AQA

Free-Standing Mathematics Qualification
Higher Level
June 2015

Data Handling 4986

Unit 6

Monday 11 May 2015   1.30 pm to 2.45 pm

For this paper you must have:
- a clean copy of the Data Sheet (enclosed)
- a calculator
- a protractor
- a ruler.

Time allowed
- 1 hour 15 minutes

Instructions
- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- You may **not** refer to the copy of the Data Sheet that was available prior to this examination. A clean copy is enclosed for your use.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 50.
- You are expected to use a calculator where appropriate.

Advice
- In all calculations, show clearly how you work out your answer.

Section A

Answer **all** questions.

Answer each question in the space provided for that question.

*Use **Cricket scores** on page 2 of the Data Sheet.*

1 (a) The data are reproduced below.

Draw a cumulative frequency diagram on the grid opposite to show the data.
You may use the spare column on the table below for any calculation required.

[3 marks]

Number of runs	Frequency	
0	7	
1 – 20	21	
21 – 40	15	
41 – 60	13	
61 – 100	11	
101 – 140	5	

Cumulative frequency

Number of runs
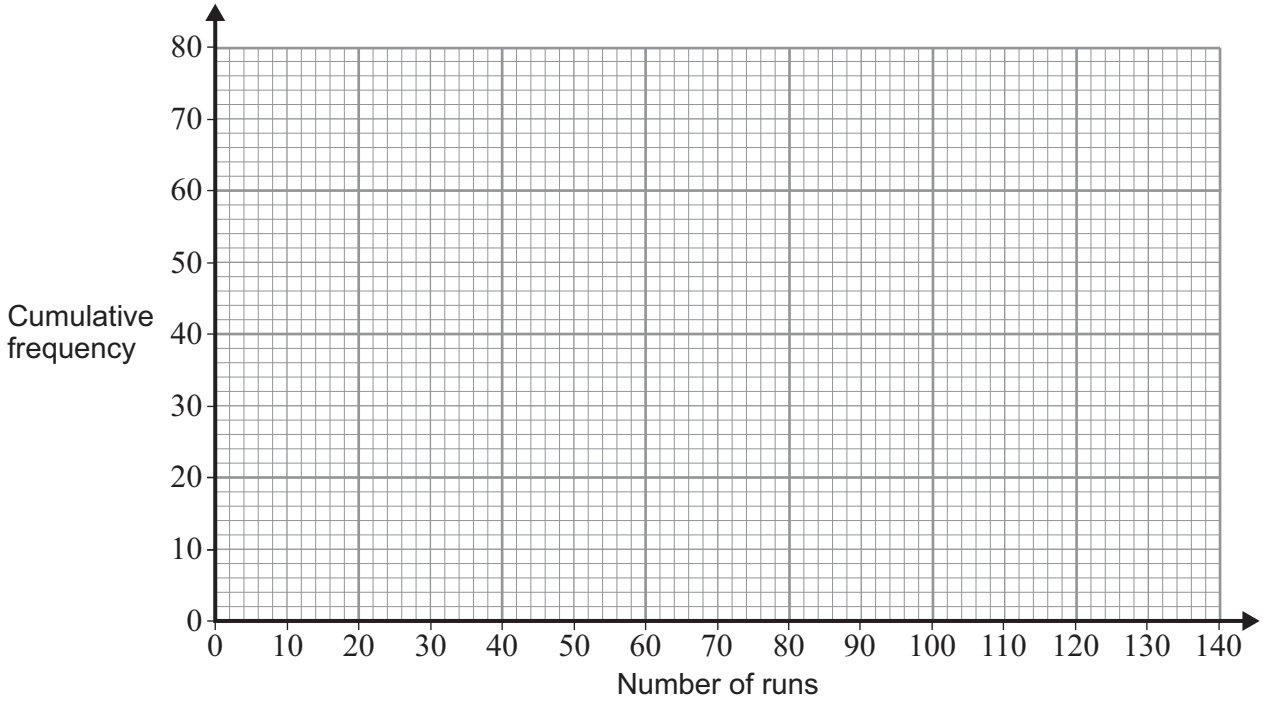
Question 1 continues on the next page

1 (b) Use your cumulative frequency diagram to find:

1 (b) (i) the lower quartile;

[1 mark]

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Answer ....

1 (b) (ii) the median;

[1 mark]

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Answer ....

1 (b) (iii) the upper quartile.

[1 mark]

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Answer ....

1 (c) Alastair Cook also played test match cricket for England between 2006 and June 2013.

The numbers of runs he scored are shown by the box and whisker diagram below.
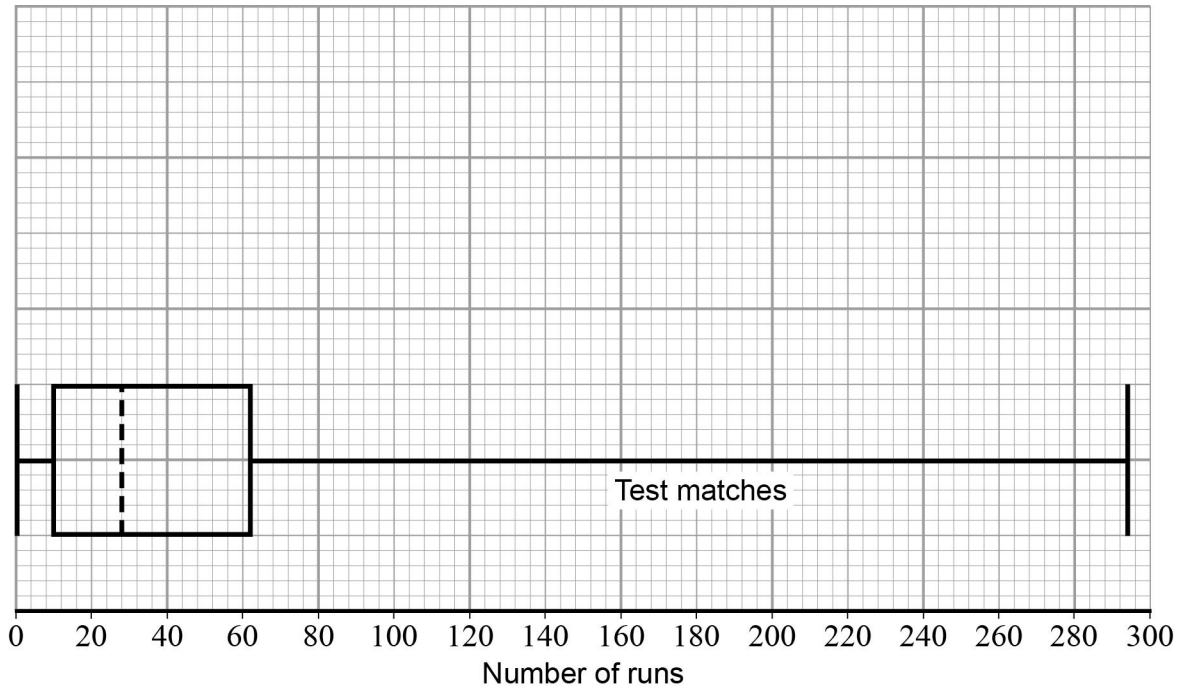
Number of runs

On the grid above, draw another box and whisker diagram to show the data for one-day internationals.

[3 marks]

1 (d) Compare the numbers of runs Alastair Cook scored in test matches and one-day internationals. Use the information in the box and whisker diagrams.
Give two different comments.

[2 marks]

Comment 1

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Comment 2

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Turn over ▶

Section B

Answer **all** questions.

Answer each question in the space provided for that question.

*Use **Reading Ease** on page 2 of the Data Sheet.*

2   You want to compare the reading difficulty level of a book for children to the reading difficulty level of a book for adults.

The book for children is 'Horrid Henry Rules the World' by Francesca Simon.
The book for adults is 'Sense and Sensibility' by Jane Austen.

2 (a)   Write a suitable hypothesis.

[1 mark]

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2 (b)   The mean number of words per sentence for the first 100 sentences of 'Horrid Henry Rules the World' is 7.11 .

The table below shows the number of syllables per word for the first 100 words of 'Horrid Henry Rules the World'.

Number of syllables	Frequency	
1	60	
2	35	
3	4	
4	1	
Total	**100**	

Use the Flesch formula to work out the Reading Ease score for 'Horrid Henry Rules the World'.

[5 marks]

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Answer ....

2 (c) The Reading Ease score for 'Sense and Sensibility' is 57.7.

What is the reading difficulty level for 'Sense and Sensibility'?
Circle your answer.

[1 mark]

Difficult   Fairly difficult   Standard   Fairly easy   Easy

2 (d) Compare the reading difficulty levels of 'Horrid Henry Rules the World' and 'Sense and Sensibility'.

Do your calculations support your hypothesis from part **(a)**?

Give a reason for your answer.

[2 marks]

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Turn over for the next question

Section C

Answer **all** questions.

Answer each question in the space provided for that question.

*Use **Sea creatures** on page 3 of the Data Sheet.*

3 (a) A child from the survey is chosen at random.

What is the probability that the child was **able** to identify a crab?

[1 mark]

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Answer ....

3 (b) A reader of the article told a friend that '29% of British children cannot identify an octopus'.

Why might the reader be wrong?

[1 mark]

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Section D

Answer **all** questions.

Answer each question in the space provided for that question.

Use **BBC spending** *on page 3 of the Data Sheet.*

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	A	**B**	**C**
1	**Channel**	**Amount spent (£ millions)**	**Angle on pie chart (degrees)**
2	BBC 1	1337.6	
3	BBC 2	537.1	
4	BBC 3	112.9	
5	BBC 4	67.8	
6	BBC News	57.5	
7	CBBC	107.4	
8	CBeebies	42.4	
9	Other	72.3	
10	**Total**		

4 (a) Which formula would give the value in cell **B10**?
Circle your answer.

[1 mark]

=MEAN(B2:B9)   =SUM(A9:B9)   =MODE(B2:B9)   =SUM(B2:B9)

4 (b) Complete the spreadsheet to show:

4 (b) (i) the total amount spent in millions of pounds;

4 (b) (ii) the angle on a pie chart that would show the amount spent on each channel.

Give each angle to the nearest whole number of degrees.

[3 marks]

Space for working

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4 (c) Show working to check that the total number of degrees in the pie chart is correct.

[1 mark]

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Turn over for the next question

Section E

Answer **all** questions.

Answer each question in the space provided for that question.

Use **Library closures** *on page 4 of the Data Sheet.*

5 (a) A questionnaire about using libraries could have this question.

"Do you agree that libraries should be closed if not enough people use them?"

Make **one** criticism of the question.

[1 mark]

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5 (b) Write a question to ask how often someone uses a library.
Give a list of responses to choose from.

[2 marks]

Question

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Response

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5 (c) Design a data collection sheet to record the number of people going into a library each hour from 9 am to 4 pm.

[2 marks]

Turn over for the next question

Turn over ▶

Section F

Answer **all** questions.

Answer each question in the space provided for that question.

*Use **Carbon emission** on page 5 of the Data Sheet.*

6 (a)   Assume that the amount of electricity generated per day in the UK is constant at one billion kilowatt hours (1 000 000 000 kwh).

Work out the increase in the carbon emitted per day in the UK from total electricity generation by coal and gas from the beginning of 2010 to the end of 2012.

Give your answer in tonnes.

[5 marks]

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Answer ....

6 (b) In the newspaper the ratio of the **areas** of the circles was equal to the ratio of the number of grams of carbon emitted per kilowatt hour.

The radius of the circle for gas was 16 mm.

Work out the radius of the circle for coal.

[3 marks]

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Answer .... mm

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Turn over for the next question

Section G

Answer **all** questions.

Answer each question in the space provided for that question.

*Use **Exam results** on page 6 of the Data Sheet.*
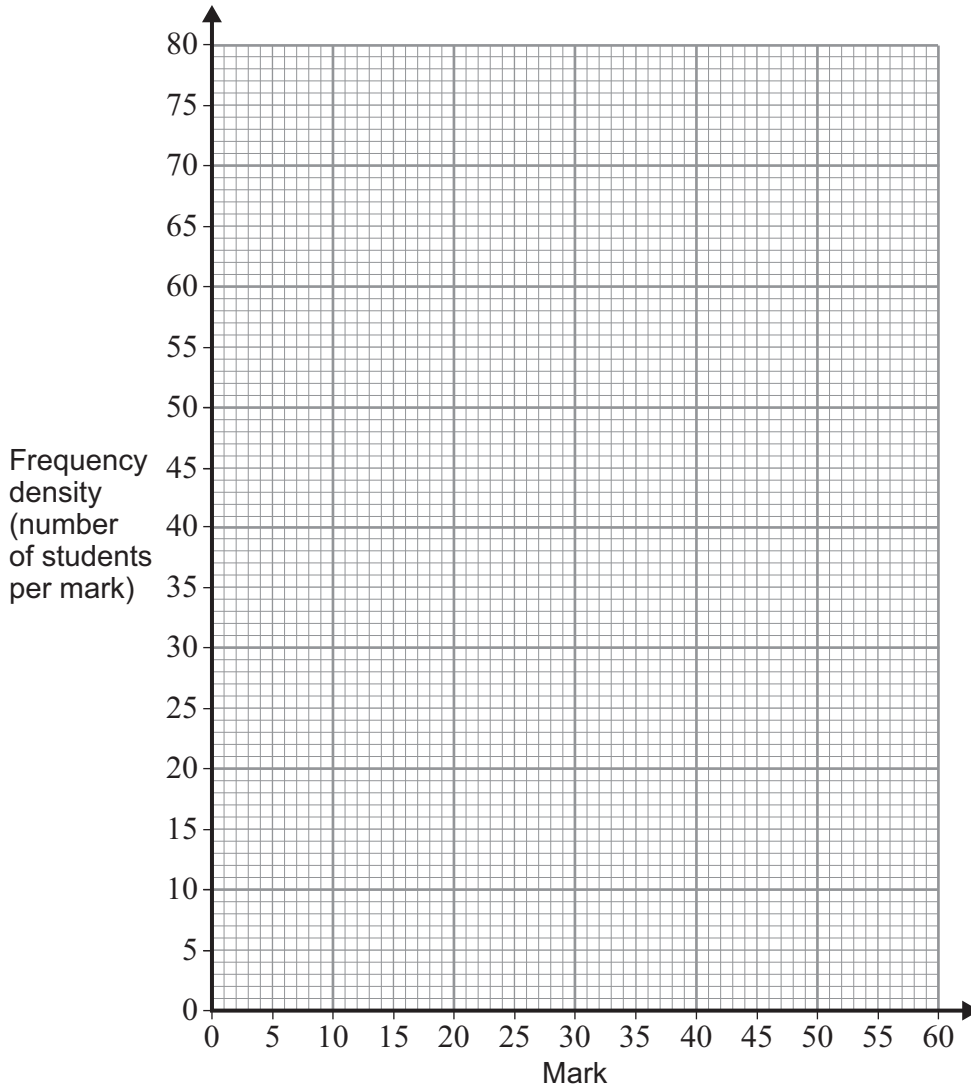
7   The data are reproduced below.

You may use the spare columns for any calculation required.

Mark, m	Number of students		
$0 \leqslant m \leqslant 10$	206		
$10 < m \leqslant 20$	463		
$20 < m \leqslant 30$	645		
$30 < m \leqslant 35$	379		
$35 < m \leqslant 40$	370		
$40 < m \leqslant 50$	603		
$50 < m \leqslant 60$	224		

7 (a)   Draw a histogram on the axes below to show the data.

[5 marks]

Frequency density (number of students per mark)

Mark

7 (b)   The pass mark for the exam was 34.

One of the 2890 students is chosen at random.
Use the data to estimate the probability that the student passed the exam.

[3 marks]

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Answer ....

Turn over ▶

8

Section H

Answer **all** questions.

Answer each question in the space provided for that question.

*Use **Global warming** on page 7 of the Data Sheet.*

8 (a) If 'Sea ice extent' and 'Land surface air temperature' were plotted as a scatter graph, what correlation would there be?

Circle your answer.

[1 mark]

Positive   Negative   None   Cannot tell

8 (b) What is misleading about presenting these three graphs together as shown on the Data Sheet?

[1 mark]

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END OF QUESTIONS

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