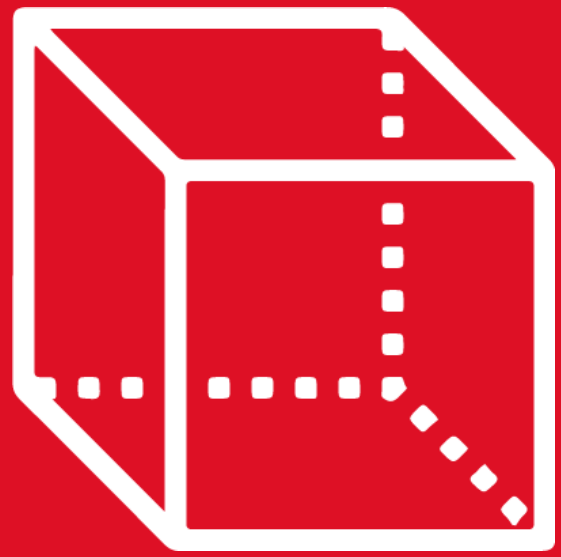
GEOMETRÍA

Tomo III

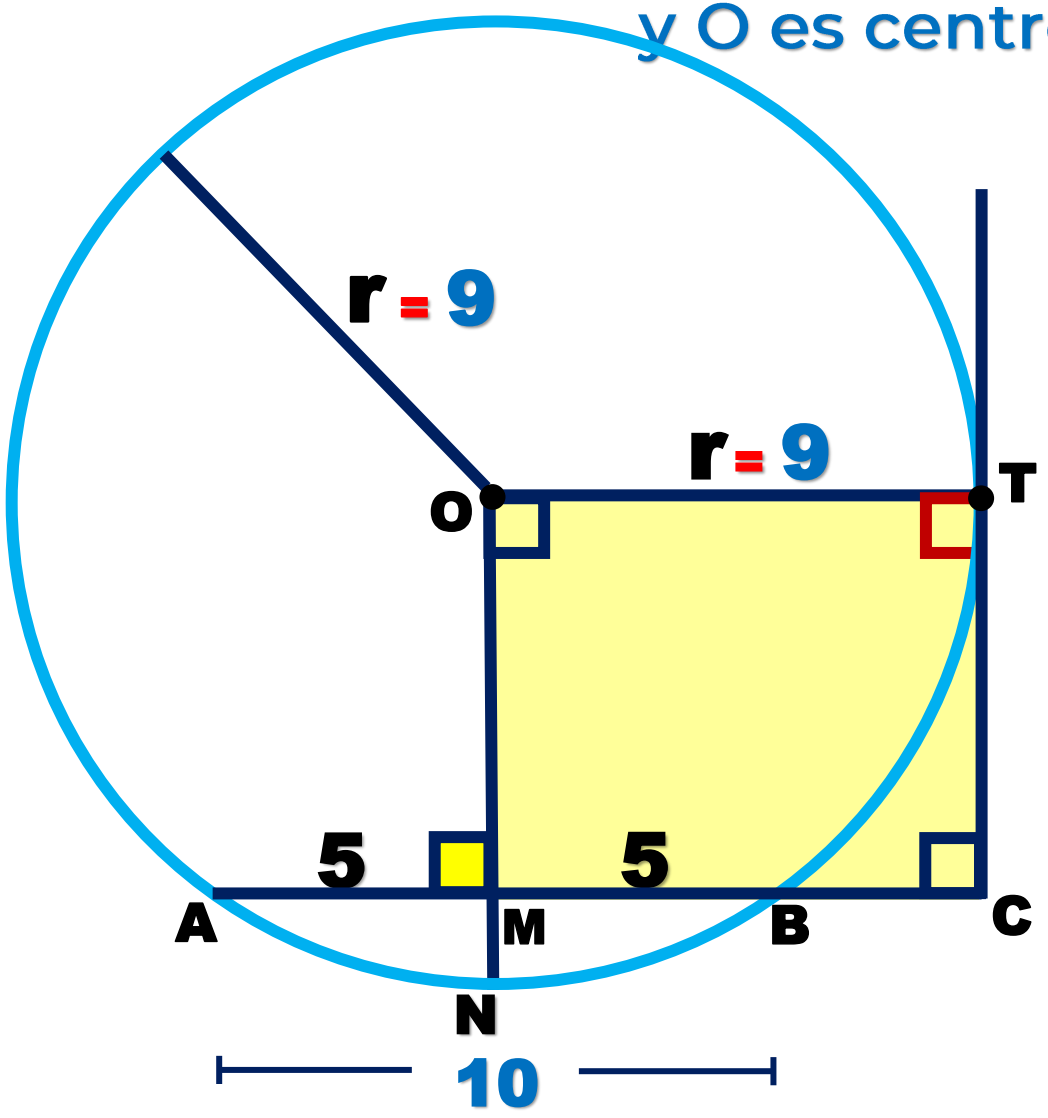


4th
SECONDARY

RETROALIMENTACIÓN

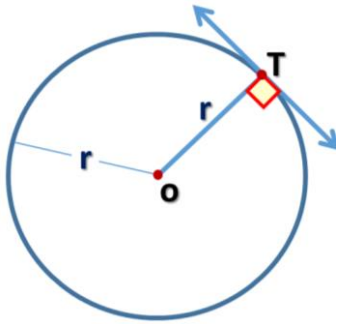
SACO OLIVEROS

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

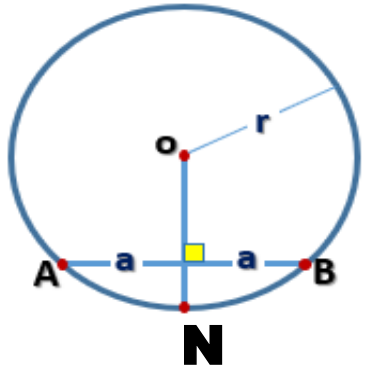


Resolución

- Trazamos $\overline{OT}$



- Trazamos $\overline{ON} \perp \overline{AB}$



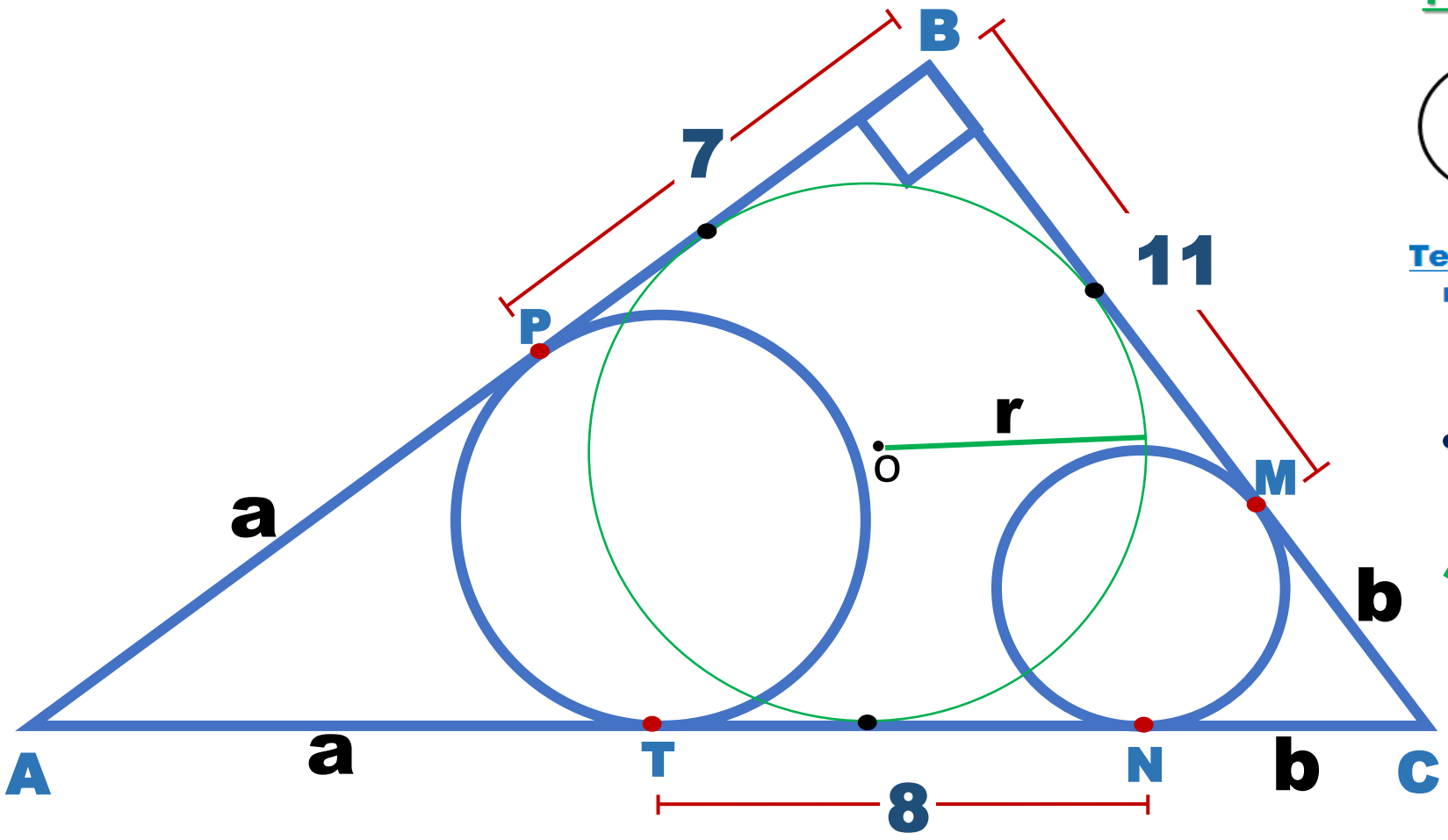
- ▭ OTCM :

$$OT = MB + BC$$

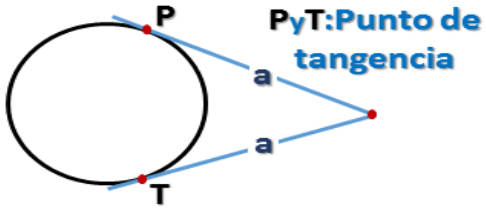
$$9 = 5 + BC$$

$$4 = BC$$

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



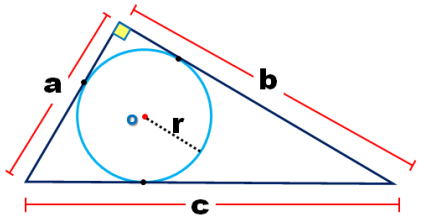
Resolución



Teorema de Poncelet

r: medida del inradio

$a + b = c + 2r$



- $\triangle ABC$: T. Poncelet

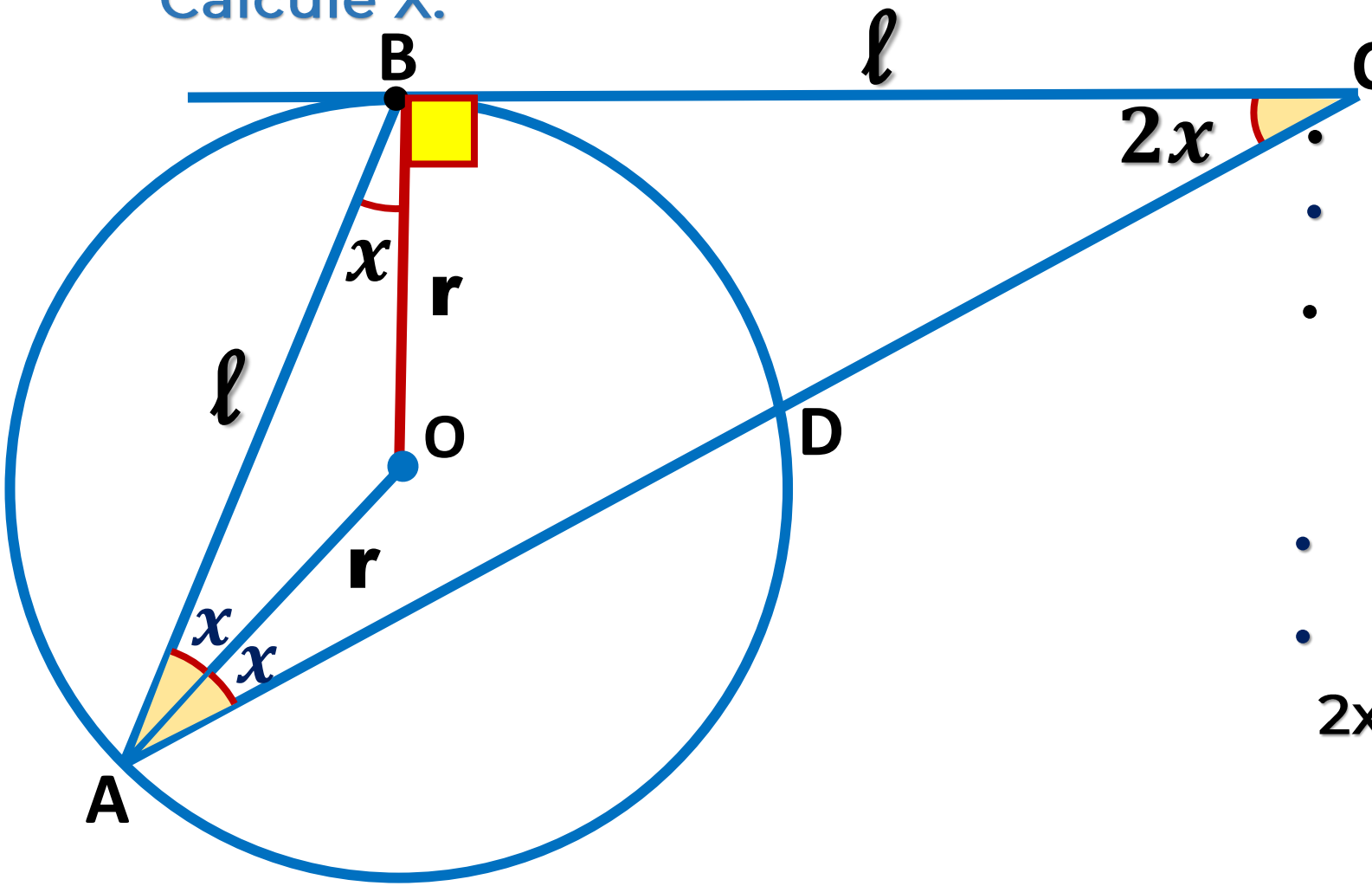
$a + 7 + 11 + b = a + 8 + b + 2r$

$18 = 8 + 2r$

$10 = 2r$

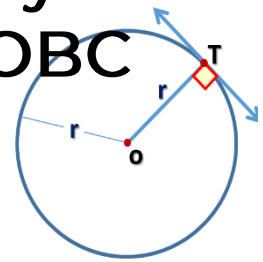
$r = 5$

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



Resolución

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



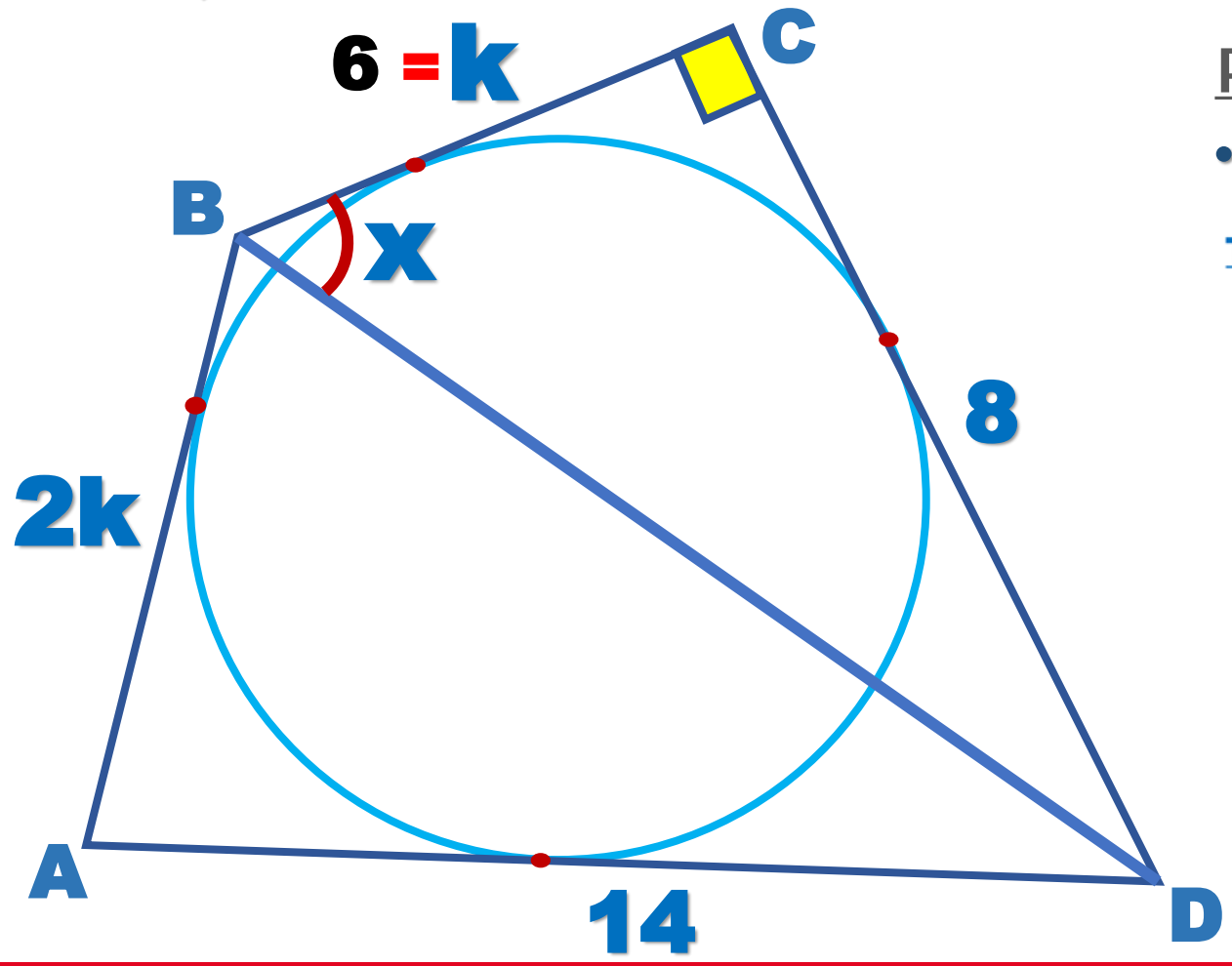
- △ ABO : ISÓSCELES
- En el △ ABC:

$2x + x + 90° + 2x = 180°$

$5x = 90°$

$x = 18°$

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

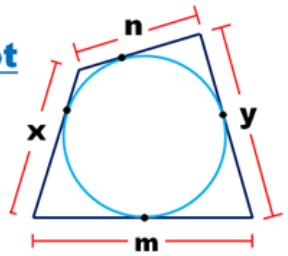
Por dato

- AB = 2(BC)

BC = k
AB = 2k

Teorema de Pitot

$x + y = m + n$



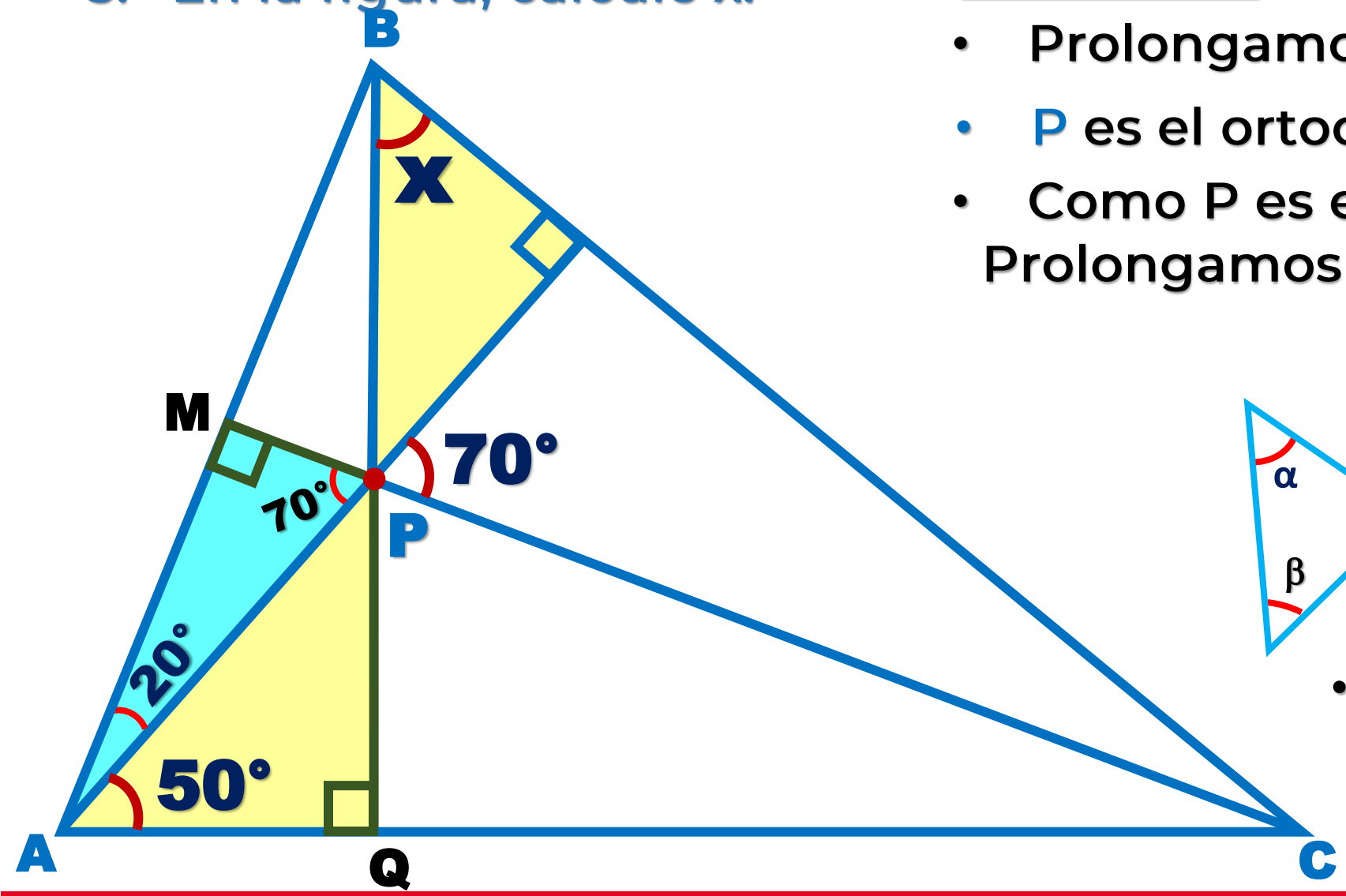
$2k + 8 = 14 + k$

$k = 6$

- Notable 37°y 53°

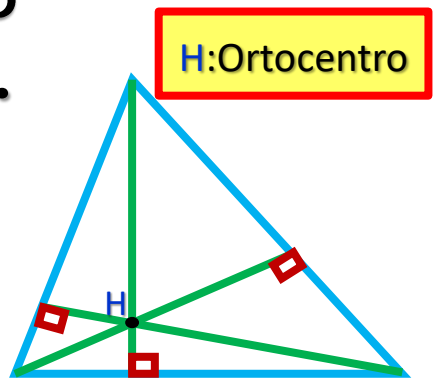
$x = 53°$

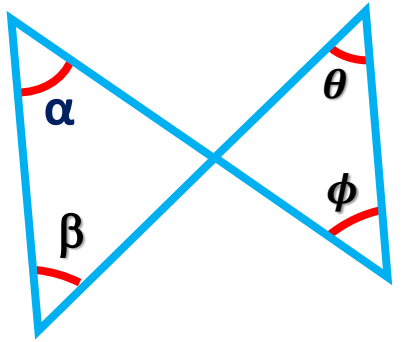
5. En la figura, calcule x.



Resolución

- Prolongamos $\overline{CP}$ hasta M.
- P es el ortocentro del ABC.
- Como P es el ortocentro Prolongamos $\overline{BP}$ hasta Q.





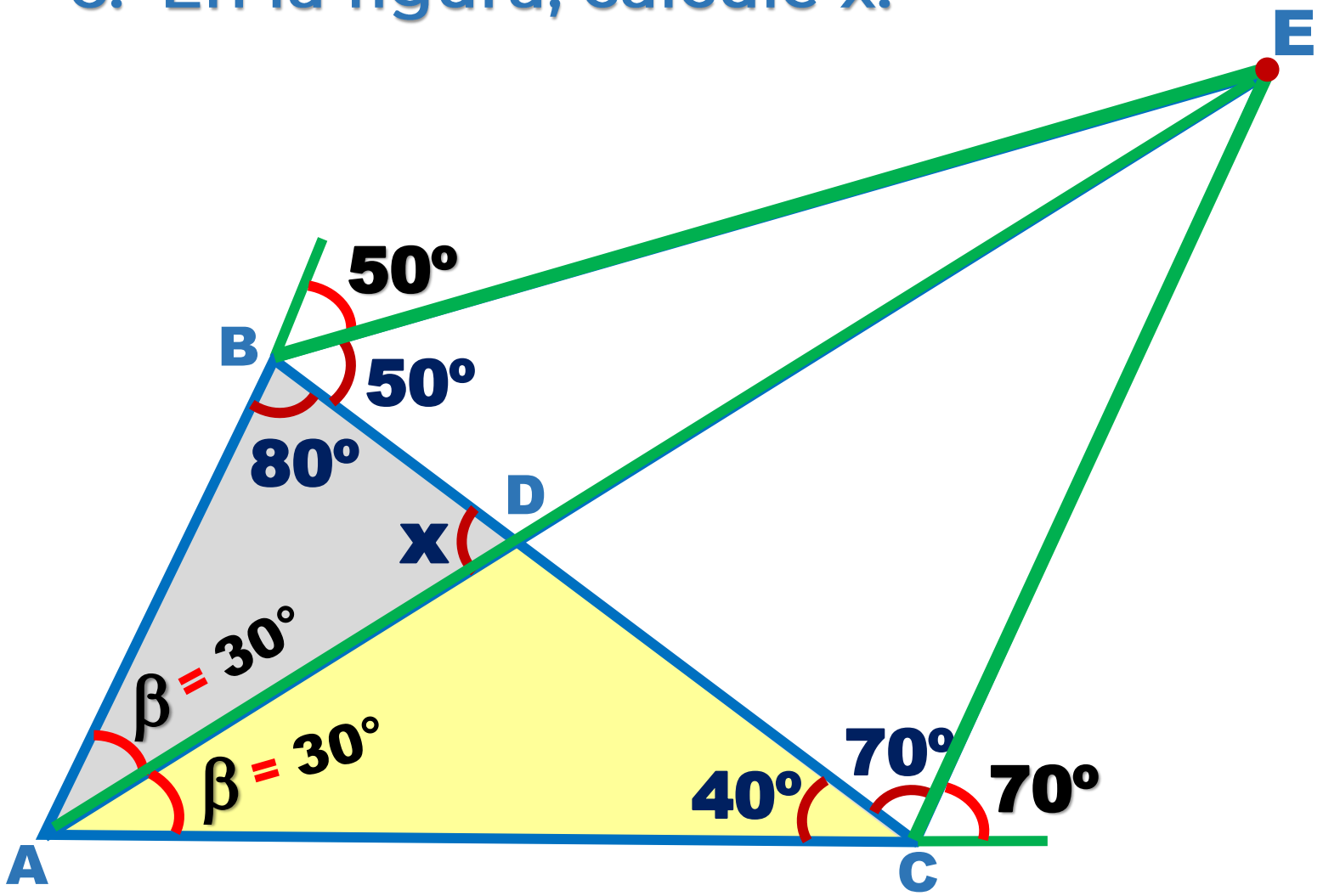
$\alpha + \beta = \theta + \phi$

- Del gráfico

$x + 90° = 50° + 90°$

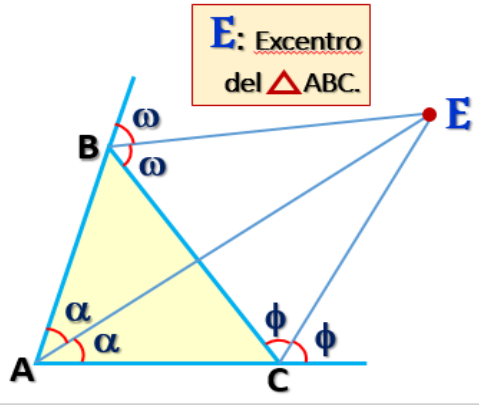
$x = 50$

6. En la figura, calcule x.



Resolución

- E es el excentro del △ABC.



- △ABC :

$2\beta + 80° + 40° = 180°$

$2\beta = 60°$

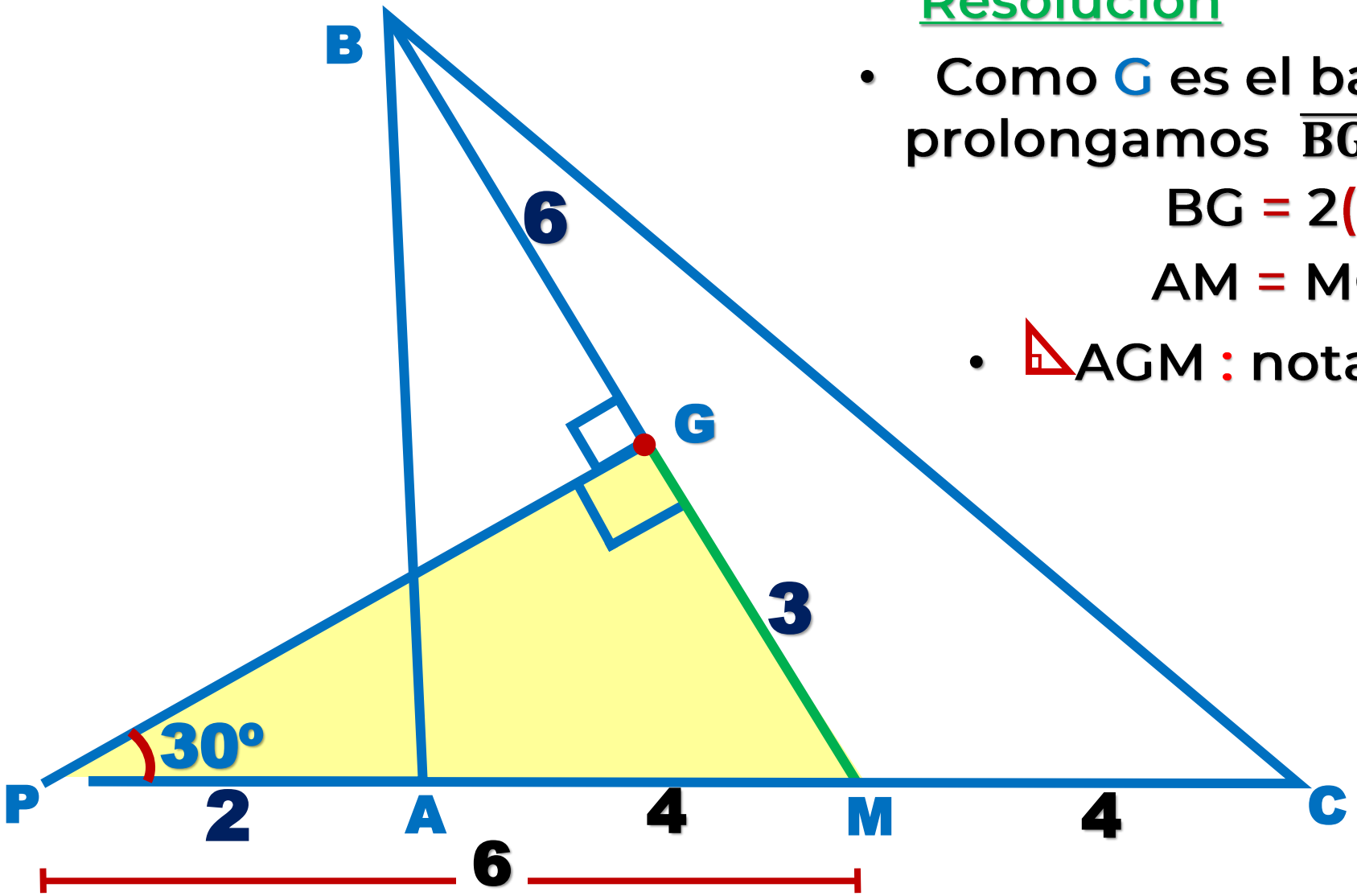
$\beta = 30°$

- △ADC :

$x = 30° + 40°$

$x = 70°$

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



Resolución

- Como G es el baricentro prolongamos $\overline{BG}$ hasta M.

$$BG = 2(GM)$$

$$AM = MC$$

- $\triangle AGM$: notables de 30° y 60°.

$$PM = 6$$

- $PA + AM = PM$

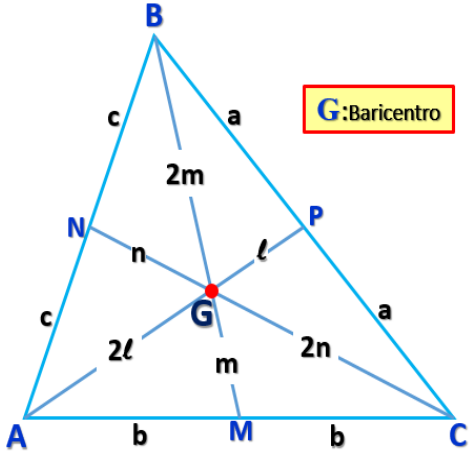
$$2 + AM = 6$$

$$AM = 4$$

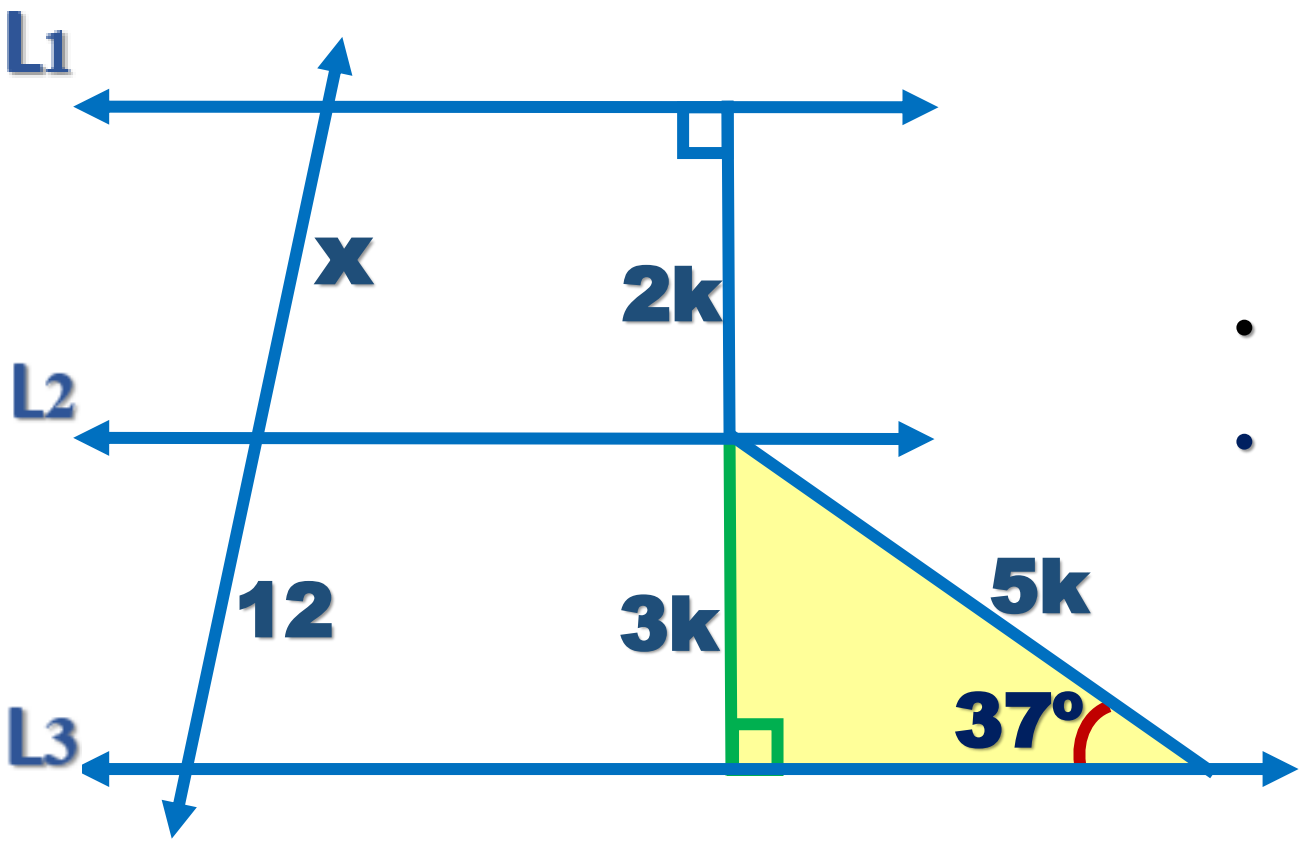
- $AC = AM + CM$

$$AC = 4 + 4$$

$$\boxed{AC = 8}$$

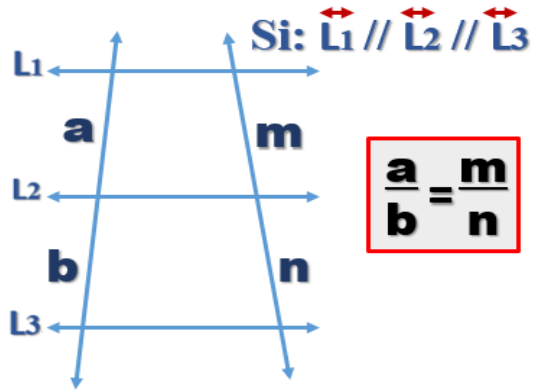


8. En la figura, calcule x, si $\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2} \parallel \overleftrightarrow{L_3}$.



Resolución

Teorema de Tales



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

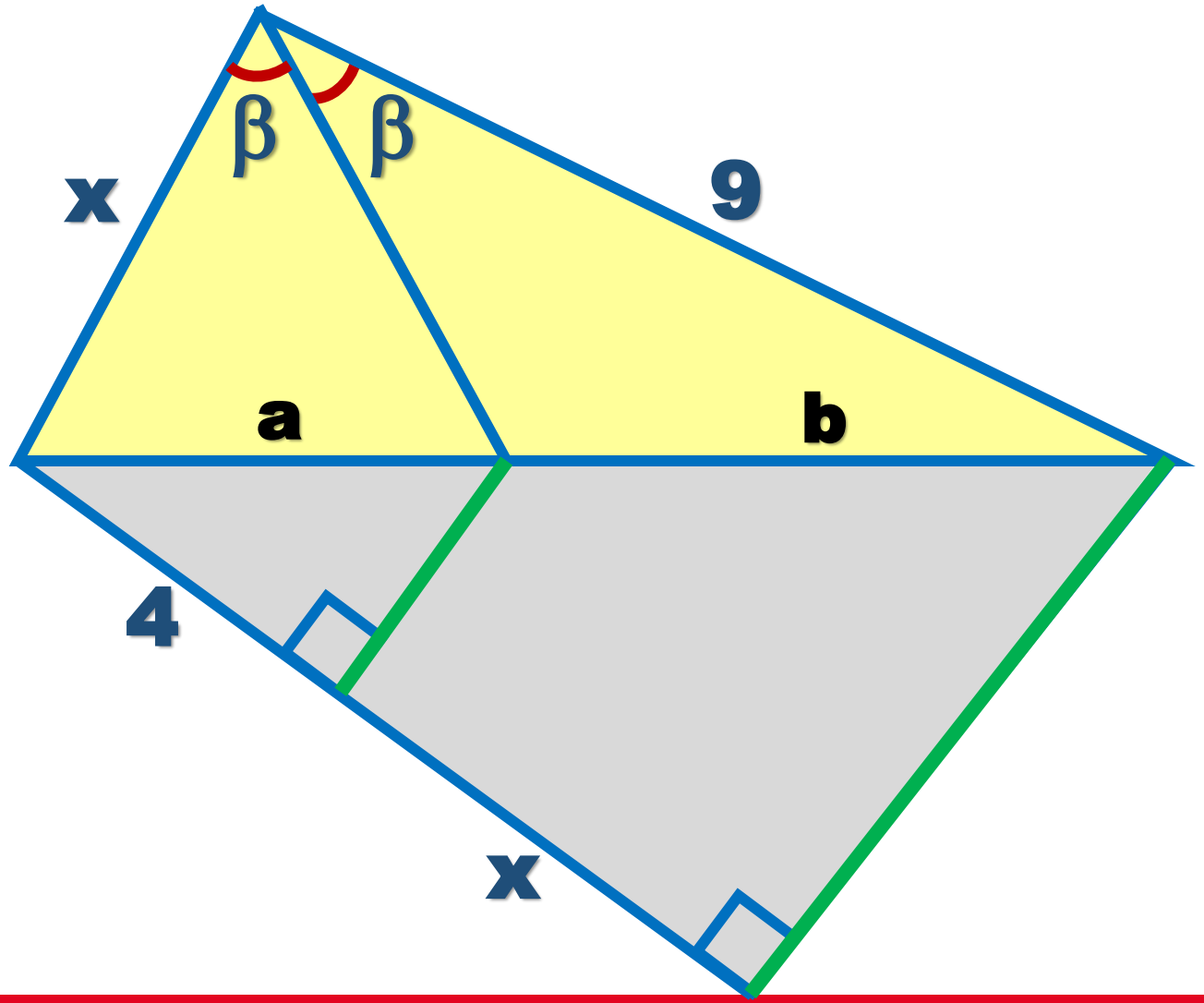
- notables de 37° y 53°.
- Por teorema de Tales

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

$$3x = 2(12)$$

$$x = 8$$

9. En la figura, calcule x.



Resolución

- **Teorema de la bisectriz interior**

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

- **Corolario de Tales**

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

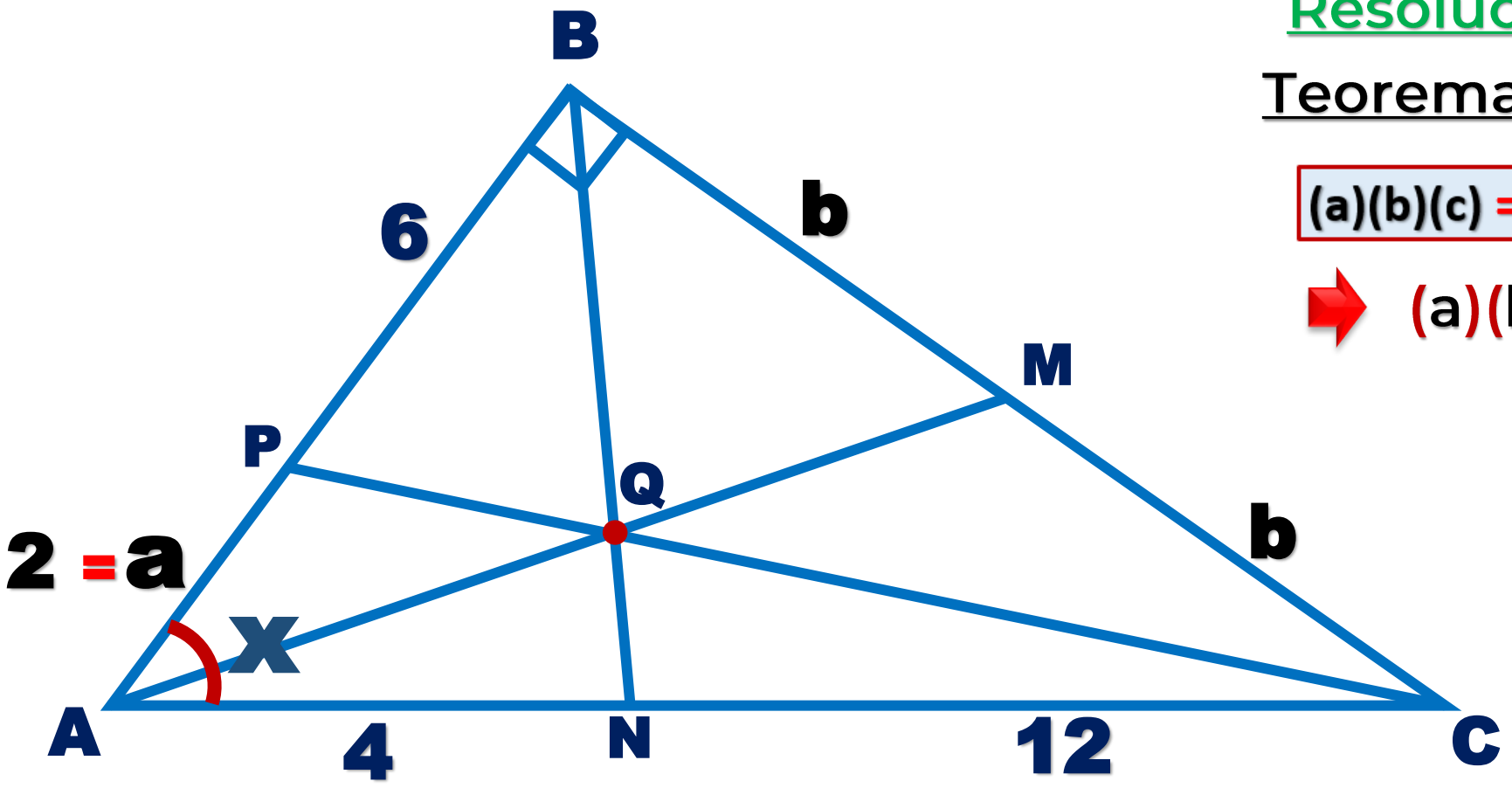
- **Igualando 1 y 2**

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

$$x^2 = 36$$

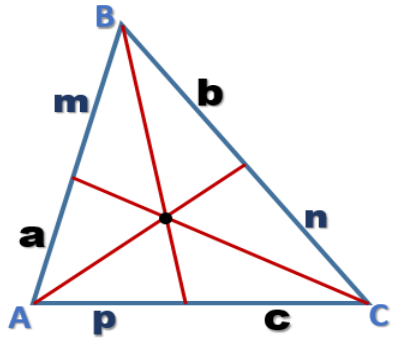
$$x = 6$$

10. En un triángulo 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

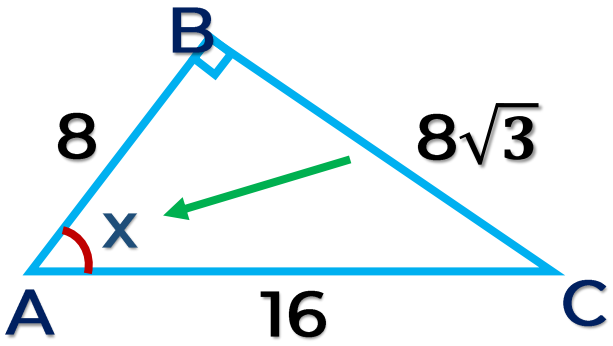
Teorema de Ceva



$$(a)(b)(c) = (m)(n)(p)$$

$$(a)(b)(12) = (6)(b)(4)$$

$$a = 2$$



ΔABC:

Notable de 30° y 60°

$x = 60°$

SACO
OLIVEROS