



Cambridge O Level

CANDIDATE
NAME

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MATHEMATICS (SYLLABUS D)

4024/23

Paper 2 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.
- You should use a scientific 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.
- For π , use either your calculator value or 3.142.

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. Any blank pages are indicated.

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 .

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

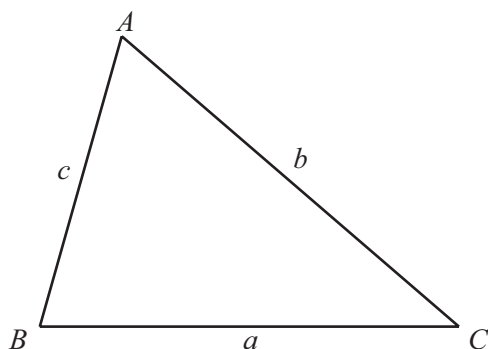
Volume, V , of sphere of radius r .

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

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,



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

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

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





1 (a) Write 412 396 correct to the nearest 100.

..... [1]

(b) Write 3.1349 correct to 2 decimal places.

..... [1]

2 Flo buys 5 cups of tea for \$2.50 each and 3 cups of coffee for \$3.40 each.

Work out how much change she receives from \$30.

\$ [3]

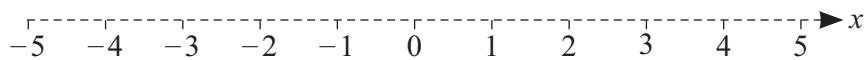


- 3 Three interior angles of a hexagon are 110° , 140° and 150° .
The other three interior angles are in the ratio $2 : 3 : 5$.

Calculate the size of the largest angle in the hexagon.

..... [4]

- 4 (a) Represent the inequality $-4 < x \leq 1$ on the number line.



[2]

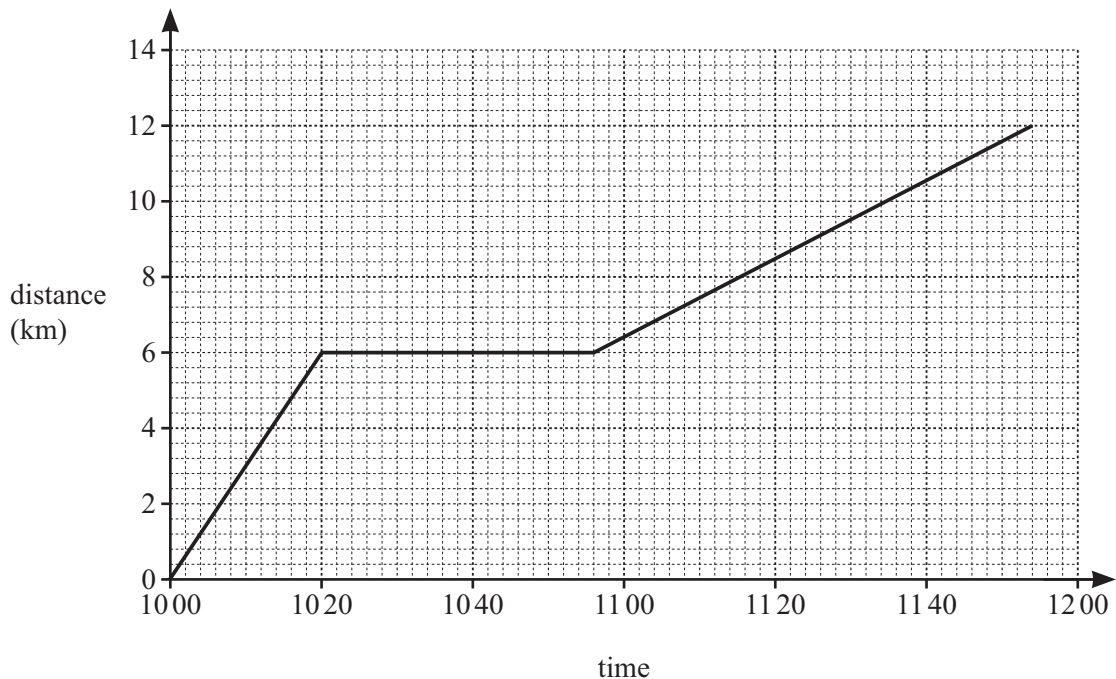
- (b) Solve.

$$3x < 6$$

..... [1]



5 The distance–time graph shows the journey of a bus.



(a) The bus is not moving for part of its journey.

Find the total time, in minutes, that the bus is **not** moving.

..... minutes [1]

(b) Calculate the average speed of the bus for the whole journey.

Give your answer in kilometres per hour.

..... km/h [3]

(c) A cyclist completes the same journey as the bus.

The cyclist travels at a constant speed.

The journey of the cyclist starts at 10 30 and finishes at 11 30.

(i) Draw a line on the distance–time graph to show the journey of the cyclist.

[2]

(ii) Find the distance from the start of the route to the point that the cyclist passes the bus.

..... km [1]

6 Factorise.

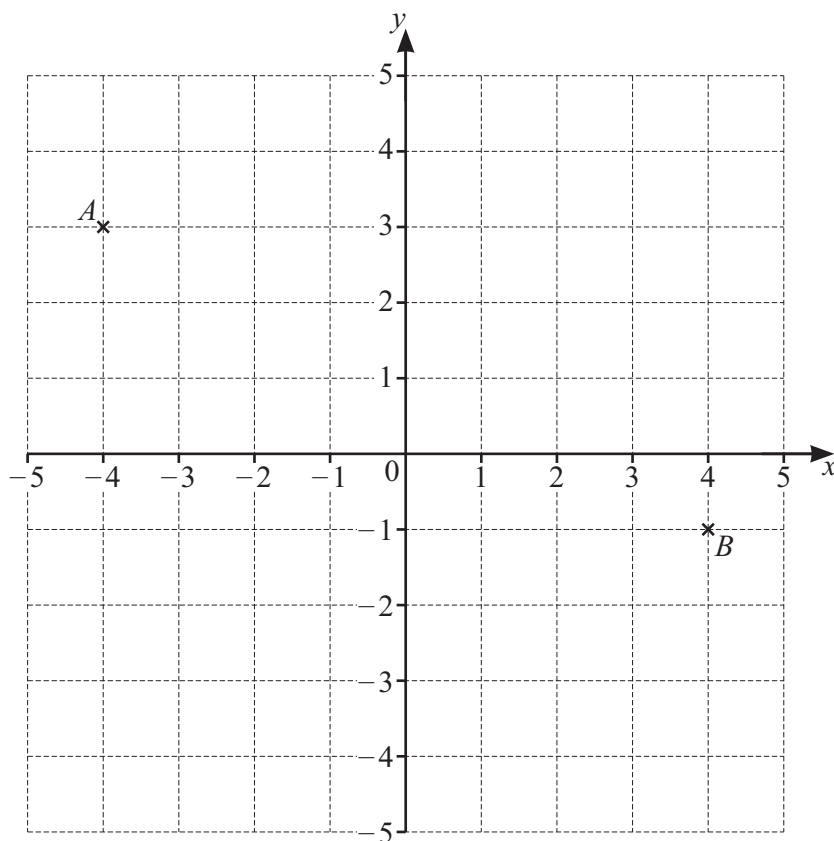
(a) $4a - 2$

..... [1]

(b) $3x^2 + 6x$

..... [2]

7 The diagram shows point A and point B .



(a) Write down the coordinates of point A .

(.....,) [1]

(b) Work out the gradient of AB .

..... [2]



8 Solve.

(a) $12x + 3 = 7$

$x = \dots\dots\dots$ [2]

(b) $\frac{8-y}{3} = 5$

$y = \dots\dots\dots$ [2]

9 D is the point $(3, -2)$ and E is the point $(-1, 8)$.

(a) Find $\overrightarrow{DE}$.

$\overrightarrow{DE} = \begin{pmatrix} \\ \end{pmatrix}$ [2]

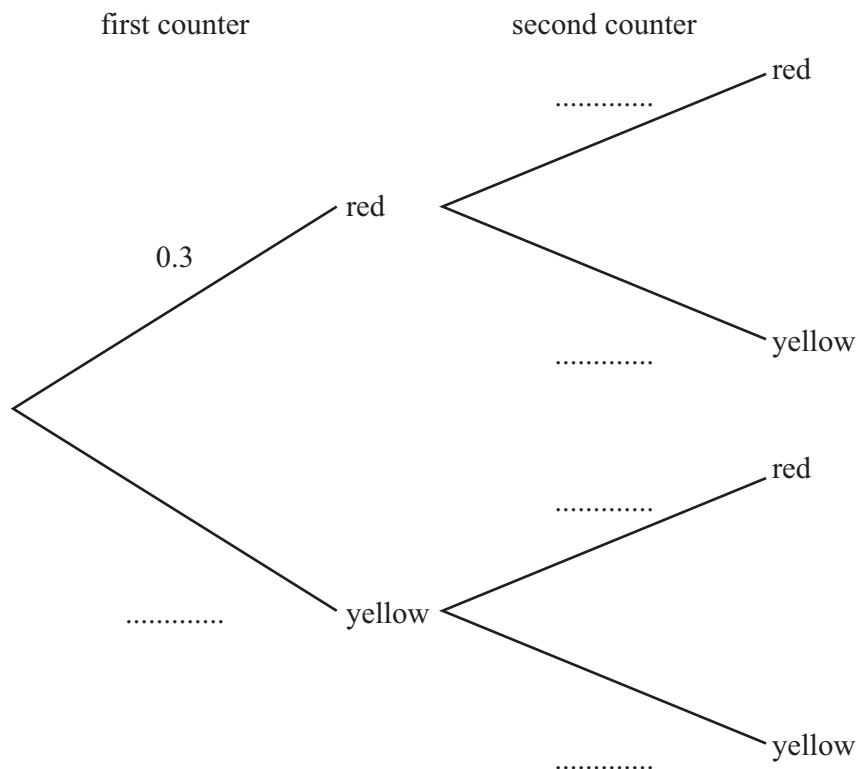
(b) $\overrightarrow{FE} = \begin{pmatrix} 2 \\ -4 \end{pmatrix}$

Find the coordinates of point F .

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

- 10 A bag contains red counters and yellow counters.
The probability of choosing a red counter is 0.3 .
A counter is chosen at random from the bag and is then replaced.
A second counter is then chosen at random.

(a) Complete the tree diagram.



[2]

(b) Work out the probability that both counters are yellow.

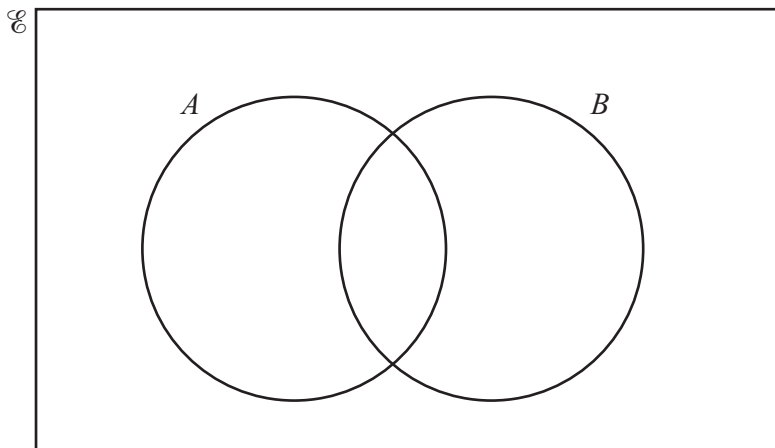
..... [1]





- 11 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
 $A = \{x : x \text{ is a factor of } 10\}$
 $B = \{x : x \text{ is a multiple of } 2\}$

(a) Complete the Venn diagram.



[2]

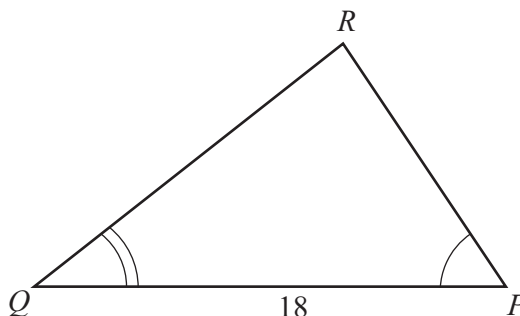
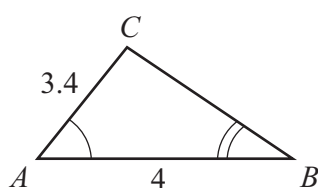
(b) List the elements of $(A \cup B)'$.

..... [1]

(c) Find $n(A' \cup B)$.

..... [1]





NOT TO SCALE

Triangle ABC is mathematically similar to triangle PQR .
 Angle $BAC = \text{angle } QPR$ and angle $ABC = \text{angle } PQR$.
 $AC = 3.4 \text{ cm}$, $AB = 4 \text{ cm}$ and $PQ = 18 \text{ cm}$.

(a) Work out PR .

$PR = \dots\dots\dots \text{ cm}$ [2]

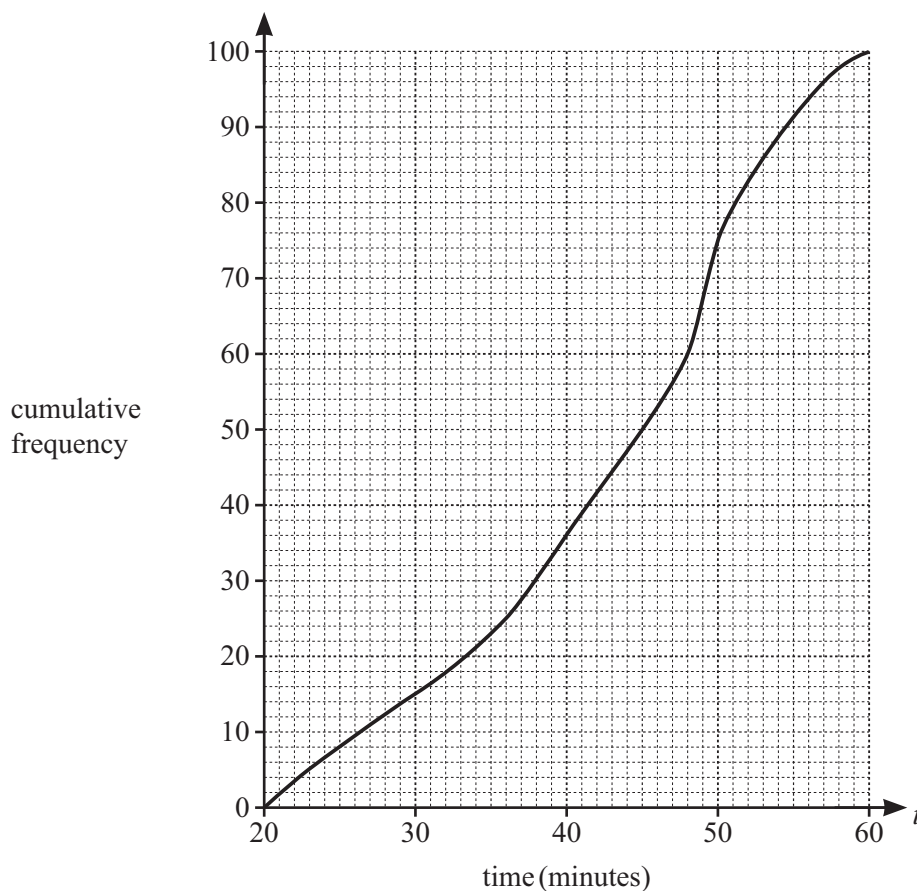
(b) The area of triangle PQR is 56.7 cm^2 .

Calculate the area of triangle ABC .

$\dots\dots\dots \text{ cm}^2$ [2]



- 13 A group of 100 students each solve a problem.
The cumulative frequency diagram shows the times taken to solve the problem.



- (a) Use the cumulative frequency diagram to find an estimate for

- (i) the median

..... minutes [1]

- (ii) the interquartile range.

..... minutes [2]

- (b) Complete the frequency table.

time (t minutes)	$20 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$
frequency	15			

[2]



- 14 The price of a computer is reduced by 18% in a sale.
The sale price of the computer is \$303.40 .

Calculate the price of the computer before the sale.

\$ [2]

15 $f(x) = 6x + 8$ $g(x) = \frac{x-1}{3}$

(a) Find $f(-1)$.

..... [1]

(b) Find $g^{-1}(x)$.

$g^{-1}(x) =$ [2]

(c) Solve $fg(x) = 14$.

$x =$ [3]



- 16 The table shows the times taken by 50 children to complete their homework.

time (t minutes)	$10 < t \leq 30$	$30 < t \leq 50$	$50 < t \leq 70$	$70 < t \leq 90$
frequency	12	18	14	6

- (a) Write down the modal class.

..... $< t \leq$ [1]

- (b) Calculate an estimate of the mean time taken to complete the homework.

..... minutes [4]

- (c) One of the 50 children is chosen at random.

Find the probability that this child took 30 minutes or less to complete their homework.

..... [1]



- 17 Zahir invests \$3000 in a savings account which pays compound interest at a rate of $x\%$ per year. At the end of 6 years, there is \$3918 in the account.

Calculate the value of x .

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

- 18 The width, w cm, of a rectangle is 7 cm, correct to the nearest centimetre.

(a) Complete this statement about the value of w .

$$\dots\dots\dots \leq w < \dots\dots\dots [2]$$

- (b) The area of the same rectangle is 161.8 cm^2 , correct to the nearest 0.1 cm^2 .

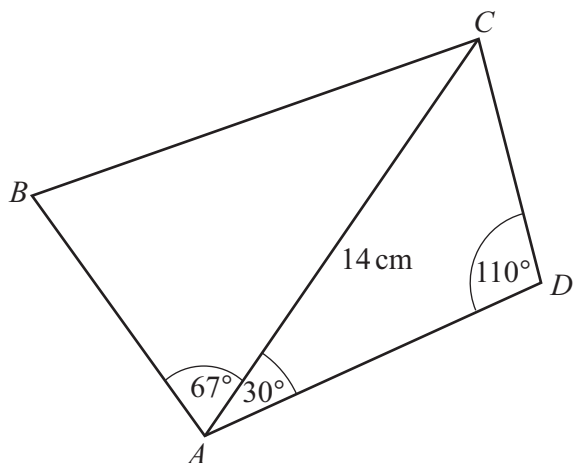
Calculate the upper bound for the length of the rectangle.

$$\dots\dots\dots \text{ cm} [2]$$





19 The diagram shows quadrilateral $ABCD$.



NOT TO SCALE

(a) Calculate AD .

..... cm [3]

(b) The area of triangle ABC is 50.9 cm^2 .

Show that $AB = 7.9 \text{ cm}$, correct to 1 decimal place.

[2]

(c) Calculate BC .

..... cm [3]



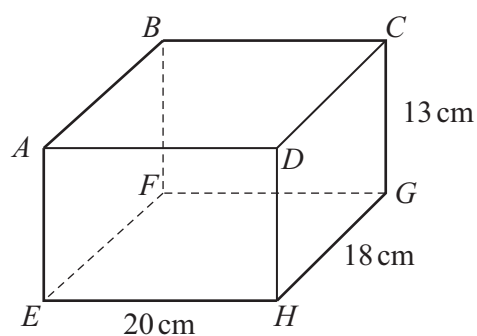


- 20 a is inversely proportional to the cube of c .
When $a = -200$, $c = 0.1$.

Find a when $c = 2$.

$a = \dots\dots\dots$ [3]

- 21 The diagram shows a cuboid.



NOT TO SCALE

Calculate the angle between EC and the face $ABFE$.

$\dots\dots\dots$ [4]





22 (a) Expand.

$$3(x - 5)$$

..... [1]

(b) Expand and simplify.

$$(x + 1)(2x - 3)(x + 4)$$

..... [3]





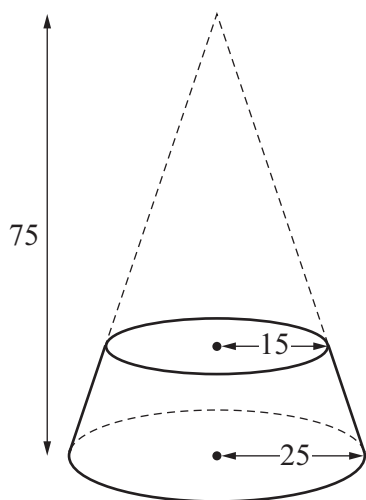
23 Simplify.

$$\frac{3x^2 - 11x - 4}{2x^2 - 32}$$

..... [5]



- 24 The diagram shows the frustum of a cone.
All the lengths are in centimetres.



NOT TO SCALE

Calculate the total surface area of the frustum.

..... cm^2 [6]



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