



Aberdare Community School  
Mathematics Department

WJEC GCSE

**Higher – Calculator**

Shape

## **Circle theorems**

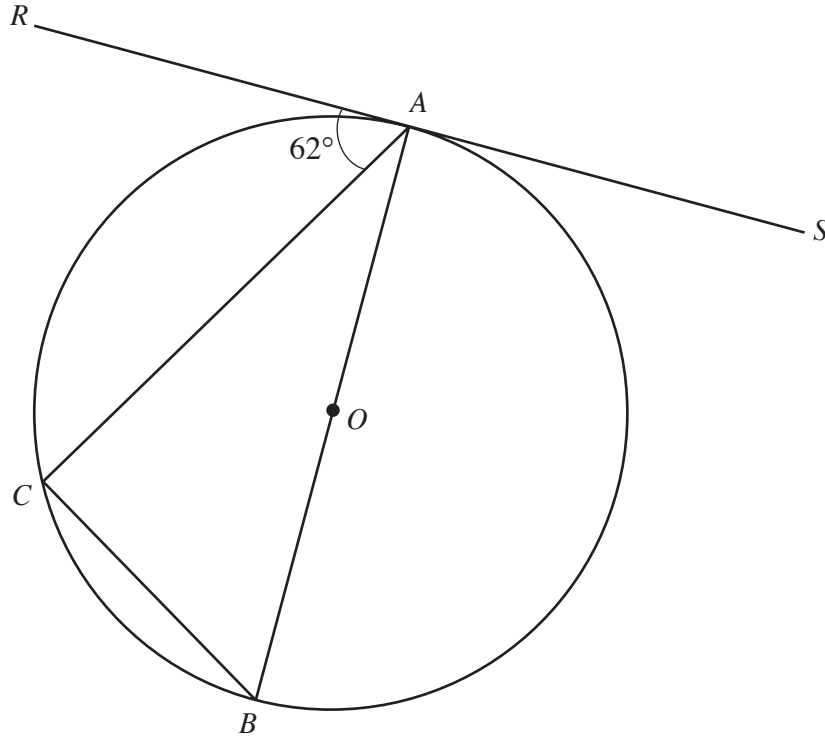
Name: .....

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Teacher: .....

19. Three points  $A$ ,  $B$  and  $C$  lie on the circumference of the circle centre  $O$ .  
The tangent  $RS$  meets the circle at  $A$ .



*Diagram not drawn to scale.*

Given that  $\widehat{RAC} = 62^\circ$ , find the following angles giving reasons for your answers.

(a)  $\widehat{ACB}$

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(b)  $\widehat{ABC}$

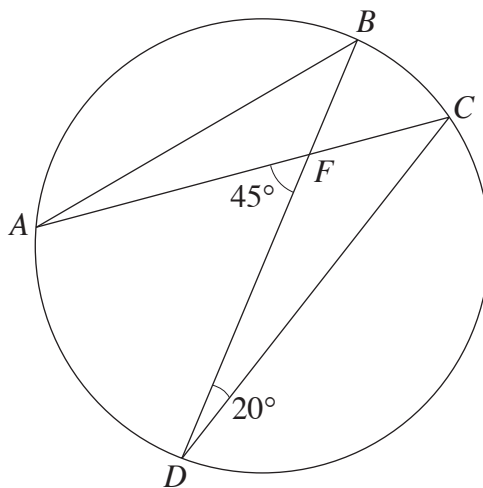
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[3]

16. (a) Four points  $A, B, C$  and  $D$  lie on the circumference of a circle. The lines  $AC$  and  $BD$  intersect at the point  $F$ .



*Diagram not drawn to scale.*

Given that  $\widehat{AFD} = 45^\circ$  and  $\widehat{BDC} = 20^\circ$ , find the size of  $\widehat{ABD}$  giving a reason for your answer.

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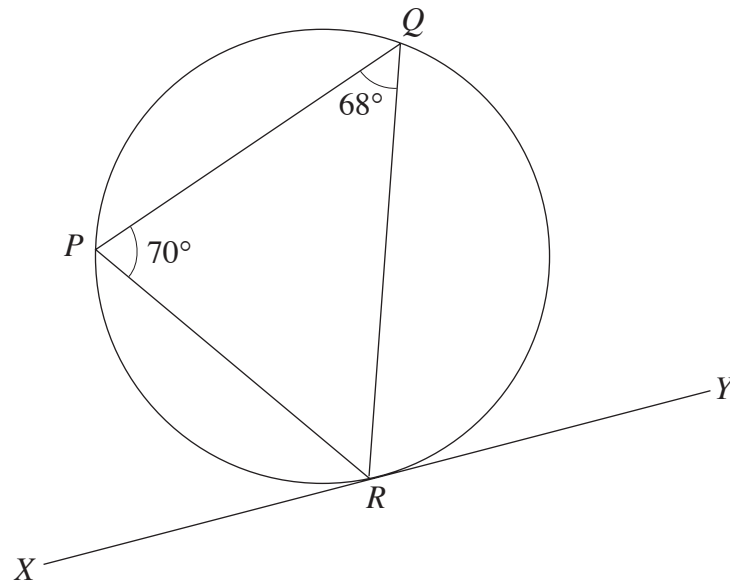
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[2]

- (b) Three points  $P$ ,  $Q$  and  $R$  lie on the circumference of a circle.  
The tangent  $XY$  touches the circle at  $R$ .



*Diagram not drawn to scale.*

Given that  $\widehat{RPQ} = 70^\circ$  and  $\widehat{PQR} = 68^\circ$ , find the size of  $\widehat{PRX}$ , giving a reason for your answer.

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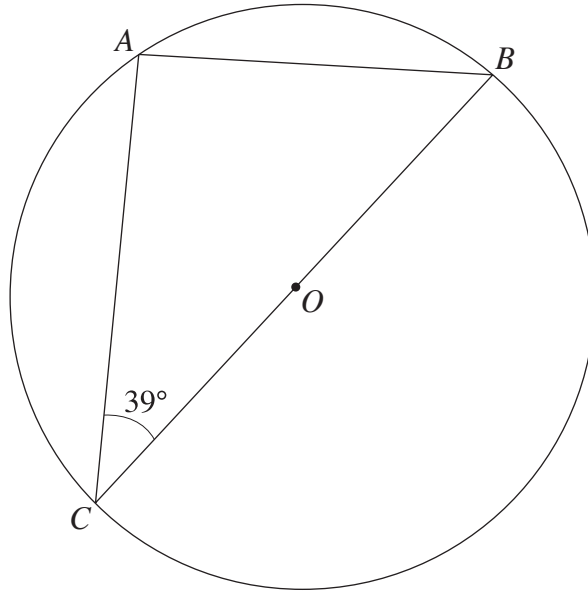
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[2]

15. Three points  $A$ ,  $B$  and  $C$  lie on the circumference of the circle with centre  $O$ .

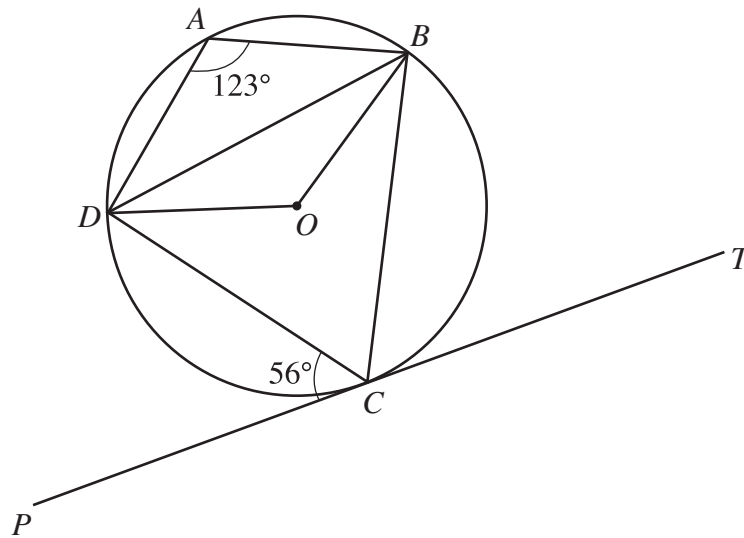


*Diagram not drawn to scale.*

Given that  $\widehat{ACB} = 39^\circ$ , find the size of  $\widehat{ABC}$ .

[1]

14.



*Diagram not drawn to scale.*

Four points  $A$ ,  $B$ ,  $C$  and  $D$  lie on the circumference of the circle centre  $O$ .

The tangent  $TP$  touches the circle at  $C$ ,  $\widehat{DCP} = 56^\circ$  and  $\widehat{DAB} = 123^\circ$ .  
Find **each** of the following angles.

(a)  $\widehat{DBC}$

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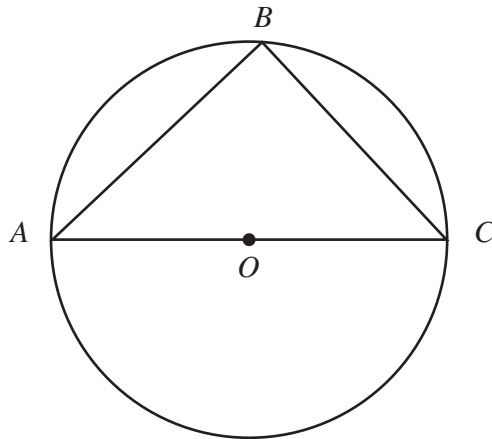
(b)  $\widehat{BCD}$

..... [1]

(c)  $\widehat{DOB}$

..... [1]

(b)



*Diagram not drawn to scale.*

The point  $O$  is the centre of a circle with radius  $5.5$  cm.  
Points  $A$ ,  $B$  and  $C$  are on the circumference of the circle, and  $AOC$  is a straight line.  
Given that  $AB = BC$ , calculate the length of  $AB$ .

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[4]

14. (a)

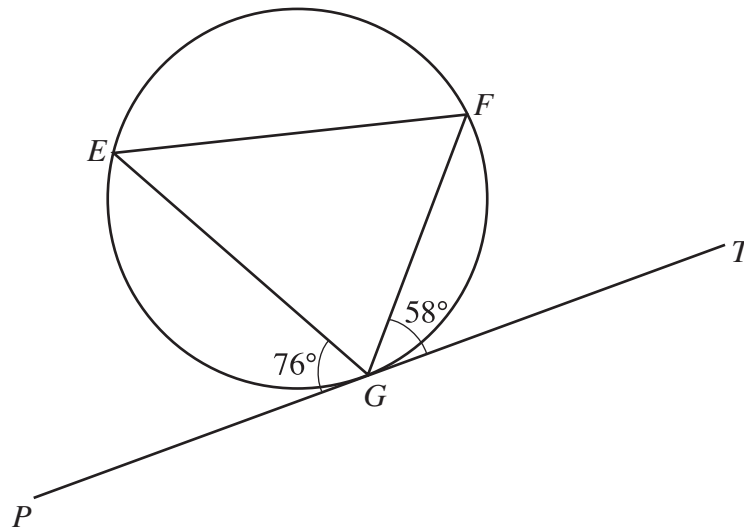


Diagram not drawn to scale.

Three points  $E$ ,  $F$  and  $G$  lie on the circumference of the circle.

The tangent  $PT$  touches the circle at  $G$ .

Given that  $\widehat{EGP} = 76^\circ$  and  $\widehat{FGT} = 58^\circ$ , find the size of  $\widehat{FEG}$ , giving a reason for your answer.

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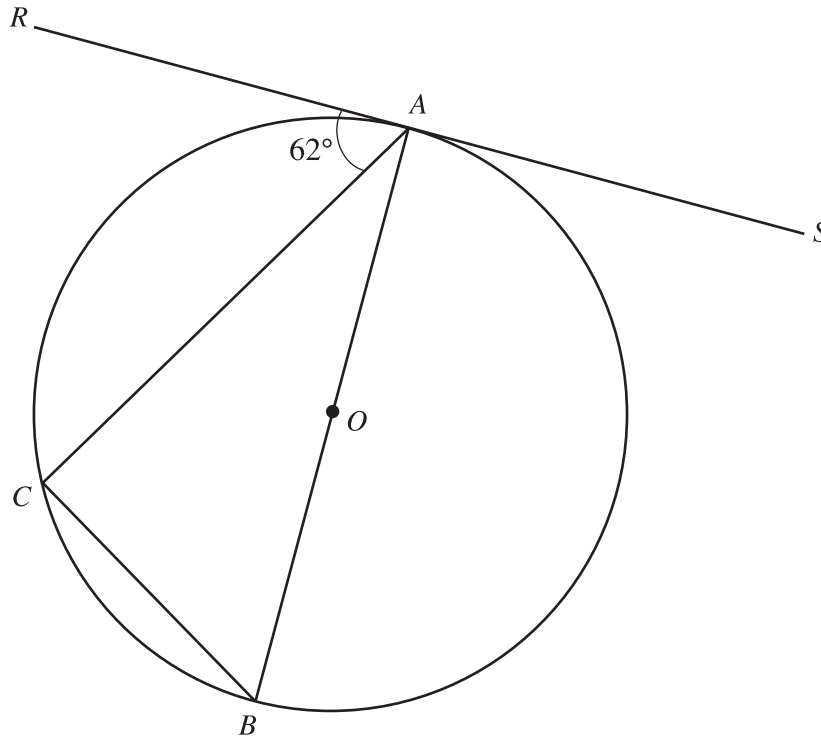
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[2]



19. Three points  $A$ ,  $B$  and  $C$  lie on the circumference of the circle centre  $O$ .  
The tangent  $RS$  meets the circle at  $A$ .



*Diagram not drawn to scale.*

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(a)  $\widehat{ACB}$

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(b)  $\widehat{ABC}$

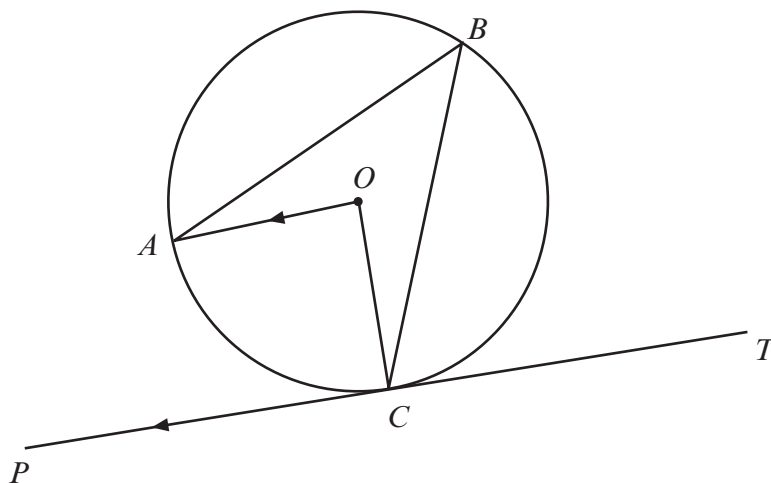
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[3]

- (b) The diagram shows a circle with centre  $O$  of radius  $6.8$  cm.  
The straight line  $PCT$  is a tangent to the circle.



*Diagram not drawn to scale.*

- (i) Write down the size of  $\widehat{ABC}$ .

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- (ii) Calculate the area of the sector  $AOC$ .

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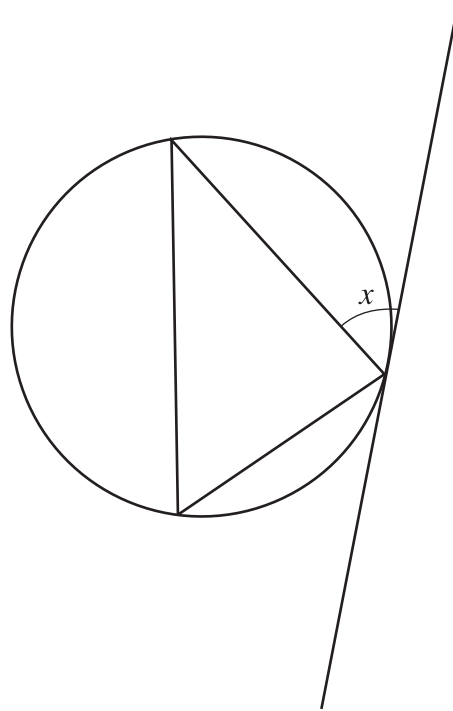
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[4]

- (c) The diagram shows a tangent touching a circle.



On the diagram above, mark another angle that is equal to  $x$ .  
State a reason for your answer using your knowledge of circle theorems.

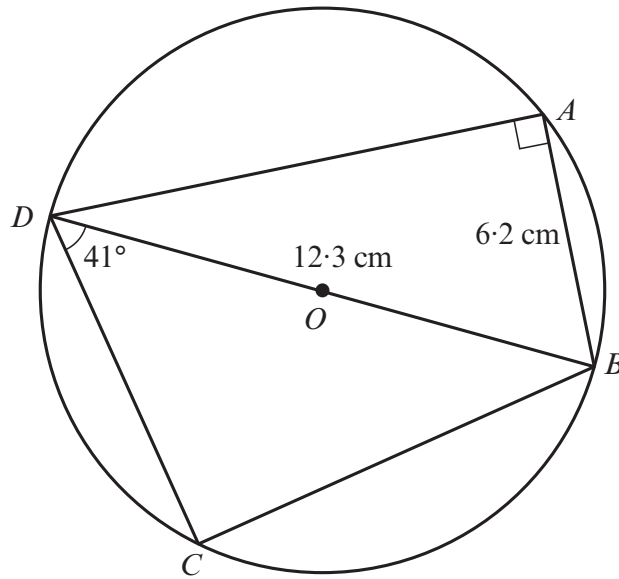
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[2]

10. The points  $A$ ,  $B$ ,  $C$  and  $D$  all lie on the circumference of a circle with centre  $O$ .



*Diagram not drawn to scale*

Given that  $BD = 12.3$  cm,  $AB = 6.2$  cm,  $\widehat{BDC} = 41^\circ$  and  $\widehat{DAB} = 90^\circ$ , calculate

- (a) the length  $AD$ ,

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(b) the area of triangle  $BCD$ .

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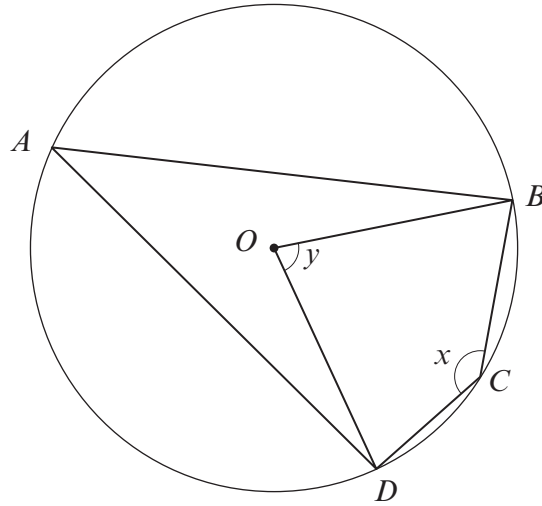
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[8]

12. (a) The diagram shows a circle with centre  $O$ .  
The points  $A$ ,  $B$ ,  $C$  and  $D$  all lie on the circumference of the circle.



*Diagram not drawn to scale*

Find an expression for  $y$  in terms of  $x$ .

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16. (a) The diagram below shows a circle with centre  $O$ .

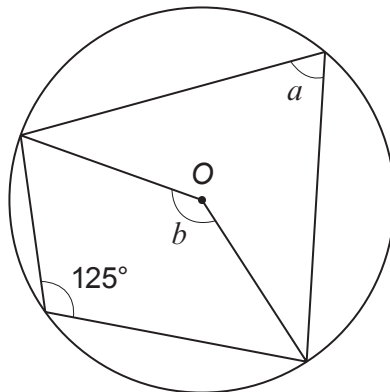


Diagram not drawn to scale

Calculate the sizes of angles  $a$  and  $b$ .

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$a = \dots\dots\dots^\circ$        $b = \dots\dots\dots^\circ$

- (b) The diagram shows a tangent to a circle. The vertices of the triangle shown all lie on the circumference of the circle.

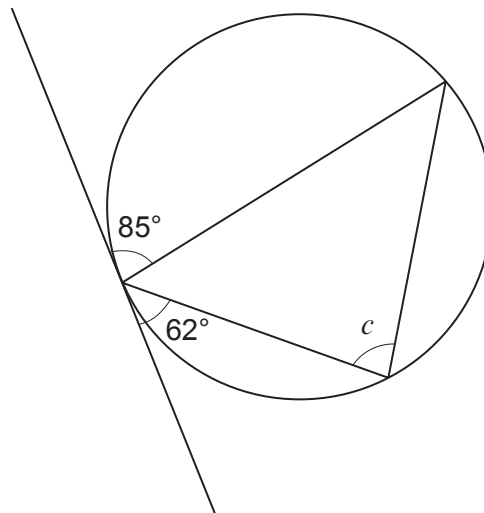


Diagram not drawn to scale

Giving a reason for your answer, calculate the size of angle  $c$ .

[2]

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$c = \dots\dots\dots^\circ$