



GEOMETRÍA

Tomo III

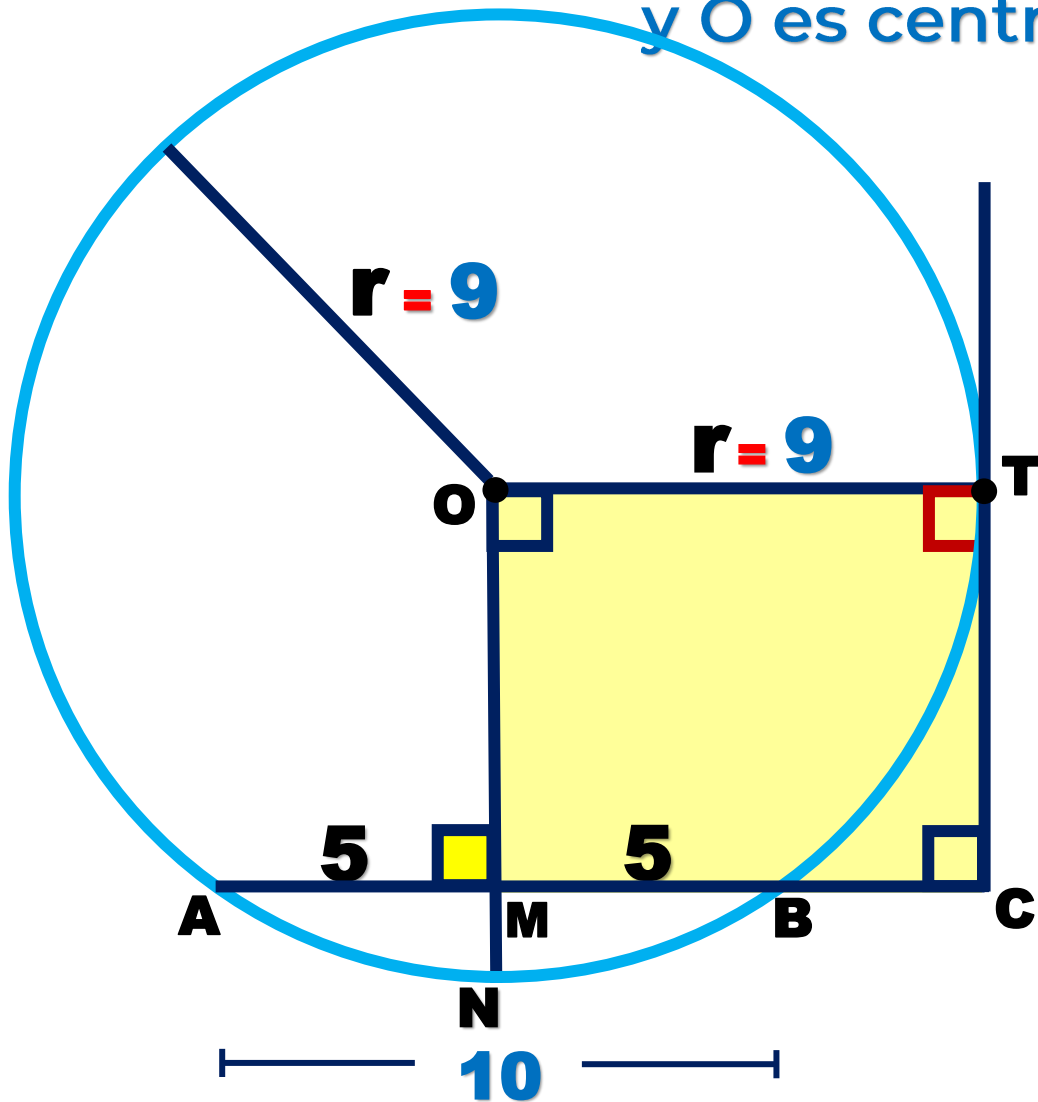
4th
SECONDARY

RETROALIMENTACIÓN



 **SACO OLIVEROS**

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



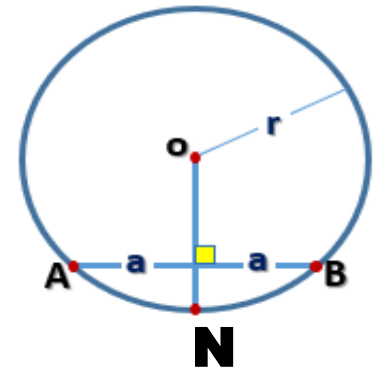
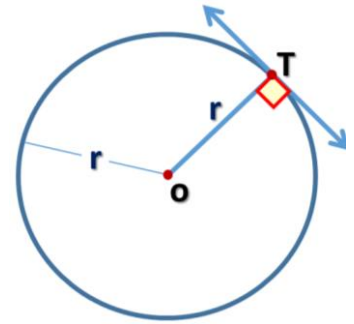
Resolución

- Trazamos \overline{OT}
- Trazamos $\overline{ON} \perp \overline{AB}$
- $\square OTCM$:

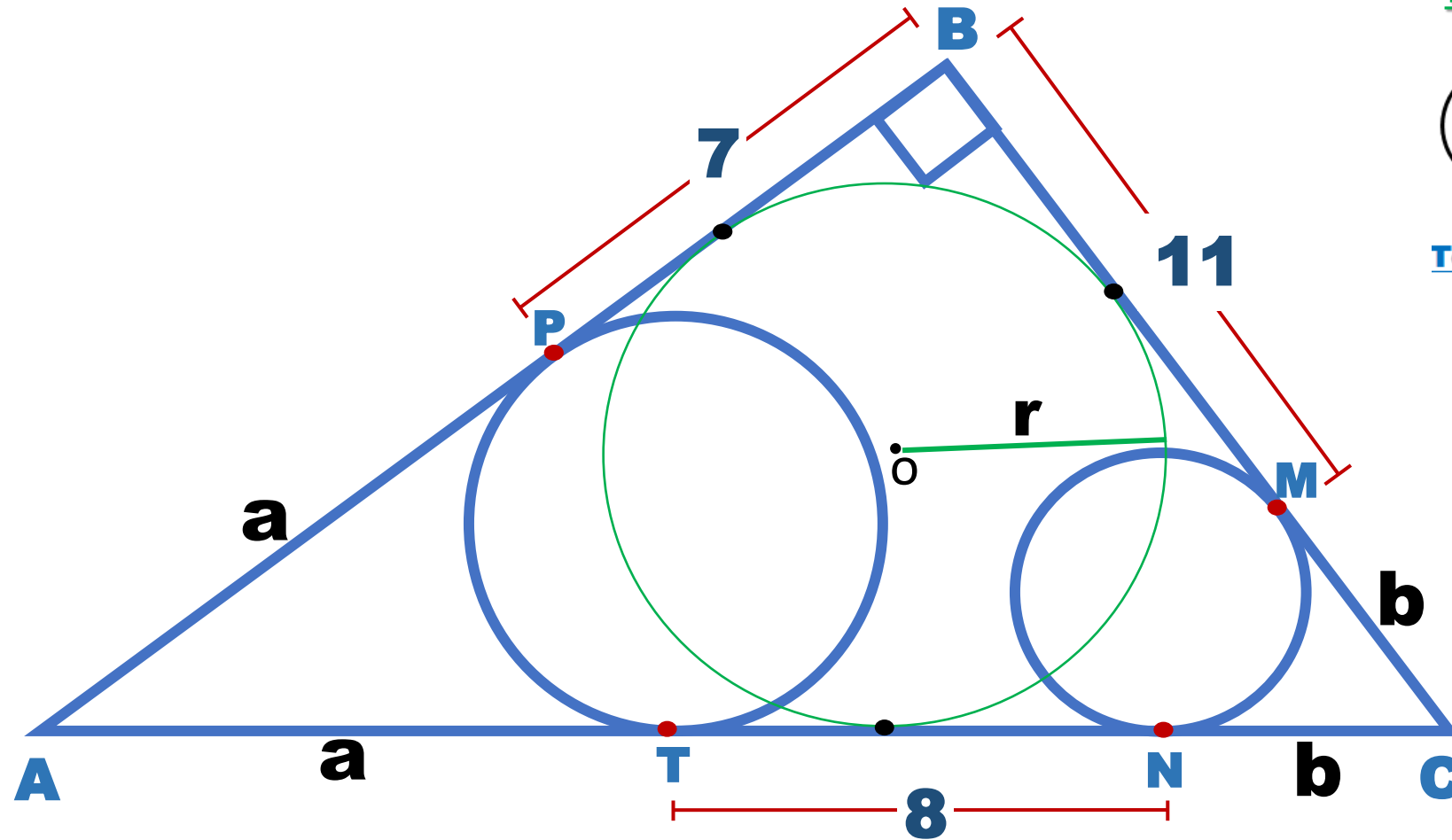
$$OT = MB + BC$$

$$9 = 5 + BC$$

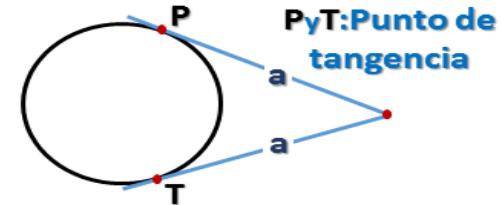
$$4 = BC$$



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



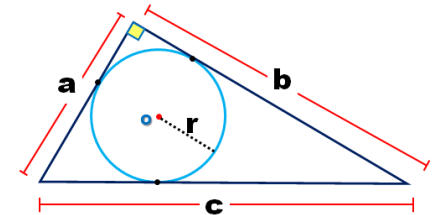
Resolución



Teorema de Poncelet

r: medida del inradio

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



- $\triangle ABC$: T. Poncelet

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

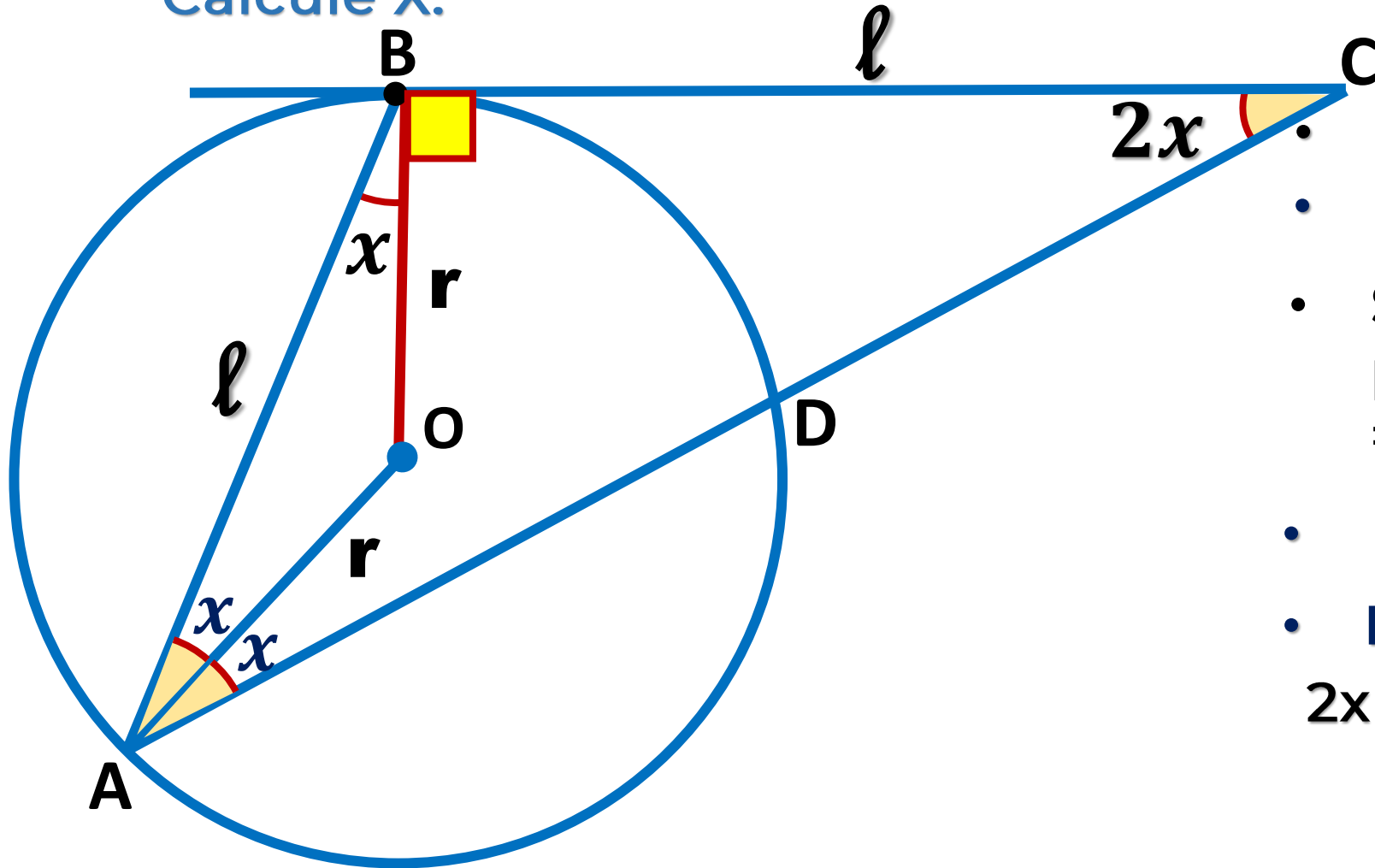
$$18 = 8 + 2r$$

$$10 = 2r$$

$$r = 5$$



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



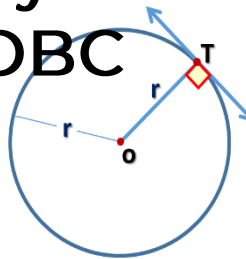
Resolución

- Piden: x
- $\triangle ABC$: ISÓSCELES
- Se traza el radio \overline{OB} y por teorema la $m\angle OBC = 90^\circ$
- $\triangle ABO$: ISÓSCELE
- En el $\triangle ABC$:

$$2x + x + 90^\circ + 2x = 180^\circ$$

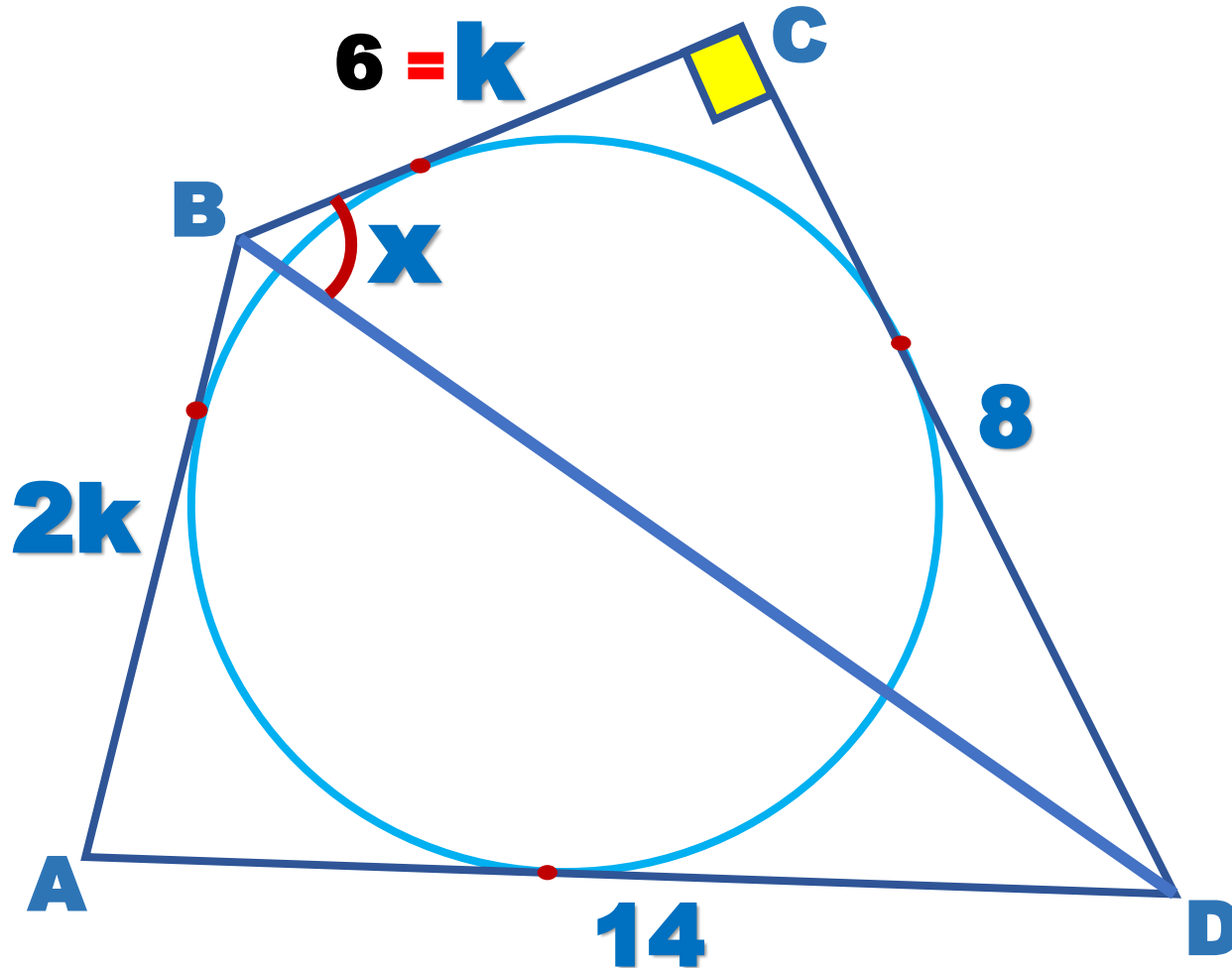
$$5x = 90^\circ$$

$$x = 18^\circ$$





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



Resolución

Por dato

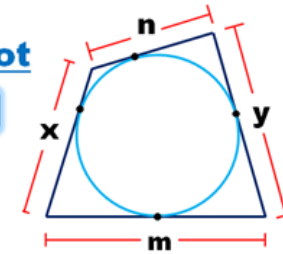
- $AB = 2(BC)$

$$BC = k$$

$$AB = 2k$$

Teorema de Pitot

$$x + y = m + n$$



$$2k + 8 = 14 + k$$

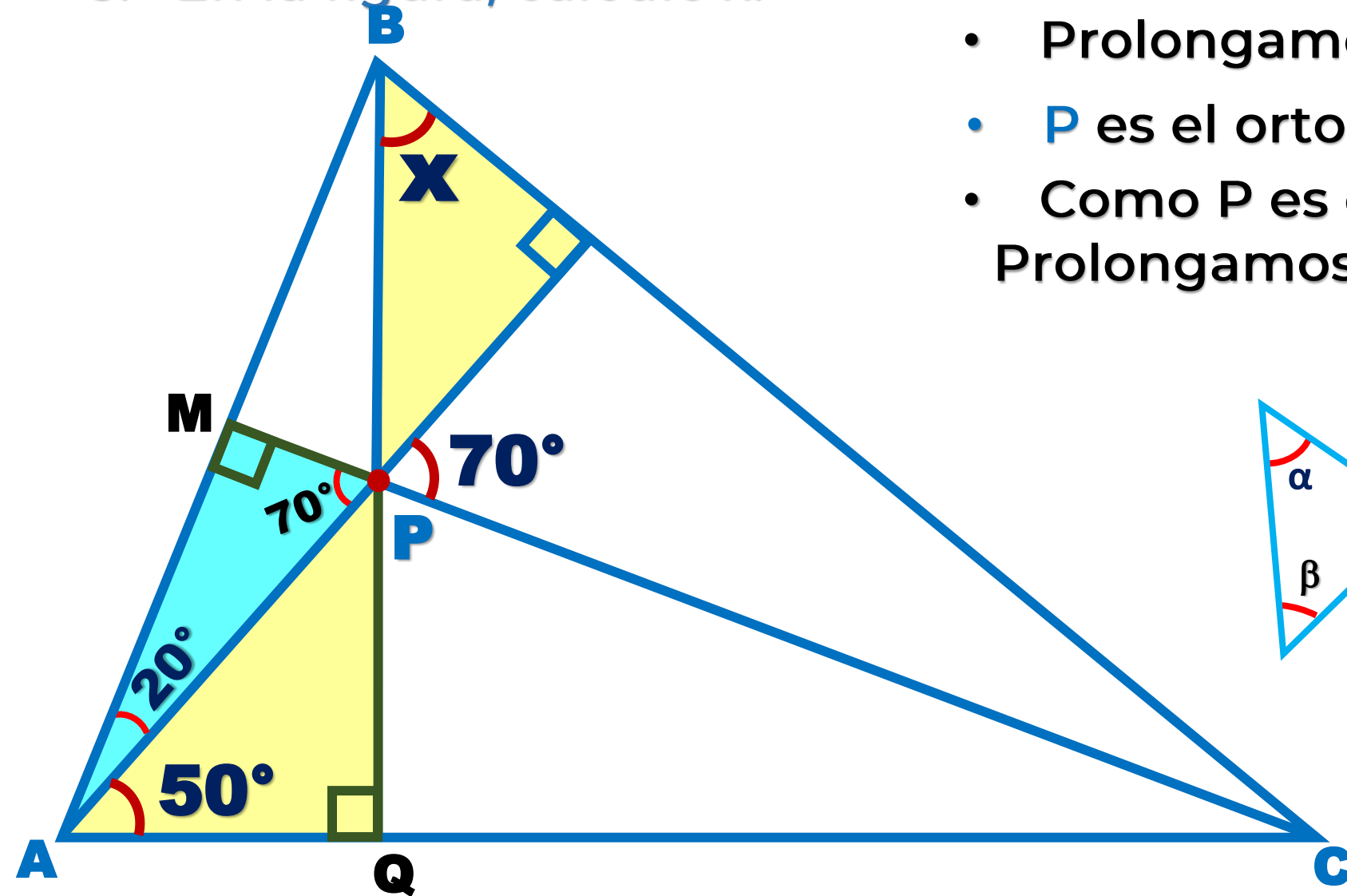
$$k = 6$$

- notable 37° y 53°

$$x = 53^\circ$$

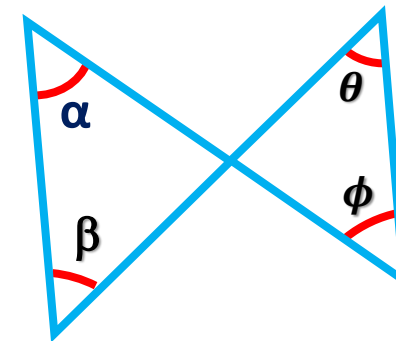


5. En la figura, calcule x .

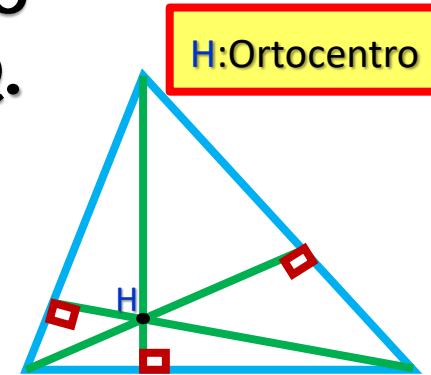


Resolución

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



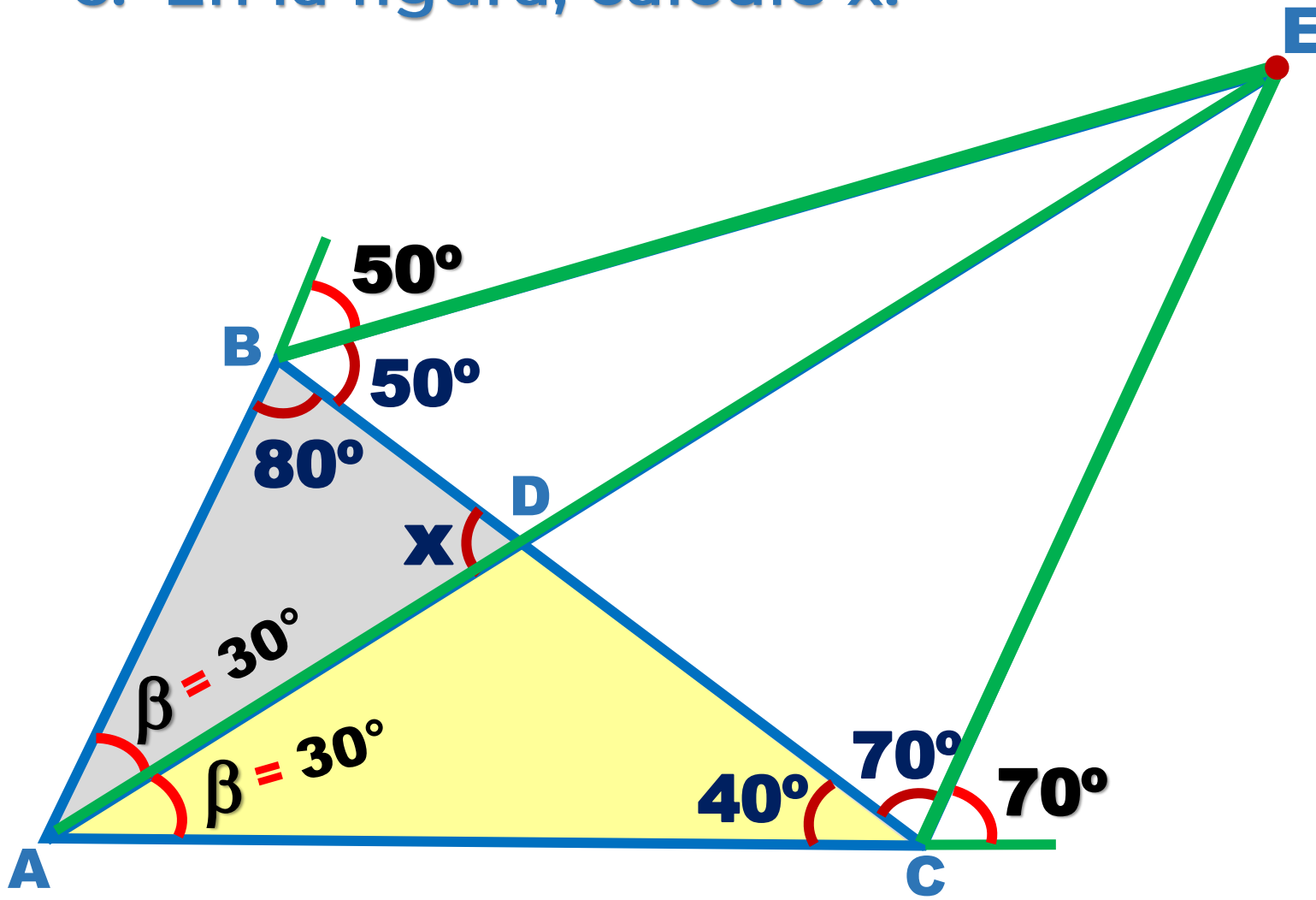
$$\alpha + \beta = \theta + \phi$$



- Del gráfico
 $x + 90^\circ = 50^\circ + 90^\circ$

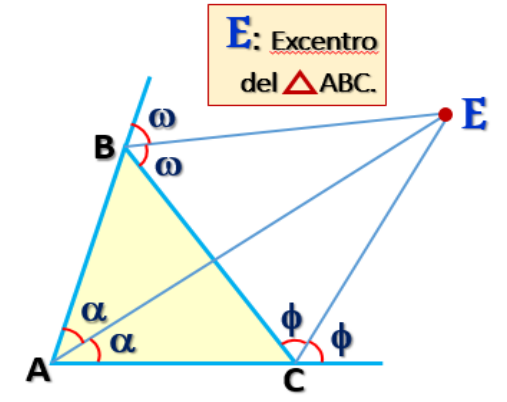
$$x = 50$$

6. En la figura, calcule x.



Resolución

- E es el excentro del $\triangle ABC$.



- $\triangle ABC$:

$$2\beta + 80^\circ + 40^\circ = 180^\circ$$

$$2\beta = 60^\circ$$

$$\beta = 30^\circ$$
- $\triangle ADC$:

$$x = 30^\circ + 40^\circ$$

$$x = 70^\circ$$

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° .

$$PM = 6$$

- $PA + AM = PM$

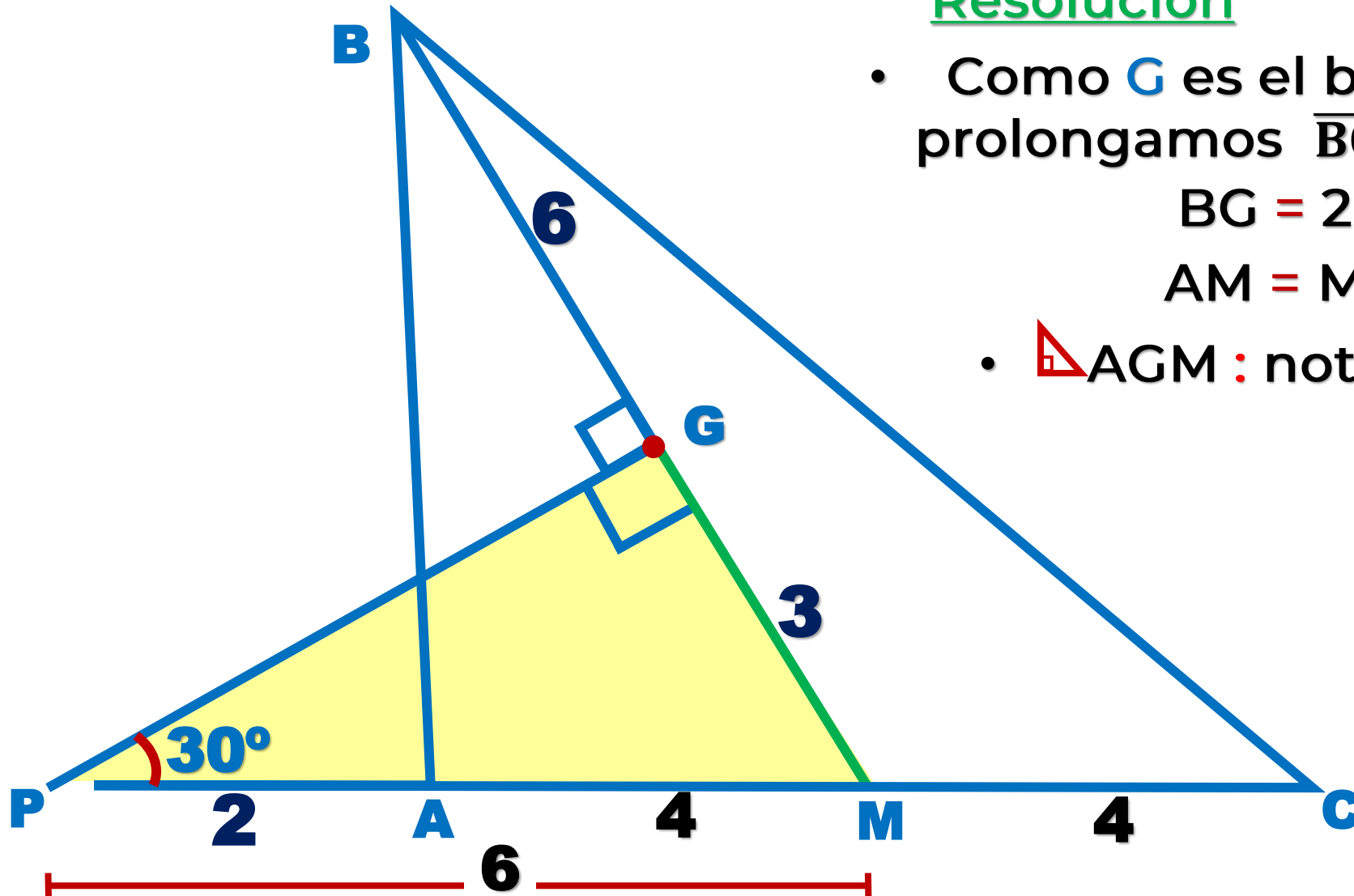
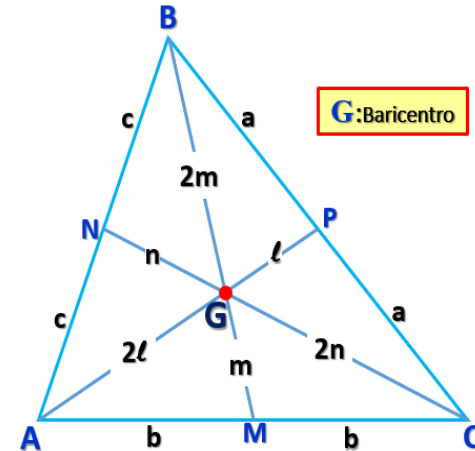
$$2 + AM = 6$$

$$AM = 4$$

- $AC = AM + CM$

$$AC = 4 + 4$$

$$AC = 8$$

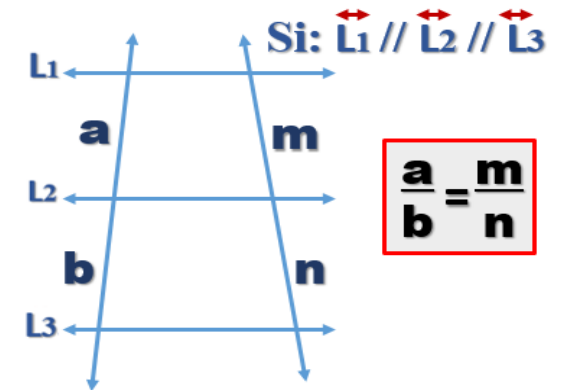




8. En la figura, calcule x , si $\vec{L_1} \parallel \vec{L_2} \parallel \vec{L_3}$.

Resolución

Teorema de Tales

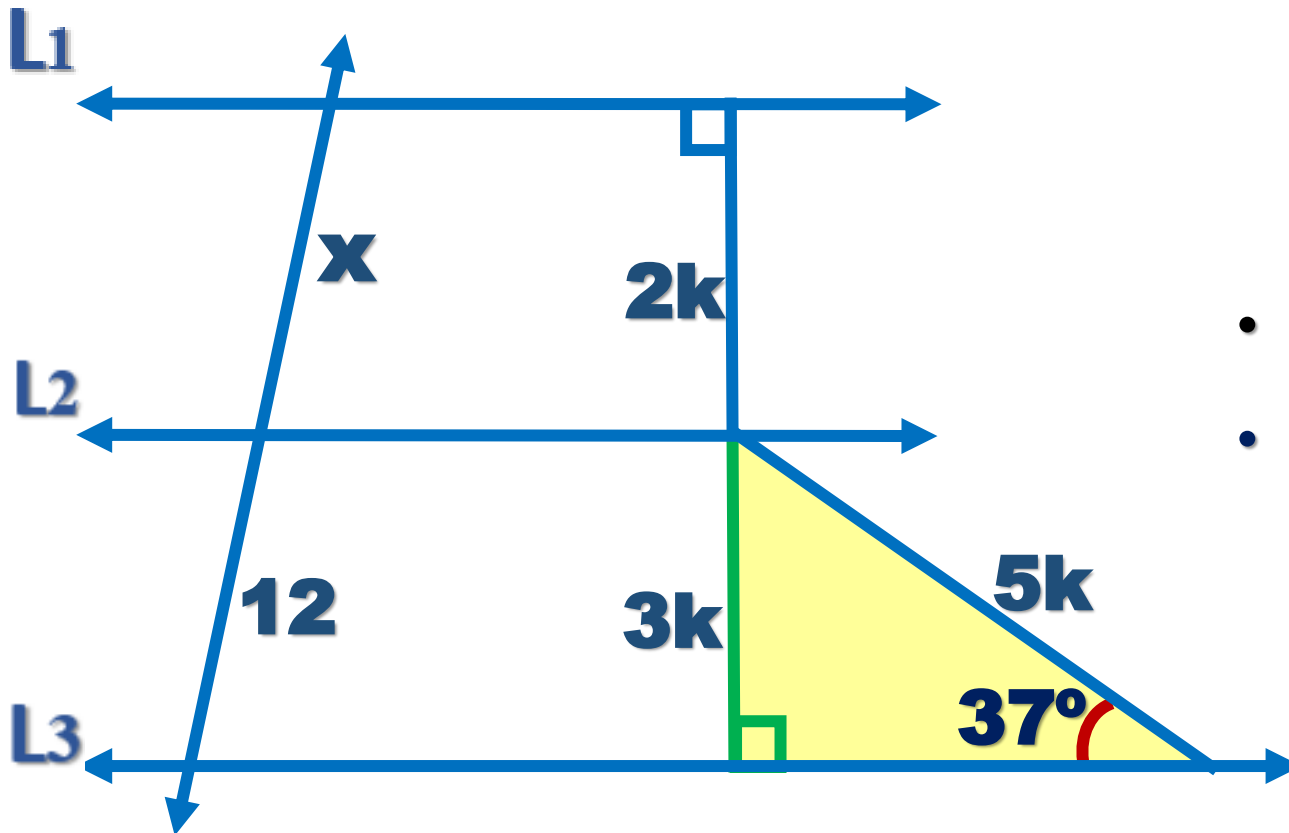


- notables de 37° y 53° .
- Por teorema de Tales

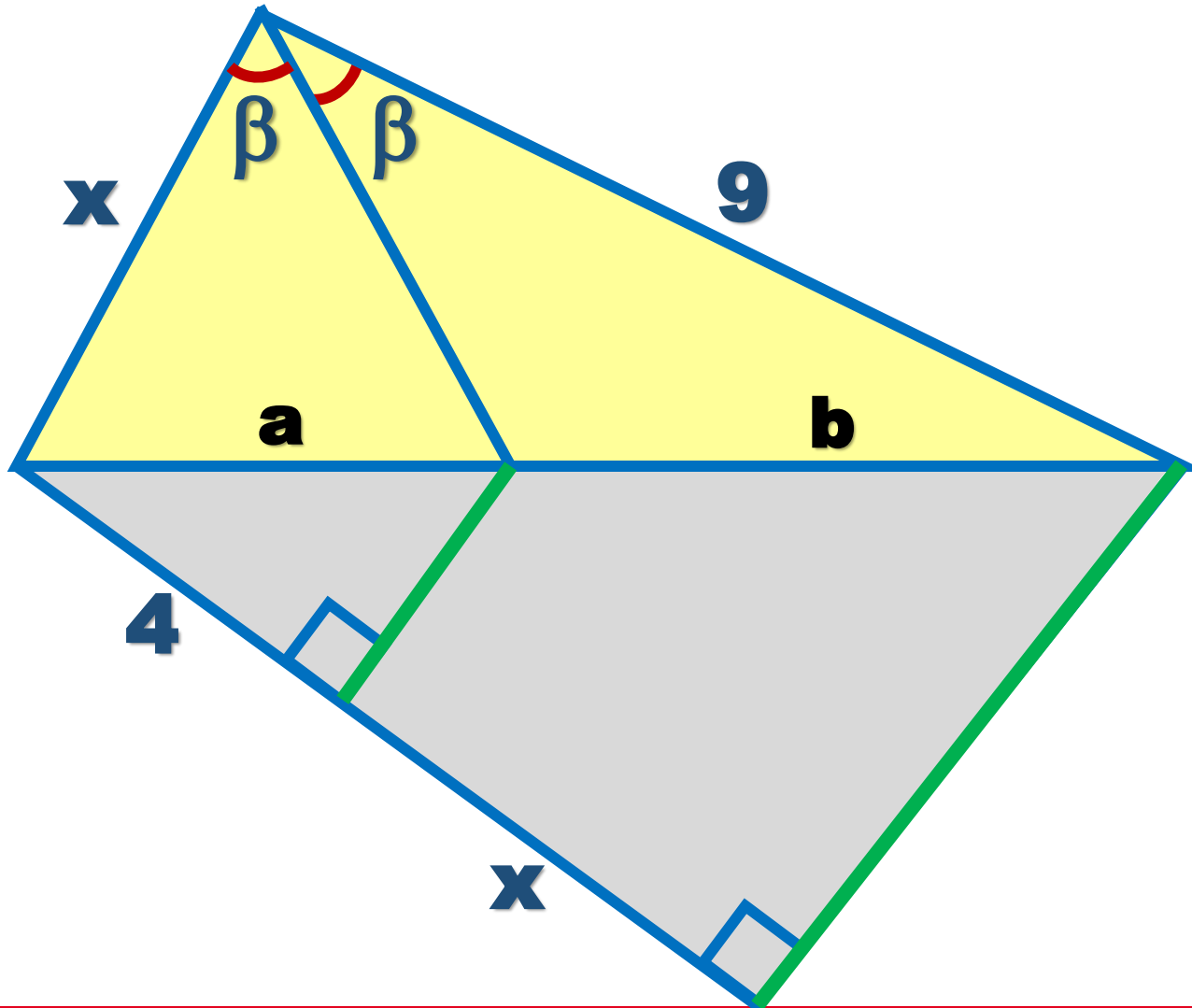
$$\frac{x}{12} = \frac{2k}{3k}$$

$$3x = 2(12)$$

$$x = 8$$



9. En la figura, calcule x.



Resolución

- Teorema de la bisectriz interior

$$\rightarrow \frac{x}{9} = \frac{a}{b} \dots\dots (1)$$

- Corolario de Tales

$$\rightarrow \frac{4}{x} = \frac{a}{b} \dots\dots (2)$$

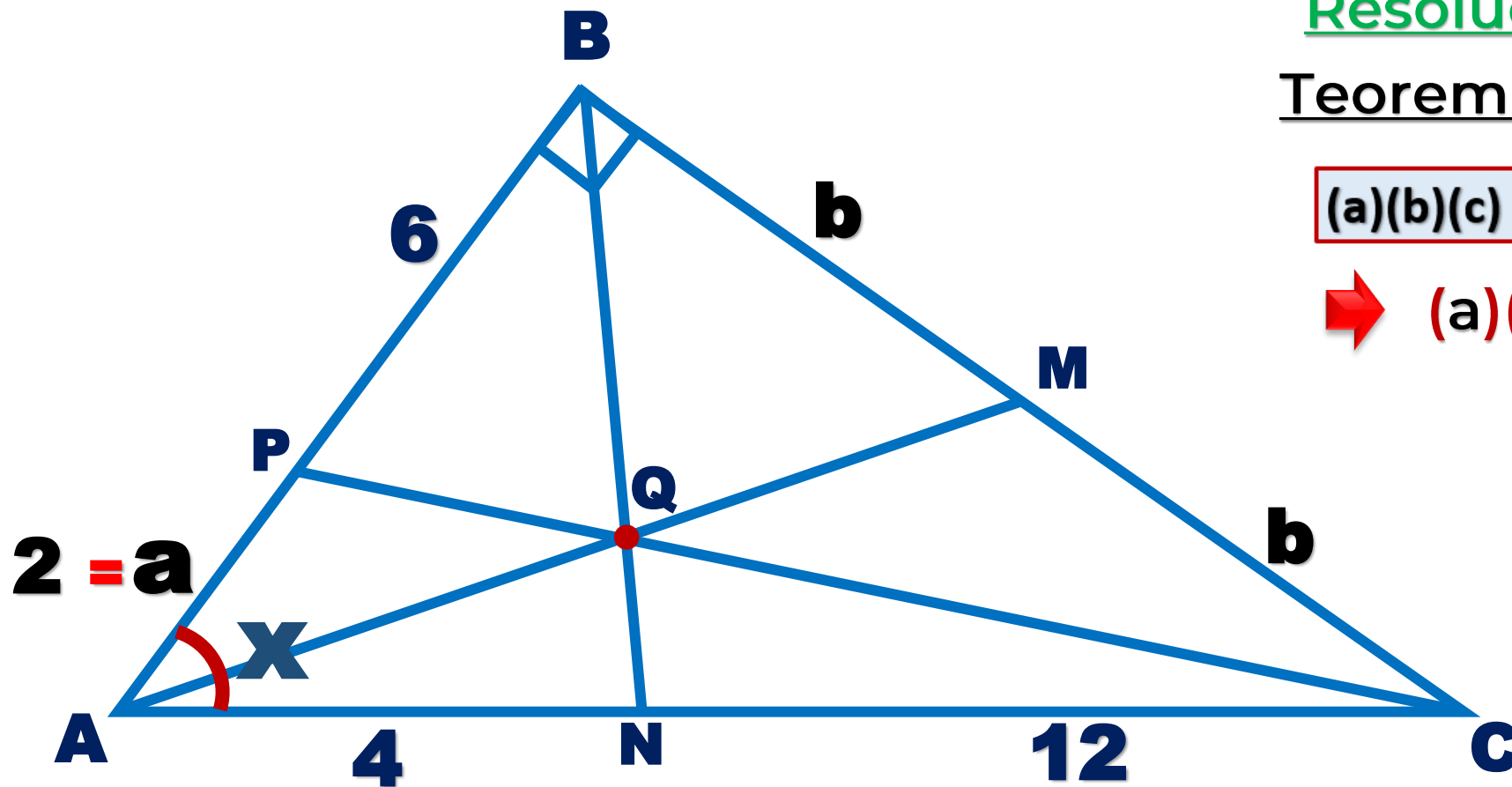
- Igualando 1 y 2

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

$$x^2 = 36$$

$$x = 6$$

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 $m\angle BAC$.

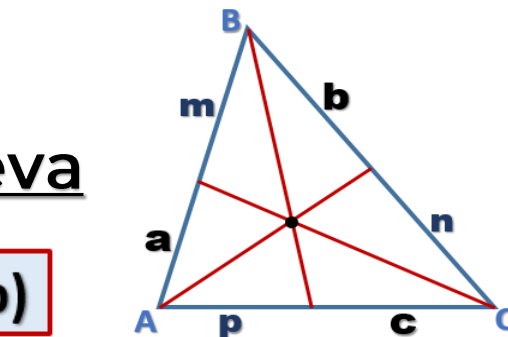


Resolución

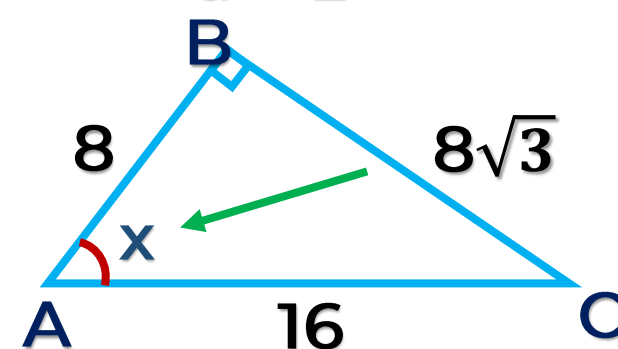
Teorema de Ceva

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

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



$$a = 2$$



$\triangle ABC$:

Notable de 30° y 60°

$$x = 60^\circ$$

The logo is centered on a solid red background. It features a stylized white icon of a spiral with an arrow pointing clockwise, positioned to the left of the text. The text "SACO OLIVEROS" is written in a bold, white, sans-serif font, with "SACO" on the top line and "OLIVEROS" on the bottom line. Behind the text and icon is a large, faint, light-red graphic consisting of several concentric, slightly irregular oval shapes, with a larger arrow shape pointing clockwise around the perimeter.

 **SACO**
OLIVEROS