GEOMETRÍA

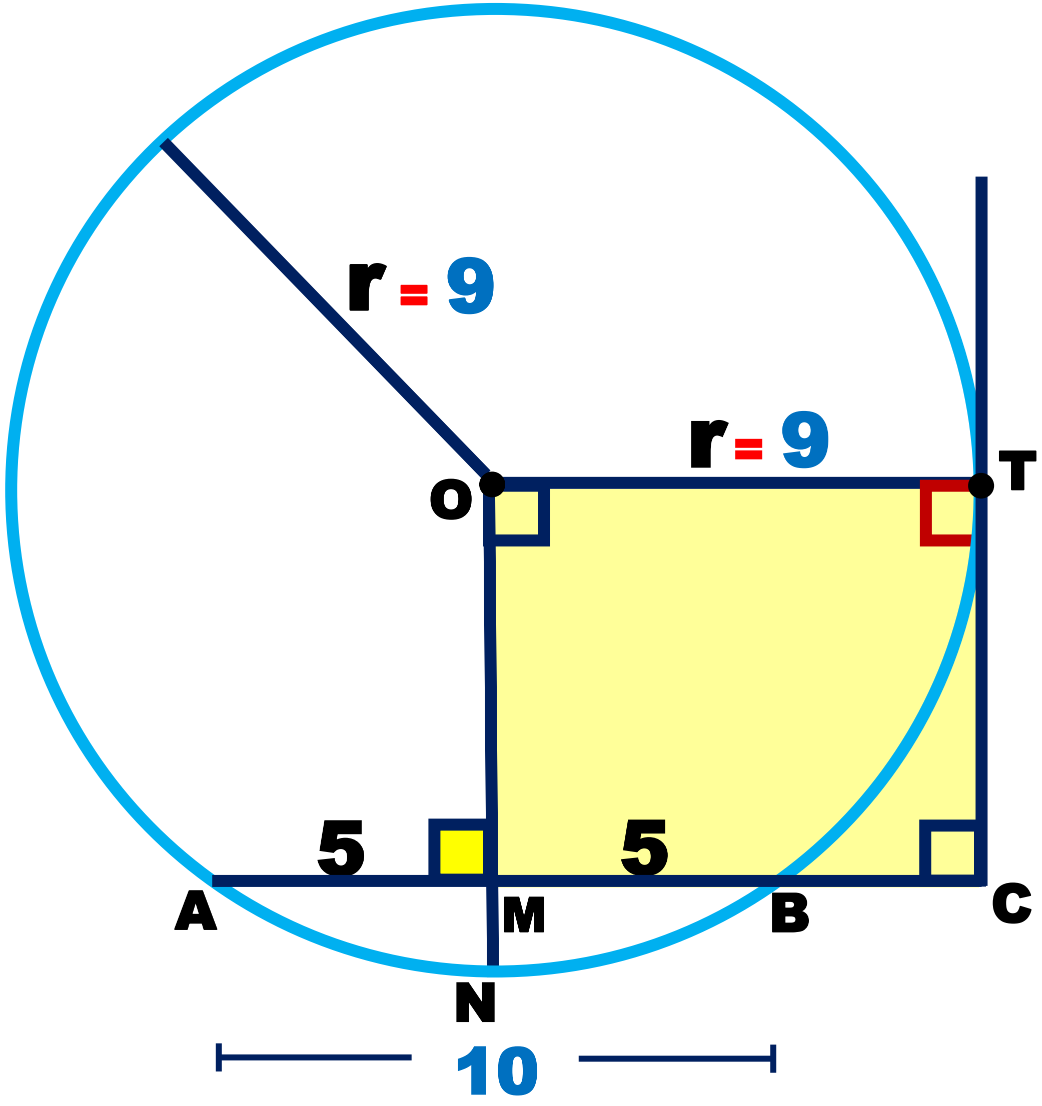
Tomo III

4th
SECONDARY

RETROALIMENTACIÓN

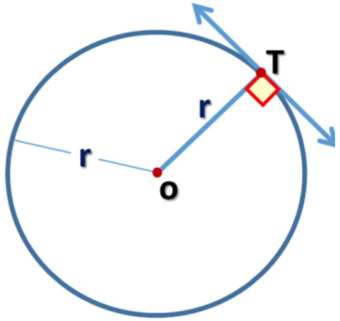
SACO OLIVEROS

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

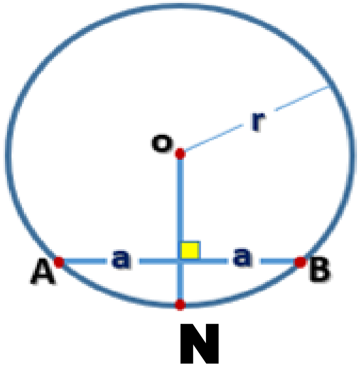


Resolución

- Trazamos $\overline{OT}$



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



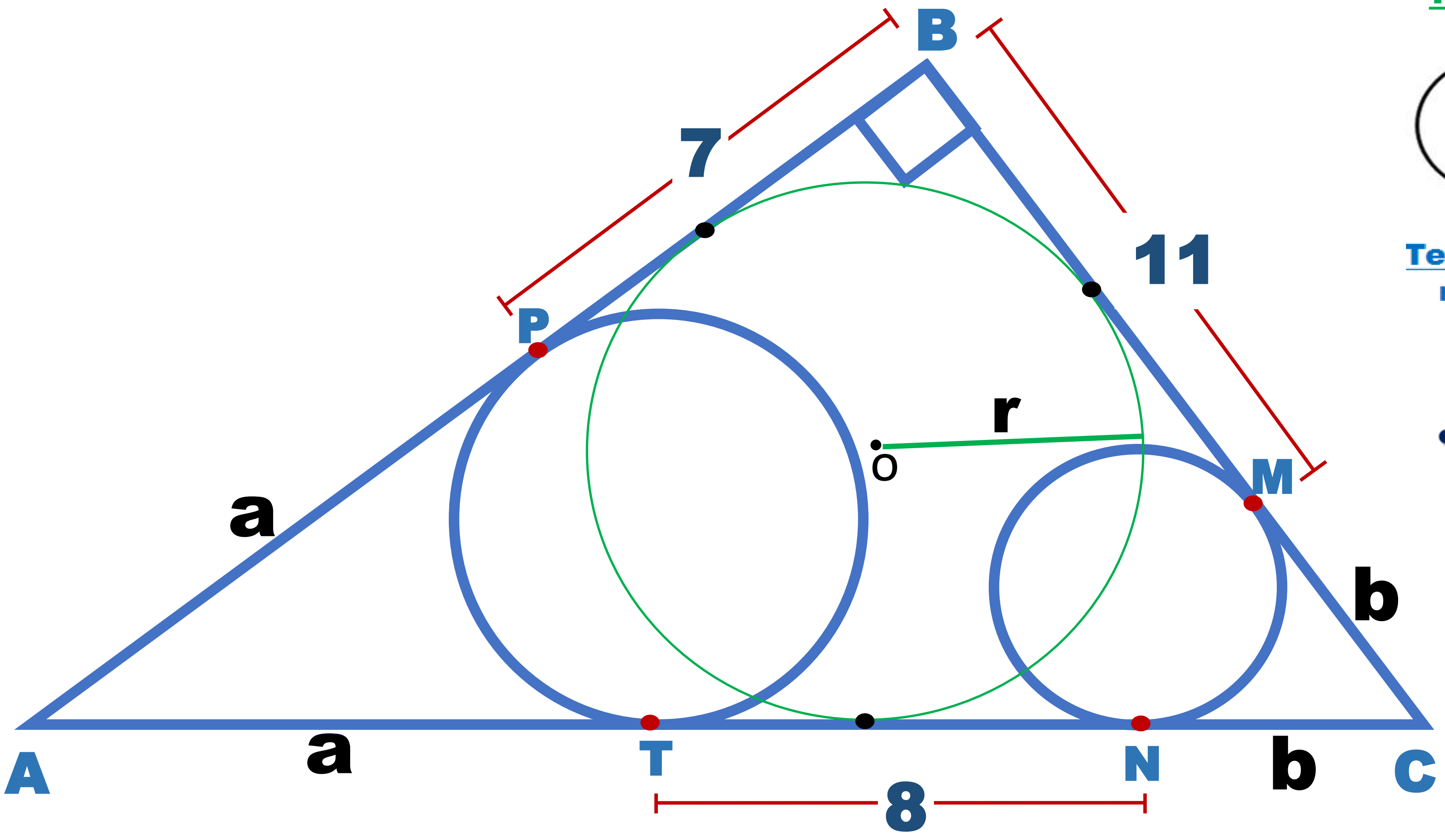
- ▭ OTCM :

OT = MB + BC

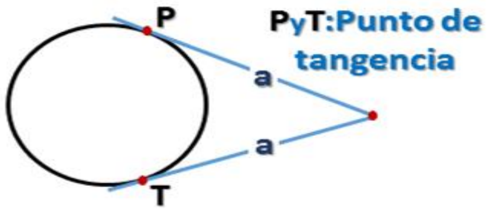
9 = 5 + BC

$\boxed{4 = BC}$

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



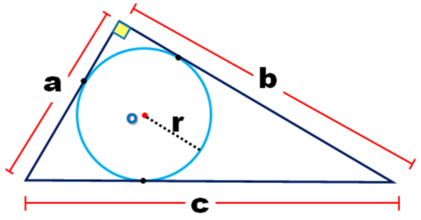
Resolución



Teorema de Poncelet

r: medida del inradio

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



- $\triangle ABC$: T. Poncelet

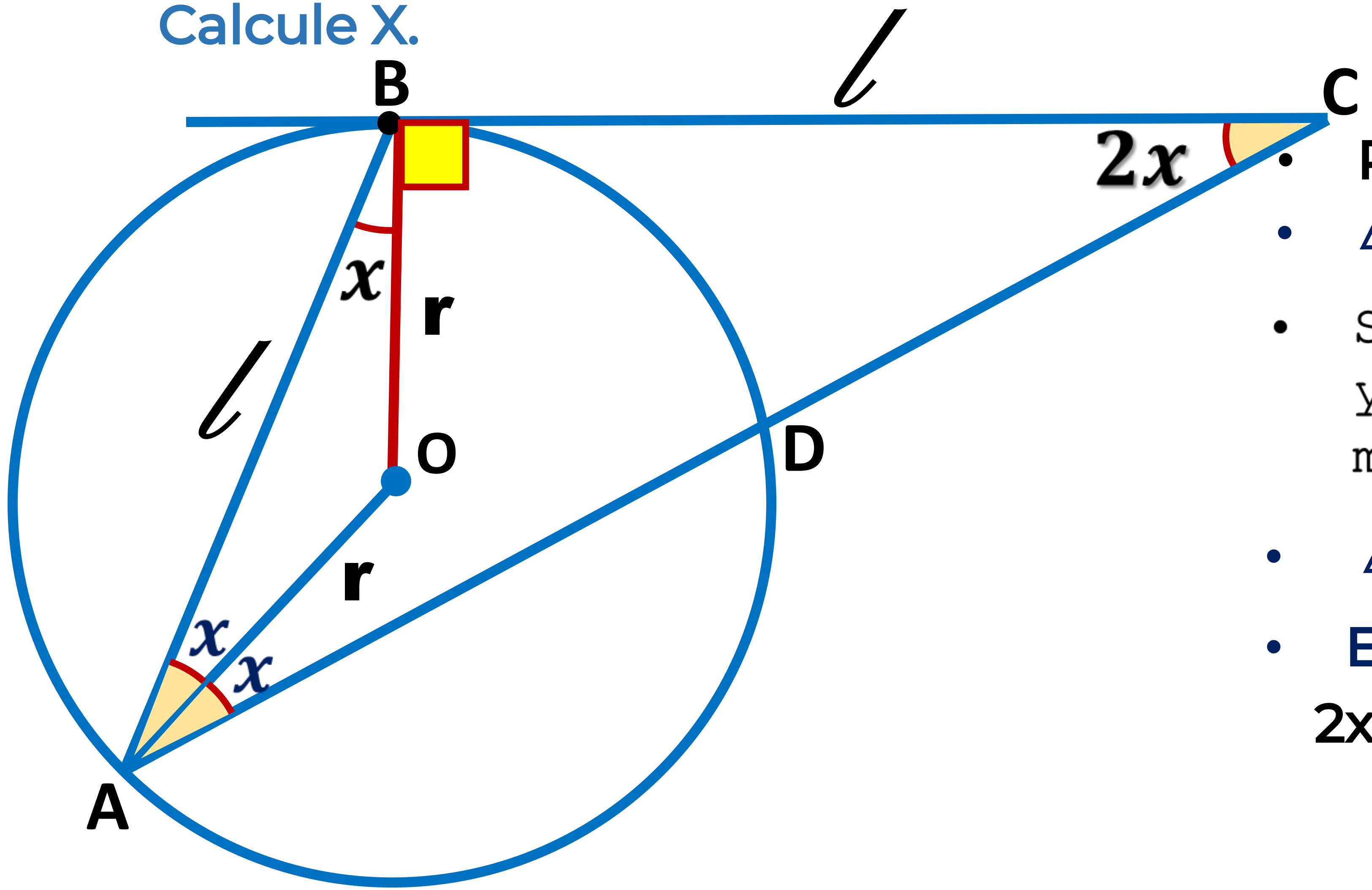
$$\cancel{a}+7+11+\cancel{b}=\cancel{a}+8+\cancel{b}+2r$$

$$18 = 8 + 2r$$

$$10 = 2r$$

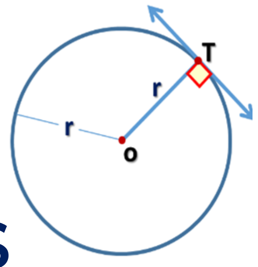
$$\boxed{r = 5}$$

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°



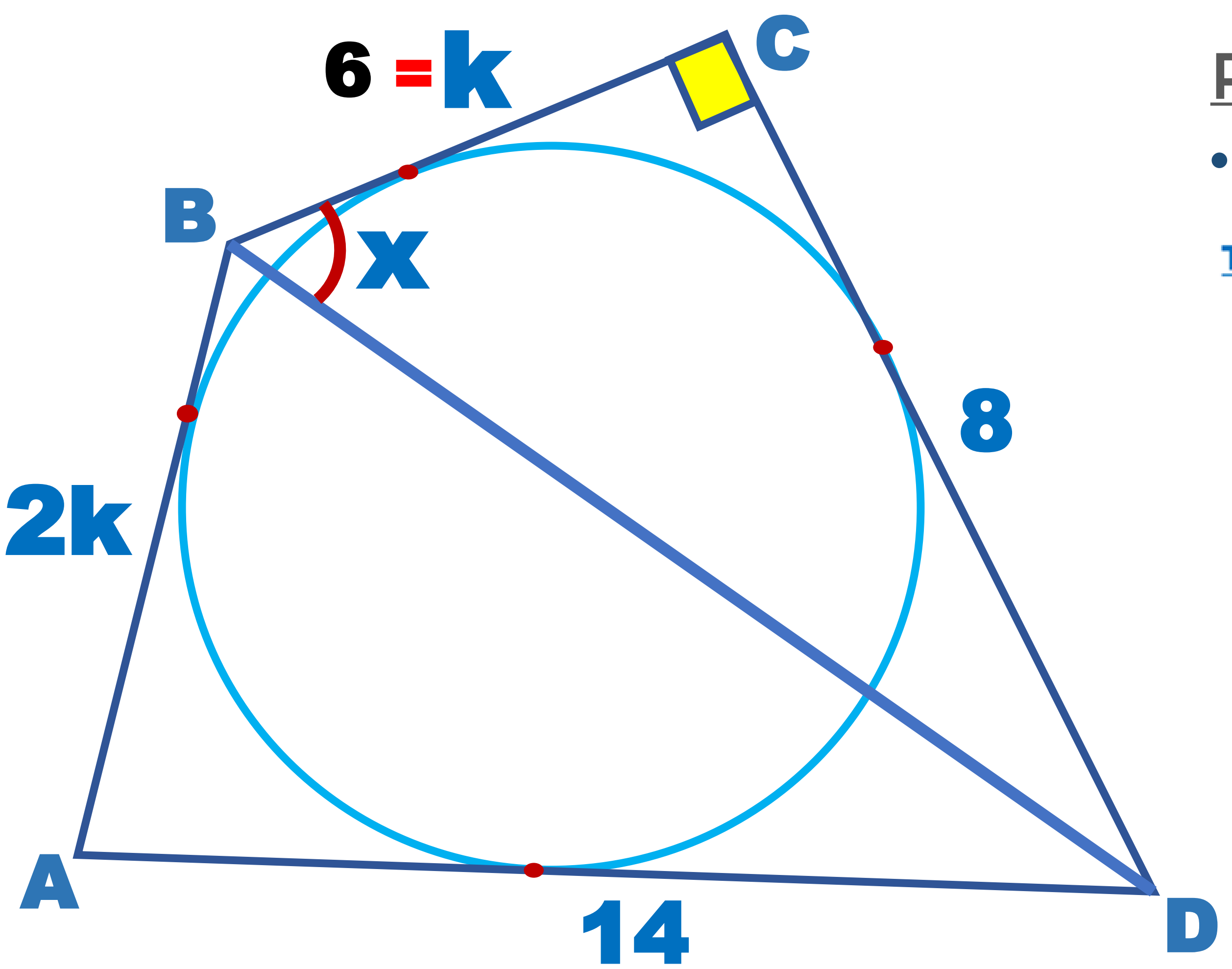
- △ ABO : ISÓSCELES
- En el △ ABC:

$$2x + x + 90° + 2x = 180°$$

$$5x = 90°$$

$$\boxed{x = 18°}$$

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

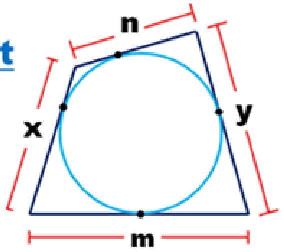
Por dato

- AB = 2(BC)

BC = k
AB = 2k

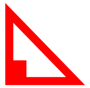
Teorema de Pitot

$x + y = m + n$



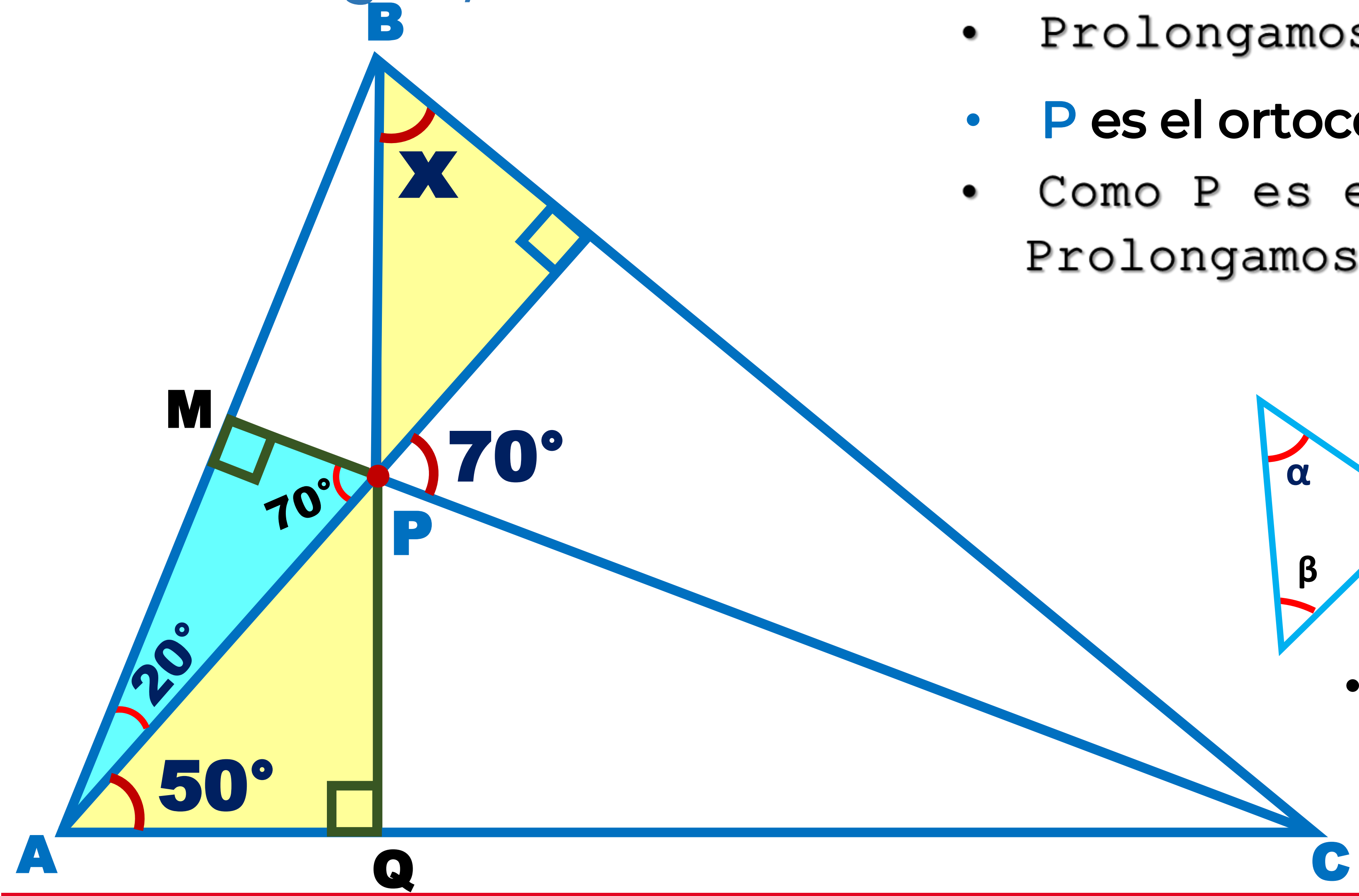
$2k + 8 = 14 + k$

$k = 6$

-  notable 37°y 53°

$\boxed{x = 53°}$

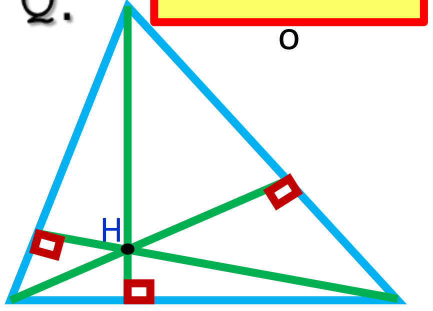
5. En la figura, calcule x.

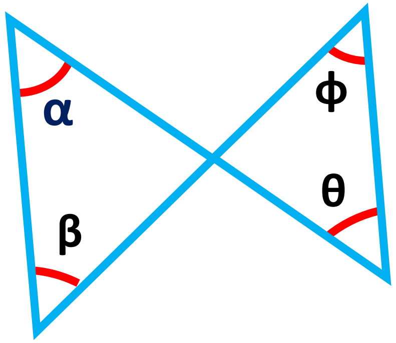


Resolución

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

H:Ortocentro





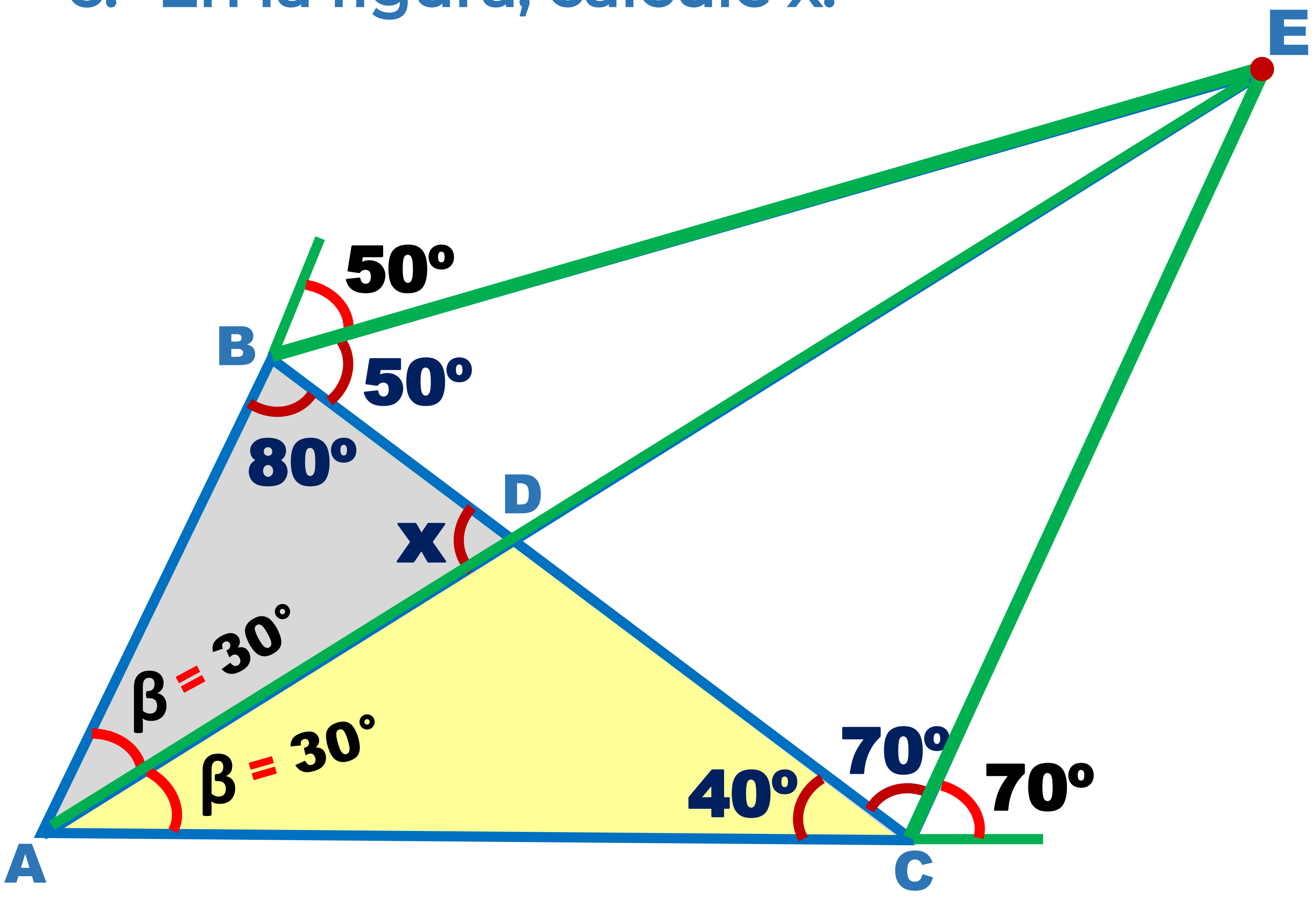
$\alpha + \beta = \theta + \phi$

- Del gráfico

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

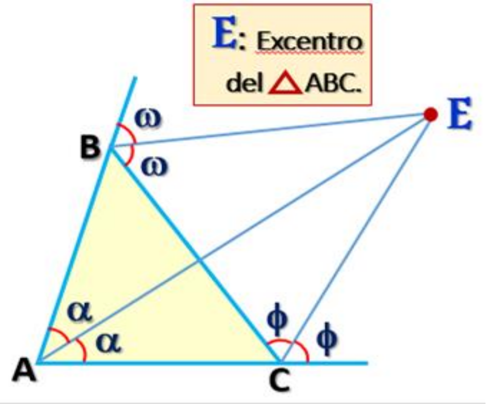
$\boxed{x = 50}$

6. En la figura, calcule x.



Resolución

- E es el excentro del △ABC.



- △ABC :

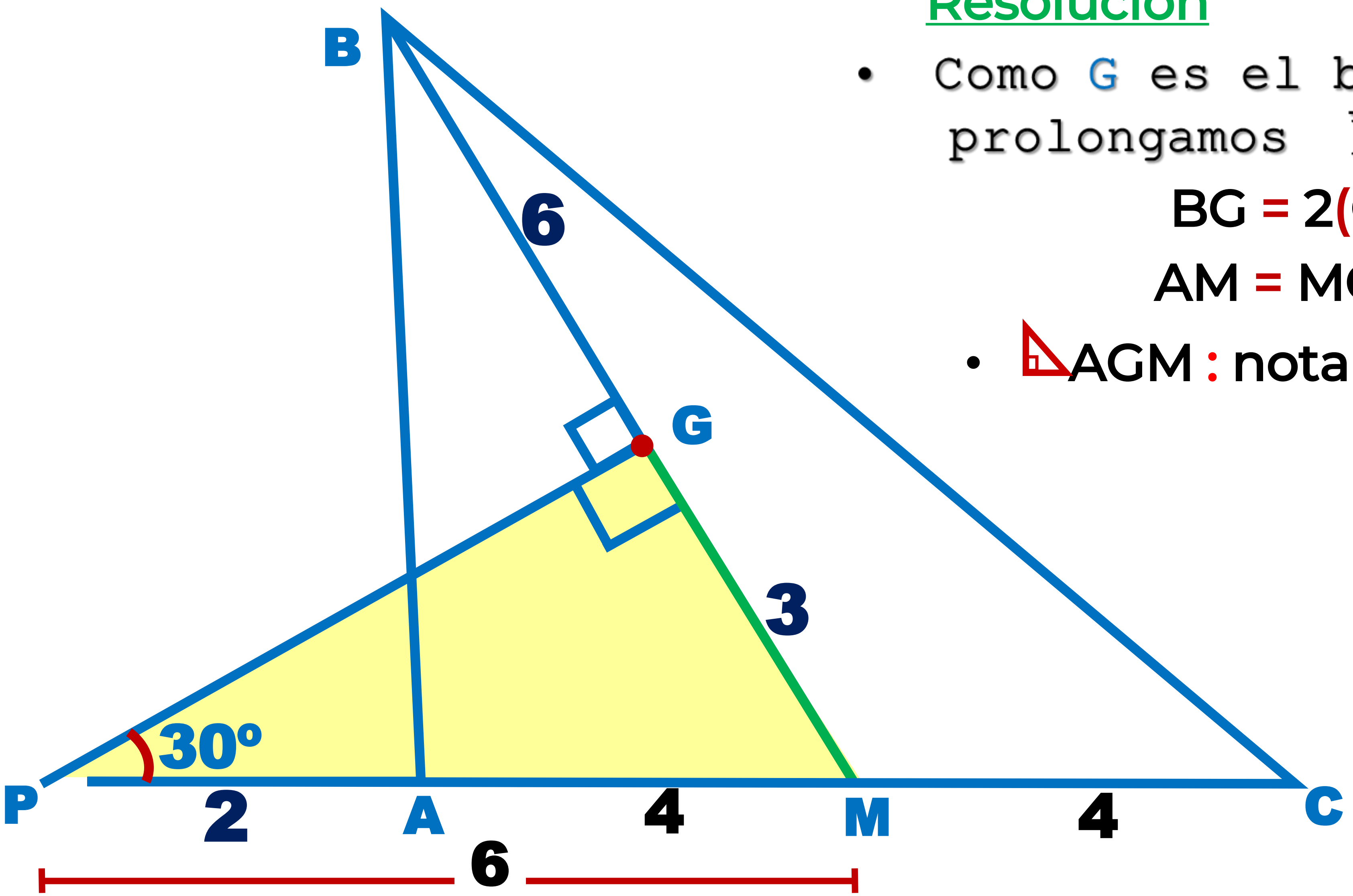
$$2\beta + 80° + 40° = 180°$$
$$2\beta = 60°$$
$$\beta = 30°$$

- △ADC :

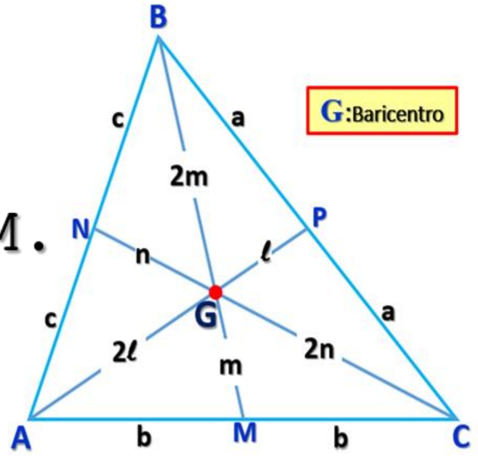
$$x = 30° + 40°$$

$$\boxed{x = 70°}$$

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.

$BG = 2(GM)$

$AM = MC$

- ⊿AGM : notables de 30° y 60°.

$PM = 6$

- $PA + AM = PM$

  $2 + AM = 6$

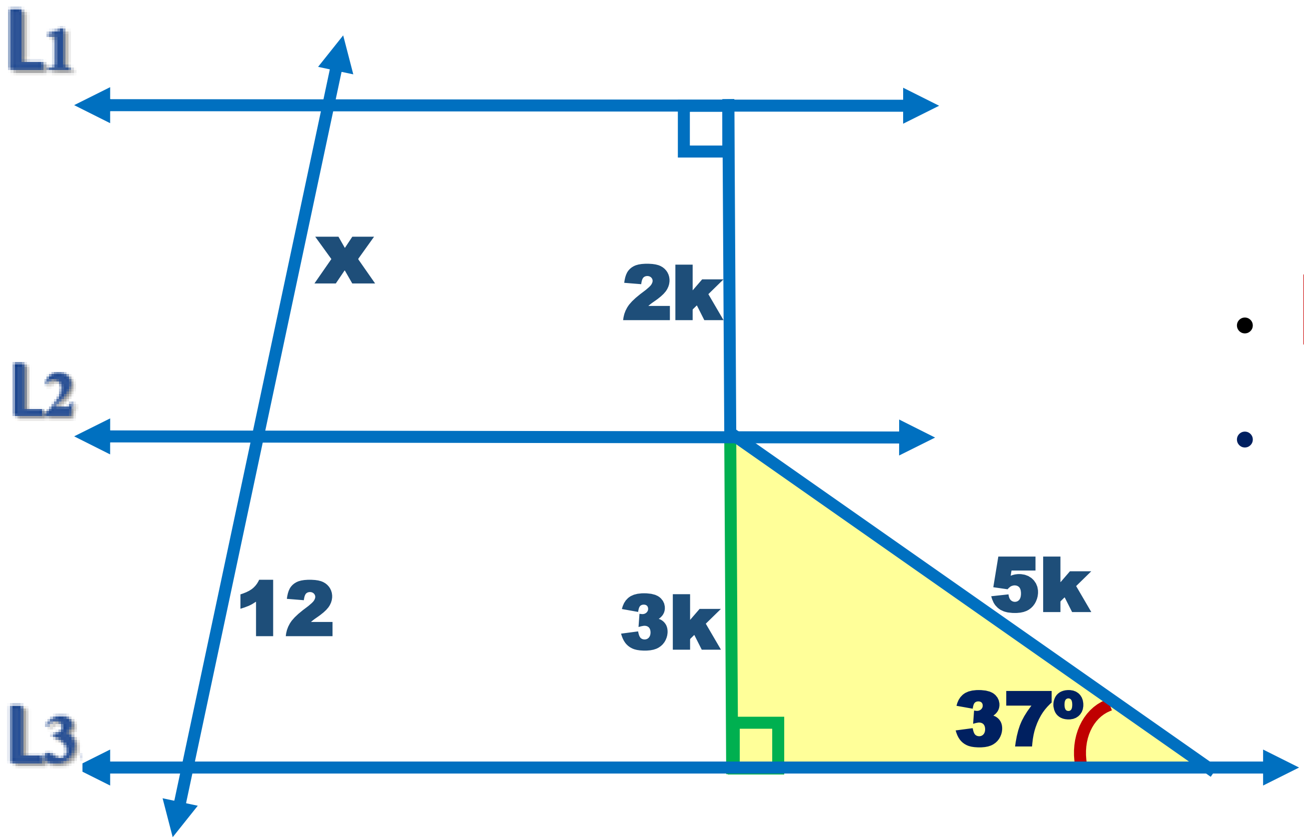
  $AM = 4$

- $AC = AM + CM$

  $AC = 4 + 4$

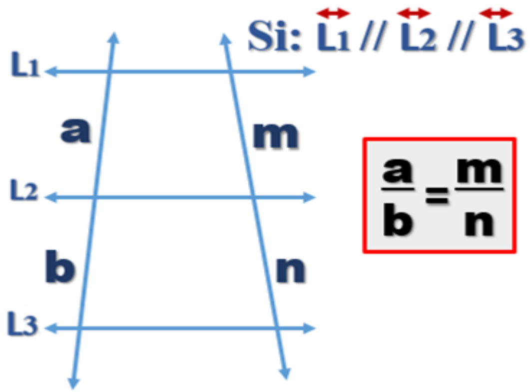
  $\boxed{AC = 8}$

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



Resolución

Teorema de Tales



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

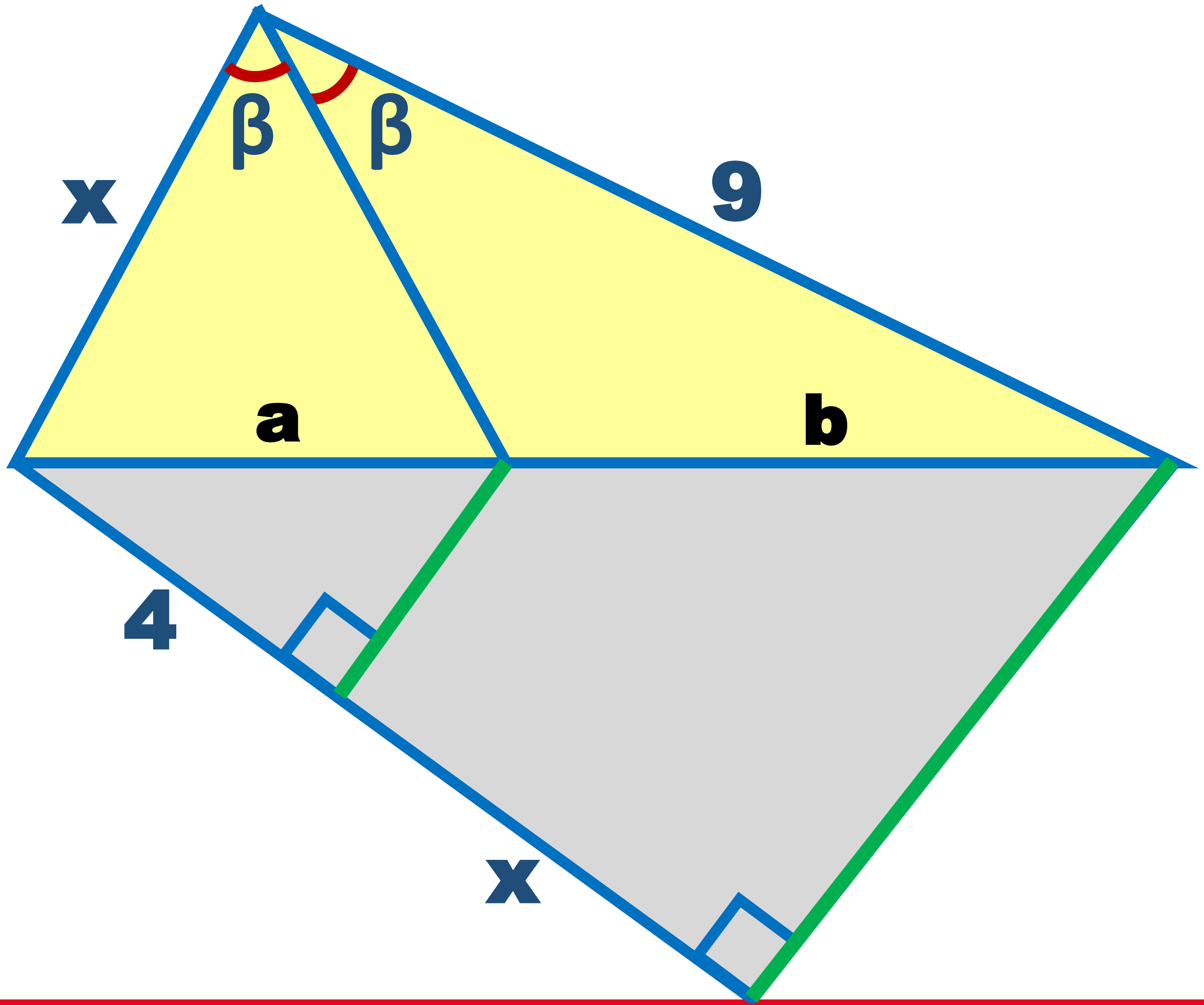
- ◺ notables de 37° y 53°.
- Por teorema de Tales

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

$$3x = 2(12)$$

$$\boxed{x = 8}$$

9. En la figura, calcule x.



Resolución

- Teorema de la bisectriz interior

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

- Corolario de Tales

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

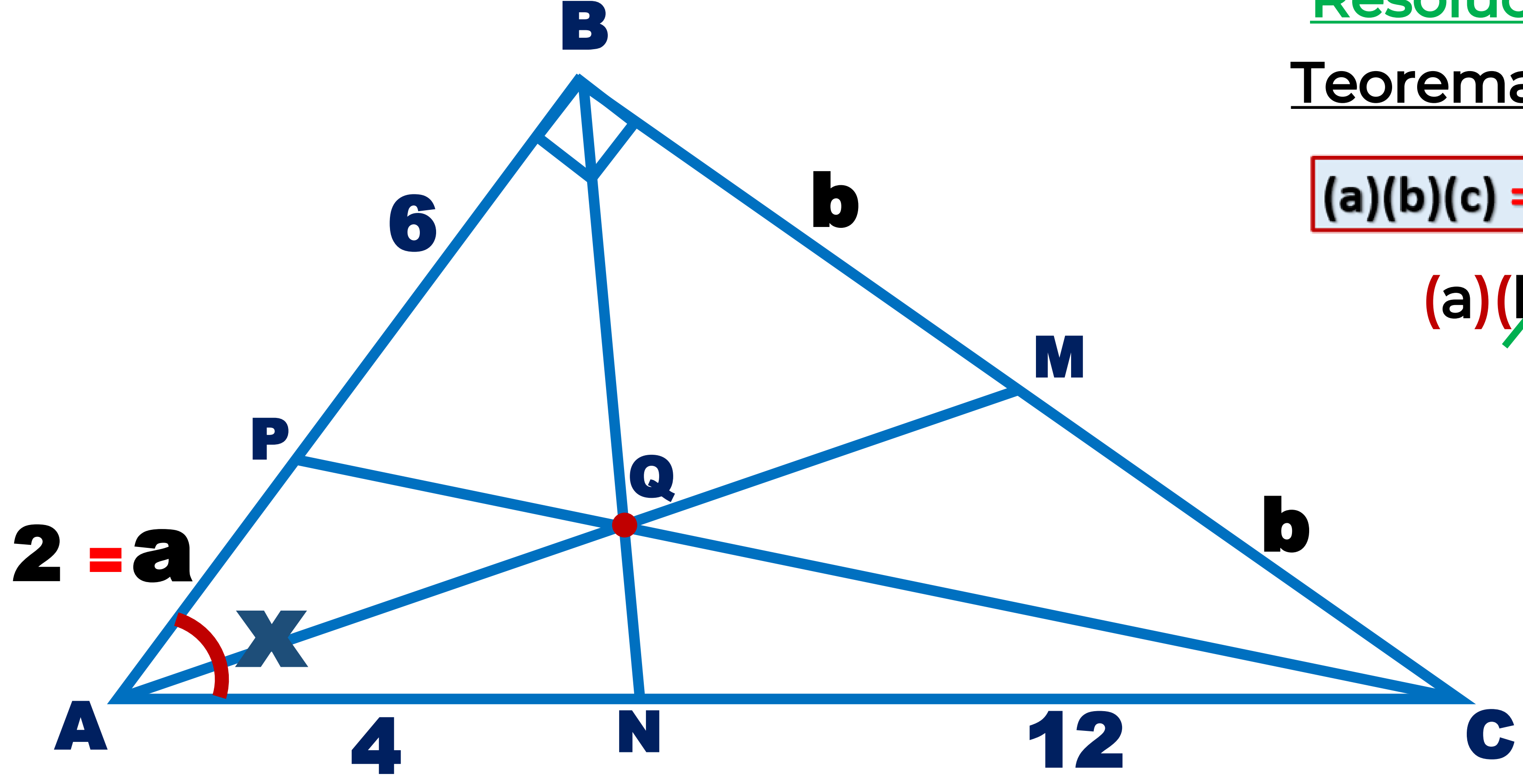
- Igualando 1 y 2

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

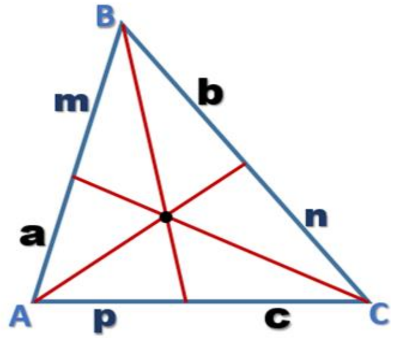
$$x^2 = 36$$

$$\boxed{x = 6}$$

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

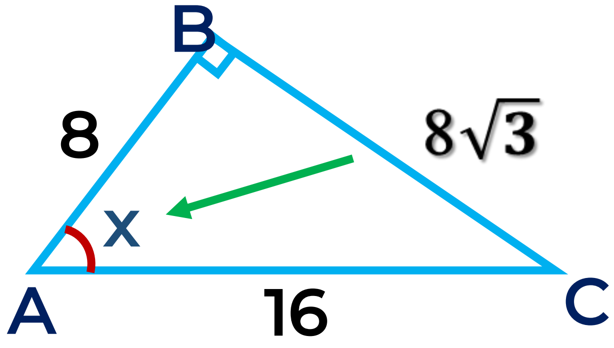


Teorema de Ceva

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

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

$$a = 2$$



ΔABC : Notable de 30° y 60°

$$\boxed{x = 60°}$$