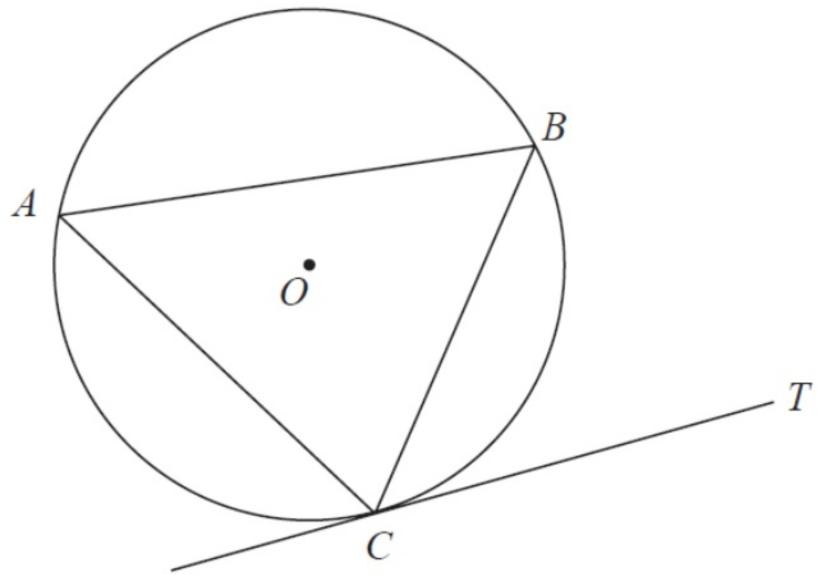
G63b...Circle Theorem Proofs

Edexcel

Video created by W Neill

17

G63b



A, *B* and *C* are points on a circle, centre *O*.
CT is the tangent to the circle at *C*.

Prove that angle *BAC* = angle *BCT*

(Total for Question 17 is 4 marks)

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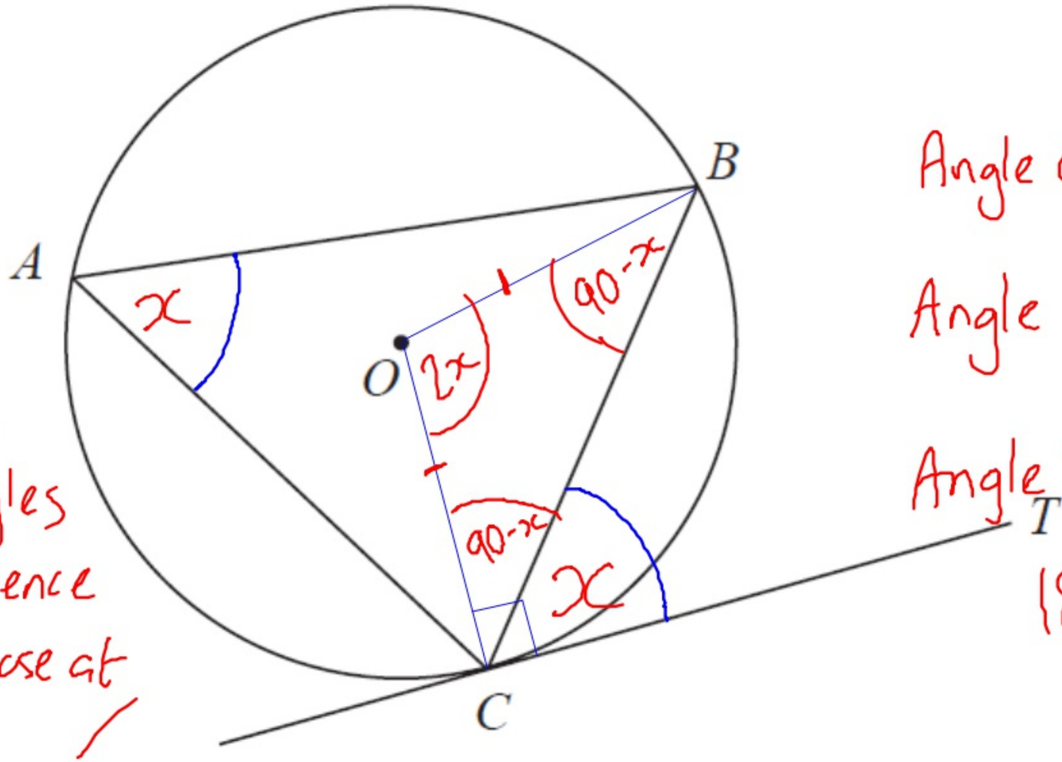
17

G63b



BAC = x

because angles at circumference are half those at centre. ✓

A, B and C are points on a circle, centre O.
CT is the tangent to the circle at C.

Prove that angle BAC = angle BCT ✓

Angle OCB = 90 - x

Angle CBO = 90 - x

Angle BOC =

$180^\circ - \begin{pmatrix} 90 - x \\ + 90 - x \end{pmatrix}$

$180 - (180 - 2x)$

$+2x$

BAC = BCT ✓

(Total for Question 17 is 4 marks)

20

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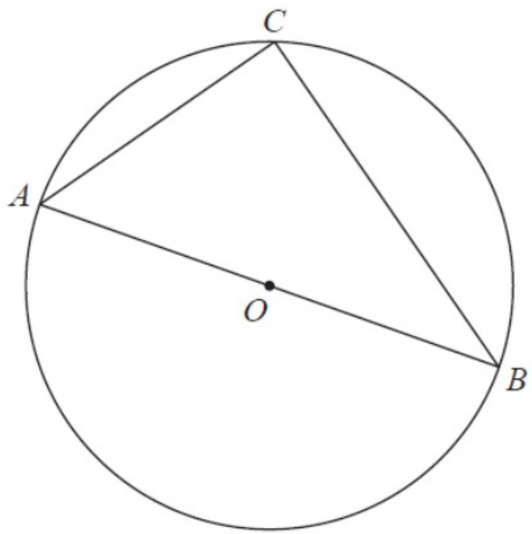

A, *B* and *C* are points on the circumference of a circle, centre *O*.
AOB is a diameter of the circle.

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

(Total for Question 20 is 4 marks)

20

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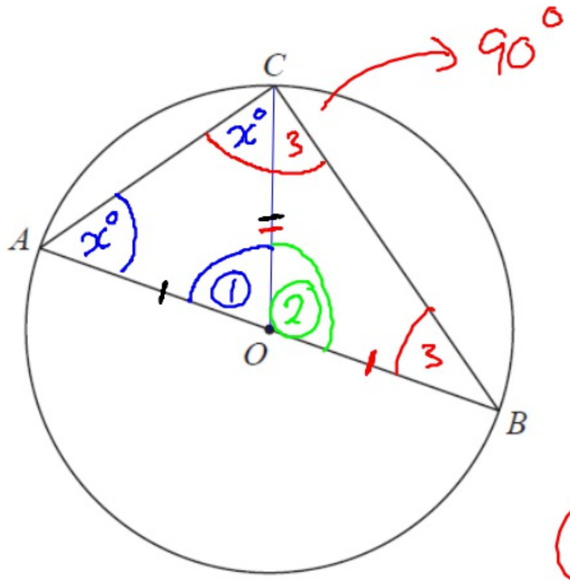

$① = 180° - 2x$

$② = 180° - (180° - 2x)$

$2x$

$③ \frac{180 - 2x}{2}$

$= 90 - x$ ✓

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.

angle = ACB .... $x + 90° - x$

$= 90°$ ✓

(Total for Question 20 is 4 marks)

11
G63a/b

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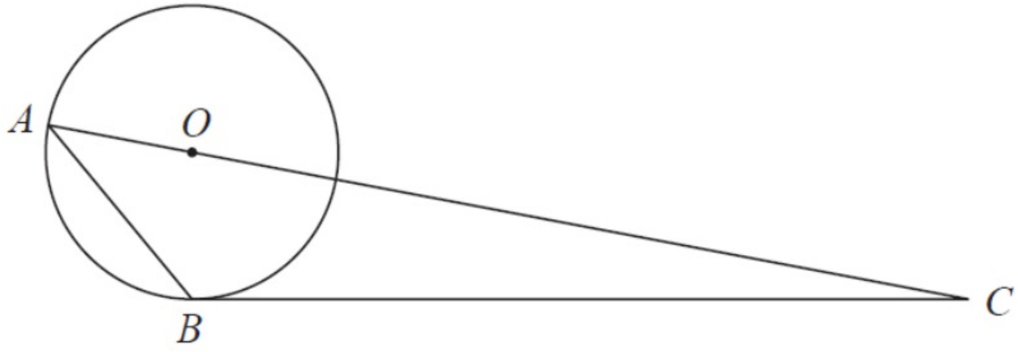

A and *B* are points on a circle, centre *O*.

BC is a tangent to the circle.
AOC is a straight line.
Angle *ABO* = $x°$.

Find the size of angle *ACB*, in terms of x.
Give your answer in its simplest form.
Give reasons for each stage of your working.

(Total for Question 11 is 5 marks)

11

G63a/b

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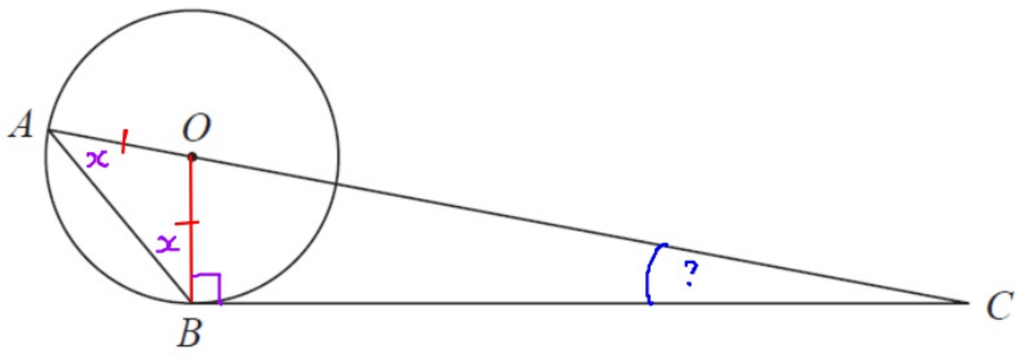

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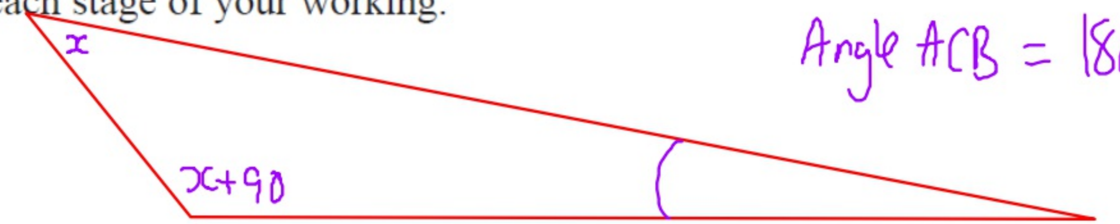


Triangle AOB is isosceles as OB and AO are both radii

angle OBC = 90° as a tangent meets a Radius at 90°

180 − + 90

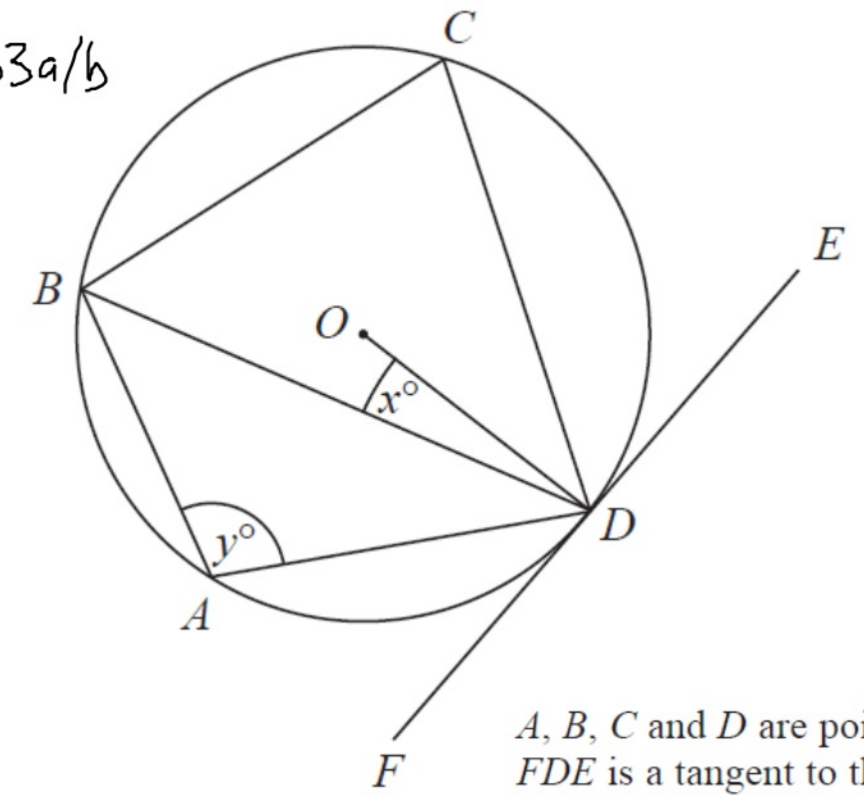
Angle ACB = 180 − (x + x+90)

90 − 2x ✓

(Total for Question 11 is 5 marks)

13

Gb3a/b

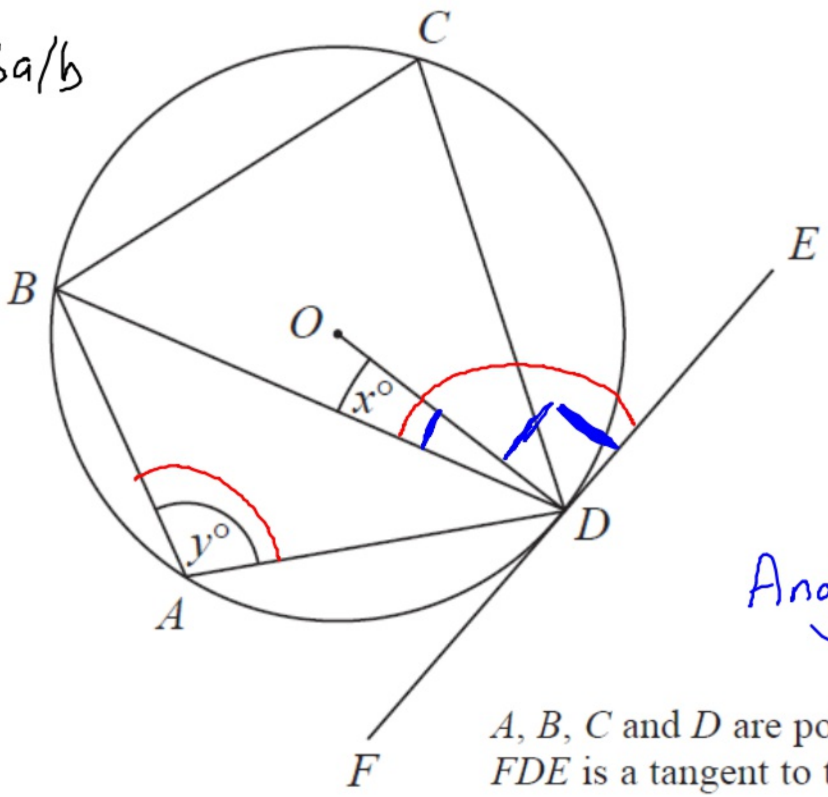


A, B, C and D are points on the circumference of a circle, centre O.
FDE is a tangent to the circle.

(a) Show that $y - x = 90$
You must give a reason for each stage of your working.

13

Gb3a/b



Angle BDE = $y°$

because of Alternate Segment rule

Angle ODE = $90°$

tangents meet radii at $90°$

Angle BDE − x = $90°$

$y - x = 90°$

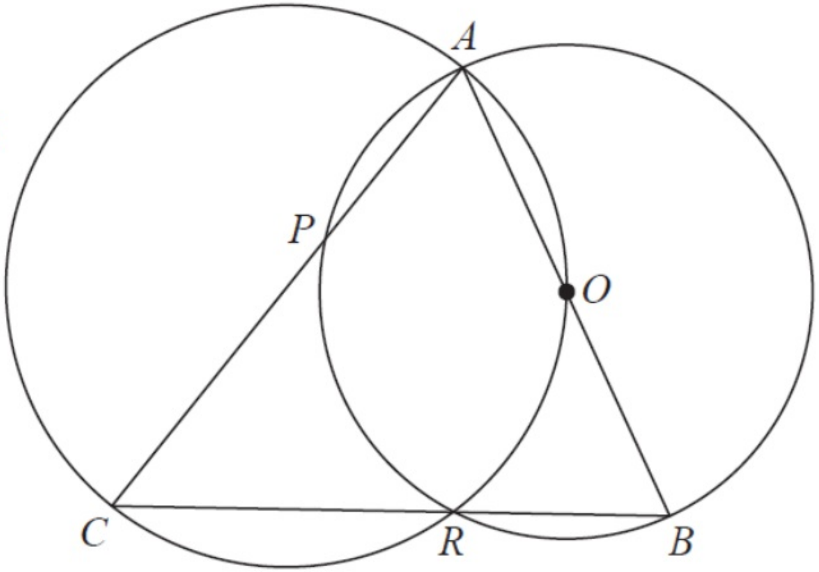
A, *B*, *C* and *D* are points on the circumference of a circle, centre *O*.
FDE is a tangent to the circle.

(a) Show that $y - x = 90$

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

21

G63b



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*.

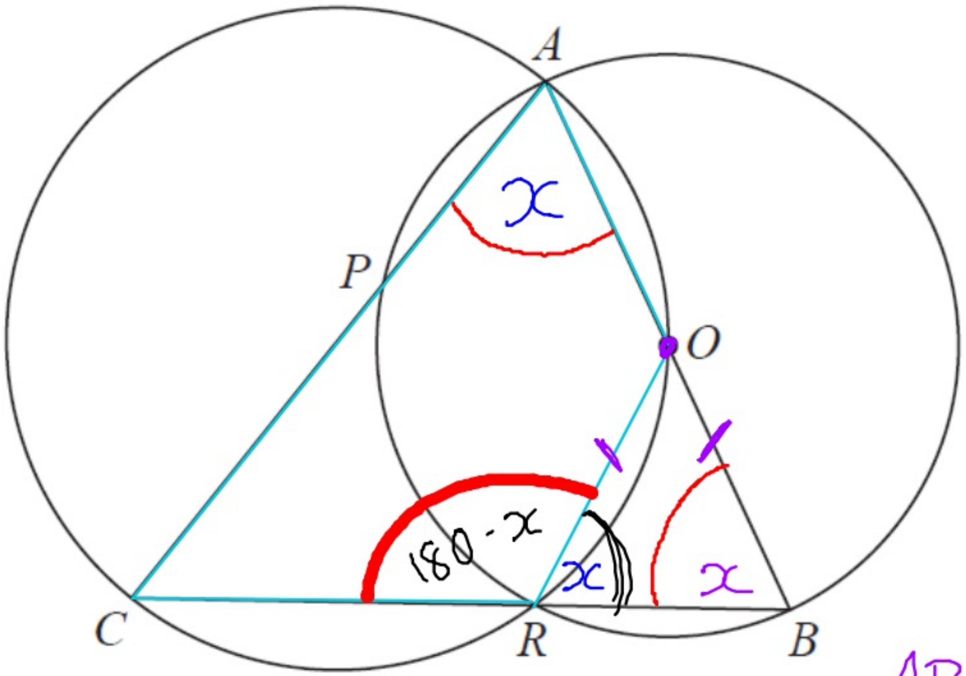
CPA, *CRB* and *AOB* are straight lines.

Prove that angle *CAB* = angle *ABC*.

(Total for Question 21 is 4 marks)

21

G63b



Angle CRO = 180 - x

Angle ORB = x

180 - x + x = 180°

ABC = x° as it is in an isosceles Δ (ORB)

∴ angle CAB = angle ABC

A, *B*, *R* and *P* are four points on a circle with centre *O*.
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(Total for Question 21 is 4 marks)