

# Circle Theorems using Geometer's sketchpad

Log on and go to [www.mrsmyers.co.uk](http://www.mrsmyers.co.uk)  
Go to year 11 and GCSE revision .  
Click on Waldos site, go to shape, space and measures, circle theorems 1.

Drag highlighted points and try to predict what the formula will say.  
Copy the diagram and formula into your exercise book.  
Move on through the 4 pages. There are 7 theorems altogether.

Circle theorem 1: Angles in a cyclic quadrilateral.

Circle Theorem 2: Angles in the same segment. A

Circle theorem 3: Angle in a semi-circle. B

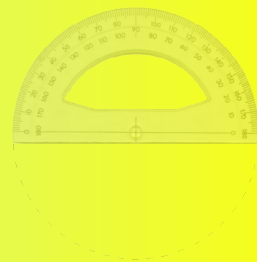
Circle Theorem 4: Angles sharing the same arc. A

Circle theorem 5: The angle between a tangent and a radius. A

Circle Theorem 6: The Alternate Segment theorem A\*

Circle Theorem 7: The length of tangents from a point to the circle. A

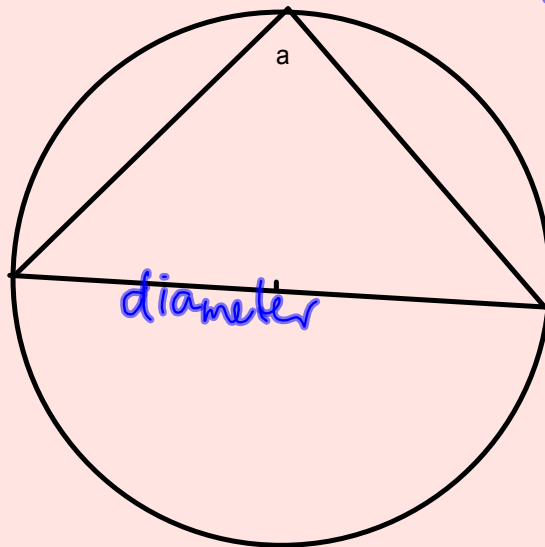
You will need a  
protractor  
pencil  
ruler  
pair of compasses



## Circle Theorems

### Circle theorem 1:

The angle in a semi-circle is ..... *a right angle* .....

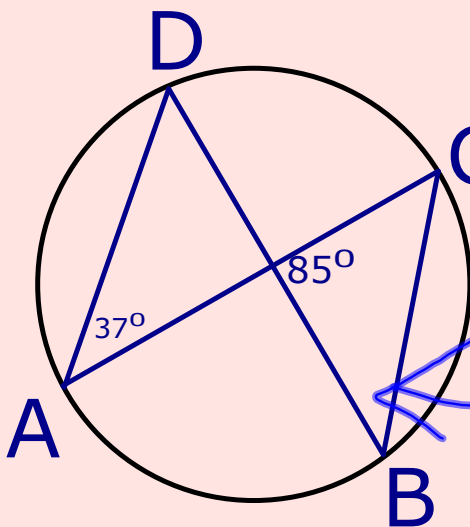
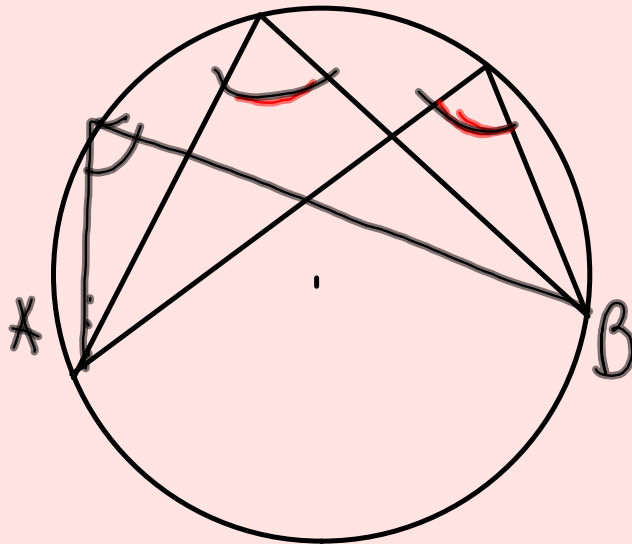


# Circle Theorems

## Circle theorem 2 :

The angles on the circumference are ..... *equal* .....

*In the same segment  
( from the same points )  
on the same arc*



Find  $\hat{ACB}$  and  $\hat{CDB}$

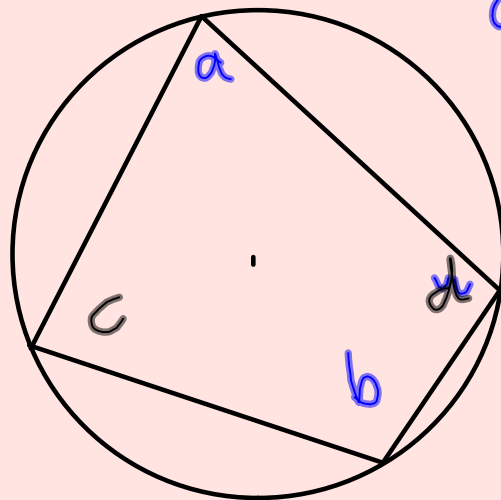
$$\hat{CDB} = 180 - 37 - 85 = 58^\circ$$

*Angles in the same segment are equal*

# Circle Theorems

Circle theorem 3:

Opposite angles in a cyclic quadrilateral  $\hat{a} + \hat{b} = 180^\circ$  .....

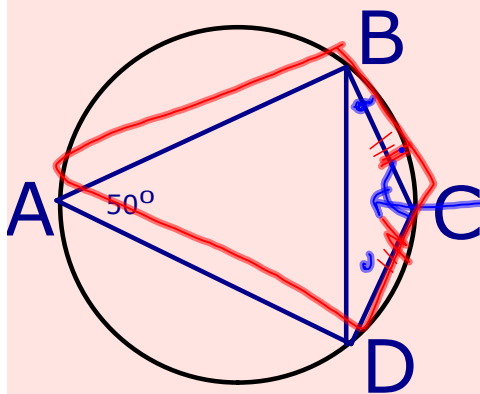


$$a + b = 180^\circ$$

$$c + d = 180^\circ$$



Example



Find  $\hat{C}BD = 25^\circ$   
because BC is  
isosceles

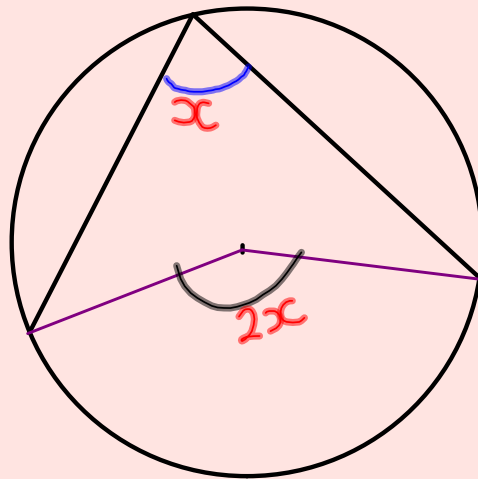
$30^\circ$  because  
opposite angles of a cyclic  
quadrilateral total  $180^\circ$

# Circle Theorems

## Circle theorem 4 :

half

The angle on the circumference is .....the angle at the centre subtended on the same arc.



130, 70

130, 70

68, 138

152, 76

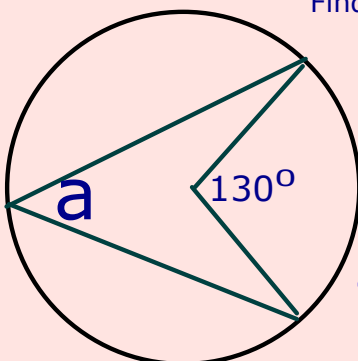
59, 114

122, 57

page 288 B1 - C2

## Example

Find the size of  $a$ , giving a reason for your answer.



$$a = 65^\circ$$

The angle at the centre is  
twice the angle on the  
circumference.

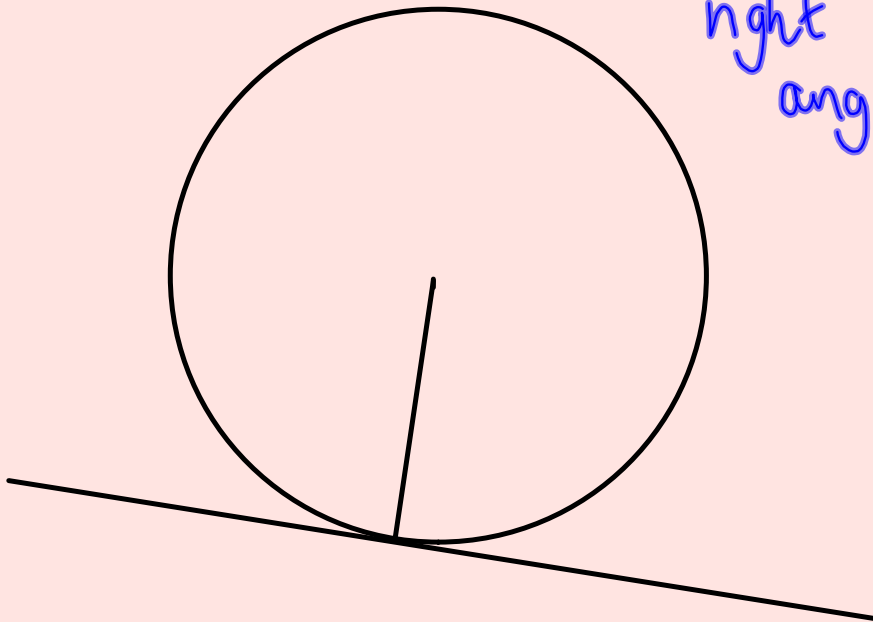
✓

## Circle Theorems

Circle theorem 5 :

The angle between a tangent and a radius is a.....

right  
angle

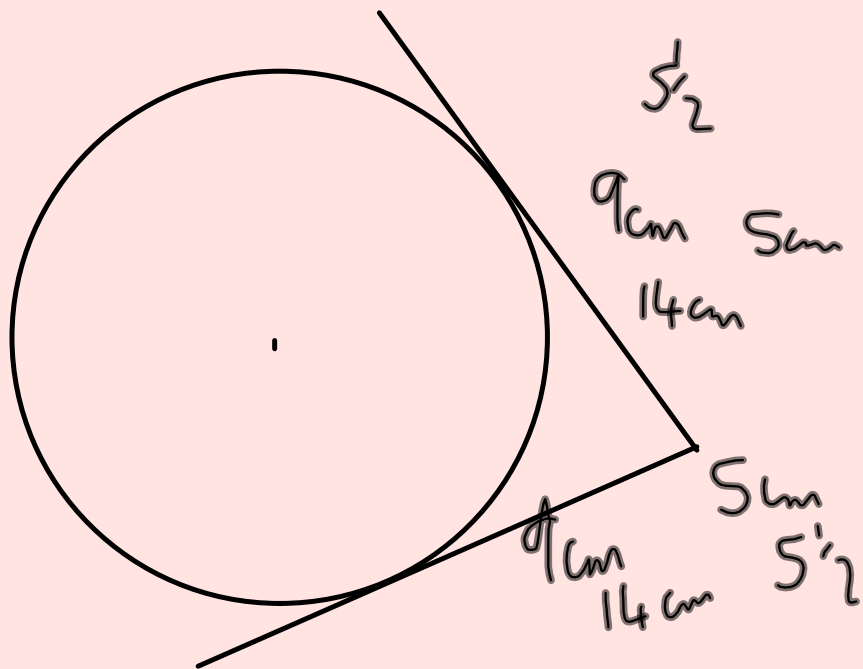




## Circle Theorems

Circle theorem 7 :

**The length of tangents from a point to the circle....are equal.**



Worksheet;  
Edexcel Higher  
Ex 26 H