AQA

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

Level 3 Certificate
MATHEMATICAL STUDIES

Paper 1

Wednesday 18 May 2016 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a clean copy of the Preliminary Material and formulae sheet (enclosed)
- a scientific calculator or a graphics calculator
- a ruler.

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 questions in the space provided. Do not write outside the box around each page or on blank pages.
- Show all necessary working; otherwise, marks for method may be lost.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- The **final** answer to questions should be given to an appropriate degree of accuracy.
- You may **not** refer to the copy of the Preliminary Material 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 60.
- You may ask for more answer or graph paper, which must be tagged securely to this answer booklet.
- The paper reference for this paper is 1350/1.

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

1 A maths exam has two papers.

This table shows the percentage marks for 19 students for Paper 2 of the exam.

Student	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Paper 2 mark	65	80	65	84	70	82	71	75	51	70

Student	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**
Paper 2 mark	50	81	90	57	76	99	67	81	92

1 (a) Circle the words that describe this type of data.

[2 marks]

discrete qualitative continuous quantitative

1 (b) The table below shows information about the percentage marks for the same 19 students on Paper 1

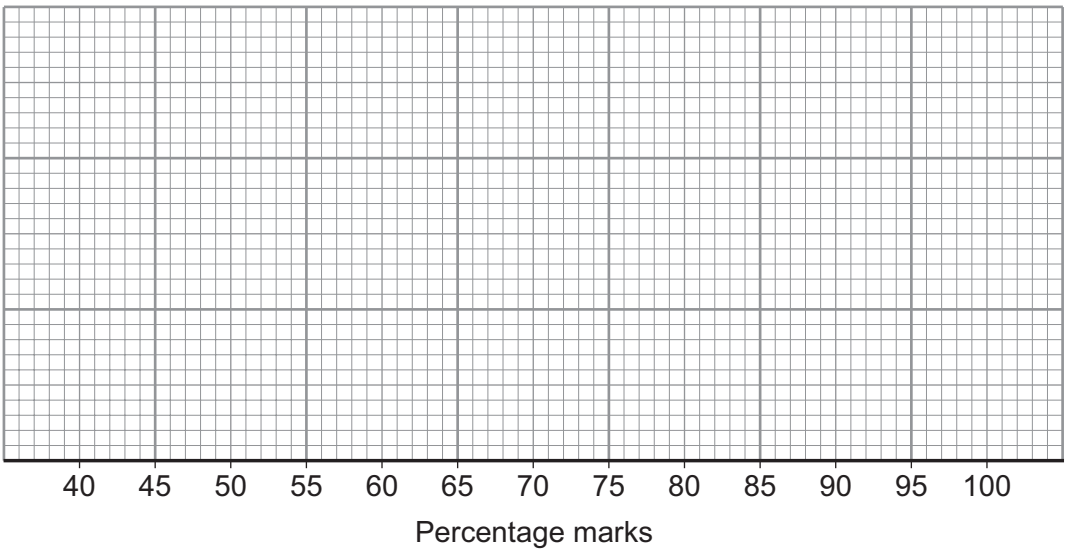
	Lowest value	**Lower quartile**	**Median**	**Upper quartile**	**Highest value**
Paper 1	45	70	73	83	90
Paper 2					

[4 marks]

Complete this table to show the information for Paper 2

1 (c) Draw box plots to represent the data for Paper 1 and Paper 2

[3 marks]



1 (d) Compare the performance of the students on the two papers.

[3 marks]

12

2 In an enterprise project Anish buys sweatshirts for £22.50 each.

He has to decide what price, P, he wants to put on each sweatshirt.

If he doesn't sell them all, he will reduce this price, P, by 10%

He still wants to make 20% profit on the cost of each reduced-price sweatshirt.

What should the price, P, be for each sweatshirt?

[3 marks]

Answer £ _____

3

3 (a) A Healthy Living campaign encourages everyone to eat more fruit and vegetables.

Estimate the amount of fruit and vegetables an average person eats in a year.
State any assumptions you make.
You **must** show working to justify your answer.

[4 marks]

Answer _____

3 (b) Give one way you could improve the accuracy of your estimate.

[1 mark]

5

4 There are 85 girls and 65 boys in Year 12 of a school.

A sample of students is to be taken.

4 (a) The headteacher decides to choose a sample stratified by gender.

Is this a suitable sampling method to use?
Give reasons for your answer.

[2 marks]

4 (b) There will be 34 girls in the sample.

Describe how random numbers could be used to select a sample of the 34 girls.

[3 marks]

4 (c) For a different sample, the headteacher decides to choose all the girls in the two tutor groups closest to her office.

What type of sampling method is this?

[1 mark]

Answer _____

6

5 Ben has booked a holiday and paid the deposit.
He has to pay the balance of £2173 in seven months' time.

Ben's net pay is £838 per month.

He pays

12% of this pay into a private pension

£250 to his parents towards living costs.

He decides to save $\frac{2}{3}$ of his remaining money to pay for the holiday.

Will Ben have saved enough to pay the balance in seven months' time?
You **must** show your working.

[4 marks]

4

6 Use **Income Tax and National Insurance 2015–2016** on pages 2 and 3 of the Preliminary Material.

Beth has an annual salary of £39 500 in her current job.
Her monthly net pay is £2495.64

She wants to apply for a new job, which has an annual salary of £43 500
She will have to pay an extra £150 per month in travel costs to get to the new job.

Beth's personal tax allowance is £10 600

She says,

"The increase in my net pay will be more than the increase in travel costs."

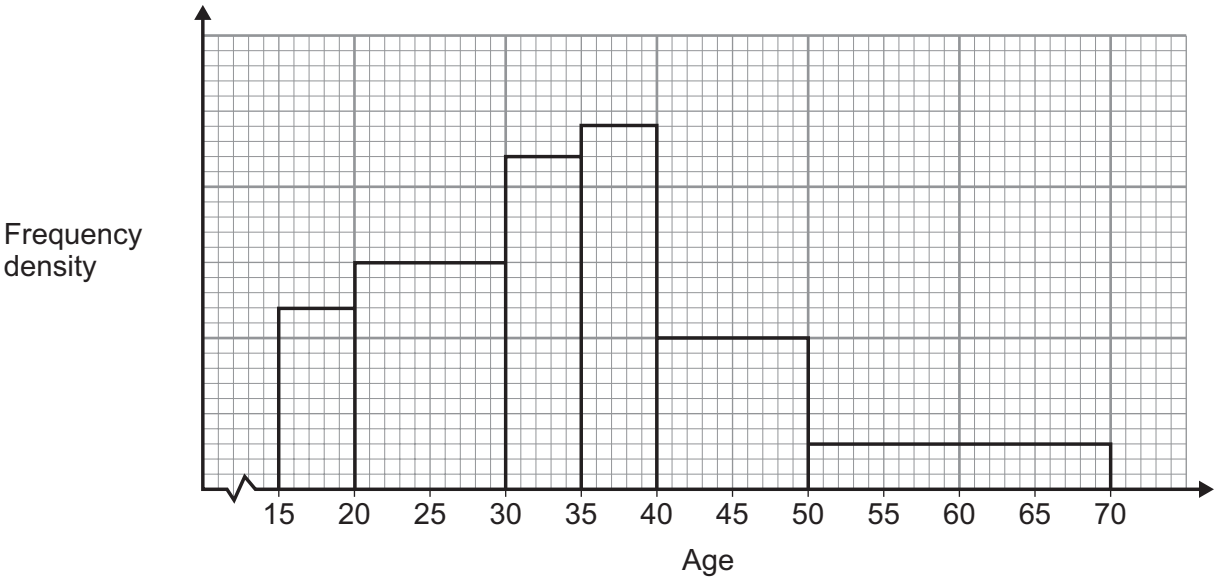
Is Beth correct?
You **must** show your working.

[9 marks]

9

7 The histogram shows the distribution of the ages of members of a gym.

The members are all aged 15 or over but less than 70



There are 600 gym members in total.
The bar between 20 and 30 represents the 150 members aged 20 or over but less than 30

The table shows the monthly membership fees for different age groups.

Age	Monthly fee
Less than 21	£9
21 to 64	£12
65 and over	£9

Estimate the total amount of membership fees paid per month.

[4 marks]

Answer £_____

4

8 Use **Student Loans** on page 4 of the Preliminary Material.

In September 2014 Urmila started a one-year postgraduate course at university.
She had to pay total fees of £9300

The university awarded her a grant of £6200 towards the fees.
The rest of the money was loaned to her by the Student Loans Company (SLC).

In September 2015 the SLC added 5.5% interest to the money they loaned her.
At the same time, Urmila started a job on an annual salary of £56 700
She now has to start repaying her loan by making monthly payments to the SLC.

The SLC takes payments from her salary each month for 10 months.
Urmila then decides she wants to pay off the rest of her loan as one final payment.

How much should this final payment be?
You may assume that no more interest is added to the outstanding loan.

[7 marks]

Answer £_____

7

9 Use **Water** on page 5 of the Preliminary Material.

A new housing estate is being planned.

There will be a total of 350 new homes on the estate.

240 homes will be 3 or 4 bedroom family homes.

80 homes will be 1 or 2 bedroom apartments.

30 homes will be retirement flats for one person.

The local water company wants to check if they have sufficient capacity to supply this new housing estate.

Estimate the number of litres of water **per day** needed for the new housing estate.
State any assumptions you make.
You **must** show your working.

[10 marks]

Answer _____ litres

10

END OF QUESTIONS

Do not write outside the box

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ANSWER IN THE SPACES PROVIDED