



# 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

<b>Surname</b>	
<b>Name</b>	
<b>Middle name</b>	
<b>Signature</b>	

### FOR OFFICE USE ONLY

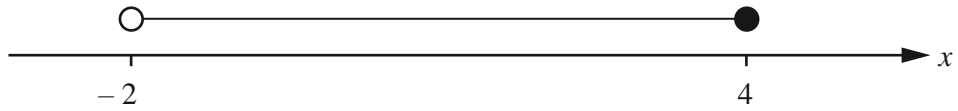
1	2	3	4	5	6	7	8	9	10	Total

Staff name and signature: \_\_\_\_\_

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1 (a)



Write down the inequality shown by the number line

..... [1]

(b)  $-3 \leq 2x + 3 < 9$

(i) Solve the inequality

..... [3]

(ii) Write down all the integer values of  $x$  that satisfy the inequality

..... [2]

(c) Solve the equation:

$$3(3-x) - \frac{2(x+2)}{5} = 1$$

$x =$  ..... [4]

2 (a) A plane has 14 First Class seats, 70 Premium seats and 168 Economy seats.

Find the ratio First Class seats : Premium seats : Economy seats.  
Give your answer in its simplest form.

..... : ..... : ..... [2]

(b) (i) For a morning flight, the costs of tickets are in the ratio

$$\text{First Class : Premium : Economy} = 14 : 6 : 5.$$

The cost of a Premium ticket is \$114.

Calculate the cost of a First Class ticket and the cost of an Economy ticket.

First Class \$ ..... Economy \$ ..... [3]

(ii) For an afternoon flight, the cost of a Premium ticket is reduced from \$114 to \$96.90.

Calculate the percentage reduction in the cost of a ticket.

..... % [2]

(c) When the local time in Athens is 09 00, the local time in Berlin is 08 00.

A plane leaves Athens at 13 15.

It arrives in Berlin at 15 05 local time.

(i) Find the flight time from Athens to Berlin.

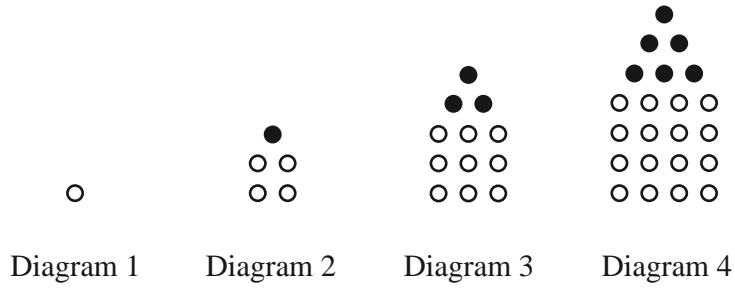
..... h ..... min [1]

(ii) The distance the plane flies from Athens to Berlin is 1802 km.

Calculate the average speed of the plane.

Give your answer in kilometres per hour.

..... km/h [2]



These are the first four diagrams of a sequence.  
The diagrams are made from white dots and black dots.

(a) Complete the table for Diagram 5 and Diagram 6.

Diagram	1	2	3	4	5	6
Number of white dots	1	4	9	16		
Number of black dots	0	1	3	6		
Total number of dots	1	5	12	22		

[3]

(b) Write an expression, in terms of  $n$ , for the number of white dots in Diagram  $n$ .

..... [2]

(c) The expression for the total number of dots in Diagram  $n$  is  $\frac{1}{2}(3n^2 - n)$ .

(i) Find the total number of dots in Diagram 8.

..... [2]

(ii) Find an expression for the number of black dots in Diagram  $n$ .  
Give your answer in its simplest form.

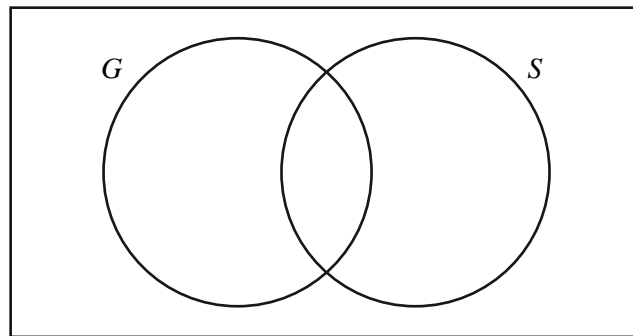
..... [3]

4 There are 32 students in a class.

5 do not study any languages.

15 study German ( $G$ ).

18 study Spanish ( $S$ ).



(i) Complete the Venn diagram to show this information.

[4]

(ii) A student is chosen at random.

Find the probability that the student studies Spanish but not German.

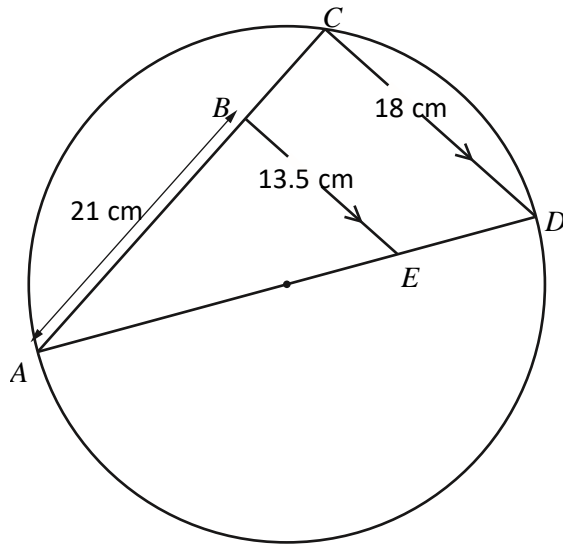
..... [3]

(iii) A student who studies German is chosen at random.

Find the probability that this student also studies Spanish.

..... [3]

5 (a)

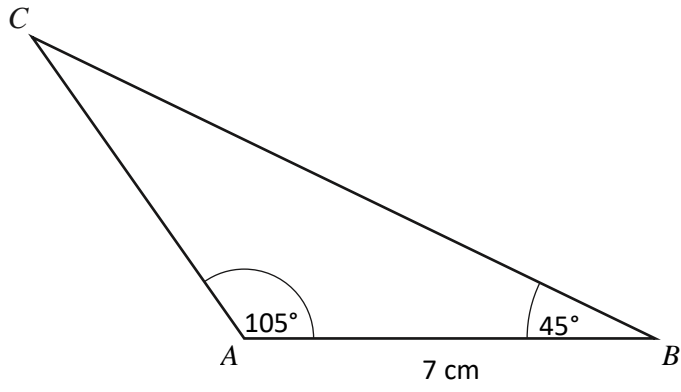


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$C$  lies on a circle with diameter  $AD$ .  $B$  lies on  $AC$  and  $E$  lies on  $AD$  such that  $BE$  is parallel to  $CD$ .  
 $AB = 21$  cm,  $CD = 18$  cm and  $BE = 13.5$  cm.  
Work out the radius of the circle.

..... cm [5]

(b)



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Calculate the length  $BC$ .

$BC = \dots\dots\dots$  cm [5]

**6**     **a)** Line  $L$  has equation  $y = 4 - 5x$ .

Find the equation of a line that is perpendicular to line  $L$  and passes through the point  $(0, 6)$ .

..... [5]

**b)**  $y$  is inversely proportional to the square root of  $(x - 2)$ .

When  $x = 4.25$ ,  $y = 12$ .

Find  $x$  when  $y = 3$ .

$x =$  ..... [5]

7 A bag contains 5 red balls, 4 blue balls and 3 green balls.

(a) (i) Megan picks a ball at random.

Write down the probability that the ball is red or blue.

..... [2]

(ii) Megan replaces the ball.

She picks a ball at random, notes the colour and replaces the ball.

She repeats this 60 times.

Calculate the number of times the ball is expected to be red or blue.

..... [2]

(b) Mick picks 2 of the 12 balls at random, without replacement.

Calculate the probability that the balls are different colours.

..... [4]

(c) Marie picks balls at random, without replacement, from the 12 balls.

When she picks a green ball she stops.

The probability that she picks a green ball on pick  $n$  is  $\frac{21}{220}$ .

Find the value of  $n$ .

$n =$  ..... [2]

8 (i) Zak invests \$500 at a rate of 2% per year simple interest

Calculate the value of Zak's investment at the end of 5 years

\$ ..... [3]

(ii) Yasmin invests \$500 at a rate of 1.8% per year compound interest

Calculate the value of Yasmin's investment at the end of 5 years

\$..... [3]

(iii) Zak and Yasmin continue with these investments

How many **more complete** years is it before the value of Yasmin's investment is greater than the value of Zak's investment?

..... [4]

9 (a) Complete these statements.

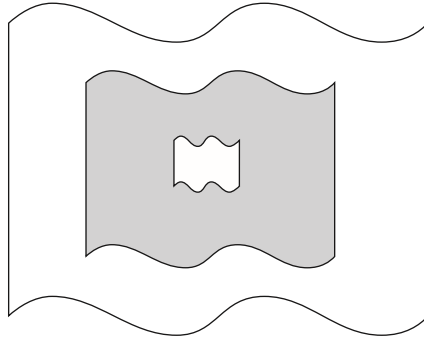
(i) The reciprocal of 0.2 is ..... [2]

(ii) A prime number between 90 and 100 is ..... [2]

(iii)  $\frac{7}{5}$  0.6  $\sqrt{7}$  8  $\sqrt{9}$  .....

From this list, write down an irrational number. .... [1]

(b)



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The diagram shows three shapes that are mathematically similar.  
The heights of the shapes are in the ratio small : medium : large = 1 : 5 : 8.

Find the ratio shaded area : total unshaded area.  
Give your answer in its simplest form.

..... : ..... [5]

**10** The expression  $5 + 12x - 2x^2$  can be written in the form  $q - 2(x + p)^2$ .

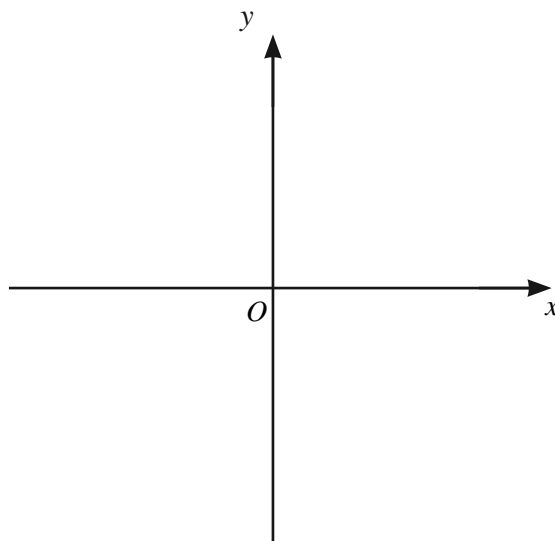
**(i)** Find the value of  $p$  and the value of  $q$ .

$p = \dots\dots\dots, q = \dots\dots\dots$  [4]

**(ii)** Write down the coordinates of the maximum point of the curve  $y = 5 + 12x - 2x^2$ .

$(\dots\dots\dots, \dots\dots\dots)$  [2]

**(iii)** Sketch the graph of the function clearly showing the coordinates of the turning point (vertex).



$\dots\dots\dots$  [4]

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