

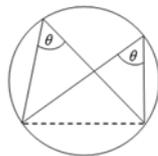


**Starter**

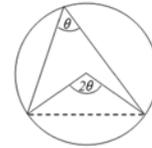
Fill in the missing words of circle properties

- ..... The area inside a circle enclosed by an arc.
- ..... The area enclosed by an arc and two radii.
- ..... A straight line joining any two points on the circumference.

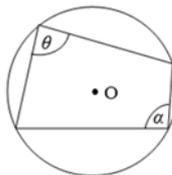
**Top Tips! Do you know the circle theorem rules?**



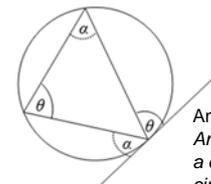
Angles inside the small segment are equal



Angle in the centre is double angle on the circumference



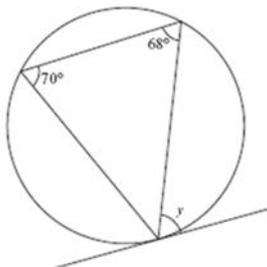
Opposite angles in a cyclic quadrilateral add to 180°



Angles in alternate segment  
Angles between a tangent and a chord is equal to an angle on circumference standing on the

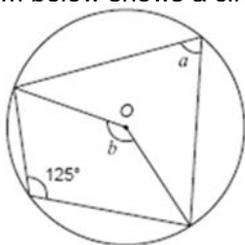
**Skills:**

- Calculate the size of the angle  $y$ . You must give a reason for your answer. [2]



$y = \dots\dots\dots^\circ$

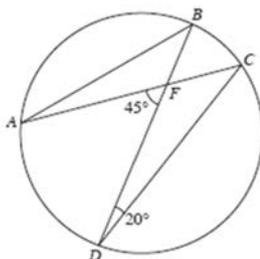
- The diagram below shows a circle with centre  $O$ . [3]



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

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

- Given that  $AFD = 45^\circ$  and  $BDC = 20^\circ$ , find the size of  $ABD$  [2]



$ABD = \dots\dots\dots^\circ$

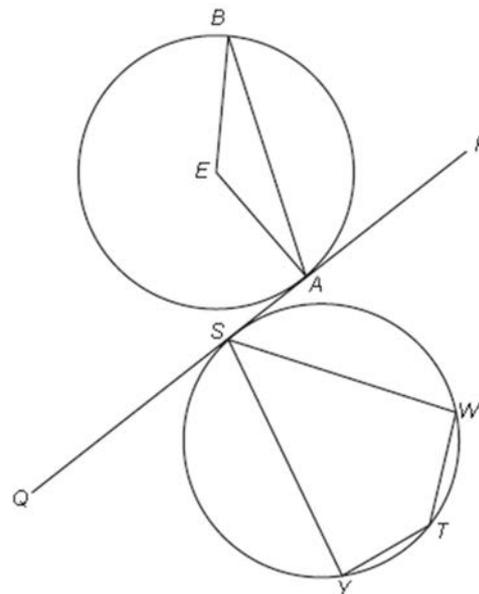
**Examination Question:**

2016 5 January Unit 1 Higher Qu 12

$PQ$  is a tangent to both the circles.

The points  $A$  and  $S$  lie on the tangent  $PQ$ .

$E$  is the centre of one of the circles, with points  $A$  and  $B$  on the circumference of this circle. The points  $S$ ,  $T$ ,  $W$  and  $Y$  lie on the circumference of the other circle.



You are given three further facts:

- $\angle BEA = 144^\circ$
- $\angle PAB = \angle PSW$
- $\angle SWT = 96^\circ$

Calculate the size of  $\angle WYT$ . You must show your working. To do this, you may wish to label the size of any angles that you calculate and show any extra lines on the diagram. [7]

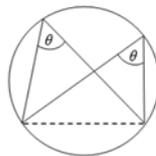


**Starter**

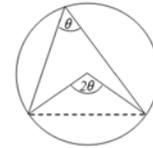
Fill in the missing words of circle properties

- 4) **Segment** The area inside a circle enclosed by an arc and a chord
- 5) **Sector** The area enclosed by an arc and two radii.
- 6) **Chord** A straight line joining any two points on the circumference.

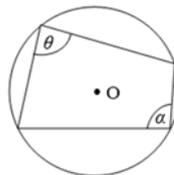
**Top Tips! Do you know the circle theorem rules?**



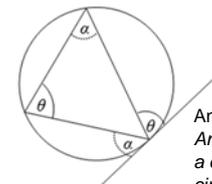
Angles inside the small segment are equal



Angle in the centre is double angle on the circumference



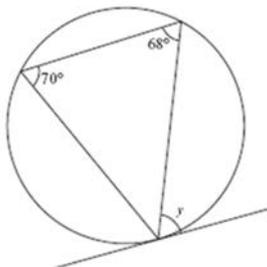
Opposite angles in a cyclic quadrilateral add to 180°



Angles in alternate segment  
Angles between a tangent and a chord is equal to an angle on circumference standing on the

**Skills:**

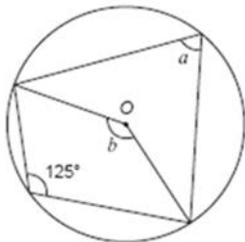
4. Calculate the size of the angle  $y$ . You must give a reason for your answer. [2]



$y = \dots 70^\circ$

angle between a tangent and a chord

5. The diagram below shows a circle with centre  $O$ . [3]



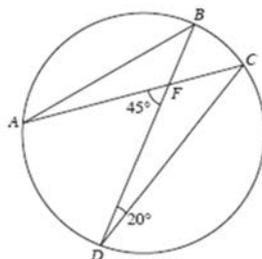
Calculate the sizes of angles  $a$  and  $b$ .

$a = 55^\circ$        $b = 110^\circ$

6. Given that  $AFD = 45^\circ$  and  $BDC = 20^\circ$ , find the size of  $ABD$  [2]

$BAC = 20^\circ$

$AFB = 135^\circ$



$ABD = 25^\circ$

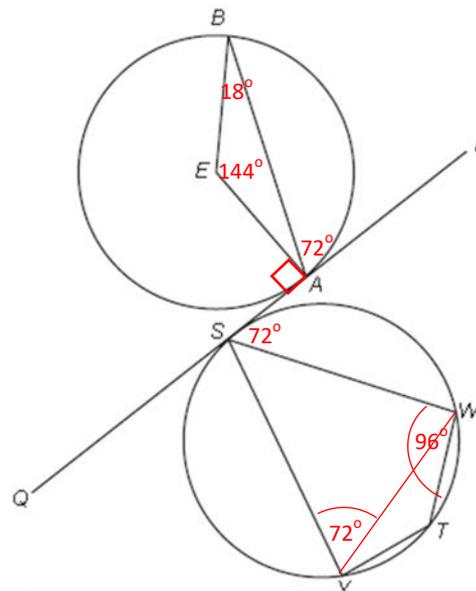
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You are given three further facts:

- $BEA = 144^\circ$
- $PAB = PSW$
- $SWT = 96^\circ$

Calculate the size of  $WYT$ . You must show your working.

To do this, you may wish to label the size of any angles that you calculate and show any extra lines on the diagram. [7]

Triangle  $AEB$  is Isosceles      Angles  $EAB = EBA$   
 Therefore angle  $EAB$   $180 - 144 = 36$        $EAB = 36 \div 2 = 18^\circ$   
 $PAB = 72^\circ$  (Angle  $EAP$  between Tangent and radius  $= 90^\circ$ )  
 Angle  $PAB = PSW = 72^\circ$   
 Chord  $WY$ . Angle  $SYW = 72^\circ$  Angles between tangent and chord.  
 Opposite angles in Cyclic Quadrilateral If  $SWT = 96^\circ$  then  $SYT = 84^\circ$   
 Angle  $WYT$        $84^\circ - 72^\circ = 12^\circ$