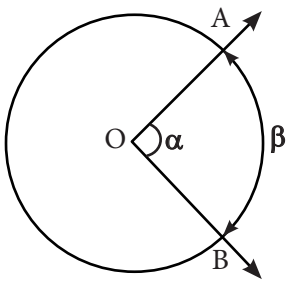
PROPIEDADES DE ÁNGULOS EN LA CIRCUNFERENCIA

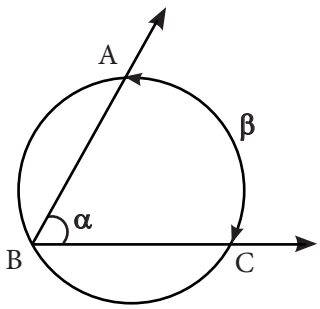
Ángulos relacionados con la circunferencia

- Ángulo central (∠AOB)



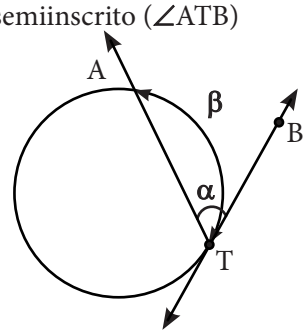
$$\beta = \alpha$$

- Ángulo inscrito (∠ABC)



$$\beta = 2\alpha$$

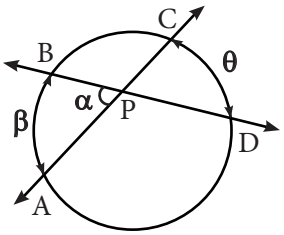
- Ángulo semiinscrito (∠ATB)



$$\beta = 2\alpha$$

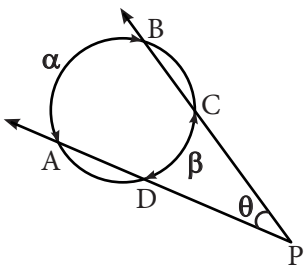
T: punto de tangencia

- Ángulo interior (∠APB)

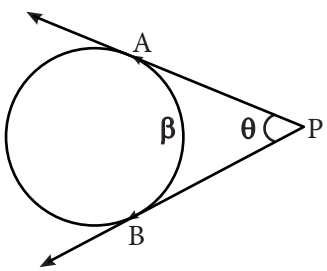


$$\alpha = \frac{\beta + \theta}{2}$$

- Ángulo exterior (∠APB)



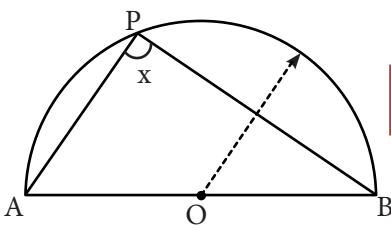
$$\theta = \frac{\alpha - \beta}{2}$$



$$\theta + \beta = 180°$$

Observaciones:

- Si AB es diámetro y P es un punto cualquiera de la circunferencia.

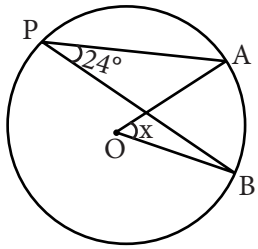


$$x = 90°$$

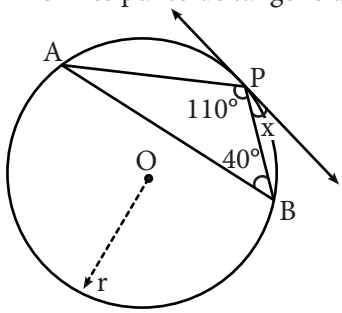
Trabajando en clase

Integral

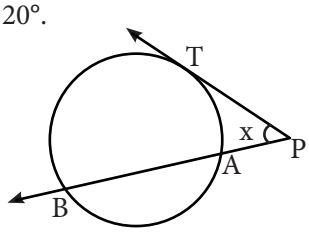
1. Calcula "x" si O es centro.



2. Calcula "x" si P es punto de tangencia.

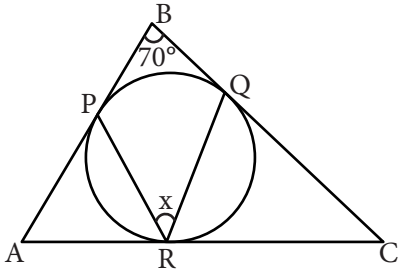


3. Calcula "x" si T es punto de tangencia; $m\overset{\frown}{TA} = 70°$ y $m\overset{\frown}{AB} = 120°$.

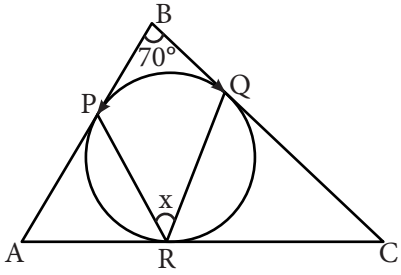


PUCP

4. Calcula "x", si P, R y Q son puntos de tangencia.



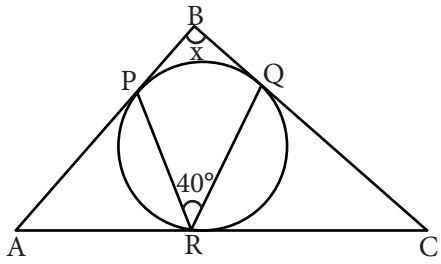
Resolución:



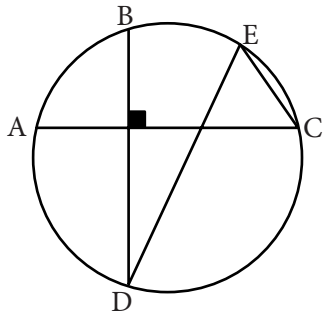
Por ángulo inscrito
$m\overset{\frown}{PQ} = 2x$

Luego:
$2x + 70° = 180°$
$2x = 110°$
$\boxed{x = 55°}$

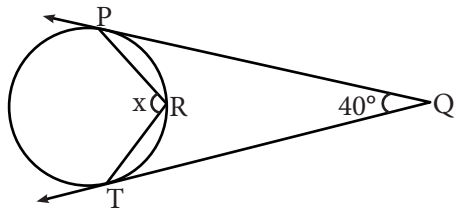
5. Calcula "x" si P, Q y R son puntos de tangencia.



6. Calcula la $m\angle CED$, si $m\overset{\frown}{AB} = 55°$.

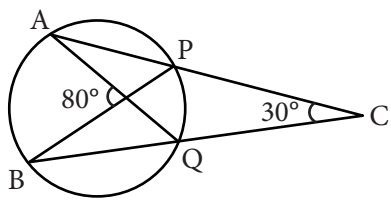


7. Calcula "x" si P y T son puntos de tangencia.

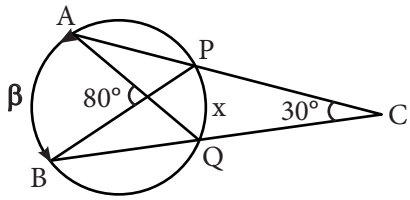


UNMSM

8. Calcula $m\overset{\frown}{PQ}$.



Resolución:



$m\overset{\frown}{AB} = \beta$

$m\overset{\frown}{PQ} = x$

Por ángulo interior: $\frac{\beta + x}{2} = 80°$

$\beta - x = 160°$ .....(I)

Por ángulo exterior: $\frac{\beta - x}{2} = 30°$

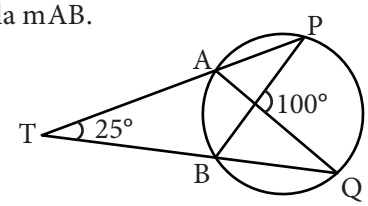
$\beta + x = 60°$ .....(II)

Luego: (I) – (II)

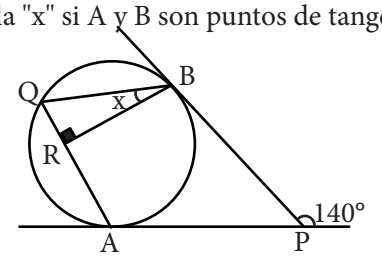
$2x = 100°$

$\boxed{x = 50°}$

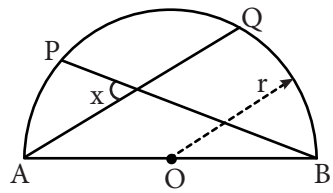
9. Calcula $m\overset{\frown}{AB}$.



10. Calcula "x" si A y B son puntos de tangencia.



11. Calcula "x" si $m\overset{\frown}{PQ} = 70°$.



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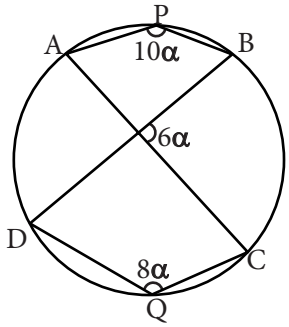
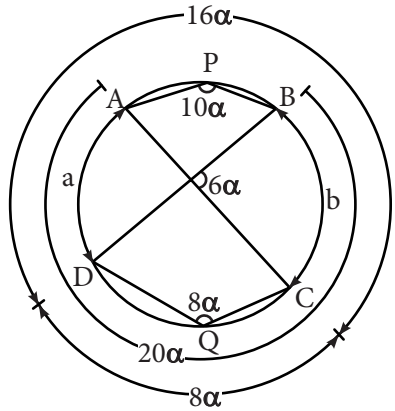
12. Calcula α.



Resolución:



$m\overset{\frown}{AD} = a$

$m\overset{\frown}{BC} = b$

$\Rightarrow \frac{a + b}{2} = 6\alpha$

$a + b = 12\alpha$

Luego: $m\overset{\frown}{AQB} = 20\alpha$

$m\overset{\frown}{DQC} = 8\alpha$

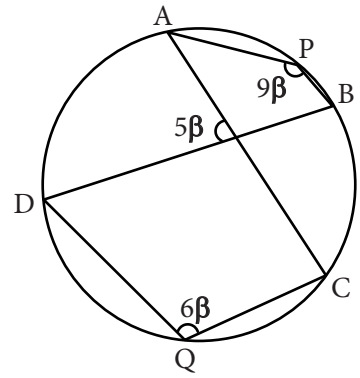
$m\overset{\frown}{DPC} = 16\alpha$

$\therefore\ 16\alpha + 8\alpha = 360°$

$24\alpha = 360°$

$\boxed{\alpha = 15°}$

13. Calcula β en el gráfico mostrado.



14. Calcula "x" si ABCD es un romboide y B y D son puntos de tangencia.