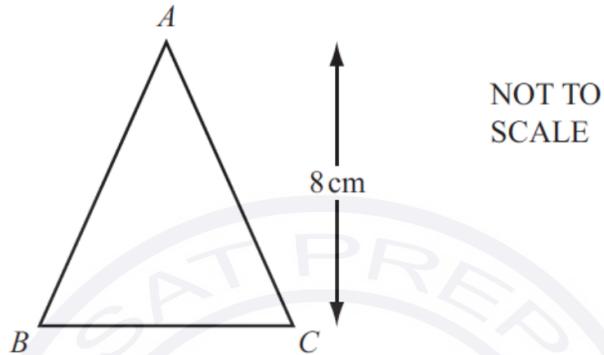


Extended Mathematics
Topic : Trigonometry
Year :May 2013 -May 2024
Paper -2
Questions

Question 1

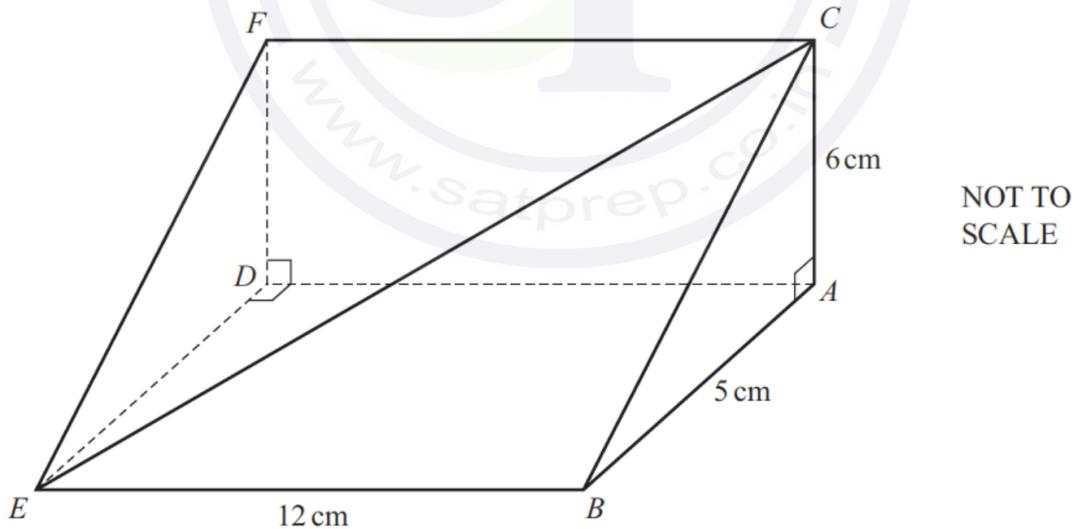


Triangle ABC has a height of 8 cm and an area of 42 cm^2 .

Calculate the length of BC .

Answer $BC = \dots\dots\dots \text{ cm}$ [2]

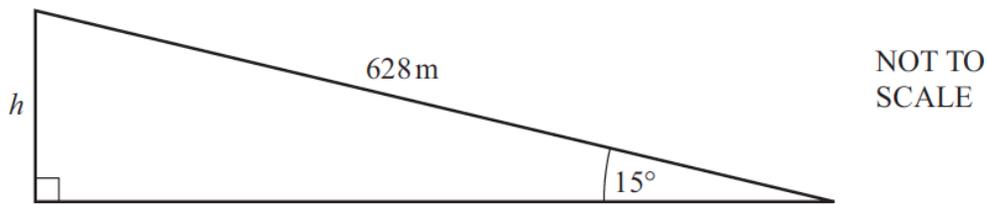
Question 2



The diagram shows a triangular prism of length 12 cm.
 Triangle ABC is a cross section of the prism.
 Angle $BAC = 90^\circ$, $AC = 6 \text{ cm}$ and $AB = 5 \text{ cm}$.

Answer $\dots\dots\dots$ [4]

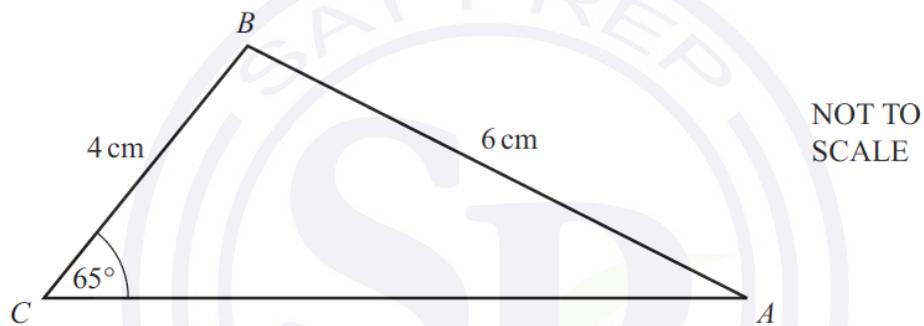
Question 3



Calculate the length h .
Give your answer correct to 2 significant figures.

Answer $h = \dots\dots\dots$ m [3]

Question 4



In triangle ABC , $AB = 6$ cm, $BC = 4$ cm and angle $BCA = 65^\circ$.

Calculate

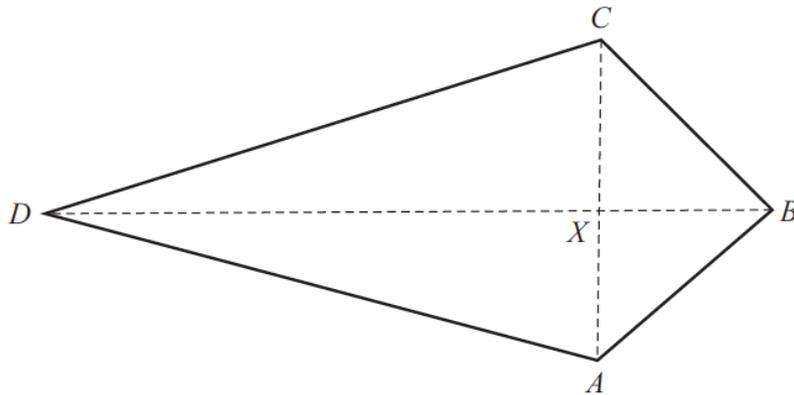
(a) angle CAB ,

Answer(a) Angle $CAB = \dots\dots\dots$ [3]

(b) the area of triangle ABC .

Answer(b) $\dots\dots\dots$ cm^2 [3]

Question 5



NOT TO SCALE

$ABCD$ is a kite.
 The diagonals AC and BD intersect at X .
 $AC = 12$ cm, $BD = 20$ cm and $DX : XB = 3 : 2$.

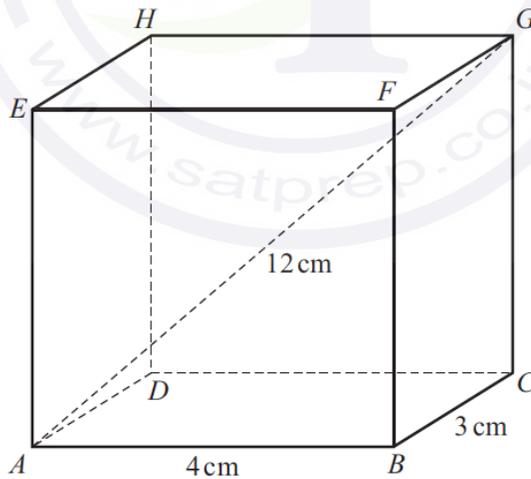
(a) Calculate angle ABC .

Answer(a) Angle $ABC = \dots\dots\dots$ [3]

(b) Calculate the area of the kite.

Answer(b) $\dots\dots\dots$ cm² [2]

Question 6



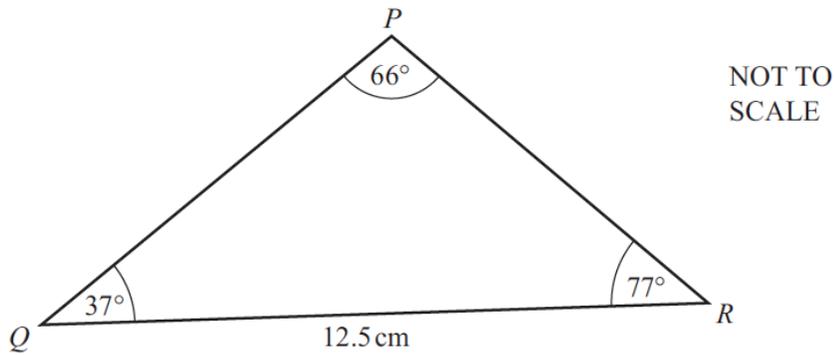
NOT TO SCALE

$ABCDEFGH$ is a cuboid.
 $AB = 4$ cm, $BC = 3$ cm and $AG = 12$ cm.

Calculate the angle that AG makes with the base $ABCD$.

Answer $\dots\dots\dots$ [4]

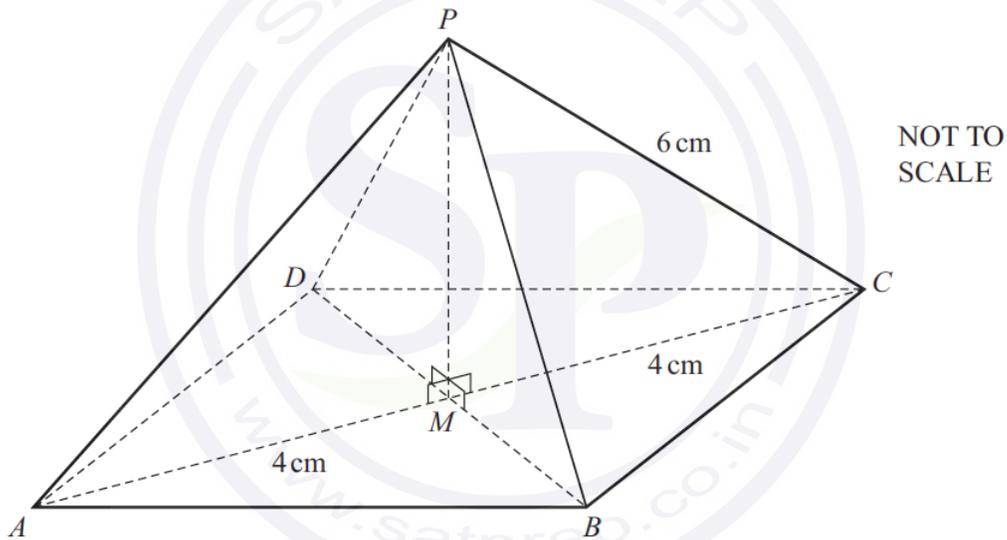
Question 7



Calculate PR .

Answer $PR = \dots\dots\dots$ cm [3]

Question 8



The diagram shows a pyramid on a square base $ABCD$ with diagonals, AC and BD , of length 8 cm. AC and BD meet at M and the vertex, P , of the pyramid is vertically above M . The sloping edges of the pyramid are of length 6 cm.

Calculate

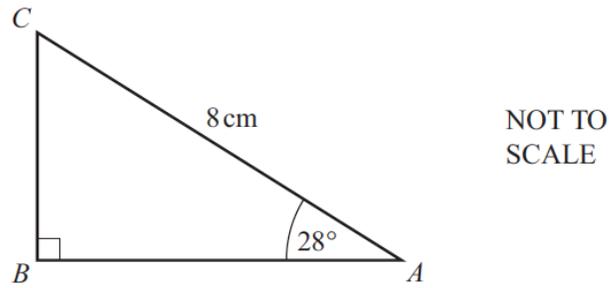
- (a) the perpendicular height, PM , of the pyramid,

Answer(a) $PM = \dots\dots\dots$ cm [3]

- (b) the angle between a sloping edge and the base of the pyramid.

Answer(b) $\dots\dots\dots$ [3]

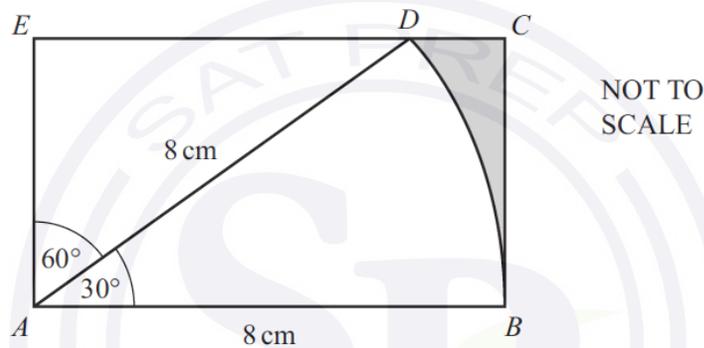
Question 9



Calculate the length of AB .

Answer $AB = \dots\dots\dots$ cm [2]

Question 10



The diagram shows a rectangle $ABCE$.
 D lies on EC .
 DAB is a sector of a circle radius 8 cm and sector angle 30° .

Calculate the area of the shaded region.

Answer $\dots\dots\dots$ cm^2 [7]

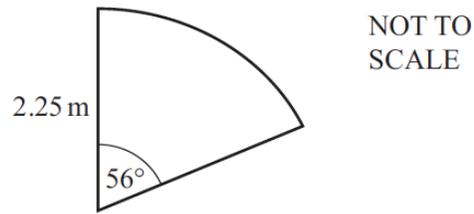
Question 11

A triangle has sides of length 2 cm, 8 cm and 9 cm.

Calculate the value of the largest angle in this triangle.

Answer $\dots\dots\dots$ [4]

Question 12



The diagram shows a sand pit in a child's play area.
 The shape of the sand pit is a sector of a circle of radius 2.25 m and sector angle 56° .

(a) Calculate the area of the sand pit.

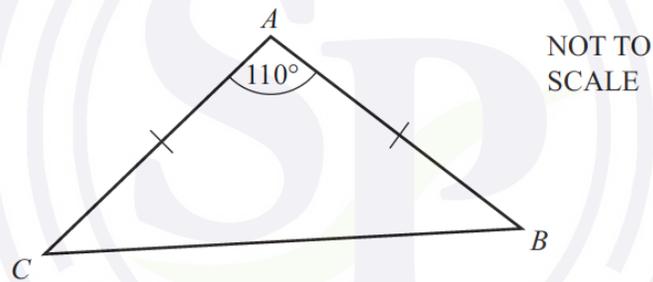
Answer(a) m^2 [2]

(b) The sand pit is filled with sand to a depth of 0.3 m.

Calculate the volume of sand in the sand pit.

Answer(b) m^3 [1]

Question 13

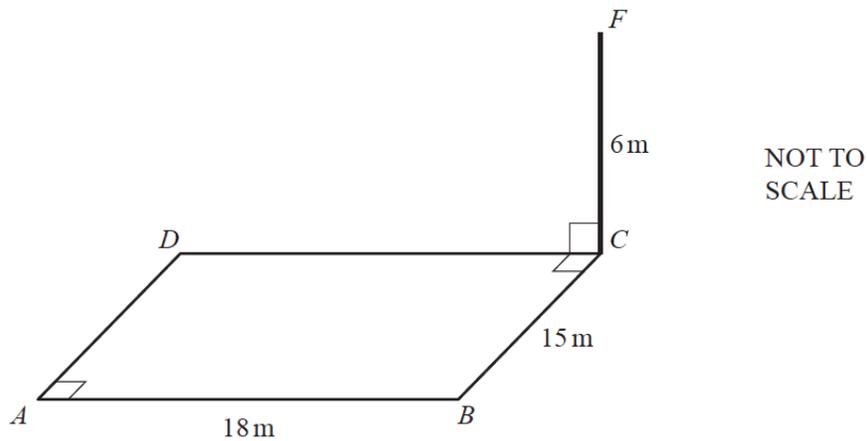


Triangle ABC is isosceles with $AB = AC$.
 Angle $BAC = 110^\circ$ and the area of the triangle is 85 cm^2 .

Calculate AC .

Answer $AC =$ cm [3]

Question 14

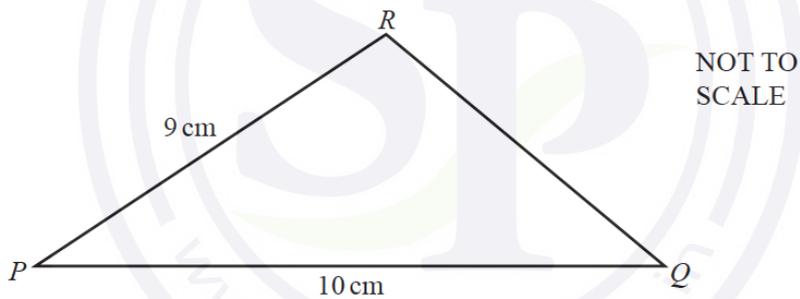


The diagram shows a rectangular playground $ABCD$ on horizontal ground.
 A vertical flagpole CF , 6 metres high, stands in corner C .
 $AB = 18\text{ m}$ and $BC = 15\text{ m}$.

Calculate the angle of elevation of F from A .

Answer [4]

Question 15

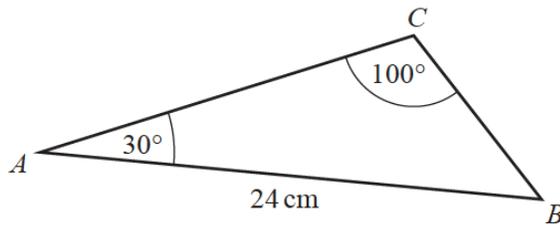


The area of triangle PQR is 38.5 cm^2 .

Calculate the length QR .

Answer $QR =$ cm [6]

Question 16

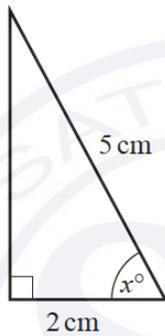


NOT TO SCALE

Use the sine rule to calculate BC .

Answer $BC = \dots\dots\dots$ cm [3]

Question 17

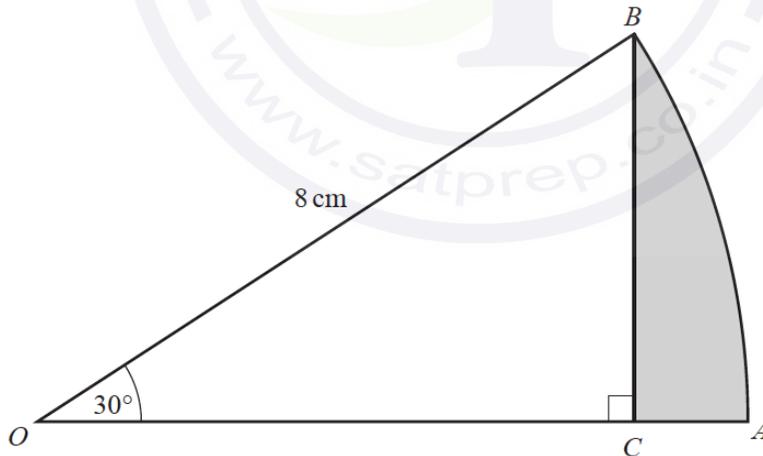


NOT TO SCALE

Calculate the value of x .

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

Question 18



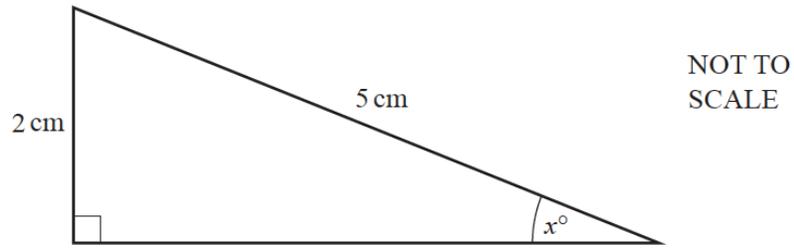
NOT TO SCALE

OAB is the sector of a circle, centre O , with radius 8 cm and sector angle 30° . BC is perpendicular to OA .

Calculate the area of the region shaded on the diagram.

Answer $\dots\dots\dots$ cm^2 [5]

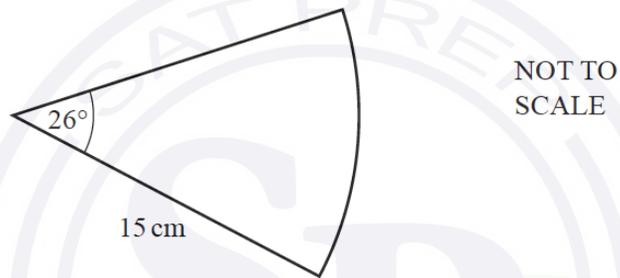
Question 19



Calculate the value of x .

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

Question 20

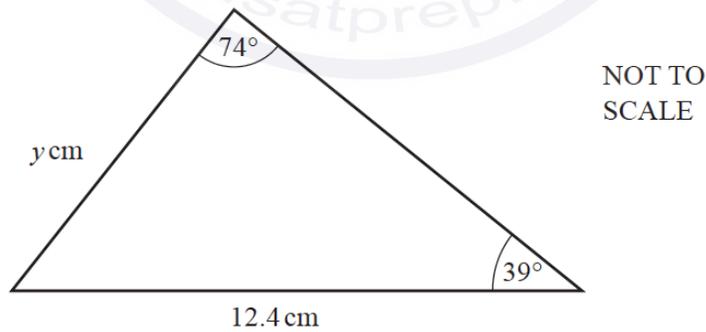


The diagram shows a sector of a circle with radius 15 cm.

Calculate the perimeter of this sector.

Answer $\dots\dots\dots$ cm [3]

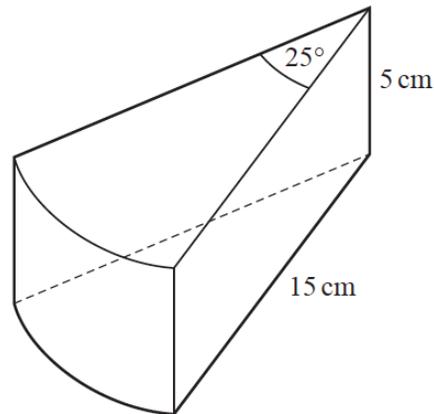
Question 21



Calculate the value of y .

Answer $y = \dots\dots\dots$ [3]

Question 22



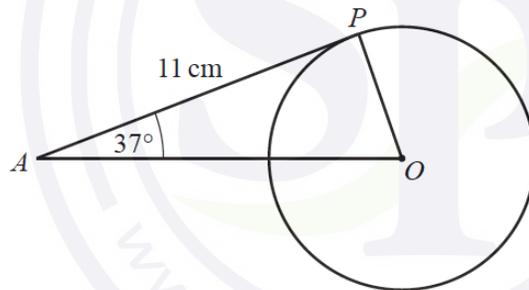
NOT TO SCALE

The diagram shows a wooden prism of height 5 cm .
 The cross section of the prism is a sector of a circle with sector angle 25° .
 The radius of the sector is 15 cm .

Calculate the **total** surface area of the prism.

Answer cm^2 [5]

Question 23



NOT TO SCALE

In the diagram, AP is a tangent to the circle at P .
 O is the centre of the circle, angle $PAO = 37^\circ$ and $AP = 11\text{ cm}$.

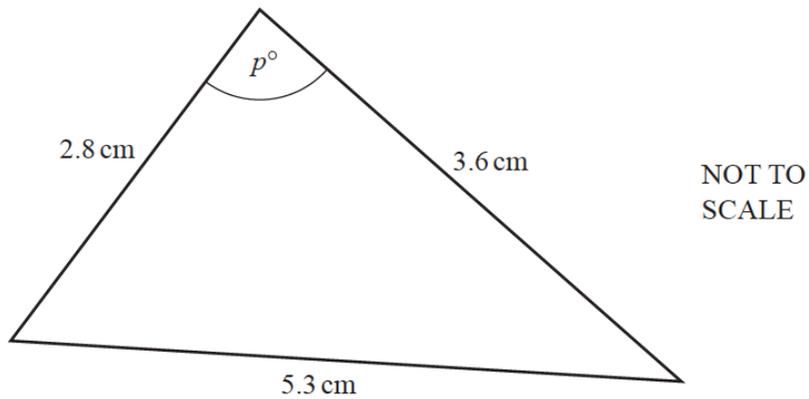
(a) Write down the size of angle OPA .

Answer(a) Angle $OPA =$ [1]

(b) Work out the radius of the circle.

Answer(b) cm [2]

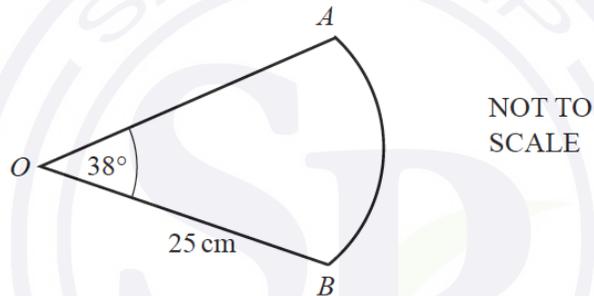
Question 24



Find the value of p .

$p = \dots\dots\dots$ [4]

Question 25

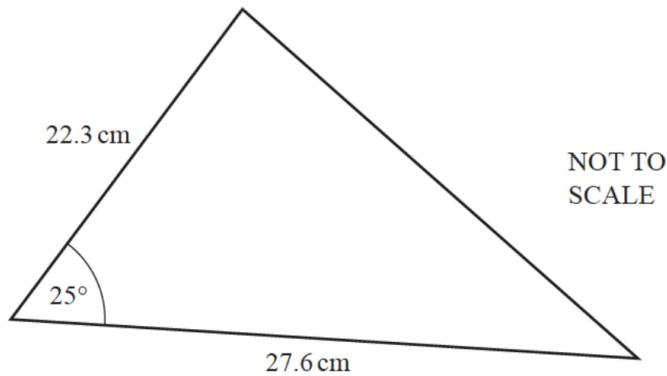


The diagram shows a sector of a circle, centre O , radius 25 cm.
The sector angle is 38° .

Calculate the length of the arc AB .
Give your answer correct to 4 significant figures.

$AB = \dots\dots\dots$ cm [3]

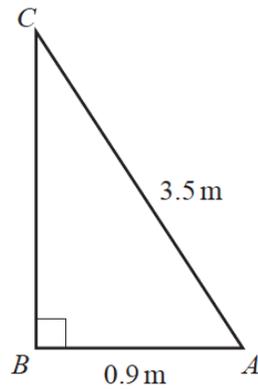
Question 26



Calculate the area of this triangle.

$\dots\dots\dots$ cm^2 [2]

Question 27

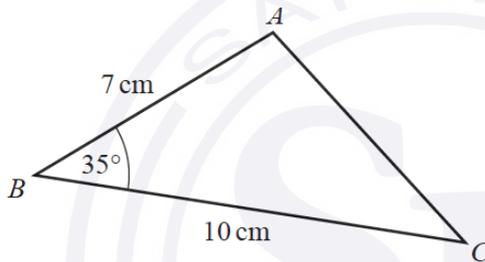


NOT TO SCALE

Calculate angle BAC .

Angle $BAC = \dots\dots\dots [2]$

Question 28



NOT TO SCALE

(a) Calculate the area of triangle ABC .

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

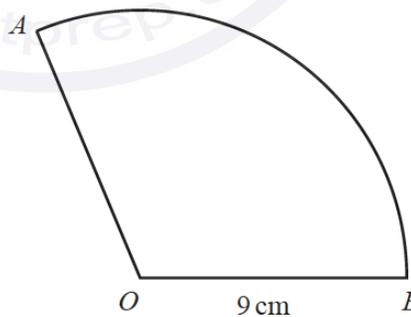
(b) Calculate the length of AC .

$AC = \dots\dots\dots\text{ cm} [4]$

Question 29

AB is an arc of a circle, centre O , radius 9 cm .
 The length of the arc AB is $6\pi\text{ cm}$.
 The area of the sector AOB is $k\pi\text{ cm}^2$.

Find the value of k .

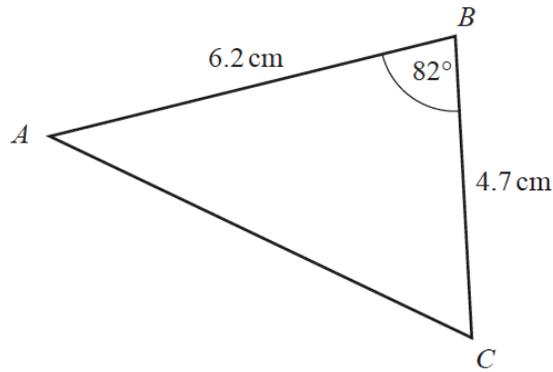


NOT TO SCALE

$k = \dots\dots\dots [3]$

Question 30

(a)

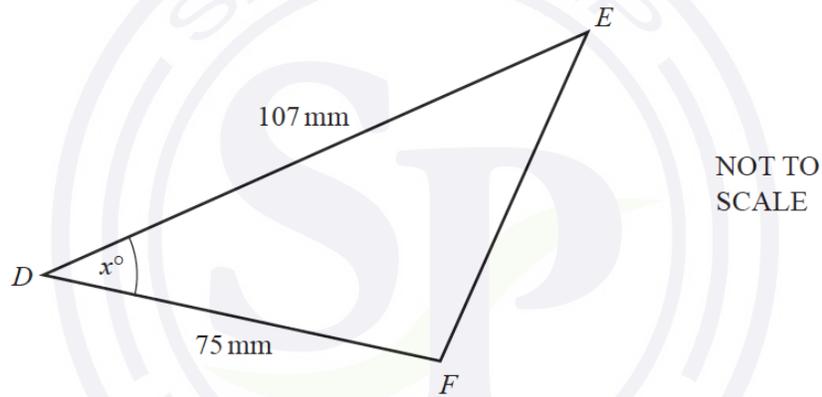


NOT TO SCALE

Calculate the area of triangle ABC .

..... cm^2 [2]

(b)



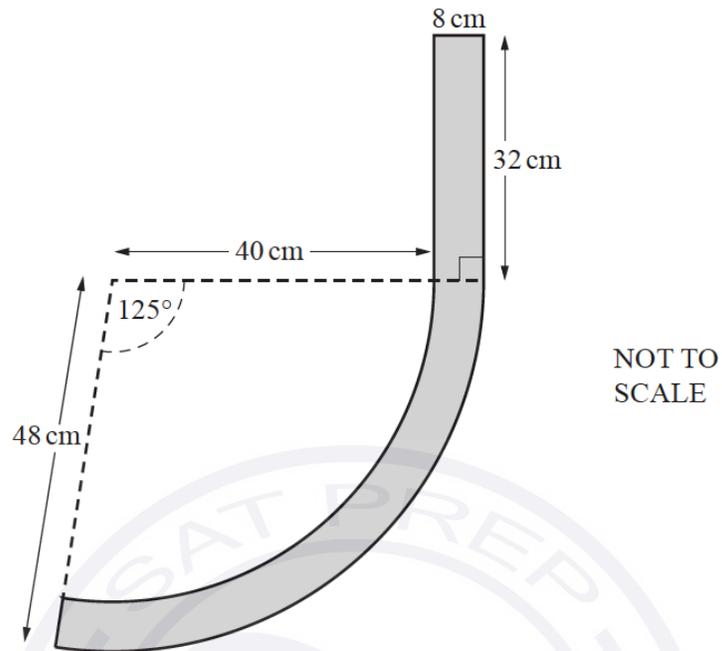
NOT TO SCALE

The area of triangle DEF is 2050 mm^2 .

Work out the value of x .

$x =$ [2]

Question 31



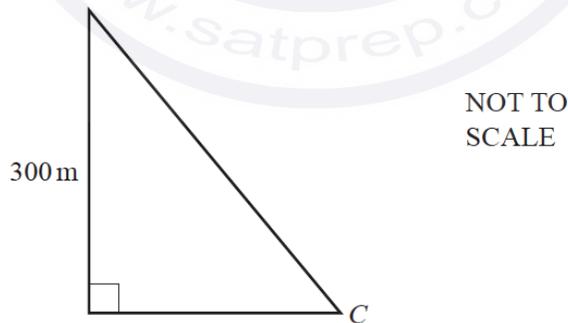
The diagram shows the cross section of part of a park bench. It is made from a rectangle of length 32 cm and width 8 cm and a curved section. The curved section is made from two concentric arcs with sector angle 125° . The inner arc has radius 40 cm and the outer arc has radius 48 cm.

Calculate the area of the cross section correct to the nearest square centimetre.

..... cm^2 [5]

Question 32

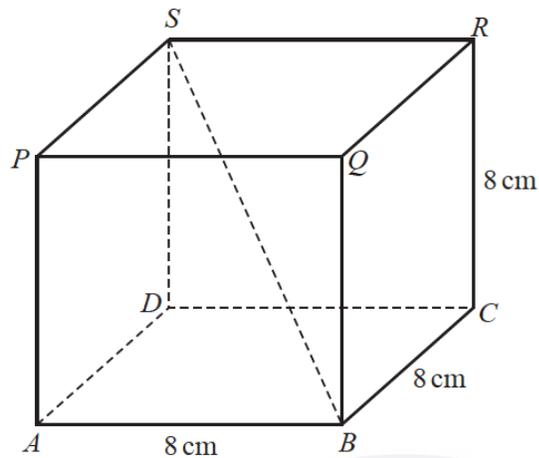
From the top of a building, 300 metres high, the angle of depression of a car, C , is 52° .



Calculate the horizontal distance from the car to the base of the building.

..... m [3]

Question 33



NOT TO SCALE

The diagram shows a cube of side length 8 cm.

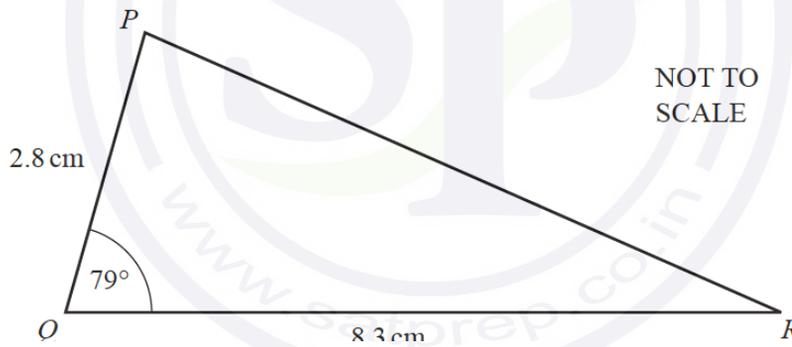
(a) Calculate the length of the diagonal BS .

$BS = \dots\dots\dots$ cm [3]

(b) Calculate angle SBD .

Angle $SBD = \dots\dots\dots$ [2]

Question 34



NOT TO SCALE

(a) Calculate the area of triangle PQR .

$\dots\dots\dots$ cm² [2]

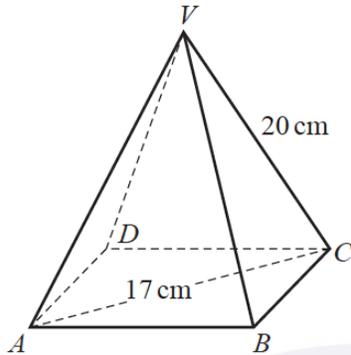
(b) Triangle PQR is enlarged by scale factor 4.5 .

Calculate the area of the enlarged triangle.

$\dots\dots\dots$ cm² [2]

Question 35

The diagram shows a pyramid with a square base $ABCD$.
 All the sloping edges of the pyramid are 20 cm long and $AC = 17$ cm.



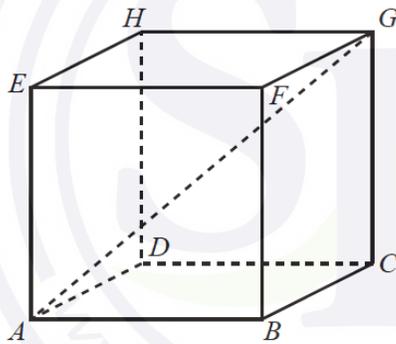
NOT TO SCALE

Calculate the height of the pyramid.

..... cm [3]

Question 36

The diagram shows a cube $ABCDEFGH$ of side length 26 cm.

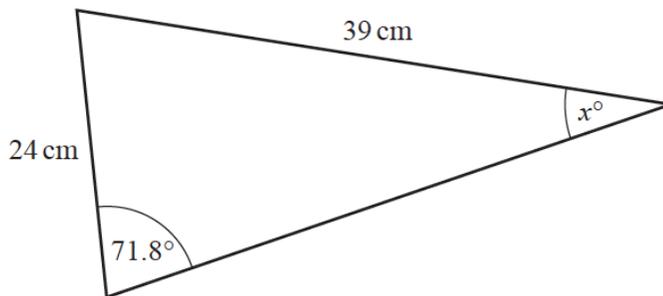


NOT TO SCALE

Calculate the angle between AG and the base of the cube.

..... [4]

Question 37



NOT TO SCALE

Find the value of x .

$x =$ [3]

Question 38

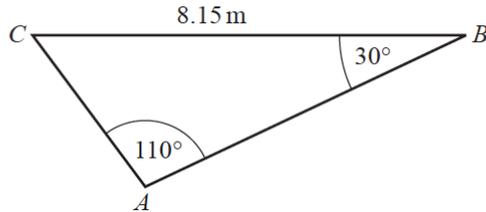
In a triangle PQR , $PQ = 8$ cm and $QR = 7$ cm.

The area of this triangle is 17 cm².

Calculate the two possible values of angle PQR .

Angle $PQR = \dots\dots\dots$ or $\dots\dots\dots$ [3]

Question 39

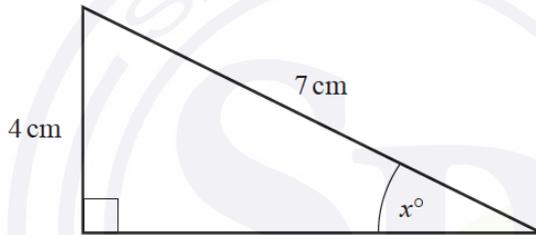


NOT TO SCALE

Calculate AC .

$AC = \dots\dots\dots$ m [3]

Question 40



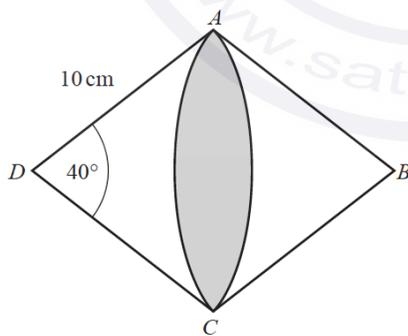
NOT TO SCALE

Calculate the value of x .

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

Question 41

$ABCD$ is a rhombus with side length 10 cm.



NOT TO SCALE

Angle $ADC = 40^\circ$.

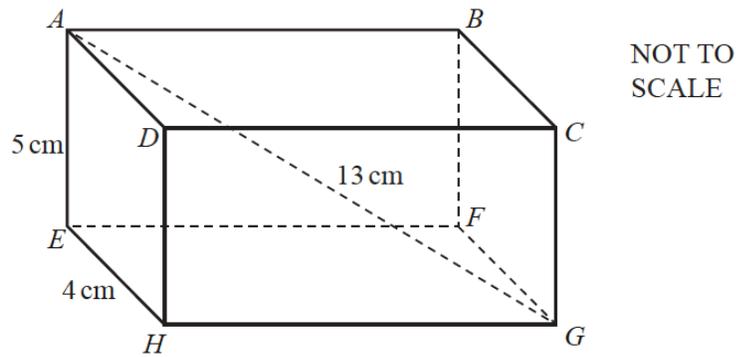
DAC is a sector of a circle with centre D .

BAC is a sector of a circle with centre B .

Calculate the shaded area.

$\dots\dots\dots$ cm² [4]

Question 42

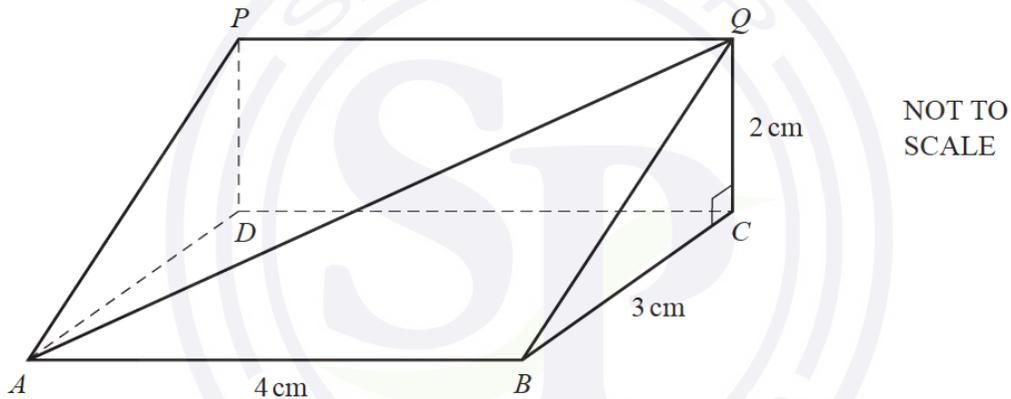


The diagram shows a cuboid $ABCDEFGH$.
 $AE = 5$ cm, $EH = 4$ cm and $AG = 13$ cm.

Calculate the angle between the line AG and the base $EFGH$ of the cuboid.

..... [3]

Question 43

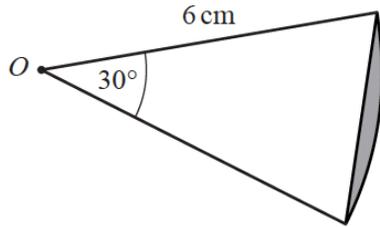


The diagram shows a prism of length 4 cm.
 The cross section is a right-angled triangle.
 $BC = 3$ cm and $CQ = 2$ cm.

Calculate the angle between the line AQ and the base, $ABCD$, of the prism.

..... [4]

Question 44



NOT TO SCALE

The diagram shows a sector of a circle, centre O and radius 6 cm.
 The sector angle is 30° .
 The area of the shaded segment is $(k\pi - c) \text{ cm}^2$, where k and c are integers.

Find the value of k and the value of c .

$k = \dots\dots\dots$
 $c = \dots\dots\dots$ [3]

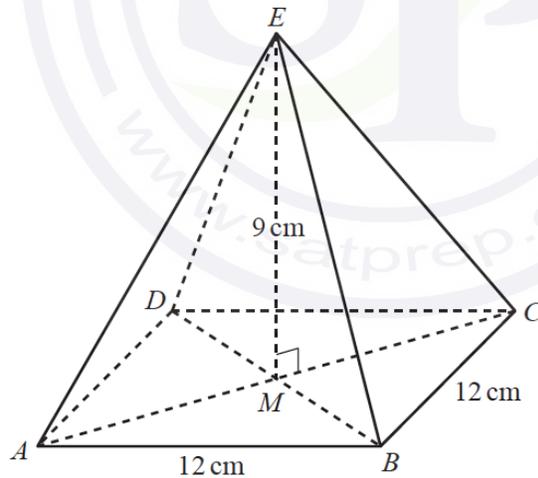
Question 45

The area of a triangle is 528 cm^2 .
 The length of its base is 33 cm.

Calculate the perpendicular height of the triangle.

$\dots\dots\dots$ cm [2]

Question 46



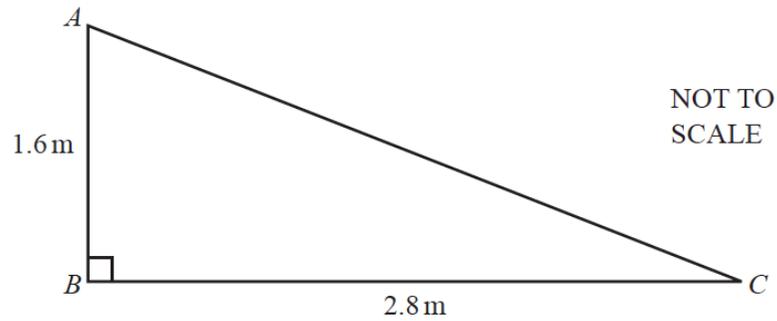
NOT TO SCALE

The diagram shows a square-based pyramid $ABCDE$.
 The diagonals of the square meet at M .
 E is vertically above M .
 $AB = BC = 12 \text{ cm}$ and $EM = 9 \text{ cm}$.

Calculate the angle between the edge EC and the base, $ABCD$, of the pyramid.

$\dots\dots\dots$ [4]

Question 47



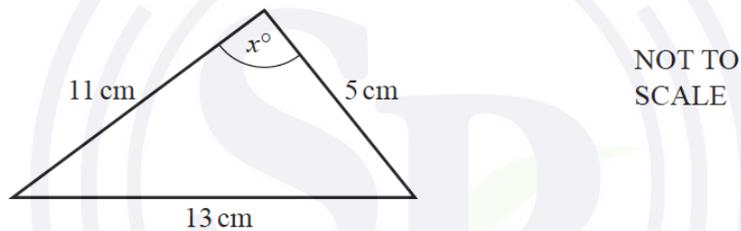
(a) Find the area of triangle ABC .

..... m^2 [2]

(b) Calculate AC .

$AC =$ m [2]

Question 48



Calculate the value of x .

$x =$ [4]

Question 49

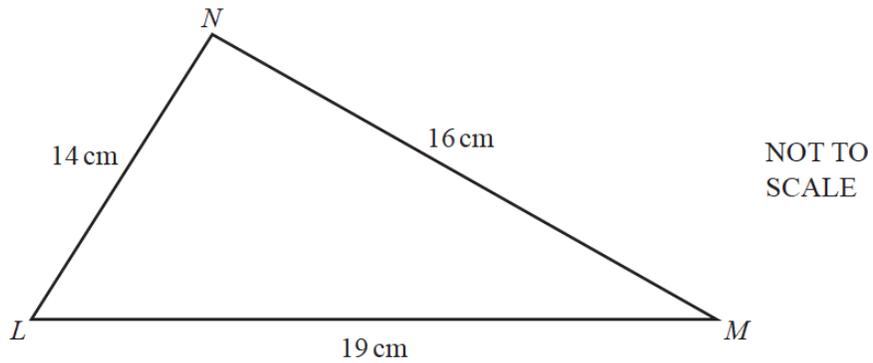
A and B are two towns on a map.

The bearing of A from B is 140° .

Work out the bearing of B from A .

..... [2]

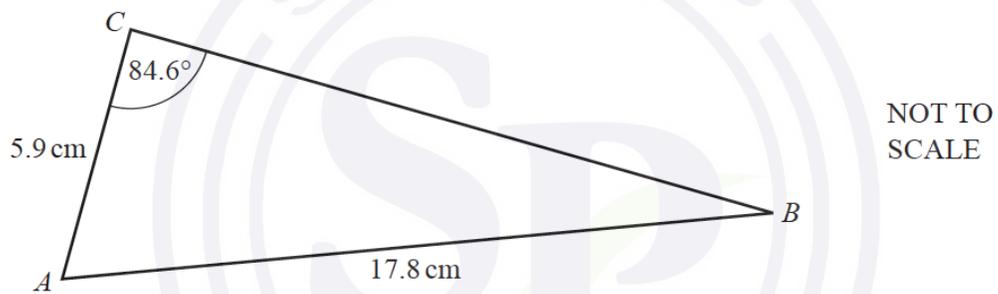
Question 50



Calculate angle LMN .

Angle $LMN = \dots\dots\dots [4]$

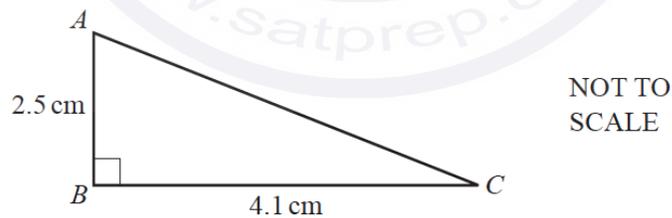
Question 51



Use the sine rule to find angle ABC .

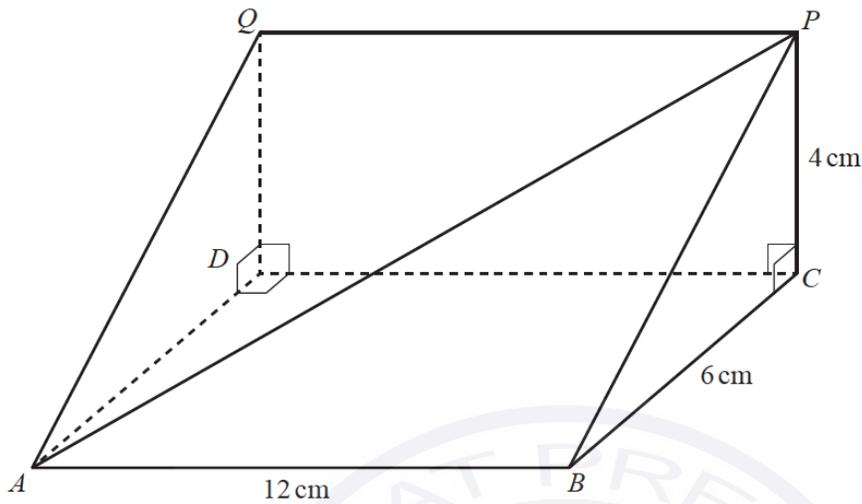
Angle $ABC = \dots\dots\dots [3]$

Question 52



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

Question 53



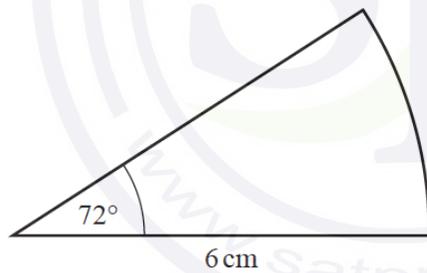
NOT TO SCALE

The diagram shows a triangular prism.
 $AB = 12$ cm, $BC = 6$ cm, $PC = 4$ cm, angle $BCP = 90^\circ$ and angle $QDC = 90^\circ$.

Calculate the angle between AP and the rectangular base $ABCD$.

..... [4]

Question 54



NOT TO SCALE

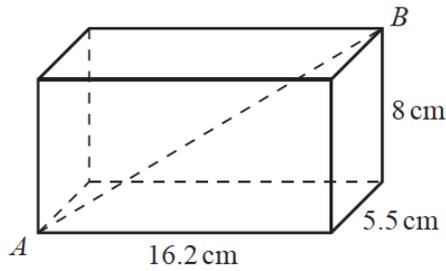
The diagram shows a sector of a circle with radius 6 cm and sector angle 72° .
 The perimeter of this sector is $(p + q\pi)$ cm.

Find the value of p and the value of q .

$p =$

$q =$ [3]

Question 55



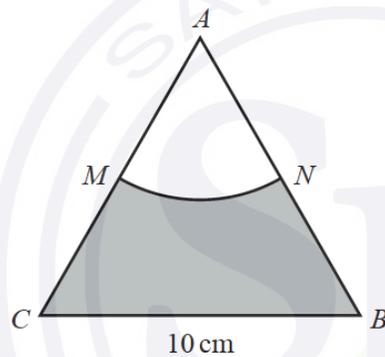
NOT TO SCALE

The diagram shows a cuboid with dimensions 5.5 cm, 8 cm and 16.2 cm.

Calculate the angle between the line AB and the horizontal base of the cuboid.

..... [4]

Question 56



NOT TO SCALE

The diagram shows an equilateral triangle ABC with sides of length 10 cm.

AMN is a sector of a circle, centre A .

M is the mid-point of AC .

Work out the area of the shaded region.

..... cm^2 [4]

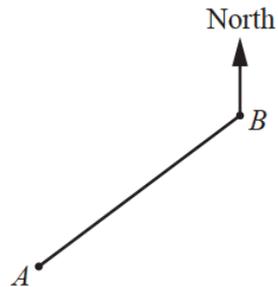
Question 57

x° is an **obtuse** angle and $\sin x^\circ = 0.43$.

Find the value of x .

$x =$ [2]

Question 58



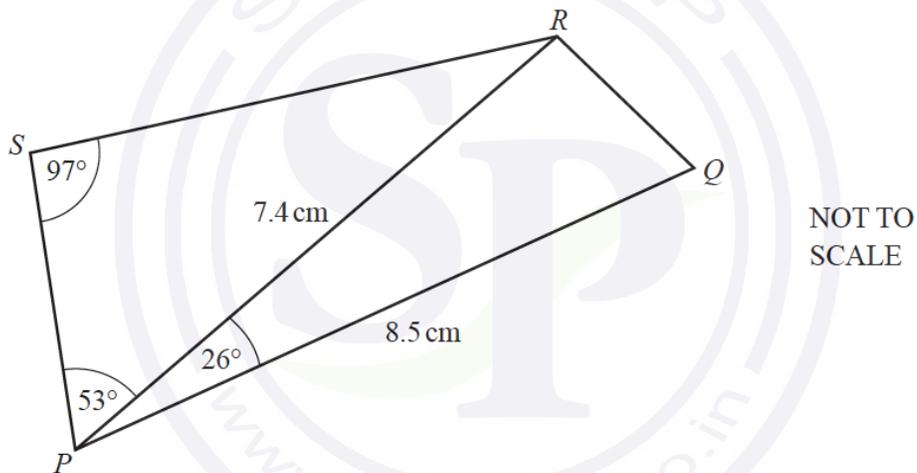
NOT TO SCALE

The bearing of A from B is 227° .

Find the bearing of B from A .

Question 59

..... [2]



NOT TO SCALE

Calculate

(a) SR ,

$SR = \dots\dots\dots$ cm [3]

(b) RQ .

$RQ = \dots\dots\dots$ cm [4]

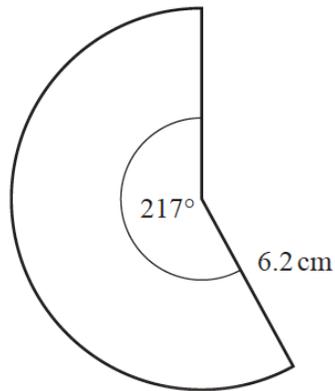
Question 60

The bearing of Alexandria from Paris is 128° .

Calculate the bearing of Paris from Alexandria.

..... [2]

Question 61



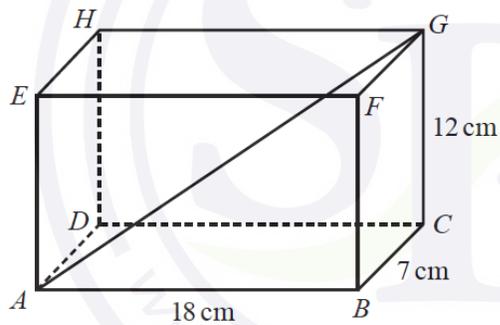
NOT TO SCALE

The diagram shows a sector of a circle with radius 6.2 cm and sector angle 217°.

Calculate the area of this sector.

..... cm² [2]

Question 62



NOT TO SCALE

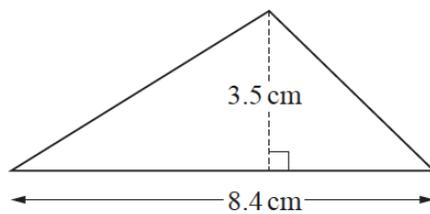
ABCDEFGH is a cuboid.

$AB = 18$ cm, $BC = 7$ cm and $CG = 12$ cm.

Calculate the angle that the diagonal *AG* makes with the base *ABCD*.

..... [4]

Question 63

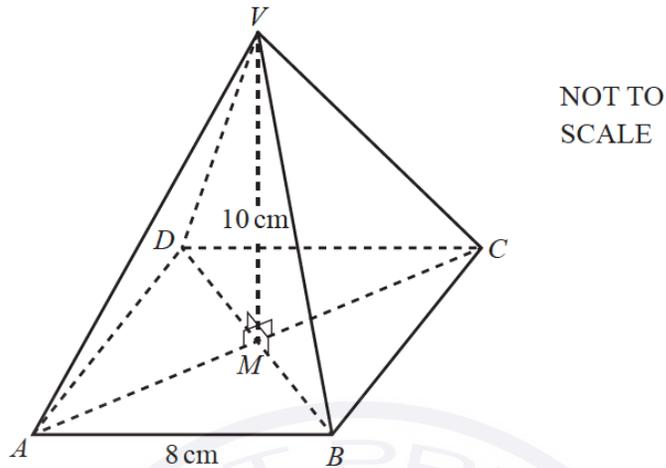


NOT TO SCALE

Calculate the area of this triangle.

..... cm² [2]

Question 64

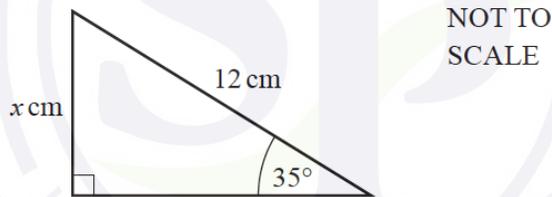


The diagram shows a pyramid with a square base $ABCD$ of side length 8 cm. The diagonals of the square, AC and BD , intersect at M . V is vertically above M and $VM = 10$ cm.

Calculate the angle between VA and the base.

..... [4]

Question 65



The diagram shows a right-angled triangle.

Calculate the value of x .

$x =$ [2]

Question 66

When $\sin x^\circ = 0.36$, find

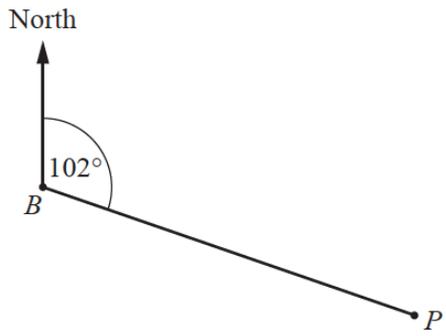
(a) the acute angle x° ,

..... [1]

(b) the obtuse angle x° .

..... [1]

Question 67

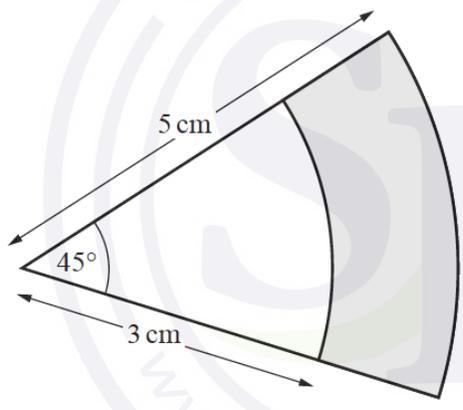


NOT TO SCALE

The bearing of P from B is 102° .

Find the bearing of B from P .

Question 68



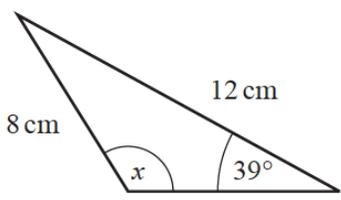
NOT TO SCALE

The diagram shows two sectors of circles with the same centre.

Calculate the shaded area.

..... cm^2 [3]

Question 69

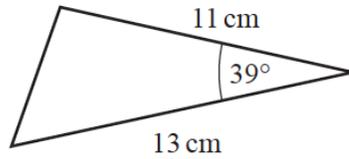


NOT TO SCALE

Calculate the **obtuse** angle x in this triangle.

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

Question 70

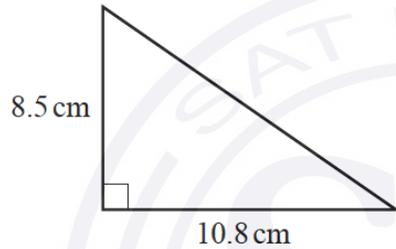


NOT TO SCALE

Calculate the area of the triangle.

$\dots\dots\dots$ cm² [2]

Question 71



NOT TO SCALE

The diagram shows a right-angled triangle.

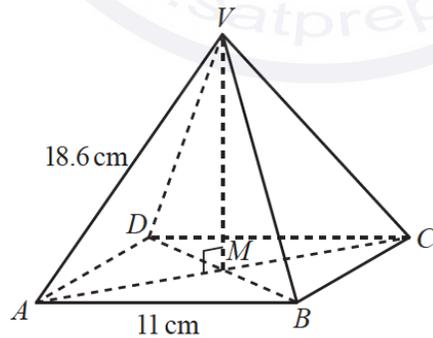
(a) Calculate the area.

$\dots\dots\dots$ cm² [2]

(b) Calculate the perimeter.

$\dots\dots\dots$ cm [3]

Question 72



NOT TO SCALE

The diagram shows a pyramid with a square base $ABCD$.
The diagonals AC and BD intersect at M .
The vertex V is vertically above M .
 $AB = 11$ cm and $AV = 18.6$ cm.

Calculate the angle that AV makes with the base.

..... [4]

Question 73

The total perimeter of a semicircle is 19.02 cm.

Calculate the radius of the semicircle.

..... cm [3]

Question 74

Calculate the area of the sector of a circle with radius 65 mm and sector angle 42° .

Give your answer in square centimetres.

..... cm^2 [3]

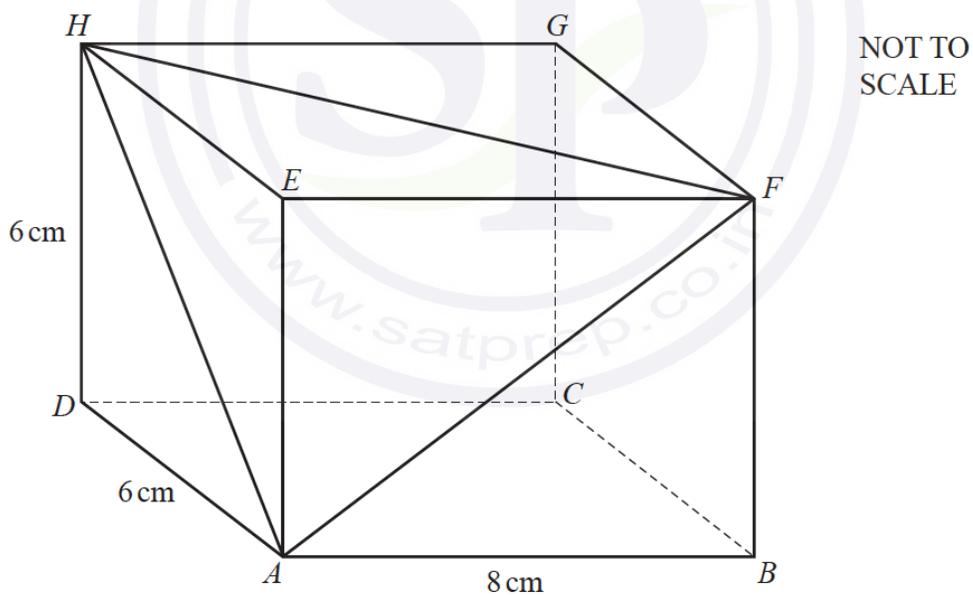
Question 75

The bearing of X from Y is 274° .

Calculate the bearing of Y from X .

..... [2]

Question 76



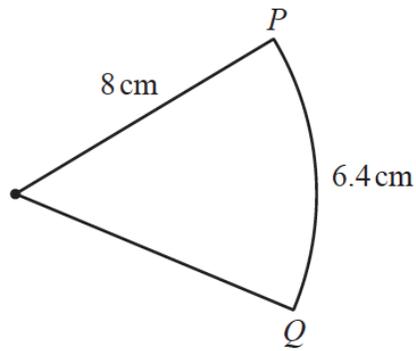
The diagram shows a cuboid.

$AB = 8\text{ cm}$, $AD = 6\text{ cm}$ and $DH = 6\text{ cm}$.

Calculate angle HAF .

Angle $HAF =$ [6]

Question 77



NOT TO SCALE

The diagram shows a sector of a circle of radius 8 cm.
The length of the arc PQ is 6.4 cm.

Find the area of the sector.

..... cm^2 [4]

Question 78



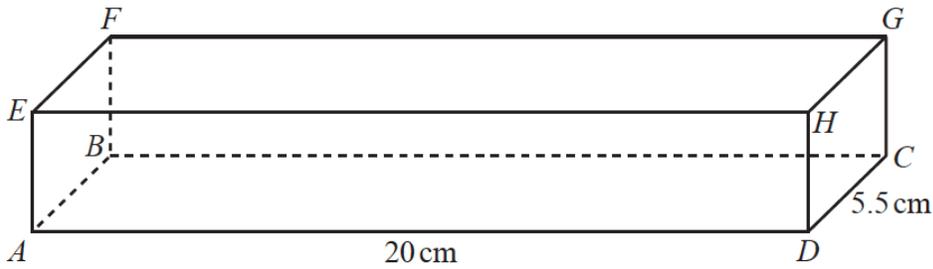
NOT TO SCALE

The bearing of B from A is 105° .

Find the bearing of A from B .

..... [2]

Question 79



NOT TO SCALE

The diagram shows cuboid $ABCDEFGH$ of length 20 cm and width 5.5 cm. The volume of the cuboid is 495 cm^3 .

Find the angle between the line AG and the base of the cuboid $ABCD$.

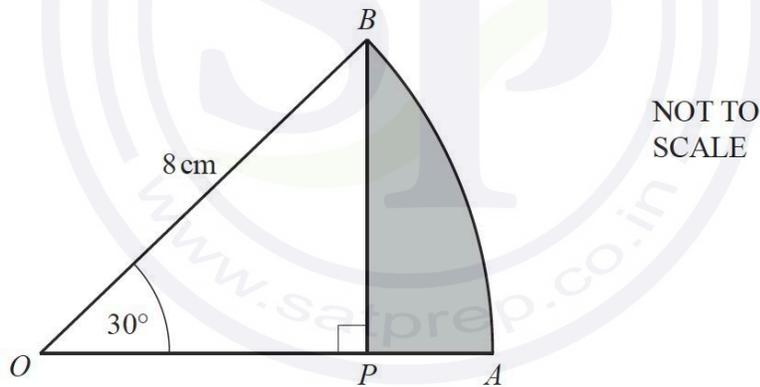
..... [5]

Question 80

Solve $3 \tan x = -4$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 81



NOT TO SCALE

OAB is the sector of a circle, centre O .
 $OB = 8 \text{ cm}$ and angle $AOB = 30^\circ$.
 BP is perpendicular to OA .

(a) Calculate AP .

$AP = \dots\dots\dots \text{ cm}$ [3]

(b) Work out the area of the shaded region APB .

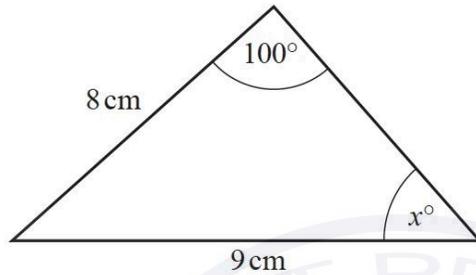
..... cm^2 [3]

Question 82

Solve the equation $\tan x = 2$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 83



NOT TO SCALE

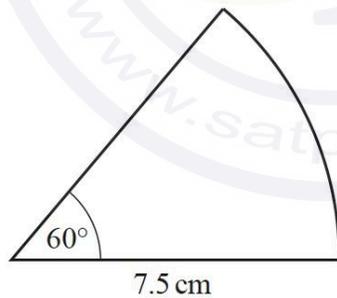
(a) Calculate the value of x .

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

(b) Calculate the area of the triangle.

$\dots\dots\dots\text{ cm}^2$ [3]

Question 84

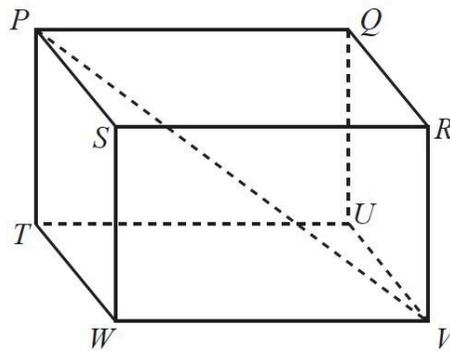


NOT TO SCALE

Calculate the area of this sector of a circle.

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

Question 85



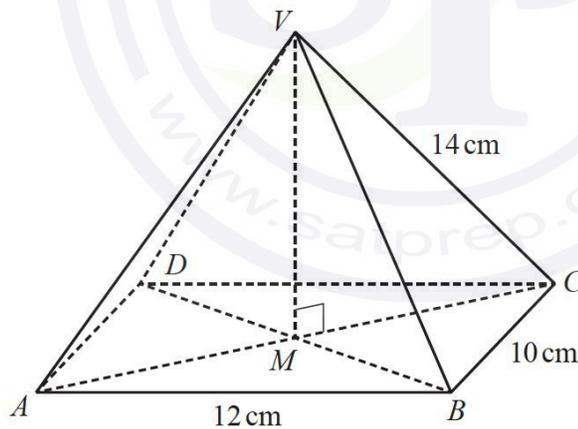
NOT TO SCALE

The diagram shows a cuboid $PQRSTUWV$.
 $PV = 17.2$ cm
 The angle between the line PV and the base $TUVW$ of the cuboid is 43° .

Calculate PT .

$PT = \dots\dots\dots$ cm [3]

Question 86



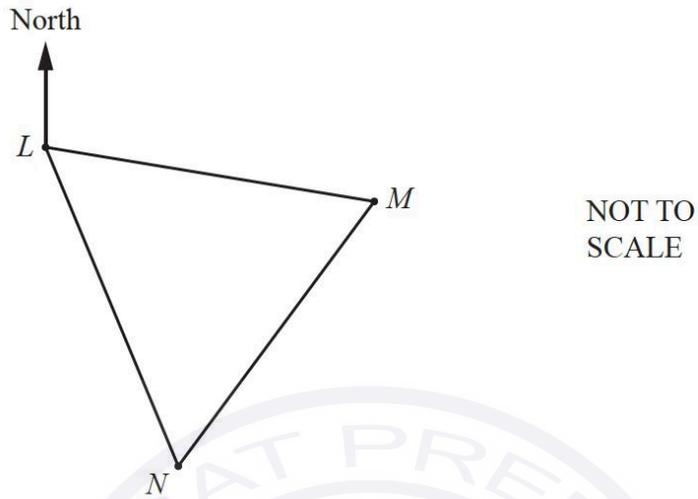
NOT TO SCALE

The diagram shows a pyramid $VABCD$ with a rectangular base.
 V is vertically above M , the intersection of the diagonals AC and BD .
 $AB = 12$ cm, $BC = 10$ cm and $VC = 14$ cm.

Calculate the angle that VC makes with the base $ABCD$.

$\dots\dots\dots$ [4]

Question 87

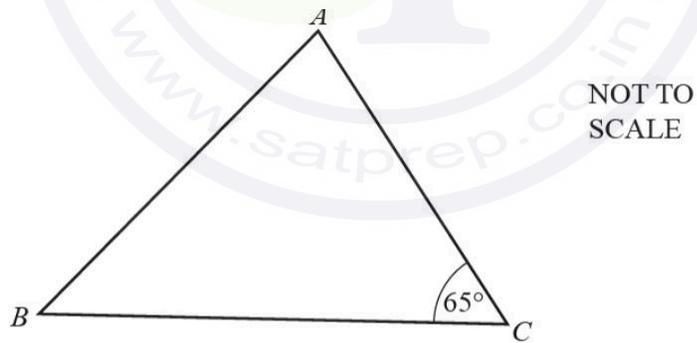


On a map, the positions of the towns L , M and N form an equilateral triangle. The bearing of M from L is 103° .

Work out the bearing of L from N .

..... [2]

Question 88



The shortest distance from B to AC is 12.8 cm.

Calculate BC .

$BC = \dots\dots\dots$ cm [3]

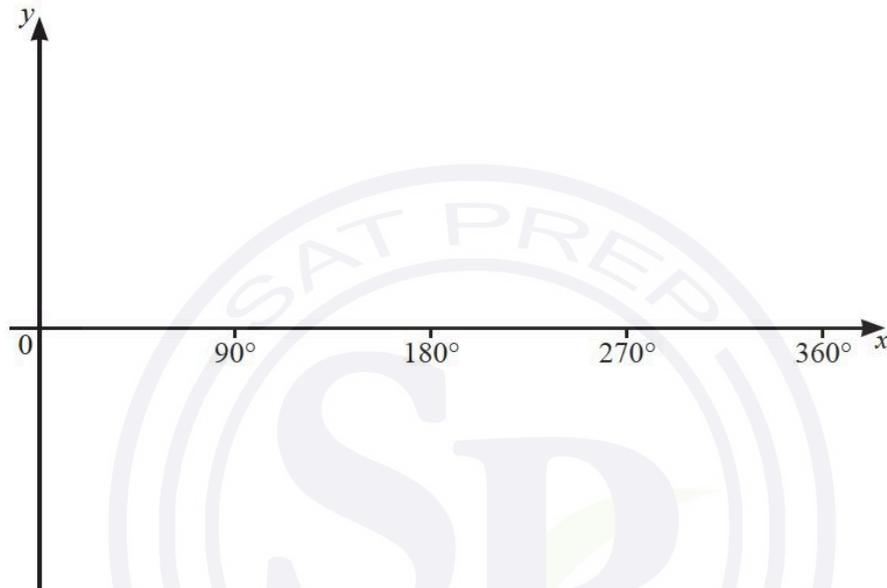
Question 89

Find all the solutions of $4 \sin x = 3$ for $0^\circ \leq x \leq 360^\circ$.

..... [2]

Question 90

(a) Sketch the graph of $y = \tan x$ for $0^\circ \leq x \leq 360^\circ$.



[2]

(b) Solve the equation $5 \tan x = 1$ for $0^\circ \leq x \leq 360^\circ$.

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

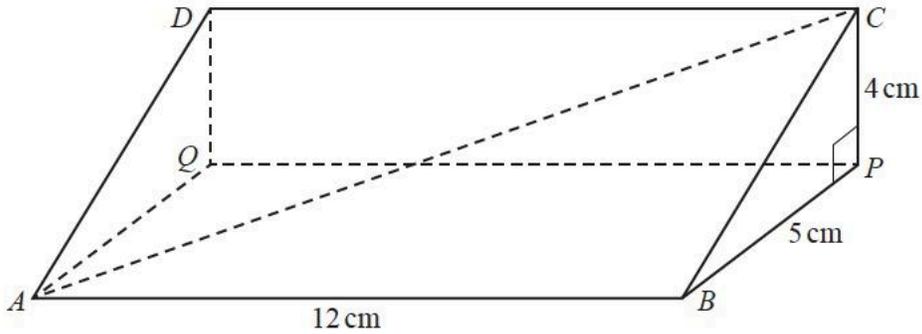
Question 91

$\tan x = \sqrt{3}$ and $0^\circ \leq x \leq 360^\circ$.

Find all the possible values of x .

..... [2]

Question 92



NOT TO SCALE

The diagram shows a triangular prism.
Angle $BPC = 90^\circ$.

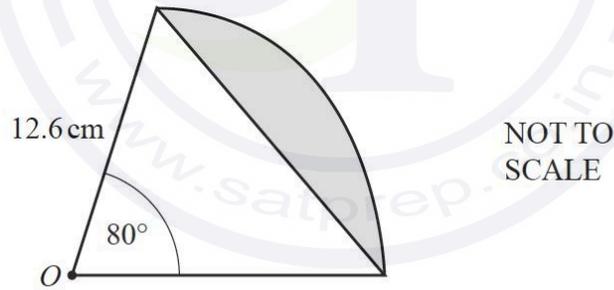
(a) Calculate AC .

$AC = \dots\dots\dots$ cm [3]

(b) Calculate the angle between AC and the base $ABPQ$.

$\dots\dots\dots$ [3]

Question 93



NOT TO SCALE

The diagram shows a sector of a circle, centre O , radius 12.6 cm.

Calculate the perimeter of the shaded segment.

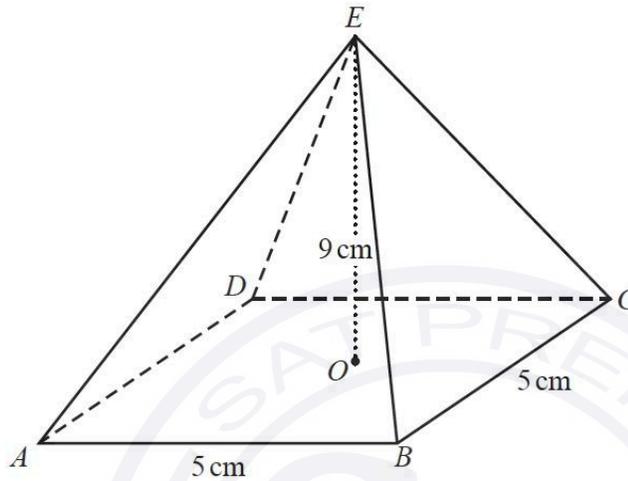
$\dots\dots\dots$ cm [4]

Question 94

Solve the equation $7 \sin x + 2 = 0$ for $0^\circ \leq x \leq 360^\circ$.

..... [3]

Question 95



NOT TO SCALE

The diagram shows a pyramid $ABCDE$.
The pyramid has a square horizontal base $ABCD$ with side 5 cm .
The vertex E is vertically above the centre O of the base.
The height OE of the pyramid is 9 cm .

Calculate the angle that EC makes with the base $ABCD$.

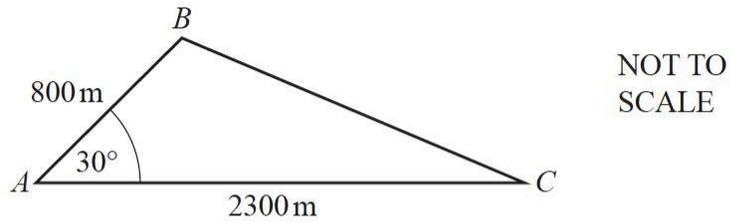
..... [4]

Question 96

Solve $3(2 + \cos x) = 5$ for $0^\circ \leq x \leq 360^\circ$.

..... [3]

Question 97

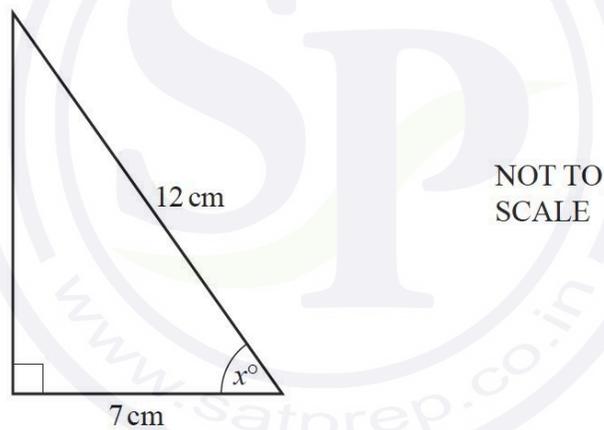


The diagram shows some land in the shape of a triangle ABC .
Houses are built on this land.
Each house requires 400 m^2 of land.

Find the greatest number of houses that can be built on this land.

..... [3]

Question 98

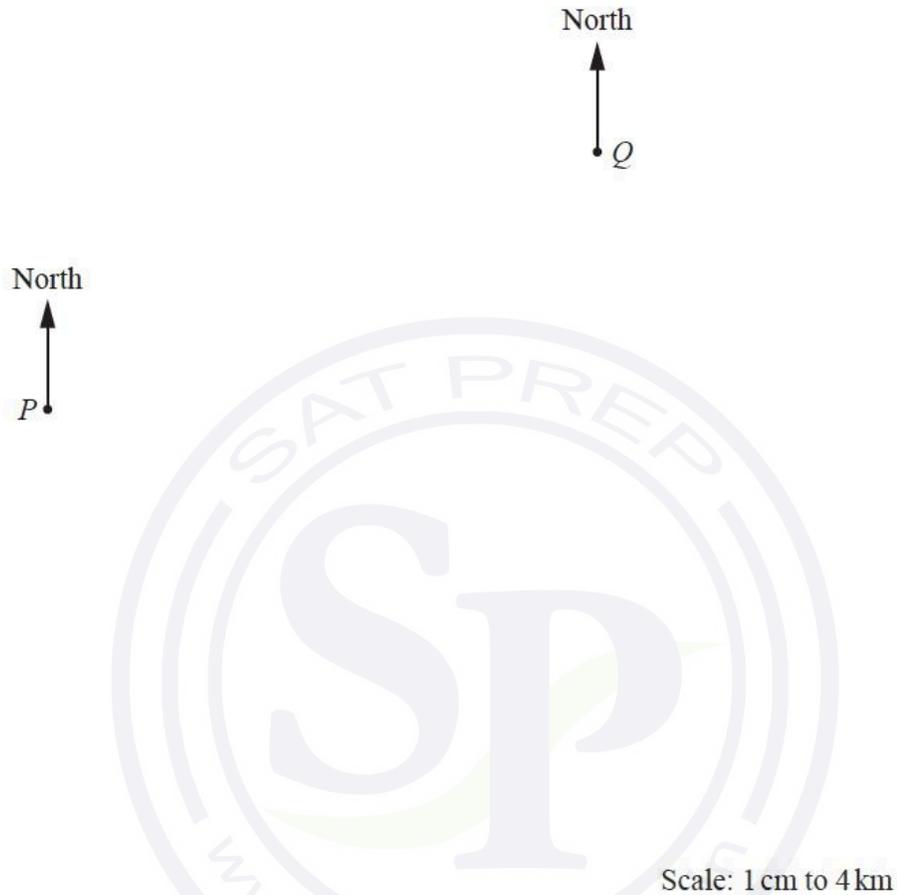


Calculate the value of x .

$x =$ [2]

Question 99

The scale drawing shows the positions of two towns, P and Q .
The scale is 1 cm represents 4 km.



(a) Find the actual distance between town P and town Q .

..... km [2]

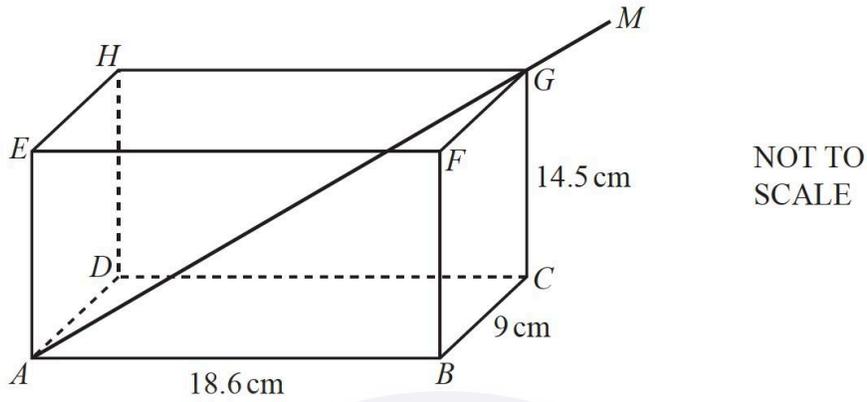
(b) Measure the bearing of town Q from town P .

..... [1]

(c) Town X is 28 km from town P on a bearing of 140° .

On the scale drawing, mark the position of town X . [2]

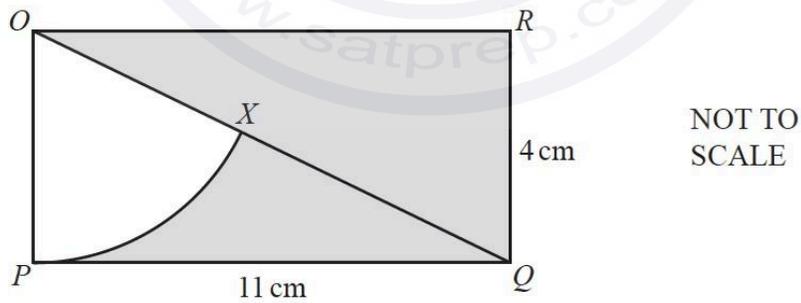
Question 100



The diagram shows an open rectangular box $ABCDEFGH$.
 $AB = 18.6$ cm, $BC = 9$ cm and $CG = 14.5$ cm.
 A straight stick AGM rests against A and G and extends outside the box to M .

- (a) Calculate the angle between the stick and the base of the box.
 [4]
- (b) $AM = 30$ cm.
 Show that $GM = 4.8$ cm, correct to 1 decimal place.
 [3]

Question 101



The diagram shows a rectangle $OPQR$ with length 11 cm and width 4 cm.
 OQ is a diagonal and OPX is a sector of a circle, centre O .

Calculate the percentage of the rectangle that is shaded.
 % [5]

Question 102

Solve the equation $3 \sin x + 3 = 1$ for $0^\circ \leq x \leq 360^\circ$.

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

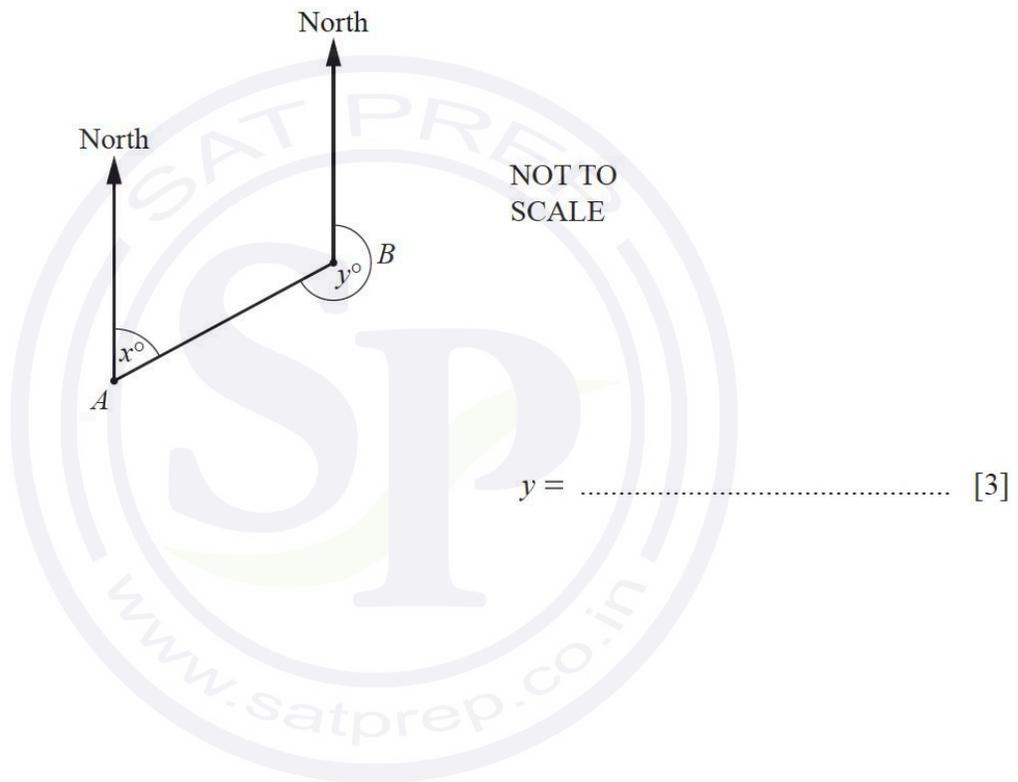
Question 103

The bearing of B from A is x° .

The bearing of A from B is y° .

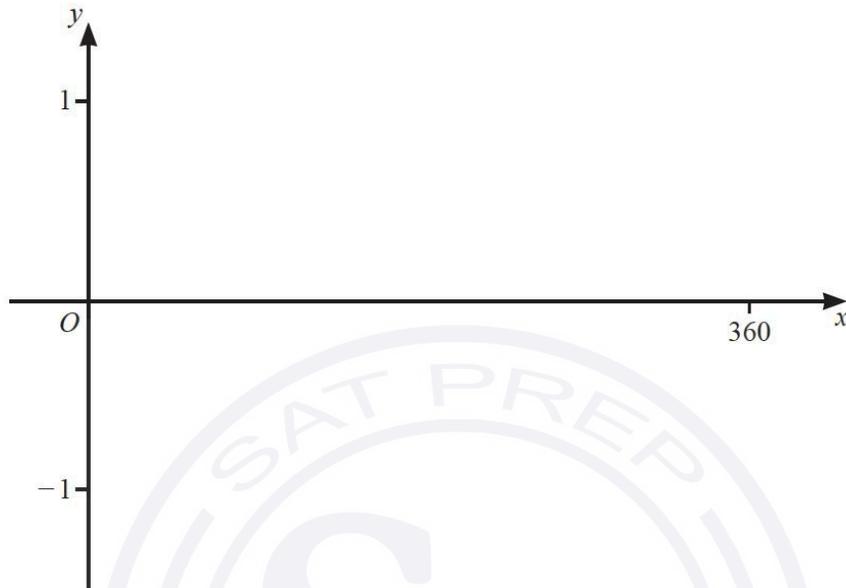
$x : y = 2 : 7$

Calculate the value of y .



Question 104

(a) Sketch the graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$.

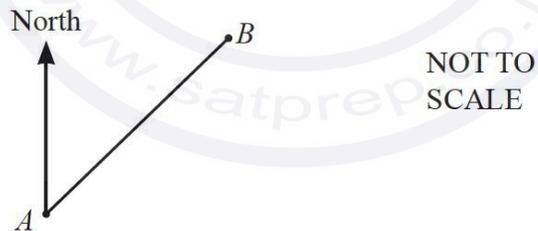


[2]

(b) Solve the equation $3 \sin x + 1 = 0$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 105

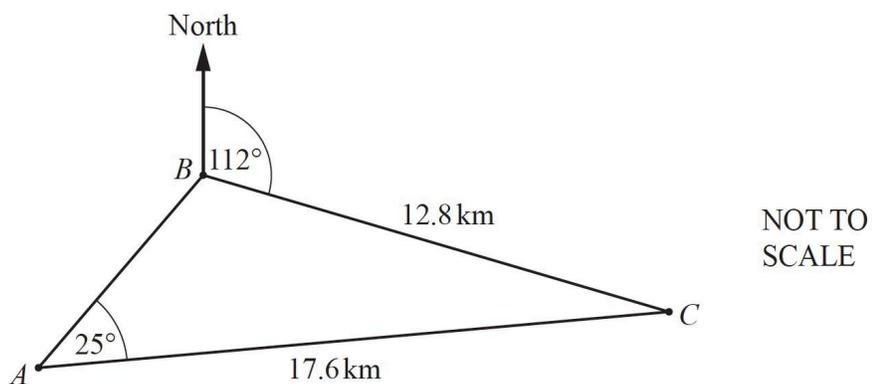


The bearing of B from A is 059° .

Work out the bearing of A from B .

$\dots\dots\dots$ [2]

Question 106



The diagram shows the positions of three ships A , B and C .
 $AC = 17.6$ km, $BC = 12.8$ km and angle $BAC = 25^\circ$.
 The bearing of C from B is 112° and angle ABC is obtuse.

Calculate the bearing of B from A .

..... [5]

Question 107



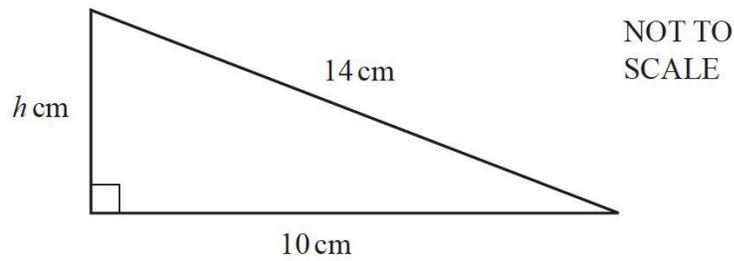
Sketch the graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$. [2]

Question 108

Solve $3 - 2 \sin x = \frac{13}{4}$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 109



The diagram shows a right-angled triangle.

(a) Calculate the value of h .

$h = \dots\dots\dots$ [3]

(b) Find the perimeter of this triangle.

$\dots\dots\dots$ cm [1]

Question 110

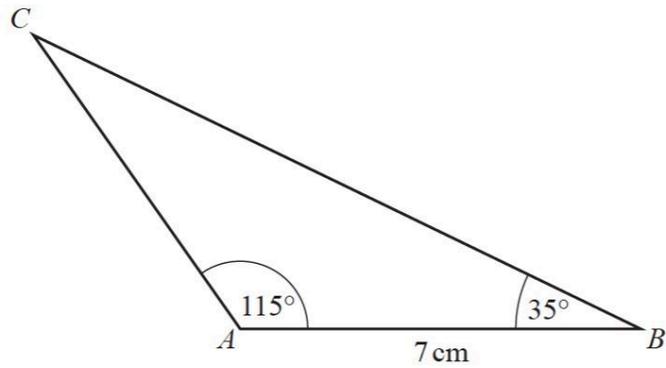


(a) On the diagram, sketch the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$. [2]

(b) Solve the equation $\cos x = -\frac{1}{2}$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 111

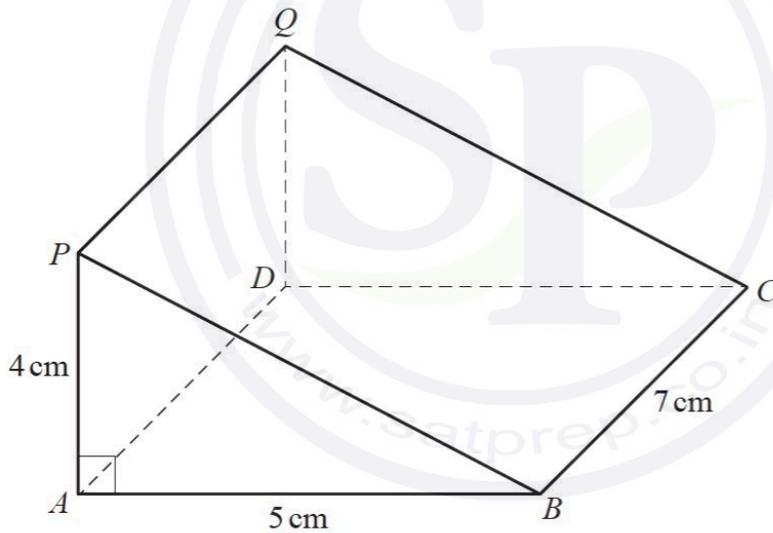


NOT TO SCALE

Calculate the length BC .

$BC = \dots\dots\dots$ cm [4]

Question 112



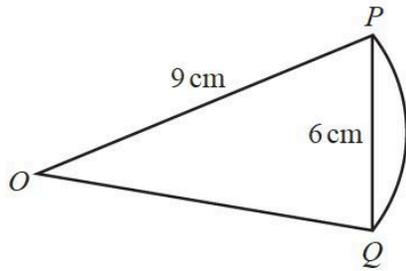
NOT TO SCALE

The diagram shows a triangular prism $ABCDQP$ of length 7 cm.
 The cross-section is triangle PAB with $PA = 4$ cm, $AB = 5$ cm and angle $PAB = 90^\circ$.

Calculate the angle between the line PC and the base $ABCD$.

$\dots\dots\dots$ [4]

Question 113



NOT TO SCALE

The diagram shows a sector of a circle with centre O and radius 9 cm .
The length of the chord PQ is 6 cm .

Calculate the length of the arc PQ .

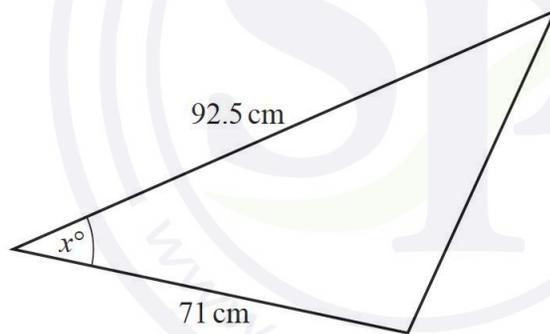
..... cm [3]

Question 114

Solve the equation $5 \sin x = -3$ for $0^\circ \leq x \leq 360^\circ$.

..... [3]

Question 115



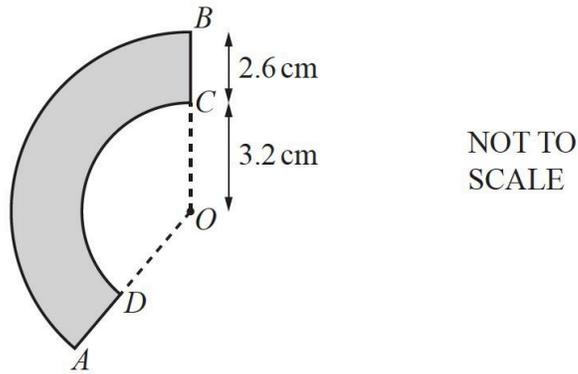
NOT TO SCALE

The diagram shows a triangle with an acute angle marked x° .
The area of the triangle is 2143 cm^2 .

Work out the value of x .

$x =$ [2]

Question 116



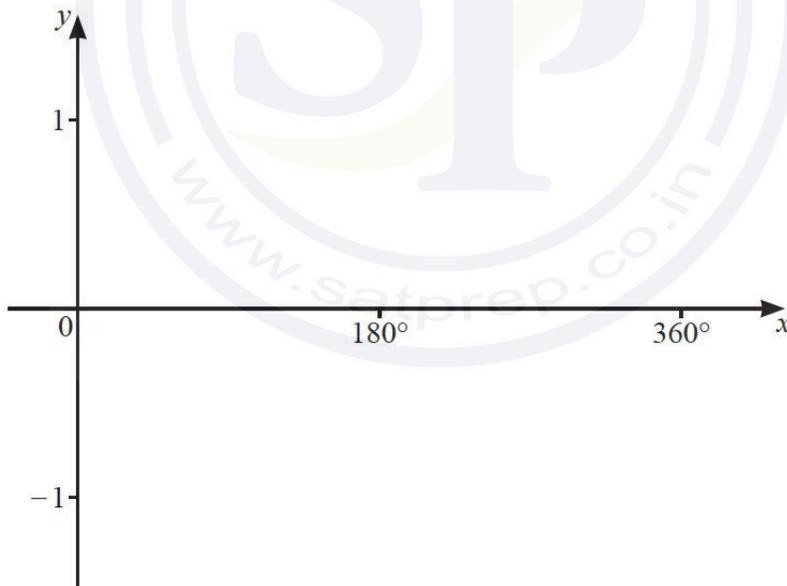
The diagram shows a shape, $ABCD$, formed by the sectors of two circles with the same centre O . Both sector angles are 140° , $OC = 3.2$ cm and $CB = 2.6$ cm. The area of the shape is $k\pi$ cm².

Find the value of k .

$k = \dots\dots\dots$ [3]

Question 117

(a) On the diagram, sketch the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$.

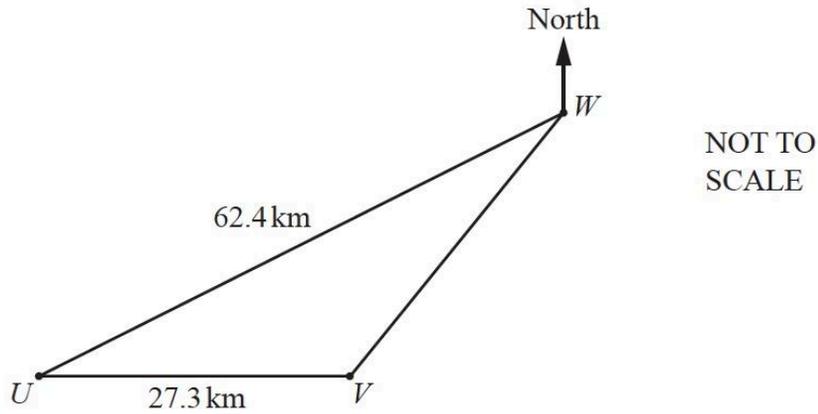


[2]

(b) Solve the equation $5 \cos x + 3 = 0$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 118

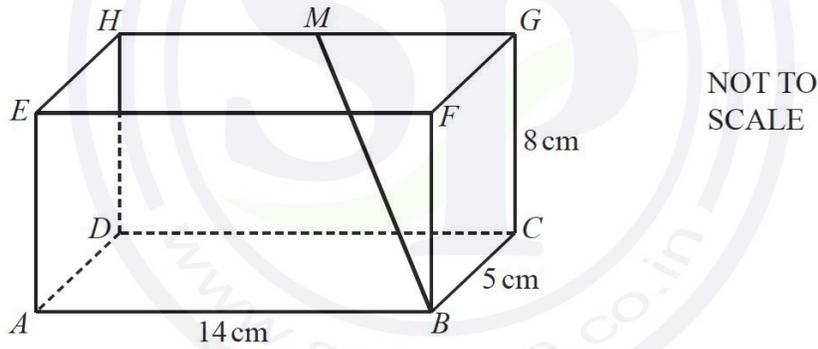


The diagram shows the position of three towns, U , V and W .
 U is due west of V and angle $UWV = 125^\circ$.

Calculate the bearing of U from W .

.....[4]

Question 119



The diagram shows a cuboid $ABCDEFGH$.
 $AB = 14$ cm, $BC = 5$ cm and $CG = 8$ cm.
 M is the midpoint of HG .

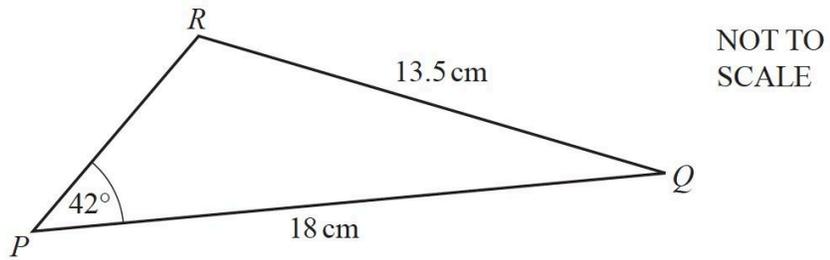
(a) Calculate BM .

..... cm [3]

(b) Calculate the angle that BM makes with the base $ABCD$.

..... [3]

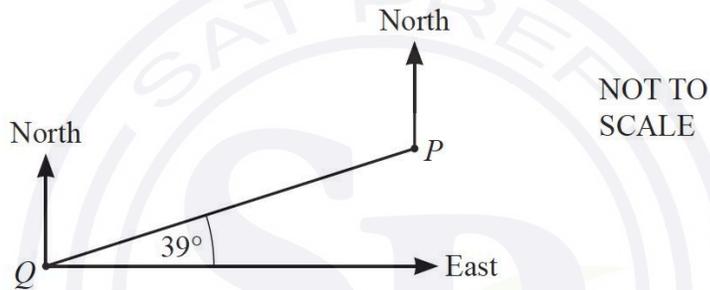
Question 120



Calculate the obtuse angle PRQ .

Angle $PRQ = \dots\dots\dots$ [4]

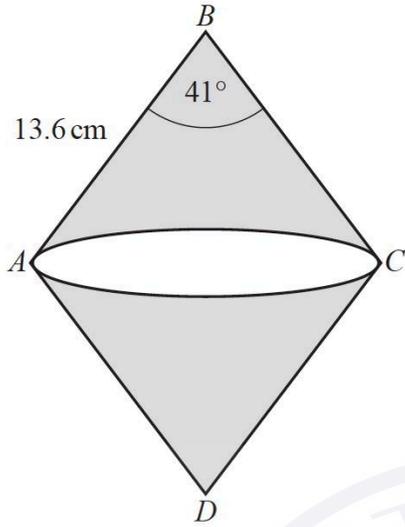
Question 121



Find the bearing of Q from P .

$\dots\dots\dots$ [2]

Question 122



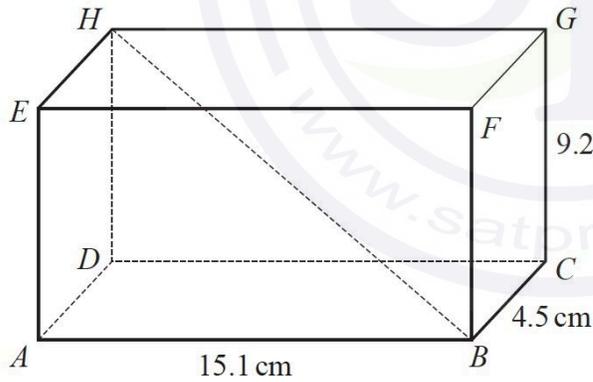
NOT TO SCALE

$ABCD$ is a rhombus with side length 13.6 cm.
 Angle $ABC = 41^\circ$.
 BAC is a sector of a circle with centre B .
 DAC is a sector of a circle with centre D .

Calculate the shaded area.

..... cm^2 [4]

Question 123



NOT TO SCALE

The diagram shows a cuboid $ABCDEFGH$.
 $AB = 15.1$ cm, $BC = 4.5$ cm and $CG = 9.2$ cm.

Calculate the angle that the diagonal BH makes with the face $ADHE$.

..... [4]

Question 124

(a)



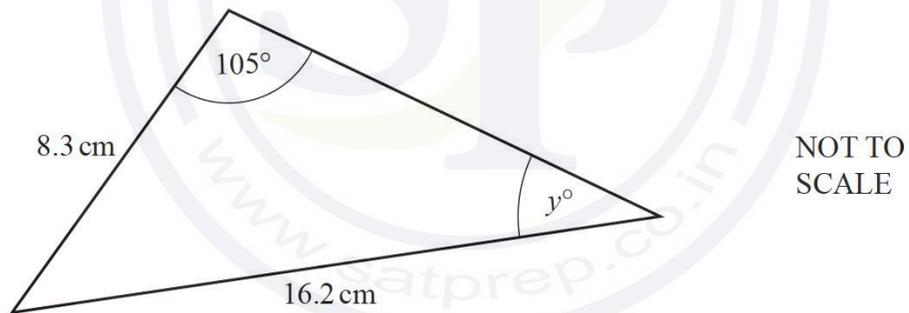
Sketch the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$.

[2]

(b) When $\cos x = 0.21$, find the **reflex** angle x .

..... [2]

Question 125

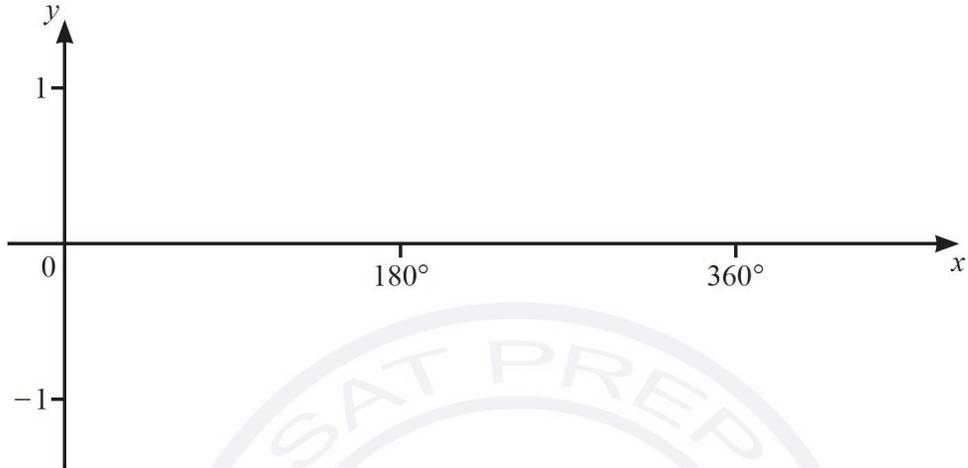


Calculate the value of y .

$y =$ [3]

Question 126

(a) On the axes, sketch the graph of $y = \cos x$, for $0^\circ \leq x \leq 360^\circ$.

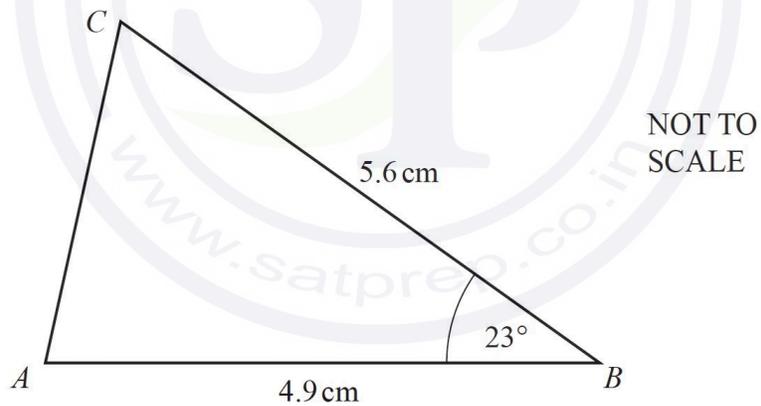


[2]

(b) Solve the equation $\cos x = 0.294$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 127



Calculate the area of triangle ABC .

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

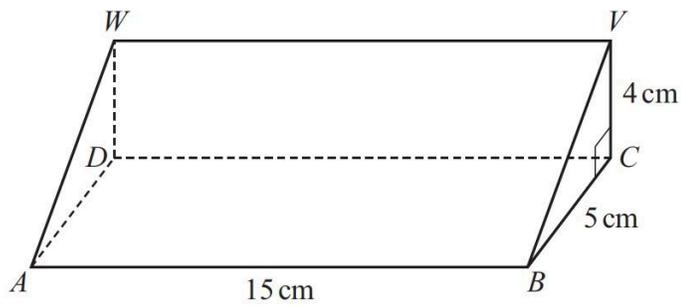
Question 128

The bearing of B from A is 107° .

Calculate the bearing of A from B .

$\dots\dots\dots$ [2]

Question 129



NOT TO SCALE

The diagram shows a triangular prism with cross-section triangle BCV . Angle $BCV = 90^\circ$, $BC = 5\text{ cm}$, $CV = 4\text{ cm}$ and $AB = 15\text{ cm}$.

Calculate the angle between AV and the base $ABCD$.

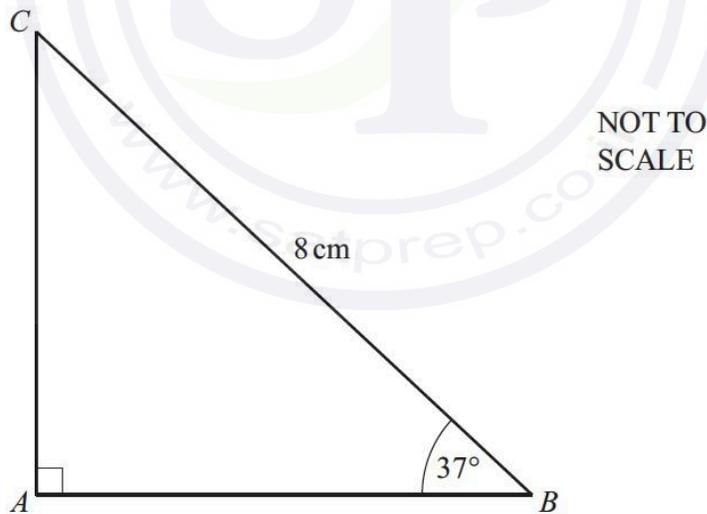
..... [4]

Question 130

Solve the equation $\tan x + \sqrt{3} = 0$ for $0^\circ \leq x \leq 360^\circ$.

..... [3]

Question 131



NOT TO SCALE

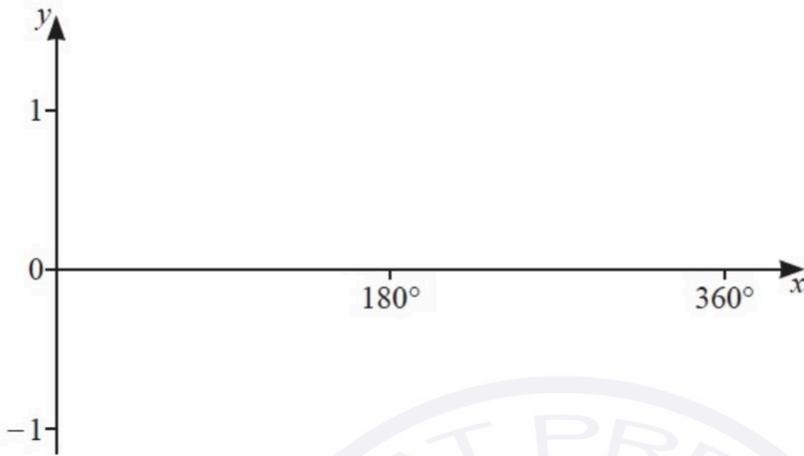
The diagram shows a right-angled triangle.

Calculate AB .

$AB = \dots\dots\dots$ cm [2]

Question 132

(i) On the grid, sketch the curve $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$.

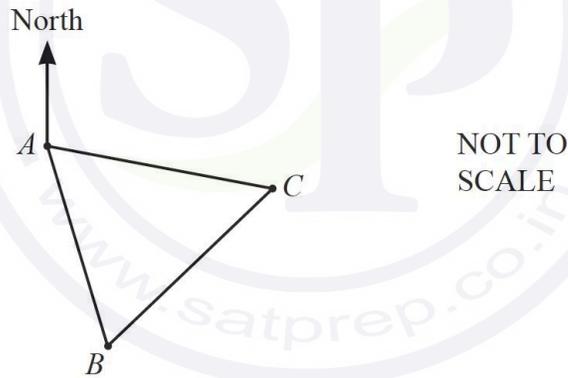


[2]

(ii) Solve the equation $\sin x + 0.4 = 0$ for $0^\circ \leq x \leq 360^\circ$.

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

Question 133

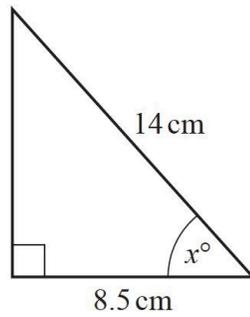


Three towns, A , B and C , are equidistant from each other.
The bearing of C from A is 104° .

Calculate the bearing of B from C .

$\dots\dots\dots$ [3]

Question 134



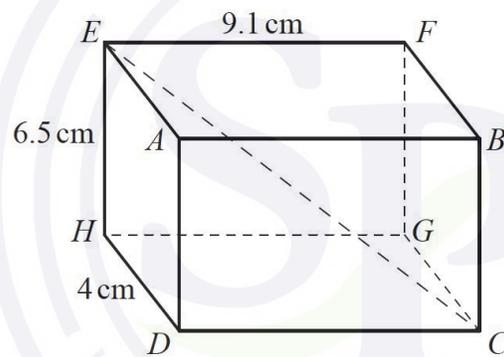
NOT TO SCALE

The diagram shows a right-angled triangle.

Calculate the value of x .

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

Question 135



NOT TO SCALE

The diagram shows a cuboid.

$HD = 4$ cm, $EH = 6.5$ cm and $EF = 9.1$ cm.

Calculate the angle between CE and the base $CDHG$.

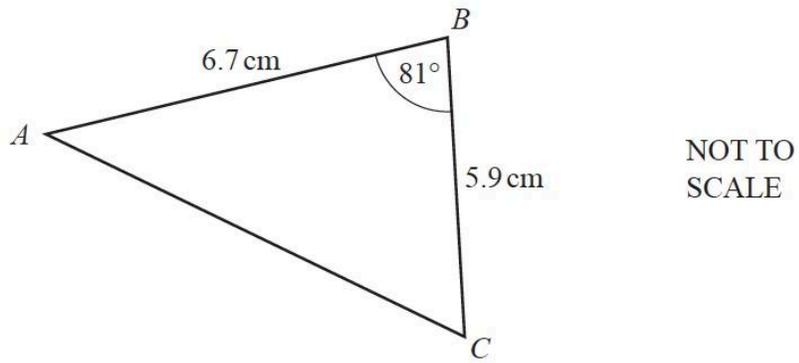
$\dots\dots\dots$ [4]

Question 136

Solve the equation $8 \sin x + 6 = 1$ for $0^\circ \leq x \leq 360^\circ$.

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

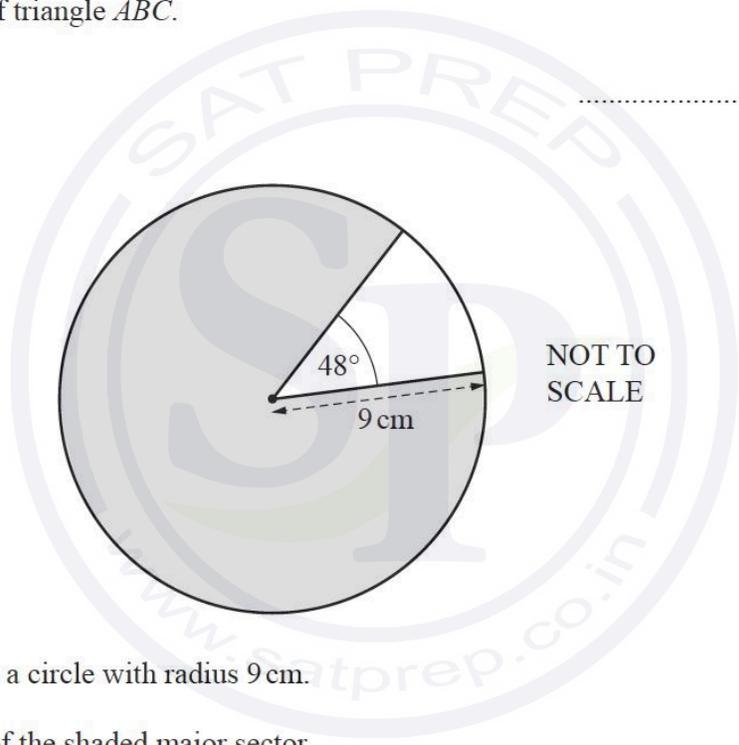
Question 137



Calculate the area of triangle ABC .

..... cm^2 [2]

Question 138

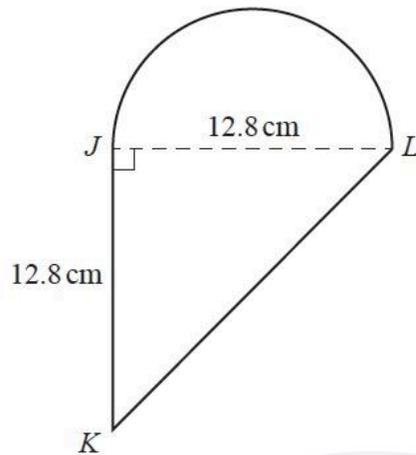


The diagram shows a circle with radius 9 cm .

Calculate the area of the shaded major sector.

..... cm^2 [3]

Question 139



NOT TO
SCALE

The diagram shows a shape made from a triangle JKL and a semicircle with diameter JL . JKL is an isosceles right-angled triangle with $JK = JL = 12.8$ cm.

(a) Calculate the area of this shape.

..... cm^2 [3]

(b) Calculate the perimeter of this shape.

..... cm [4]

