

Practice paper 2

Time allowed: 1 hour 30 minutes

- Answer all the questions
- Unless otherwise stated in the question, all numerical answers must be given exactly or correct to three significant figures.

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. In particular, solutions found from a graphic display calculator should be supported by suitable working,

e.g. if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written working. You are therefore advised to show all working.

SECTION A

- 1** It is thought that the weight of a mango is related to its length. The length (x) in cm and the weight (y) in grams are shown in the table below.

Length x (cm)	14	21	10	22	15	17	12	25	22	18
Weight y (g)	70	95	58	112	77	92	63	130	121	100

- Write down the correlation coefficient, r .
- Comment on your value for r .
- Write down the equation of the regression line of y on x .
- Use your regression line to calculate the weight of a mango of length 20 cm.

[1 mark]

[2 marks]

[1 mark]

[2 marks]

[illegible]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

- 2** Consider the arithmetic sequence 5, 9, 13, ..., 329

[3 marks]

c Find the sum of the sequence.

[illegible]

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- [4 marks]

[illegible]

This image shows a full page of a document template. It consists of approximately 30 horizontal dotted lines spaced evenly down the page, providing a guide for handwriting or typing. The background is plain white, and there are no margins, headers, or footers visible.

- 4** The following table shows the number of computers that a class has owned. The mean was 4 computers.

Computers	1	2	3	4	5	6
Frequency	2	1	4	9	x	3

- Show that the value of x is 9.
- Write down the standard deviation.

[2 marks]

[1 mark]

A different school had a mean of 3.6 computers and a standard deviation of 1.2 computers. An old teacher gives every student a new computer.

- c** What will be the new mean?
- d** What effect will this have on the standard deviation?

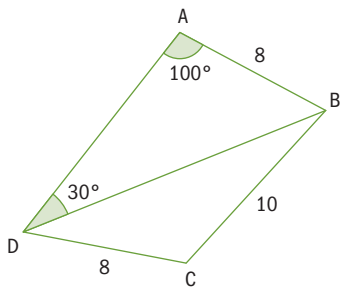
[1 mark]

[1 mark]

[illegible]

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5 The diagram below shows quadrilateral ABCD.



- Find BD.
- Find angle BCD.
- Find the area of triangle BCD.

[2 marks]

[3 marks]

[2 marks]

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[illegible]

- 6** The acceleration, $a \text{ ms}^{-2}$, of a particle at time t seconds is given by

$$a = \frac{1}{t} + 3\sin 2t, \text{ for } t \geq 1.$$

The particle is at rest when $t = 1$.

Find the velocity of the particle when $t = 5$.

[6 marks]

[illegible]

[illegible]

- [4 marks]*

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-

- [illegible]

Handwriting practice lines consisting of 40 horizontal dotted lines.

- [2 marks]

[5 marks]

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[illegible]

10 In a large school, the heights of all fourteen-year-old students are measured.

The heights of the girls are normally distributed with mean 155 cm and standard deviation 10 cm.

The heights of the boys are normally distributed with mean 160 cm and standard deviation 12 cm.

- Find the probability that a girl is taller than 170 cm.
- Given that 10% of the girls are shorter than x cm, find x .
- Given that 90% of the boys have heights between q cm and r cm where q and r are symmetrical about 160 cm, and $q < r$, find the value of q and of r .

[3 marks]

[3 marks]

[4 marks]

In the group of fourteen-year-old students, 60% are girls and 40% are boys.

The probability that a girl is taller than 170 cm was found in part (a).

The probability that a boy is taller than 170 cm is 0.202.

A fourteen-year-old student is selected at random.

- d Calculate the probability that the student is taller than 170 cm.
- e Given that the student is taller than 170 cm, what is the probability the student is a girl?

[4 marks]

[3 marks]

This image shows a full page of a document template designed for handwritten notes or essays. It features approximately 30 evenly spaced, thin grey horizontal lines across the entire width of the page. The margins are consistent on all sides, providing ample space for writing. There are no pre-printed questions, headings, or other markings on the page.

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