WESTMINSTER
International University in Tashkent

An Accredited Institution of
the University of Westminster (UK)

CAMBRIDGE AS&A LEVEL ENTRANCE EXAMINATION MATHEMATICS

Date: 12 August 2025

Time allowed: 1 hour 30 minutes

You will need: Geometrical instruments, calculator

INSTRUCTIONS

● Answer all questions.

● Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.

● Write your answer to each question in the space provided.

● Do not use an erasable pen or correction fluid.

● You must show all necessary working clearly.

● Give non-exact numerical answers correct to 2 decimal places, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.

● The total mark for this paper is 100

Surname	
Name	
Middle name	
Signature	

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1	2	3	4	5	6	7	8	9	10	Total

Staff name and signature: _____

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USE AS A DRAFT

1 **(a)** Expand and simplify.

$$(2x + 3)(x - 2)^2$$

..... [3]

(b) $y = \frac{3x-2}{1-x}$

Make *x* the subject of the formula.

x = ... [4]

(c) Simplify $(3125x^{3125})^{\frac{1}{5}}$.

..... [3]

2 **(a)** Alex, Bobbie and Chris share strawberries in the ratio Alex : Bobbie : Chris = 3 : 2 : 2. Chris receives 12 strawberries. Calculate the total number of strawberries shared.

..... [2]

(b) In a sale, a shop reduces all prices by 12%.

(i) Dina buys a book which has an original price of $6.50 .
Calculate how much Dina pays for the book.

$ ..... [2]

(ii) Elu pays $11 for a toy.
Calculate the original price of the toy.

$ ..... [2]

(c) Feri invests some money.
The rate of interest for the first year is 2.5%.
At the end of the second year the overall percentage increase of Feri's investment is 6.6%.
Find the rate of interest for the second year.

.....% [2]

(d) A radioactive substance decays at an exponential rate of 2% per day. The initial mass is 80 g.

(i) Find the mass at the end of 5 days.

..... g [2]

(ii) Find how many **more** whole days, after day 5, it takes for the mass to reduce to less than 67 g.

..... [2]

3 **(a)** $f(x) = 3 - 5x$

Find x when $f(x) = -5$.

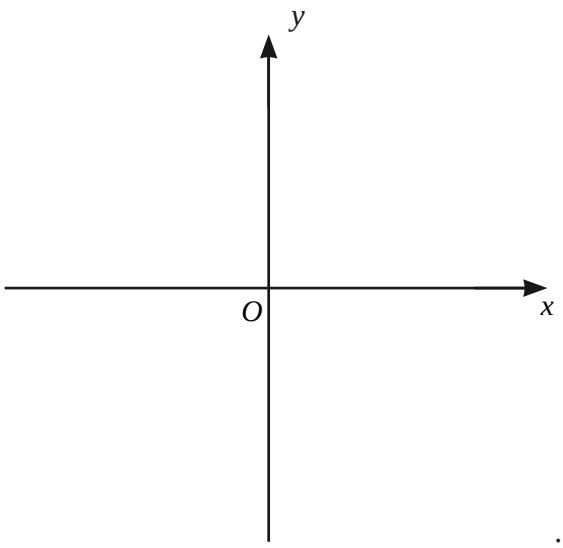
$x =$ ..... [2]

(b) $g(x) = 18 - 3x - x^2$

(i) Write $g(x)$ in the form $b - (a + x)^2$.

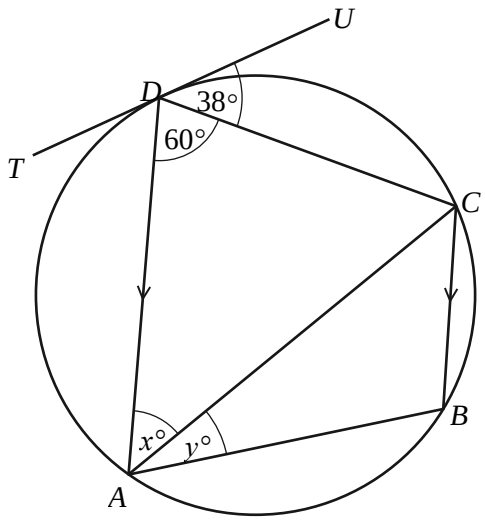
..... [3]

(ii) Sketch the graph of $y = g(x)$.
On your sketch, show the coordinates of the turning point (vertex).



..... [3]

4 **a)**



NOT TO SCALE

A, *B*, *C* and *D* are points on a circle.
TU is a tangent to the circle at *D*. *DA* is parallel to *CB*. Find the value of *x* and the value of *y*.

x = ...

y = ... [5]

b) The interior angles of a pentagon are in the ratio 4 : 5 : 5 : 7 : 9.

Find the size of the largest angle.

..... [5]

5 **a)** P is a prime number where $60 < P < 80$.
P is 2 less than a square number.

Find the value of P.

P = ... [4]

(b) The line $y = x + 1$ intersects the graph of $y = x^2 - 3x - 11$ at the points A and B.
Find the coordinates of A and the coordinates of B. You must show all your working.

A (..... , ...)

B (..... , ...) [6]

6 **a)** A train passes through a station at a speed of 108 km/h.
The length of the station is 120 m.
The train takes 7 seconds to completely pass through the station.

Work out the length of the train.

..... m [5]

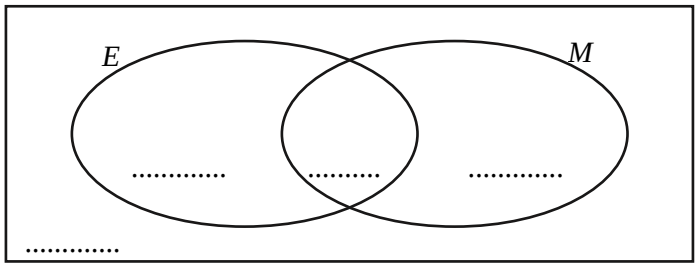
b) w is proportional to the square root of y.

y is inversely proportional to x.

When $x = 4$, $y = 16$ and $w = 8$. Find w in terms of x.

$w =$ ..... [5]

7



50 students are asked if they like English (E) and if they like mathematics (M).
3 say they do not like English and do not like mathematics.
33 say they like English.
42 say they like mathematics.

(i) Complete the Venn diagram. [3]

(ii) A student is chosen at random.

Find the probability that this student likes English and likes mathematics.

..... [2]

(iii) Two students are chosen at random.

Find the probability that they both like mathematics.

..... [3]

(iv) Two students who like English are chosen at random.

Find the probability that they both also like mathematics.

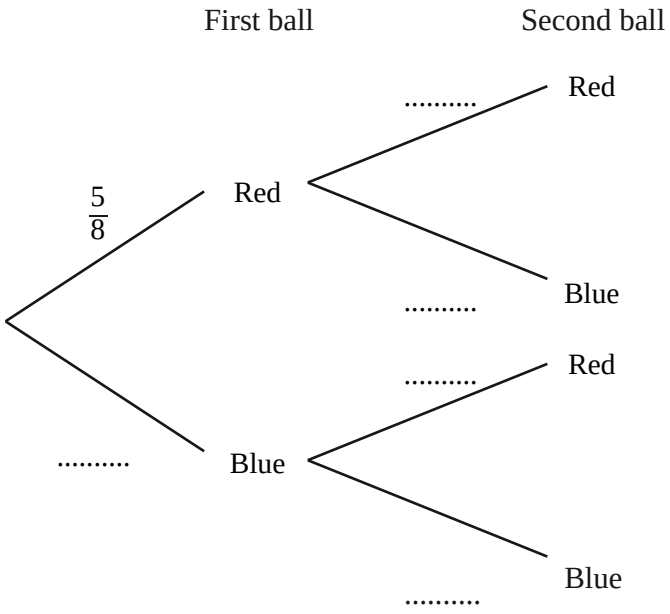
..... [2]

8 **(a)** A bag contains 3 blue buttons, 8 white buttons and 5 red buttons. Two buttons are picked at random from the bag, without replacement. Work out the probability that the two buttons are either both red or both white.

..... [4]

(b) A bag contains 5 red balls and 3 blue balls.
Sophie takes a ball at random, notes its colour and then puts it back in the bag.
She does this a second time.

(i) Complete the tree diagram.

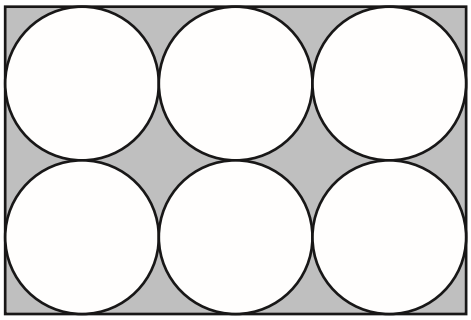


[3]

(ii) Work out the probability that both of the balls she takes are blue.

..... [3]

9



NOT TO
SCALE

The diagram shows a rectangle with 6 congruent circles inside. Each circle touches the adjacent circles and the sides of the rectangle. The radius of each circle is 8 cm.

(i) Show that the length of the rectangle is 48 cm.

..... [2]

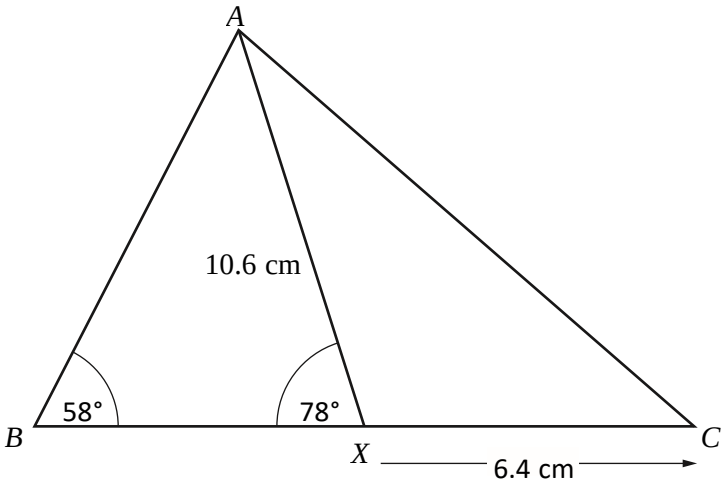
(ii) Find the area of the rectangle.

..... [3]

(iii) Calculate the percentage of the rectangle that is shaded.

..... % [5]

10 (a)



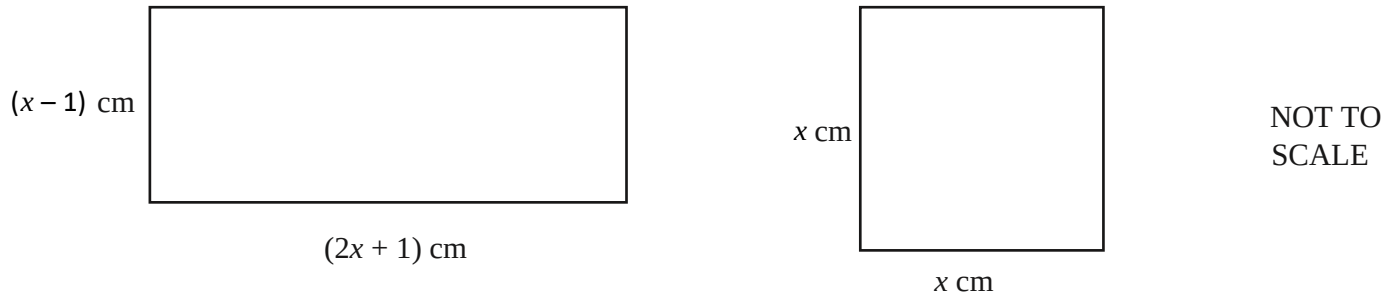
NOT TO SCALE

The diagram shows triangle *ABC*.
X is a point on *BC*.
AX = 10.6 cm, *XC* = 6.4 cm, angle *ABC* = 58° and angle *AXB* = 78°.

Calculate *AC*.

AC = ... cm [4]

(b)



The area of the rectangle is 29 cm^2 greater than the area of the square.
The difference between the perimeters of the two shapes is k cm. Find the value of k. You must show all your working.

k = ... [6]

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