

Proving Circle Theorems

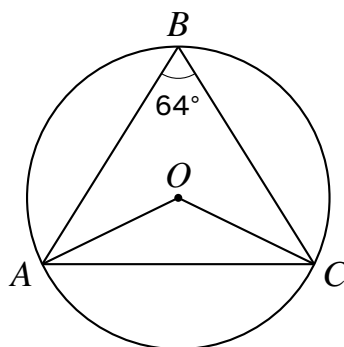
For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **25**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. Diagrams are not drawn accurately.

- 1** A , B and C are points on a circle, centre O .



Not drawn accurately

Angle $ABC = 64^\circ$

Jo works out the size of angle OAC .

Complete the reasons in her working.

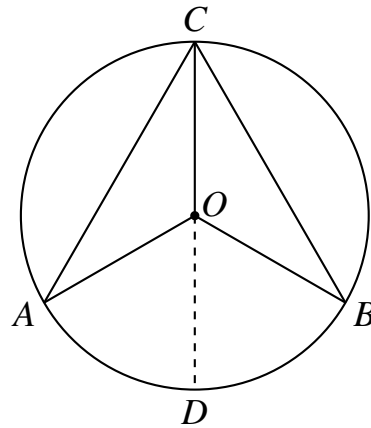
$OA = OC$ because _____

Angle $AOC = 128^\circ$ because _____

Angle $OAC = (180 - 128) \div 2 = 26^\circ$ because _____

[3 marks]

2 A, B and C are points on a circle, centre O .



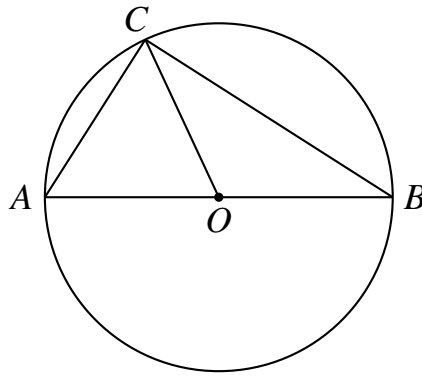
Not drawn accurately

Prove that the angle at the centre is twice the angle at the circumference, i.e. angle $AOB = 2 \times \text{angle } ACB$

You may use the diagram. CO is extended to D .

[4 marks]

- 3 AB is a diameter of a circle, centre O . C is a point on the circle.

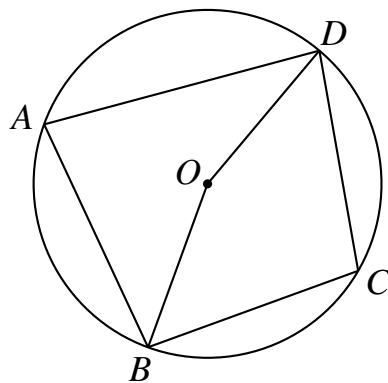


Not drawn accurately

Prove that angle $ACB = 90^\circ$

[4 marks]

- 4 $ABCD$ is a cyclic quadrilateral, centre O .

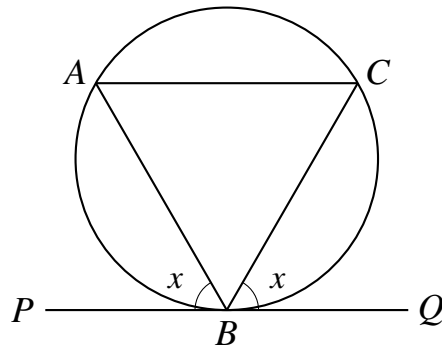


Not drawn accurately

Prove that opposite angles of a cyclic quadrilateral add up to 180°
You may use the fact that the angle at the centre is twice the angle at the circumference.

[3 marks]

- 5 A, B and C are points on a circle.



Not drawn accurately

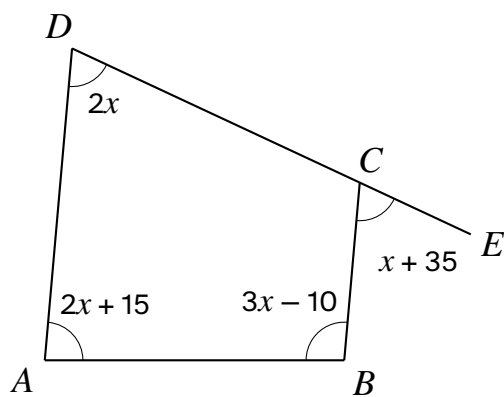
PBQ is a tangent to the circle at B .

Angle $ABP = \text{angle } CBQ = x$

Prove that $AB = BC$

[3 marks]

- 6 Here is a quadrilateral $ABCD$.



Not drawn accurately

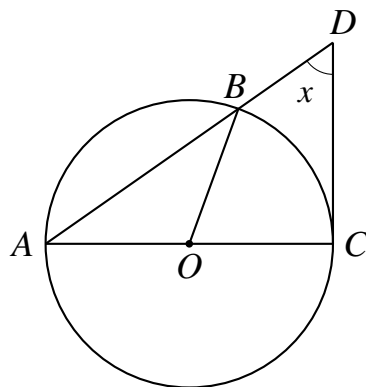
DCE is a straight line.

The angles are in degrees.

Prove that $ABCD$ is **not** a cyclic quadrilateral.

[4 marks]

- 7 A, B and C are points on a circle, centre O .



Not drawn accurately

AC is a diameter of the circle.

CD is a tangent to the circle at C .

ABD is a straight line. Angle $ADC = x$

Prove that angle $BOC = 180^\circ - 2x$

[4 marks]
