

Q1.

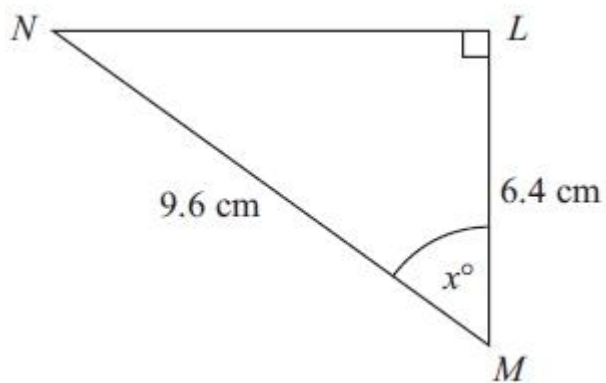


Diagram **NOT** accurately drawn

LMN is a right-angled triangle.

$MN = 9.6 \text{ cm}$.

$LM = 6.4 \text{ cm}$.

Calculate the size of the angle marked x° .

Give your answer correct to 1 decimal place.

.....^o

(Total for Question is 3 marks)

Q1.

Question	Working	Answer	Mark	Notes
	$\cos x = \frac{6.4}{9.6}$ $x = \cos^{-1} \frac{6.4}{9.6} =$	48.2	3	<p>M1 for $\cos x = \frac{6.4}{9.6}$ or $\cos x = 0.66(6\dots)$ or $\cos x = 0.67$ M1 for $\cos^{-1} \frac{6.4}{9.6}$ or $\cos^{-1} 0.66(6\dots)$ or $\cos^{-1} 0.67$ A1 for 48.1 – 48.2</p> <p>OR Correct use of Pythagoras and then trigonometry, no marks until M1 for $\sin x = \frac{7.155}{9.6}$ or $\tan x = \frac{7.155}{6.4}$ or $\sin x = \frac{7.155}{9.6} \times \sin 90$ or $\cos x = \frac{6.4^2 + 9.6^2 - 7.155^2}{2 \times 6.4 \times 9.6}$ M1 for $\sin^{-1} \frac{7.155}{9.6}$ or $\tan^{-1} \frac{7.155}{6.4}$ or $\sin^{-1} \left(\frac{7.155}{9.6} \times \sin 90 \right)$ or $\cos^{-1} \left(\frac{6.4^2 + 9.6^2 - 7.155^2}{2 \times 6.4 \times 9.6} \right)$ A1 for 48.1 – 48.2 SC B2 for 0.841... (using rad) or 53.5... (using grad)</p>

Q2.

The diagram shows a quadrilateral $ABCD$.

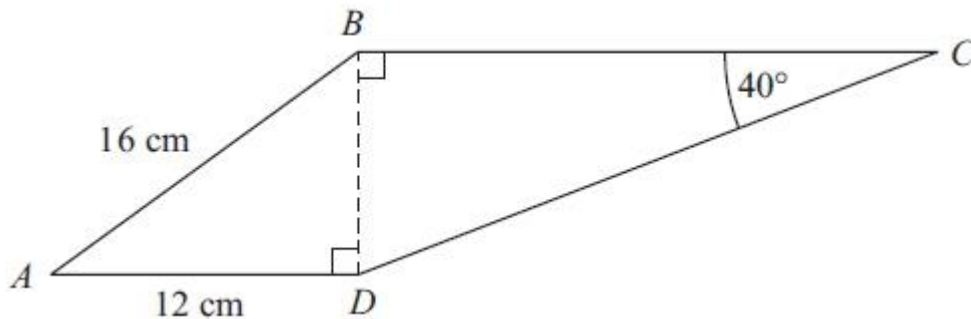


Diagram **NOT** accurately

drawn

$AB = 16\text{ cm}$.

$AD = 12\text{ cm}$.

Angle $BCD = 40^\circ$.

Angle $ADB = \text{angle } CBD = 90^\circ$.

Calculate the length of CD .

Give your answer correct to 3 significant figures.

..... cm

(Total for Question is 5 marks)

Q2.

Question	Working	Answer	Mark	Notes
	$BD^2 + 12^2 = 16^2$ oe $BD = \sqrt{256 - 144}$ (=10.58...) $\sin 40 = '10.58' / CD$ $CD = '10.58' / \sin 40$	16.5	5	M1 for $BD^2 + 12^2 = 16^2$ oe or $16^2 - 12^2$ or 112 seen M1 for $\sqrt{256 - 144}$ or $\sqrt{112}$ (=10.58...) M1 for $\sin 40 = '10.58' / CD$ or $\cos 50 = '10.58' / CD$ M1 for $(CD =) '10.58' / \sin 40$ or $'10.58' / \cos 50$ A1 for 16.4 – 16.5 OR M1 for $BD^2 + 12^2 = 16^2$ oe or $16^2 - 12^2$ or 112 seen M1 for $\sqrt{256 - 144}$ or $\sqrt{112}$ (=10.58...) M1 for $(BC =) '10.58' \times \tan 50$ or $'10.58' / \tan 40 (=12.6...)$ M1 for $\sqrt{'12.6'^2 + '10.58...'^2}$ A1 for 16.4 – 16.5

Q3.

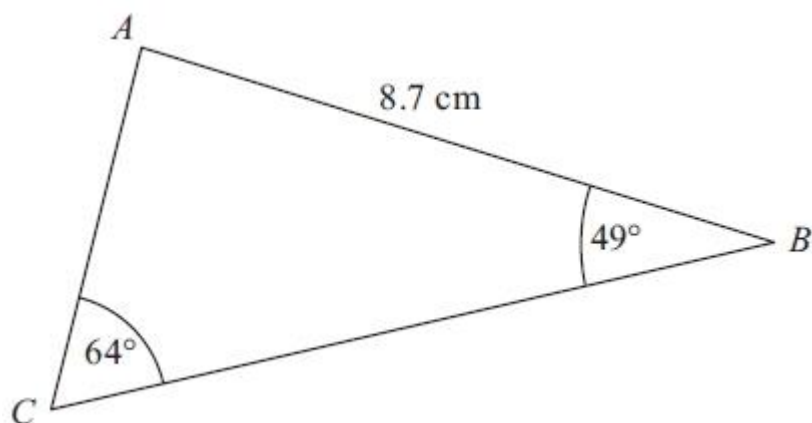


Diagram **NOT** accurately drawn

ABC is a triangle.

$AB = 8.7$ cm.

Angle $ABC = 49^\circ$.

Angle $ACB = 64^\circ$.

Calculate the area of triangle ABC .

Give your answer correct to 3 significant figures.

..... cm²

(Total for Question is 5 marks)

Q3.

Question	Working	Answer	Mark	Notes
	$\frac{AC}{\sin 49} = \frac{8.7}{\sin 64}$ $AC = \frac{8.7}{\sin 64} \times \sin 49$ $(\approx 7.305\dots)$ $\frac{1}{2} \times 8.7 \times 7.305\dots \times \sin$ $(180 - 64 - 49)$	29.3	5	<p>M1 for $\frac{AC}{\sin 49} = \frac{8.7}{\sin 64}$ oe M1 for $(AC =) \frac{8.7}{\sin 64} \times \sin 49$ A1 for 7.3(05...) M1 for $\frac{1}{2} \times 8.7 \times '7.305' \times \sin(180 - 64 - 49)$ A1 for 29.19 - 29.3</p> <p>OR</p> $\text{M1 for } \frac{BC}{\sin(180 - 64 - 49)} = \frac{8.7}{\sin 64} \text{ oe}$ <p>M1 for $(BC =) \frac{8.7}{\sin 64} \times \sin '67'$ A1 for 8.9(10...) M1 for $\frac{1}{2} \times 8.7 \times '8.910' \times \sin 49$ A1 for 29.19 - 29.3</p> <p>OR</p> <p>(X is point such that AX is perpendicular to BC) M1 for $AX = 8.7 \times \sin 49$ (= 6.565...) or $XB = 8.7 \times \cos 49$ (= 5.707...) M1 for $XB = 8.7 \times \cos 49$ (= 5.707...) and $CX = '6.565' \div \tan 64$ oe (= 3.202...) A1 for 8.9(10...) or 5.7(07...) and 3.2(02...) M1 for $\frac{1}{2} \times '6.565...' \times ('5.707' + '3.202')$ oe A1 for 29.19 - 29.3</p>

Q4.

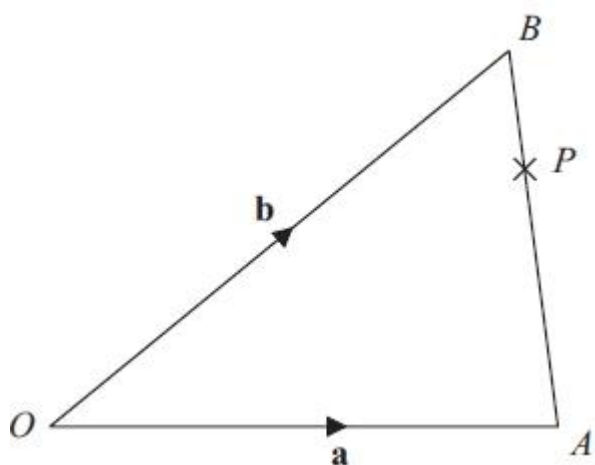


Diagram **NOT** accurately drawn

OAB is a triangle.

$$\vec{OA} = \mathbf{a}$$

$$\vec{OB} = \mathbf{b}$$

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

.....
(1)

P is the point on AB such that $AP : PB = 3 : 1$

(b) Find \vec{OP} in terms of \mathbf{a} and \mathbf{b} . Give your answer in its simplest form.

.....
(3)

(Total for Question is 4 marks)

Q4.

Question	Working	Answer	Mark	Notes
(a)		b - a	1	B1 for b - a or -a + b
(b)	$\vec{OP} = \vec{OA} + \vec{AP}$ $\vec{AP} = \frac{3}{4} \times (\mathbf{b} - \mathbf{a})$ $\vec{OP} = \mathbf{a} + \frac{3}{4} \times (\mathbf{b} - \mathbf{a})$ <p>a)</p> <p>OR</p> $\vec{OP} = \vec{OB} + \vec{BP}$ $\vec{BP} = \frac{1}{4} \times (\mathbf{a} - \mathbf{b})$ $\vec{OP} = \mathbf{b} + \frac{1}{4} \times (\mathbf{a} - \mathbf{b})$ <p>b)</p>	$\frac{1}{4}(\mathbf{a} + 3\mathbf{b})$	3	<p>B1 for $\frac{3}{4} \times '(\mathbf{b} - \mathbf{a})'$</p> <p>M1 for $(\vec{OP} =) \vec{OA} + \vec{AP}$ or $(\vec{OP} =) \vec{OA} + \frac{3}{4}\vec{AB}$ or $\mathbf{a} \pm \frac{3}{4} \times '(\mathbf{b} - \mathbf{a})'$</p> <p>A1 for $\frac{1}{4}(\mathbf{a} + 3\mathbf{b})$ or $\frac{1}{4}\mathbf{a} + \frac{3}{4}\mathbf{b}$</p> <p>OR</p> <p>B1 for $\frac{1}{4} \times '(\mathbf{a} - \mathbf{b})'$</p> <p>M1 for $(\vec{OP} =) \vec{OB} + \vec{BP}$ or $(\vec{OP} =) \vec{OB} + \frac{1}{4}\vec{BA}$ or $\mathbf{b} \pm \frac{1}{4} \times '(\mathbf{a} - \mathbf{b})'$</p> <p>A1 for $\frac{1}{4}(\mathbf{a} + 3\mathbf{b})$ or $\frac{1}{4}\mathbf{a} + \frac{3}{4}\mathbf{b}$</p>

Q5.

$ABCD$ is a trapezium.

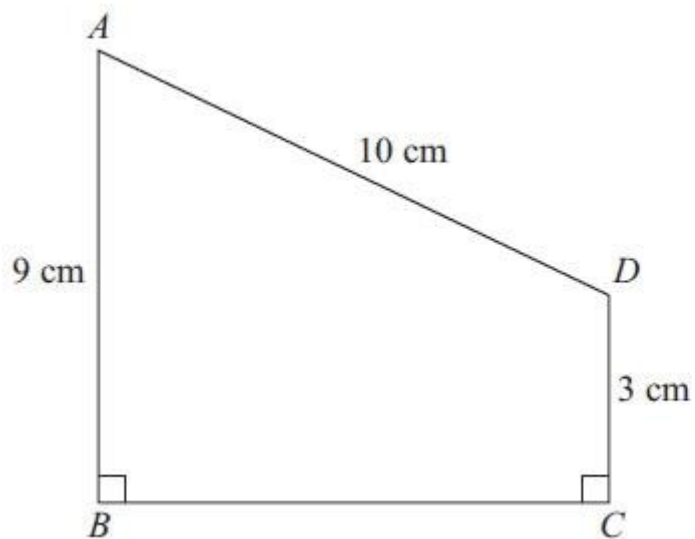


Diagram **NOT** accurately drawn

$$AD = 10 \text{ cm}$$

$$AB = 9 \text{ cm}$$

$$DC = 3 \text{ cm}$$

$$\text{Angle } ABC = \text{angle } BCD = 90^\circ$$

Calculate the length of AC .

Give your answer correct to 3 significant figures.

(Total for Question is 5 marks)

Q5.

Question	Working	Answer	Mark	Notes
	$9 - 3 = 6$ $10^2 - 6^2 = 64$ $BC = 8$ $AC^2 = 9^2 + 8^2 = 145$	12.0	5	M2 $10^2 - (9 - 3)^2 (=64)$ or $BC = 8$ (M1 $9 - 3 (= 6)$ may be seen on diagram) M1 (indep) $9^2 + 'BC'^2$ where BC is a numerical value M1 (dep on previous M1) $\sqrt{81 + '64'}$ A1 12.0 – 12.042

(Higher)

Q6.

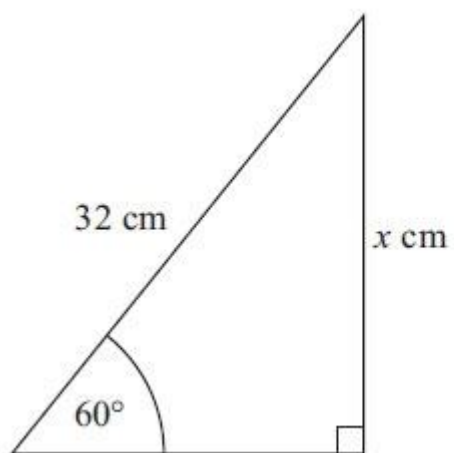


Diagram **NOT**
accurately drawn

Calculate the value of x .
Give your answer correct to 3 significant figures.

(Total for Question is 3 marks)

Q6.

Question	Working	Answer	Mark	Notes
	$\sin 60^\circ = \frac{x}{32}$ $x = 32 \times \sin 60$ $(= 27.712\dots)$	27.7	3	M1 $\sin 60 = \frac{x}{32}$ or $\frac{x}{\sin 60} = \frac{32}{\sin 90}$ oe M1 (x =) $32 \times \sin 60$ or (x =) $\frac{32}{\sin 90} \times \sin 60$ A1 27.7 – 27.72 OR M1 $\cos(90 - 60) = \frac{x}{32}$ M1 (x =) $32 \times \cos(90 - 60)$ A1 27.7 – 27.72 Radians : - 9.7539398... Gradians : 25.888554... SC : B2 for an answer in the range (-) 9.75 to (-)9.754 or 25.8 to 25.9

(Higher)

Q7.

* The diagram shows the triangle PQR .

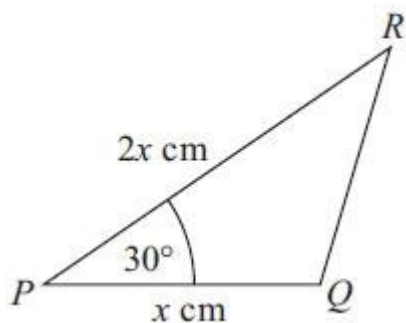


Diagram **NOT**
accurately drawn

$$PQ = x \text{ cm}$$

$$PR = 2x \text{ cm}$$

$$\text{Angle } QPR = 30^\circ$$

The area of triangle $PQR = A \text{ cm}^2$

Show that $x = \sqrt{2A}$

(Total for Question is 3 marks)

Q7.

Question	Working	Answer	Mark	Notes
	$A = \frac{1}{2} \times x \times 2x \sin 30^\circ$ $A = \frac{1}{2} \times 2x^2 \times 0.5$ <p>OR</p> $\text{Height} = 2x \sin 30^\circ = x$ $A = \frac{x \times x}{2} = \frac{x^2}{2}$ <p>OR</p> $\text{Height} = x \sin 30 = \frac{x}{2}$ $A = \frac{1}{2} \times 2x \times \frac{x}{2} = \frac{x^2}{2}$	$x = \sqrt{2A} \text{ shown}$	3	<p>M1 (A =) $\frac{1}{2} \times x \times 2x \sin 30^\circ$ A1 $A = x^2 \times 0.5$ or $A = \frac{x^2}{2}$ C1 for completion with all steps shown</p> <p>OR</p> <p>M1 height = $2x \sin 30 (= x)$ A1 $A = x^2 \times 0.5$ or $A = \frac{x^2}{2}$ C1 for completion with all steps shown</p> <p>OR</p> <p>M1 for height = $x \sin 30 (= \frac{x}{2})$ A1 $A = x^2 \times 0.5$ or $A = \frac{x^2}{2}$ C1 for completion with all steps shown</p>

Q8.

Here is a solid prism.

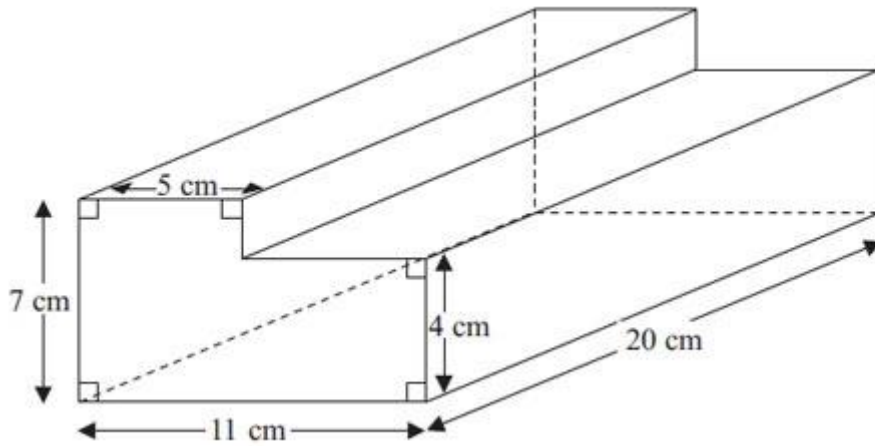


Diagram **NOT** accurately drawn

Work out the volume of the prism.

.....cm³
(Total for Question is 3 marks)

Q8.

		Working	Answer	Mark	Notes
			1180	3	M1 for a correct method to find the area of the cross section M1 (dep) for a complete correct method for the volume of the prism A1 cao OR M1 for a correct method to find the volume of one cuboid M1 (dep) for a complete correct method for the volume of the prism A1 cao

Q9.

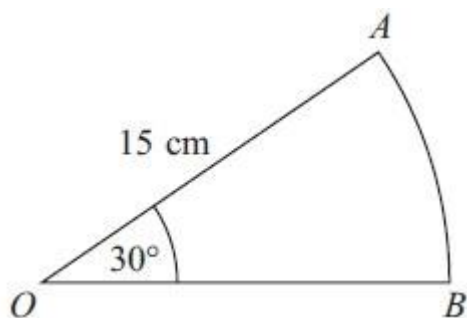


Diagram **NOT**
accurately drawn

OAB is a sector of a circle, centre O .
The radius of the circle is 15 cm.
The angle of the sector is 30° .

Calculate the area of sector OAB .
Give your answer correct to 3 significant figures.

..... cm^2
(Total for Question is 2 marks)

Q9.

	Working	Answer	Mark	Notes
	$\frac{30}{360} \times \pi \times 15^2$	58.8	2	M1 for a correct method to find the area of sector <i>OAB</i> A1 for answer in range 58.8 – 58.9125

Q10.

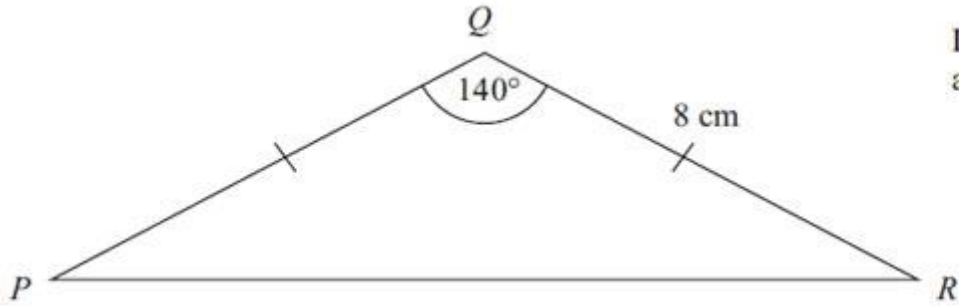


Diagram **NOT**
accurately drawn

Calculate the length of PR .
Give your answer correct to 3 significant figures.

.....
(Total for Question is 3 marks)

Q10.

		Working	Answer	Mark	Notes
			15.0	3	<p>M1 for $8^2 + 8^2 - 2 \times 8 \times 8 \times \cos 140$ M1 (dep) for correct order of evaluation or 226.(05...) A1 for answer in range 15.0 – 15.04</p> <p>OR</p> <p>M1 for $\frac{PR}{\sin 140} = \frac{8}{\sin\left(\frac{180-140}{2}\right)}$ M1 for $PR = \frac{8}{\sin\left(\frac{180-140}{2}\right)} \times \sin 140$ A1 for answer in range 15.0 – 15.04</p> <p>OR</p> <p>M1 for $8 \times \sin 70$ or $8 \times \cos 20$ M1 for $2 \times 8 \times \sin 70$ or $2 \times 8 \times \cos 20$ A1 for answer in range 15.0 – 15.04</p>

Q11.

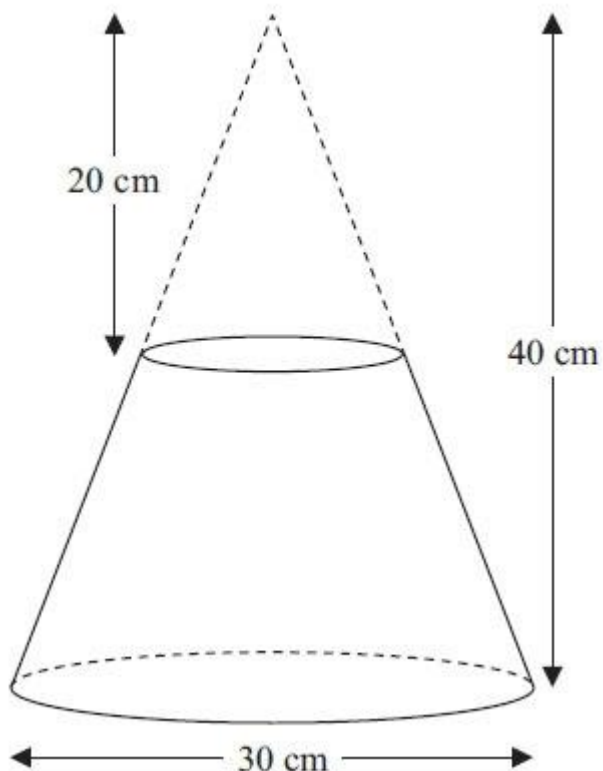


Diagram **NOT**
accurately drawn

A frustum is made by removing a small cone from a similar large cone.

The height of the small cone is 20 cm.

The height of the large cone is 40 cm.

The diameter of the base of the large cone is 30 cm.

Work out the volume of the frustum.

Give your answer correct to 3 significant figures.

.....cm³

(Total for Question is 4 marks)

Q11.

	Working	Answer	Mark	Notes
	$\frac{1}{3} \times \pi \times 15^2 \times 40 -$ $\frac{1}{3} \times \pi \times 7.5^2 \times 20$	8250	4	<p>B1 for 15cm as diameter or 7.5 cm as radius of smaller cone (may be marked on diagram or used in a formula)</p> <p>M1 for a numerical expression for the volume of one cone eg. $\frac{1}{3} \times \pi \times 15^2 \times 40$ (=9424...) or $\frac{1}{3} \times \pi \times 7.5^2 \times 20$ (=1178...)</p> <p>M1 for $\frac{1}{3} \times \pi \times 15^2 \times 40$ oe $-\frac{1}{3} \times \pi \times 7.5^2 \times 20$ oe</p> <p>A1 for answer in the range 8240 – 8250</p> <p>OR</p> <p>B1 for 2^3</p> <p>M1 for a numerical expression for the volume of the large cone eg. $\frac{1}{3} \times \pi \times 15^2 \times 40$ (=9424...)</p> <p>M1 volume of frustrum = $\frac{7}{8} \times \frac{1}{3} \times \pi \times 15^2 \times 40$ oe</p> <p>A1 for answer in the range 8240 – 8250</p>

Q12.

Here is a cuboid.

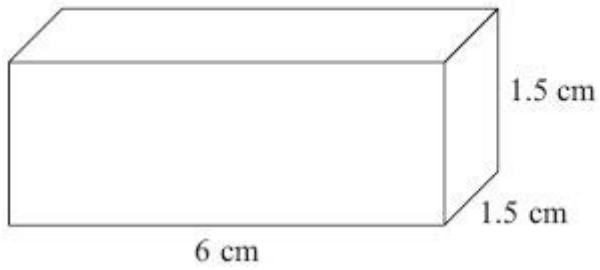


Diagram **NOT**
accurately drawn

The cuboid is 6 cm by 1.5 cm by 1.5 cm.

Work out the total surface area of the cuboid.

..... cm²
(Total for Question is 3 marks)

Q12.

		Working	Answer	Mark	Notes
			40.5	3	M1 for 1.5×6 or 1.5×1.5 M1 for adding area of 5 or 6 faces provided at least 3 are the correct area A1 cao NB: anything that leads to a volume calculation 0 marks.

Q13.

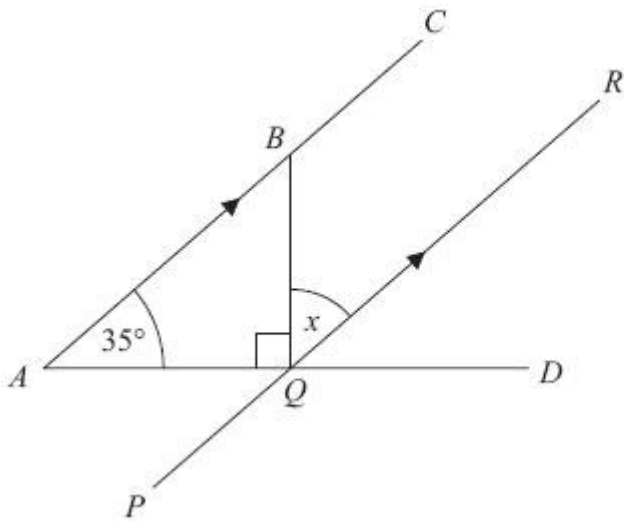


Diagram **NOT**
accurately drawn

ABC, *PQR* and *AQD* are straight lines.
ABC is parallel to *PQR*.

Angle $BAQ = 35^\circ$
Angle $BQA = 90^\circ$

Work out the size of the angle marked x .
Give reasons for each stage of your working.

$x = \dots\dots\dots^\circ$

(Total for Question is 4 marks)

Q13.

		Working	Answer	Mark	Notes
			55	4	M1 for a correct method to find a different angle using 35° M1 for setting up a complete process to calculate angle x A1 cao B1 states one of the following reasons relating to their chosen method: <u>Alternate angles</u> are equal; <u>Corresponding angles</u> are equal; <u>Allied angles</u> / <u>Co-interior angles</u> add up to <u>180</u> ; the <u>exterior angle</u> of a triangle is <u>equal</u> to the sum of the <u>interior opposite angles</u> .

Q14.

XYZ is a right-angled triangle.

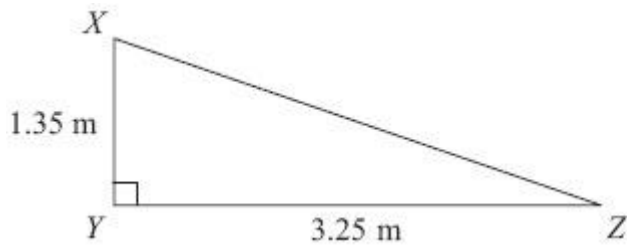


Diagram **NOT**
accurately drawn

Calculate the length of XZ.

Give your answer correct to 3 significant figures.

(Total for Question is 3 marks)

Q14.

Question	Working	Answer	Mark	Notes
		3.52	3	M1 for $1.35^2 + 3.25^2$ M1 (dep) for $\sqrt{(1.35^2 + 3.25^2)}$ (= $\sqrt{12.385}$) A1 for answer in the range 3.51 to 3.52

Q15.

*

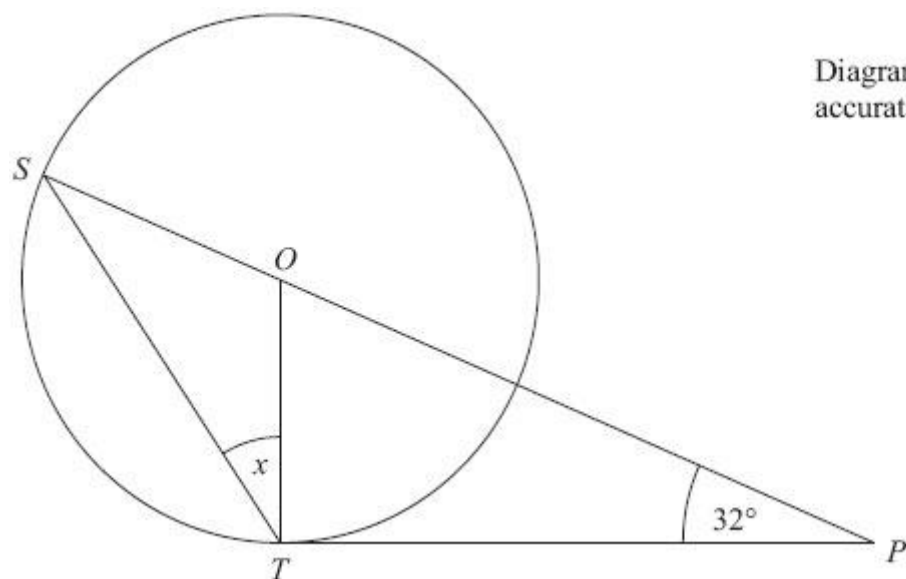


Diagram **NOT**
accurately drawn

S and T are points on the circumference of a circle, centre O .
 PT is a tangent to the circle.
 SOP is a straight line.

Angle $OPT = 32^\circ$

Work out the size of the angle marked x .
Give reasons for your answer.

(Total for Question is 5 marks)

Q15.

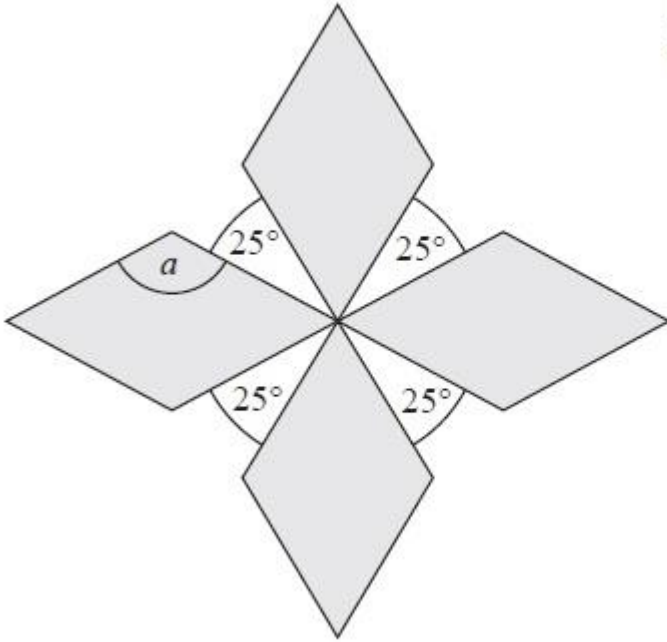
	Working	Answer	Mark	Notes
*	<p>Angle $POT = 180 - 90 - 32 = 58$ (angle between <u>radius</u> and <u>tangent</u> = 90° and sum of <u>angles</u> in a <u>triangle</u> = 180°) Angle $OST = \text{angle } OTS = 58 \div 2$ (ext angle of a triangle <u>equal</u> to sum of <u>int opp angles</u> and base <u>angles</u> of an <u>isos</u> triangle are <u>equal</u>) or (angle at centre = $2x$ angle at <u>circumference</u>) OR Angle $SOT = 90 + 32 = 122$ (ext angle of a triangle <u>equal</u> to sum of <u>int opp angles</u>) (180 - 122) $\div 2$ (base <u>angles</u> of an <u>isos</u> triangle are <u>equal</u>)</p>	29	5	<p>B1 for angle $OTP = 90^\circ$, quoted or shown on the diagram M1 for a method that leads to $180 - (90 + 32)$ or 58 shown at TOP M1 for completing the method leading to "58"$\div 2$ or 29 shown at TSP A1 cao C1 for "angle between <u>radius</u> and <u>tangent</u> = 90°" and one other correct reason given from theory used NB: C0 if inappropriate rules listed OR B1 for angle $OTP = 90^\circ$, quoted or shown on the diagram M1 for a method that leads to 122 shown at SOT M1 for $(180 - "122") \div 2$ or 29 shown at TSP A1 cao C1 for "angle between <u>radius</u> and <u>tangent</u> = 90°" and one other correct reason given from theory used NB: C0 if inappropriate rules listed</p>

(Higher and Foundation)

Q16.

The diagram shows a pattern using four identical rhombuses.

Diagram **NOT**
accurately drawn



Work out the size of the angle marked *a*.

You must show your working.

.....°

(Total for Question is 4 marks)

Q16.

PAPER: 1MA0_2H				
Question	Working	Answer	Mark	Notes
		115	4	M1 for $360 - 4 \times 25 (=260)$ M1 (dep) for $'260' \div 4 (=65)$ M1 for $180 - '65'$ or $(360 - 2 \times '65') \div 2$ A1 for 115 with working OR M1 for $360 \div 4 (=90)$ M1 (dep) for $'90' - 25 (=65)$ M1 for $180 - '65'$ or $(360 - 2 \times '65') \div 2$ A1 for 115 with working

Q17.

A circle has a diameter of 140 cm.

Work out the circumference of the circle.

Give your answer correct to 3 significant figures.

..... cm

(Total for Question is 2 marks)

Q17.

PAPER: 1MA0_2H				
Question	Working	Answer	Mark	Notes
		440	2	M1 for $140 \times \pi$ oe or 439 A1 for 439.6 – 440

Q18.

ABC is an isosceles triangle.

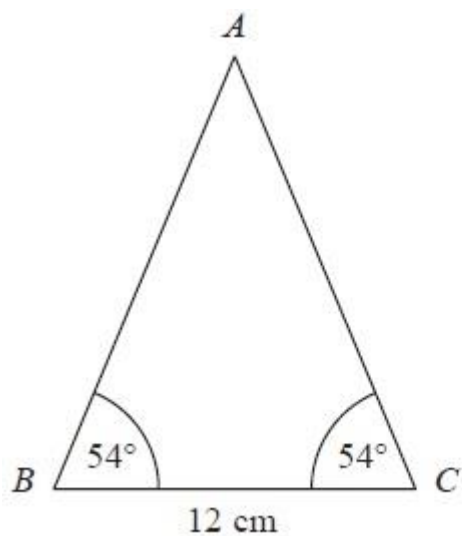


Diagram NOT
accurately drawn

Work out the area of the triangle.

Give your answer correct to 3 significant figures.

..... cm²

(Total for Question is 4 marks)

Q18.

PAPER: 1MA0 2H				
Question	Working	Answer	Mark	Notes
		49.5	4	<p>M1 for $\tan 54 = \frac{\text{height}}{6}$</p> <p>M1 for (height =) $6 \times \tan 54$ (=8.2-8.3)</p> <p>M1 for $\frac{1}{2} \times '8.258..' \times 12$</p> <p>A1 for 49.2 - 50</p> <p>OR</p> <p>M1 for $\cos 54 = \frac{6}{AC}$</p> <p>M1 for $(AC =) \frac{6}{\cos 54}$ (=10.2(07...))</p> <p>M1 for $\frac{1}{2} \times 12 \times '10.207' \times \sin 54$</p> <p>A1 for 49.2 - 50</p> <p>OR</p> <p>M1 for $\frac{AC}{\sin 54} = \frac{12}{\sin 72}$</p> <p>M1 for $(AC =) \frac{12}{\sin 72} \times \sin 54$ (=10.2(07...))</p> <p>M1 for $\frac{1}{2} \times 12 \times '10.207' \times \sin 54$</p> <p>A1 for 49.2 - 50</p>

Q19.

The diagram shows a large tin of pet food in the shape of a cylinder.

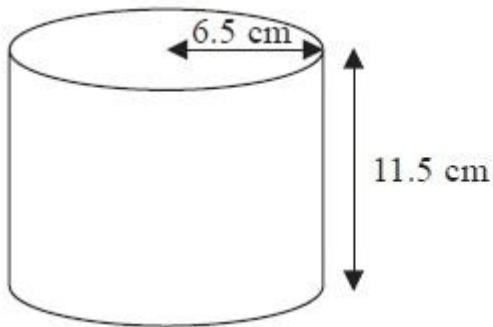


Diagram NOT accurately drawn

The large tin has a radius of 6.5 cm and a height of 11.5 cm.

A pet food company wants to make a new size of tin.

The new tin will have a radius of 5.8 cm.

It will have the same volume as the large tin.

Calculate the height of the new tin.

Give your answer correct to one decimal place.

..... cm

(Total for Question is 3 marks)

Q19.

PAPER: IMA0 2H				
Question	Working	Answer	Mark	Notes
		14.4	3	<p>M1 for $\pi \times 6.5^2 \times 11.5$ (=1526.42...)</p> <p>M1 (dep) for $\frac{1526.42...}{\pi \times 5.8^2}$</p> <p>A1 for 14.4 - 14.5</p> <p>OR</p> <p>M1 for $\frac{5.8}{6.5}$ or $\frac{6.5}{5.8}$ or 0.89(23...) or 1.12(06896...)</p> <p>M1 for $11.5 \div \left(\frac{5.8}{6.5}\right)^2$ or $11.5 \div \left(\frac{6.5}{5.8}\right)^2$</p> <p>A1 for 14.4 - 14.5</p>

Q20.

The diagram shows triangle LMN .

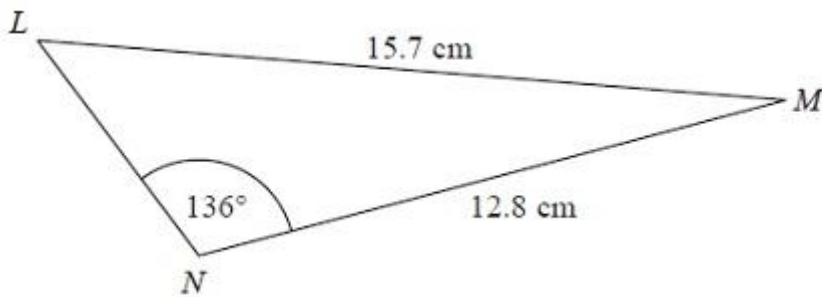


Diagram **NOT**
accurately drawn

Calculate the length of LN .

Give your answer correct to 3 significant figures.

..... cm

(Total for Question is 5 marks)

Q20.

PAPER: IMA0 2H				
Question	Working	Answer	Mark	Notes
	180-136- "34.4" =9.504	3.73	5	<p>M1 for $\frac{\sin L}{12.8} = \frac{\sin 136}{15.7}$</p> <p>M1 for $L = \sin^{-1}\left(\frac{\sin 136}{15.7} \times 12.8\right)$ or or $\sin^{-1}0.566\dots$</p> <p>A1 for 34.4 - 34.5</p> <p>M1 for $\frac{LN}{\sin(180-136-'34.4')} = \frac{15.7}{\sin 136}$ or $\frac{LN}{\sin(180-136-'34.4')} = \frac{12.8}{\sin '34.4'}$ or</p> <p>$(LN^2 =) 15.7^2 + 12.8^2 - 2 \times 15.7 \times 12.8 \times \cos(180 - 136 - '34.4')$</p> <p>A1 for 3.73 - 3.74</p>

Q21.

The diagram shows a solid made from a hemisphere and a cone.

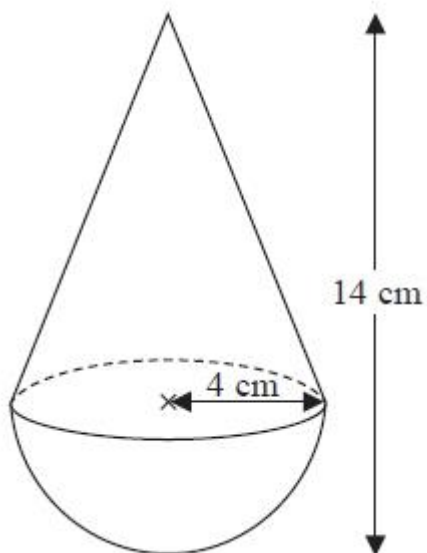


Diagram **NOT** accurately drawn

The radius of the hemisphere is 4 cm.
The radius of the base of the cone is 4 cm.

Calculate the volume of the solid.
Give your answer correct to 3 significant figures.

.....cm³

(Total for Question is 3 marks)

Q21.

PAPER: IMA0_2H				
Question	Working	Answer	Mark	Notes
		302	3	M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 4^3$ oe (= 133.9 – 134.2) M1 for $\frac{1}{3} \times \pi \times 4^2 \times 10$ oe (= 167.4 – 167.7) A1 for 301 – 302 (or 96π or $\frac{288}{3}\pi$)

Q22.

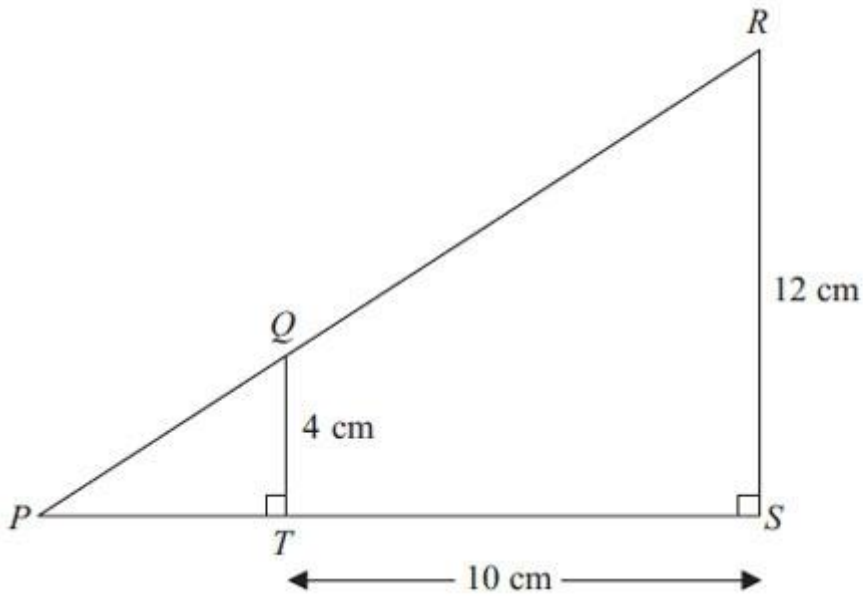


Diagram **NOT** accurately drawn

PQR and PTS are straight lines.
Angle $PTQ = \text{Angle } PSR = 90^\circ$
 $QT = 4 \text{ cm}$
 $RS = 12 \text{ cm}$
 $TS = 10 \text{ cm}$

(a) Work out the area of the trapezium $QRST$.

..... cm^2
(2)

(b) Work out the length of PT .

.....
(3)

(Total for Question is 5 marks)

Q22.

	Working	Answer	Mark	Notes
(a)	$\frac{1}{2} \times (4 + 12) \times 10$	80	2	M1 for a fully correct method for area of <i>QRST</i> A1 cao
(b)	<p>For example</p> $\frac{PT+10}{PT} = \frac{12}{4} = 3$ $PT + 10 = 3PT$ $2PT = 10$	5	3	<p>M1 for a correct scale factor or ratio using two corresponding sides from two similar triangles or two sides within the same triangle (may be seen within an equation) eg. $\frac{12}{4}$ oe or $4 : 12$ oe or $\frac{PT}{4}$ or $\frac{PS}{12}$ or $\frac{12}{12-4}$ etc.</p> <p>M1 for a correct equation with <i>PT</i> or <i>PS</i> as the only variable or complete correct method using scale factor</p> <p>A1 cao</p>

Q23.

The diagram shows the positions of three turbines A , B and C .

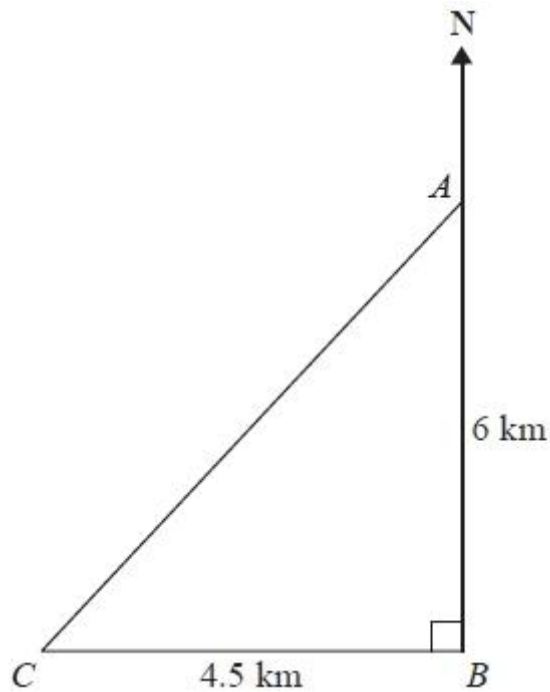


Diagram **NOT** accurately drawn

A is 6 km due north of turbine B .
 C is 4.5 km due west of turbine B .

(a) Calculate the distance AC .

..... km
(3)

(b) Calculate the bearing of C from A .
Give your answer correct to the nearest degree.

.....°
(4)

(Total for Question is 7 marks)

Q23.

PAPER: IMA0_2H				
Question	Working	Answer	Mark	Notes
(a)		7.5	3	M1 for $4.5^2 + 6^2 (=56.25)$ M1 for $\sqrt{56.25}$ or $\sqrt{(4.5^2 + 6^2)}$ A1 for 7.5
(b)		217	4	M1 for use of appropriate trig ratio eg $\tan CAB = \frac{4.5}{6}$ (= 0.75), $\sin CAB = \frac{4.5}{7.5}$ (= 0.6), $\cos CAB = \frac{6}{7.5}$ (= 0.8) M1 for inverse trig shown correctly eg $CAB = \tan^{-1} \frac{4.5}{6}$ (= 0.75), $CAB = \sin^{-1} \frac{4.5}{7.5}$ (= 0.6), $CAB = \cos^{-1} \frac{6}{7.5}$ (= 0.8) A1 for 36.8 to 37 (or 53 to 53.2 if identified as <i>ACB</i>) B1ft for bearing $180 + "36.8"$ if "36.8" is not 40-50 eg 216.8 to 217

(Higher)

Q24.

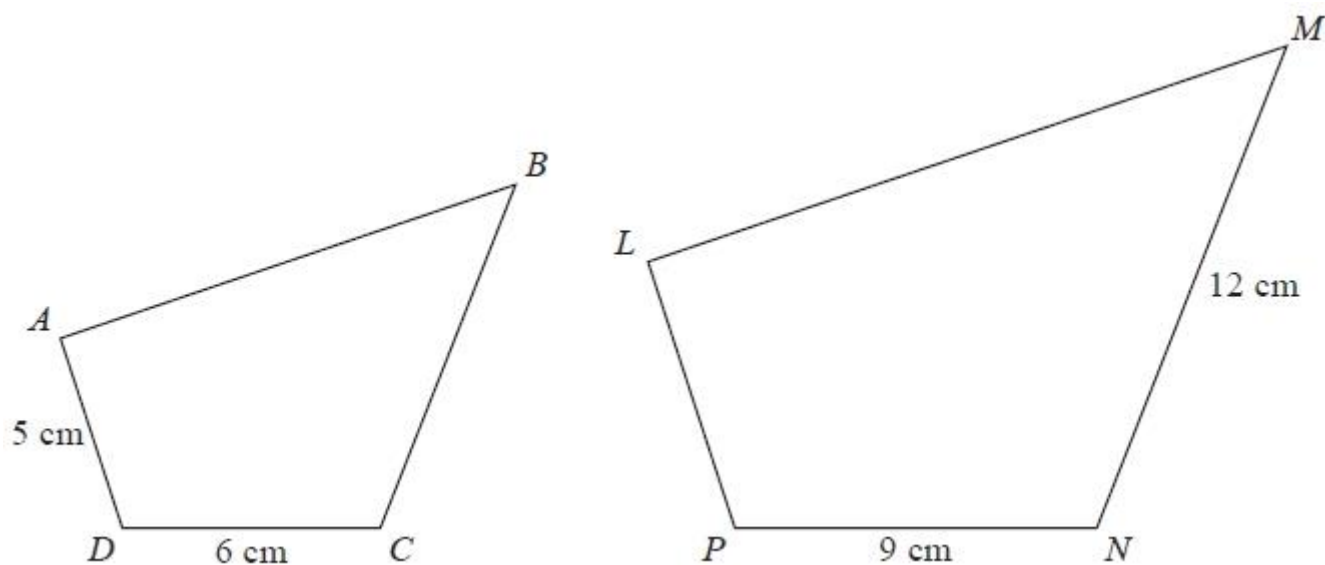


Diagram **NOT** accurately drawn

Quadrilaterals $ABCD$ and $LMNP$ are mathematically similar.

Angle $A =$ angle L
Angle $B =$ angle M
Angle $C =$ angle N
Angle $D =$ angle P

(a) Work out the length of LP .

.....cm
(2)

(b) Work out the length of BC .

.....cm
(2)

(Total for Question is 4 marks)

Q24.

PAPER: IMA0 2H				
Question	Working	Answer	Mark	Notes
(a)		7.5	2	M1 for sight of $\frac{9}{6}$ (=1.5) oe or $\frac{6}{9}$ (=0.66..) oe or $\frac{5}{6}$ (=0.83..) oe or $\frac{6}{5}$ (=1.2) oe or a ratio, eg 6:9 oe or decimal, eg 1.5 oe A1 cao
(b)		8	2	M1 for $12 \times \frac{6}{9}$ oe or $12 \div \frac{9}{6}$ oe or $\frac{12}{"7.5"} \times 5$ oe A1 cao

(Higher)

Q25.

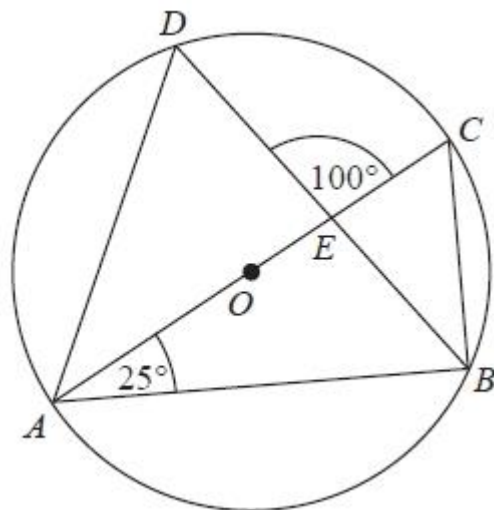


Diagram **NOT**
accurately drawn

A , B , C and D are points on the circumference of a circle, centre O .
 AC is a diameter of the circle.
 AC and BD intersect at E .

Angle $CAB = 25^\circ$
Angle $DEC = 100^\circ$

Work out the size of angle DAC .
You must show all your working.

.....^o

(Total for question = 4 marks)

Q25.

PAPER: IMA0_2H				
Question	Working	Answer	Mark	Notes
		35°	4	M1 for $ABC = 90$ M1 for $(ACB =) 180 - 90 - 25 (= 65)$ M1 for $(DBC =) 180 - '65' - 80 (= 35)$ A1 cao supported by working OR M1 for $(AOB =) 180 - 2 \times 25 (= 130)$ M1 for $(ADB =) 130 \div 2 (= 65)$ M1 for $(DAC =) 180 - 65 - 80$ A1 cao supported by working.