



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Circle Theorems · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Circle Theorems

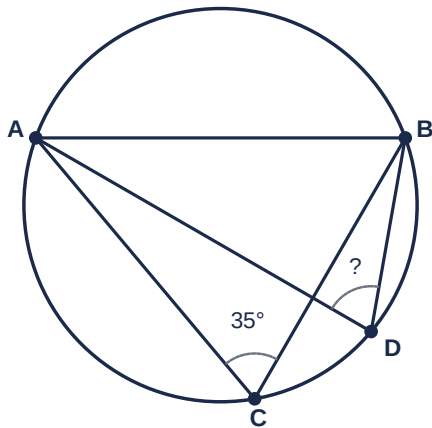
Total marks available: 89

● Circle Theorems

Q1

[2 marks]

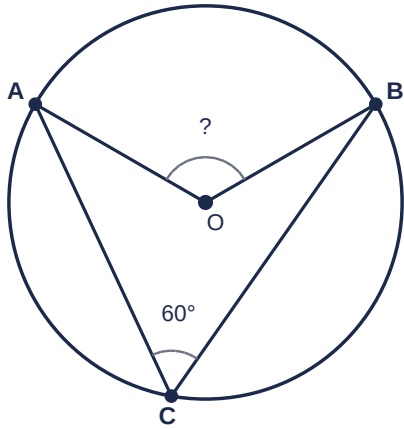
A, B, C and D are points on the circumference of a circle. C and D are on the same side of chord AB. Angle $ACB = 35^\circ$. Find angle ADB , giving a reason.



Q2

[3 marks]

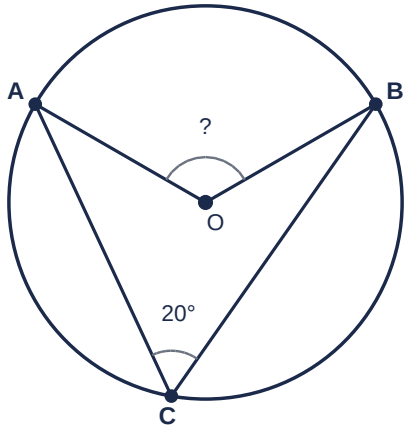
A, B and C are points on the circumference of the circle, centre O. Angle $ACB = 60^\circ$. Find the angle marked ?, the angle AOB at the centre.



Q3

[3 marks]

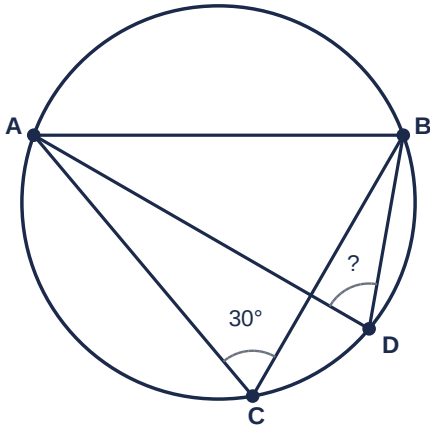
A, B and C are points on the circumference of the circle, centre O. Angle $ACB = 20^\circ$. Find the angle marked ?, the angle AOB at the centre.



Q4

[2 marks]

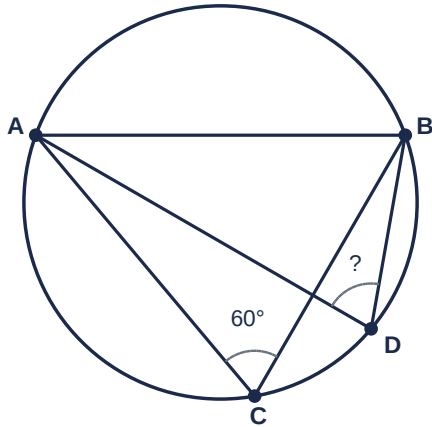
A, B, C and D are points on the circumference of a circle. C and D are on the same side of chord AB. Angle $ACB = 30^\circ$. Find angle ADB, giving a reason.



Q5

[2 marks]

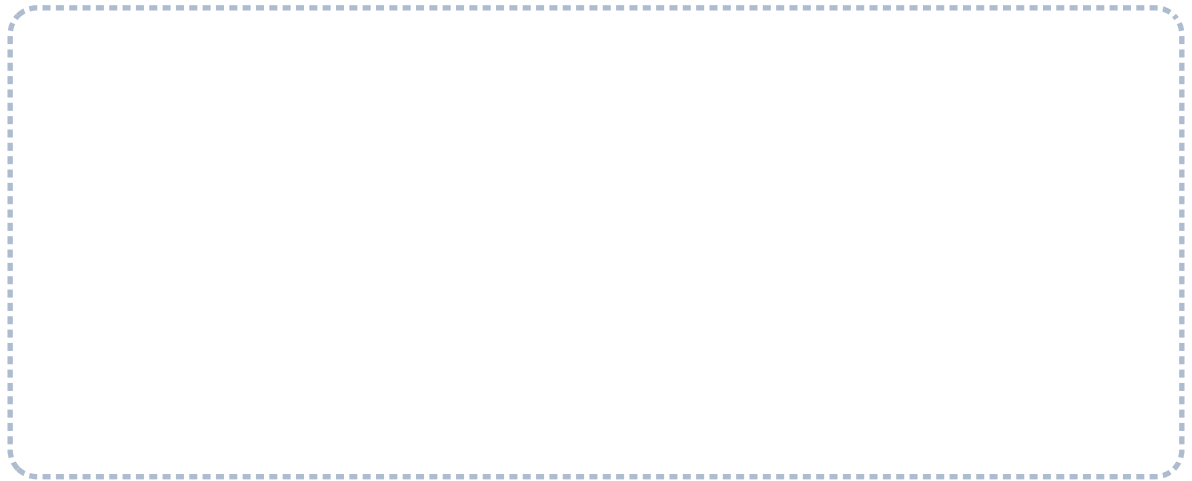
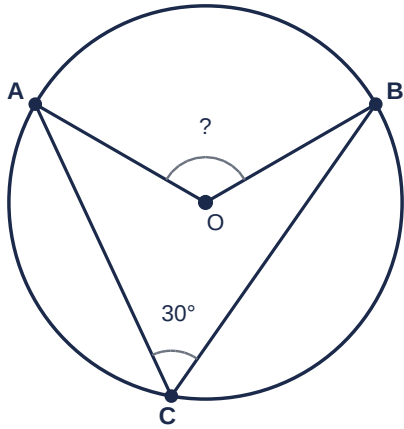
A, B, C and D are points on the circumference of a circle. C and D are on the same side of chord AB. Angle $ACB = 60^\circ$. Find angle ADB, giving a reason.



Q6

[3 marks]

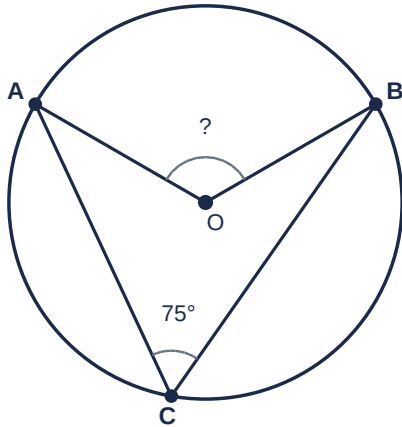
A, B and C are points on the circumference of the circle, centre O. Angle $ACB = 30^\circ$. Find the angle marked ?, the angle AOB at the centre.



Q7

[3 marks]

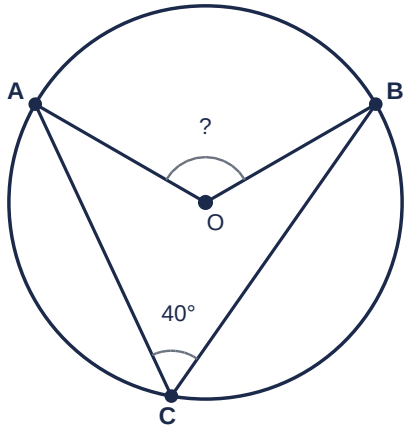
A, B and C are points on the circumference of the circle, centre O. Angle $ACB = 75^\circ$. Find the angle marked ?, the angle AOB at the centre.



Q8

[3 marks]

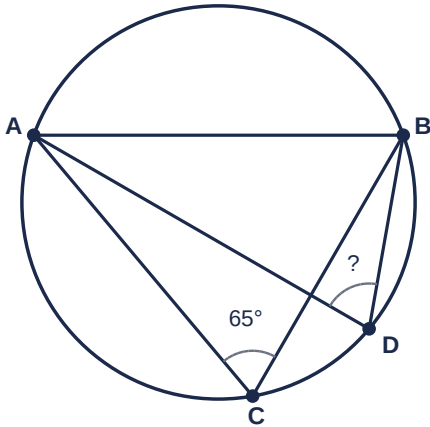
A, B and C are points on the circumference of the circle, centre O. Angle $ACB = 40^\circ$. Find the angle marked ?, the angle AOB at the centre.



Q9

[2 marks]

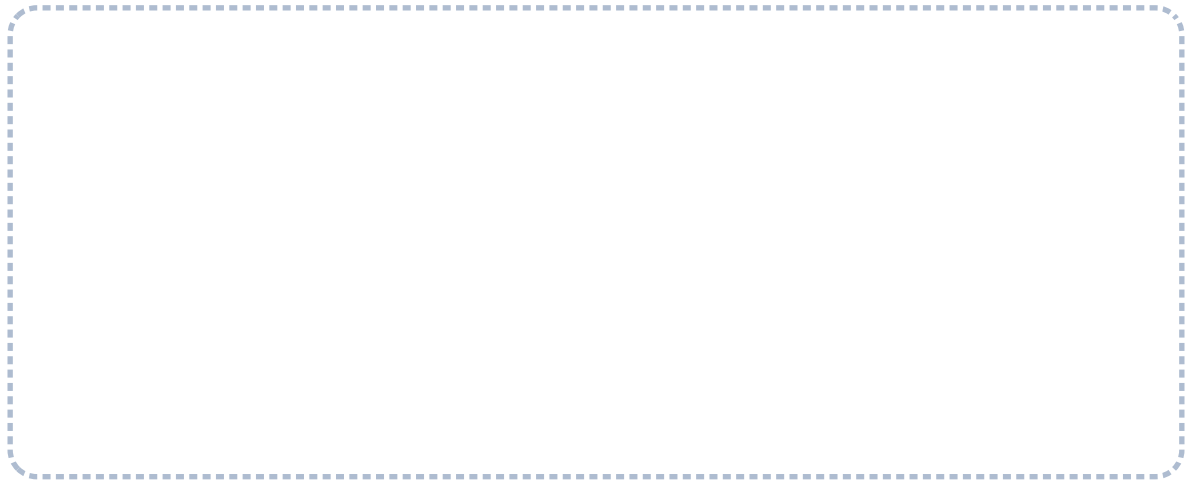
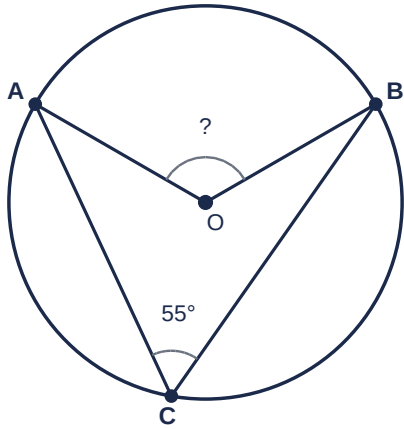
A, B, C and D are points on the circumference of a circle. C and D are on the same side of chord AB. Angle $ACB = 65^\circ$. Find angle ADB , giving a reason.



Q10

[3 marks]

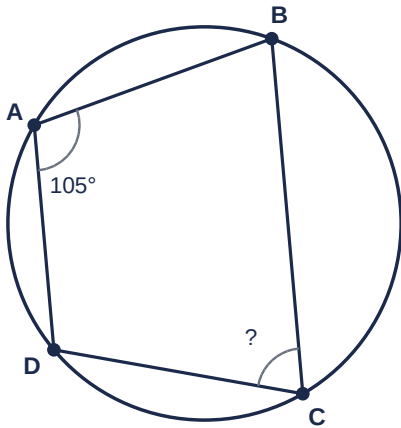
A, B and C are points on the circumference of the circle, centre O. Angle $ACB = 55^\circ$. Find the angle marked ?, the angle AOB at the centre.



Q11

[3 marks]

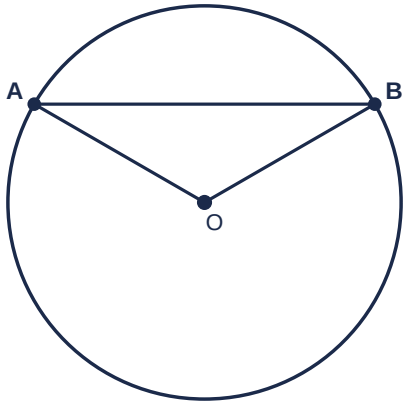
ABCD is a cyclic quadrilateral (all four vertices lie on the circle). Angle $DAB = 105^\circ$. Find angle BCD, giving a reason.



Q12

[3 marks]

OA and OB are radii of the circle below, so triangle OAB is isosceles. Angle $AOB = 100^\circ$. Find angle OAB.

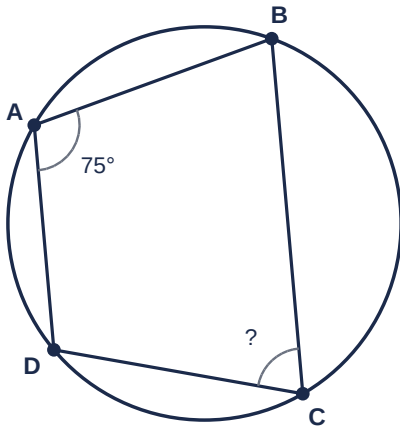


A large dashed rectangular box for the student to write their answer.

Q13

[3 marks]

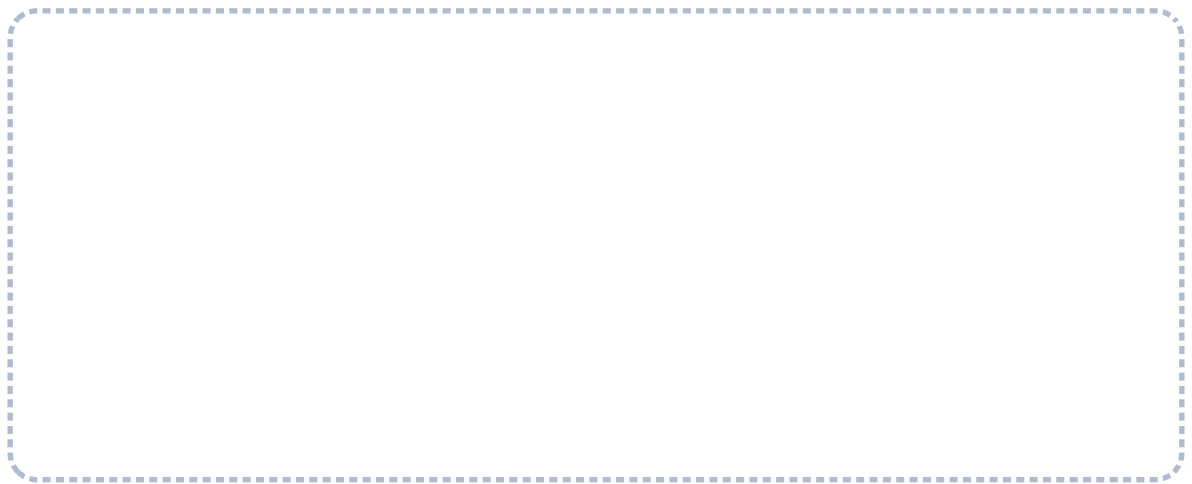
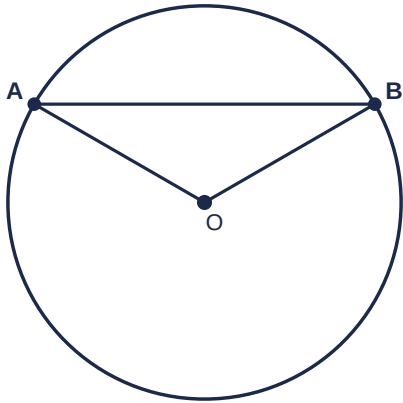
ABCD is a cyclic quadrilateral (all four vertices lie on the circle). Angle $DAB = 75^\circ$. Find angle BCD, giving a reason.



Q14

[3 marks]

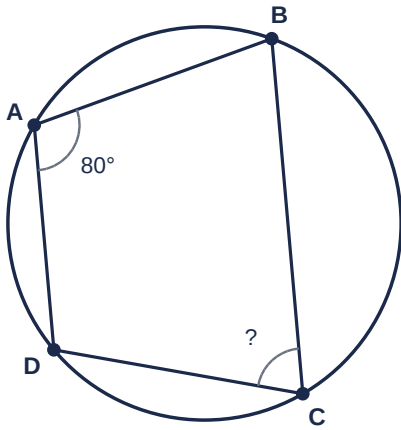
OA and OB are radii of the circle below, so triangle OAB is isosceles. Angle $OAB = 25^\circ$. Find angle AOB.



Q15

[3 marks]

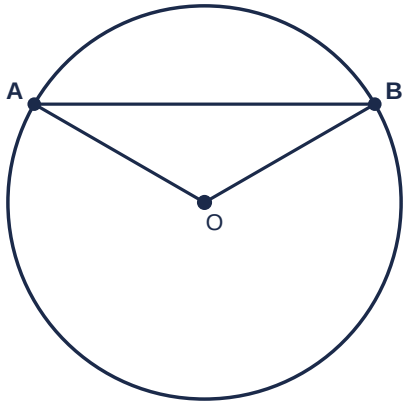
ABCD is a cyclic quadrilateral (all four vertices lie on the circle). Angle $DAB = 80^\circ$. Find angle BCD, giving a reason.



Q16

[3 marks]

OA and OB are radii of the circle below, so triangle OAB is isosceles. Angle $OAB = 45^\circ$. Find angle AOB.

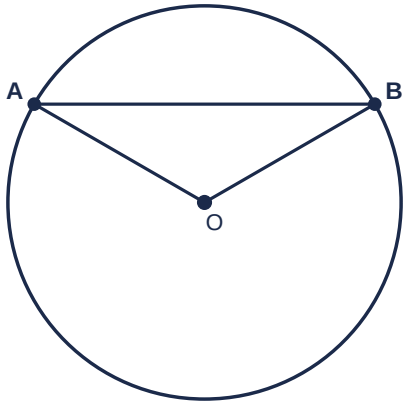


A large dashed rectangular box for the student to write their answer.

Q17

[3 marks]

OA and OB are radii of the circle below, so triangle OAB is isosceles. Angle $OAB = 80^\circ$. Find angle AOB.

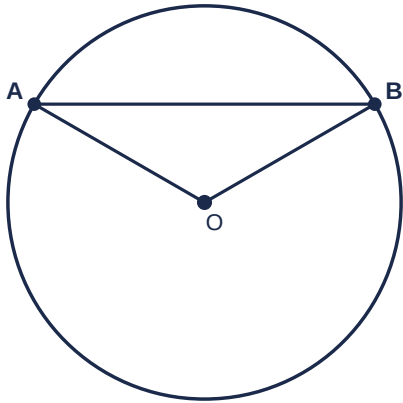


A large dashed rectangular box for the student to write their answer.

Q18

[3 marks]

OA and OB are radii of the circle below, so triangle OAB is isosceles. Angle $OAB = 65^\circ$. Find angle AOB.

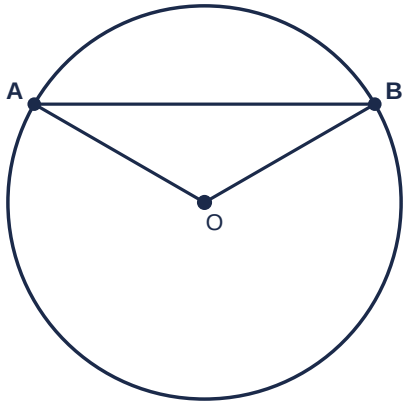


A large dashed rectangular box for writing the answer.

Q19

[3 marks]

OA and OB are radii of the circle below, so triangle OAB is isosceles. Angle $OAB = 20^\circ$. Find angle AOB.

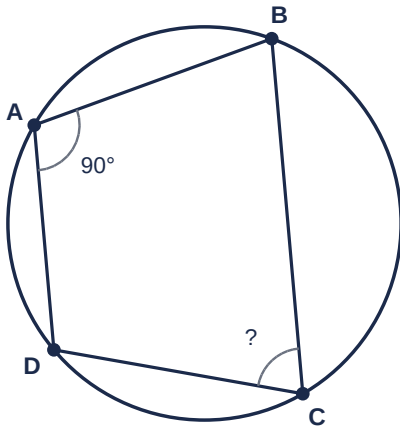


A large dashed rectangular box for writing the answer.

Q20

[3 marks]

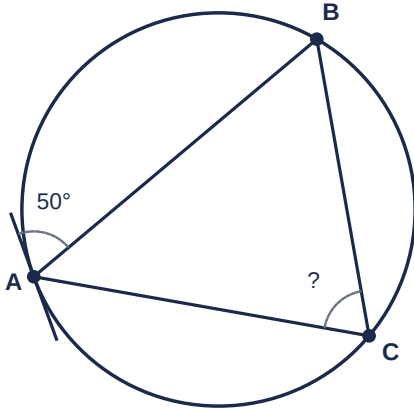
ABCD is a cyclic quadrilateral (all four vertices lie on the circle). Angle $DAB = 90^\circ$. Find angle BCD, giving a reason.



Q21

[3 marks]

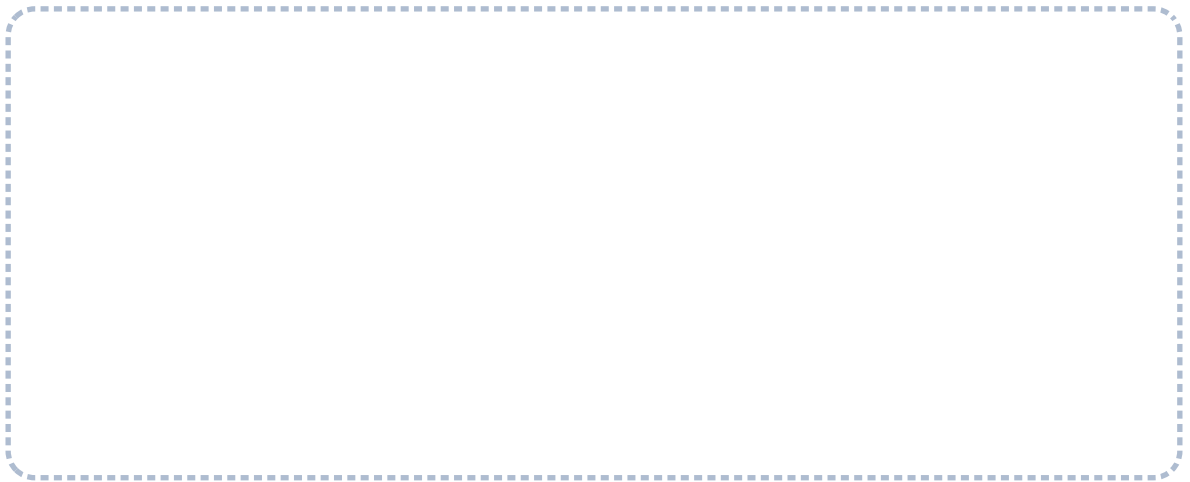
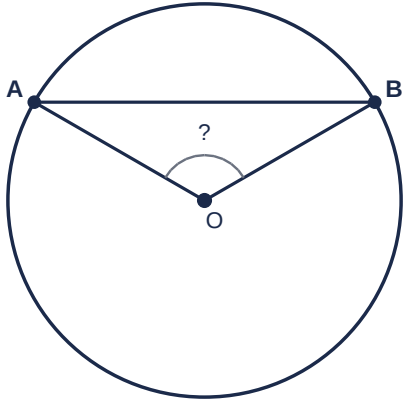
The line through A is a tangent to the circle. B and C are points on the circumference. The angle between the tangent and chord AB is 50° . Find angle ACB, giving a reason.



Q22

[4 marks]

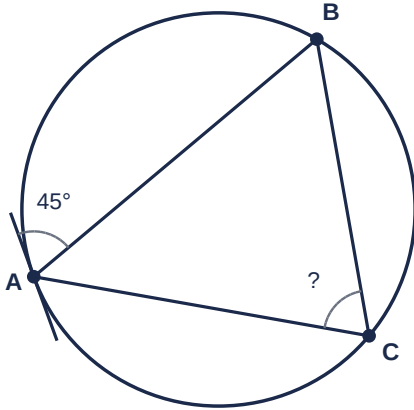
Two tangents are drawn from an external point P to touch the circle, centre O , at A and B (shown here as radii OA and OB ; P and the tangent lines themselves are not drawn). Since a tangent meets a radius at 90° , quadrilateral $OAPB$ has two right angles, at A and at B . The angle APB at P is 30° . Find angle AOB , the angle between the two radii at the centre.



Q23

[3 marks]

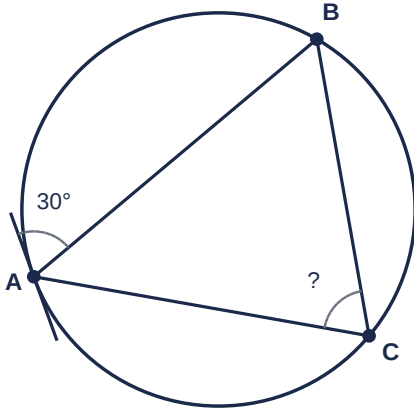
The line through A is a tangent to the circle. B and C are points on the circumference. The angle between the tangent and chord AB is 45° . Find angle ACB, giving a reason.



Q24

[3 marks]

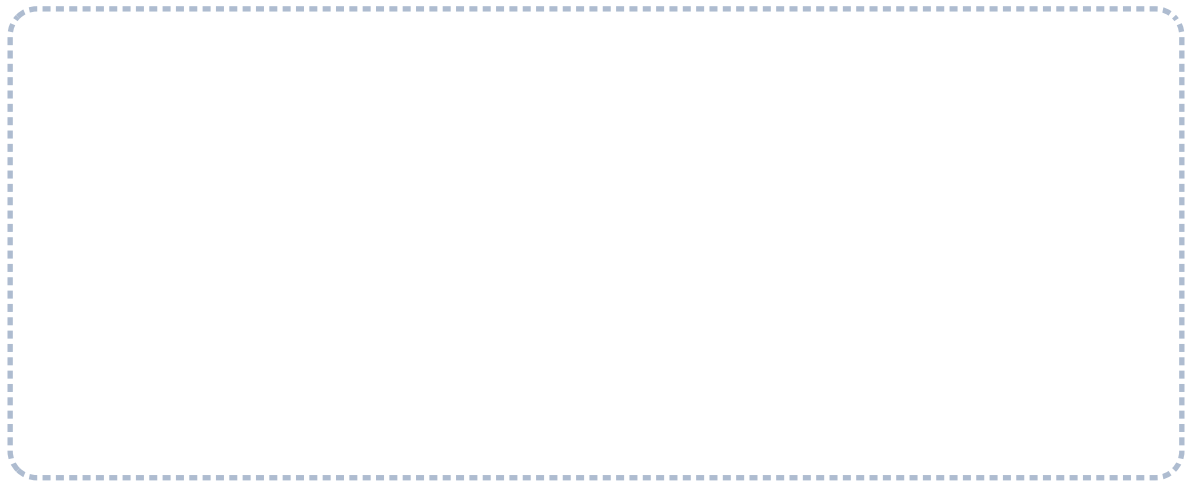
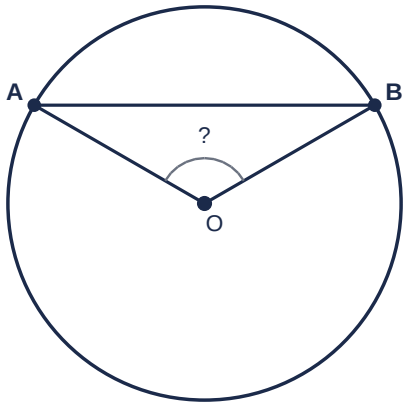
The line through A is a tangent to the circle. B and C are points on the circumference. The angle between the tangent and chord AB is 30° . Find angle ACB, giving a reason.



Q25

[4 marks]

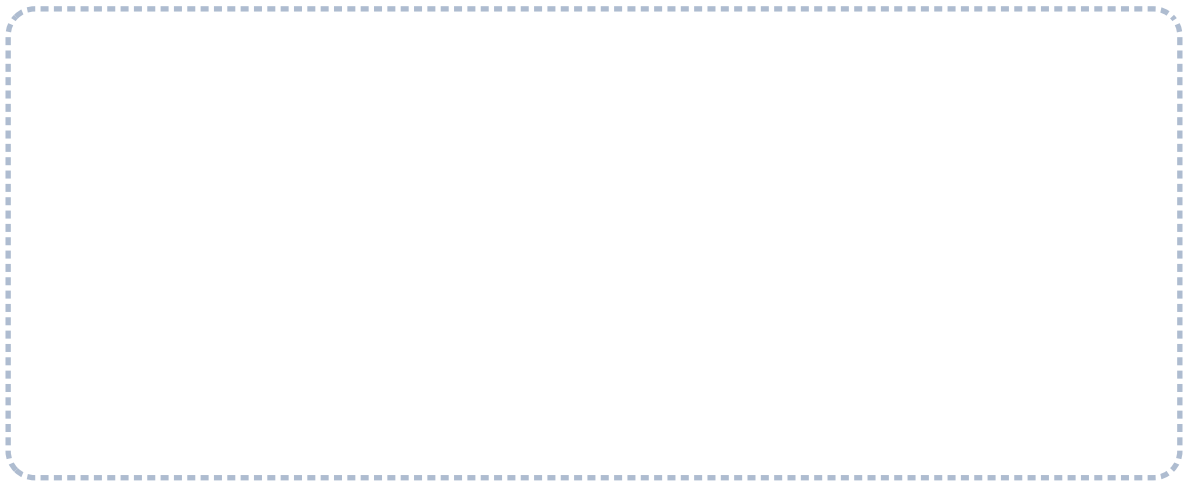
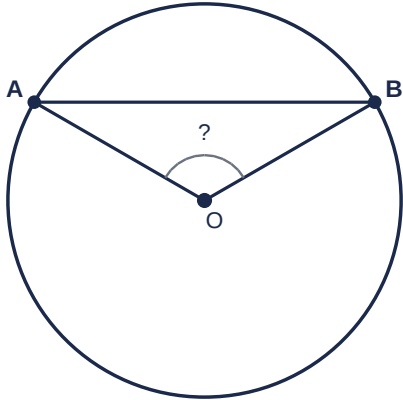
Two tangents are drawn from an external point P to touch the circle, centre O , at A and B (shown here as radii OA and OB ; P and the tangent lines themselves are not drawn). Since a tangent meets a radius at 90° , quadrilateral $OAPB$ has two right angles, at A and at B . The angle APB at P is 90° . Find angle AOB , the angle between the two radii at the centre.



Q26

[4 marks]

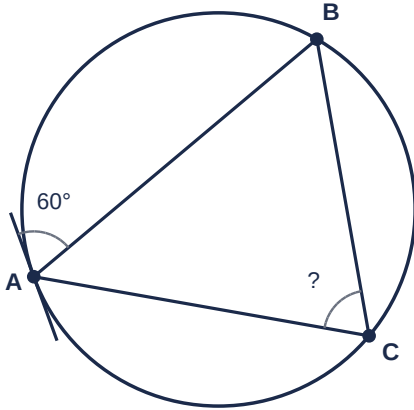
Two tangents are drawn from an external point P to touch the circle, centre O , at A and B (shown here as radii OA and OB ; P and the tangent lines themselves are not drawn). Since a tangent meets a radius at 90° , quadrilateral $OAPB$ has two right angles, at A and at B . The angle APB at P is 110° . Find angle AOB , the angle between the two radii at the centre.



Q27

[3 marks]

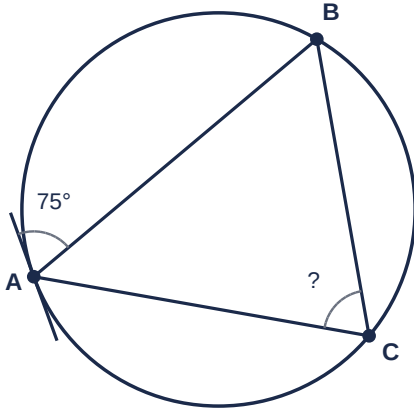
The line through A is a tangent to the circle. B and C are points on the circumference. The angle between the tangent and chord AB is 60° . Find angle ACB, giving a reason.



Q28

[3 marks]

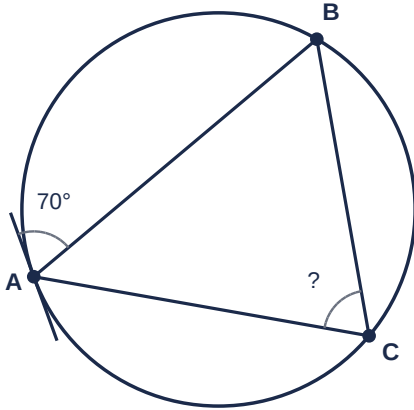
The line through A is a tangent to the circle. B and C are points on the circumference. The angle between the tangent and chord AB is 75° . Find angle ACB, giving a reason.



Q29

[3 marks]

The line through A is a tangent to the circle. B and C are points on the circumference. The angle between the tangent and chord AB is 70° . Find angle ACB, giving a reason.



Q30

[3 marks]

The line through A is a tangent to the circle. B and C are points on the circumference. The angle between the tangent and chord AB is 40° . Find angle ACB, giving a reason.

