AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE
STATISTICS

F

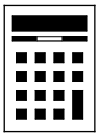
Foundation tier Paper 1

Time allowed: 1 hour 45 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- 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 or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross out any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
TOTAL	

Answer **all** questions in the spaces provided.

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1 An event is more likely to happen than not.

Circle a possible probability of the event happening.

[1 mark]

0 $\frac{2}{7}$ 60% 1.4

1

2 Which of these is qualitative data about a horse?

Circle your answer.

[1 mark]

The length of the horse's face | The age of the horse

The mass of the horse | The colour of the horse

1

3 Circle the value that indicates a strong correlation.

[1 mark]

1.2 – 0.86 0.51 0

1

4 A bank asks a representative sample of 50 customers about internet banking.

40 of these customers feel internet banking is secure.

Based on this sample, estimate the proportion of the **population** who feel that internet banking is secure.

Circle your answer.

[1 mark]

0.8 0.2 0.6 0.4

1

Do not write outside the box

5 Jack is wondering whether he gets value for money from his subscription to a sports channel.

He records the number of live football matches he watches for each of the **40** weeks in the season.

Some of his results are shown in the table.

Number of matches watched in a week		Frequency
0	|||	3
1	𝍸 |||	
2	𝍸 𝍸 𝍸 |||	18
3		7
4	||||	4

5 (a) Complete the table by filling in the **three** empty cells correctly.

[3 marks]

5 (b) Jack chooses one of the 40 weeks at random.

5 (b) (i) What is the probability he chooses a week in which he watched **five** matches?

[1 mark]

Answer _____

5 (b) (ii) What is the probability he chooses a week in which he watched exactly **two** matches?

[2 marks]

_____

_____

Answer _____

5 (b) (iii) What is the probability he chooses a week in which he watched at least **three** matches?

[1 mark]

_____

_____

Answer _____

7

Turn over ►

Do not write outside the box

6 Ronnie and Lewis are looking for new cushions for their living room.

They record the colour of each cushion they like.

The pictogram shows some of this information.

Red	○
Brown	○ ○ ○
White	○ ○ ○ ○ ◔
Multi-coloured	

Key: ○ represents 4 cushions

6 (a) How many **more** brown cushions than red cushions do they like?

[2 marks]

Answer _____

6 (b) They liked 10 different **multi-coloured** cushions.

Complete the pictogram to show this information.

[2 marks]

6 (c) Assume that they decide to buy one of the cushions represented in the pictogram.

6 (c) (i) What is the probability that they buy a **white** cushion?

[3 marks]

Answer _____

Do not write outside the box

6 (c) (ii) What **other** assumption did you have to make to answer **part (c)(i)**?

[1 mark]

8

Turn over for the next question

Do not write outside the box

7 (a) As part of a school project Hakeeb asks 10 of his friends to write down how many **hours** they slept last Sunday night.

These are the 10 values given by his friends.

6 8 6 480 7 9 7 8.5 8 6

7 (a) (i) Identify the value which appears to be incorrect.

[1 mark]

Answer _____

7 (a) (ii) Suggest, in context, what might have happened and write down the correct value.

[2 marks]

What might have happened _____

_____

_____

Correct value _____

7 (b) Here is part of a statement seen in a text book.

'Raw data sometimes need to be 'cleaned' so that...'

7 (b) (i) What are raw data?

[1 mark]

_____

_____

_____

Do not write outside the box

7 (b) (ii) What does 'cleaned' mean in this statement?

[1 mark]

7 (b) (iii) Complete the sentence from the book to give a reason **why** cleaning may take place.

[1 mark]

'Raw data sometimes need to be 'cleaned' so that…' _____

_____

_____

6

Turn over for the next question

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8 Rachel has a social media account and tracks the number of new followers she gets each day.

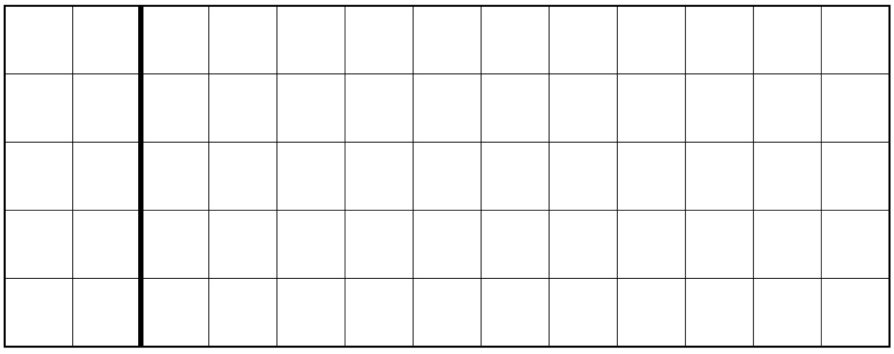
The table shows the data for the last three weeks.

Week 1	New followers	Week 2	New followers	Week 3	New followers
Monday	14	Monday	13	Monday	16
Tuesday	16	Tuesday	20	Tuesday	21
Wednesday	12	Wednesday	16	Wednesday	17
Thursday	11	Thursday	13	Thursday	15
Friday	21	Friday	24	Friday	56
Saturday	34	Saturday	38	Saturday	55
Sunday	40	Sunday	42	Sunday	40

8 (a) Show the data in an ordered stem-and-leaf diagram.

[4 marks]

Key: _____|_____ represents _____ new followers



You may use the blank space below to sort the data.

Do not write outside the box

8 (b) Using the stem-and-leaf diagram, show that the median number of new followers she received during this three-week period is 20.

[1 mark]

8 (c) Rachel makes this statement about **weekends**.

'The mean number of new followers at weekends is more than 20.'

Explain, **without calculation**, why Rachel is correct.

[1 mark]

8 (d) Rachel makes this statement about **weekdays**.

'The mean number of new followers on weekdays is less than 20.'

Decide whether Rachel's second statement is true.

Tick (✓) a box about the statement.

True ☐ False ☐ Cannot tell ☐

You **must** show your calculations.

[3 marks]

9

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9 Dr Cho runs a clinic where each appointment is meant to be 5 minutes.

She thinks that some doctors at the clinic are spending much longer than 5 minutes with a patient.

9 (a) The table shows information about actual lengths, in minutes, of appointments for one day.

Length, t (mins)	**Frequency**		
$0 < t \leqslant 2$	8		
$2 < t \leqslant 4$	44		
$4 < t \leqslant 6$	43		
$6 < t \leqslant 8$	11		
$8 < t \leqslant 10$	10		

Dr Cho says,

"The data show that the mean length of an appointment is longer than 5 minutes."

Calculate an estimate of the mean length of appointment to decide if she is correct.

[5 marks]

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9 (b) Dr Cho wants to investigate any relationship that might exist between the length of an appointment and the age of the patient.

She collects data from a random sample of 20 patients.

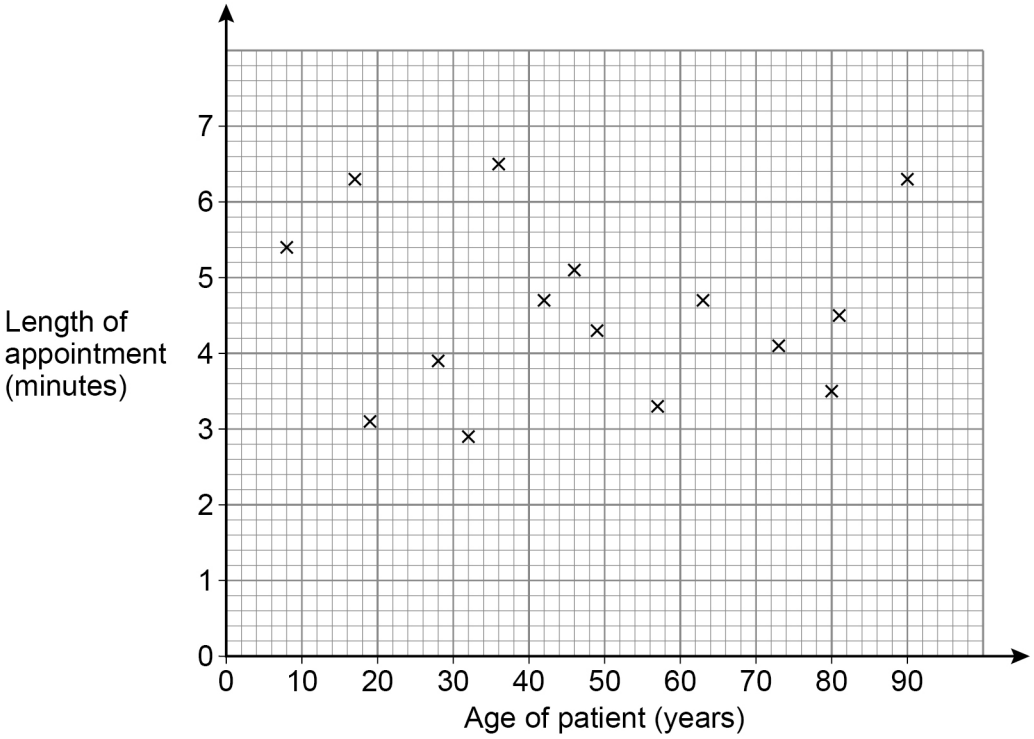
The scatter diagram shows 15 of the results.

The table shows the remaining 5 results.

Age of patient (years)	12	26	40	55	76
Length of appointment (minutes)	3.1	2.4	4.5	2.5	5.8

9 (b) (i) Use the data in the table to complete the scatter diagram.

[2 marks]



9 (b) (ii) Dr Cho says she can predict the length of an appointment if she knows the age of a patient.

Comment on her statement.

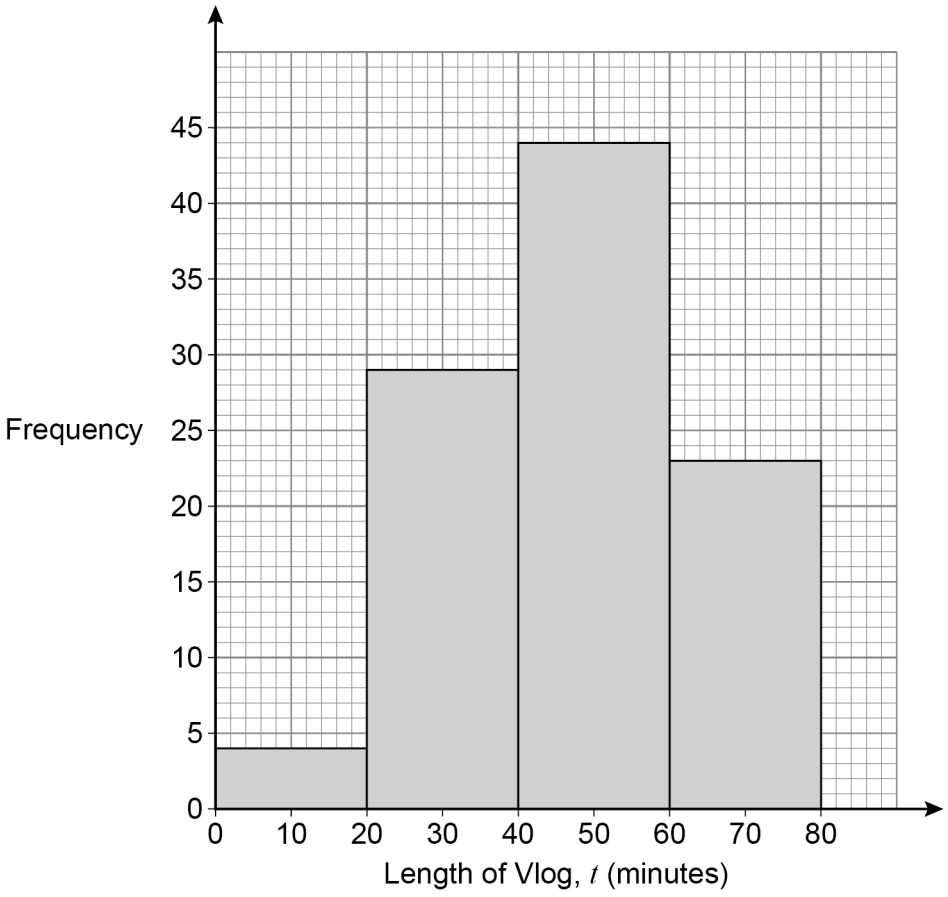
[1 mark]

8

Turn over ►

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10 The equal-width histogram shows information about the length of 100 Vlogs (video blogs) about **gaming**.



10 (a) What is the length of the longest of these 100 Vlogs?

Circle your answer.

[1 mark]

44 minutes 79 minutes 80 minutes Cannot tell

10 (b) Complete the grouped frequency table for these 100 gaming Vlogs.

[2 marks]

Length of Vlog, *t* (minutes)	**Frequency**
$0 < t \leqslant 20$	4
$20 < t \leqslant 40$	
	44

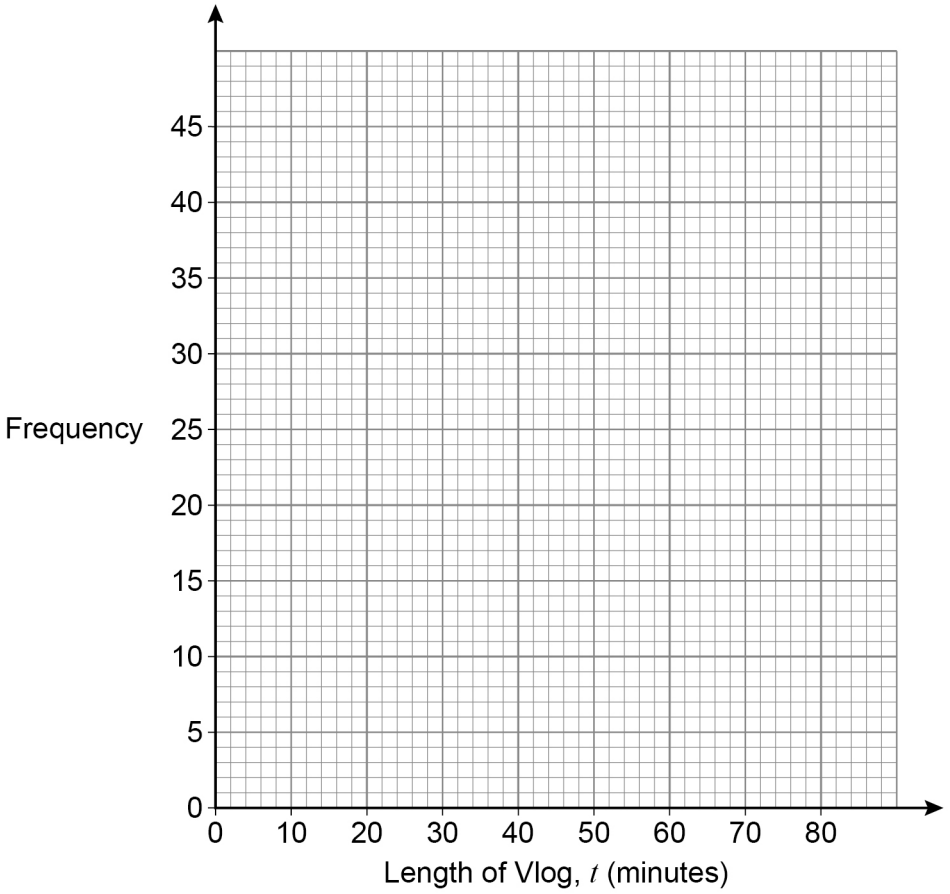
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10 (c) This table shows information about the length of 100 Vlogs about **fashion**.

Length of Vlog, t (minutes)	Frequency
$0 < t \leqslant 20$	38
$20 < t \leqslant 40$	45
$40 < t \leqslant 60$	17
$60 < t \leqslant 80$	0

On the graph paper below, draw an equal-width histogram for the fashion Vlogs.

[2 marks]



10 (d) Make **two** comparisons of the length of gaming Vlogs with the length of fashion Vlogs.

[2 marks]

Comparison 1 _____

_____

_____

Comparison 2 _____

_____

_____

7

Turn over ►

Do not write outside the box

11 Lauren plays online games with 6 friends.

She likes to pick at random which friend she invites to join the game first.

Explain how Lauren could use a single dice to pick one of these friends at random.

[3 marks]

3

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12 Here is a table showing the cumulative frequencies for the length of 140 sales calls (in minutes) made by Kelly last week.

Length of call t (in minutes)	Cumulative frequency
$t \leqslant 2$	30
$t \leqslant 4$	80
$t \leqslant 6$	92
$t \leqslant 8$	116
$t \leqslant 10$	124
$t \leqslant 12$	136
$t \leqslant 14$	140

Length of call t (in minutes)	Frequency
$0 < t \leqslant 2$	
$2 < t \leqslant 4$	
$4 < t \leqslant 6$	
$6 < t \leqslant 8$	
$8 < t \leqslant 10$	
$10 < t \leqslant 12$	
$12 < t \leqslant 14$	

12 (a) How many calls were 10 minutes or shorter?

[1 mark]

Answer _____

12 (b) How many calls were **more** than 12 minutes?

[2 marks]

_____

_____

Answer _____

12 (c) Which two-minute interval is the modal class?

Justify your answer with calculations.

It may help to complete the extra column in the table at the top of this page.

[3 marks]

Modal class _____ minutes

_____

_____

_____

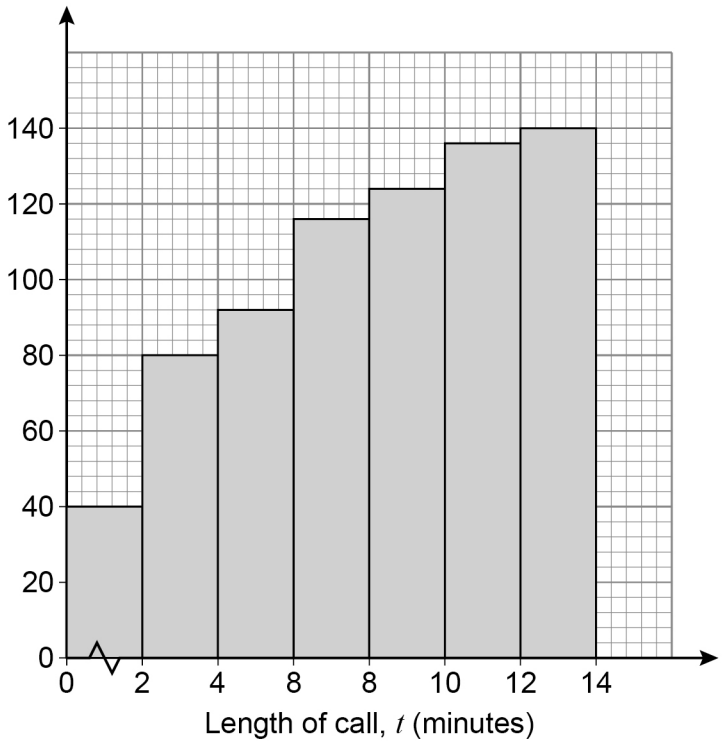
Question 12 continues on the next page

Turn over ►

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12 (d) Kelly tries to draw a cumulative frequency graph for her call data.

This graph has several errors.



Identify **three** of the errors in the graph.

[3 marks]

Error 1 _____

_____

_____

Error 2 _____

_____

_____

Error 3 _____

_____

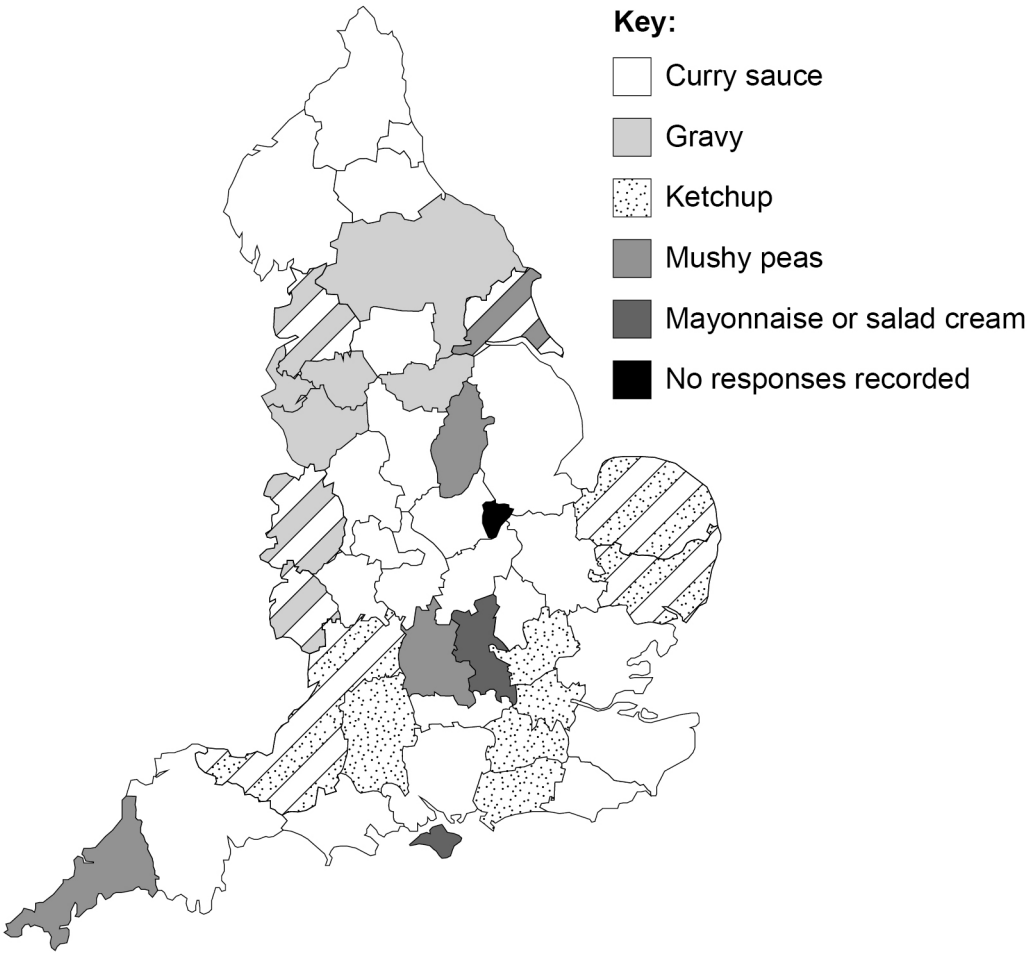
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9

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13 A sample of 670 adults in England were asked what side order they preferred at fish and chip shops.

A striped area indicates two equally popular side orders.



13 (a) Based on area of land, which is the most popular side order?

[1 mark]

Answer _____

13 (b) Give **two** reasons why your answer to **part (a)** might not be the side order that **most** people eating fish and chips in England prefer.

[2 marks]

1 _____

_____

2 _____

_____

3

Turn over ►

Do not write outside the box

14 Tom is doing a statistical study into the amount of homework received by Year 7 and Year 11 students in his school.

14 (a) Write down a hypothesis Tom could use.

[1 mark]

14 (b) State the population of his study.

[1 mark]

14 (c) Tom wants a sample of Year 7 students and a sample of Year 11 students to complete a questionnaire for him.

He considers these three sampling methods for Year 7 students.

Method A

Number all the students in Year 7.
Obtain 30 random numbers.
Ask the students whose random numbers come up to complete the questionnaire.

Method B

Wait outside the dinner hall.
Ask the first 30 Year 7 students he sees to complete the questionnaire.

Method C

Choose three Year 7 students from each of the 10 maths sets.
Ask these students to complete his questionnaire.

Name and compare the merits of each sampling method.
Make a reasoned choice of which method Tom should use.

[7 marks]

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Question 14 continues on the next page

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14 (d) One of Tom's questions is,

'How much homework do you receive?'

Write down **two** problems with this question.

[2 marks]

Problem 1 _____

_____

Problem 2 _____

_____

14 (e) Tom improves his questionnaire and collects his data.

He finds that:

- on average Year 7 have five hours of homework per week
- on average Year 11 have eight hours of homework per week.

Write a possible conclusion for Tom.

[1 mark]

_____

_____

Question 14 continues on pages 22 and 23

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Question 14 continues on the next page

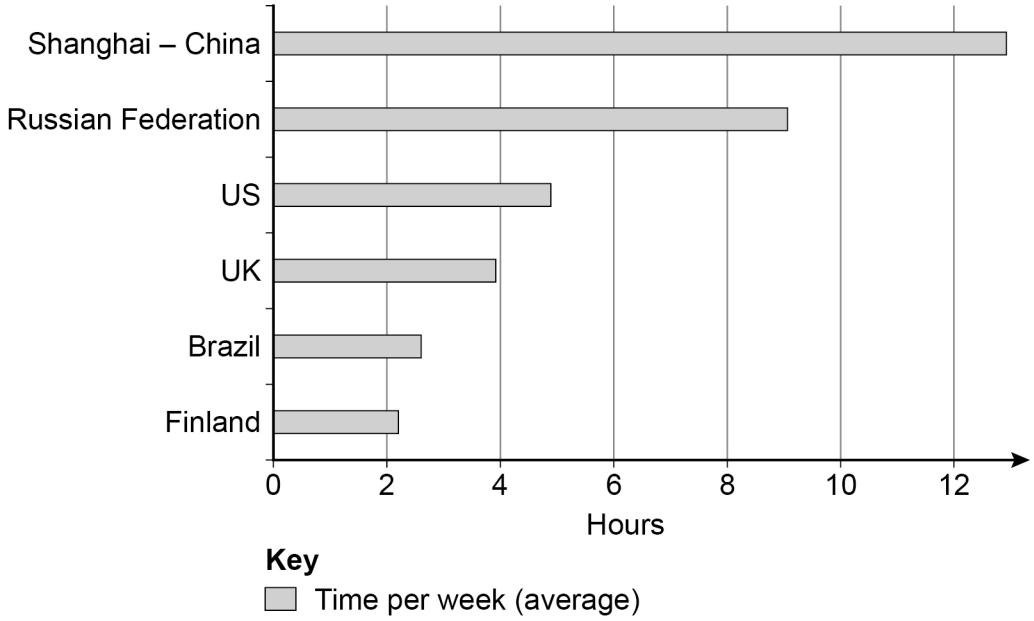
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14 (f) Tom wonders how this compares with other schools in the UK and schools in other countries.

He finds this chart on the internet but it has no source.

How much time do 15-year-olds spend on homework?



Use the chart to compare Tom's Year 11 results of an average of 8 hours homework per week with those for other schools in the UK and with other countries.

[2 marks]

Tom's school and other UK schools _____

_____

_____

Tom's school and schools in other countries _____

_____

_____

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14 (g) Why are Tom's data and the internet data not completely comparable?

[1 mark]

14 (h) Is Tom's data or the internet data more reliable?

Give a reason for your answer.

[1 mark]

16

END OF QUESTIONS

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