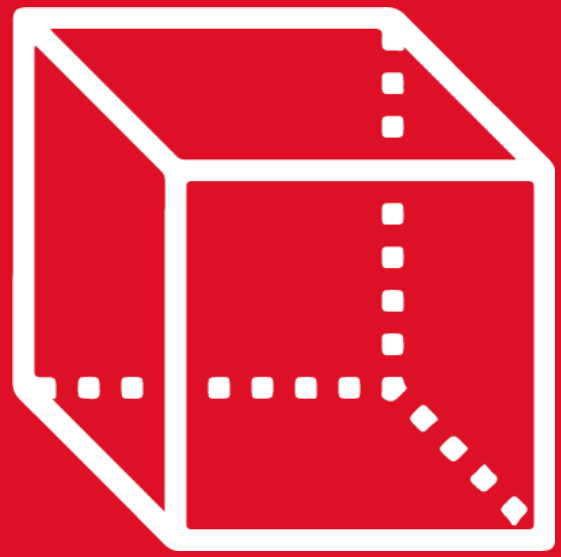
GEOMETRÍA

Capítulo 14

Sesión 1

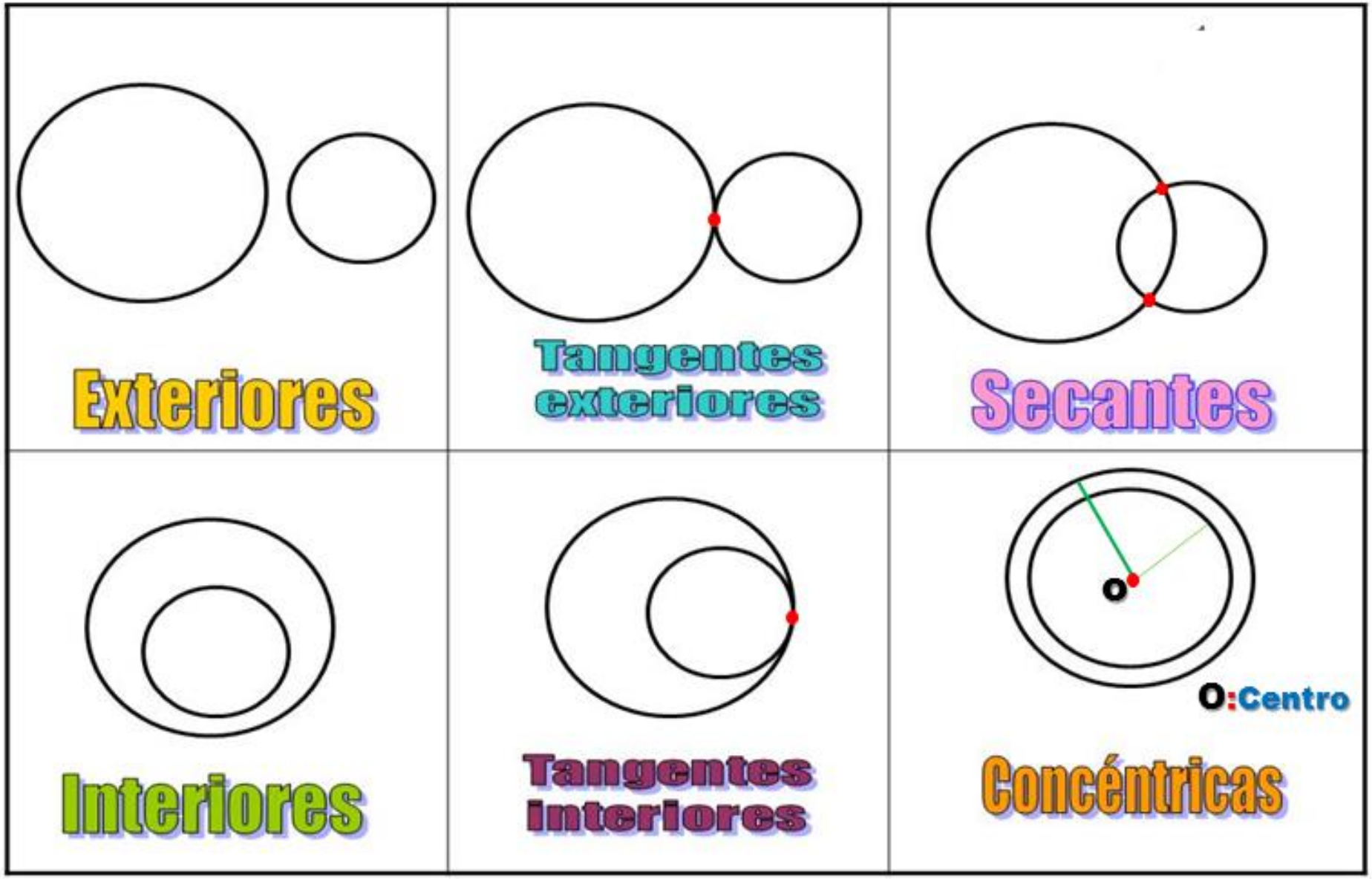


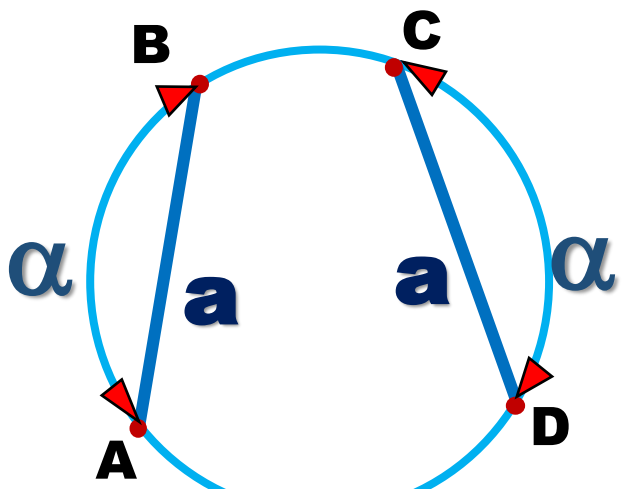
3th

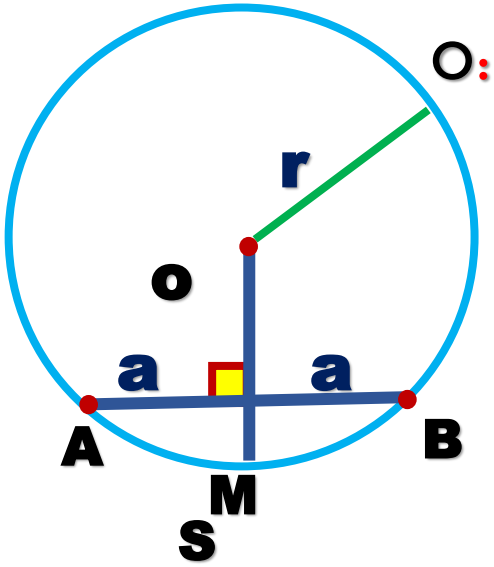
SECONDARY

CIRCUNFERENCIA II

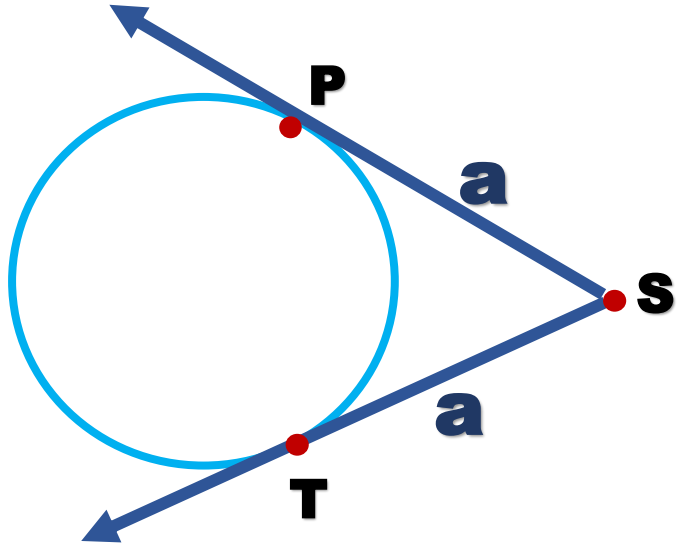
SACO OLIVEROS

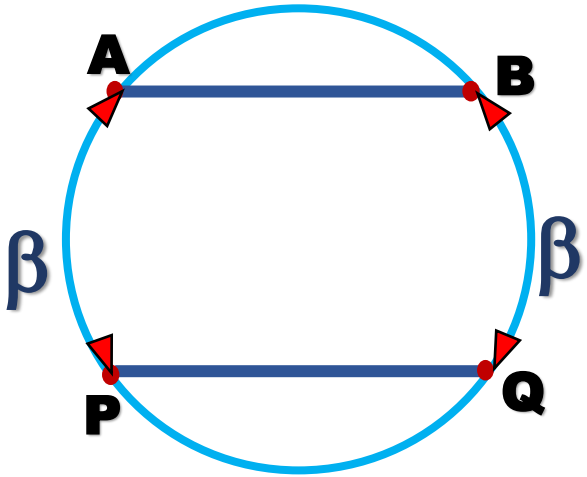

Exteriores
Tangentes exteriores
Secantes
Interiores
Tangentes interiores
O
O:Centro
Concéntricas



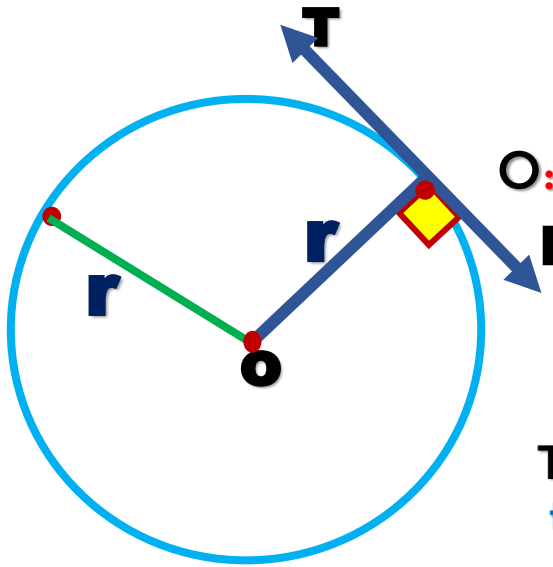


O: Centro



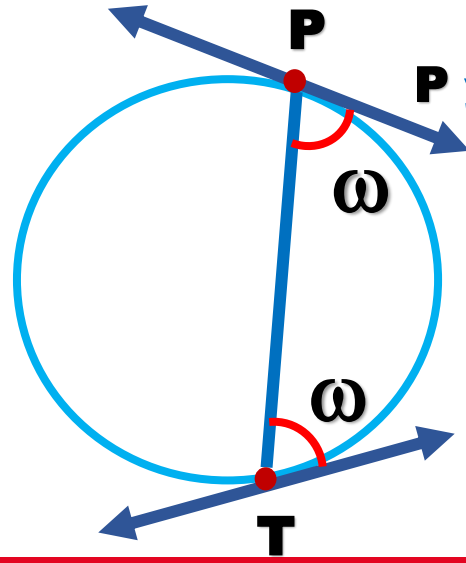


$\overline{AB}//\overline{PQ}$



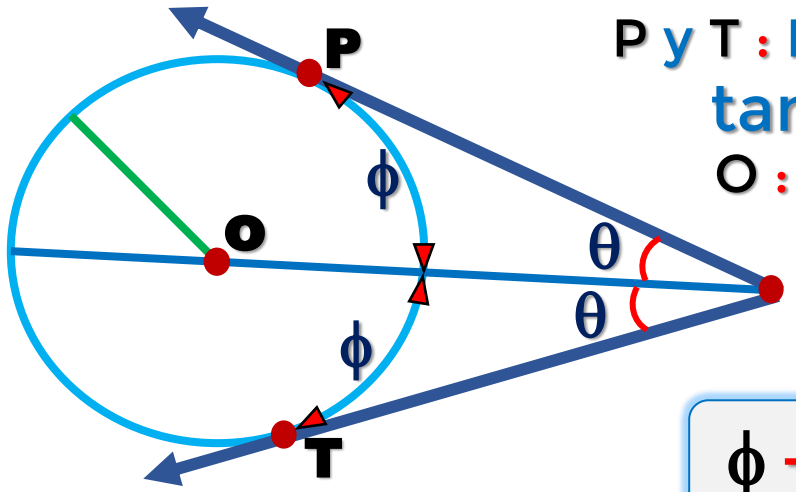
O:Centro

T:Punto de tangencia



P y T : Punto de tangencia

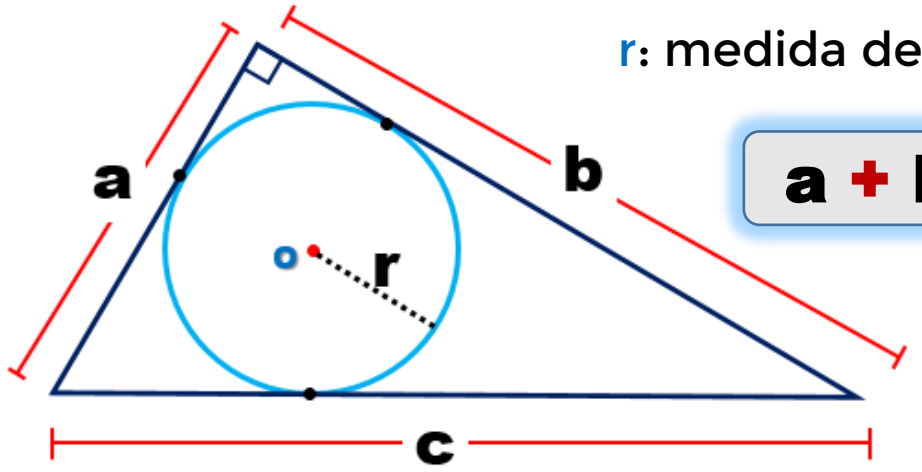
Teorema de Poncelet



P y T : Punto de tangencia

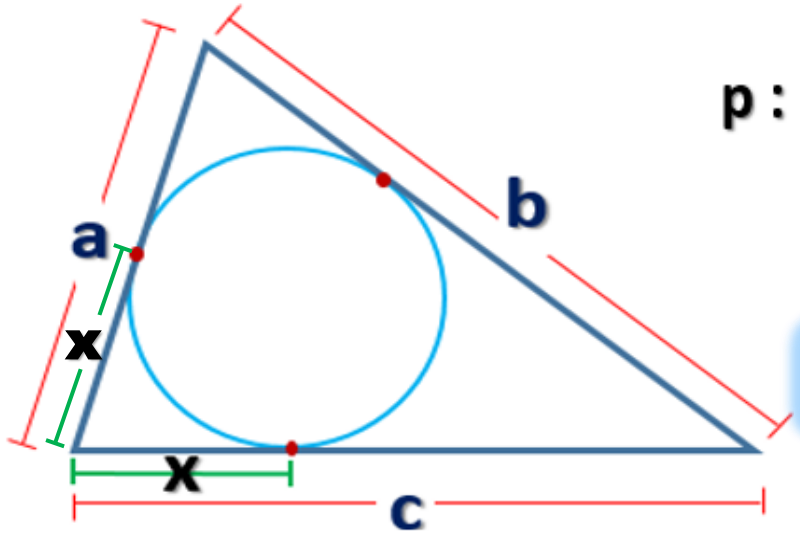
O : Centro

$$\phi + \theta = 90°$$



r: medida del inradio

$$a + b = c + 2r$$

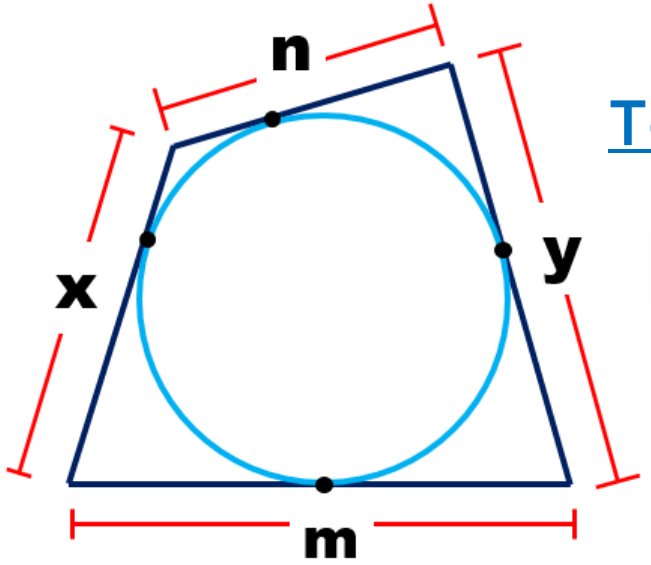


p : Semiperímetro

$$p = \frac{a+b+c}{2}$$

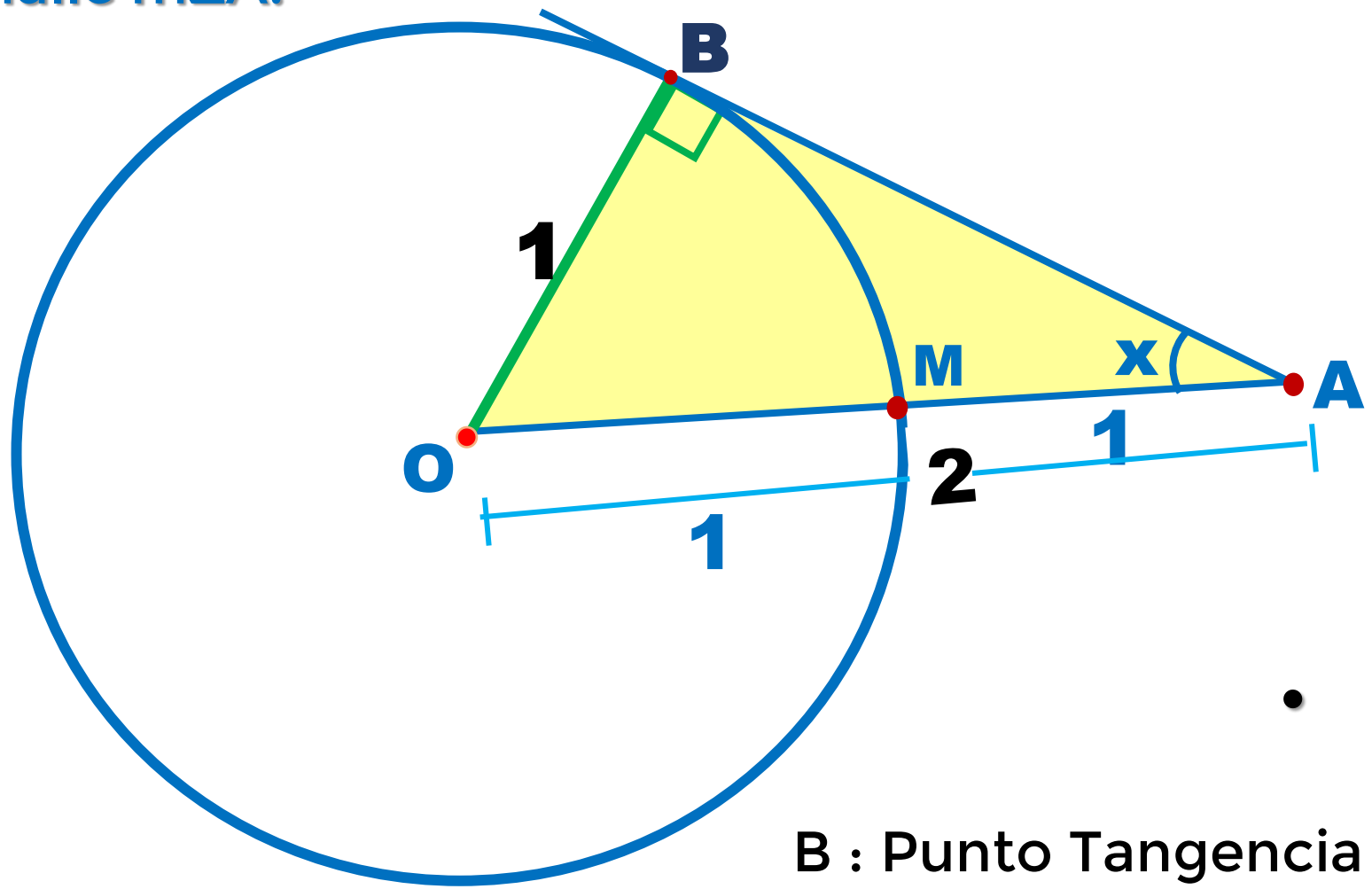
$$x = p - b$$

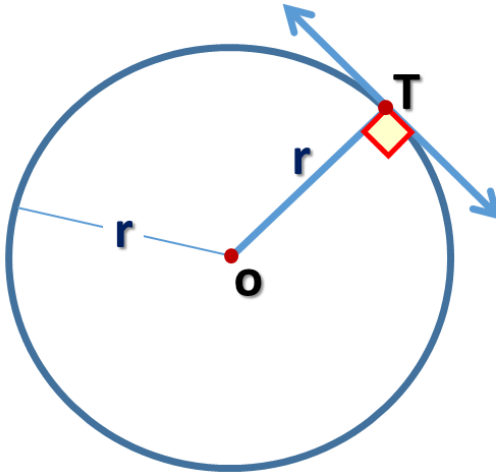
Teorema de Pitot



$$x + y = m + n$$

1. Desde un punto A, exterior a una circunferencia de centro O se traza la tangente AB, AO interseca a la circunferencia en M. Si OM = 1 y MA = 1, halle m∠A.



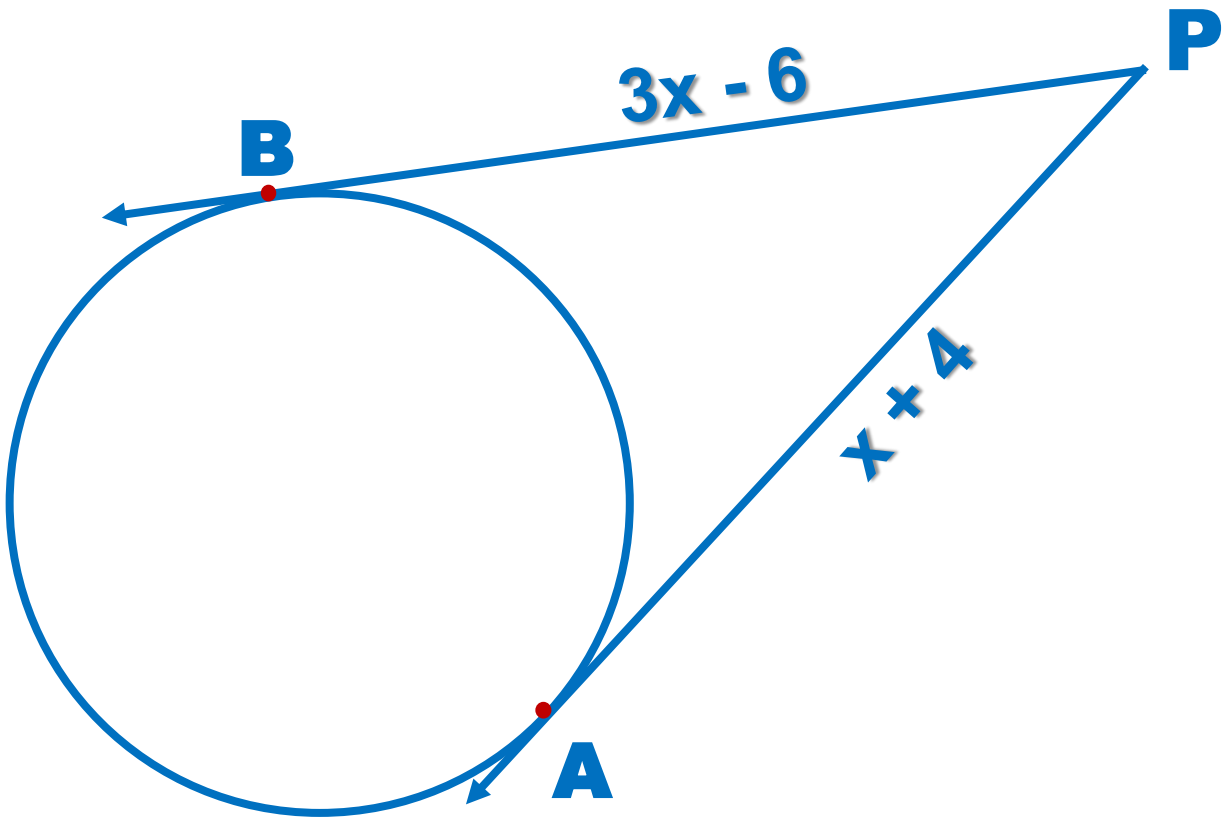


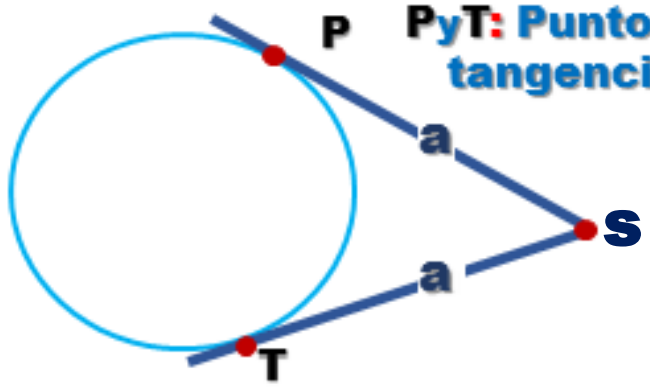
- Se traza $\overline{OB}$.
- Por teorema la m∢OBA= 90^0
- $\triangle OBA$: Notable de 30° y 60°

B : Punto Tangencia

$x = 30°$

2. Si A y B son puntos de tangencia, halle el valor de x.





Por teorema

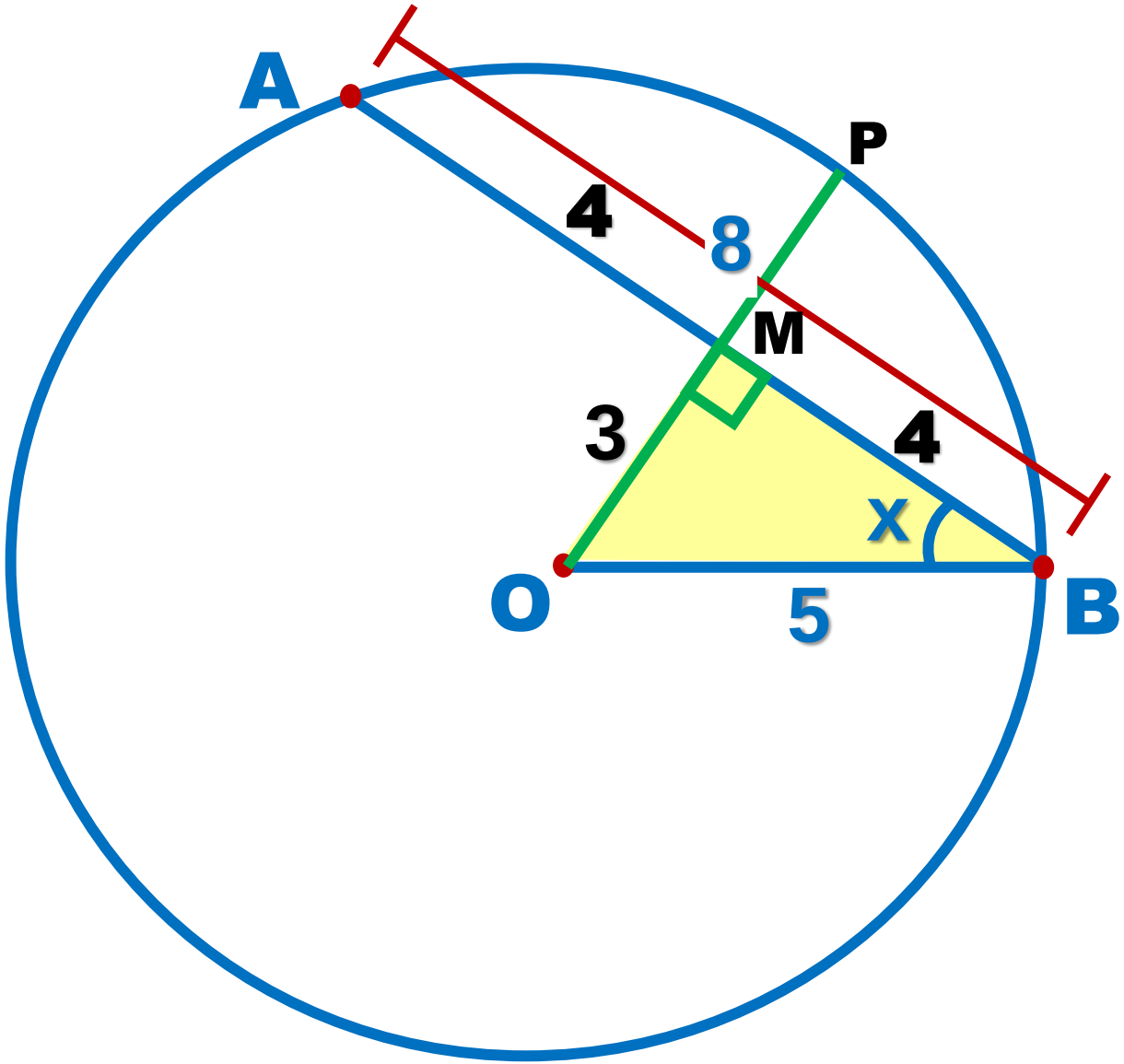
$$BP = AP$$

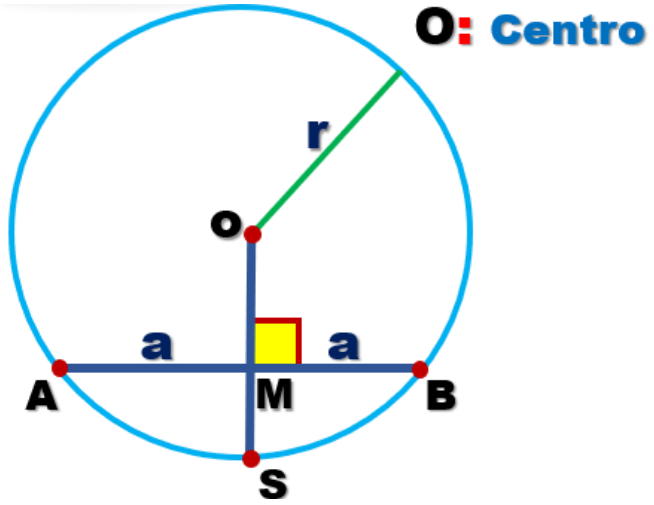
$$3x - 6 = x + 4$$

$$2x = 10$$

$$\boxed{x = 5}$$

3. Si “O” es centro, AB = 8m y OB = 5m, halle el valor de x.





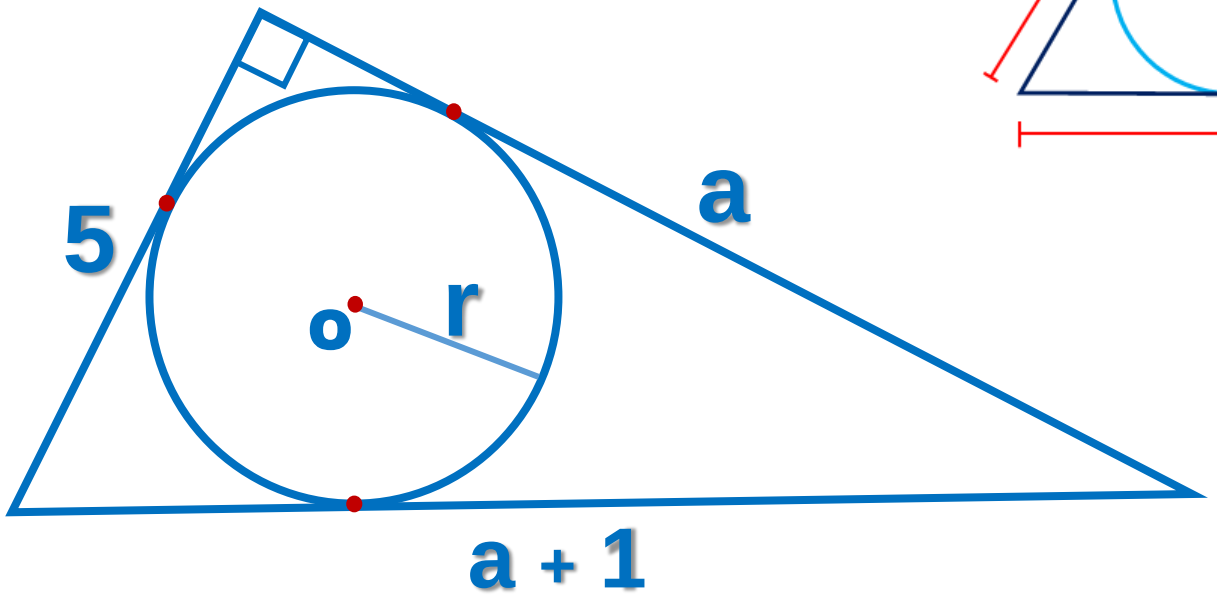
- Se traza el radio $\overline{OP}$ perpendicular a $\overline{AB}$.

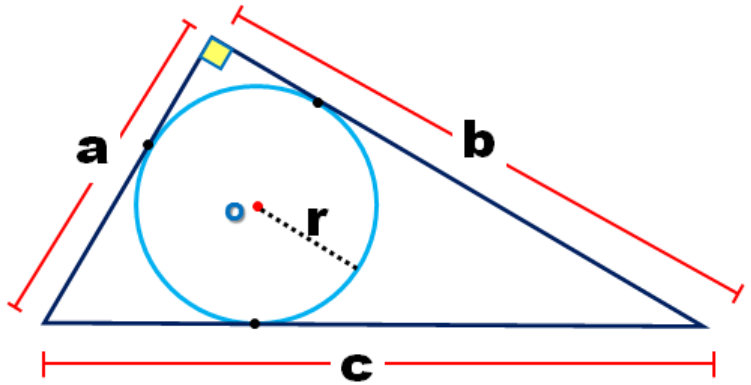
$$AM = BM$$

- △OMB: Notable de 37° y 53°

x = 37°

4. Determine la longitud del radio de la circunferencia inscrita en un triángulo rectángulo si la longitud de un cateto es 5m y las longitudes de los otros lados se diferencian en 1.





Teorema de Poncelet

r: medida del inradio

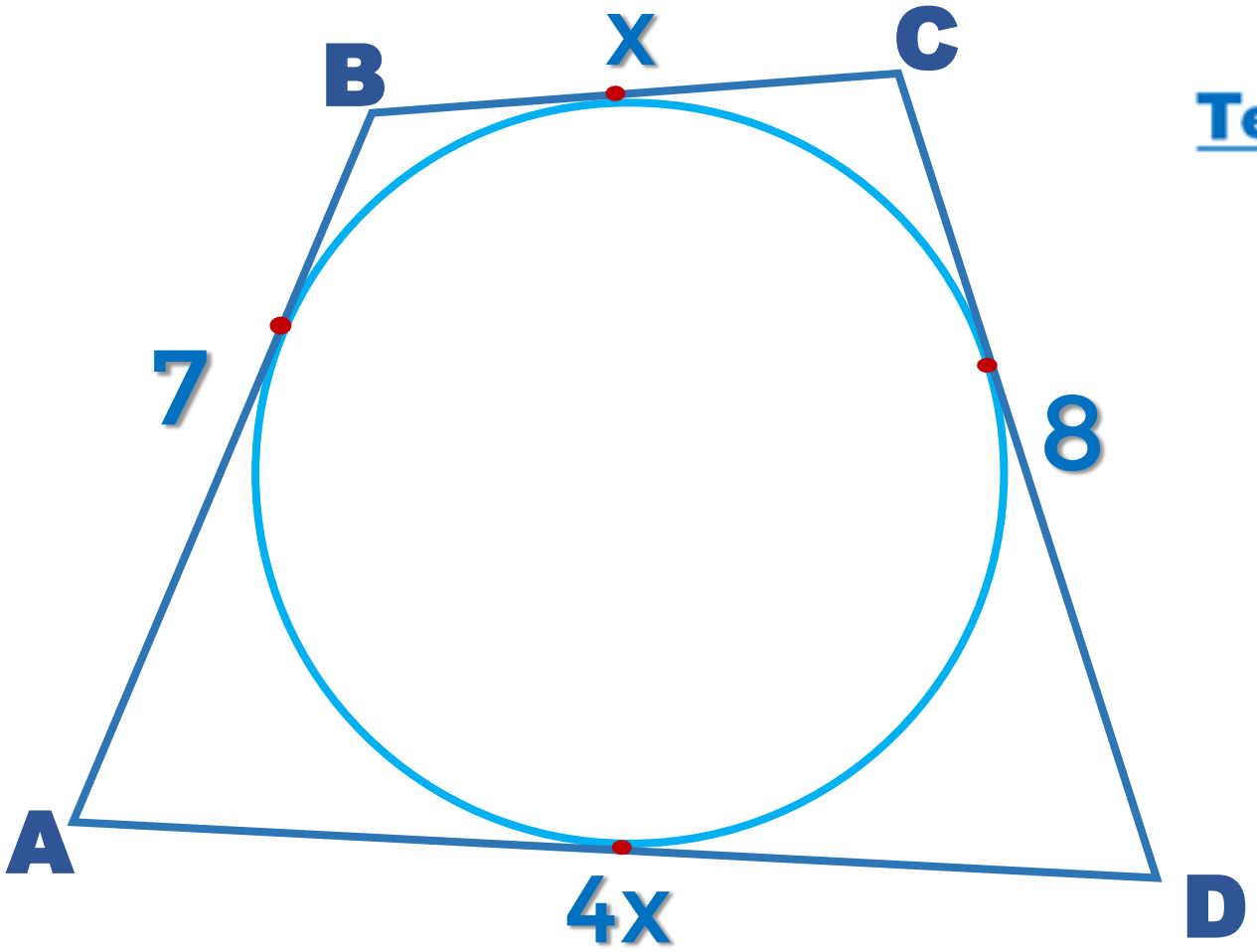
$$a + b = c + 2r$$

$$5 + a = a + 1 + 2r$$

$$4 = 2r$$

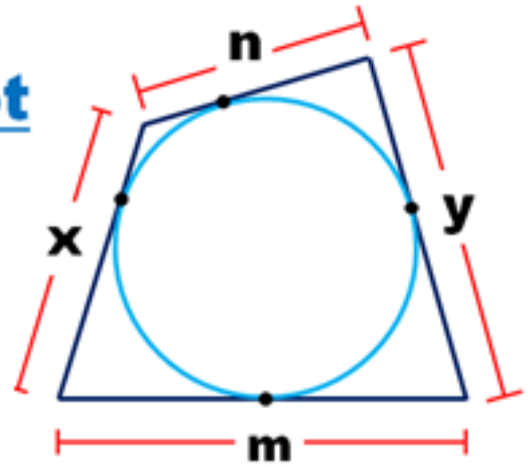
$$r = 2$$

5. Se tiene un cuadrilátero circunscrito a una circunferencia, cuyas longitudes de sus lados en forma consecutiva son 7m, x, 8m y 4x. Halle el valor de x.



Teorema de Pitot

$x + y = m + n$

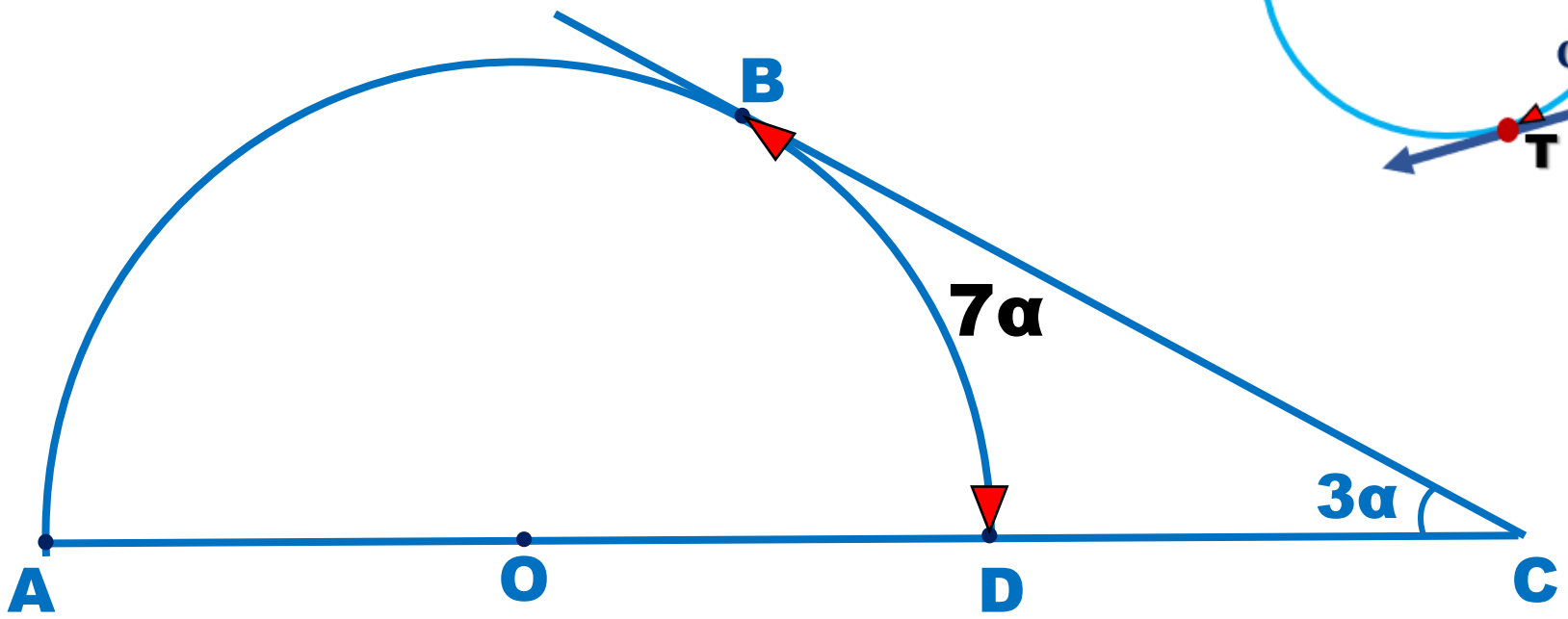


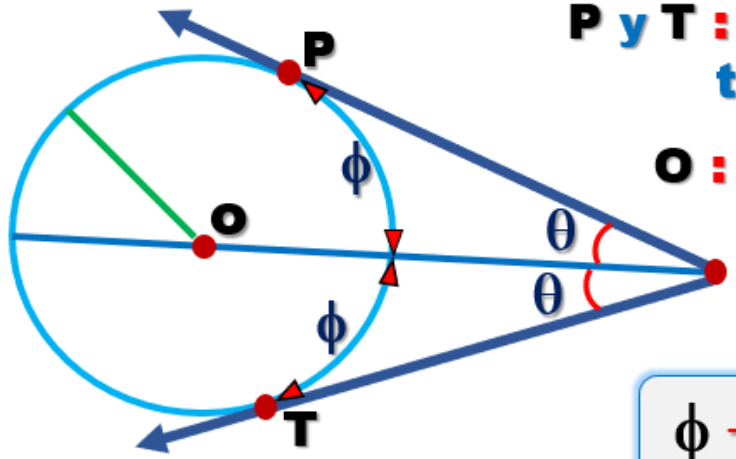
$x + 4x = 7 + 8$

$5x = 15$

$x = 3$

6. Halle el valor de α, si $m\overset{\frown}{BD} = 7\alpha$ y B es punto de tangencia.





P y T : Punto de tangencia

O : Centro

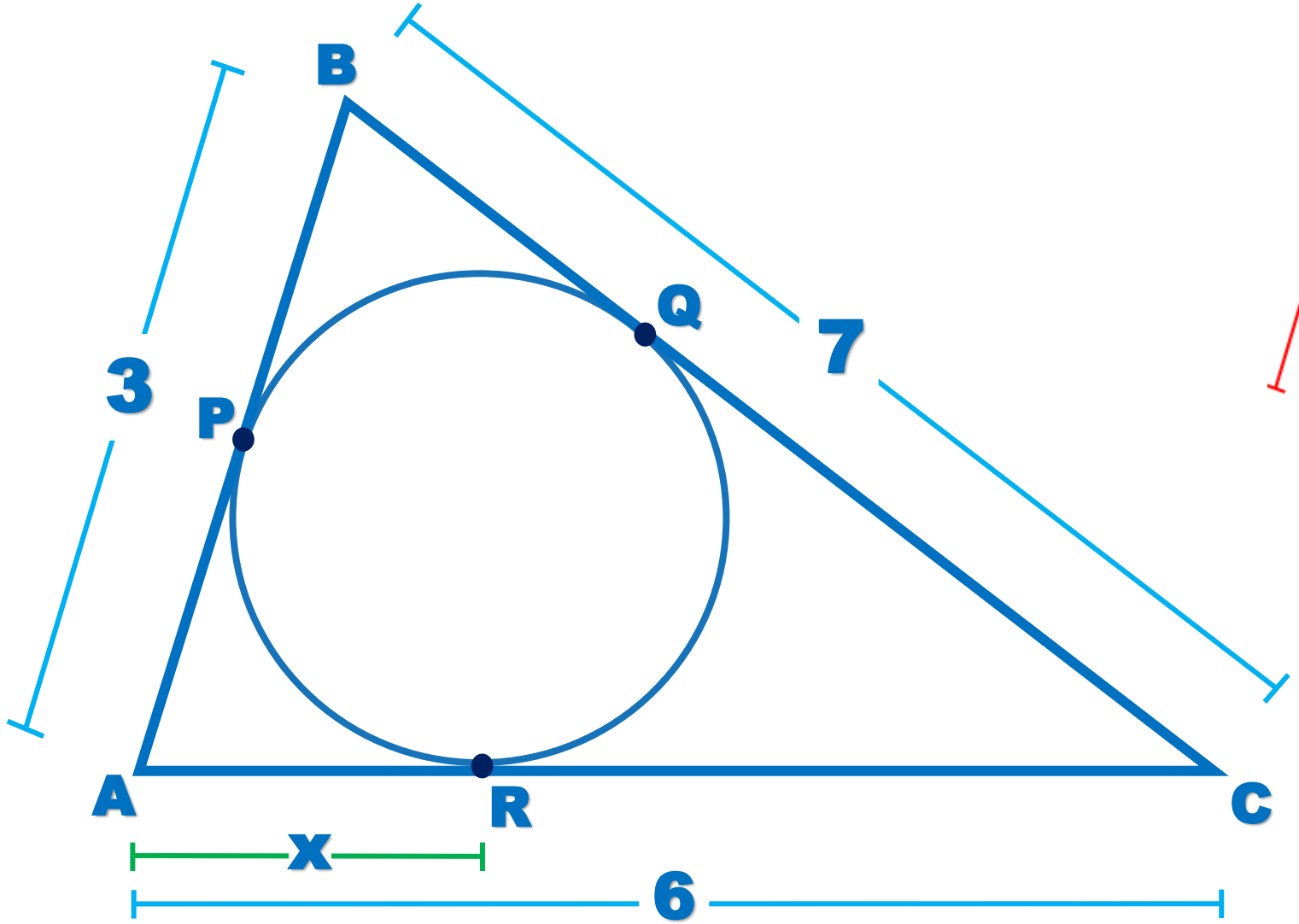
$$\phi + \theta = 90°$$

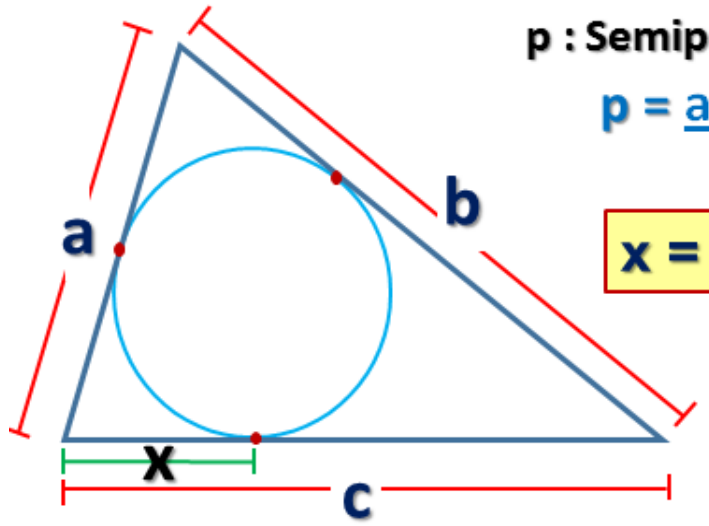
$$3\alpha + 7\alpha = 90°$$

$$10\alpha = 90°$$

$$\alpha = 9°$$

7. Halle el valor de x, si la circunferencia está inscrita en el triángulo.





p : Semiperímetro

$$p = \frac{a + b + c}{2}$$

$$x = p - b$$

$$p = \frac{3 + 7 + 6}{2}$$

$$p = 8$$

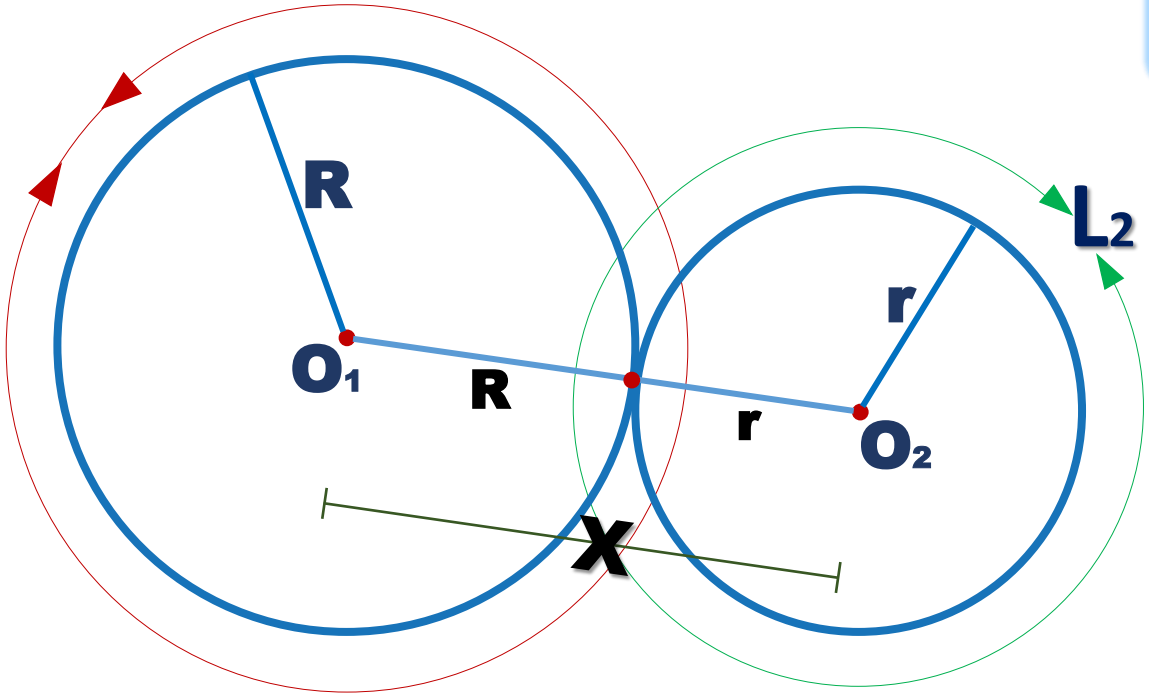
$$x = p - b$$

(Reemplazando

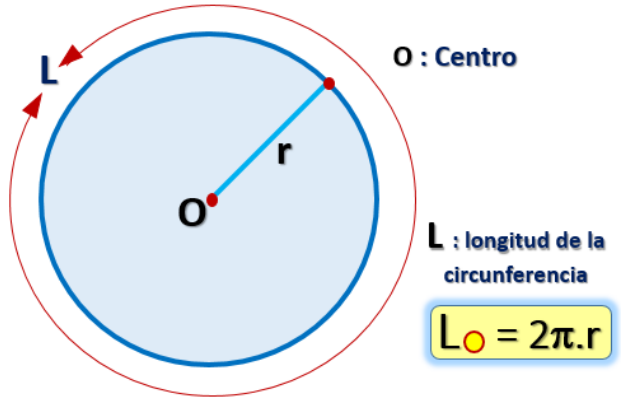
$$x = 8 - 7$$

$$x = 1$$

8. Con un alambre de longitud 44cm se forma dos circunferencias, una mayor que la otra. Cortando el alambre en dos partes, halle aproximadamente la distancia entre los centros si los anillos se colocan tangentes.



$\pi = 22/7$



Por dato

$L_1 + L_2 = 44$

$2\pi R + 2\pi r = 44$

$2\pi(R + r) = 44$

$2.\frac{22}{7}(R + r) = 44$

$R + r = 7$

Nos piden

$x = \underbrace{R + r}_{7}$

$x = 7\text{cm}$