

Cambridge IGCSE[™]

REMAD	CANDIDATE NAME						
	CENTRE NUMBER		CANDIDATE NUMBER				
* 7 0	MATHEMATIC	S	0580/42				
0 7 0	Paper 4 (Extend	led)	October/November 2024				
α л			2 hours 30 minutes				
9 1 7	You must answe	er on the question paper.					

You will need: Geometrical instruments

INSTRUCTIONS

- Answer all questions. •
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs. •
- Write your name, centre number and candidate number in the boxes at the top of the page. •
- Write your answer to each question in the space provided.
- Do not use an erasable pen or correction fluid. •
- Do not write on any bar codes. •
- You should use a calculator where appropriate. •
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in • degrees, unless a different level of accuracy is specified in the question.

This document has 20 pages. Any blank pages are indicated.

For π , use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 130. •
- The number of marks for each question or part question is shown in brackets [].



Calculate the amount she pays.

			\$	[2]
	(ii)	The fuel tank in the new car has a capacity of 45 litres. This is 72% of the capacity of the fuel tank in her old c	ar.	
		Calculate the capacity of the fuel tank in her old car.		
			litres	[2]
(b)	Aac Hej The	li buys a new car costing \$28000. pays for the car using a finance plan. e finance plan is		
	•	a deposit 47 equal monthly payments of \$330		

• a final payment of \$11490.

Using this finance plan, Aadi pays a total of \$31900 for the car.

Calculate the deposit paid as a percentage of \$28000.



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(c) A car travels 64 km and uses 2.5 litres of fuel. It then travels 128 km and uses 6 litres of fuel.

> Calculate the rate at which the car uses fuel during the whole journey. Give your answer in litres per 100 km.

> > litres per 100 km [2]

(d) At the start of 2021 the value of a car was \$46500. At the end of 2021 the value of the car was 20% less. At the end of 2022 the value of the car was 15% less than its value at the end of 2021.

Calculate the value of the car at the end of 2022.

\$.....[2]



* 0000800000004 *



2 The table shows some values for $y = x^3 + 4x^2 - 4$.

x	-4.5	-4	-3	-2	-1	0	1	1.5
у	-14.1		5	4		-4	1	8.4

- (a) Complete the table.
- (b) On the grid, draw the graph of $y = x^3 + 4x^2 4$ for $-4.5 \le x \le 1.5$.



[4]

[1]

- (c) (i) Draw the tangent to the graph at the point (1, 1).
 - (ii) Use your tangent to estimate the gradient of the curve at the point (1, 1).

[2]

* 0000800000005 *



(d) By drawing a suitable straight line on the grid, solve the equation $x^3 + 4x^2 - x - 6 = 0$.

5

 $x = \dots$ or $x = \dots$ [4]





3 (a) Simplify.

(i) 3m - 5n - 4m + 8n

- (ii) $(3a^2c^3)^4$
- (iii) $\frac{4x}{5} \frac{3x}{10} + \frac{2x}{15}$



.....

(b) This isosceles triangle has a perimeter of 35.5 cm.



6

Find the value of *a*.

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a =

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[2]

[2]





(c) Using the quadratic formula, solve $5x^2 - 4x - 3 = 0$. You must show all your working.

 $x = \dots$ [3]

(d) Solve these simultaneous equations.

$$y = x^2 - 4x + 5$$
$$y = 2x - 3$$

You must show all your working.

 $x = \dots$ $y = \dots$

$$x = \dots$$
 [5]





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* 000080000009 *

(c)

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D

9

A

(ii) Calculate the length of the minor arc *ABC*.

..... cm [2]

(iii) Calculate the area of the major sector OCDA.



* 000080000010 *



The cumulative frequency diagram shows information about the distance travelled by each of 5 **(a)** 80 motorists in a month.

10





- (i) Show that there are 8 cars with a top speed in the interval $120 < v \le 160$.
- [1]

(ii) Calculate an estimate of the mean top speed. You must show all your working.

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[Turn over

* 000080000012 * **6** (a) Work out $2\binom{3}{-5} - \binom{2}{-7}$.

- **(b)** $\overrightarrow{MN} = \begin{pmatrix} -6\\ 4 \end{pmatrix}$.
 - (i) *M* is the point (2, -5).

Find the coordinates of N.

(ii) Find $|\vec{MN}|$.

(.....) [1]

[2]

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- (i) Show that angle $CBD = 81^{\circ}$.
- (ii) Calculate CD.

......m [3]

(iii) Show that angle $ABD = 31.6^\circ$, correct to 1 decimal place.

[1]



* 0000800000015 *



(iv) Find the shortest distance from A to BD.

15

...... m [3]

(v) Find the bearing of *B* from *C*.

......[2]

(vi) Trees are planted in the field. The number of trees planted is 1100 per hectare.

Calculate the total number of trees planted in the field. $[1 \text{ hectare} = 10000 \text{ m}^2]$

.....[4]

(b) A rectangle has an area of 9400 cm^2 , correct to the nearest 100 cm^2 . The length of the rectangle is 80 cm, correct to the nearest 10 cm.

Calculate the upper bound of the width of the rectangle.

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			16		
8	(a)	A b Son One	ag contains 24 coloured beads. ne are red, some are blue and 10 are yellow. e bead is picked at random from the bag.		
		Fin	d the probability that		
		(i)	the bead is yellow		
					[1]
		(ii)	the bead is not yellow.		
					[1]
	(b)	And Me	other bag contains 5 green marbles, 6 white marbles and 4 era picks 2 marbles at random from the bag, without replace	black marbles. cement.	
		Fin	d the probability that		
		(i)	the first marble is black and the second marble is white		
					[2]
		(ii)	both marbles have different colours.		

[4]

.....

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 $f^{-1}(x) = \dots$ [2]

(b) Find gf(x) - 3g(x). Give your answer in the form $ax^2 + bx + c$.

.....[4]

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- 10 A curve has the equation $y = x^3 9x^2 48x$.
 - (a) Differentiate $x^3 9x^2 48x$.

- (b) Find the coordinates of the turning points of the graph of $y = x^3 9x^2 48x$. You must show all your working.

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(c) Determine whether each of the turning points is a maximum or a minimum. Give reasons for your answers.

[3]

