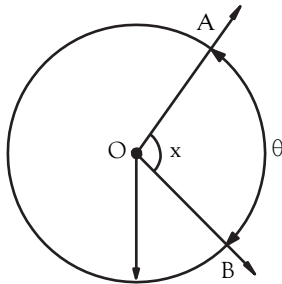


## Geometría

# ANGULOS EN LA CIRCUNFERENCIA

### A) ÁNGULO CENTRAL

La medida del ángulo central es igual a la de su arco correspondiente.

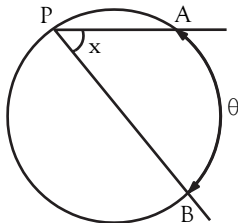


$$\sphericalangle AOB : \text{Ángulo central}$$

$$x = \theta$$

### B) ÁNGULO INSCRITO

Es el ángulo que tiene su vértice en la circunferencia y sus lados son dos secantes.

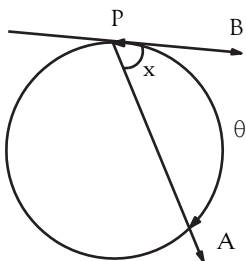


$$\sphericalangle APB : \text{Ángulo inscrito}$$

$$x = \frac{\theta}{2}$$

### C) ÁNGULO SEMIINSCRITO

Es el ángulo que tiene su vértice en la circunferencia, siendo uno de sus lados tangente y el otro secante.

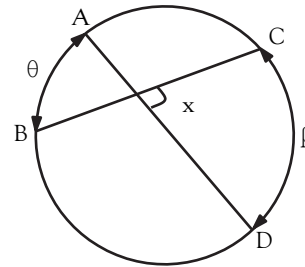


$$\sphericalangle APB : \text{Ángulo semiinscrito}$$

$$x = \frac{\theta}{2}$$

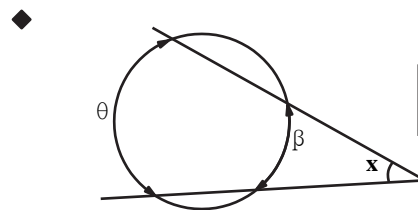
P: Punto de tangencia

### D) ÁNGULO INTERIOR

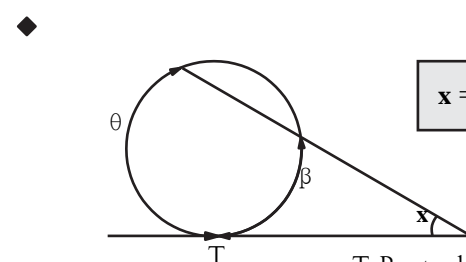


$$x = \frac{\theta + \beta}{2}$$

### E) ÁNGULO EXTERIOR

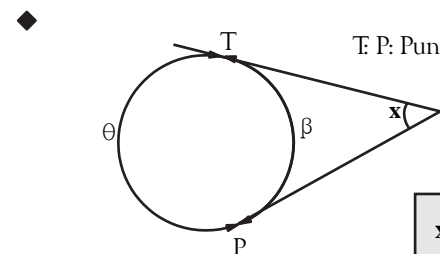


$$x = \frac{\theta - \beta}{2}$$



$$x = \frac{\theta - \beta}{2}$$

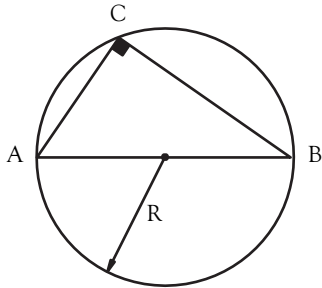
T: Punto de tangencia



T P: Punto de tangencia

$$x = \frac{\theta - \beta}{2}$$

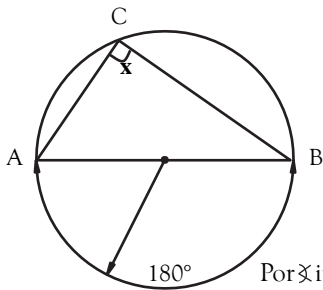
◆ **TEOREMA 1**



Si  $\overline{AB}$  es diámetro:

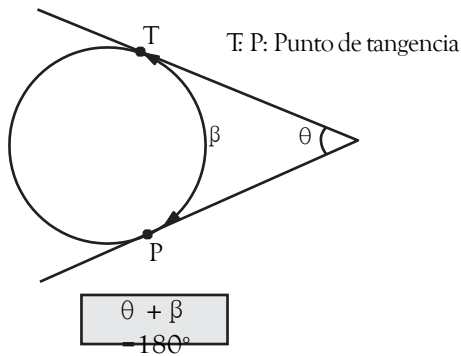
$$\Rightarrow \angle ACB = 90^\circ$$

**Demostración:**



Por  $\angle$  inscrito:  
 $x = 90^\circ$

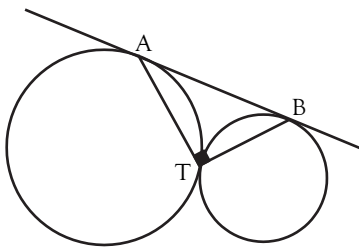
◆ **TEOREMA 2**



T P: Punto de tangencia

$$\theta + \beta = 180^\circ$$

◆ **TEOREMA 3**

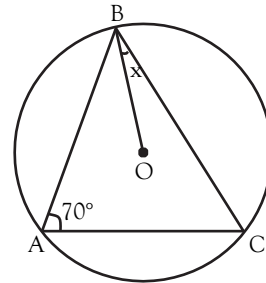


Si A, B y T son puntos de tangencia:

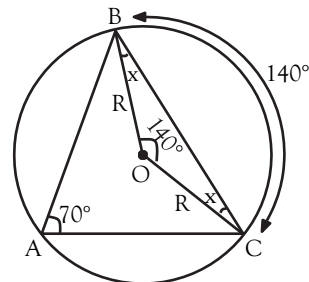
$$\Rightarrow m\angle ATB = 90^\circ$$

**Ejercicios Resueltos**

1) Calcule "x" si "O" es centro.

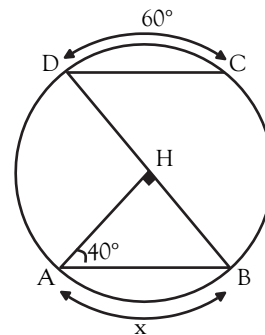


**Resolución:**

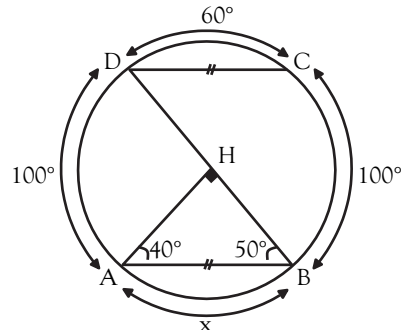


En la figura:  $m\widehat{BC} = 140^\circ \Rightarrow m\angle BOC = 140^\circ$   
Del  $\triangle BOC$ :  $2x + 140^\circ = 180^\circ \therefore x = 20^\circ$

2) Si  $\overline{CD} \parallel \overline{AB}$ , calcule "x".



**Resolución:**

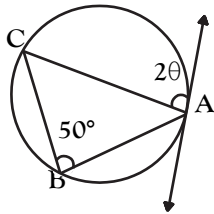


En la figura:  $m\widehat{AD} = m\widehat{BC} = 2m\angle ABD$   
 $\Rightarrow m\widehat{AD} = m\widehat{BC} = 100^\circ$   
Luego:  $100^\circ + 60^\circ + 100^\circ + x = 360^\circ$

$$\therefore x = 100^\circ$$

## Resolviendo en clase

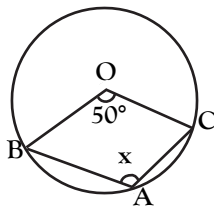
1 Calcule " $\theta$ " si "A" es punto de tangencia.



Resolución:

**Rpta:**

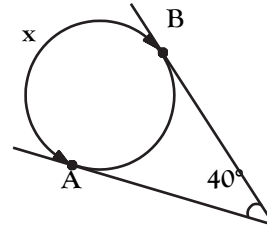
2 Calcule " $x$ " si "O" es centro.



Resolución:

**Rpta:**

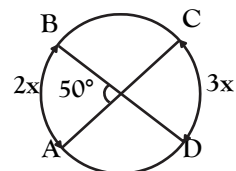
3 Calcule " $x$ " si "A" y "B" son puntos de tangencia.



Resolución:

**Rpta:**

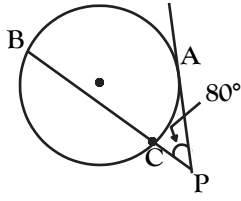
4 Calcule " $x$ ".



Resolución:

**Rpta:**

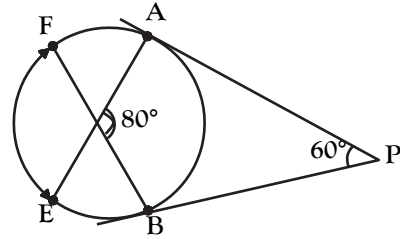
5 Si  $m\widehat{AB} = 5x$  y  $m\widehat{AC} = x$ , calcule "x".



Resolución:

**Rpta:**

6 Calcule  $m\widehat{EF}$ .

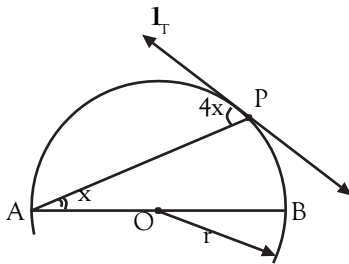


Resolución:

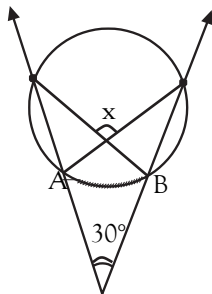
**Rpta:**

## Ahora en tu cuaderno

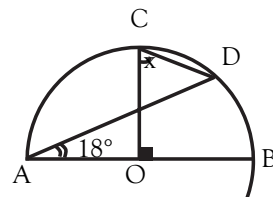
7. Calcule x, siendo  $L_T$  una recta tangente.



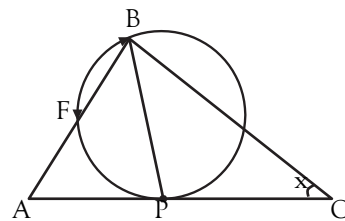
8. Calcule x si  $m\widehat{AB} = 40^\circ$ .



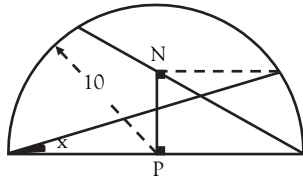
9. Calcule x, siendo "O" el centro de la semicircunferencia.



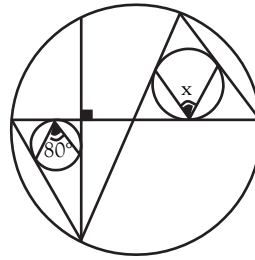
10. Si  $\overline{BP}$  es bisectriz, "P" es punto de tangencia y  $m\widehat{FB} = 40^\circ$ , calcule x.



11. En la figura, calcule  $x$  si  $PN=5$ .

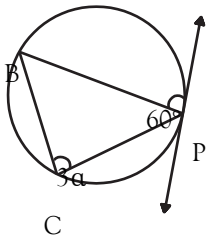


12. Calcule  $x$  en:



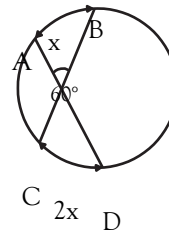
## Para reforzar

1. Calcule " $\alpha$ " si "P" es punto de tangencia.



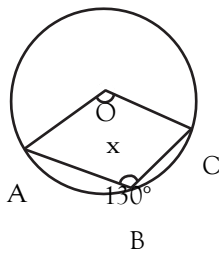
- a)  $10^\circ$       b)  $15^\circ$       c)  $20^\circ$   
d)  $25^\circ$       e)  $28^\circ$

3. Calcule " $x$ ".



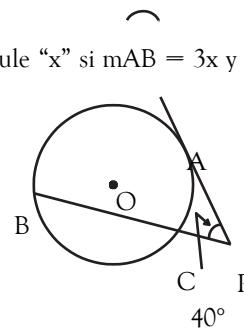
- a)  $10^\circ$       b)  $20^\circ$       c)  $30^\circ$   
d)  $40^\circ$       e)  $50^\circ$

2. Calcule " $x$ " si "O" es centro.



- a)  $100^\circ$       b)  $110^\circ$       c)  $120^\circ$   
d)  $130^\circ$       e)  $140^\circ$

4. Calcule " $x$ " si  $m\widehat{AB} = 3x$  y  $m\widehat{AC} = x$ .



- a)  $10^\circ$       b)  $20^\circ$       c)  $30^\circ$   
d)  $40^\circ$       e)  $50^\circ$

