



Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

Level 3 Certificate MATHEMATICAL STUDIES

Paper 1

Wednesday 17 May 2023

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 each question in the space 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).
- Show all necessary working; otherwise marks for method may be lost.
- Do all rough work in this book. Cross through any work 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 paper or graph paper, which must be tagged securely to this answer booklet.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
TOTAL	



J U N 2 3 1 3 5 0 1 0 1

G/LM/Jun23/E5

1350/1

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

- 1** Rafiq and Ellen are doing surveys about favourite school lessons. They each want to take a sample of 75 students from their school. The table shows the number of students in each year group.

Year 7	Year 8	Year 9	Year 10	Year 11
216	203	163	174	144

- 1 (a)** To get his sample of 75, Rafiq asks 15 students from each of the five year groups.

What is the name of this sampling method?

[1 mark]

Answer _____

- 1 (b)** Give **one** advantage and **one** disadvantage of Rafiq's sampling method.

[2 marks]

Advantage _____

Disadvantage _____



- 1 (c)** Ellen decides that the number in her sample from each year group should be in proportion to the total number of students in that group.

What is the name of this sampling method?

[1 mark]

Answer _____

- 1 (d)** There are 900 students in the school.

How many **more** Year 7 students than Year 11 students should Ellen have in her sample?

[2 marks]

Answer _____

6

Turn over for the next question

Turn over ►



2 (b) During the holiday, Sally bought a handbag for 190 Canadian dollars.
She paid with her bank debit card.

The bank

added a fee of 2.5% of the cost of the handbag

used an exchange rate of £1 = 1.75 Canadian dollars.

Work out the **total** amount, in pounds, that Sally had to pay.

[3 marks]

Answer £ _____

7

Turn over for the next question

Turn over ►



3 Mr Berry wants his class to study some data on swimming times.

He collects data from the Internet about two swimming strokes, backstroke and breaststroke.

The table shows the fastest 19 times, in seconds, for the men's 100m Backstroke at a major championship.

Swimmer	A	B	C	D	E	F	G	H	I	J
Time (s)	51.85	51.94	52.38	52.54	52.91	52.98	53.17	53.45	53.60	53.86

Swimmer	K	L	M	N	O	P	Q	R	S
Time (s)	53.93	54.51	54.91	54.95	55.00	55.16	55.17	55.19	55.38

3 (a) Which **two** words describe the type of data he has collected?

Circle your answers.

[1 mark]

qualitative

primary

quantitative

secondary

3 (b) The table below shows information about the fastest 19 times for the men's 100m Breaststroke in the same championship.

	Lowest value	Lower quartile	Median	Upper quartile	Highest value
Breaststroke	49.45	50.12	51.76	52.32	53.44
Backstroke	51.85				55.38

Complete this table to show the information for the backstroke.

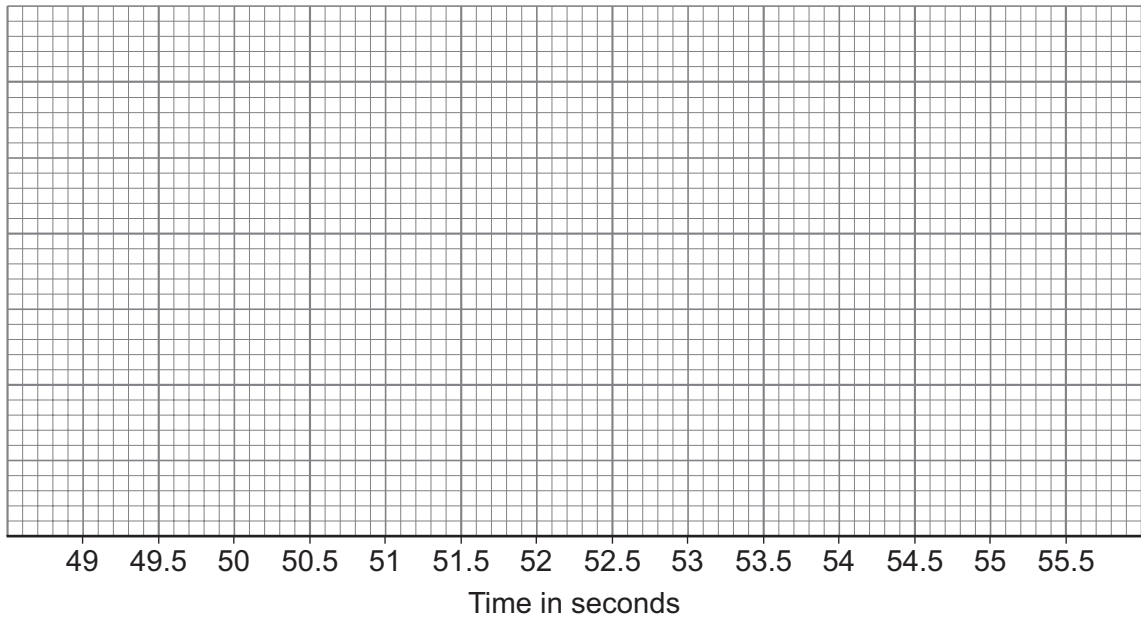
The lowest and highest values have been completed for you.

[3 marks]



3 (c) Draw box and whisker plots to represent the data for the backstroke and breaststroke times.

[3 marks]



3 (d) Make two comparisons of the distribution of times for the swimming strokes.

You should make **one** comparison based on the averages and **one** comparison based on the spreads.

[2 marks]

Averages _____

Spreads _____

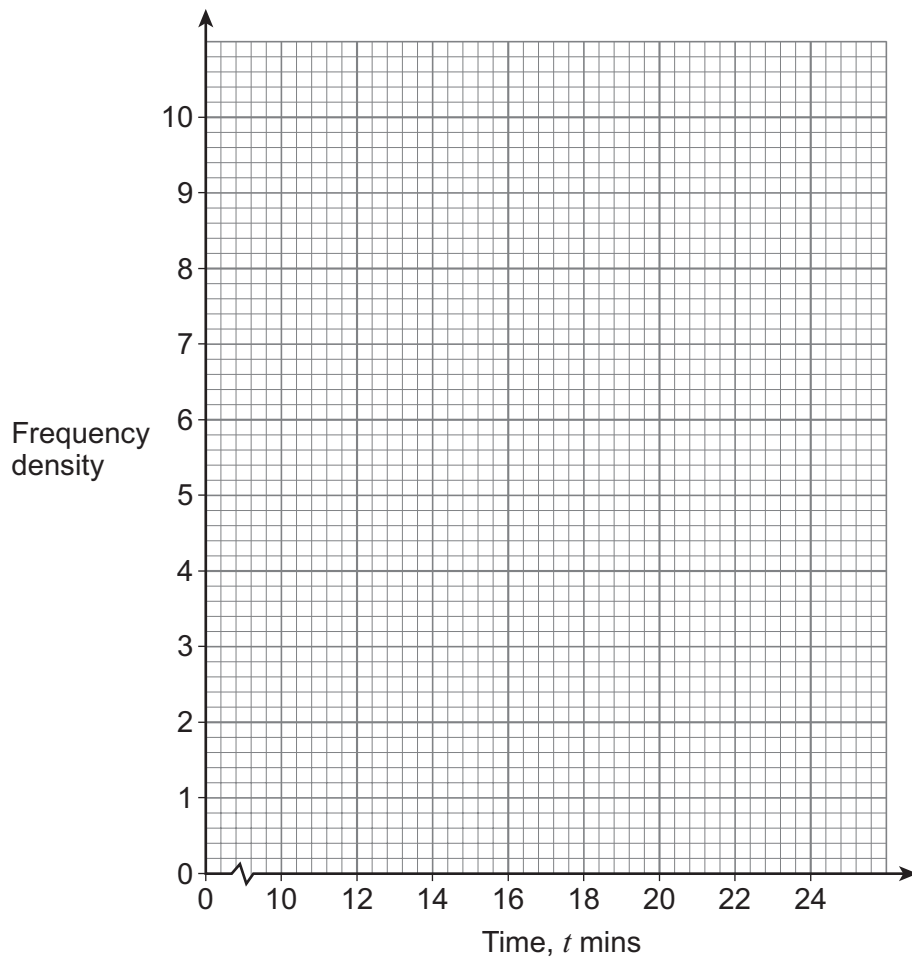


- 7 The members of a running club are divided into two teams for a race. The table shows information about the times taken to complete the race by the 40 members of Team A.

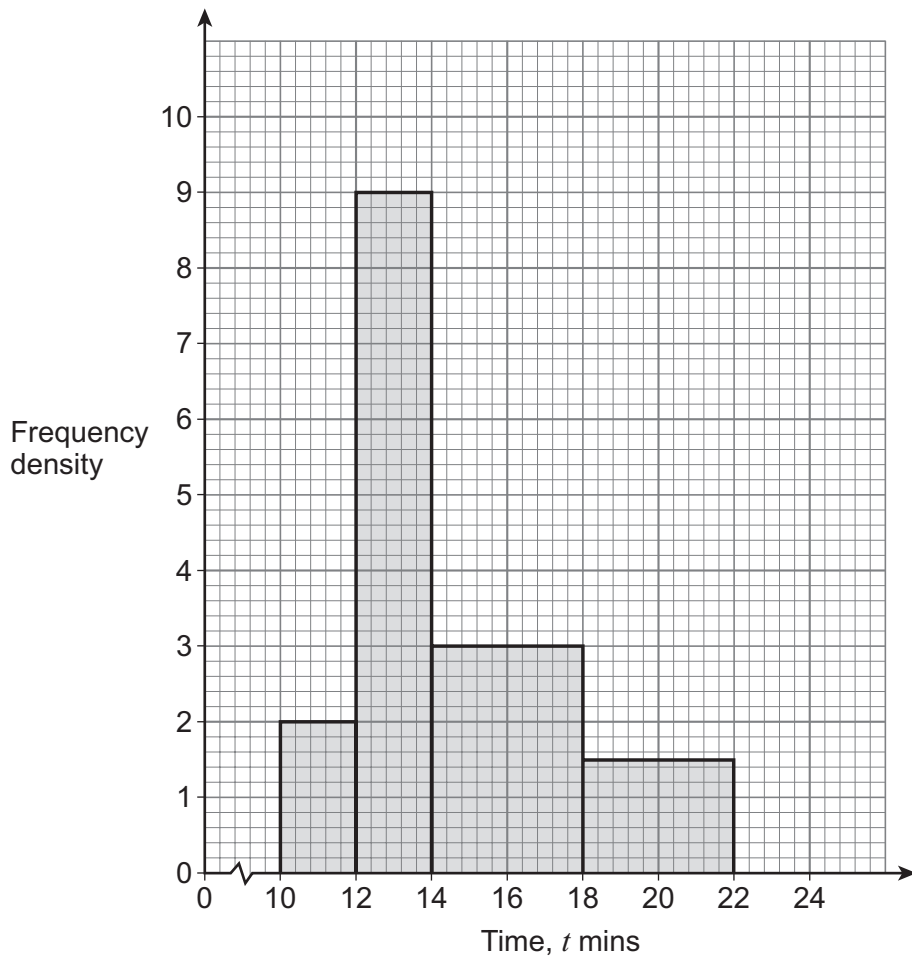
Time, t mins	Frequency
$10 \leq t < 12$	8
$12 \leq t < 14$	17
$14 \leq t < 20$	12
$20 \leq t < 24$	3

- 7 (a) Draw a histogram to represent the data for Team A.

[3 marks]



7 (b) This histogram shows information about the times for the 40 members of Team B.



The runners from each team who completed the race in 15 minutes or less qualified for a competition.

Use the graph and data to estimate which team had more members who qualified.

You **must** show your working.

[5 marks]

Answer _____

8

Turn over ►



9 Arzoo wants to borrow money to buy a new car.

Two companies offer loans.

Company A nominal interest rate of 9% with the interest calculated annually.

Company B nominal interest rate of 8.75% with the interest calculated monthly.

Which company offers the best Annual Equivalent Rate (AER)?

Use the Formula Sheet.

You **must** show your working.

[4 marks]

Answer _____

4

END OF QUESTIONS



There are no questions printed on this page

*Do not write
outside the
box*

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**



