GEOMETRÍA

Tomo III

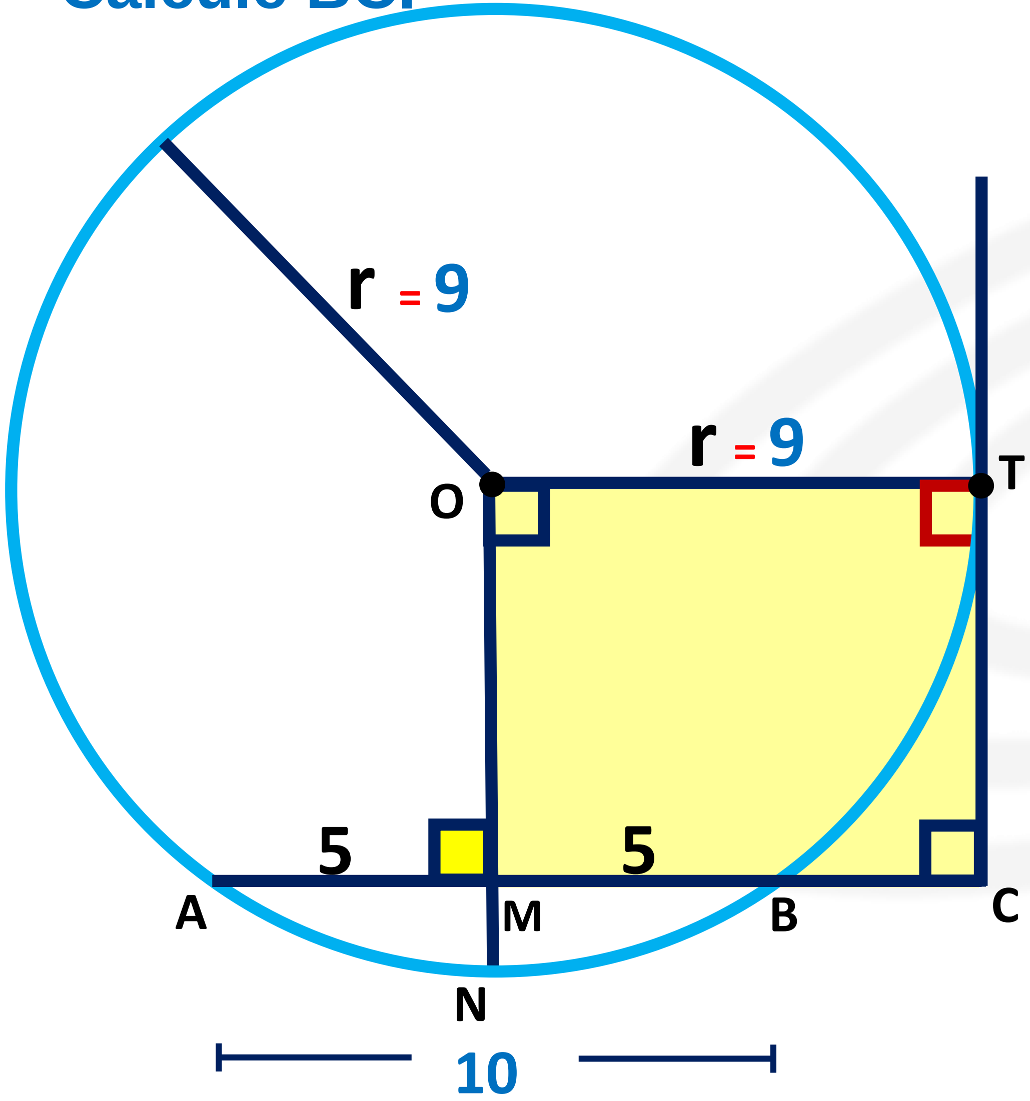
4th

SECONDARY

RETROALIMENTACIÓN

SACO OLIVEROS

1. En la circunferencia de centro O, T es su punto de tangencia, r = 9 y AB = 10. Calcule BC.



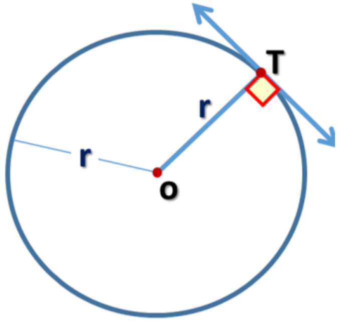
Resolución

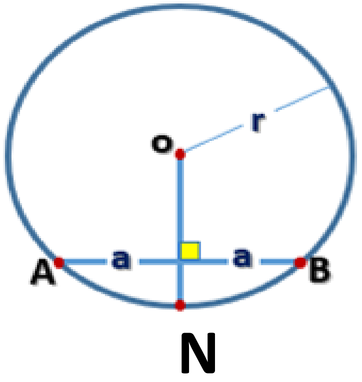
- Piden: BC
- Trazamos $\overline{OT}$
- Trazamos $\overline{ON} \perp \overline{AB}$
- ▭ OTCM :

$$OT = MB + BC$$

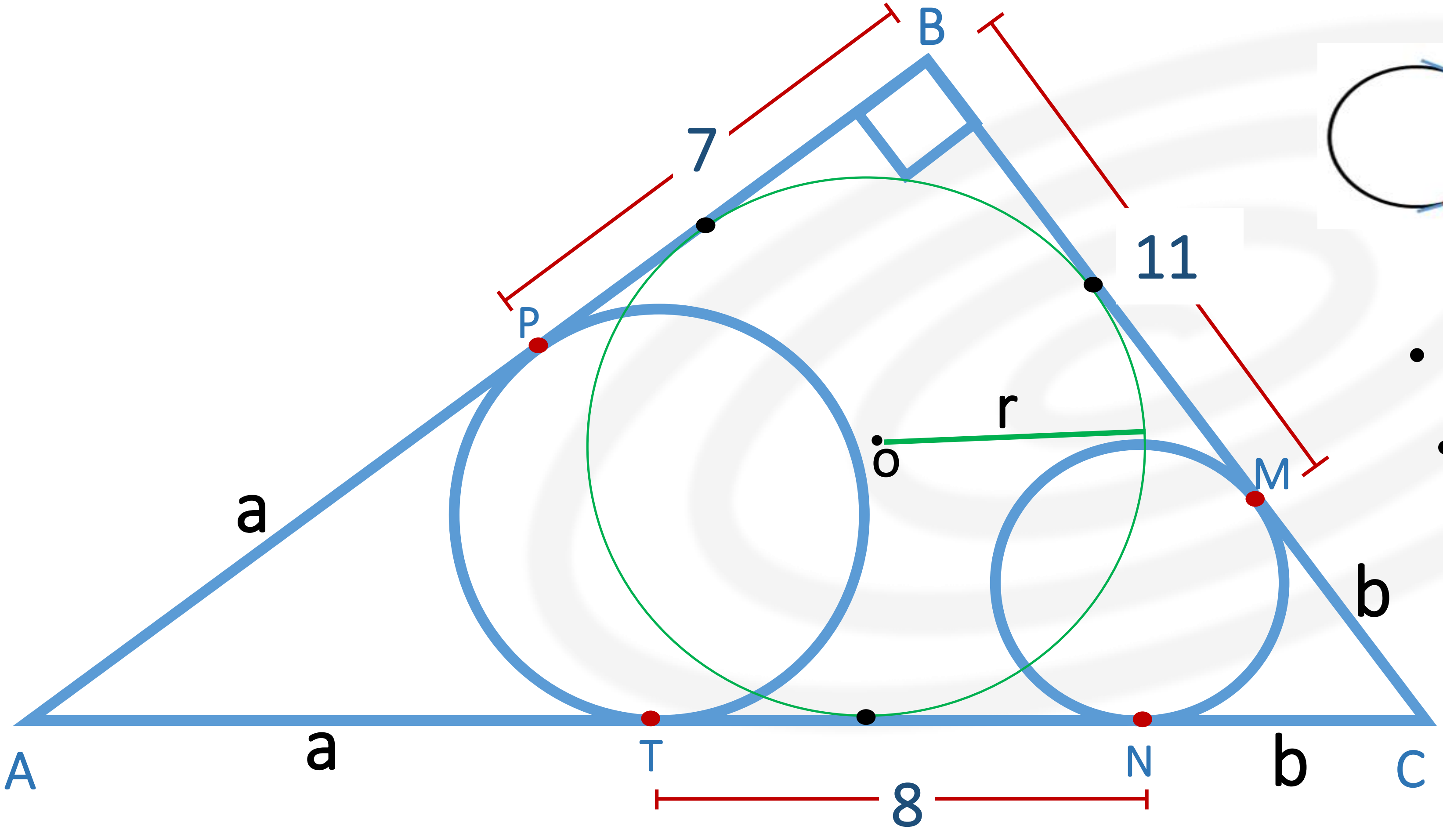
$$9 = 5 + BC$$

$$\boxed{4 = BC}$$

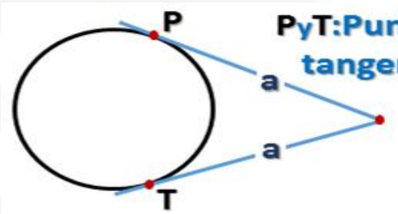




2. En la figura, calcule la longitud del inradio del triángulo ABC.



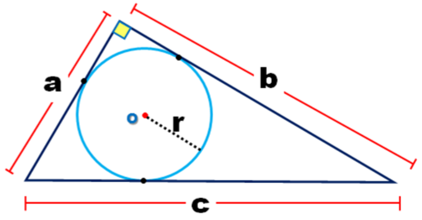
Resolución



Teorema de Poncelet

r: medida del inradio

$$\boxed{a+b=c+2r}$$



- **Piden r**
- $\triangle$ABC

T. Poncelet

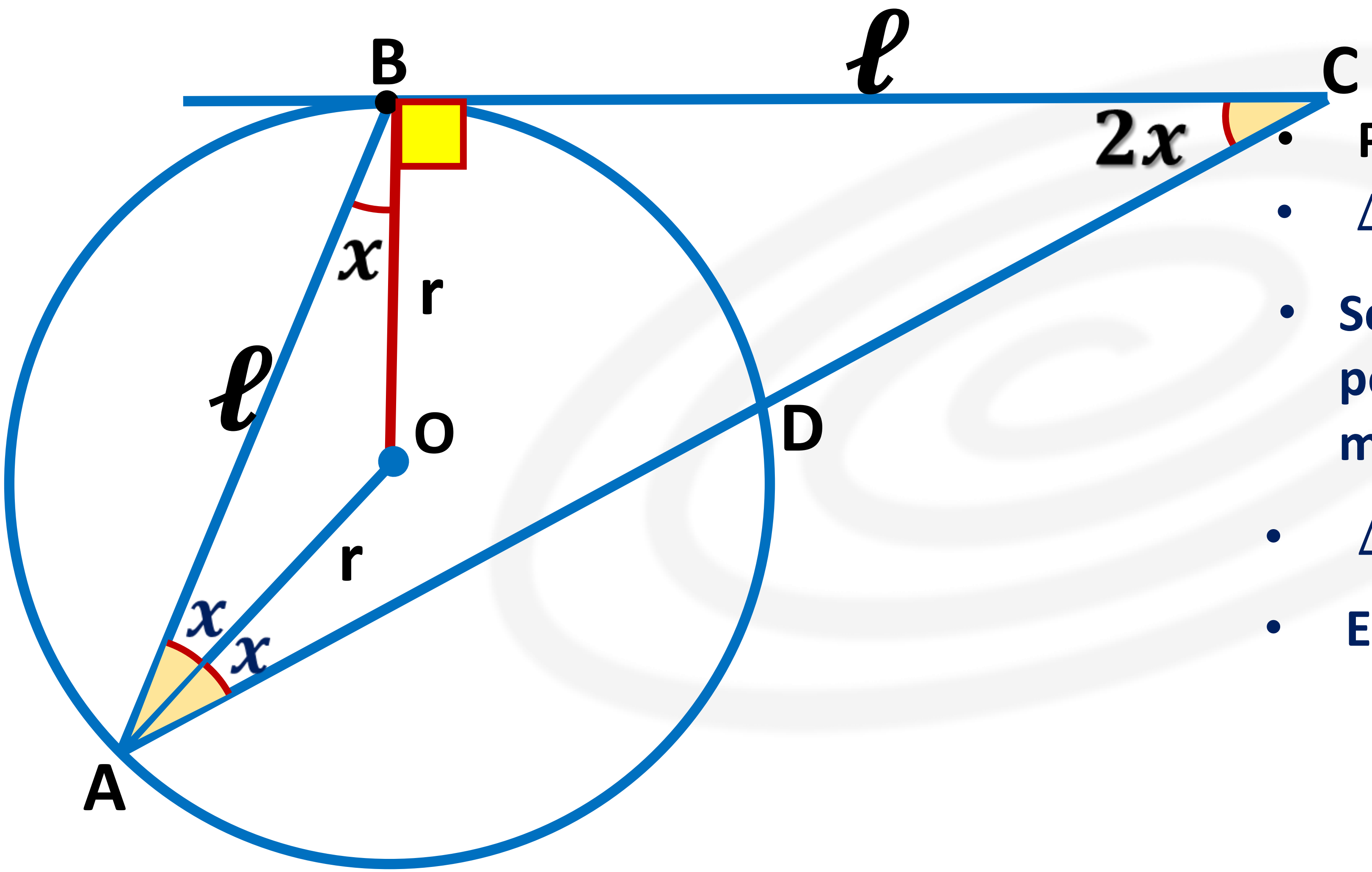
$$\cancel{a}+7+11+\cancel{b}=\cancel{a}+8+\cancel{b}+2r$$

$$18 = 8 + 2r$$

$$10 = 2r$$

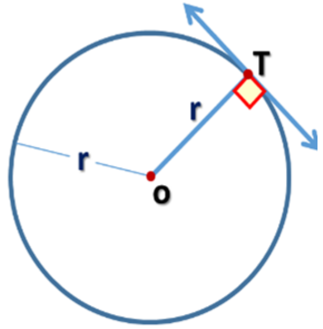
$$\boxed{r = 5}$$

3. En la figura, AB = BC, O es centro y B es punto de tangencia. Calcule x.



Resolución

- Piden: x
- Δ ABC : ISÓSCELES
- Se traza el radio $\overline{OB}$ y por teorema la m∡OBC = 90



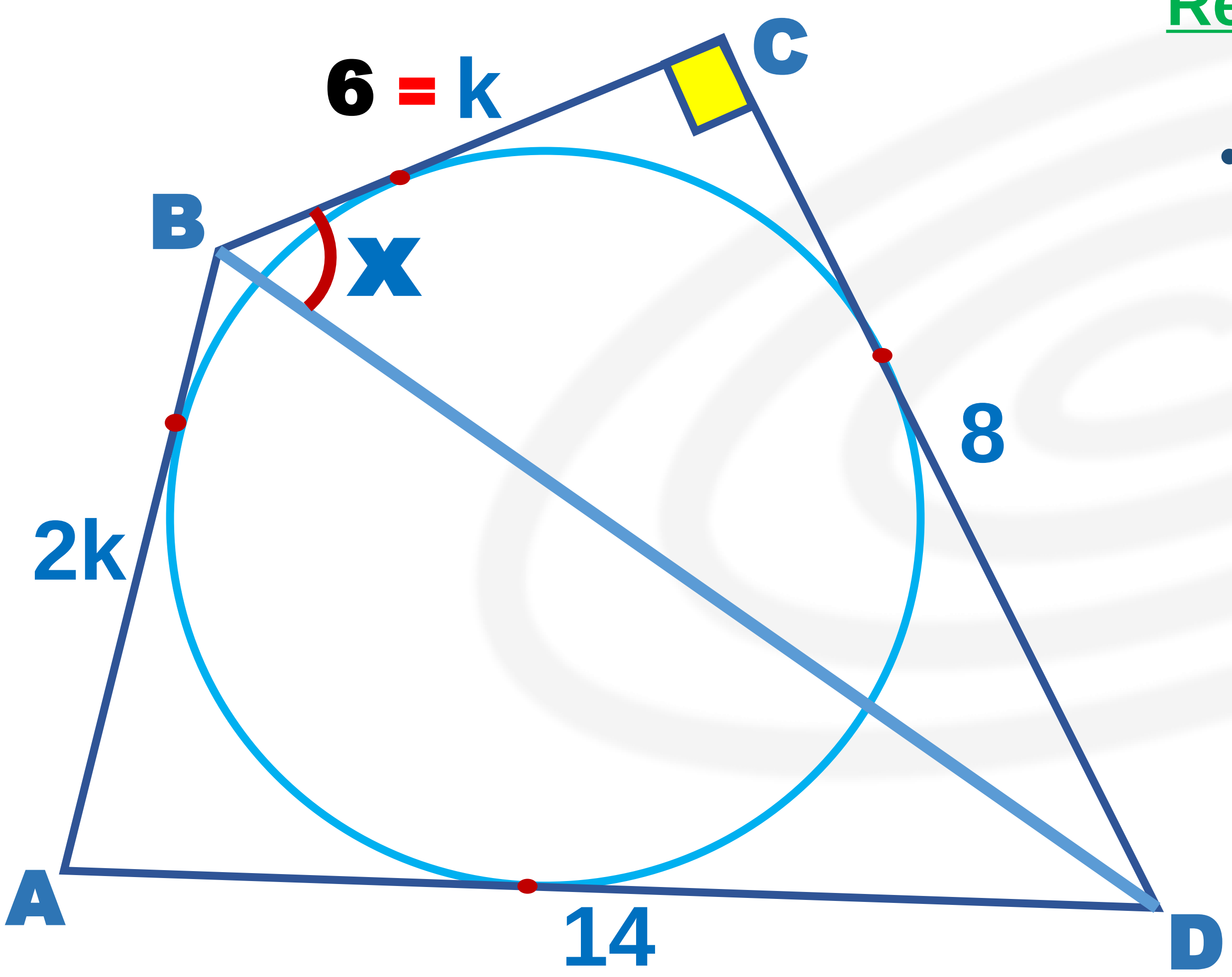
- Δ ABO: Isósceles
- En el ΔABC:

$$2x + x + 90° + 2x = 180°$$

$$5x = 90°$$

$$\boxed{x = 18°}$$

4. Se tiene un cuadrilátero ABCD circunscrito a una circunferencia tal que, CD = 8, AD = 14, AB = 2(BC) y m∡BCD = 90°. Calcule m∡CBD.



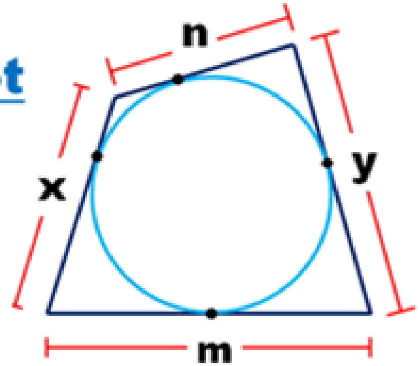
Resolución

Por dato

- AB = 2(BC) BC = k y AB = 2k

Teorema de Pitot

$x + y = m + n$



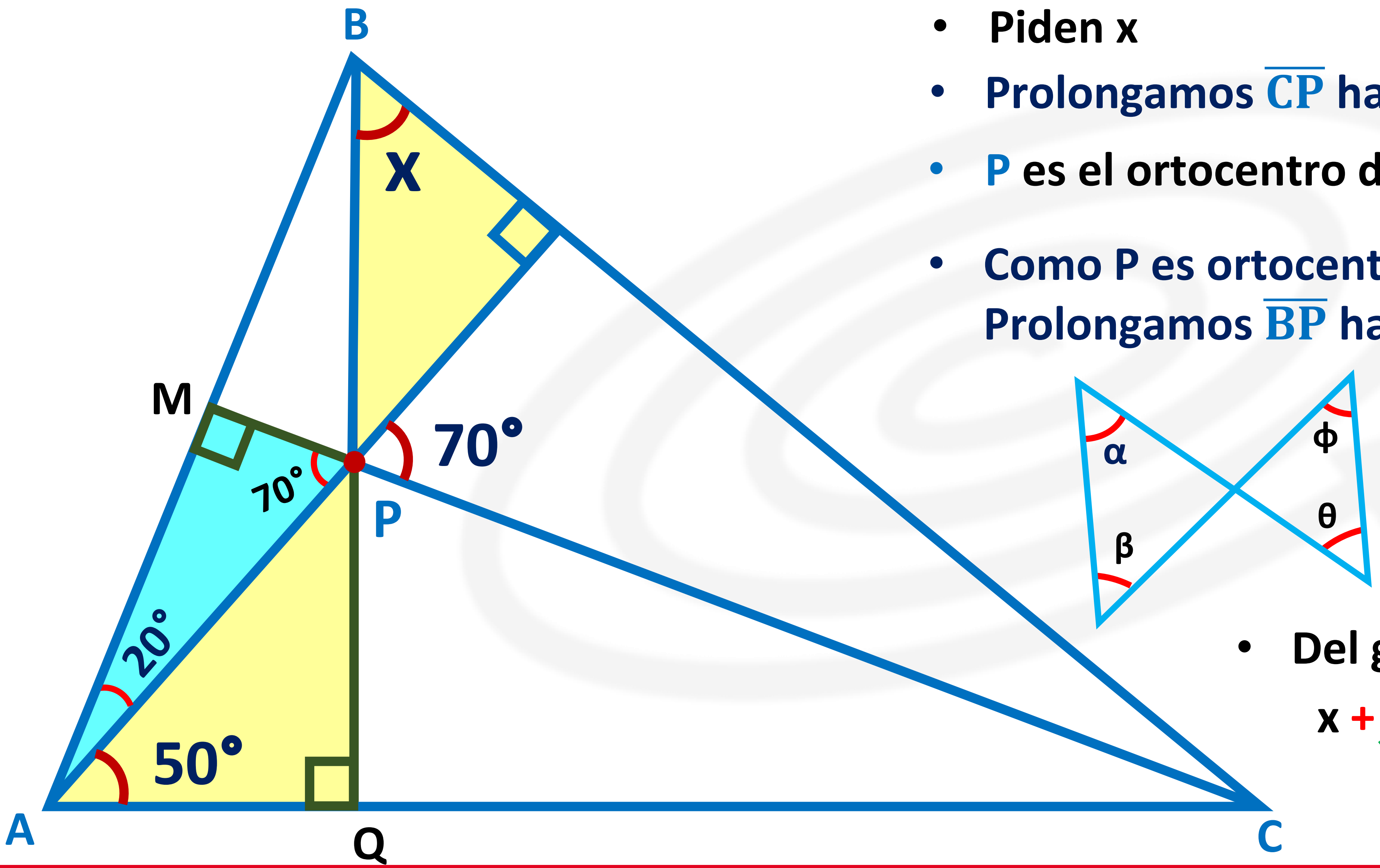
$2k + 8 = 14 + k$

$k = 6$

- ◺BCD: Notable 37° y 53°

$\boxed{x = 53°}$

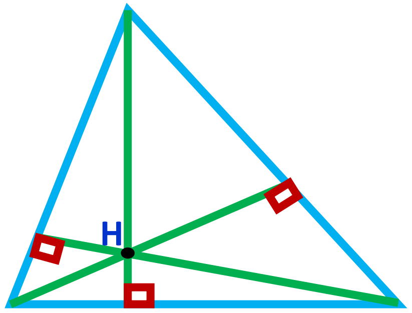
5. En la figura, calcule x.



Resolución

- Piden x
- Prolongamos $\overline{CP}$ hasta M.
- P es el ortocentro del ΔABC.

H:Ortocentro



- Como P es ortocentro
  Prolongamos $\overline{BP}$ hasta Q.

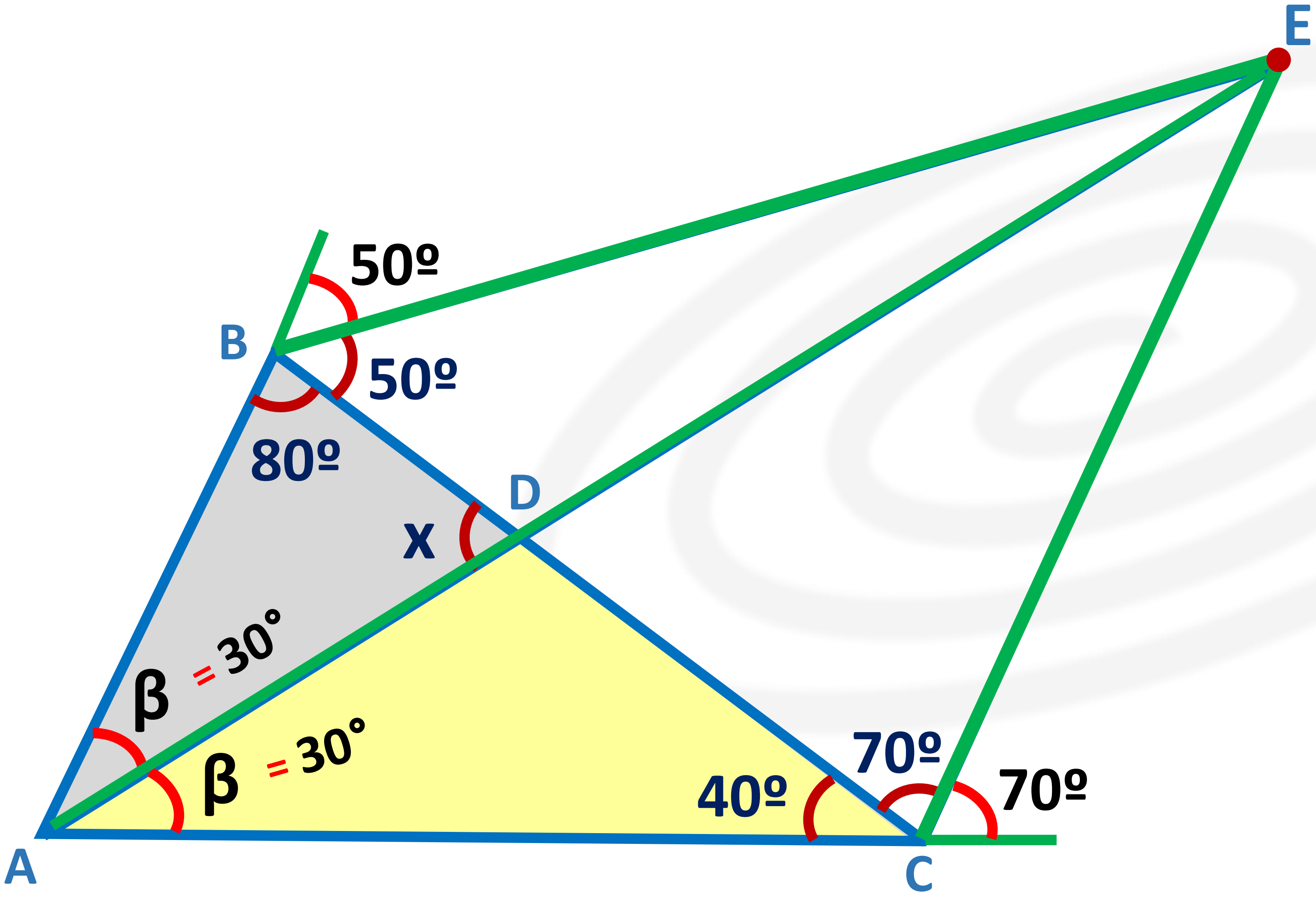
$\alpha + \beta = \theta + \phi$

- Del gráfico

$$x + \cancel{90°} = 50° + \cancel{90°}$$

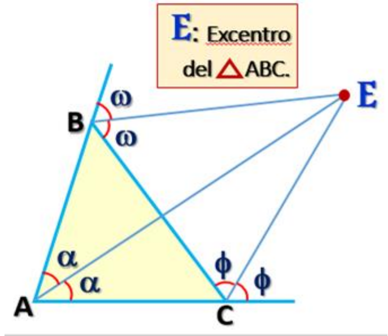
$$\boxed{x = 50}$$

6. En la figura, halle el valor de x.



Resolución

- Piden x
- E es el excentro del Δ ABC.



- Δ ABC :

$$2\beta + 80º + 40° = 180°$$

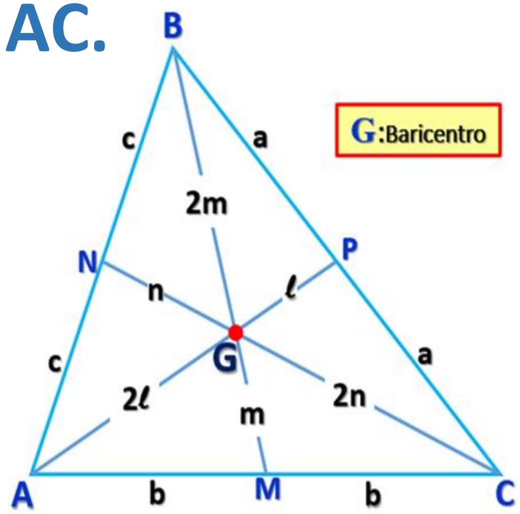
$$2\beta = 60°$$

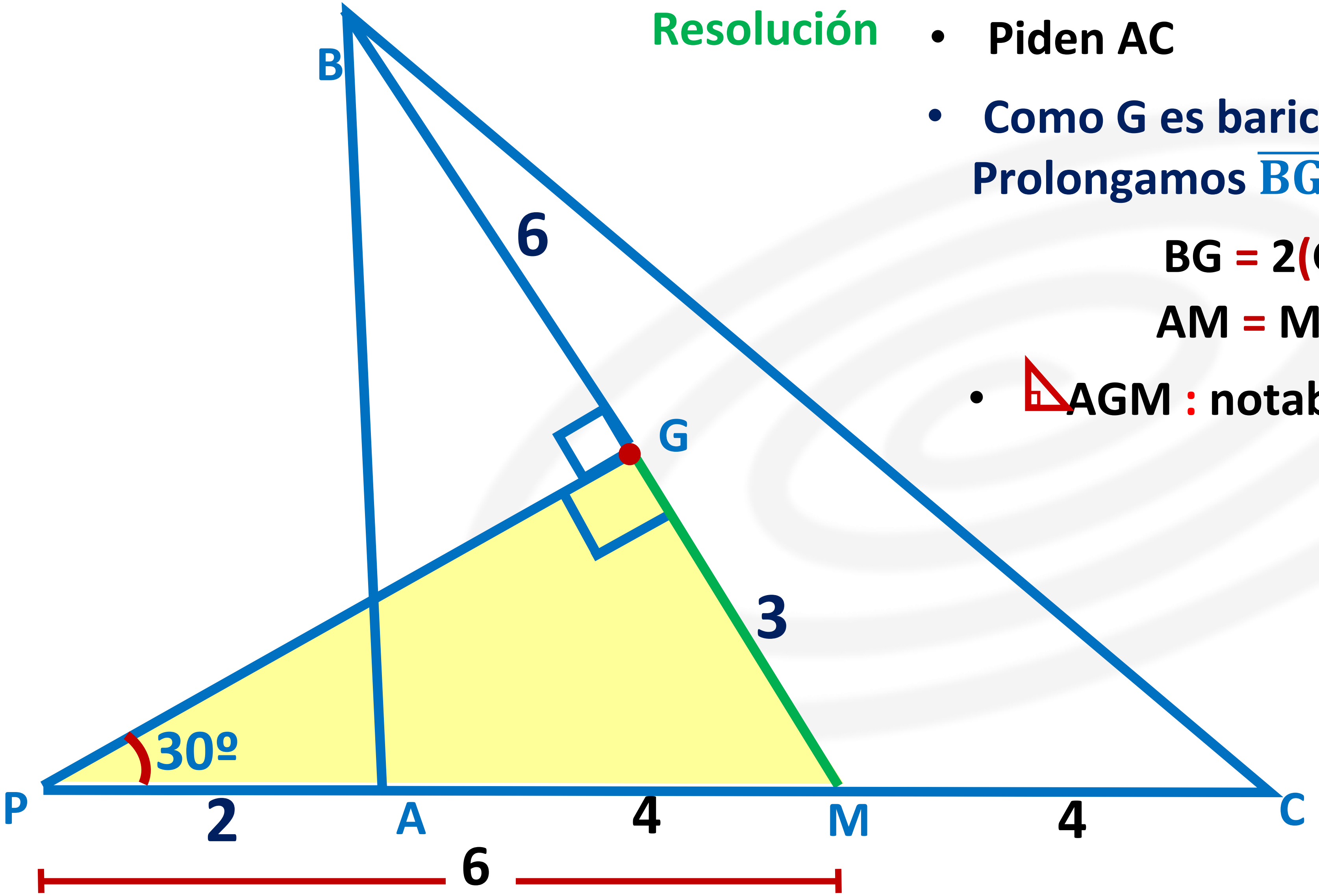
$$\beta = 30°$$

- Δ ADC : $x = 30º + 40°$

$$\boxed{x = 70°}$$

7. En la figura, G es baricentro del ABC, BG = 6 y AP = 2. Calcule AC.





Resolución

- Piden AC
- Como G es baricentro
  Prolongamos $\overline{BG}$ hasta M.

  BG = 2(GM)

  AM = MC

- ◺AGM : notables de 30° y 60°.

  PM = 6

- PA + AM = PM

  2 + AM = 6

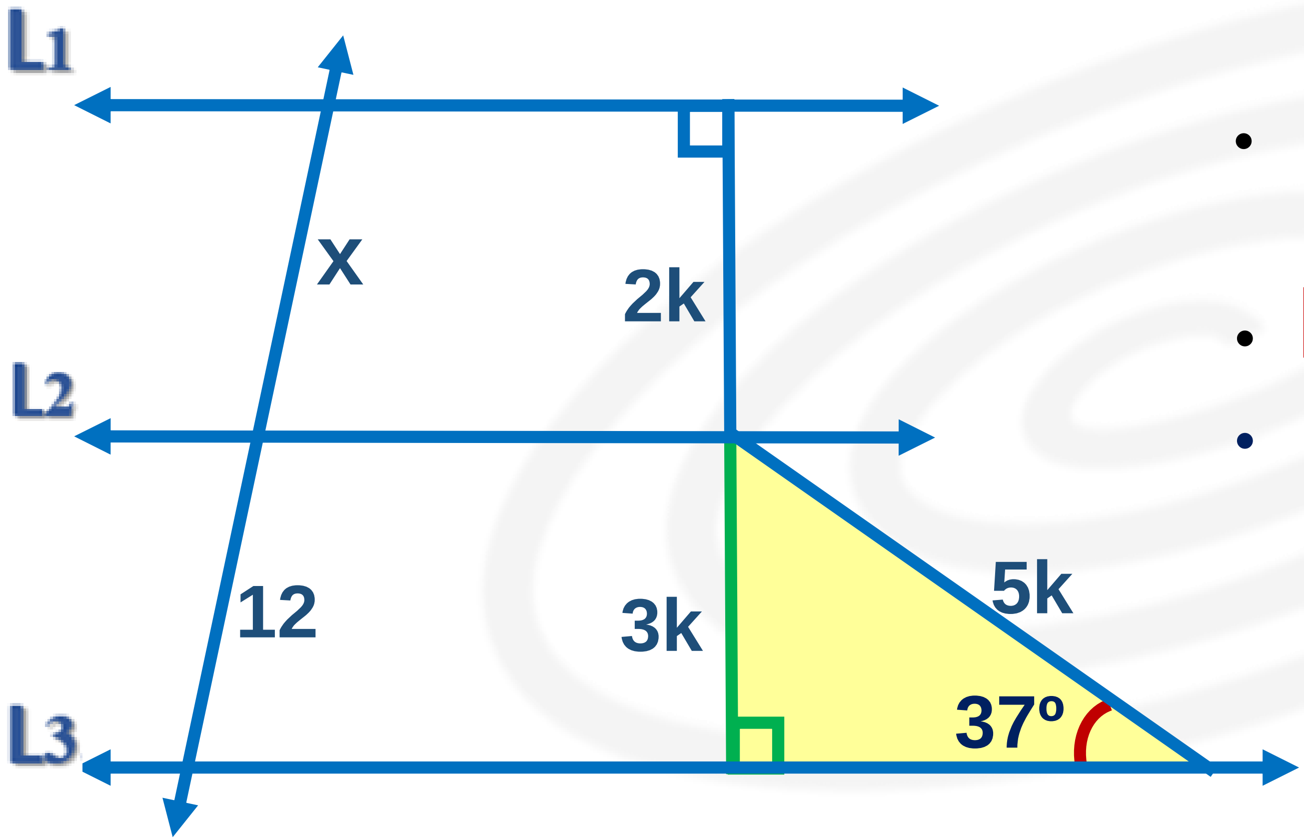
  AM = 4

- AC = AM + CM

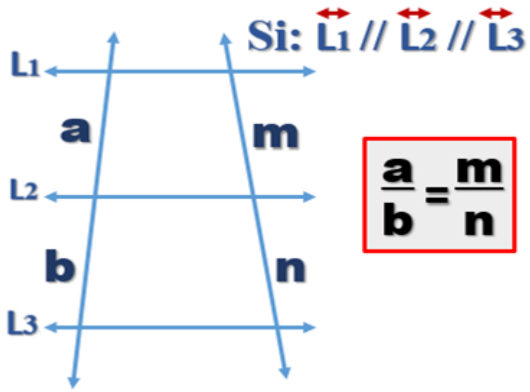
  AC = 4 + 4

  $\boxed{AC = 8}$

8. En la figura, si $\overleftrightarrow{L_1}$ // $\overleftrightarrow{L_2}$ // $\overleftrightarrow{L_3}$. Halle el valor de x.



Teorema de Tales



$$\frac{a}{b} = \frac{m}{n}$$

Resolución

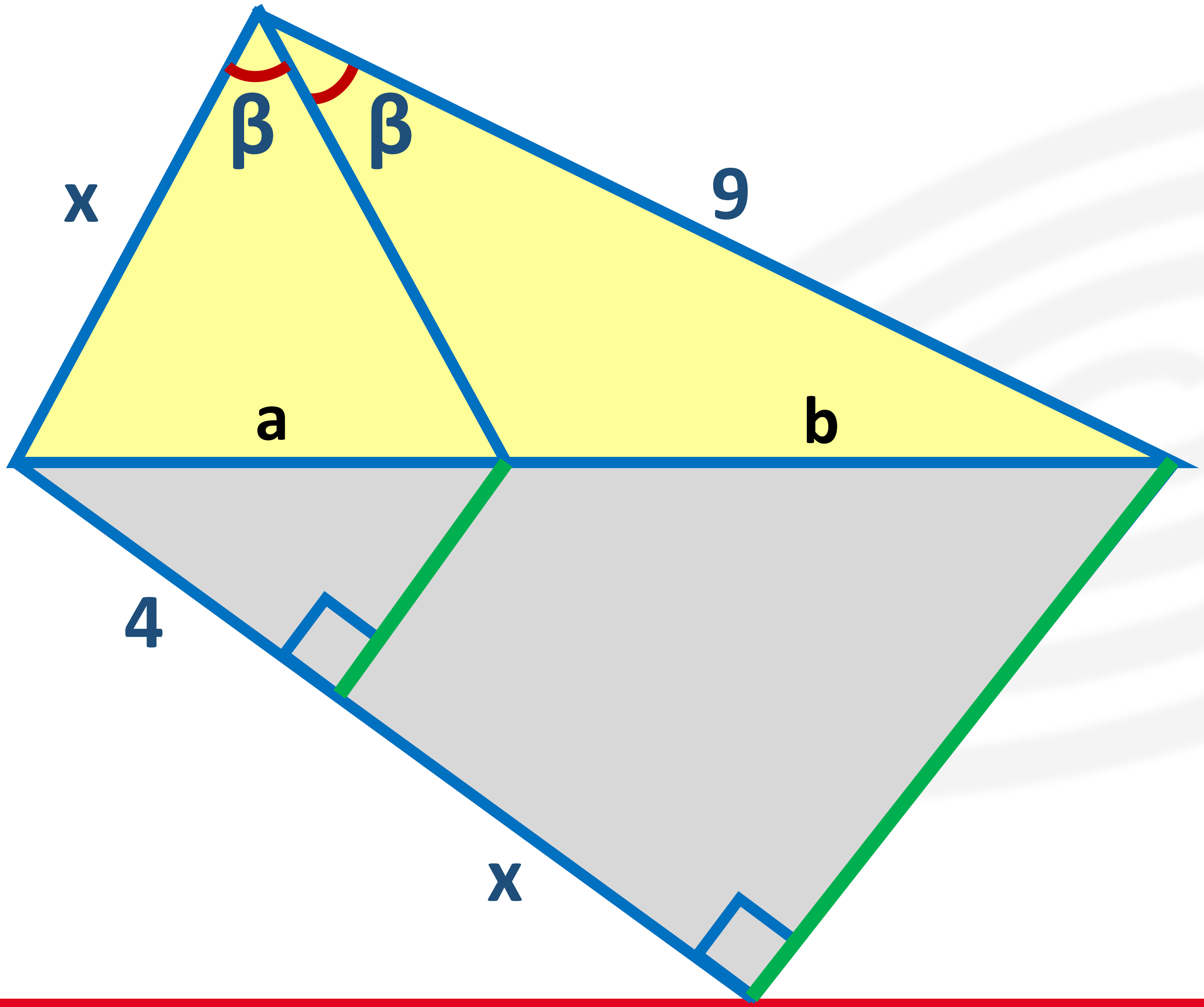
- Piden x
- ◺ notables de 37° y 53°.
- Por teorema de Tales

$$\frac{x}{12} = \frac{2\cancel{k}}{3\cancel{k}}$$

$$3x = 2(12)$$

$$\boxed{x = 8}$$

9. En la figura, halle el valor de x.



Resolución

- Piden x
- Teorema de la bisectriz interior

$$\frac{x}{9} = \frac{a}{b} \quad \ldots \quad (1)$$

- Corolario de Tales

$$\frac{4}{x} = \frac{a}{b} \quad \ldots \quad (2)$$

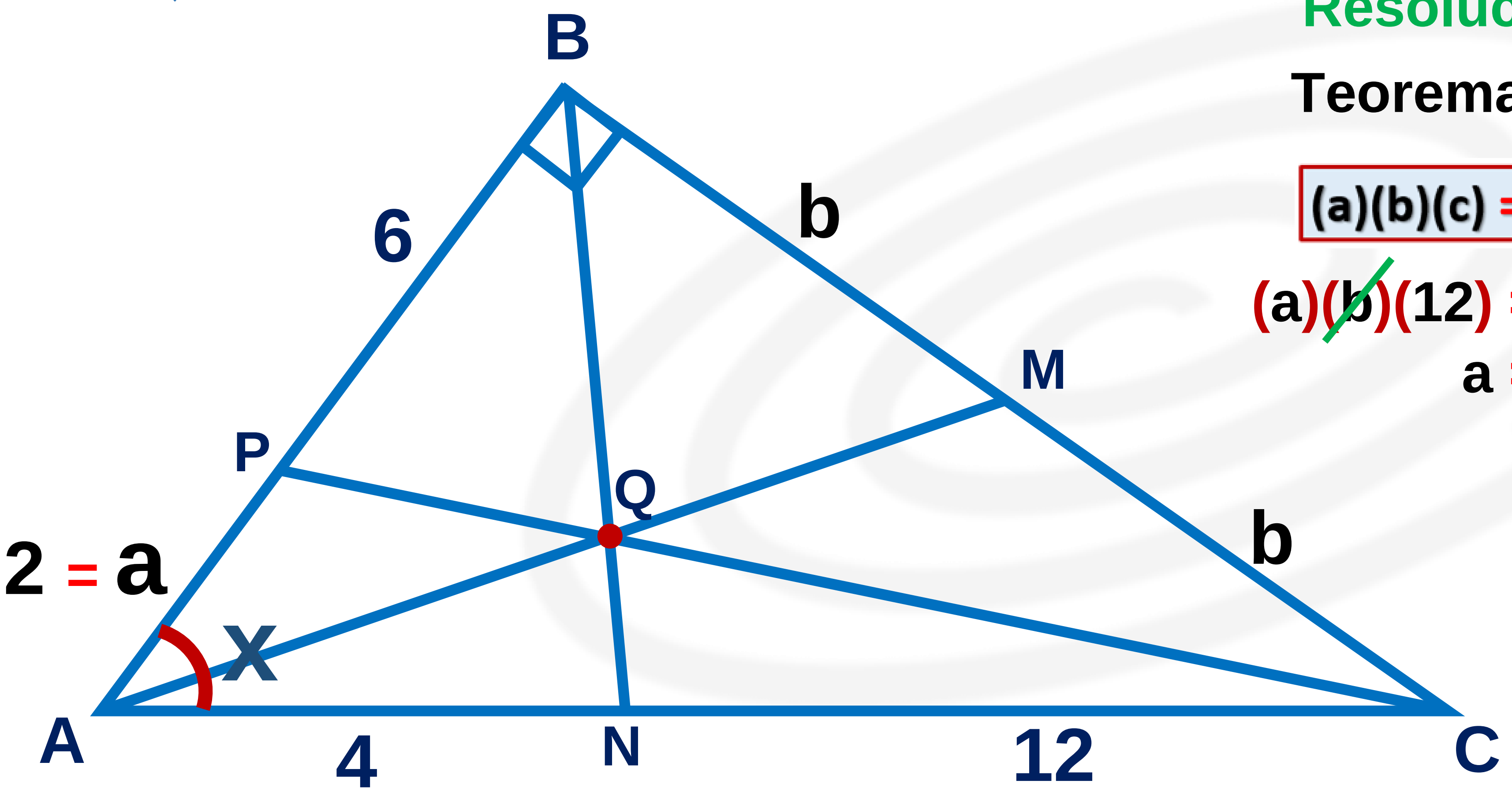
- Igualando 1 y 2

$$\frac{x}{9} = \frac{4}{x}$$

$$x^2 = 36$$

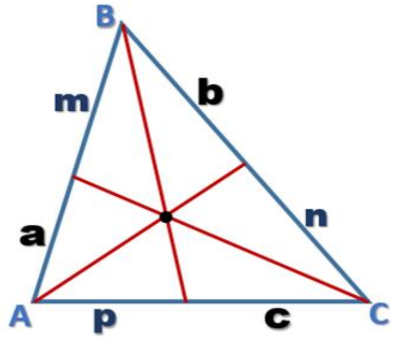
$$\boxed{x = 6}$$

10. En un triangulo rectángulo ABC, recto en B, la mediana $\overline{AM}$ y las cevianas interiores $\overline{BN}$ y $\overline{CP}$ se intersecan en Q. Si PB = 6, AN = 4 y NC = 12. Calcule m∡BAC.



Resolución

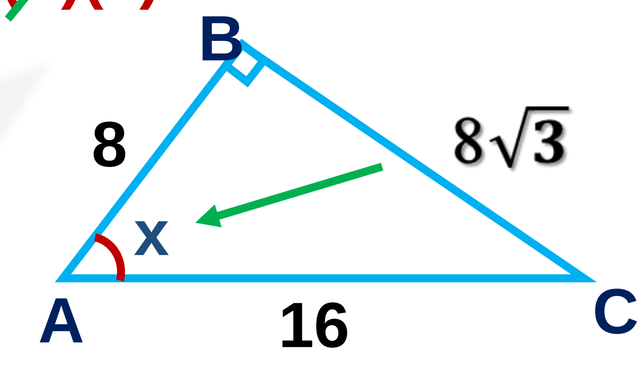
Teorema de Ceva



$$\boxed{(a)(b)(c) = (m)(n)(p)}$$

$$(a)(\cancel{b})(12) = (6)(\cancel{b})(4)$$

$$a = 2$$



ΔABC :

Notable de 30° y 60°

$$\boxed{x = 60°}$$