

Surname	Centre Number	Candidate Number
First name(s)		2



GCE A LEVEL

1305U50-1



S25-1305U50-1

FRIDAY, 13 JUNE 2025 – AFTERNOON

FURTHER MATHEMATICS – A2 unit 5
FURTHER STATISTICS B

1 hour 45 minutes

ADDITIONAL MATERIALS

In addition to this examination paper, you will need:

- a Formula Booklet;
- a calculator;
- statistical tables (RND/WJEC Publications).

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

The maximum mark for this paper is 80.

The number of marks is given in brackets at the end of each question or part-question.

Sufficient working must be shown to demonstrate the **mathematical** method employed.

Answers without working may not gain full credit.

Unless the degree of accuracy is stated in the question, answers should be rounded appropriately.

You are reminded of the necessity for good English and orderly presentation in your answers.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	9	
2	5	
3	18	
4	14	
5	6	
6	11	
7	17	
Total	80	



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[3]

[1]

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(b) Hence, write down an unbiased estimator for θ^2 .

[1]

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In a further trial, Jeff wants to test whether there is a difference in levels of anxiety between teenagers who use social media as usual and those who are restricted in their use of social media. Participants are assigned to be in either a control group who can continue to use social media as usual, or an experimental group who are not allowed to use social media. There are 30 participants in the control group and 20 in the experimental group.

Participants are asked a series of questions and are assigned an anxiety score based on their responses.

Summary statistics for the anxiety scores, x for the control group and y for the experimental group, are shown below.

$$\sum x = 1560 \qquad \sum y = 940$$

You may assume that anxiety scores are normally distributed with a standard deviation of 5.5 for each group.

- (b) State the hypotheses for Jeff's test. [1]

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- (c) Calculate the p -value and state your conclusion in context. [8]

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- [6]



Independently, the time taken, Y minutes, for people to complete a puzzle of Type B has the distribution $N(8, 2 \cdot 8^2)$. Mali is given, at random, a puzzle of Type A and Ela is given, at random, a puzzle of Type B.

- (c) Find the probability that Mali completes her puzzle in less time than Ela takes to complete her puzzle.

[4]

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- (b) A random sample of 15 women from Country A have a mean height of 165 cm. State, with a reason, whether you think that Country A is likely to be The Netherlands. [1]

- (c) Comment on the reasonableness of the assumption that you have made in part (a). [1]



- (d) By considering $\text{Var}(T_1) - \text{Var}(T_2)$, determine which of T_1 and T_2 is the better estimator for θ . [5]

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