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CANDIDATE NAME

CENTRE NUMBER

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MATHEMATICS **0580/43**

Paper 4 Calculator (Extended) **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.

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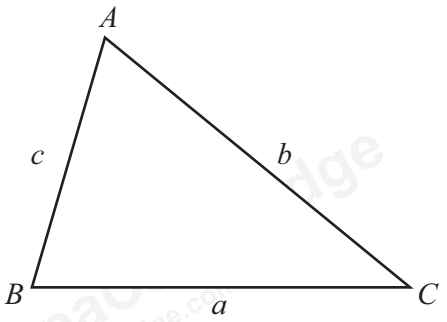
List of formulas

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 Complete the statement.

$$\frac{4}{7} = \frac{\square}{56}$$

[1]

2 Work out 55% of 12.2 .

..... [1]

3 Calculate $\dfrac{0.7 - 3.5^3}{4.2^2}$ giving your answer correct to 2 significant figures.

..... [2]

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4 Kit and Jo are changing some money.
The exchange rate is \$1 = 0.93 euros.

(a) Kit changes \$350 into euros.

Calculate the amount, in euros, that Kit receives.

..... euros [1]

(b) Jo changes 150 euros into dollars (\$).

Calculate the amount, in dollars, that Jo receives.

\$ ..... [1]

5 Ruta and Zoli share some money in the ratio 7 : 3.
Ruta receives \$420 more than Zoli.

Work out how much money Ruta and Zoli each receive.

Ruta \$ .....

Zoli \$ .....

[3]

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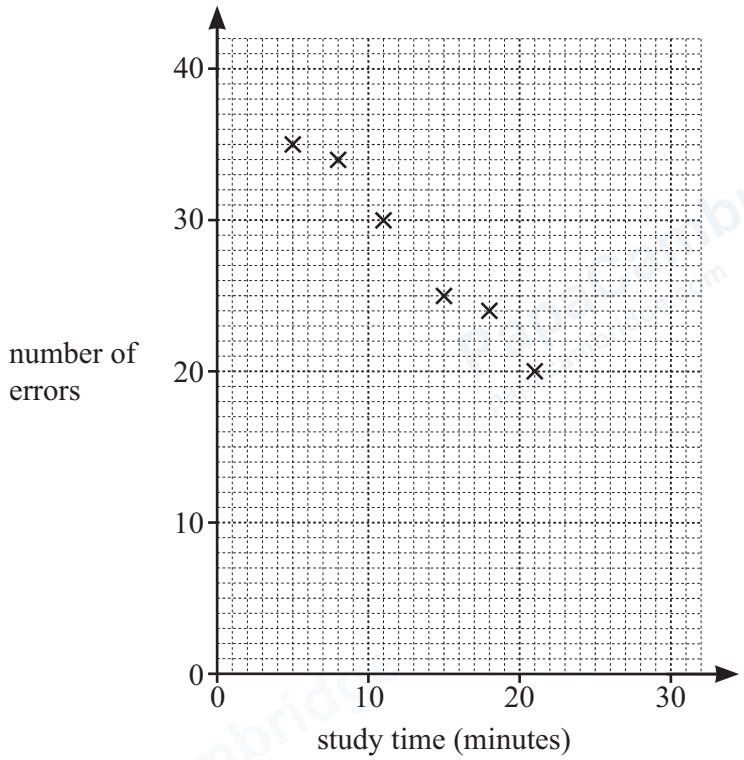
6 The table shows the time 9 students each spent studying for a test and the number of errors each student made in the test.

study time (minutes)	5	8	11	15	18	21	25	27	31
number of errors	35	34	30	25	24	20	13	9	6

(a) Complete the scatter diagram.
The first 6 points have been plotted for you.



[2]

(b) What type of correlation is shown in the scatter diagram?

..... [1]

(c) Draw a line of best fit on the scatter diagram. [1]

(d) Another student studies for 13 minutes.

Use your line of best fit to estimate the number of errors this student is expected to make in the test.

..... [1]

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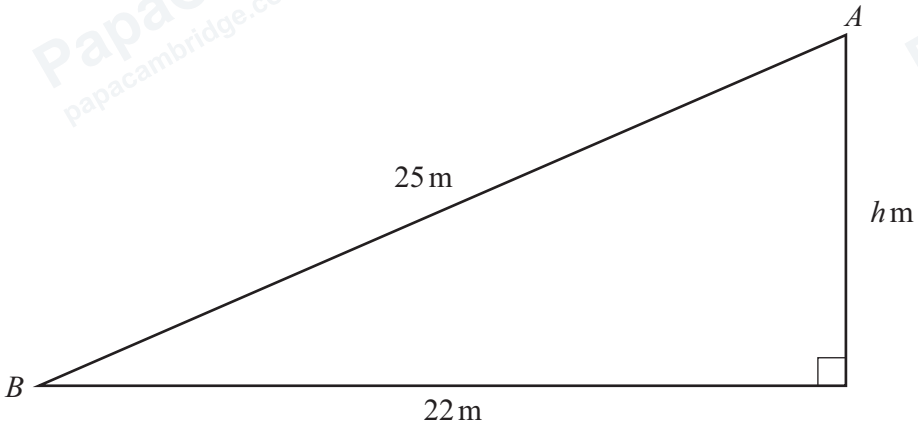

NOT TO SCALE

The point A is on the top of a vertical building.
The horizontal distance from the base of the building to B is 22 m.
$AB = 25$ m and the height of the building is h m.

(a) Find the value of h.

$h =$ ..... [3]

(b) Work out the angle of depression of B from A.

..... [2]

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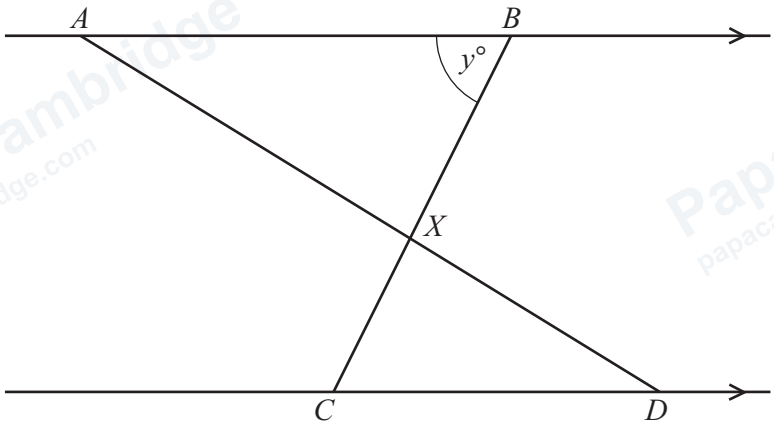

NOT TO SCALE

AB and CD are parallel lines.
AD and BC are straight lines that intersect at X.
Angle $ABX = y°$.

(a) Complete the statement with a geometrical reason.

Angle $DCX = y°$ because ..... [1]

(b) Triangle ABX is similar to triangle DCX.

$CX = 5$ cm, $XD = 8$ cm and $AD = 20$ cm.

(i) Find BX.

$BX =$ ..... cm [2]

(ii) Angle $CXD = 80.5°$.

Work out the area of triangle CXD.

..... cm^2 [2]

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9 The table shows the marks of 100 students in a test.

mark	$0 < x \leqslant 20$	$20 < x \leqslant 40$	$40 < x \leqslant 60$	$60 < x \leqslant 80$	$80 < x \leqslant 100$
frequency	4	20	31	34	11

(a) Write down the modal class.

..... $< x \leqslant$ ..... [1]

(b) Calculate an estimate of the mean.

..... [4]

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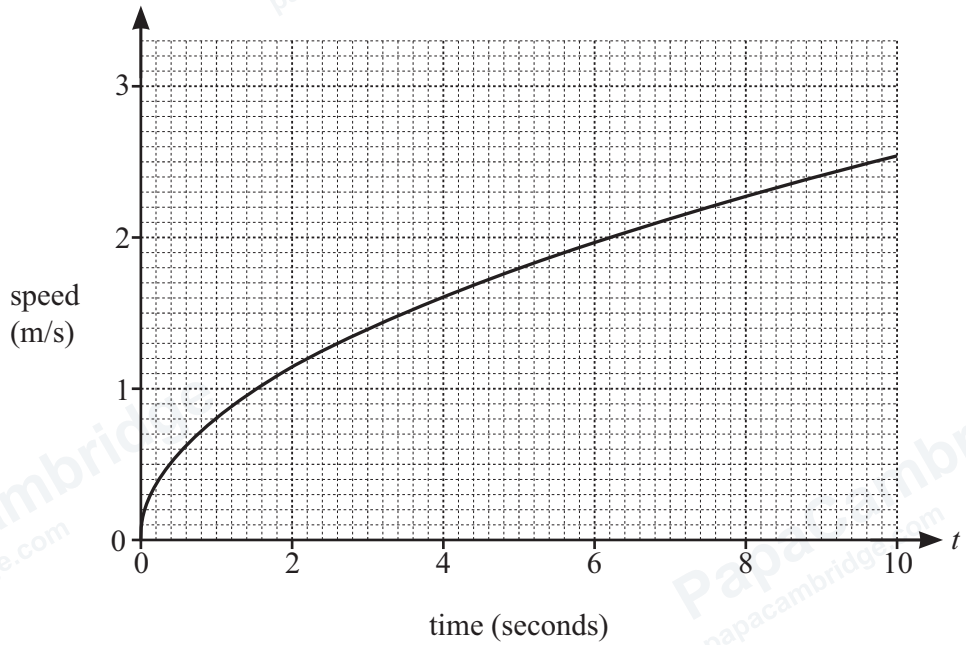
10 Llew cycles to school.

(a) The speed–time graph shows the first 10 seconds of his journey.



By drawing a suitable tangent, estimate the acceleration at $t = 2$.

..... m/s^2 [2]

(b) Llew cycles to school at an average speed of 18.9 kilometres per hour.

Write this speed in metres per second.

..... m/s [2]

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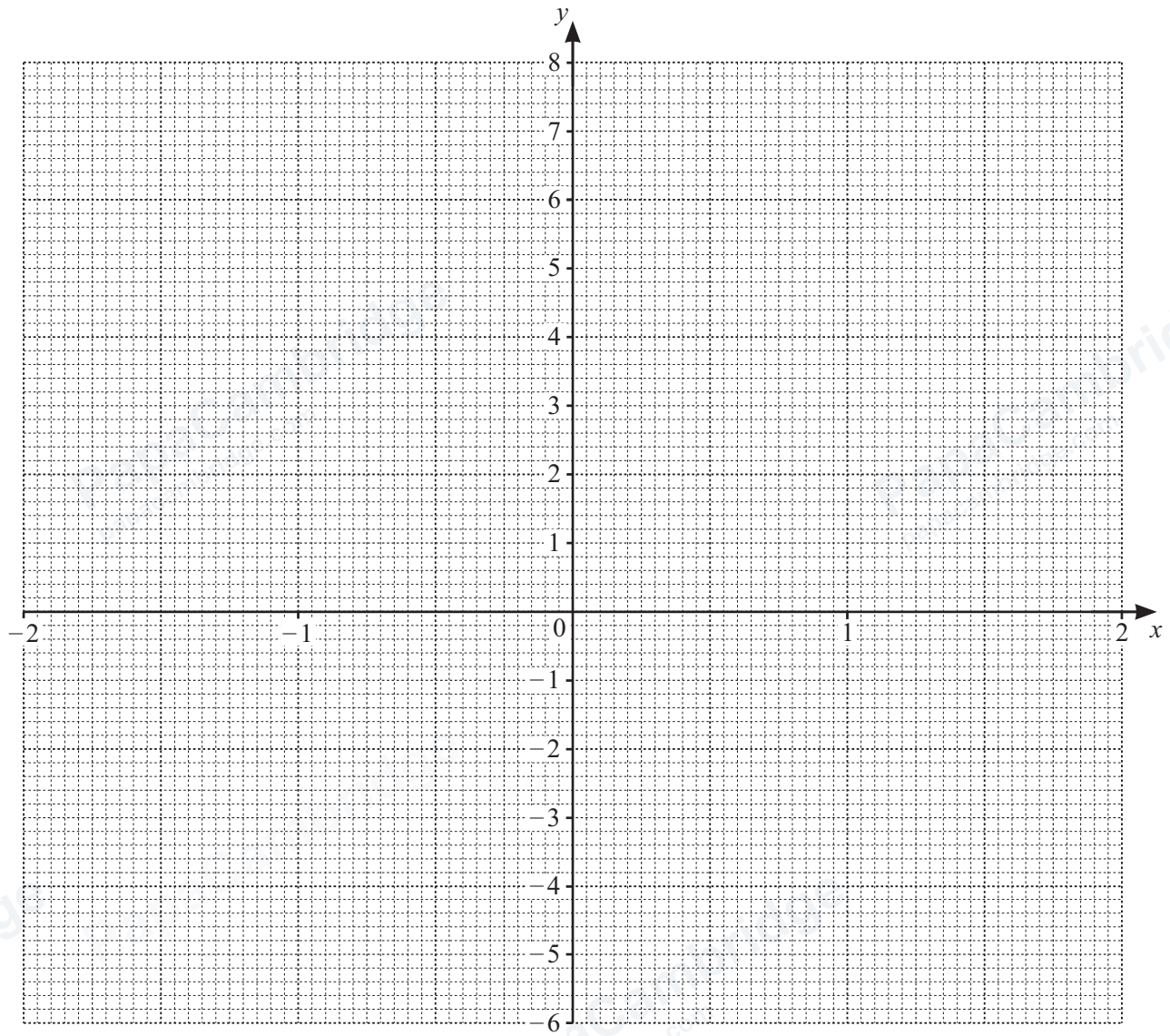
11 The table shows some values for $y = 3 \times 2^x - 5$ correct to 1 decimal place.

x	−2	−1.5	−1	−0.5	0	0.5	1	1.5	2
y		−3.9		−2.9		−0.8	1	3.5	7

(a) Complete the table. [3]

(b) Draw the graph of $y = 3 \times 2^x - 5$ for $-2 \leqslant x \leqslant 2$.



[4]

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(c) By drawing a suitable line on the graph, solve the equation $3 \times 2^x = 7$.

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

(d) Find the equation of the asymptote to the graph of $y = 3 \times 2^x - 5$.

..... [1]

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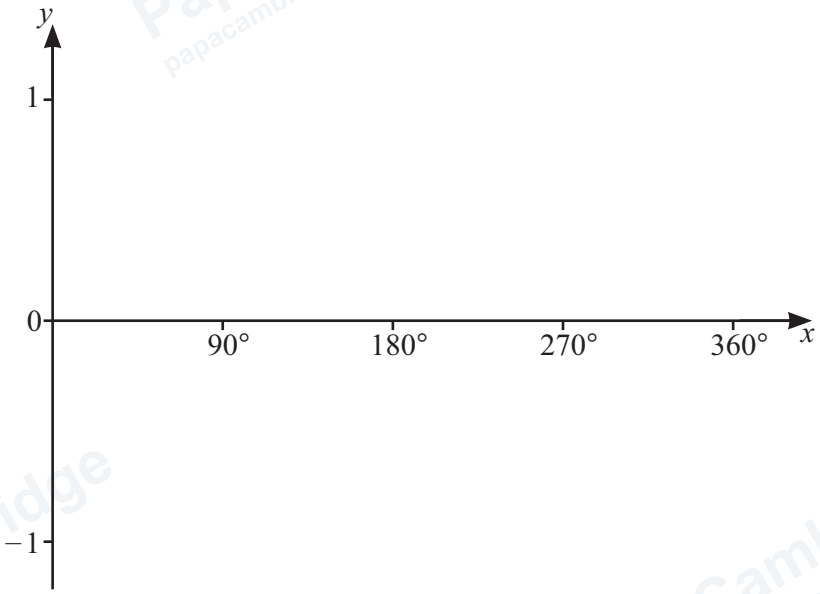
12 **(a)** Sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$.



[2]

(b) Solve the equation $3\cos x + 1 = 0$ for $0° \leqslant x \leqslant 360°$.

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

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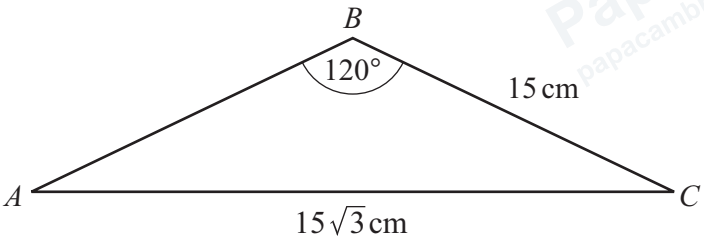

NOT TO SCALE

The diagram shows triangle ABC.
$BC = 15$ cm, $AC = 15\sqrt{3}$ cm and angle $ABC = 120°$.

(a) Show that triangle ABC is an isosceles triangle.

[4]

(b) Calculate the shortest distance from B to AC.

..... cm [3]

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14 A is the point (5, 2) and B is the point (−3, 6).

(a) Calculate the length of AB.

..... [3]

(b) Find the equation of the line perpendicular to AB that passes through the point (–2, 5).
Give your answer in the form $y = mx + c$.

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

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15 The sides of a triangle are 5 cm, 7 cm and 11 cm.

Find the size of the largest angle in this triangle.

..... [3]

16 A rectangle measures 4.2 cm by 6.8 cm.
Each measurement is given correct to the nearest millimetre.

Calculate the lower bound of the area of the rectangle.

..... cm^2 [2]

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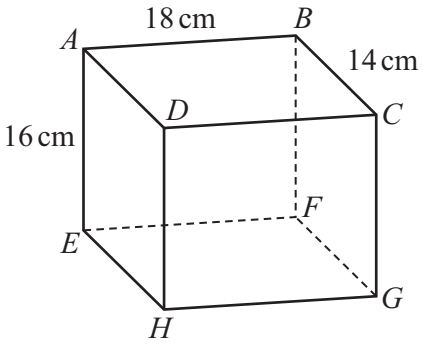

NOT TO SCALE

The diagram shows a cuboid, $ABCDEFGH$.
$AB = 18$ cm, $BC = 14$ cm and $AE = 16$ cm.

Calculate the length of the diagonal AG.

..... cm [3]

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18 **(a)** $f(x) = 3x + 1$ $g(x) = 5 - 3x$

(i) Find x when $f(x) = g(x)$.

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

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

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

(iii) Find $gg(x)$.
Give your answer in its simplest form.

$gg(x) =$ ..... [2]

(b) $h(x) = 2^{2x}$

Find x when $h^{-1}(x) = 2$.

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

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19 **(a)** Lee invests \$2000 in an account that pays simple interest at a rate of 3.5% per year.

Work out the **total** value of the investment at the end of 4 years.

\$ ..... [3]

(b) Mia invests \$3000 in an account that pays compound interest at a rate of 3.2% per year.

Find the number of complete years it takes for the value of Mia's investment to become greater than \$4800.

..... [3]

(c) Ryan invests some money.
The value of the investment increases exponentially at a rate of r% per year.
At the end of 6 years, the value of the original investment has increased by 19.4%.

Find the value of r.

$r =$ ..... [3]

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20 **(a)** Find the coordinates of the turning points of the graph $y = 8x^3 - 6x + 5$.
You must show all your working.

(..... , ...)

(..... , ...)
[5]

(b) Determine whether each turning point is a maximum or a minimum.
Show how you decide.

[3]

Question 21 is on the back page.

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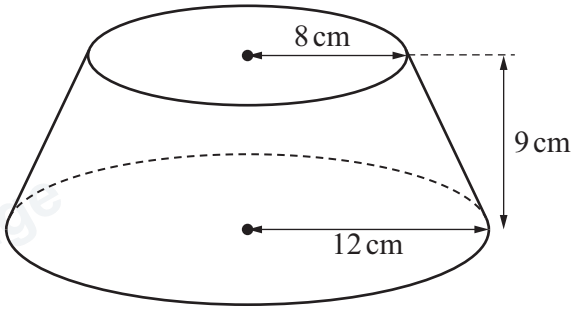

The diagram shows a frustum.

Calculate the volume of the frustum.

..... cm^3 [5]

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