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International Education

Cambridge O Level

CANDIDATE NAME

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7482821900

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.

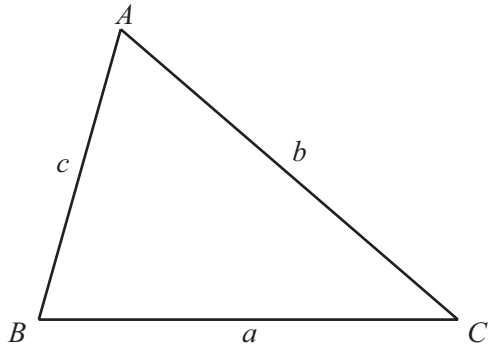
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List of formulas

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,



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

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

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

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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]

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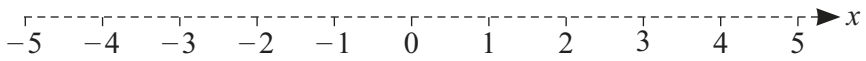
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3 Three interior angles of a hexagon are 110°, 140° and 150°.
The other three interior angles are in the ratio $2 : 3 : 5$.

Calculate the size of the largest angle in the hexagon.

..... [4]

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



[2]

(b) Solve.

$3x < 6$

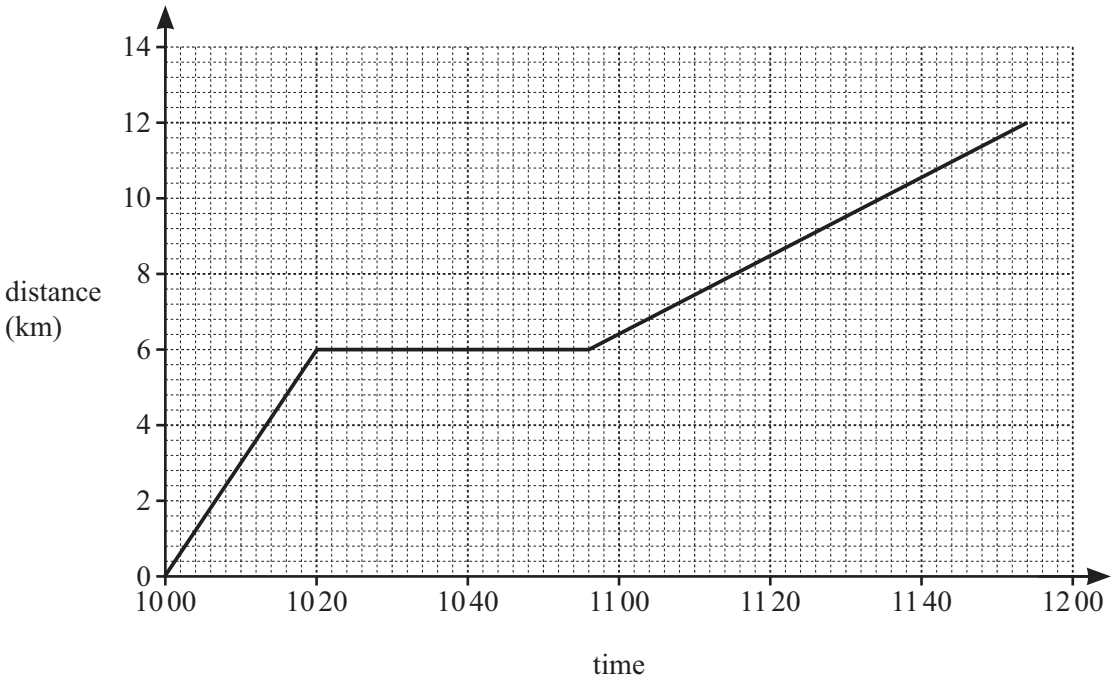
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5 The distance–time graph shows the journey of a bus.



(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]

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6 Factorise.

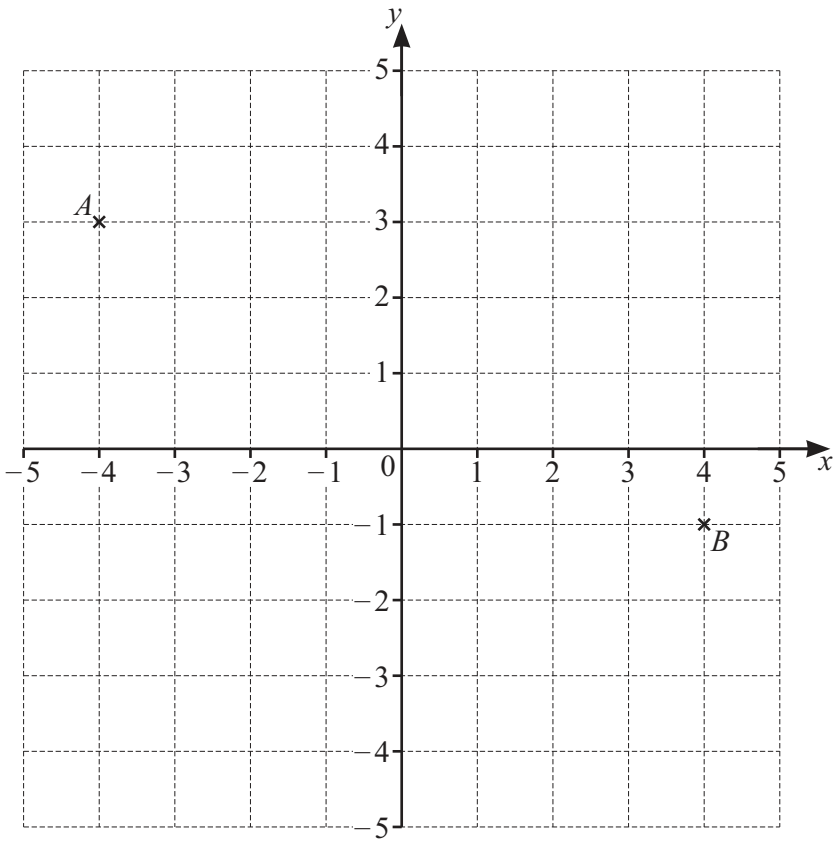
(a) $4a - 2$

..... [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]

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8 Solve.

(a) $12x + 3 = 7$

$x =$ ..... [2]

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

$y =$ ..... [2]

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

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

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

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

Find the coordinates of point F.

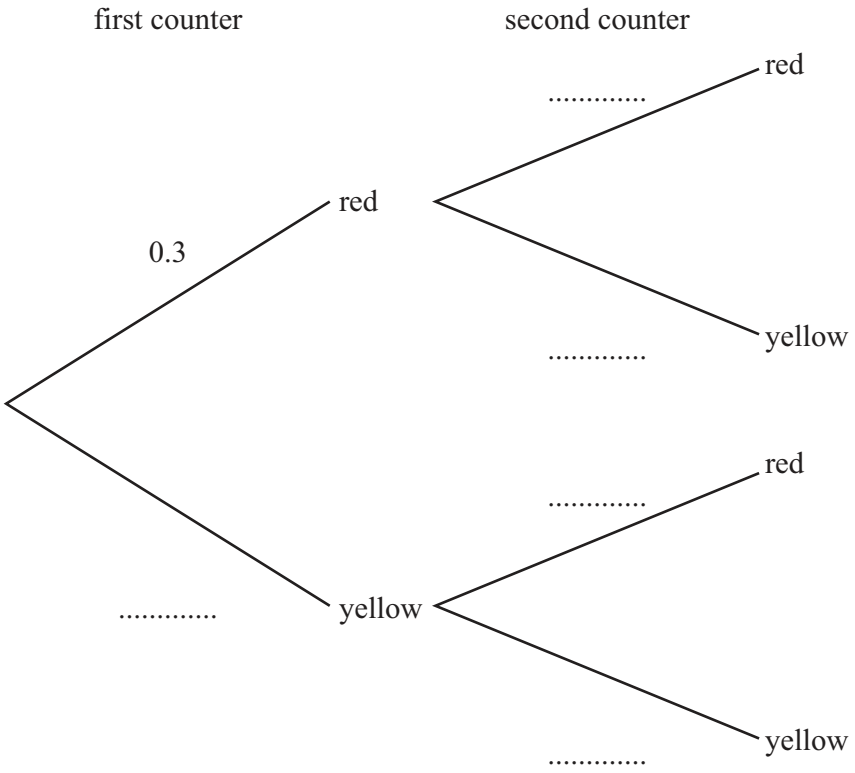
(..... , ...) [2]

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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]

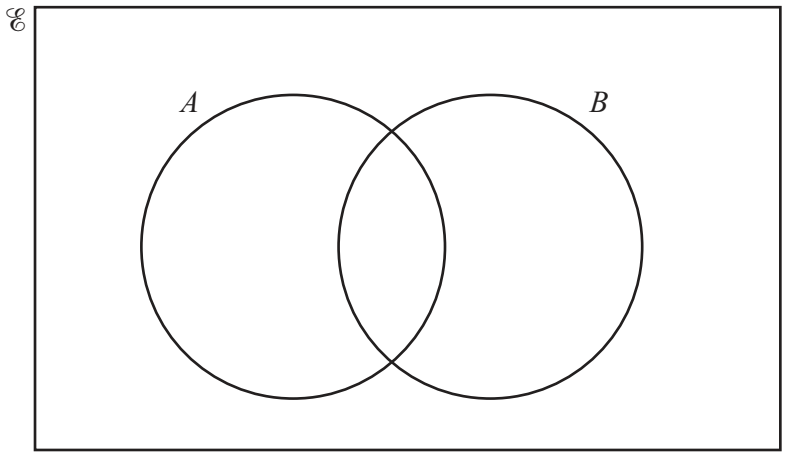
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11 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{x : x \text{ is a factor of } 10\}$
$B = \{x : x \text{ is a multiple of } 2\}$

(a) Complete the Venn diagram.



[2]

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

..... [1]

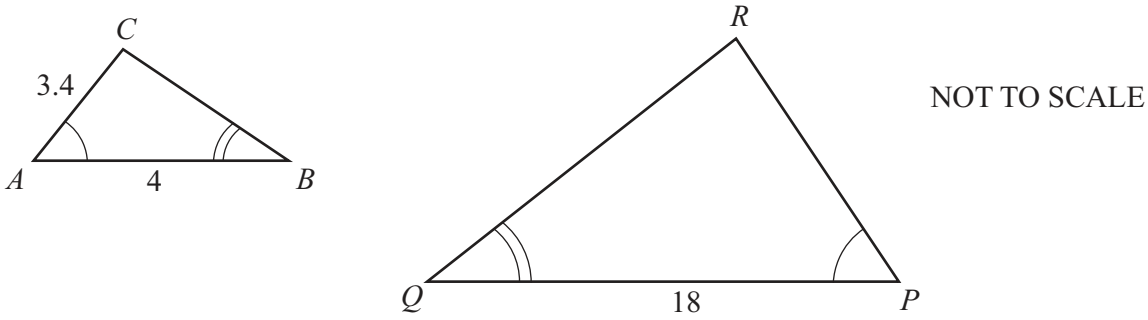
(c) Find $\mathrm{n}(A' \cup B)$.

..... [1]

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12



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

(a) Work out PR.

$PR =$ ..... cm [2]

(b) The area of triangle PQR is $56.7\,\text{cm}^2$.

Calculate the area of triangle ABC.

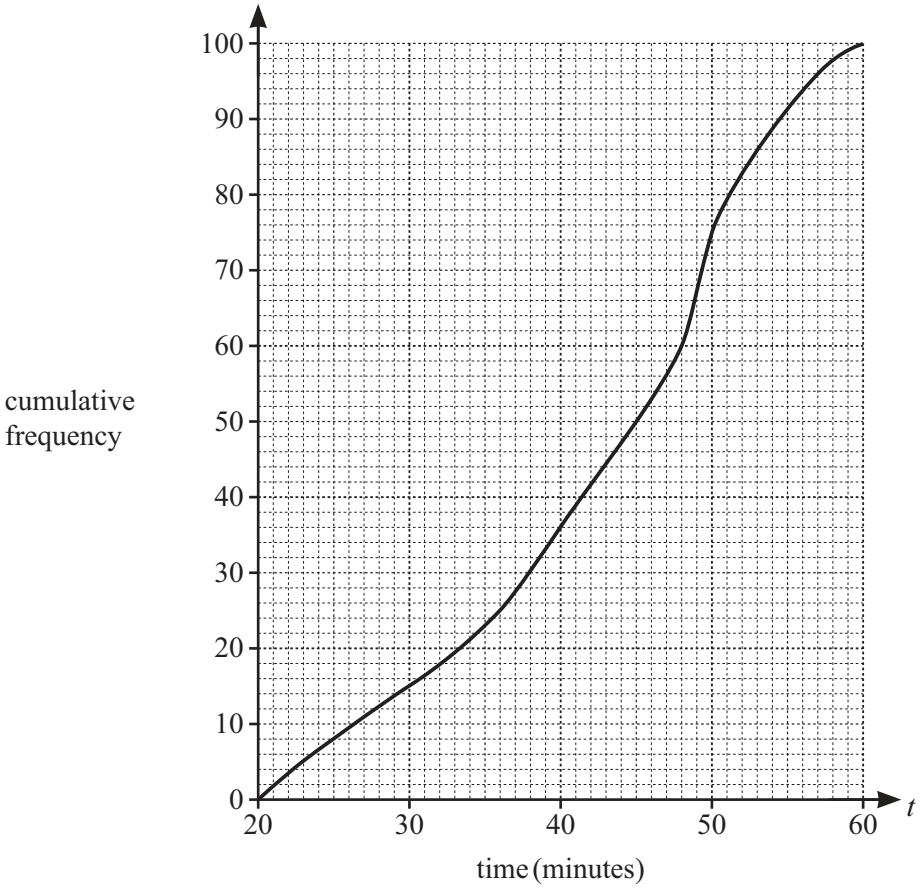
..... cm^2 [2]

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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)	$20 < t \leqslant 30$	$30 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 60$
frequency	15			

[2]

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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]

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

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

(a) Write down the modal class.

..... $< t \leqslant$ ..... [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]

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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.

$x =$ ..... [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.

..... $\leqslant w <$ ..... [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.

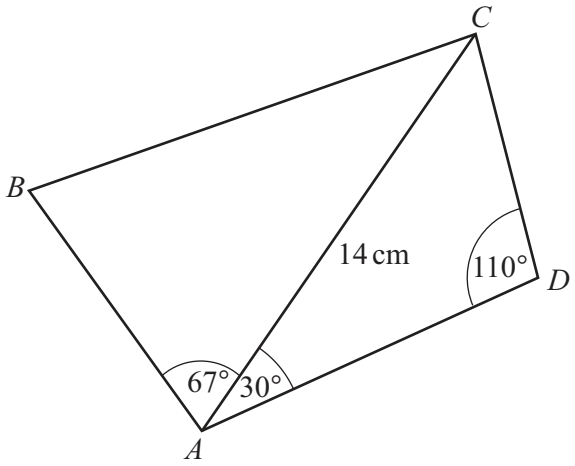
..... cm [2]

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19 The diagram shows quadrilateral $ABCD$.



NOT TO SCALE

(a) Calculate AD.

..... cm [3]

(b) The area of triangle ABC is $50.9\,\text{cm}^2$.

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

[2]

(c) Calculate BC.

..... cm [3]

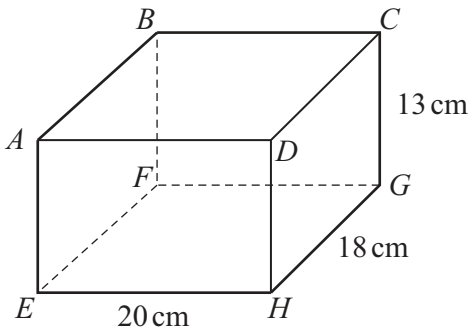
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20 a is inversely proportional to the cube of c.
When $a = -200$, $c = 0.1$.

Find a when $c = 2$.

$a =$ ..... [3]

21 The diagram shows a cuboid.



NOT TO SCALE

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

..... [4]

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22 **(a)** Expand.

$3(x-5)$

..... [1]

(b) Expand and simplify.

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

..... [3]

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23 Simplify.

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

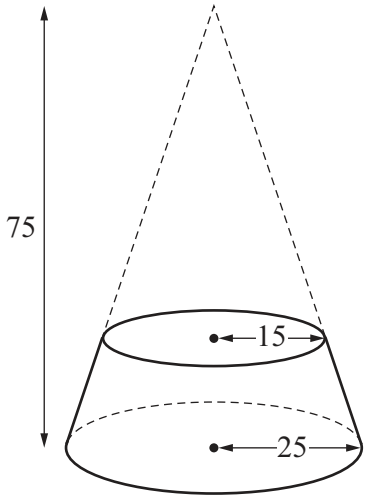
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24 The diagram shows the frustum of a cone.
All the lengths are in centimetres.



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Calculate the total surface area of the frustum.

..... cm^2 [6]

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