Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

GEOGRAPHY **2217/32**

Paper 3 Geographical Investigations **October/November 2020**

1 hour 30 minutes

You must answer on the question paper.

You will need: Insert (enclosed) Ruler
Calculator

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 at a school in Seattle, USA, measured atmospheric pressure, temperature and rainfall during 15 days in November. They tested the following hypotheses:

Hypothesis 1: *Temperatures increase as atmospheric pressure rises and decrease as atmospheric pressure falls.*

Hypothesis 2: *There is a relationship between atmospheric pressure and daily rainfall totals.*

(a) **(i)** The students measured the maximum and minimum temperature for each day using a thermometer like the one shown in Fig. 1.1 (Insert). Explain how the students would use the thermometer to measure temperature.

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..... [4]

(ii) The results of the students' measurements of temperature are shown in Table 1.1 (Insert).

Plot the maximum temperature for 13 November on the graph, Fig. 1.2 below. [1]

Results of temperature and atmospheric pressure measurements

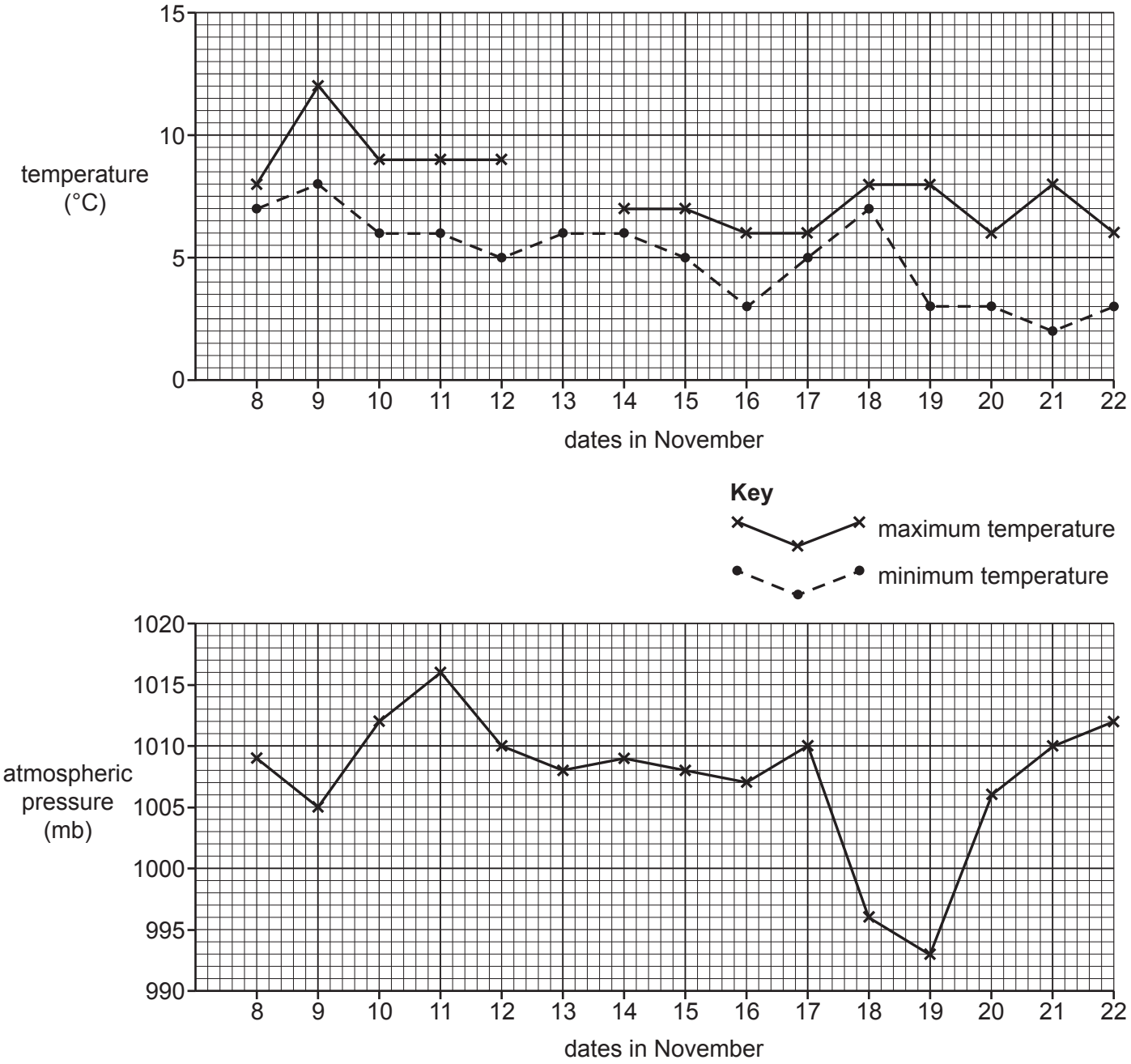

Fig. 1.2

(iii) On which date in November was the largest temperature range?

..... [1]

(b) The results of the students' measurements of atmospheric pressure are also shown in Table 1.1 (Insert) and in Fig. 1.2.

(i) Which **one** of the following instruments would the students use to measure atmospheric pressure? Circle your answer.

anemometer barometer hygrometer [1]

(ii) To measure atmospheric pressure the students took readings at midday (12:00 hours) each day. Why was it important to take readings at the same time of day?

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..... [1]

(iii) What conclusion did the students make about **Hypothesis 1:** *Temperatures increase as atmospheric pressure rises and decrease as atmospheric pressure falls*? Refer to both maximum and minimum temperatures and support your answer with evidence from Table 1.1 and Fig. 1.2.

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..... [4]

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(c) **(i)** The students used the instrument shown in Fig. 1.3 (Insert) to measure daily rainfall. Describe how the instrument is used to measure rainfall.

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..... [3]

(ii) Suggest **two** factors which the students should consider when choosing a site for the instrument shown in Fig. 1.3 (Insert). Explain why each factor is important in choosing the site.

Factor 1

.....

Explanation

.....

.....

Factor 2

.....

Explanation

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..... [4]

(iii) The results of the rainfall measurements are shown in Table 1.2 (Insert). **Plot the rainfall** for 13 November on Fig. 1.4, below. [1]

Results of rainfall and atmospheric pressure measurements

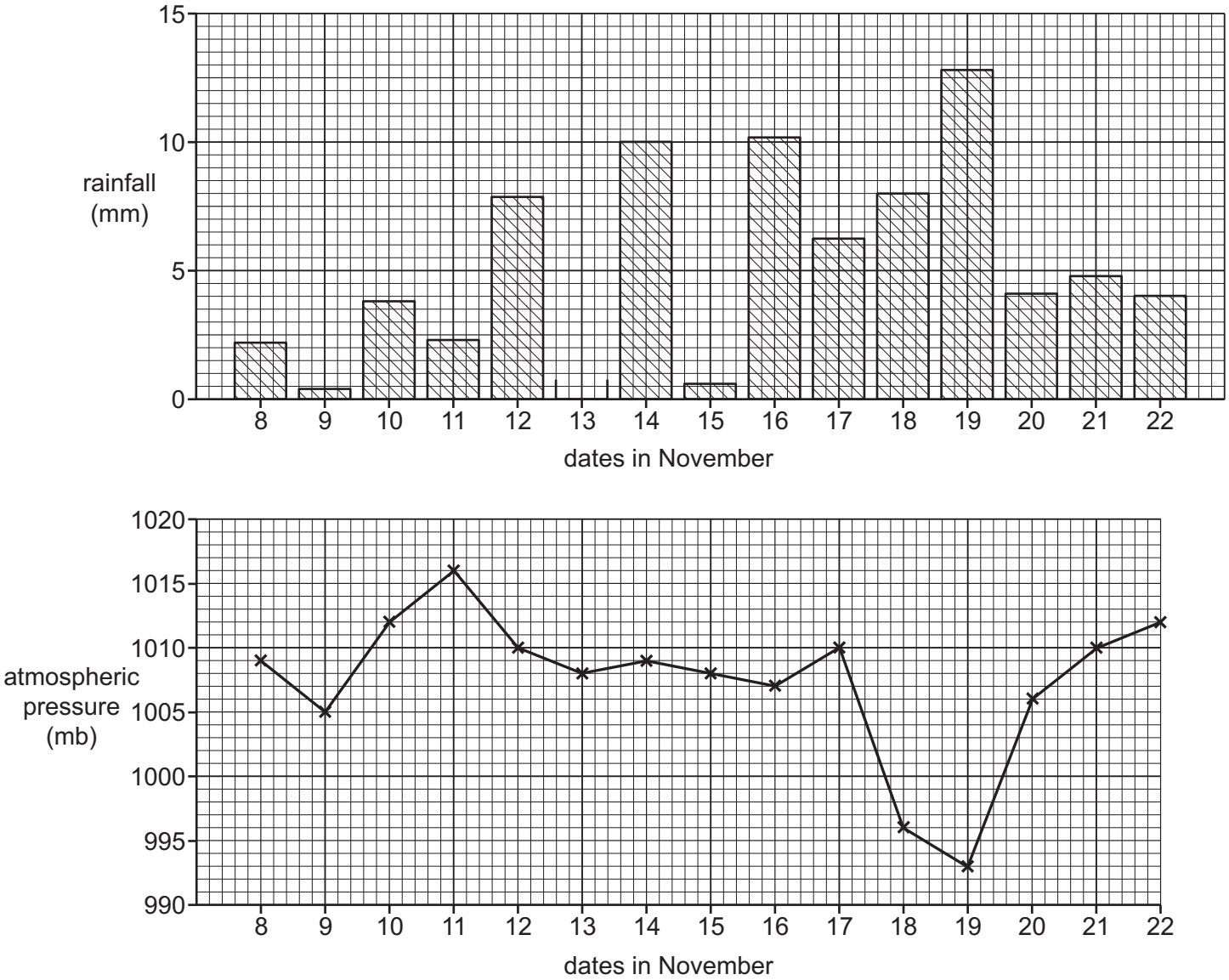

Fig. 1.4

(iv) The students decided that **Hypothesis 2:** *There is a relationship between atmospheric pressure and daily rainfall totals* was **true**. Describe the relationship between atmospheric pressure and daily rainfall totals. Use evidence from Fig. 1.4 and Tables 1.1 and 1.2 to support the relationship.

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..... [3]

(d) **(i)** To extend their fieldwork the students measured the wind speed and wind direction at midday (12:00 hours). Describe how they would make these measurements.

Wind speed

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Wind direction

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..... [4]

(ii) The results of their measurements of wind speed and wind direction are shown in Table 1.3 (Insert).
Complete the wind rose diagram, Fig. 1.5 below, by adding the number of days that the wind direction was from the south. [1]

Wind rose diagram

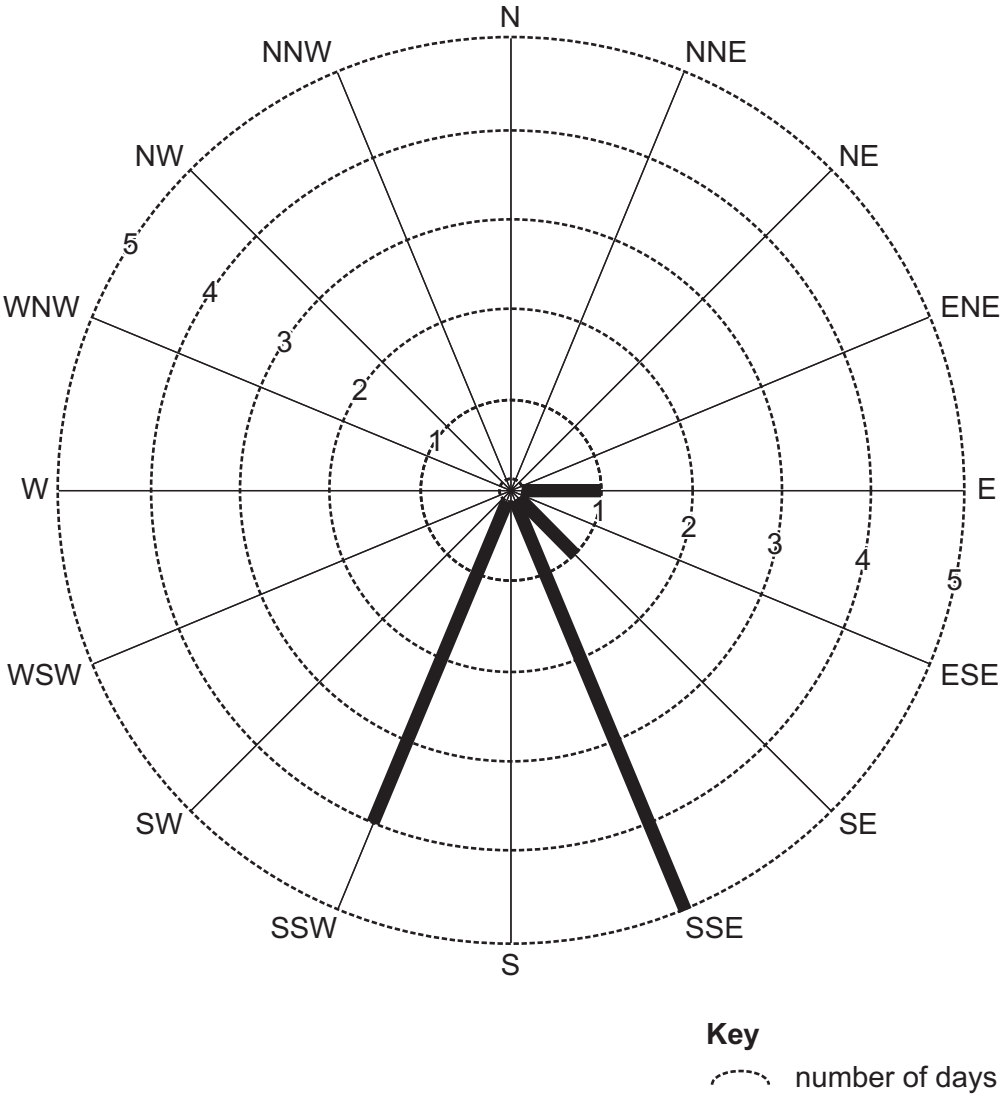

Fig. 1.5

(iii) What evidence from Table 1.3 supports the statement that there is a relationship between wind speed and wind direction (the direction from which the wind is blowing)?

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..... [2]

[Total: 30]

2 A class of students from a rural area of Wales was studying settlement and service provision.

(a) **(i)** In class the students revised 'hierarchy of services'. Services can be classified as high-order, middle-order and low-order.

Table 2.1 below shows examples of different services in the hierarchy of services. **Complete the table** by adding the following services:

bus stop fire station airport

Table 2.1

high-order service	middle-order service	low-order service
hospital	health centre	café

[2]

(ii) Which **one** of the following is the correct definition of 'low-order service'?
Tick (✓) your answer.

	Tick (✓)
a service which is frequently used	
a service which is occasionally used	
a service which is rarely used	

[1]

The students tested the following hypotheses:

Hypothesis 1: *There is a positive correlation (relationship) between the population size of settlements and the number of different services found in the settlement.*

Hypothesis 2: *People travel further to use high-order services than low-order services.*

(b) The students decided to visit eight settlements to investigate which different services were found there. They recorded the services they found in each settlement. Their results are shown in Table 2.2, on page 11.

(i) Which service is present in the highest number of settlements?

..... [1]

(ii) **Insert into Table 2.2** (on page 11) the total number of different services found in settlement F. [1]

(iii) **Complete the following table** to put the settlements in rank order based on the number of different services they contain. [2]

Rank number	Settlement
1	C
2	
3	
4	
5	
6	F
7=	B
7=	E

(c) The students found out the population living in each settlement from a census.

(i) Explain why census statistics are known as *secondary* data.

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..... [2]

Table 2.2

Results of students' fieldwork (2018)

Settlement	Population	Services											
		Bakery	Bank	Clothes shop	Doctor's surgery	General food store	Hairdressers	Household goods and hardware store	Garage / fuel station	Primary school	Secondary school	Supermarket	Total number of different services
A	551					✓	✓			✓			3
B	201					✓							1
C	12,226	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
D	2,102				✓	✓	✓	✓	✓	✓		✓	7
E	262								✓				1
F	390					✓				✓			
G	**1,312**	✓			✓	✓	✓			✓			**5**
H	4,672	✓	✓	✓	✓	✓	✓		✓	✓		✓	9

Key
✓ services found in the settlement

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(ii) **Complete Fig. 2.1 below** by plotting the population and the number of different services found in settlement G shown in Table 2.2. [1]

Relationship between population size and number of different services in the eight settlements

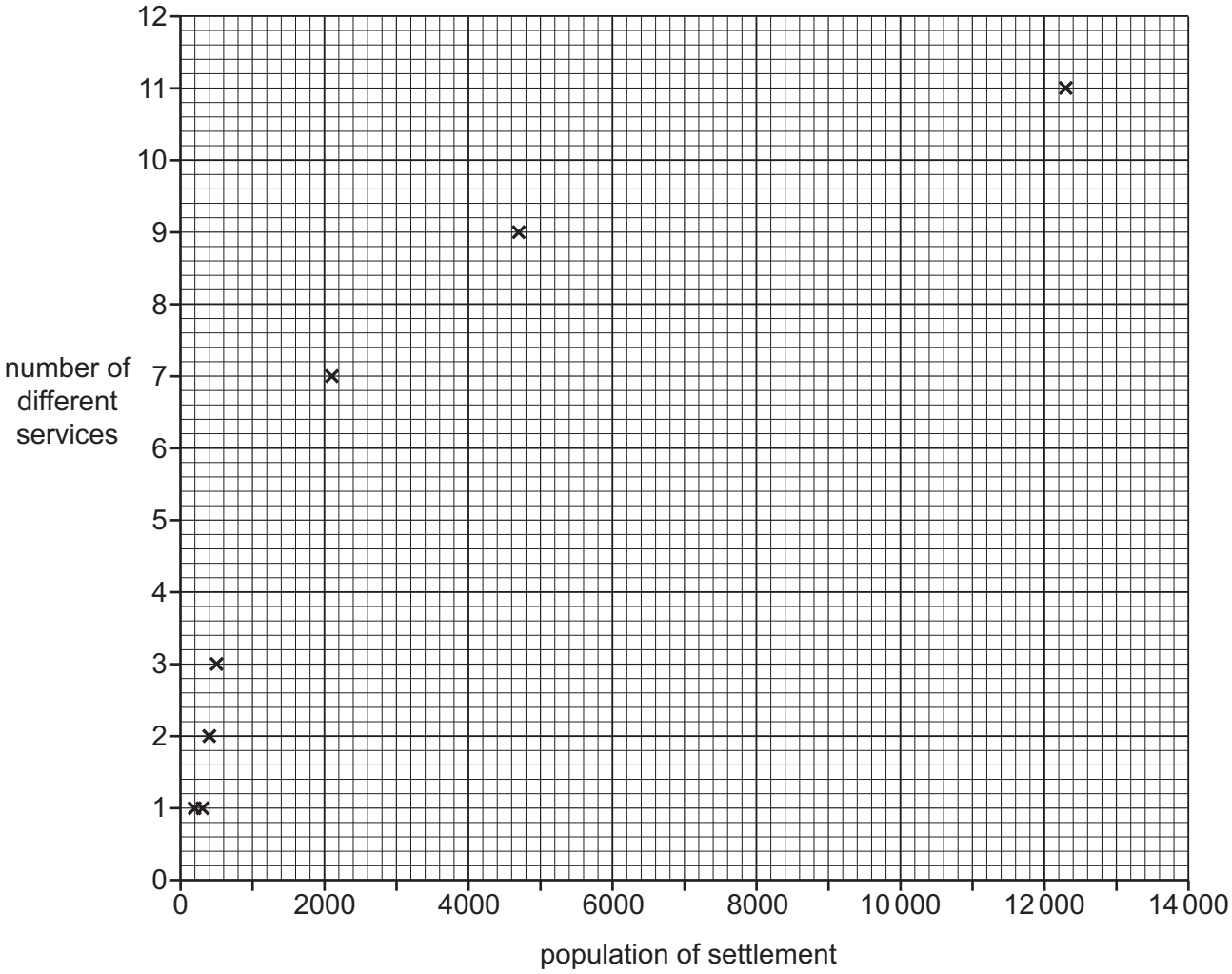

Fig. 2.1

(iii) What conclusion did the students make about **Hypothesis 1:** *There is a positive correlation (relationship) between the population size of settlements and the number of different services found in the settlement*? Support your answer with evidence from Fig. 2.1 and Table 2.2.

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..... [3]

(d) **(i)** The students compared their results with data from 1990 which is shown in Table 2.3 (Insert). Identify **one** change between the services recorded in 1990 and those found by the students in 2018 for each of the following settlements.

Settlement D

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Settlement H

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..... [2]

(ii) Suggest reasons why changes like these have occurred.

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..... [3]

(e) To investigate **Hypothesis 2:** *People travel further to use high-order services than low-order services*, the students made a questionnaire to use with 30 residents in settlement F.

(i) Describe **three** features of a good questionnaire.

1 .....

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2 .....

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3 .....

..... [3]

(ii) In their questionnaire the students included a question about how far people travelled to get different services. Their results for four services are shown in Table 2.4 (Insert).
Use the information in Table 2.4 to **plot the number of people** who travelled more than 20 km to a clothes shop on Fig. 2.2 below. [1]

How far people travelled to get to services

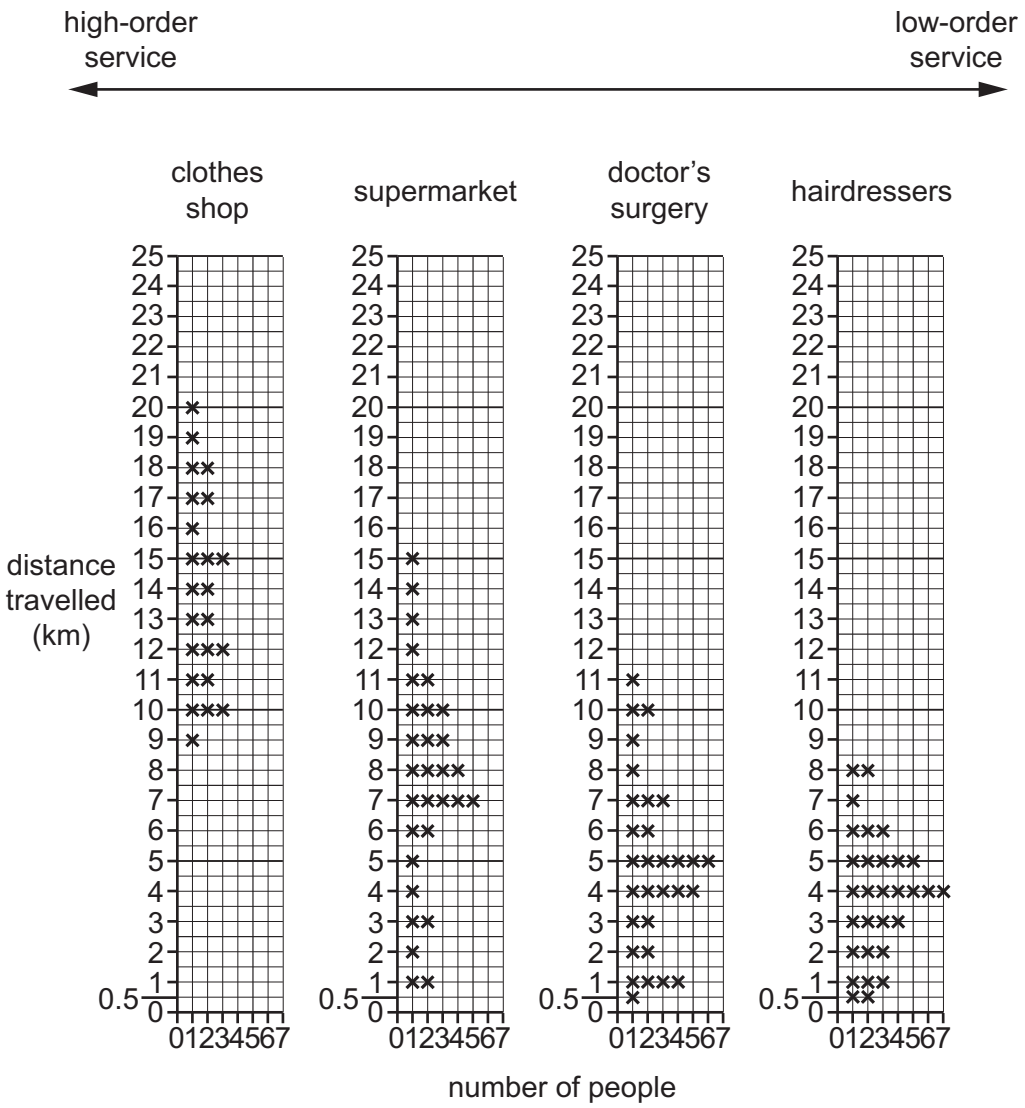

Fig. 2.2

(iii) What conclusion would the students make about **Hypothesis 2:** *People travel further to use high-order services than low-order services*? Use evidence from Fig. 2.2 and Table 2.4 to support your decision.

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..... [4]

(f) The students wanted to find out more about how settlement H had grown since 1990. They obtained a land use map of the settlement in 1990. Describe a piece of fieldwork to investigate how **land use** in the settlement changed between 1990 and 2018.

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..... [4]

[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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