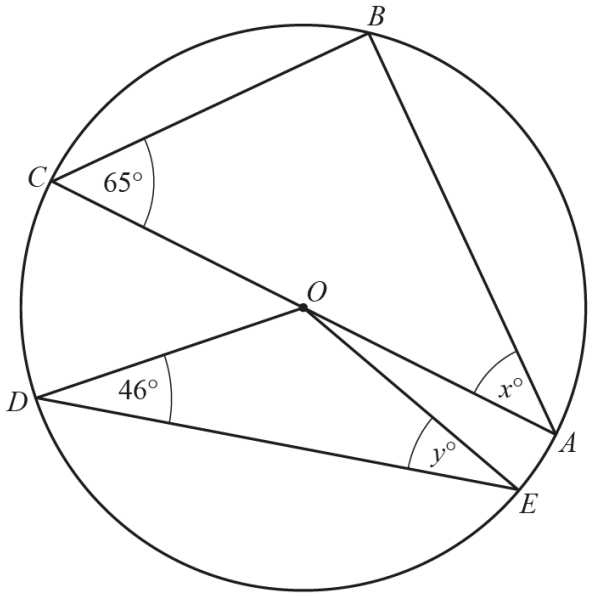
Geometry – 2023 IGCSE 0580

1. March/2023/Paper_0580/12/No.12

Work out the size of one interior angle of a regular 9-sided polygon.

..... [2]

2. March/2023/Paper_0580/12/No.15



NOT TO SCALE

The diagram shows a circle, centre O, with diameter AC.
A, B, C, D and E lie on the circumference of the circle.

(a) Find the value of x.
Give a reason for your answer.

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

(b) Find the value of y.
Give a reason for your answer.

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

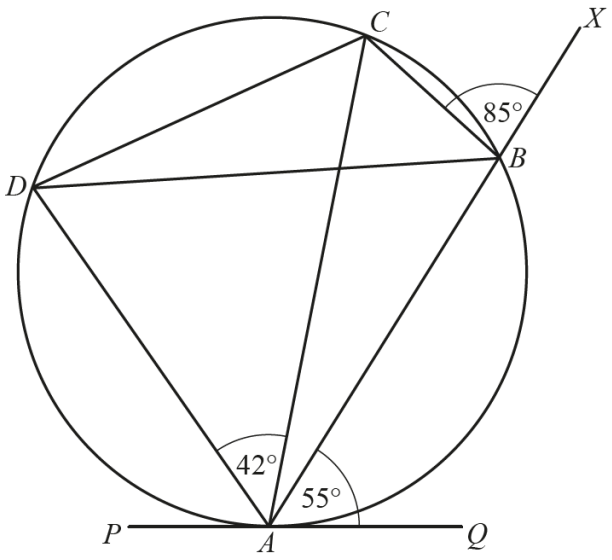
3. March/2023/Paper_0580/22/No.12

In a regular polygon, the interior angle and the exterior angle are in the ratio interior : exterior = 11 : 1.

Find the number of sides of this regular polygon.

..... [3]

4. March/2023/Paper_0580/22/No.17



NOT TO SCALE

$ABCD$ is a cyclic quadrilateral, ABX is a straight line and PQ is a tangent to the circle at A.
Angle $CBX = 85°$, angle $BAQ = 55°$ and angle $CAD = 42°$.

Find

(a) angle CBD

Angle CBD = ... [1]

(b) angle ACB

Angle ACB = ... [1]

(c) angle ADC

Angle ADC = ... [1]

(d) angle BCD.

Angle BCD = ... [2]

(e) angle PAD.

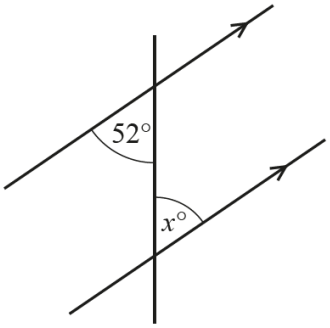
Angle PAD = ... [1]

5. June/2023/Paper_0580/11/No.4

Write down the mathematical name of a 4-sided shape that has rotational symmetry of order 2 and no lines of symmetry.

..... [1]

(a)



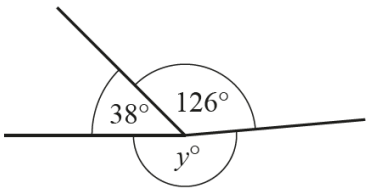
NOT TO SCALE

The diagram shows a pair of parallel lines and a straight line.

Write down the geometrical reason why the value of x is 52.

..... [1]

(b)

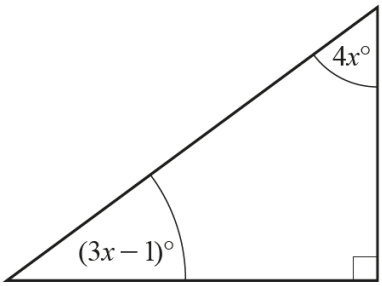


NOT TO SCALE

Find the value of y and write down the geometrical reason for your answer.

y = ... because ..... [2]

7. June/2023/Paper_0580/11/No.21



NOT TO
SCALE

The diagram shows a right-angled triangle.

Use the information in the diagram to write down and solve an equation to find the value of x.

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

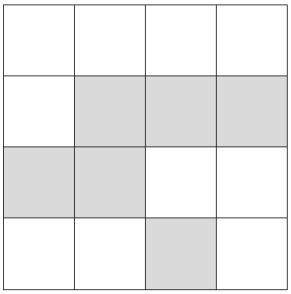
8. June/2023/Paper_0580/12/No.2

(a) Draw a line perpendicular to the line AB. [1]

(b) Measure the line AB in centimetres.

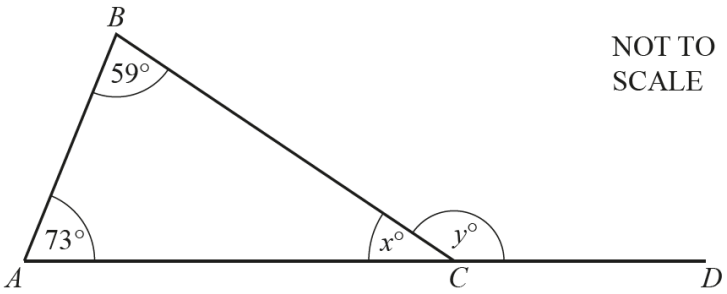
.....cm [1]

9. June/2023/Paper_0580/12/No.3



Shade two squares so that the diagram has rotational symmetry of order 4. [2]

10. June/2023/Paper_0580/12/No.5



In the diagram, ABC is a triangle and ACD is a straight line.

Find the value of x and the value of y.

$x =$ .....

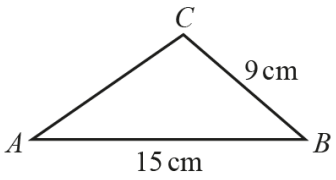
$y =$ ..... [2]

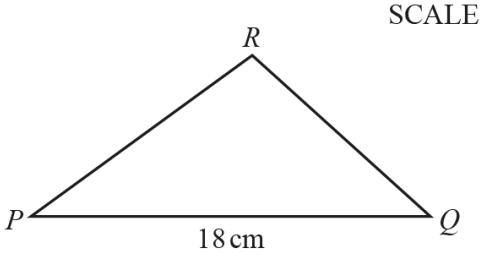
11. June/2023/Paper_0580/12/No.17

Find the size of an interior angle of a regular 15-sided polygon.

..... [2]

NOT TO SCALE

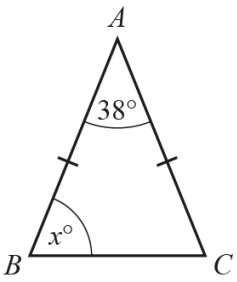




Triangle ABC is similar to triangle PQR.

Calculate QR.

$QR =$ ..... cm [2]

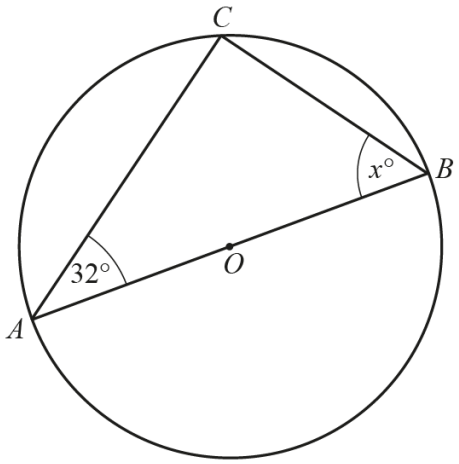


NOT TO SCALE

Triangle ABC is isosceles.
Angle $BAC = 38°$ and $AB = AC$.

Find the value of x.

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



NOT TO SCALE

The diagram shows a circle, centre O, diameter AB.
A, B and C lie on the circumference of the circle.

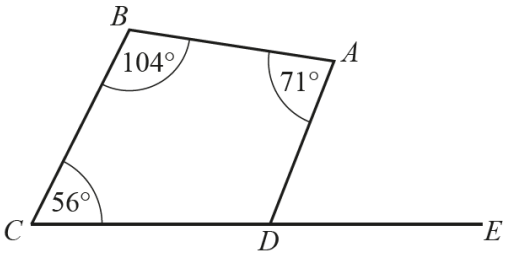
(a) Write down the mathematical name of the line AC.

..... [1]

(b) Find the value of x.
Give a geometrical reason for your answer.

x = ... because ..... [2]

15. June/2023/Paper_0580/21/No.1



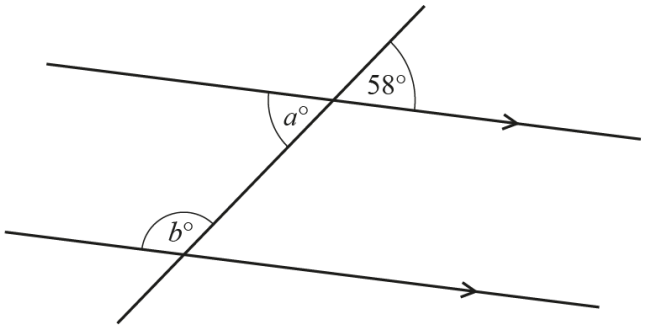
NOT TO SCALE

CDE is a straight line.

Find angle *ADE*.

..... [2]

16. June/2023/Paper_0580/21/No.3



NOT TO SCALE

The diagram shows a straight line intersecting two parallel lines.

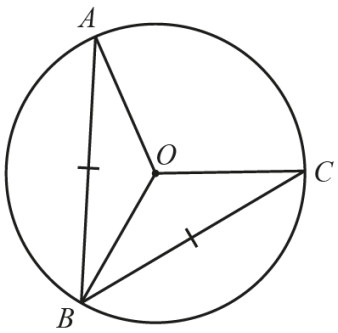
Find the value of a and the value of b, giving a geometrical reason for each answer.

a = ... because .....

b = ... because ..... [4]

17. June/2023/Paper_0580/21/No.12

(a)



NOT TO SCALE

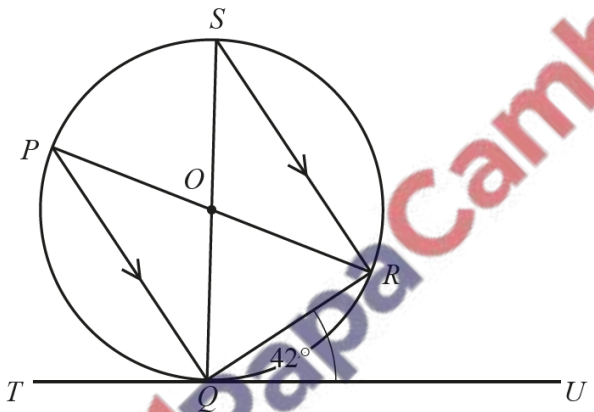
AO, OB and OC are all radii of the circle.
$AB = BC$.
Therefore triangle AOB is congruent to triangle COB.

Draw a ring around the correct criterion for this statement.

SAS *RHS* *SSS* *ASA*

[1]

(b)



NOT TO SCALE

P, Q, R and S are points on the circle and TQU is a tangent to the circle at Q.
PR and SQ intersect at the centre of the circle, O, and PQ is parallel to SR.
Angle $RQU = 42°$.

Calculate

(i) angle QSR

Angle QSR = ... [1]

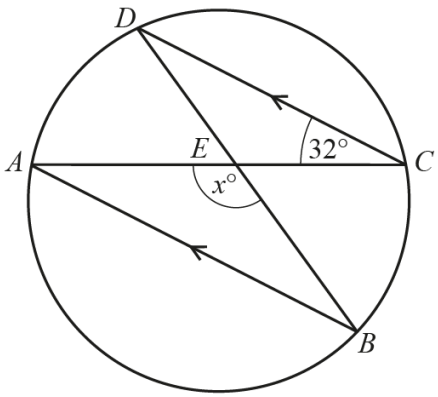
(ii) angle PQS

Angle PQS = ... [1]

(iii) angle POS.

Angle POS = ... [1]

18. June/2023/Paper_0580/22/No.13



NOT TO SCALE

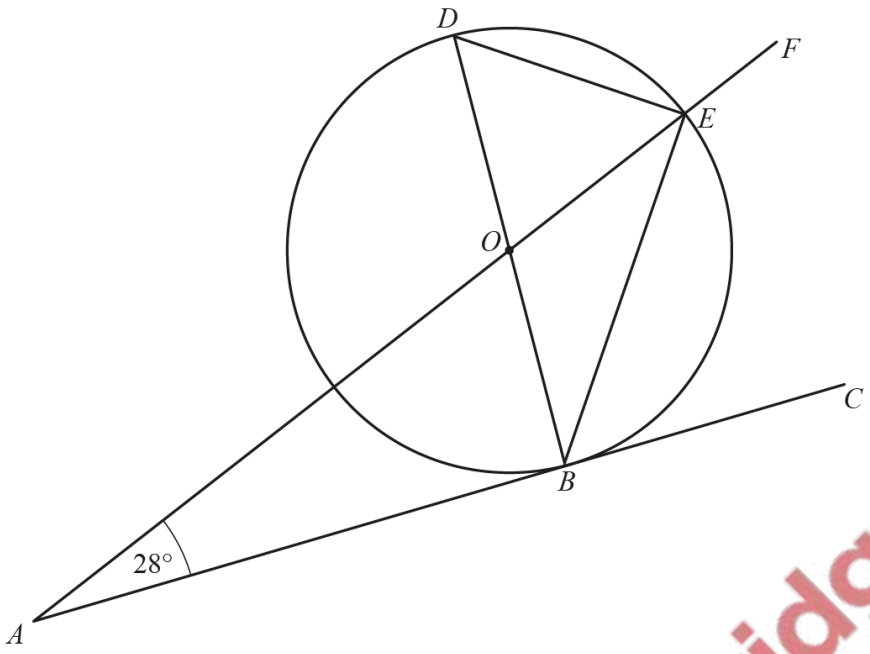
A, B, C and D are points on a circle.
AB is parallel to DC and angle $ACD = 32°$.
Chords AC and DB intersect at E.

Find the value of x.

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

19. June/2023/Paper_0580/31/No.7

(a)



NOT TO SCALE

The diagram shows a circle, centre O, with points B, D and E on the circumference.
$AOEF$ is a straight line.
The straight line AC touches the circle at B.

(i) Write down the mathematical name for

(a) line BOD

..... [1]

(b) line ABC.

..... [1]

(ii) Write down the two geometrical reasons why angle AOB is 62°.

.....

and ..... [2]

(iii) Give the geometrical reason why angle DOE is also 62°.

..... [1]

(iv) **(a)** Find angle *DEB*.

Angle *DEB* = ... [1]

(b) Find angle *ODE*.

Angle *ODE* = ... [2]

(c) Find angle *BEF*.

Angle *BEF* = ... [2]

(b) Write down two geometrical properties that show that a polygon is regular.

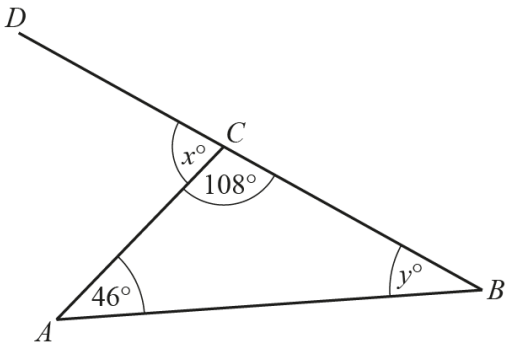
..... and ..... [2]

(c) Work out the interior angle of a regular 10-sided polygon.

..... [2]

20. June/2023/Paper_0580/33/No.7

(a)



NOT TO SCALE

The diagram shows a triangle ABC and a straight line BCD.

(i) Angle $ACB = 108°$.

Write down the mathematical name for this type of angle.

..... [1]

(ii) Work out the value of x.

$x =$ ..... [1]

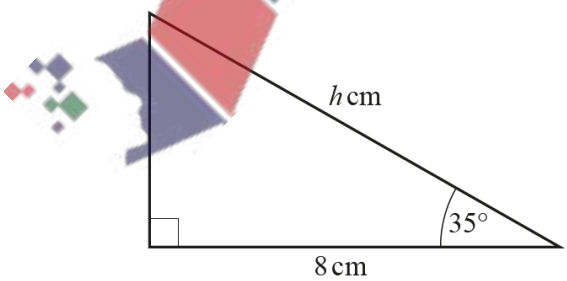
(iii) Work out the value of y.

$y =$ ..... [1]

(b) Show that the mean of the angles in any triangle is 60°.

[1]

(c)



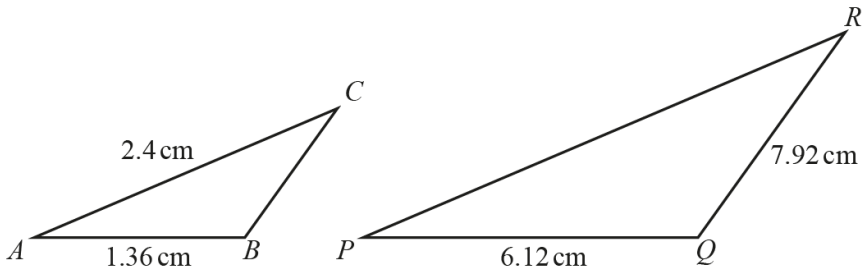
NOT TO SCALE

The diagram shows a right-angled triangle.

Calculate the value of h.

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

(d)



NOT TO SCALE

Triangle ABC is similar to triangle PQR.

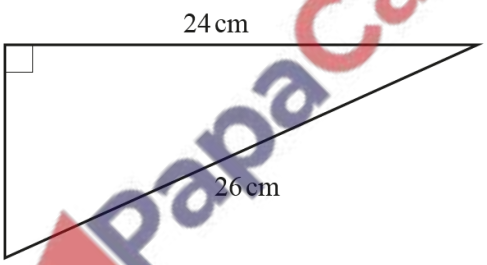
(i) Calculate PR.

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

(ii) Calculate BC.

$BC =$ ..... cm [2]

(e)



NOT TO SCALE

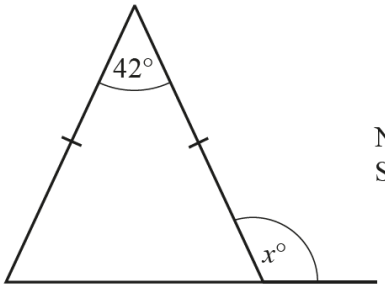
The diagram shows a right-angled triangle.

Calculate the perimeter of this triangle.

..... cm [4]

21. June/2023/Paper_0580/42/No.1

(a)



NOT TO SCALE

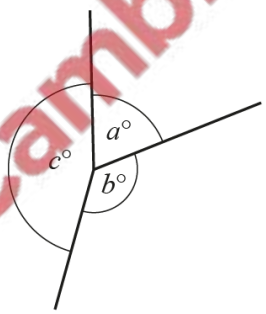
The diagram shows an isosceles triangle with the base extended.

Find the value of x.

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

(b) The diagram shows three lines meeting at a point.
The ratio $a : b : c = 3 : 4 : 5$.

Find the value of c.



NOT TO SCALE

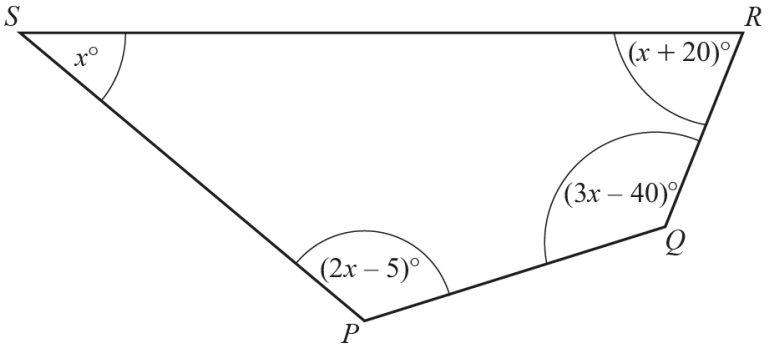
$c =$ ..... [3]

(c) A regular pentagon has an exterior angle, d.
A regular hexagon has an interior angle, h.

Find the fraction $\frac{d}{h}$.
Give your answer in its simplest form.

..... [4]

(d)

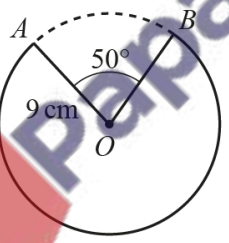


NOT TO SCALE

Show that *PQRS* is a cyclic quadrilateral.

[5]

(e)



NOT TO SCALE

The diagram shows a circle of radius 9 cm, centre *O*.
The minor sector *AOB*, with sector angle 50°, is removed from the circle.

Calculate the length of the major arc *AB*.

..... cm [3]

22. June/2023/Paper_0580/43/No.3

(a) The scale drawing shows two sides, AB and BC, of a field.
The scale is 5 centimetres represents 200 metres.

Scale: 5 cm to 200 m

(i) Measure angle ABC.

Angle ABC = ... [1]

(ii) X is a point on BC.
$BX = 332$ m.

Mark the point X on the diagram. [2]

(iii) Find the scale in the form 1 : n.

1: ..... [2]

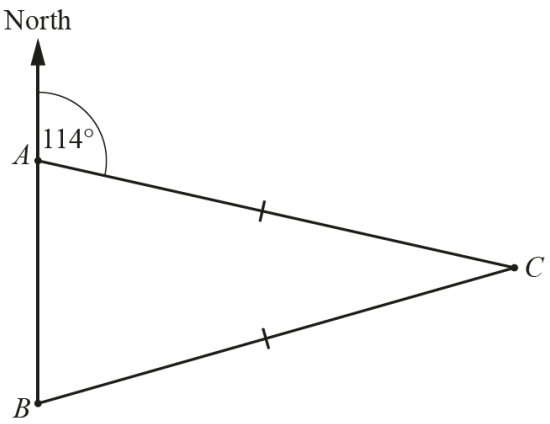
(b) A bronze statue is 4.5 m high and has a mass of 195 200 kg.
The density of bronze is 8000 kg / m^3.
The volume of a mathematically similar model of the statue is 0.385 m^3.

Calculate the height of the model.
[Density = Mass ÷ Volume]

..... m [5]

23. June/2023/Paper_0580/43/No.4

(a)



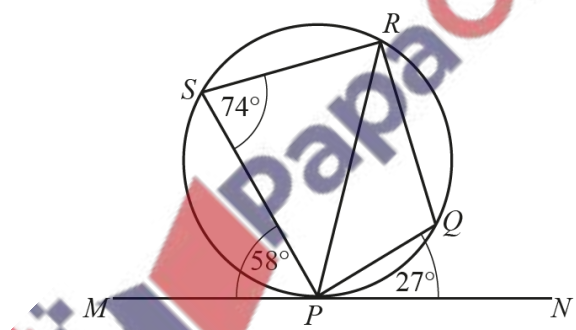
NOT TO SCALE

A, B and C are three towns and the bearing of C from A is 114°.
B is due south of A and $AC = BC$.

Calculate the bearing of B from C.

..... [3]

(b)



NOT TO SCALE

P, Q, R and S lie on a circle.
MPN is a tangent to the circle at P.
Angle $MPS = 58°$, angle $PSR = 74°$ and angle $QPN = 27°$.

(i) Find angle PRS.

Angle PRS = ... [1]

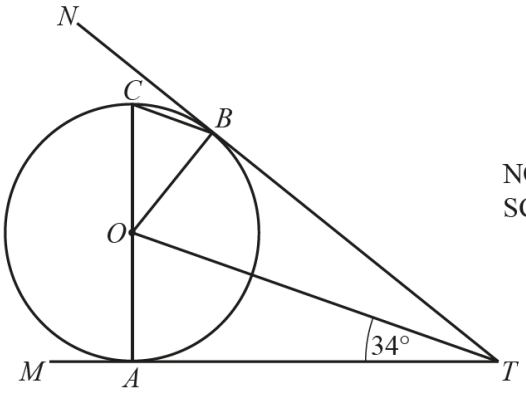
(ii) Find angle PQR.

Angle PQR = ... [1]

(iii) Find angle RPQ.

Angle RPQ = ... [2]

(c)



NOT TO SCALE

A, B and C lie on a circle, centre O, with diameter AC.
TAM and TBN are tangents to the circle and angle $ATO = 34°$.

Using values and geometrical reasons, complete these statements to show that CB is parallel to OT.

In triangles AOT and BOT, OT is common.
Angle OAT = angle OBT = 90° because .....

.....

$AT = BT$ because .....

.....

Triangle AOT is congruent to triangle BOT because of congruence criterion .....

Angle AOT = angle BOT = 56° because angles in a triangle add up to 180°.

Angle BOC = ... ° because .....

Angle OBC = ... ° because .....

.....

CB is parallel to OT because .....

[6]