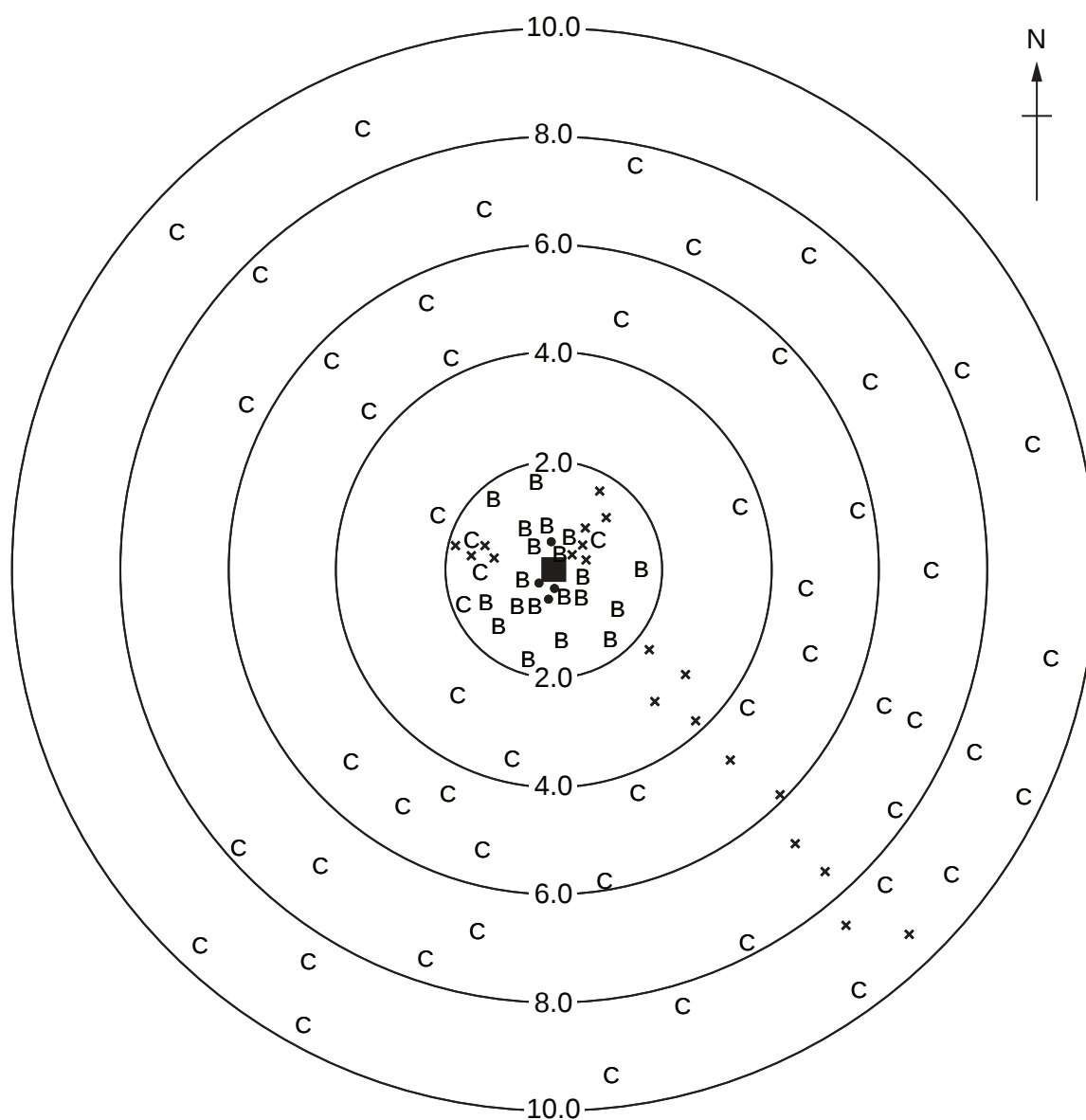
Reason 2

.....

.....[2]

Sphere of influence of Sports Centre

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Key

Residence and method of transport to
the Sports Centre

B bicycle
x bus
C car
• walking

■ Sports Centre

2.0 km distance from
Sports Centre

Fig. 5

(e) Study Fig. 5, which shows the results of the Sports Centre survey. The range of the Sports Centre is 9.6 km.

(i) Sketch the sphere of influence for the Sports Centre on to Fig. 5.

[1]

- [4]

-[6]

[Turn over
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- 2 Students recorded the rainfall and wind direction for 14 days at their school in September. The school is located to the east of the coast and at an altitude of 400 m. The hypothesis for the investigation was:

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'The school receives more rainfall when wind comes from the west'.

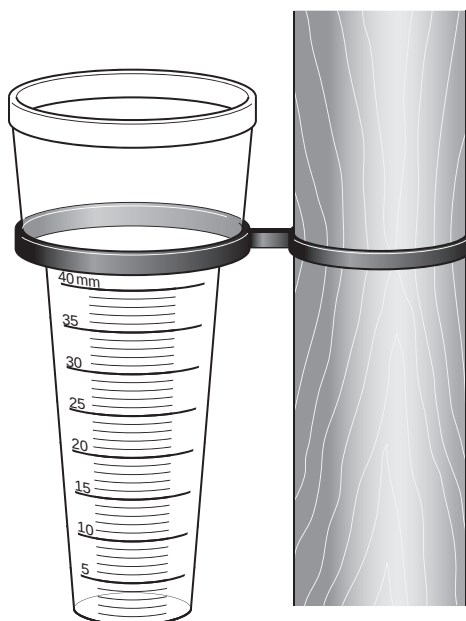


Fig. 6

- (a) Study Fig. 6, which shows a low-cost rain gauge. The teacher fixed it to a fence post so that it was accessible for the students but secure.

- (i) How is this instrument different from a traditional rain gauge?

.....

[1]

- (ii) Explain how the rain gauge should be used to measure the rain each day. Write the numbers 1–4 in the instruction box below to show the correct order for accurate measurements to be made. [2]

Instructions about how to measure rainfall each day:

Order:

- Observe carefully how many mm of water in the cylinder
 At 8.00 every day go to the rain gauge
 Empty the cylinder of water
 Record the amount of water on your recording sheet

- (iii) Table 2 (Insert) shows the rainfall results. Describe the most appropriate graph type to use to represent this data. You should suggest labels for the axes of the graph.

.....

.....

.....

.....[2]

- (b) The wind direction was measured using a wind vane fixed to the school roof (Fig. 7). Complete the sentence in each box about the wind vane. [4]

The paddle is wide because

.....

.....

.....

.....

.....

.....

The arrow shows

.....

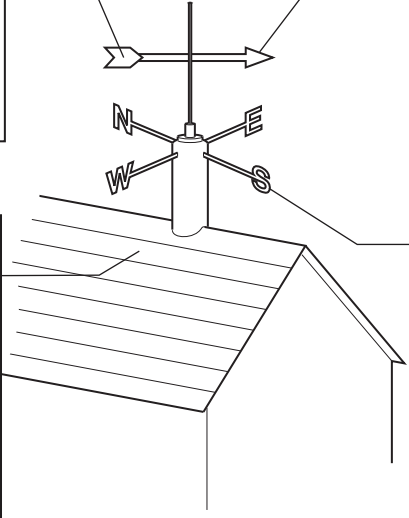
.....

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It is on the roof because

.....

.....

.....

.....

These letters represent

.....

.....

.....

.....

Fig. 7

(c) Re-read the hypothesis for the investigation:

'The school receives more rainfall when wind comes from the west'.

Study Fig. 8, which shows a sketch map of the location of the school.

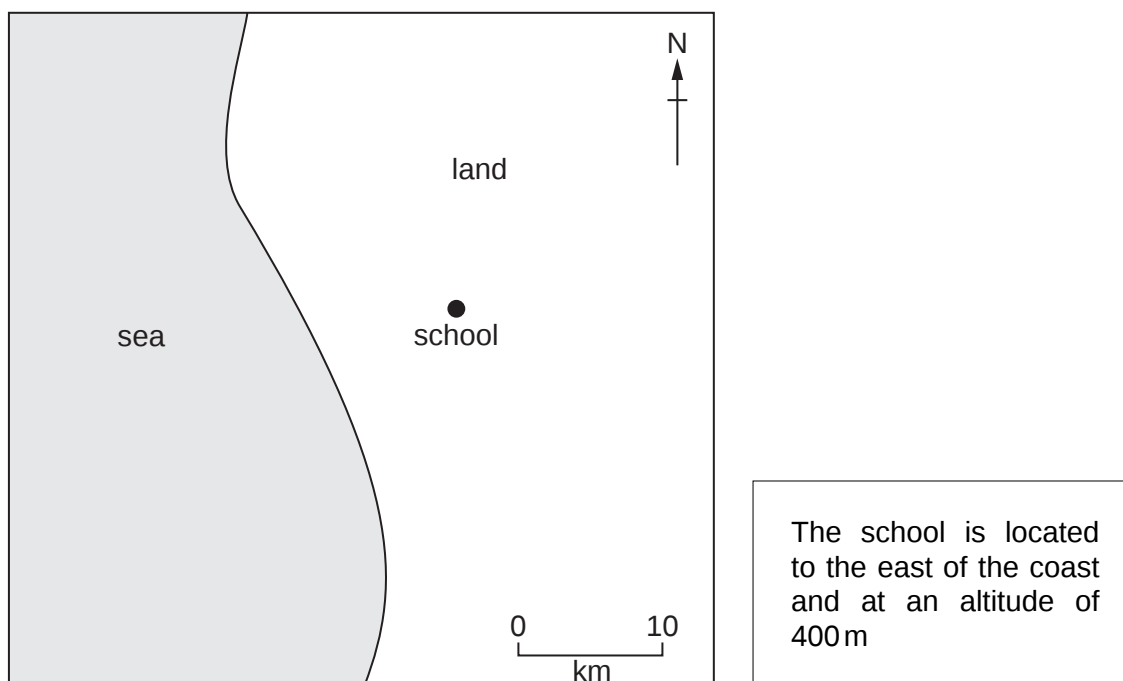


Fig. 8

In detail, explain why wind from the west may bring rain to this school.

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.....

.....

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.....

.....

.....

.....[4]

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Wind rose for September

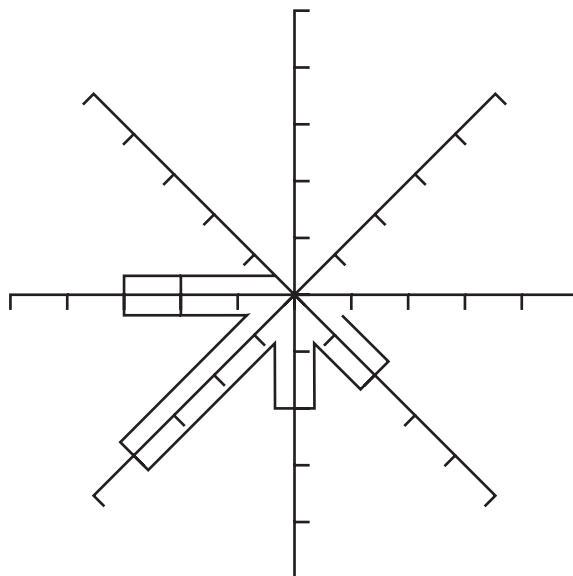
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Fig. 9

- (d) (i) Study Fig. 9, which shows a partly completed wind rose. Complete the wind rose for the east (E) and north (N) directions using the results shown in Table 2 (Insert). [2]

- (ii) The prevailing wind direction is south-west (SW).

What is a *prevailing wind*?

.....
[1]

- (iii) Describe the pattern of wind direction shown by the wind rose (Fig. 9).

.....

[3]

- (e) The students linked the rainfall data and wind direction results by drawing a scatter graph (Fig. 10).

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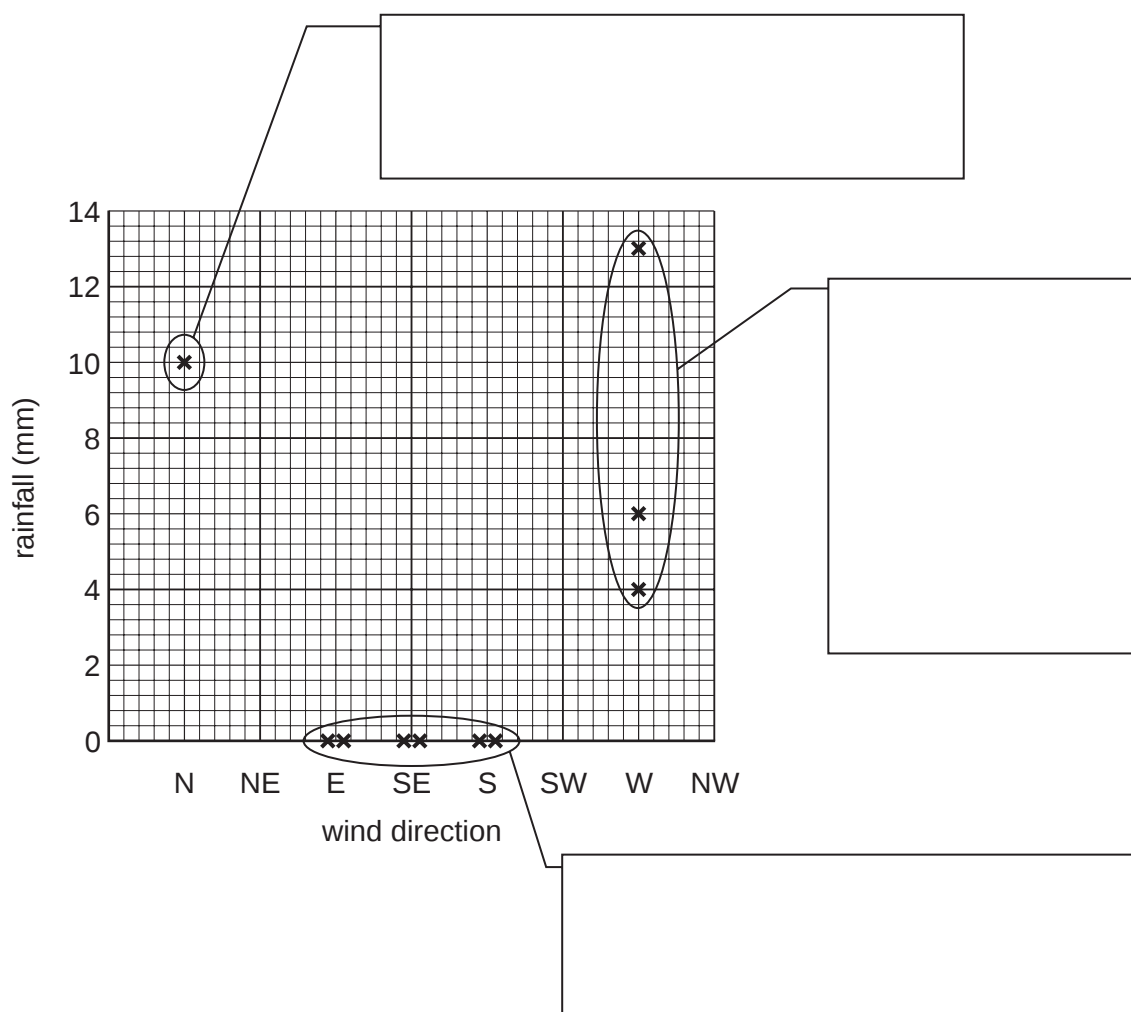


Fig. 10

- (i) Complete the graph by adding the results for south-west (SW) winds from Table 2 (Insert). [2]
- (ii) Comment on the pattern of the results by completing the boxes on Fig. 10. [3]
- (iii) The hypothesis for this investigation was:

'The school receives more rainfall when wind comes from the west'.

Does this data support the hypothesis of the investigation? Circle your decision. [1]

YES

TO SOME EXTENT

NO

-[5]

[Total: 30 marks]

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