Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3300U30-1

A23-3300U30-1

MONDAY, 13 NOVEMBER 2023 – MORNING

MATHEMATICS
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER

1 hour 45 minutes

ADDITIONAL MATERIALS

The use of a calculator is not permitted in this examination.

A ruler, a protractor and a pair of compasses may be required.

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.

Take π as 3·14.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

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

In question **7**, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**6**	
2.	**3**	
3.	**4**	
4.	**6**	
5.	**3**	
6.	**4**	
7.	**7**	
8.	**4**	
9.	**2**	
10.	**6**	
11.	**4**	
12.	**6**	
13.	**3**	
14.	**3**	
15.	**4**	
16.	**4**	
17.	**3**	
18.	**4**	
19.	**4**	
Total	**80**	

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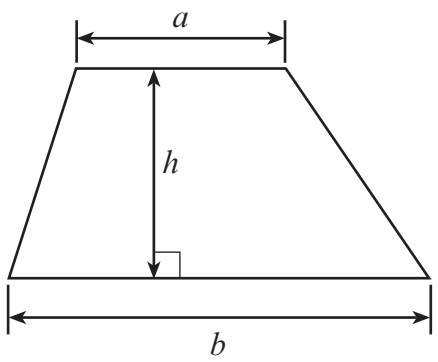
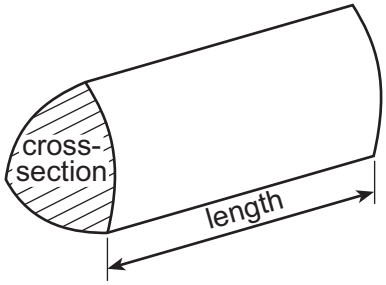
Formula List – Intermediate Tier

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



Examiner only

1. (a) Write down the next two numbers in the following sequence. [2]

26, 24, 20, 14, ... , ...

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(b) Find the value of $5x + 2y$ when $x = -4$ and $y = 9$. [2]

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(c) Simplify the expression $5y + 7m - 3y - 10m$. [2]

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2. Write 0·41, $\frac{7}{20}$ and 45% in descending order.

You must show all your working. [3]

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Greatest value ⟶ Smallest value

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3. Here is a net of a cuboid.

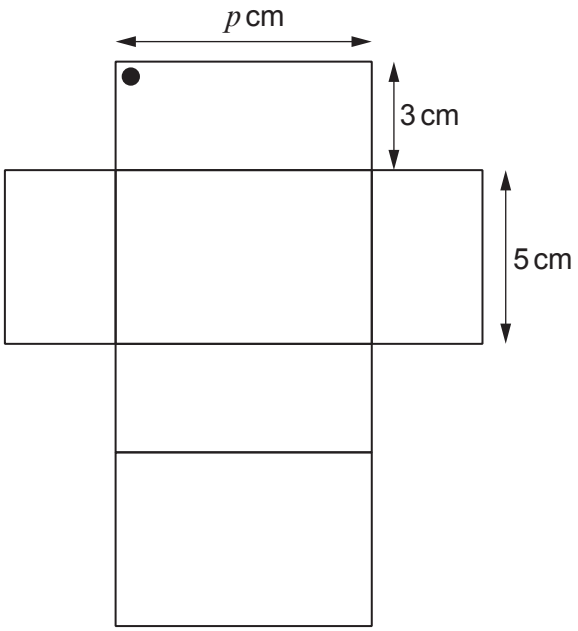

Diagram not drawn to scale

The net is folded to form a cuboid.

(a) The corner marked with ● meets two other corners on the net.
Mark these two other corners with ●. [2]

(b) The volume of the cuboid is 90 cm^3.
What is the value of p? [2]

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Examiner only

4. (a) Find $\frac{3}{7}$ of 9·17 km.

Give your answer in metres. [3]

..... metres

(b) Express 25 minutes as a percentage of 2 hours 5 minutes. [3]

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Examiner only

5. (a) The mean of four numbers is 9.
What is the total of the four numbers? [1]

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(b) Find a set of four numbers such that:
- their mean is 9
- their mode is 11.

Write your four numbers in the boxes below. [2]

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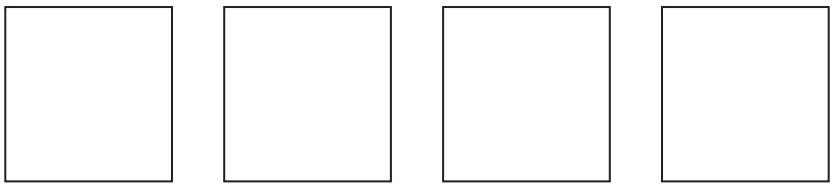

Examiner only

6. There are many socks in a drawer.
The socks are red, green, blue or pink.

(a) A sock is chosen at random from the drawer.
Complete the table below. [2]

Colour	Red	Green	Blue	Pink
Probability	0·3	0·1		0·25

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(b) In the drawer, there are 20 pink socks.
How many red socks are there in the drawer? [2]

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7. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

The diagram below shows two shaded squares inside a larger square.

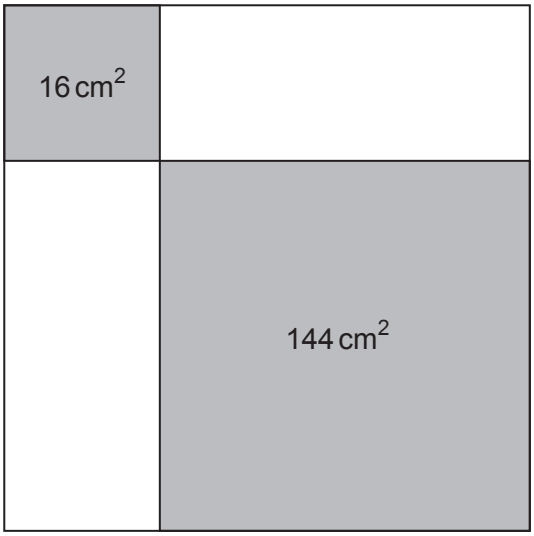


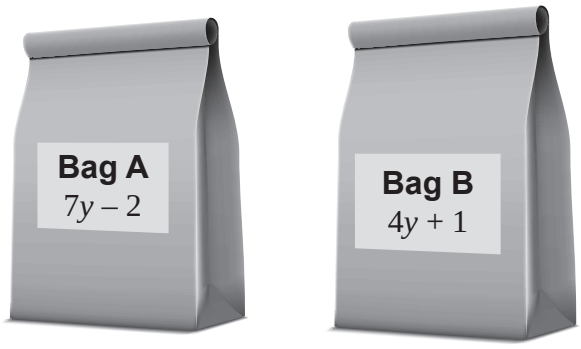
Diagram not drawn to scale

The diagram shows the area of each of the two shaded squares.

Calculate the **total** area of the two regions that have **not** been shaded.
You must show all your working. [5 + 2 OCW]

Examiner only

8. There are $7y - 2$ counters in Bag A.
There are $4y + 1$ counters in Bag B.



9 counters are added to Bag B.
There are now the same number of counters in each bag.

Form an equation in terms of y.
Solve the equation to find the value of y.
You must show all your working. [4]

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9. A cup contains some tea.

Elsie drinks $\frac{5}{7}$ of the tea.

There are 44 ml of tea left in the cup.
How much tea was in the cup before Elsie drank any? [2]

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Examiner only

10. The Geometric Mean is a special type of average.

(a) To find the Geometric Mean of two numbers, you must:
- multiply the two numbers together, and
- then find the square root.

Find the Geometric Mean of 250 and 0·4. [2]

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(b) To find the Geometric Mean of three numbers, you must:
- multiply the three numbers together, and
- then find the cube root.

(i) Find the Geometric Mean of 100, 0·3 and 0·9. [2]

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(ii) The Geometric Mean of three numbers is 10.
Two of the numbers are 8 and 25.
Find the third number. [2]

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Examiner only

11. (a) Write down an expression for the nth term of the following sequence. [2]

11, 15, 19, 23, ...

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(b) The nth term of a different sequence is given by $n^2 - 5$.
Write down the first three terms of this sequence. [2]

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First three terms are ....., ..., ...

Examiner only

12. (a) Express 495 as a product of its prime factors in index form. [3]

(b) Explain how your answer to part (a) tells you that 495 is **not** a square number. [1]

(c) Find the Highest Common Factor (HCF) of 495 and 60. [2]

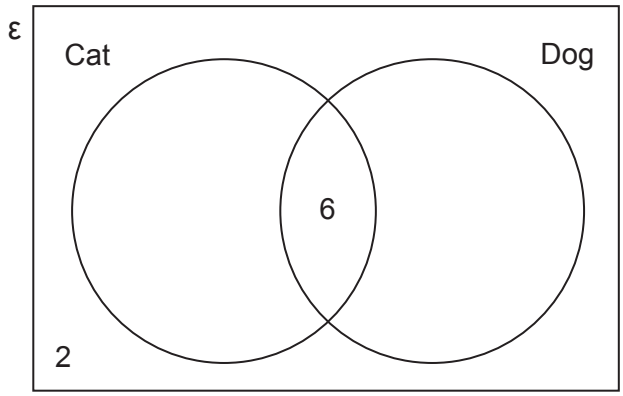
Examiner only

13. In a group of 40 people, some own a cat, some own a dog, and some own both a cat and a dog.
2 people in the group do not own a cat or a dog.

A person is chosen at random from the group.

The probability that the person owns a dog is $\frac{3}{5}$.

Complete the Venn diagram. [3]



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14. (a) £285 is decreased by 4%.
This is done 3 times in total.
Each time, the previous value is decreased by 4%.
What calculation would you use to find the value after the 3 decreases?
Circle your answer. [1]

$£285 \times 1{\cdot}04^3$ $£285 \times 0{\cdot}04^3$ $£285 \times 0{\cdot}96^3$ $£285 \times 0{\cdot}6^3$ $£285 \times 0{\cdot}96^2$

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(b) A number has been decreased by 10% to give an answer of 34·2.
What was the original number? [2]

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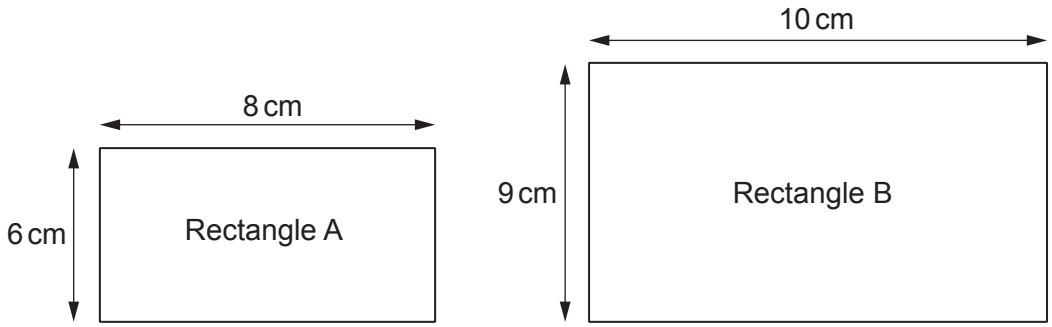

Diagrams not drawn to scale

(a) Explain why Rectangle A is **not** mathematically similar to Rectangle B. [2]

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(b) Alun changes **only one** of the measurements of **Rectangle B** to make the two rectangles mathematically similar.

Write down a possible length and width of Alun's new rectangle.
You must show all your working. [2]

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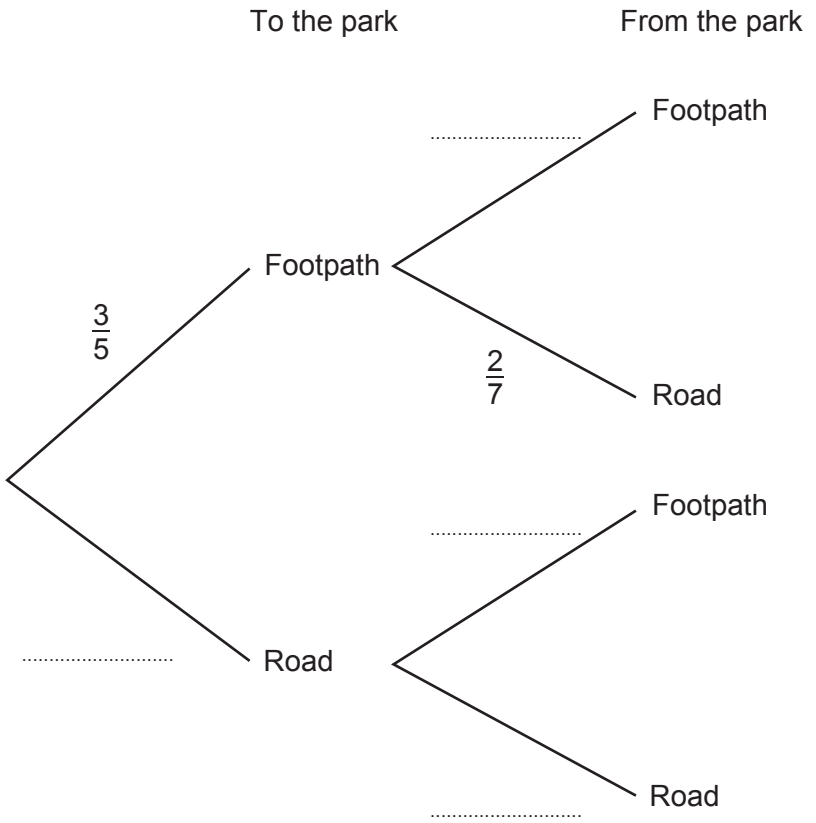
Length = ... cm

Width = ... cm

Examiner only

16. Beti walks her dog to a local park and back home every day.
She can either walk along a **footpath** or along a pavement at the side of a **road**.
The probability that Beti walks to the park along the footpath is $\frac{3}{5}$.
The probability that Beti walks home from the park along the road is $\frac{2}{7}$.
Her decisions on which routes to walk to and from the park are independent of each other.

(a) Complete the tree diagram below. [2]



(b) Find the probability that Beti walks to and from the park along the footpath. [2]

Examiner only

17. Factorise $x^2 - 8x - 20$, and hence solve $x^2 - 8x - 20 = 0$. [3]

Examiner only

18. The points *B*, *C*, *D* and *E* lie on the circumference of a circle, with centre *O*.
AF is a tangent to the circle.
AO is a straight line.

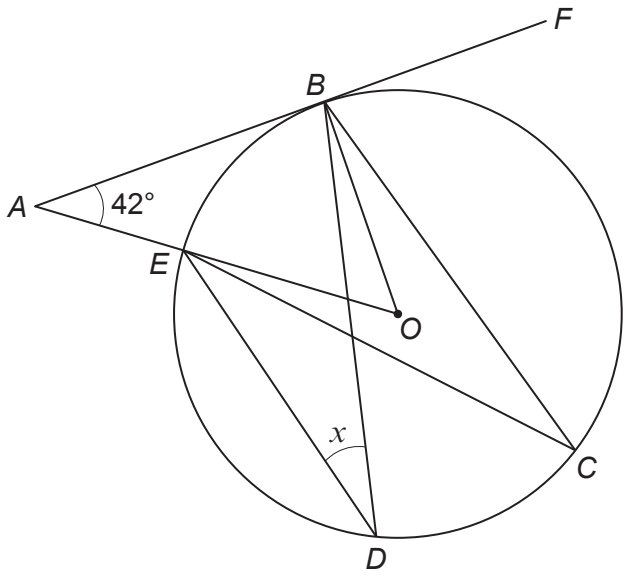


Diagram not drawn to scale

(a) Explain how you know that *AOB* is a right-angled triangle. [1]

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(b) Calculate the size of angle x.
You must show all your working. [3]

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Examiner only

19. Solve the equation $\frac{10x+2}{3} - \frac{7x-3}{5} = 9$. [4]

END OF PAPER

Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

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