

Proving Circle Theorems

For Pearson Edexcel GCSE Mathematics (1MA1) • 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 accurately drawn.

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

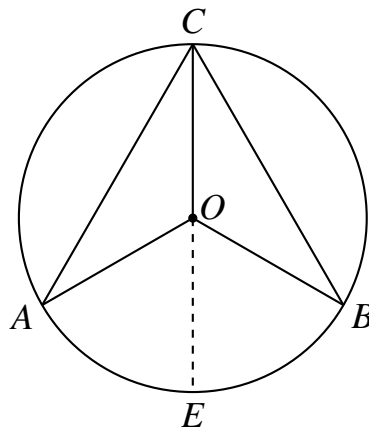


Diagram **NOT** accurately drawn

Prove that angle $AOB = 2 \times$ angle ACB .

You may use the diagram, where CO is extended to E .

(4)

(Total for Question 1 is 4 marks)

- 2 P , Q and R are points on a circle, centre O .

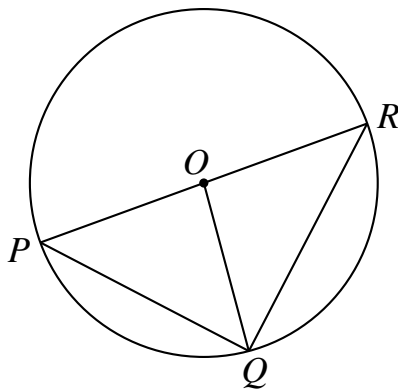


Diagram **NOT** accurately drawn

POR is a straight line.

Prove that triangle PQR has a right angle at Q .

Give a reason for each stage of your working.

(4)

(Total for Question 2 is 4 marks)

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

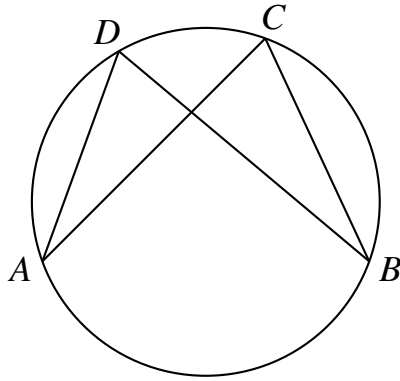


Diagram **NOT** accurately drawn

Prove that angle $ACB =$ angle ADB .

You may use the fact that the angle at the centre is twice the angle at the circumference.

(3)

(Total for Question 3 is 3 marks)

- 4 $ABCD$ is a cyclic quadrilateral. O is the centre of the circle.

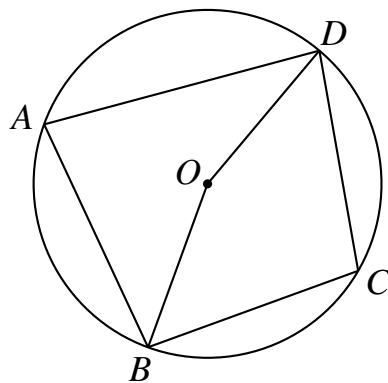


Diagram **NOT** accurately drawn

Prove that the 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)

(Total for Question 4 is 3 marks)

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

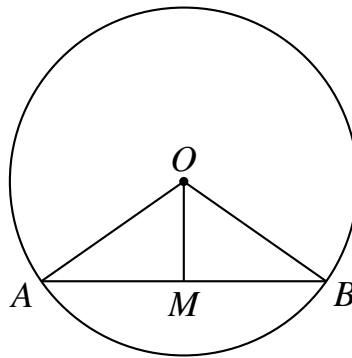


Diagram **NOT** accurately drawn

M is the midpoint of the chord AB .
Prove that OM is perpendicular to AB .

(4)

(Total for Question 5 is 4 marks)

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

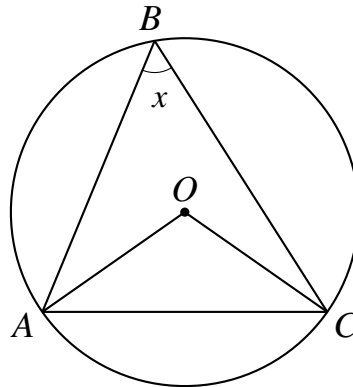


Diagram **NOT** accurately drawn

Angle $ABC = x$

Prove that angle $OCA = 90^\circ - x$

Give reasons for each stage of your working.

(3)

(Total for Question 6 is 3 marks)

- 7 TA and TB are tangents to a circle, centre O , from the point T .

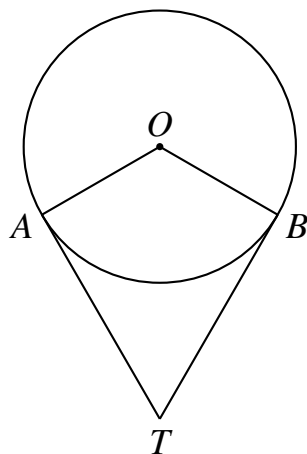


Diagram **NOT** accurately drawn

Prove that $TA = TB$.

(4)

(Total for Question 7 is 4 marks)
