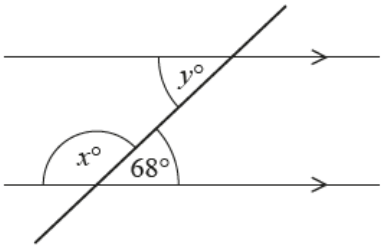
Geometry – 2022 IGCSE 0580

1. June/2022/Paper-11/No.7



NOT TO SCALE

The diagram shows two parallel lines and a straight line crossing them.

Find the value of x and the value of y.

$x =$ .....

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

2. June/2022/Paper-13/No.2

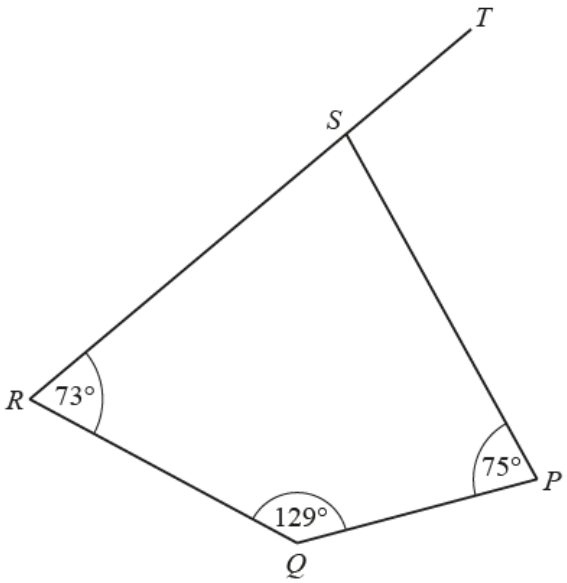
(a) Measure the length of the line AB in millimetres.

..... mm [1]

(b) Mark the midpoint, M, of the line AB. [1]

(c) Draw a line through M that is perpendicular to the line AB. [1]

3. June/2022/Paper-13/No.9



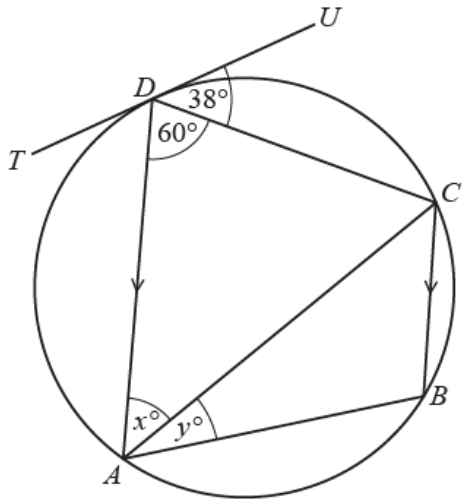
NOT TO SCALE

PQRS is a quadrilateral.
RST is a straight line.

Find angle *PST*.

Angle *PST* = ... [2]

4. June/2022/Paper-21/No.18



NOT TO SCALE

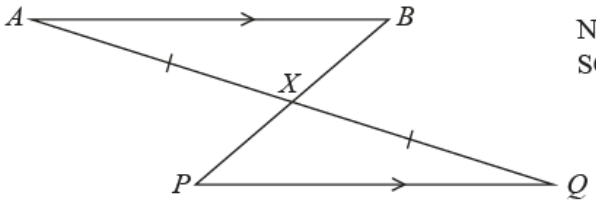
A, B, C and D are points on a circle.
TU is a tangent to the circle at D.
DA is parallel to CB.

Find the value of x and the value of y.

$x =$ .....

$y =$ ..... [3]

5. June/2022/Paper-21/No.19



NOT TO SCALE

In the diagram, AB is parallel to PQ.
AQ and PB intersect at X with $AX = XQ$.

Complete the following statements.

In triangles ABX and QPX,

$AX = XQ$ is given information.

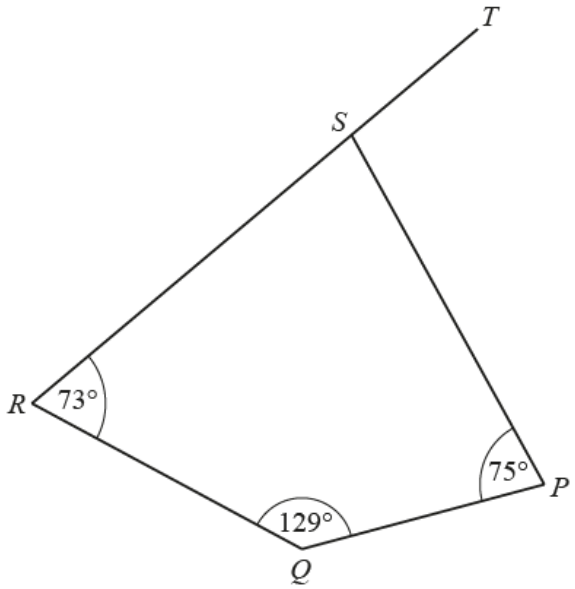
Angle BAX = Angle ..... because .....

Angle AXB = Angle ..... because .....

Triangle ABX is congruent to triangle QPX because of the congruency criterion .....

PX = ... because the triangles are congruent. [4]

6. June/2022/Paper-23/No.3



NOT TO SCALE

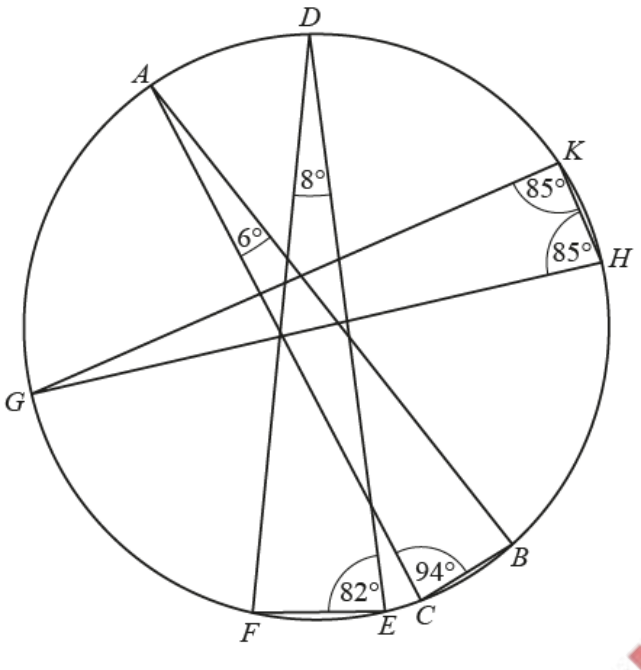
PQRS is a quadrilateral.
RST is a straight line.

Find angle *PST*.

Angle *PST* = ... [2]

7. June/2022/Paper-23/No.11

ABC, *DEF* and *GHK* are triangles with all vertices on the circumference of a circle.



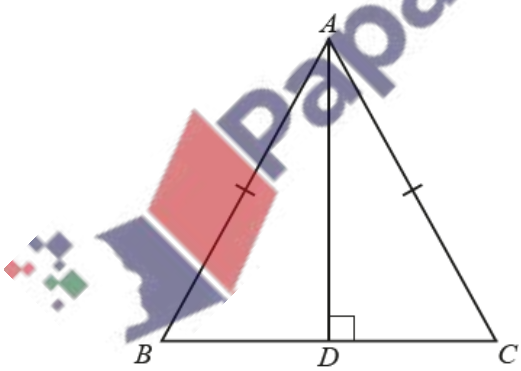
NOT TO SCALE

From the list, draw a ring around the line that is a diameter of the circle.

AB *AC* *DE* *DF* *GH* *GK*

[1]

8. June/2022/Paper-23/No.17



NOT TO SCALE

In triangle *ABC*, $AC = AB$.
D is the point on *BC* such that *AD* is perpendicular to *BC*.

Complete the following statements to show that triangle *ACD* and triangle *ABD* are congruent.

AD is perpendicular to BC so that Angle ..... = Angle ..... = ... °

$AC = AB$ is given information.

Side ..... is common to both triangles.

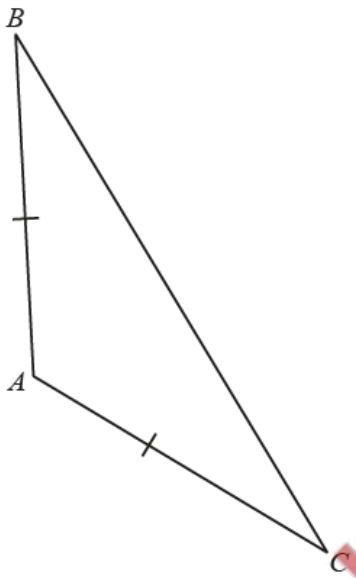
Triangle *ACD* is congruent to triangle *ABD* because of the congruency criterion ..... [3]

9. June/2022/Paper_31/No.2

(a) Write down the number of sides of a hexagon.

..... [1]

(b)



In triangle ABC, $AB = AC$.

(i) Write down the mathematical name for this type of triangle.

..... [1]

(ii) Measure angle CAB.

Angle CAB = ... [1]

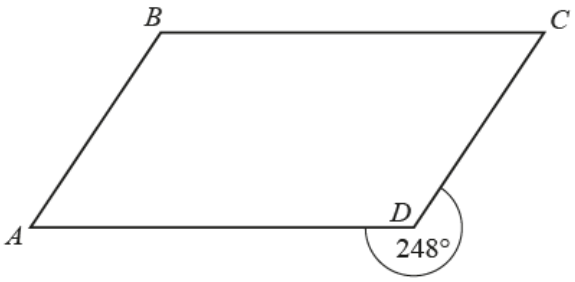
(iii) Write down the mathematical name for angle CAB.

..... [1]

(c) Show that the interior angle of a regular pentagon is 108°.

[2]

(d)



NOT TO SCALE

ABCD is a parallelogram.
The reflex angle at *D* is 248°.

Find angle *DCB*.

Angle *DCB* = ... [2]

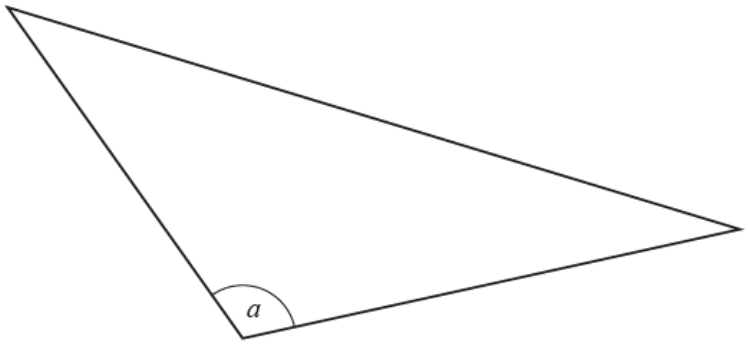
(e) The angles of a triangle are in the ratio 3 : 5 : 7.

Find the size of the largest angle in this triangle.

..... [3]

10. June/2022/Paper_32/No.3

(a)



(i) Write down the mathematical name for the type of angle a.

..... [1]

(ii) Measure angle a.

..... [1]

(b) Kate describes a quadrilateral.

- All the sides are the same length.
- It has only two lines of symmetry.

(i) Draw a sketch of this quadrilateral.

[1]

(ii) Write down the mathematical name for this quadrilateral.

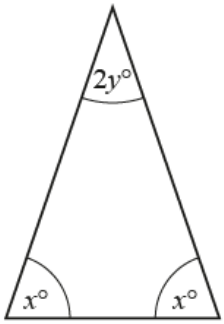
..... [1]

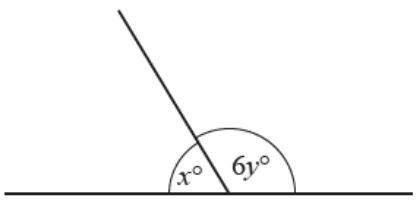
(iii) One of the interior angles of this quadrilateral is 70°.

Work out the other three interior angles.

..... , ... , ... [2]

(c) The diagrams show the angles in a triangle and two angles on a straight line.





NOT TO SCALE

(i) The triangle is used to write down an equation in terms of x and y.

$$2x + 2y = 180$$

Give the geometrical reason why this equation is correct.

Reason ..... [1]

(ii) Use the diagram with two angles on a straight line to write down another equation in terms of x and y.

..... [1]

(iii) Solve these simultaneous equations.
You must show all your working.

$x =$ .....

$y =$ ..... [3]

11. June/2022/Paper_32/No.8

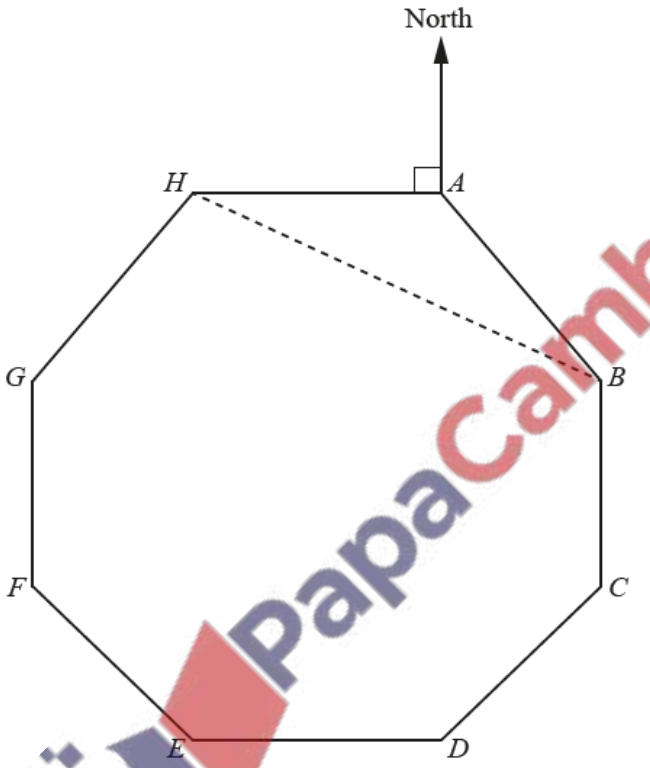
(a) (i) Show that the exterior angle of a regular octagon is 45°.

[1]

(ii) Find the interior angle of a regular octagon.

..... [1]

(b)



NOT TO SCALE

The diagram shows the route of a boat race.
The route is in the shape of a regular octagon, *ABCDEFGH*.
H is due west of *A*.

(i) Find the bearing of *B* from *A*.

..... [1]

(ii) Complete this statement.

The bearing of *C* from *D* is the same as the bearing of ..... from ..... [1]

(iii) **(a)** Write down the mathematical name of triangle ABH.

..... [1]

(b) Calculate angle ABH.

Angle ABH = ... [2]

(c) Work out the bearing of H from B.

..... [2]

(c) Each side of the octagon is 1.35 km.
The average speed of a boat is 45 km/h.

Work out the time it will take this boat to complete the race.
Give your answer in minutes.

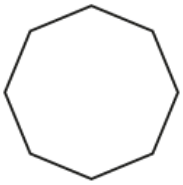
..... min [3]

(d) Hetty wants to draw a scale drawing of the route.
She chooses a scale of 1:500 000.

Has Hetty chosen a suitable scale?
Show all your working and explain your decision.

..... because ..... [2]

12. June/2022/Paper_33/No.4(a)



The diagram shows a regular polygon.

(a) **(i)** Write down the mathematical name of this polygon.

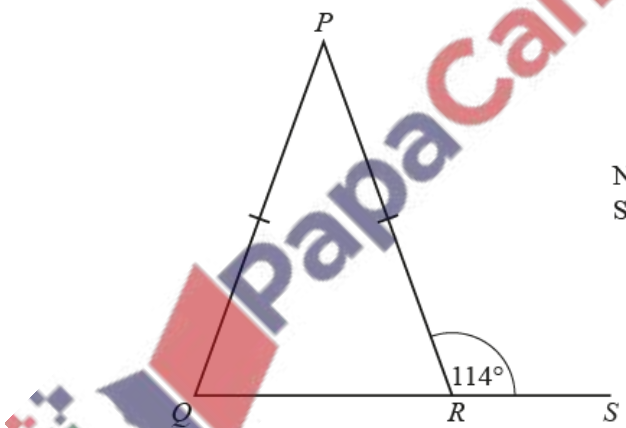
..... [1]

(ii) Show that the interior angle of this polygon is 135°.

[2]

13. June/2022/Paper_33/No.8

(a)



In the diagram, $PQ = PR$ and QRS is a straight line.

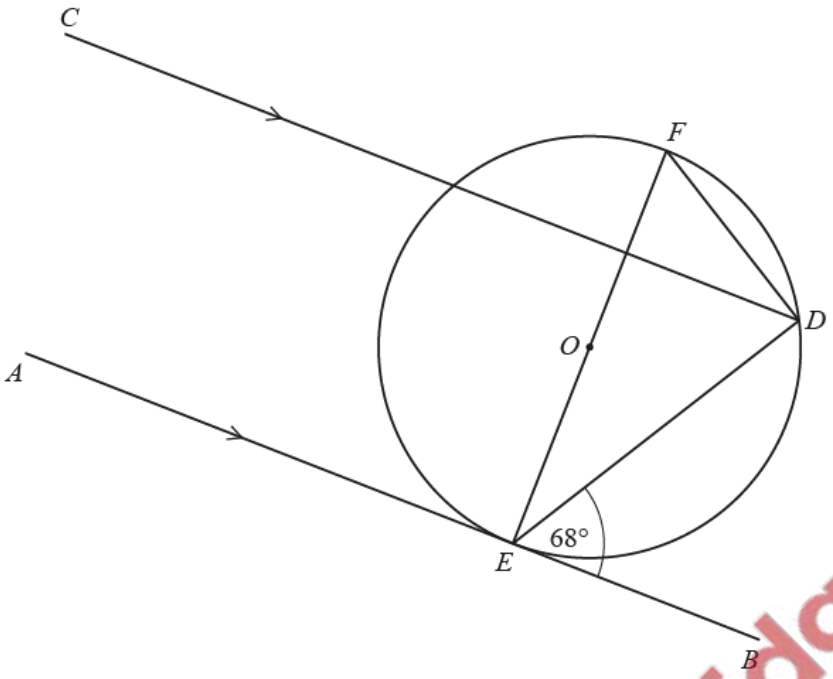
(i) Write down the mathematical name of triangle PQR.

..... [1]

(ii) Work out angle QPR.

Angle QPR = ... [3]

(b)



In the diagram, D, E and F are points on a circle, centre O.
AB is a tangent to the circle at E.
Lines AB and CD are parallel and angle $BED = 68°$.

(i) Find angle CDE and give a reason for your answer.

Angle CDE = ... because .....

..... [2]

(ii) Find angle DEF and give a reason for your answer.

Angle DEF = ... because .....

..... [2]

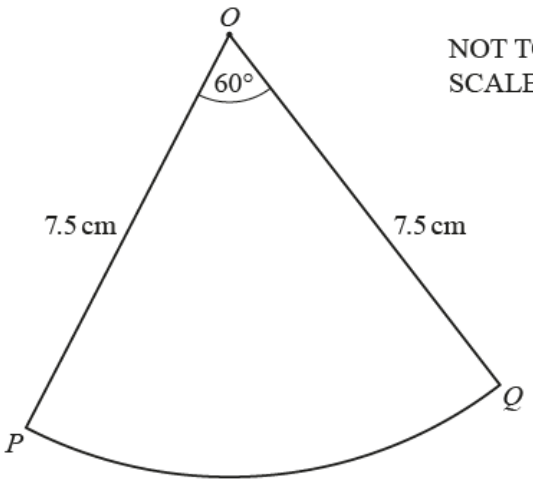
(iii) Work out angle EFD.
Write down the two further geometrical properties needed to find angle EFD.

Angle EFD = ...

1. .....

2. ..... [3]

(c)



NOT TO SCALE

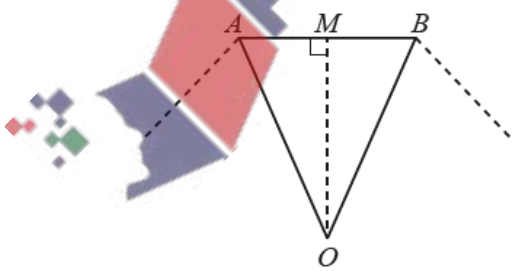
POQ is a sector of a circle, centre O and radius 7.5 cm.
The sector angle is 60°.

Calculate the length of the arc PQ.

$PQ =$ ..... cm [2]

14. June/2022/Paper_41/No.5(a)

(a) $ABCDEFGH$ is a regular octagon with sides of length 6 cm.
The diagram shows part of the octagon.
O is the centre of the octagon and M is the midpoint of AB.



NOT TO SCALE

(i) **(a)** Show that angle OAM is 67.5°.

[2]

(b) Calculate the area of the octagon.

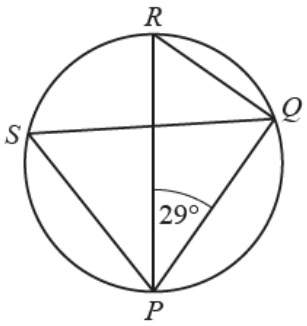
..... cm^2 [4]

(ii) Find the area of the circle that passes through the vertices of the octagon.

..... cm^2 [3]

15. June/2022/Paper_42/No.2

(a)



NOT TO SCALE

The points P, Q, R and S lie on a circle with diameter PR.

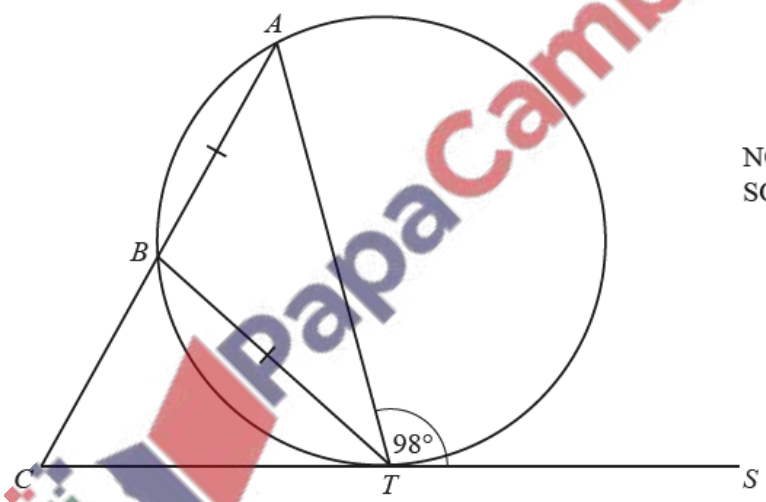
Work out the size of angle PSQ, giving a geometrical reason for each step of your working.

.....

.....

..... [3]

(b)



NOT TO SCALE

The points A, B and T lie on a circle and CTS is a tangent to the circle at T.
ABC is a straight line and $AB = BT$.
Angle $ATS = 98°$.

Work out the size of angle ACT.

Angle $ACT =$ ..... [4]

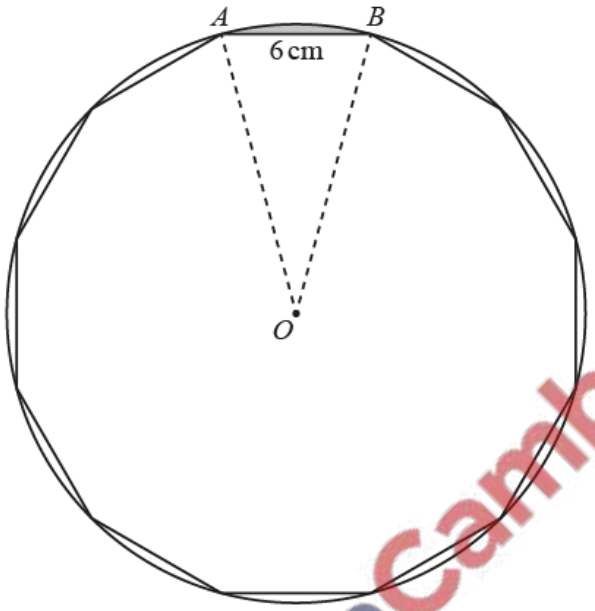
16. June/2022/Paper_43/No.4

A regular 12-sided polygon has side length 6 cm.

(a) Show that one interior angle of the polygon is 150°.

[1]

(b) The polygon is enclosed by a circle, centre O, so that each vertex touches the circumference of the circle.



NOT TO SCALE

(i) Show that the radius, AO, of the circle is 11.6 cm, correct to 1 decimal place.

[3]

(ii) Calculate

(a) the circumference of the circle,

..... cm [2]

(b) the perimeter of the shaded **minor** segment formed by the chord AB.

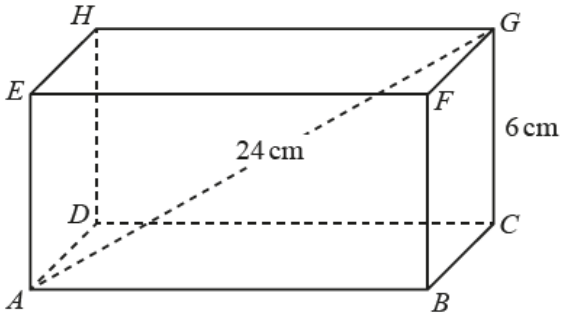
..... cm [2]

(c) The regular 12-sided polygon is the cross-section of a prism of length 2 cm.

Calculate the volume of the prism.

..... cm^3 [3]

17. June/2022/Paper_43/No.10



NOT TO SCALE

The diagram shows a cuboid $ABCDEFGH$.
$CG = 6$ cm, $AG = 24$ cm and $AB = 2BC$.

(a) Calculate AB.

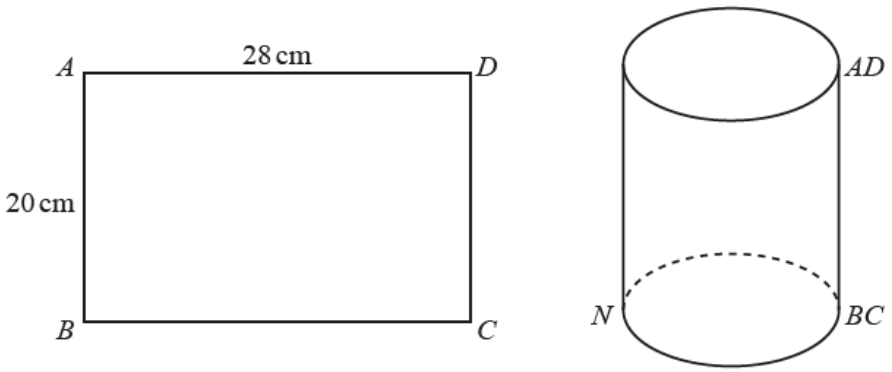
$AB =$ ..... cm [4]

(b) Calculate the angle between AG and the base $ABCD$.

..... [3]

18. June/2022/Paper_42/No.11

(a)



NOT TO SCALE

A rectangular sheet of paper $ABCD$ is made into an open cylinder with the edge AB meeting the edge DC.
$AD = 28$ cm and $AB = 20$ cm.

(i) Show that the radius of the cylinder is 4.46 cm, correct to 3 significant figures.

[2]

(ii) Calculate the volume of the cylinder.

..... cm^3 [2]

(iii) N is a point on the base of the cylinder, such that BN is a diameter.

Calculate the angle between AN and the base of the cylinder.

..... [3]

(b) The volume of a solid cone is $310\,\text{cm}^3$.
The height of the cone is twice the radius of its base.

Calculate the slant height of the cone.

[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... cm [5]