Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

0238482882

MATHEMATICS (SYLLABUS D) **4024/11**

Paper 1 **May/June 2024**

2 hours

You must answer 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.
- Calculators must **not** be used in this paper.
- You may use tracing paper.
- You must show all necessary working clearly.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

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ELECTRONIC CALCULATORS MUST NOT BE USED IN THIS PAPER

1

G	R	A	N	T

From this word write down the letters which have

(a) a line of symmetry

..... [1]

(b) rotational symmetry.

..... [1]

2 At the start of the day the mass of a bird is 4.628 kg.
Later in the day the mass of this bird is 4.693 kg.

Calculate the increase in the mass of the bird.
Give your answer in grams.

..... g [2]

3 Work out.

(a) 0.3×0.02

..... [1]

(b) 15% of 40

..... [1]

(c) $7 - (-25)$

..... [1]

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4 **(a)** ABC is a triangle with $AC = 5\,\text{cm}$ and $BC = 10\,\text{cm}$.

Using a ruler and compasses only, construct triangle ABC.
AB has been drawn for you.

[2]

(b) Measure angle BAC.

Angle BAC = ... [1]

5 The table shows information about a class of 28 students and the distances they live from their school.

	Boys	Girls
Distance of 1 km or less	11	
Distance of more than 1 km	3	6

(a) Complete the table. [1]

(b) A student is chosen at random from the class.

Write down the probability that the student lives more than 1 km from the school.

..... [1]

6 **(a)** Simplify $6r + 7s - r + 3s$.

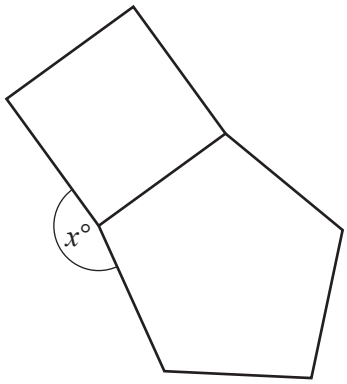
..... [2]

(b) Bananas cost x cents each.
Apples cost y cents each.

Write an expression for the total cost of 7 bananas and 5 apples.

..... cents [1]

7



NOT TO SCALE

A square and a regular pentagon are joined along one edge as shown in the diagram.

Calculate the value of x.

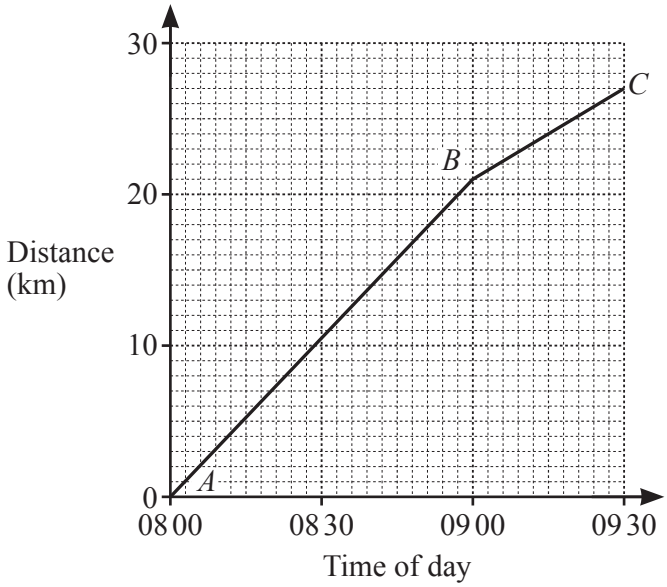
$x =$ ..... [3]

8 Ahmed invests \$4000 at a rate of 1.5% per year simple interest.

Calculate the value of the investment after 2 years.

\$ ..... [2]

9 **(a)**



The diagram shows the distance–time graph of a cyclist for the first two stages of a race, *AB* and *BC*.

Work out the average speed of the cyclist for the second stage, *BC*.

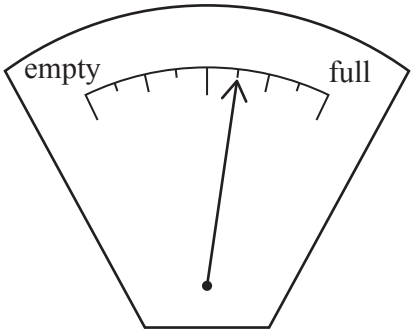
..... km/h [2]

(b) A bus travels at an average speed of 20 km/h.

Work out the time the bus takes to travel 50 km.

..... hours [1]

10 **(a)**



The diagram shows the fuel gauge of a car.
This car has 40 litres of fuel in the tank.

Calculate the amount of fuel that the tank contains when it is full.

..... litres [2]

(b) The car uses 5.4 litres of fuel for every 100 km travelled.

Calculate the amount of fuel that the car will use on a journey of 300 km.

..... litres [1]

11 Tom's pet eats $\frac{3}{5}$ of a tin of food each day.
Tom needs food for his pet for 12 days.

Calculate the number of tins of food Tom needs to buy.

..... [2]

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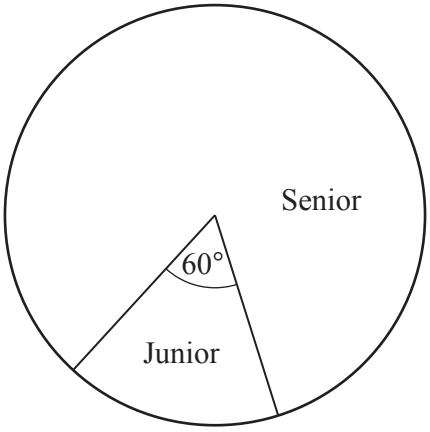
12 Solve.

$$4(2x-3)+5(x+5)=20$$

$x =$ ..... [3]

13



The pie chart shows the proportion of junior members and senior members at a gym.
There are 120 more senior members than junior members.

Calculate the total number of junior and senior members at the gym.

..... [2]

14 Solve the simultaneous equations.
Show all your working.

$$2x + 3y = 7$$
$$x - 6y = 6$$

$x =$ .....

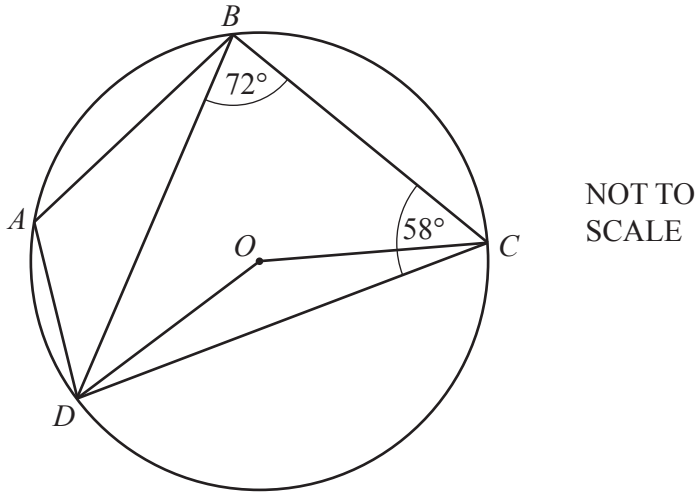
$y =$ ..... [3]

15 By writing each number correct to one significant figure, estimate the value of

$$\frac{2.87 \times \sqrt{396.5}}{1.92^2}.$$

..... [2]

16



A, B, C and D are points on the circumference of a circle centre O.
Angle $BCD = 58°$ and angle $DBC = 72°$.

(a) Complete the statement below.

Angle DAB = ... because .....

..... [2]

(b) **(i)** Find angle DOC.

Angle DOC = ... [1]

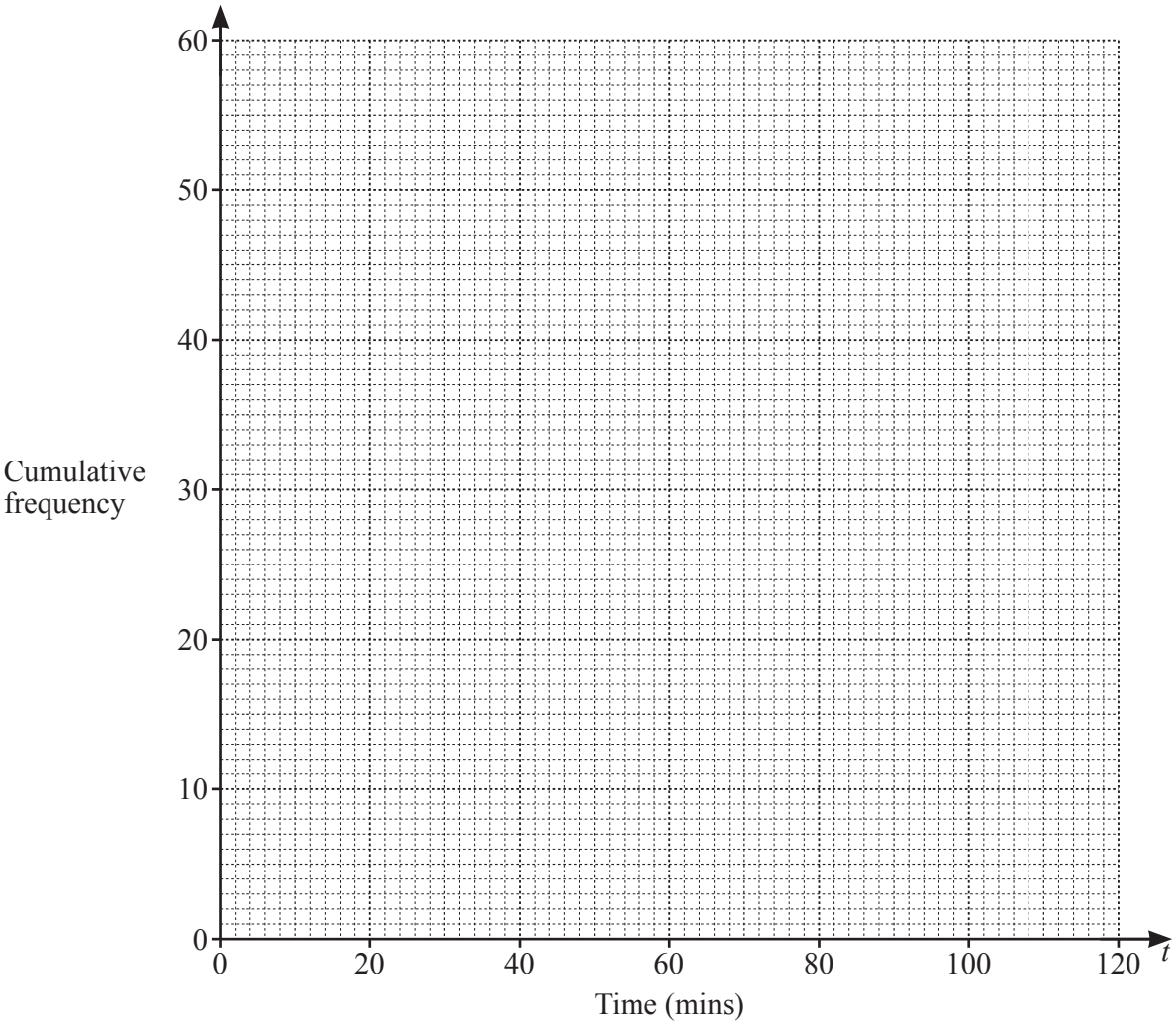
(ii) Find angle BCO.

Angle BCO = ... [2]

17 The table shows the time that each of 60 children spends in a play area.

Time (t mins)	$0 < t \leqslant 10$	$10 < t \leqslant 40$	$40 < t \leqslant 60$	$60 < t \leqslant 90$	$90 < t \leqslant 120$
Frequency	4	7	8	24	17

(a) Draw a cumulative frequency diagram to show this information.



[3]

(b) Use your diagram to estimate

(i) the median

..... minutes [1]

(ii) the interquartile range

..... minutes [2]

(iii) the number of children who spend more than 80 minutes in the play area.

..... [2]

18 In this table, p is directly proportional to q^2.

p	12	a	48
q	2	7	b

Calculate the value of a and the value of b.

$a =$ .....

$b =$ ..... [3]

19 $\mathrm{f}(x) = 2x - 5$

(a) Find $\mathrm{f}(11)$.

..... [1]

(b) Find $\mathrm{f}^{-1}(x)$.

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

(c) Solve $\mathrm{f}(x) = x^2 + x - 11$.

$x =$ ..... or $x =$ ..... [3]

20 The matrix **N** satisfies the equation

$$3\mathbf{N} = \mathbf{N} + 5\begin{pmatrix} 4 & 0 \\ 6 & -2 \end{pmatrix}.$$

Find **N**.

$\mathbf{N} = \begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [2]

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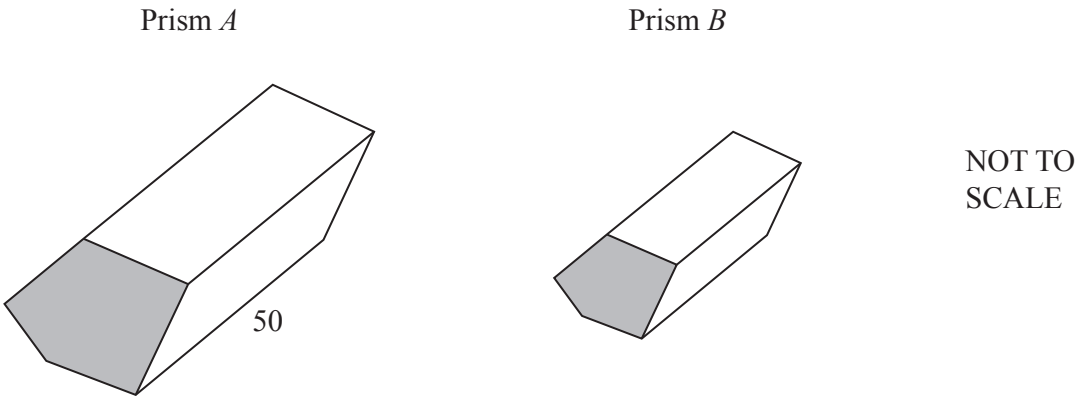
21



Prism *A* and prism *B* are mathematically similar.
In the diagram, the cross-sections of the prisms are shaded.

The volume of prism *A* is 5000 cm^3.
The length of prism *A* is 50 cm.

The area of the cross-section of prism *B* is 16 cm^2.

Calculate the length of prism *B*.

..... cm [4]

22 $$a = \frac{5b+2x}{x-3}$$

Rearrange the formula to make x the subject.

$x =$ ..... [3]

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23 AB is a line segment joining $A\,(-2, 5)$ and $B\,(1, 3)$.

(a) B is the midpoint of the line segment AC.

Find the coordinates of C.

(..... , ...) [1]

(b) The length AB is $\sqrt{t}$.

Find the value of t.

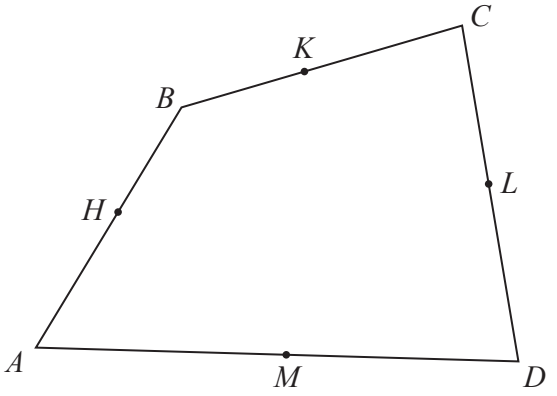
$t =$ ..... [2]

(c) Find the equation of the line perpendicular to AB that passes through A.
Give your answer in the form $y = mx + c$.

$y =$ ..... [4]

Question 24 is printed on the next page.

24



NOT TO SCALE

$ABCD$ is a quadrilateral.
H, K, L and M are the midpoints of AB, BC, CD and AD respectively.
$\overrightarrow{AB} = 2\mathbf{a}$, $\overrightarrow{BC} = 2\mathbf{b}$ and $\overrightarrow{AD} = 2\mathbf{d}$.

Express, as simply as possible, in terms of **a** and **b** or **a**, **b** and **d**

(a) $\overrightarrow{HK}$

$\overrightarrow{HK} =$ ..... [1]

(b) $\overrightarrow{CD}$

$\overrightarrow{CD} =$ ..... [1]

(c) $\overrightarrow{ML}$.

$\overrightarrow{ML} =$ ..... [2]

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