



General Certificate of Secondary Education  
2023

Centre Number

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Candidate Number

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## Statistics

### Unit 1 (With Calculator)

Foundation Tier

[GST11]



\*GST11\*

**MONDAY 12 JUNE, AFTERNOON**

#### TIME

1 hour 30 minutes.

#### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided.**

**Do not write outside the boxed area on each page or on blank pages.**

Complete in black ink only. **Do not write with a gel pen.**

Any working **must** be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.

Answer **all ten** questions.

#### INFORMATION FOR CANDIDATES

The total mark for this paper is 80.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You should have a calculator, ruler, compasses and protractor.

There is no formula sheet for this examination.



Answer **all** questions

1 Mia recorded the type of each bird she saw during a walk.

The results are shown below.

Wren	Sparrow	Pigeon	Wren
Robin	Robin	Blackbird	Wren
Wren	Robin	Sparrow	Pigeon
Sparrow	Wren	Pigeon	Wren
Robin	Blackbird	Wren	Robin
Sparrow	Robin	Sparrow	Wren

(a) Complete the table.

Type of bird	Tally	Frequency
Blackbird		
Pigeon		
Robin		
Sparrow		
Wren		

[3]

(b) Find the total number of birds.

Answer \_\_\_\_\_ [1]

(c) Write down the modal type of bird.

Answer \_\_\_\_\_ [1]



(d) Draw a pictogram to represent the data in the table.

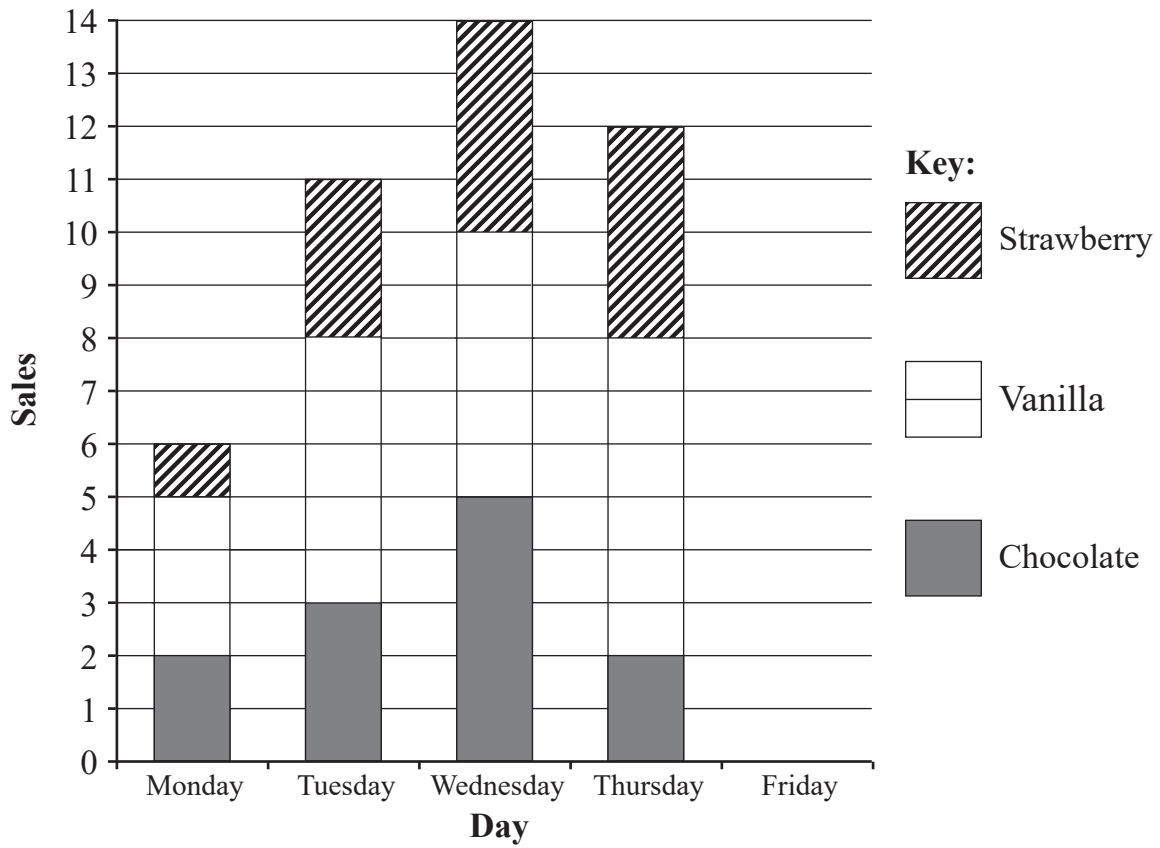
Key:  represents 2 birds

Type of bird	
Blackbird	
Pigeon	
Robin	
Sparrow	
Wren	

[3]



- 2 The compound bar chart below shows the number of doughnuts sold by a bakery over four days.



- (a) Write down the total number of doughnuts sold by the bakery on Tuesday.

Answer \_\_\_\_\_ [1]

- (b) Work out the number of vanilla doughnuts sold by the bakery on Wednesday.

Answer \_\_\_\_\_ [1]



On Friday, the bakery sold 4 chocolate doughnuts, 3 vanilla doughnuts and 6 strawberry doughnuts.

(c) Use this information to complete the compound bar chart. [3]

(d) Use the information in the compound bar chart to make two comparisons between doughnut sales on Monday and doughnut sales on Thursday.

1. \_\_\_\_\_

\_\_\_\_\_ [1]

2. \_\_\_\_\_

\_\_\_\_\_ [1]

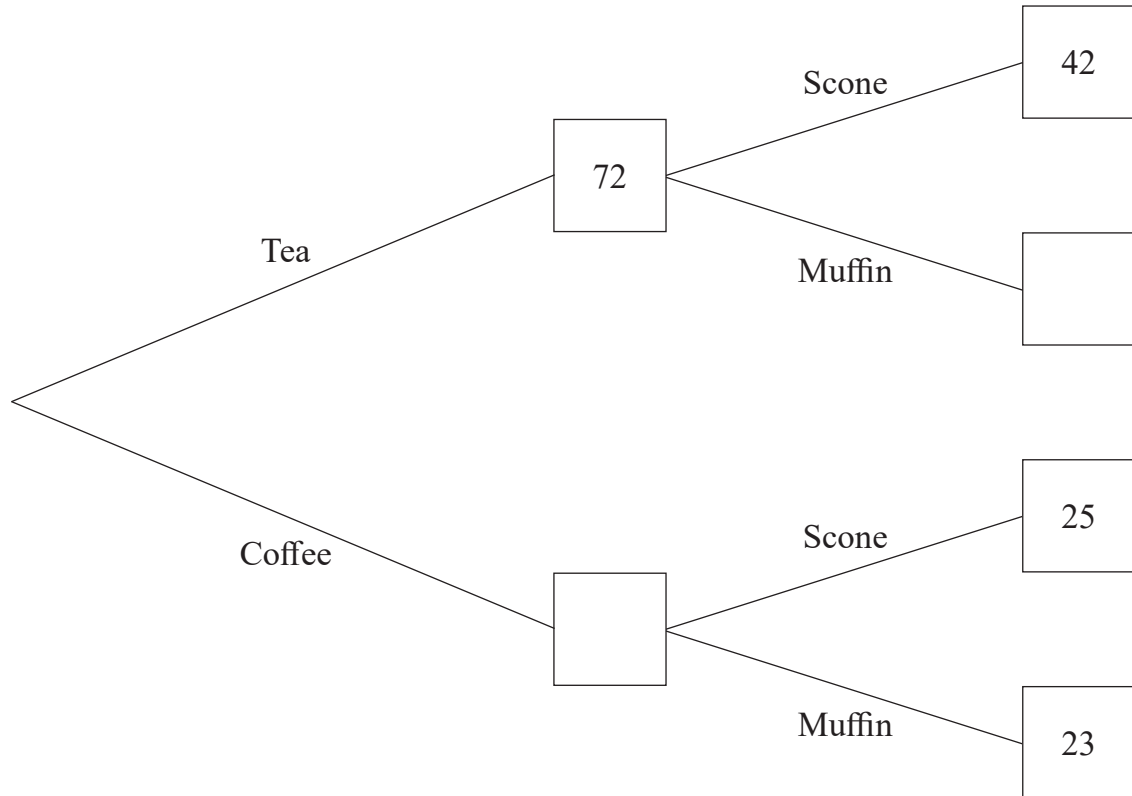
[Turn over



3 Noel recorded the purchases by customers in his cafe one Saturday.

Each customer purchases either tea or coffee and either a scone or a muffin.

Some of the information is shown in the partially completed frequency tree below.



(a) Complete the frequency tree.

[2]

Each of these customers filled in a survey.

At the end of the day, Noel selected one survey at random.

(b) Write down the probability that the selected survey was from a customer who purchased coffee and a muffin.

Answer \_\_\_\_\_ [2]





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**(Questions continue overleaf)**

**[Turn over**



4 Clare and Moira want to research the opinions of a hospital's employees regarding proposed changes to fees in the staff car park.

(a) What is the population for this research?

\_\_\_\_\_ [1]

The researchers decide to carry out a sample survey rather than a census.

(b) Give one advantage and one disadvantage of carrying out a sample survey rather than a census.

Advantage

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]

Disadvantage

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]

The researchers discuss which sampling method to use.

(c) Clare suggests surveying the first 30 employees who arrive at work on a Monday morning.

Name this sampling method.

\_\_\_\_\_ [1]



- (d) Moira suggests assigning a number to each employee in the hospital and then using a table of randomly generated numbers to select 30 employees to survey.

Name this sampling method.

\_\_\_\_\_ [1]

The researchers decide to use Moira's sampling method.

- (e) Explain why Moira's sampling method is likely to be more reliable.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]

There are 420 employees in the hospital.

Each employee is assigned a number from 001 to 420

- (f) Use the list of random numbers below to identify the first five employees which the researchers should select for their sample.

Start at 790 and read to the right.

790	246	025	533	612	179	395	707
773	535	515	765	014	638	204	502

First employee: \_\_\_\_\_

Second employee: \_\_\_\_\_

Third employee: \_\_\_\_\_

Fourth employee: \_\_\_\_\_

Fifth employee: \_\_\_\_\_

[3]

[Turn over



5 The scores for Class 10A in a Geography test are as follows:

<b>Score</b>	5	6	7	8	9	10
<b>Frequency</b>	2	3	7	11	4	3

(a) For the data in the table:

(i) calculate the mean;

Answer \_\_\_\_\_ [3]

(ii) work out the range.

Answer \_\_\_\_\_ [1]

To pass the test, a pupil had to score more than 7

(b) Work out how many pupils did not pass the test.

Answer \_\_\_\_\_ [1]



In the same test, Class 10B had a mean of 8.6 and a range of 3

Adam says Class 10B generally did better in the test.

(c) Explain why Adam is correct.

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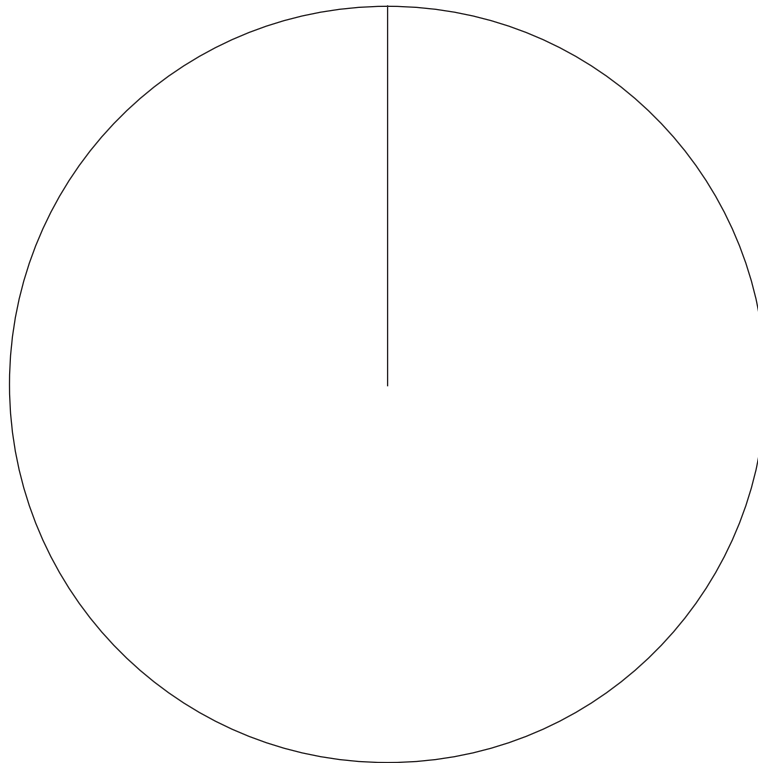
[2]



6 The table below shows the number of each type of property in a village.

Type of property	Number	
Terraced	27	
Semi-detached	31	
Detached	14	

(a) Draw a pie chart to illustrate this information.



[4]



Eamon says the pie chart shows that more people in the village live in semi-detached properties than in either terraced or detached properties.

**(b) (i)** Is Eamon correct?

Tick the correct box.

Yes

No

Maybe

[1]

**(ii)** Explain your answer.

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[1]



7 A camera automatically records the time spent by vehicles visiting a recycling centre.

(a) Name the method used to record the times.

\_\_\_\_\_ [1]

(b) Give one advantage and one disadvantage of using a camera to automatically record the times instead of a person recording the times.

Advantage

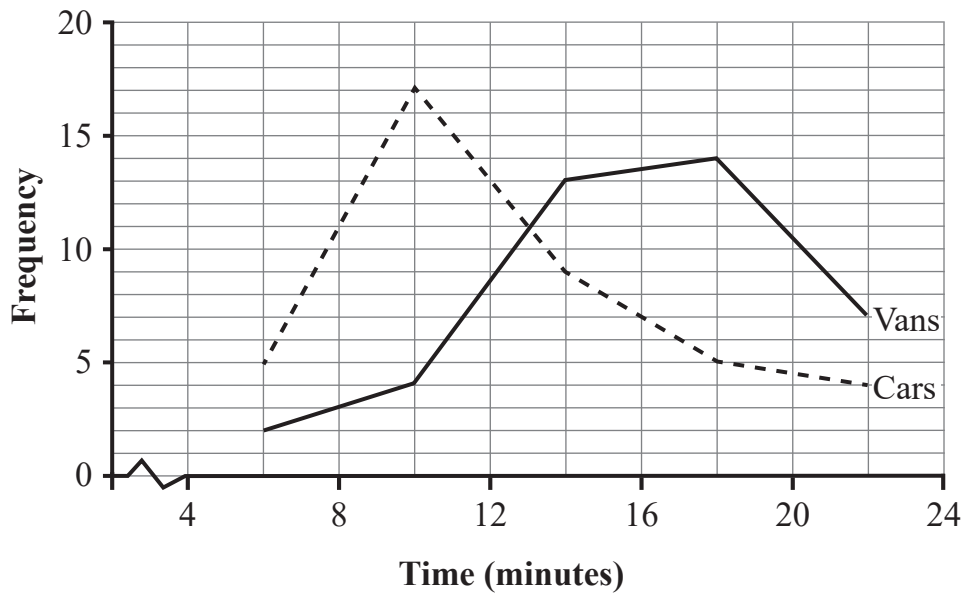
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]

Disadvantage

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]



The times recorded by the camera during one afternoon are shown in the frequency polygon below.



(c) Are the visiting times for the vans positively skewed or negatively skewed?

\_\_\_\_\_ [1]

Explain your answer.

\_\_\_\_\_ [1]

[Turn over



The modal visiting time for the cars is  $8 \leq x < 12$  minutes.

**(d) (i)** Write down the modal visiting time for the vans.

Answer \_\_\_\_\_ minutes [1]

**(ii)** Compare the modal visiting times for the cars and the vans.

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[1]

**(iii)** Suggest an explanation for your answer to part **d(ii)**.

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[1]

**(e)** Explain why it is not possible to work out the ranges of the visiting times for the cars or the vans.

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[2]





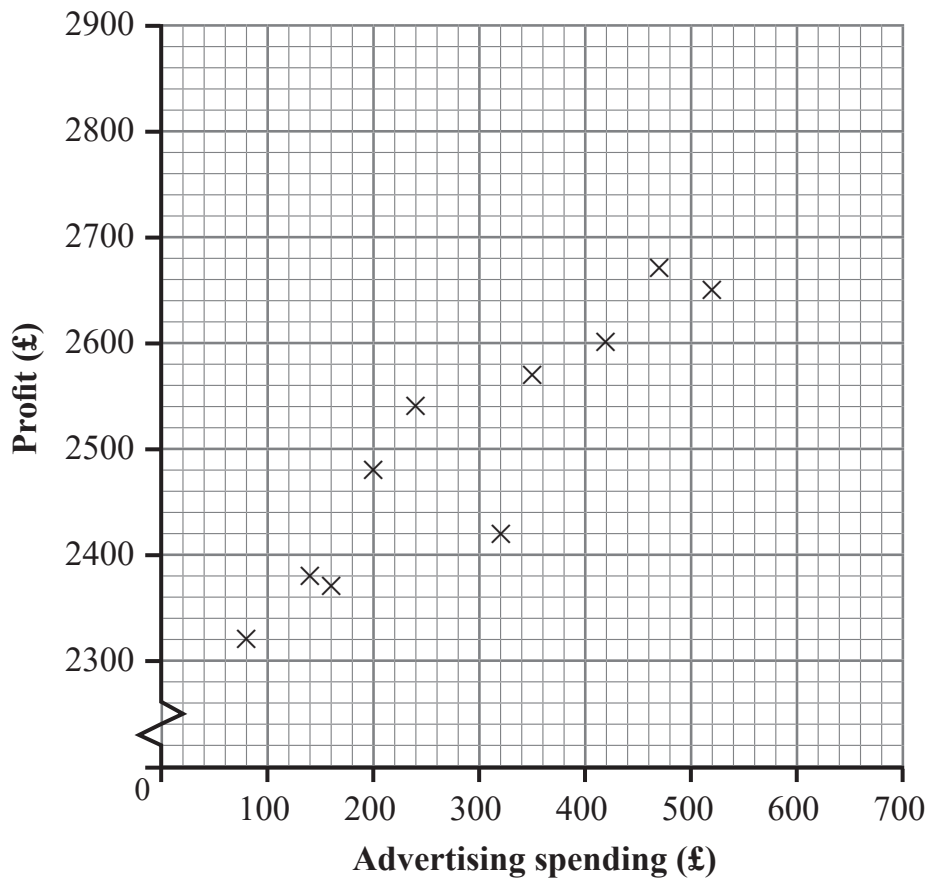
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- 8 The scatter diagram below shows the monthly advertising spending and profit for a shop.



The mean advertising spending was £290 and the mean profit was £2500

- (a) Draw a line of best fit on the scatter diagram. [2]

- (b) Describe and interpret the correlation between advertising spending and profit.

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[2]



The line of best fit was used to estimate the profit for advertising spending of £700

(c) Comment on the reliability of this estimate.

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[2]

[Turn over

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\*28GST1119\*

9 ChipCorp is a company which produces computers.

During 2021, ChipCorp produced 8000 computers.

Of these, 60 computers were found to be faulty and had to be replaced.

(a) Work out the risk of ChipCorp producing a faulty computer.

Express your answer as a percentage.

Answer \_\_\_\_\_ % [2]

The cost to the company of each faulty computer was £140

(b) Calculate the cost of this risk to the company during 2021

Answer £ \_\_\_\_\_ [2]

ChipCorp plans to increase production during 2022 to 12 800 computers.

(c) Work out the expected number of faulty computers which will be produced in 2022

Answer \_\_\_\_\_ [2]

(d) Explain why the actual number of faulty computers produced in 2022 may differ from your answer to part (c).

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[1]





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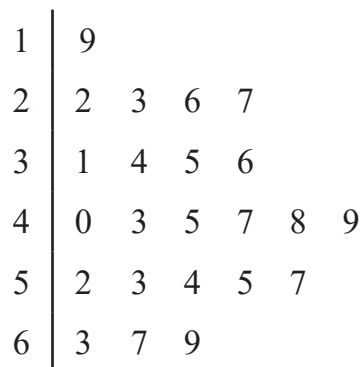
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- 10 The ages, in years, of visitors entering a museum during a one-hour period are shown in the stem and leaf diagram below.



**Key:**

3 | 4 means 34

- (a) Use the information in the stem and leaf diagram to complete the table below.

Minimum	Lower quartile	Median	Upper quartile	Maximum
	31			69

[3]

- (b) Work out the interquartile range for the ages.

Answer \_\_\_\_\_ [2]

- (c) Explain the meaning of your answer to part (b).

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[1]



- (d) Explain why the mode would not be a suitable average to represent the data shown in the stem and leaf diagram.

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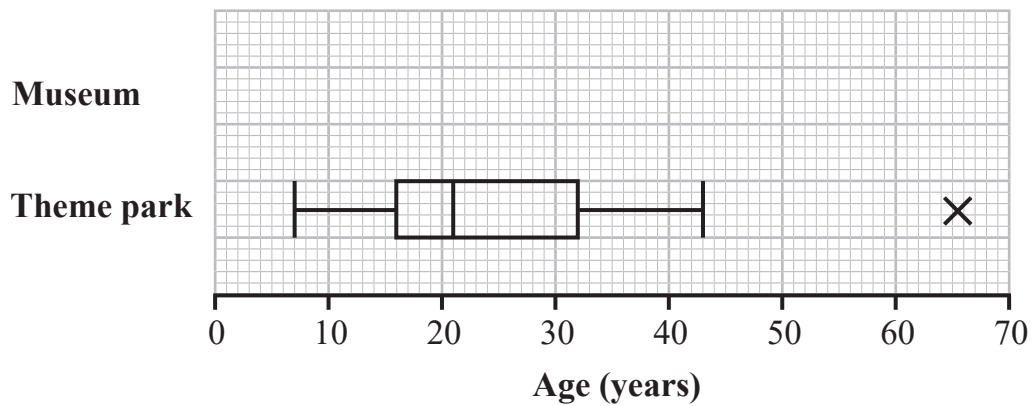
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[2]

The ages, in years, of visitors entering a theme park during the same one-hour period were also recorded.

The results are shown in the box plot below.



- (e) Explain the meaning of the value marked  $\times$  in the diagram above.

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[2]

- (f) On the same diagram, draw a box plot for the ages of the visitors to the museum.

[2]

[Turn over



(g) Use the information in the box plots to make two comparisons between the ages of the visitors to the museum and the ages of the visitors to the theme park.

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2]

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2]

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<b>For Examiner's use only</b>	
<b>Question Number</b>	<b>Marks</b>
1	
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<b>Total Marks</b>	
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Examiner Number

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