



Cambridge O Level

CANDIDATE
NAME

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CENTRE
NUMBER

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MATHEMATICS (SYLLABUS D)

4024/13

Paper 1 Non-calculator

May/June 2026

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. Do **not** use correction fluid or tape.
- 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 100.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages.

List of formulas

Area, A , of triangle, base b , height h .

$$A = \frac{1}{2}bh$$

Area, A , of circle of radius r .

$$A = \pi r^2$$

Circumference, C , of circle of radius r .

$$C = 2\pi r$$

Curved surface area, A , of cylinder of radius r , height h .

$$A = 2\pi rh$$

Curved surface area, A , of cone of radius r , sloping edge l .

$$A = \pi rl$$

Surface area, A , of sphere of radius r .

$$A = 4\pi r^2$$

Volume, V , of prism, cross-sectional area A , length l .

$$V = Al$$

Volume, V , of pyramid, base area A , height h .

$$V = \frac{1}{3}Ah$$

Volume, V , of cylinder of radius r , height h .

$$V = \pi r^2 h$$

Volume, V , of cone of radius r , height h .

$$V = \frac{1}{3}\pi r^2 h$$

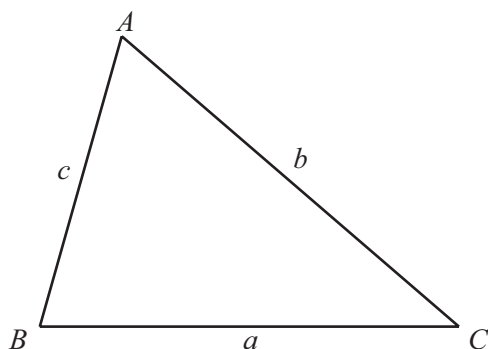
Volume, V , of sphere of radius r .

$$V = \frac{4}{3}\pi r^3$$

For the equation $ax^2 + bx + c = 0$, where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For the triangle shown,



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}ab \sin C$$



Calculators must **not** be used in this paper.

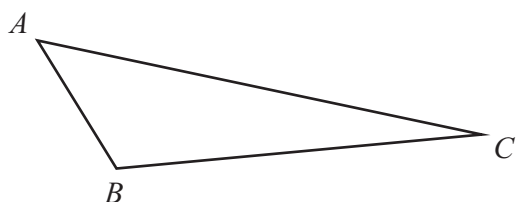
- 1 (a) Write 2.3 million in figures.

..... [1]

- (b) Write down all the factors of 45.

..... [2]

- 2 (a) The diagram shows triangle ABC .



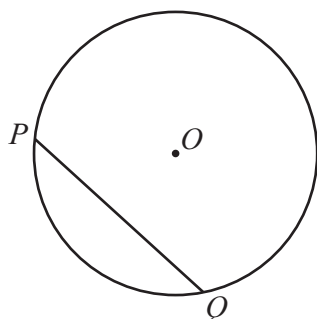
Choose a word from this list to complete each statement.

acute	equilateral	isosceles	obtuse	reflex	scalene
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- (i) Triangle ABC is [1]

- (ii) Angle ABC is [1]

- (b) P and Q are points on a circle, centre O .



Use the correct geometrical term to complete the statement.

The line PQ is a of the circle. [1]





3 These are the number of meeting rooms in each of ten offices.

6 7 8 40 4 4 3 8 4 6

(a) Write down the mode.

..... [1]

(b) Calculate the mean.

..... [2]

(c) Find the median.

..... [2]

(d) Explain why the mean is **not** a good representation of the number of meeting rooms in these offices.

..... [1]

4 Simplify.

$$5x + 7y - x + 2y$$

..... [2]





5 (a) These are the first four terms in a sequence.

2 5 8 11

Find the next two terms in the sequence.

..... , [1]

(b) The n th term of a different sequence is $n^2 + 3$.

Find the first three terms in this sequence.

..... , , [2]

6 Alice has some red beads, yellow beads and blue beads.
The ratio red : yellow : blue = 1 : 3 : 6 .
Alice has 60 more yellow beads than red beads.

Calculate the total number of beads that Alice has.

..... [3]



7 (a) Work out.

$$30 - 0.5 \times (-6)$$

..... [2]

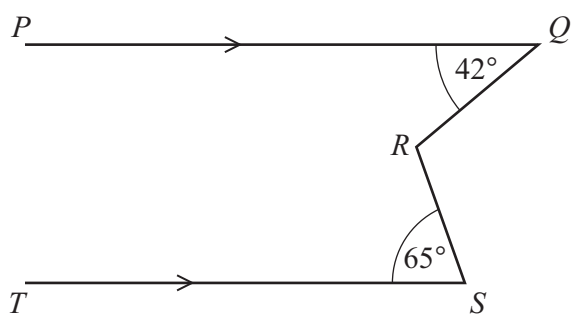
(b) Work out.

$$\frac{3}{4} - \frac{3}{10}$$

Give your answer as a fraction in its simplest form.

..... [3]

8



NOT TO SCALE

PQ is parallel to TS .

Angle $PQR = 42^\circ$ and angle $RST = 65^\circ$.

Work out the reflex angle QRS .

reflex angle $QRS =$ [2]



- 9 (a) Ann invests \$300 in a savings account.
The account pays simple interest at a rate of 4% per year.
- Calculate the value of her investment at the end of 5 years.

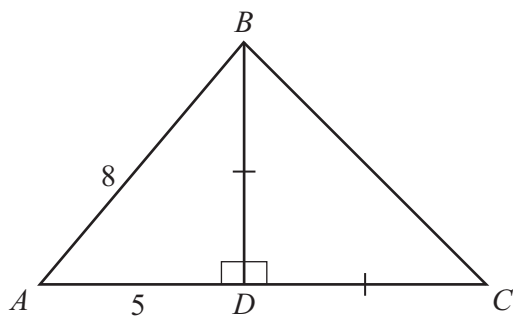
\$ [3]

- (b) Ravi buys a computer in a sale.
The cost of the computer is reduced from \$500 to \$400.
- Calculate the percentage reduction in the cost of the computer.

..... % [2]



10 ABC is a triangle.



NOT TO SCALE

D lies on AC and angle $BDA = \text{angle } BDC = 90^\circ$.
 $AB = 8 \text{ cm}$, $AD = 5 \text{ cm}$ and $BD = CD$.

Work out the area of triangle BCD .

..... cm^2 [5]



- 11 (a) The bearing of town A from town B is 162° .

Find the bearing of town B from town A .

..... [2]

- (b) On a map, the distance of town A from town B is 10 cm.
The actual distance of town A from town B is 20 km.

Work out the scale of the map in the form $1 : n$.

1 : [2]

- 12 (a) Write 0.000 63 in standard form.

..... [1]

- (b) P and Q are numbers written in standard form.

$$P = 7 \times 10^x \quad Q = 5 \times 10^{3x}$$

Giving your answers in standard form, find in terms of x

- (i) P^2

..... [2]

- (ii) $P \div Q$.

..... [2]





- 13 (a) Solve the simultaneous equations.
You must show all your working.

$$5x - 2y = 19$$

$$2x - 3y = 1$$

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

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

[4]

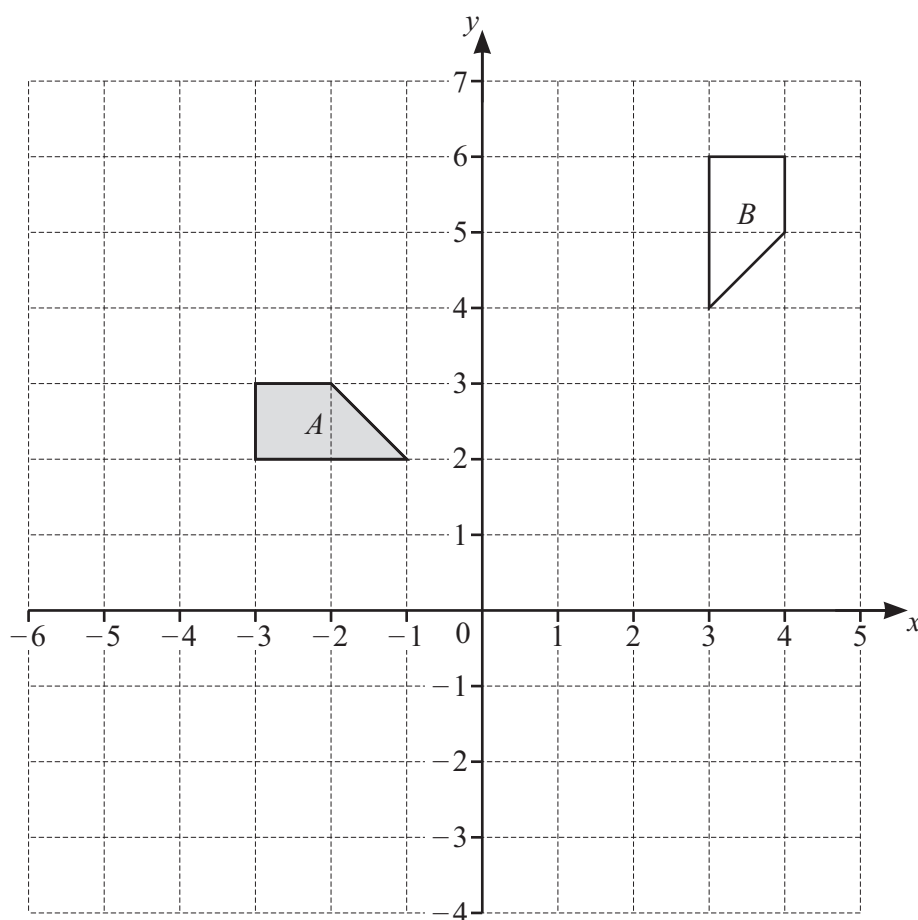
- (b) Solve by factorisation.

$$6x^2 - x - 5 = 0$$

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots [3]$$



14 Shape A and shape B are drawn on the grid.



(a) Describe fully the **single** transformation that maps shape A onto shape B .

.....
 [3]

(b) Shape C is the image of shape A after a reflection.

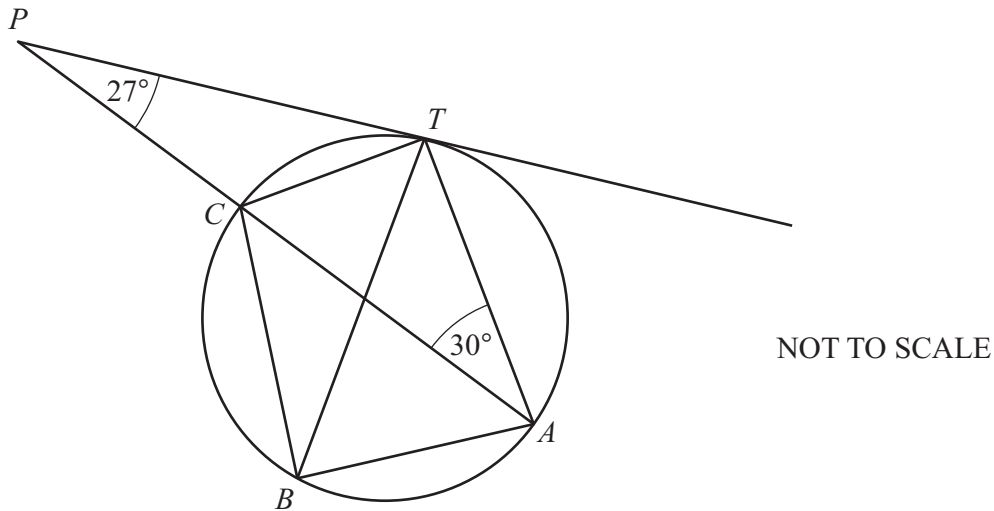
The coordinates of two of the vertices of shape C after the reflection are $(-3, 6)$ and $(-1, 6)$.

(i) Find the equation of the line of reflection.

..... [1]

(ii) Find the coordinates of the other two vertices of shape C after the reflection.

(.....,) and (.....,) [2]



A, B, C and T are points on the circumference of a circle.

PT is a tangent to the circle at T .

PCA is a straight line.

Angle $APT = 27^\circ$ and angle $TAP = 30^\circ$.

(a) Find angle TBC .

angle $TBC = \dots\dots\dots$ [1]

(b) Find angle PTC .

angle $PTC = \dots\dots\dots$ [1]

(c) Find angle ATC .

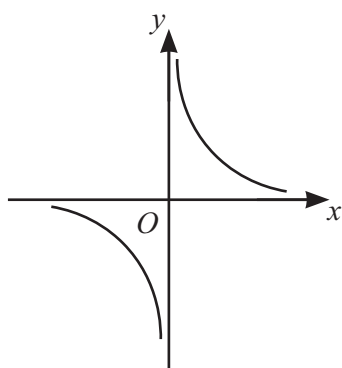
angle $ATC = \dots\dots\dots$ [2]

(d) Find angle ABC .

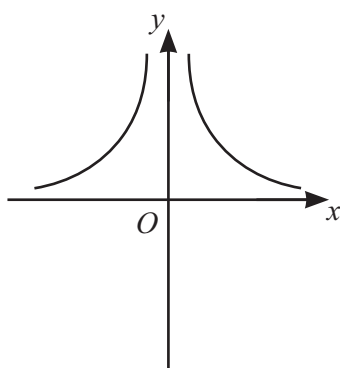
angle $ABC = \dots\dots\dots$ [1]



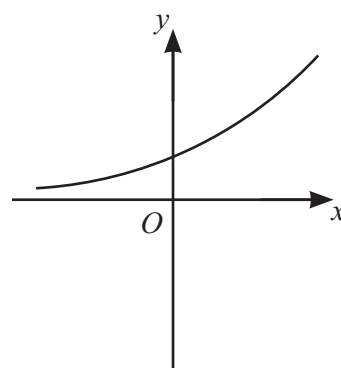
16 These are the sketches of six curves.



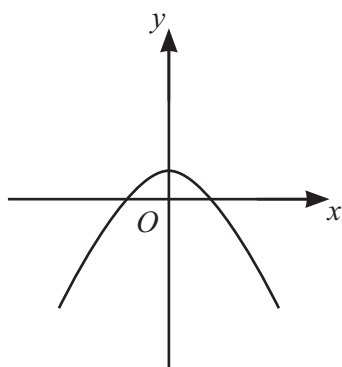
A



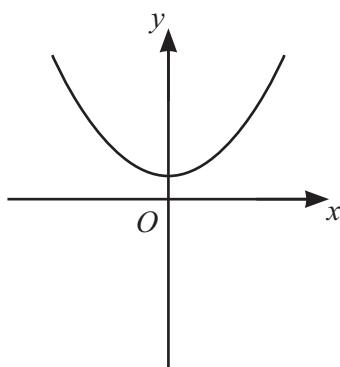
B



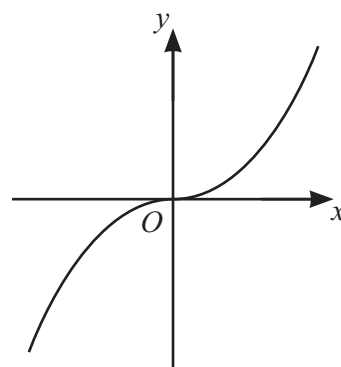
C



D



E



F

Complete each statement with the correct letter.

The sketch of the curve $y = x^2 + 1$ is

The sketch of the curve $y = 2^x$ is

The sketch of the curve $y = \frac{1}{x}$ is

[3]

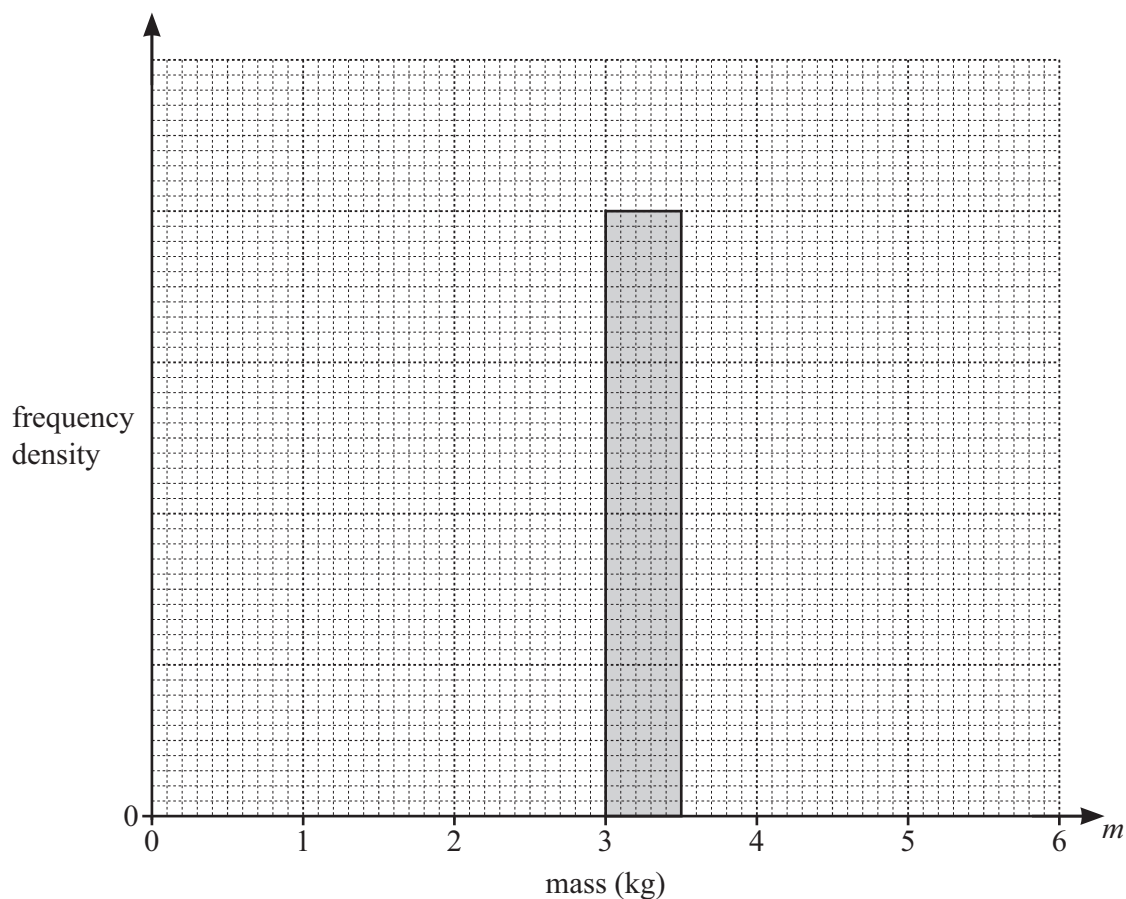


17 The table gives information about the masses of 36 parcels.

mass (m kg)	$1 < m \leq 2$	$2 < m \leq 3$	$3 < m \leq 3.5$	$3.5 < m \leq 4$	$4 < m \leq 6$
frequency	4	9	10	8	5

Complete the histogram to show this information.
Write the scale on the frequency density axis.

One bar has been drawn for you.



[4]



- 18 Rearrange the formula to make x the subject.

$$a = \frac{x+4}{7-x}$$

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

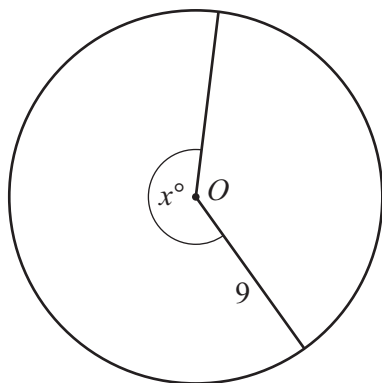
- 19 Line L passes through point $P(1, 7)$ and point $Q(3, -1)$.
Line N is perpendicular to line L and passes through point P .

Find the equation of line N .

Give your answer in the form $y = mx + c$.

$$y = \dots\dots\dots [4]$$





NOT TO SCALE

The diagram shows a circle with centre O and radius 9 cm.

The length of the minor arc is $\frac{15}{2}\pi$ cm.

Find the value of x .

$x = \dots\dots\dots [3]$





21 (a) Simplify.

$$\left(\frac{25}{x^4}\right)^{-\frac{3}{2}}$$

..... [2]

(b) Find the value of x .

$$8^x = 4^{x+3}$$

$x =$ [3]





22 (a) Simplify.

$$\sqrt{98} - \sqrt{18}$$

..... [2]

(b) Rationalise the denominator.

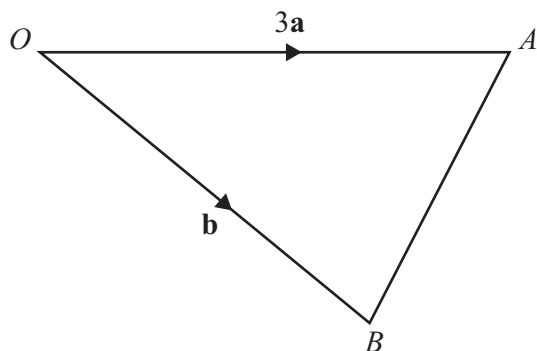
$$\frac{5}{3 + \sqrt{7}}$$

Give your answer in its simplest form.

..... [3]



23 OAB is a triangle.



NOT TO SCALE

$\vec{OA} = 3\mathbf{a}$ and $\vec{OB} = \mathbf{b}$.

(a) Find $\vec{AB}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

$\vec{AB} = \dots\dots\dots$ [1]

(b) X is a point on AB such that $AX:XB = 2:3$.

Find $\vec{OX}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.
Give your answer in its simplest form.

$\vec{OX} = \dots\dots\dots$ [3]

Question 24 is on the back page.





24 Write as a single fraction in its simplest form.

$$\frac{x+3}{x+1} - \frac{2}{x-4}$$

..... [4]

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