Name: SOLUTIONS

GCSE (1 - 9) Proof of Circle Theorems	Solutions by Kenneth Stafford MATHS TUTOR ken@kennethstafford.co.uk

These questions are compiled from released Pearson Edexcel GCSE maths exam papers

They contain exam questions from up until the ***November 2023*** exam series

More recent exam papers do exist but are withheld for mock exams

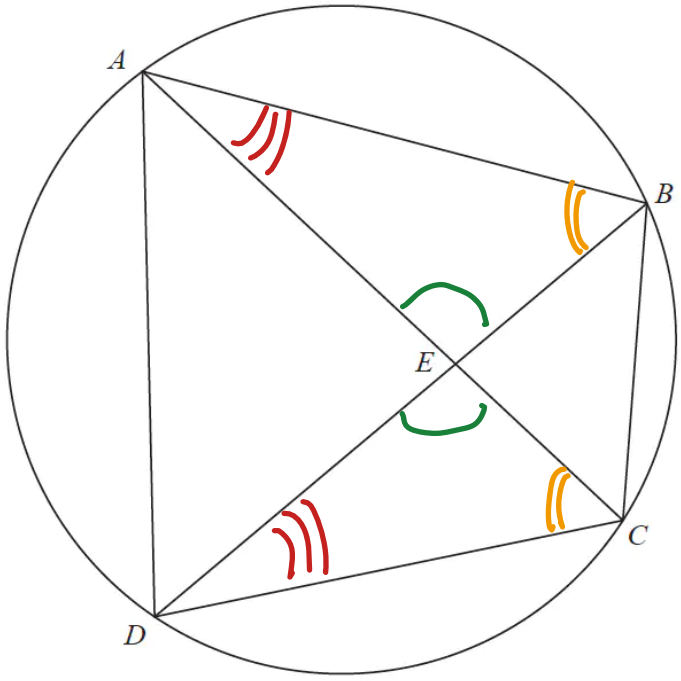
As new exam papers are released these worksheets will gradually be updated

The **most current** version of these worksheets will always be available at: kennethstafford.co.uk

Past Papers:	**Similar Worksheets:**
Solutions:	**This worksheet:**

1

A, B, C and D are four points on the circumference of a circle.



AEC and BED are straight lines.

Prove that triangle ABE and triangle DCE are similar.
You must give reasons for each stage of your working.

AEB = DEC
vertically opposite angles are equal.

ABE = ACE angles in the same segment are equal.

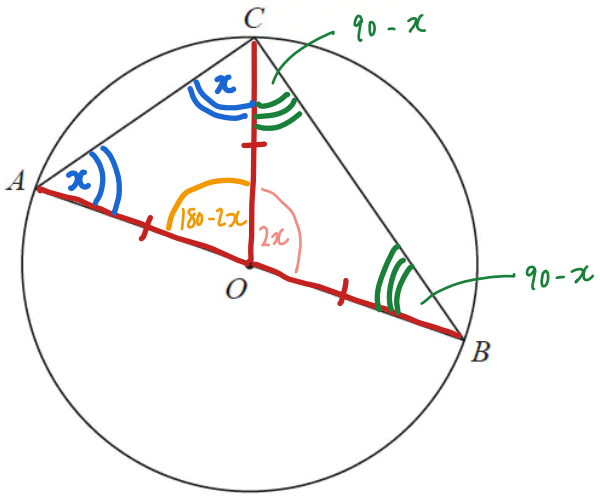
BAE = BDC angles in the same segment are equal.

All angles are equal so the triangles are similar

(Total for Question 15 is 3 marks)

[Edexcel, GCSE, Summer 2017, Paper 2H, Q15]

2



A, B and C are points on the circumference of a circle, centre O.
AOB is a diameter of the circle.

Prove that angle ACB is 90°
You must **not** use any circle theorems in your proof.

Let angle CAO = x

Angle ACO = x (base angles in an isosceles are equal)

Angle AOC = 180 - 2x (angles in a triangle sum to 180°)

Angle COB = 2x (angles on a straight line sum to 180°)

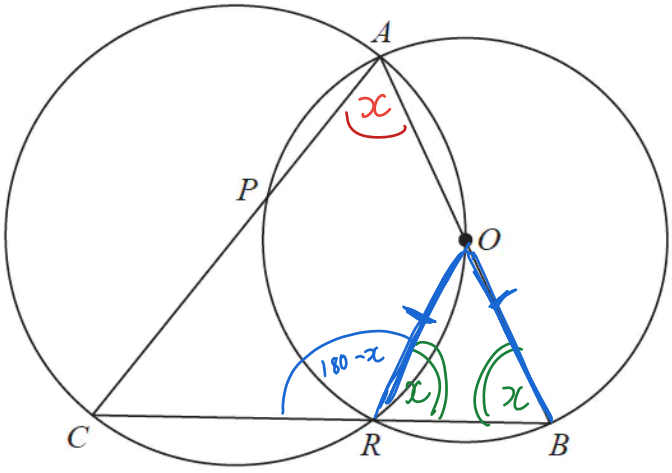
OBC = OCB = 90 - x

ACB = x + 90 - x = 90°

(Total for Question 20 is 4 marks)

[Edexcel, GCSE, Autumn 2017, Paper 3H, Q20]

3



A, B, R and P are four points on a circle with centre O.
A, O, R and C are four points on a different circle.
The two circles intersect at the points A and R.

CPA, CRB and AOB are straight lines.

Prove that angle CAB = angle ABC.

Let $CAB = x$

$CRO = 180 - x$ (opposite angles in a cyclic quadrilateral sum to 180)

$ORB = x$ (angles on a straight line sum to 180)

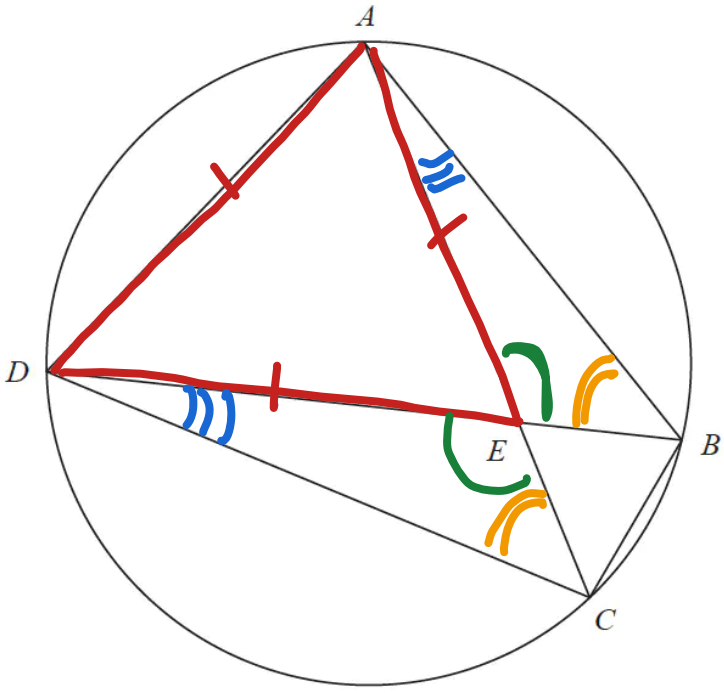
$ORB = OBR = x$ (base angles in an isosceles are equal)

(Total for Question 21 is 4 marks)

[Edexcel, GCSE, Autumn 2018, Paper 2H, Q21]

4

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



AEC and DEB are straight lines.

Triangle AED is an equilateral triangle.

Prove that triangle ABC is congruent to triangle DCB.

$AE = DE$ both are sides of an equilateral

$D\hat{B}A = D\hat{C}A$ angles in the same segment are equal

$CDB = CAB$ angles in the same segment are equal

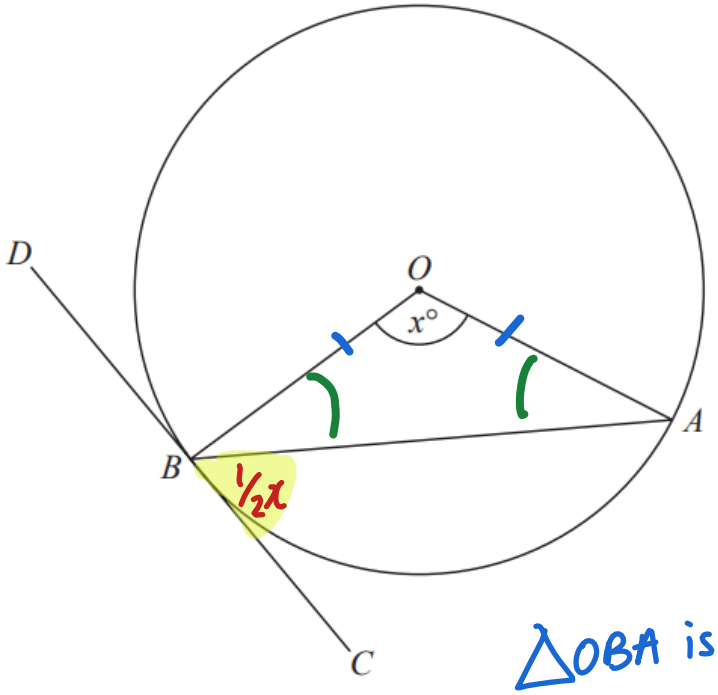
$DEC = BEA$ vertically opposite angles are equal.

ASA

(Total for Question 22 is 4 marks)

[Edexcel, GCSE, Autumn 2019, Paper 1H, Q22]

5



△OBA is isosceles as OB = OA (radii)

OBA = OAB (base angle)

$OBA = \frac{180 - x}{2} = 90 - \frac{1}{2}x$

OBC = 90° (tangent to radius)

$ABC = 90 - (90 - \frac{1}{2}x) = \frac{1}{2}x$

A and B are points on a circle, centre O.
DBC is the tangent to the circle at B.
Angle $AOB = x°$

Show that angle $ABC = \frac{1}{2}x°$

You must give a reason for each stage of your working.

(Total for Question 18 is 3 marks)

[Edexcel, GCSE, November 2022, Paper 1H, Q18]