



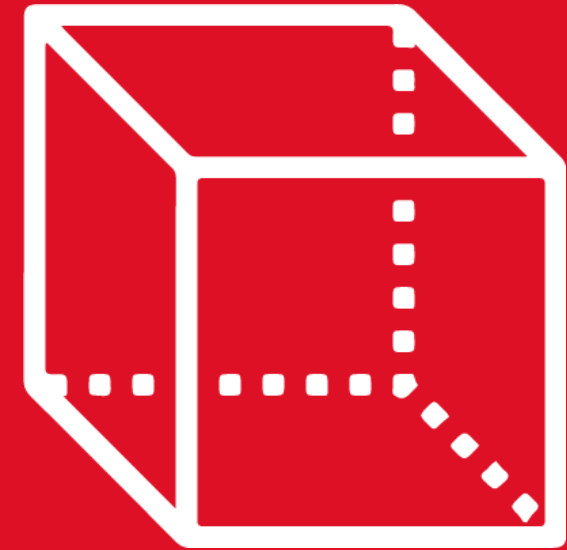
# GEOMETRÍA

Tomo III

**4th**  
SECONDARY

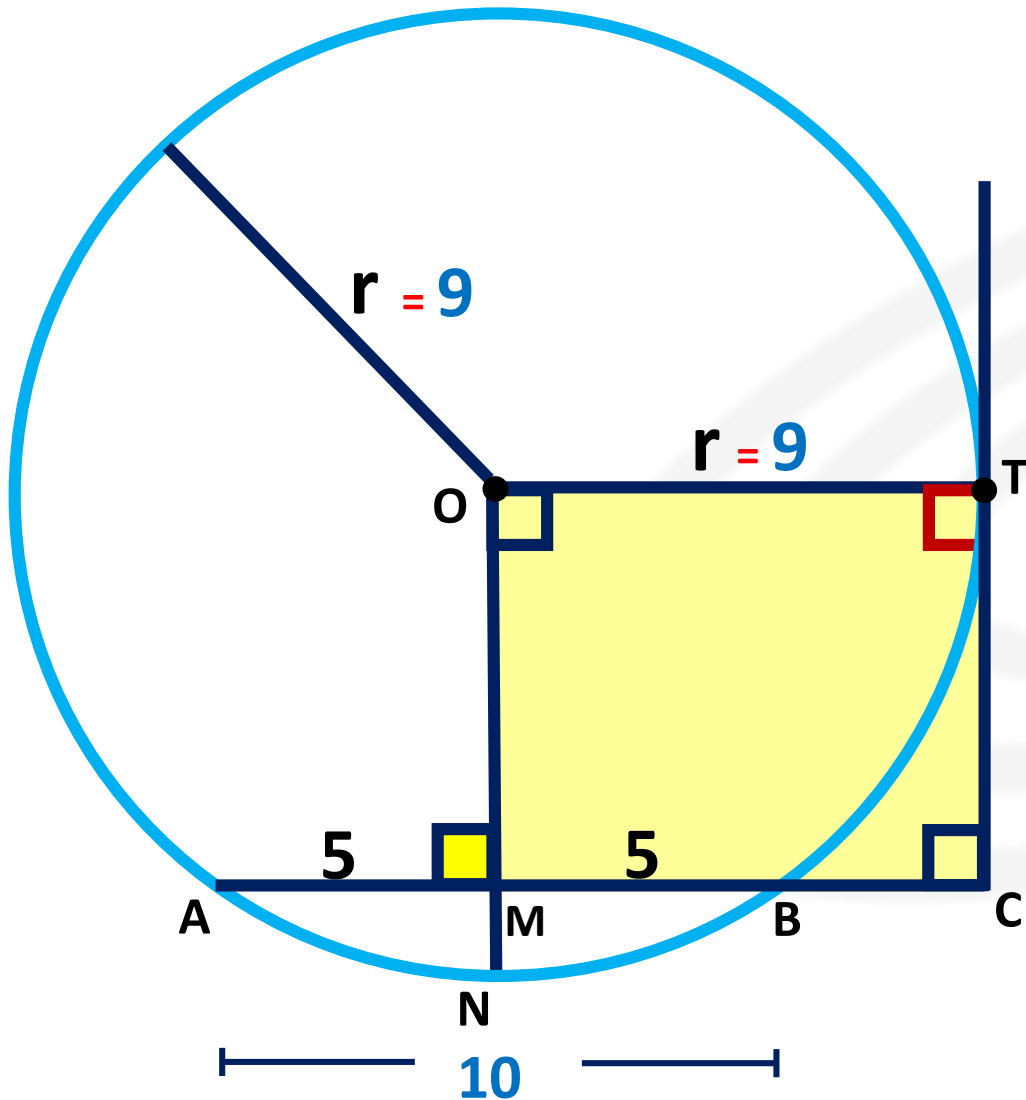
**RETROALIMENTACIÓN**

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 **SACO OLIVEROS**

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



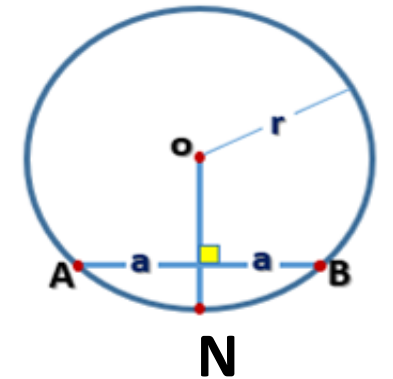
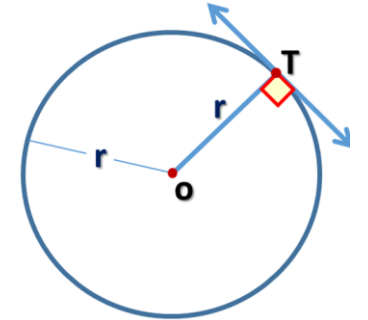
### Resolución

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

$$OT = MB + BC$$

$$9 = 5 + BC$$

$$4 = BC$$



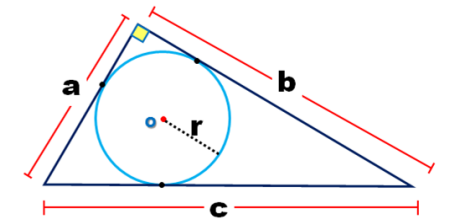
2. En la figura, calcule la longitud del inradio del triángulo ABC.

Resolución

**Teorema de Poncelet**

$r$ : medida del inradio

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



• Piden  $r$

•  $\triangle ABC$

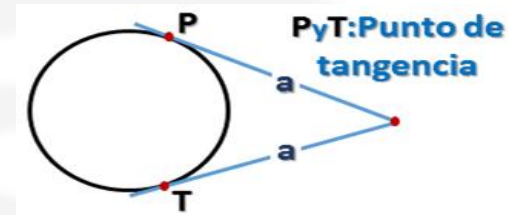
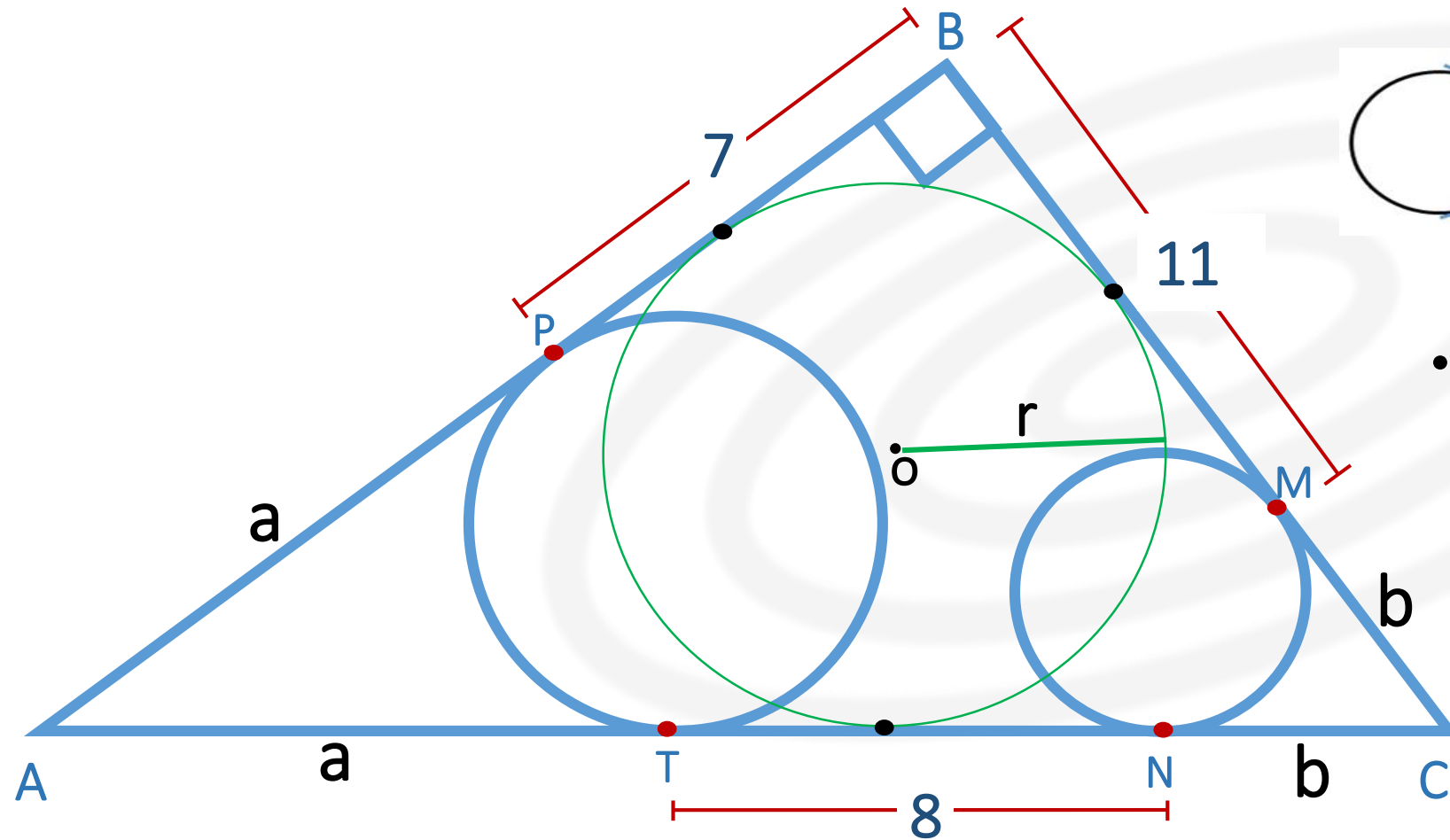
T. Poncelet

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

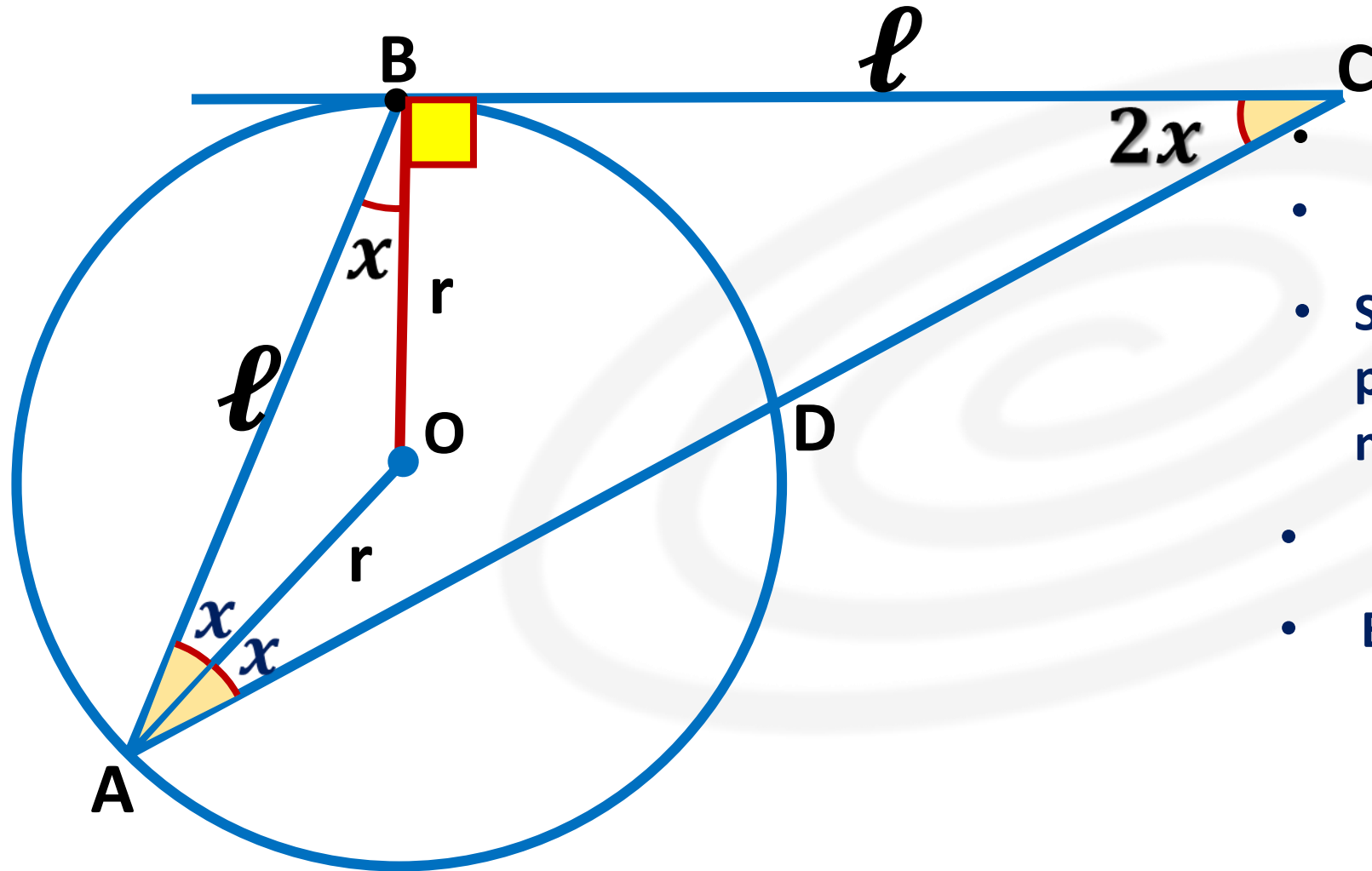
$$18 = 8 + 2r$$

$$10 = 2r$$

$$r = 5$$



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



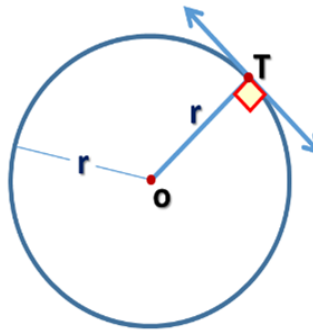
### Resolución

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

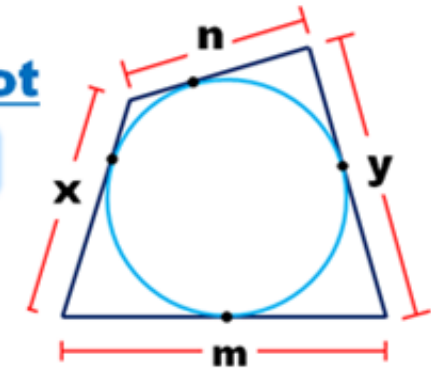
### Resolución

Por dato

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

Teorema de Pitot

$$x + y = m + n$$

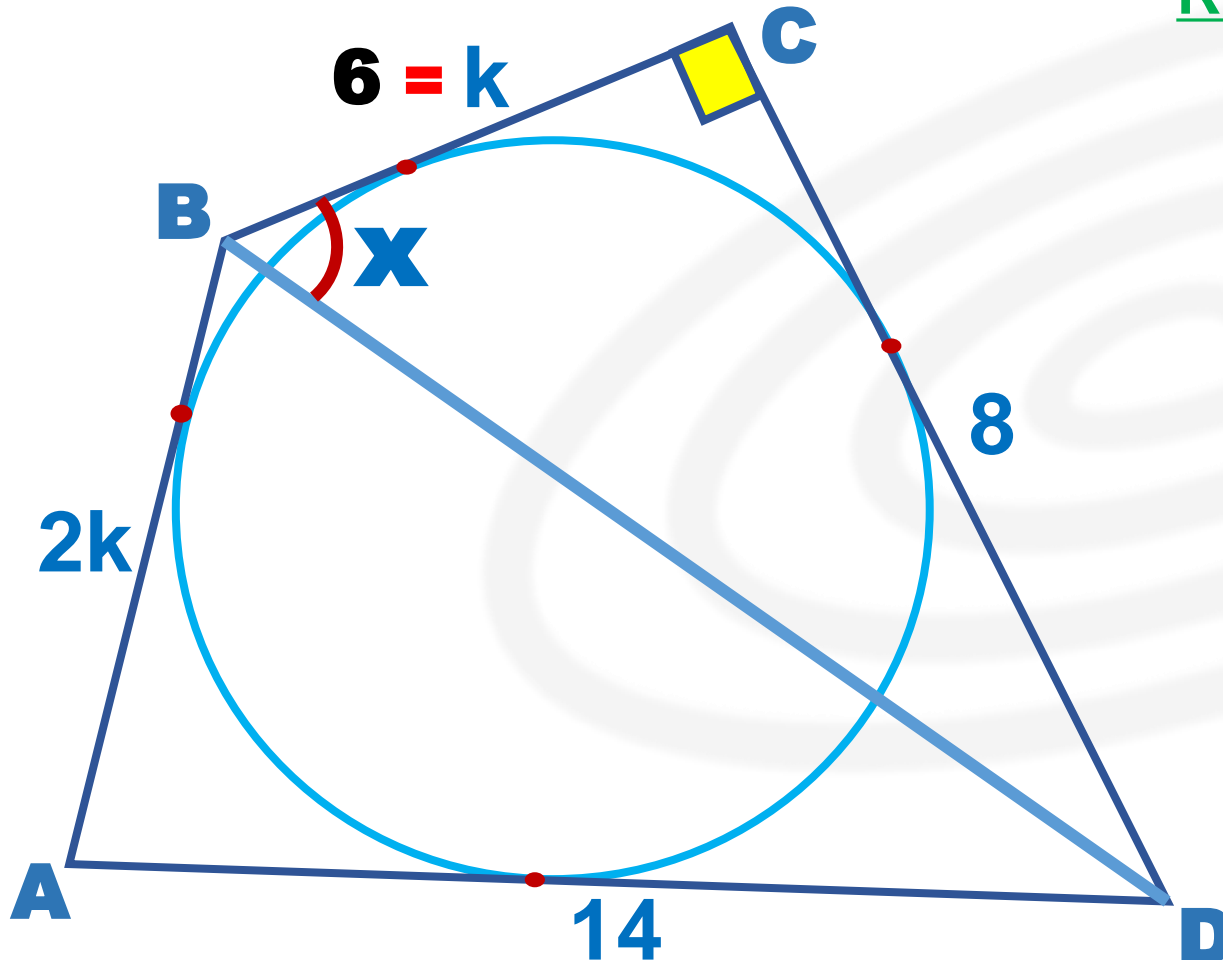


$$2k + 8 = 14 + k$$

$$k = 6$$

-  notable  $37^\circ$  y  $53^\circ$

$$x = 53^\circ$$

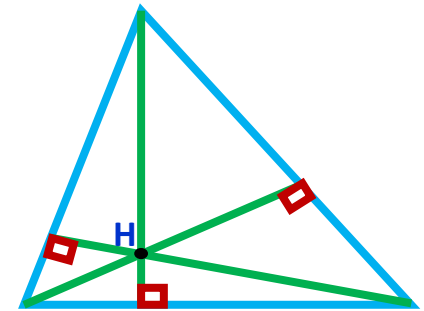


5. En la figura, calcule x.

### Resolución

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

H:Ortocentro

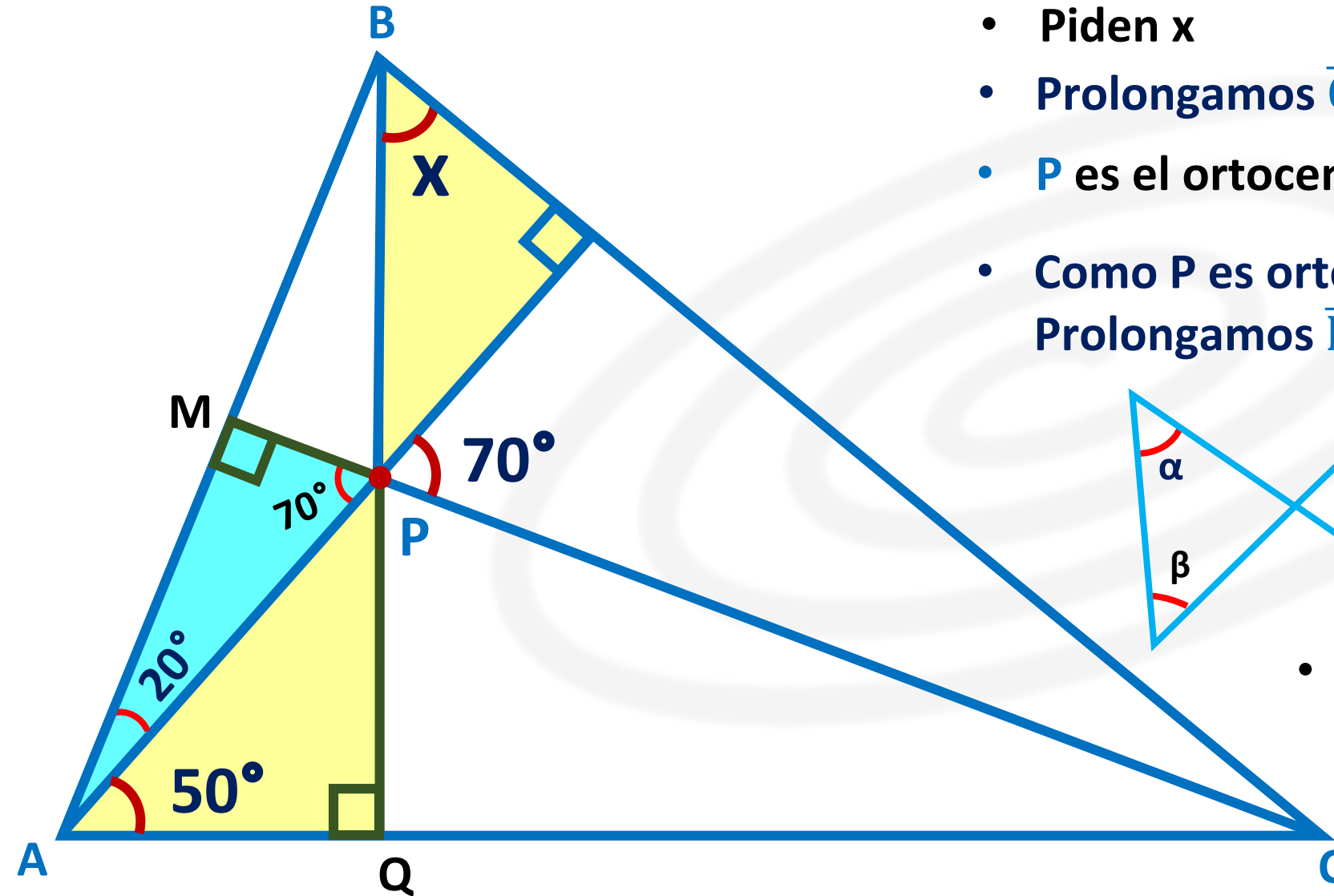


$$\alpha + \beta = \theta + \phi$$

- Del gráfico

$$x + 90^\circ = 50^\circ + 90^\circ$$

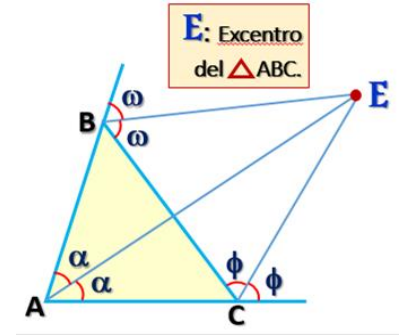
$$x = 50$$



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

### Resolución

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



- $\triangle ABC$ :

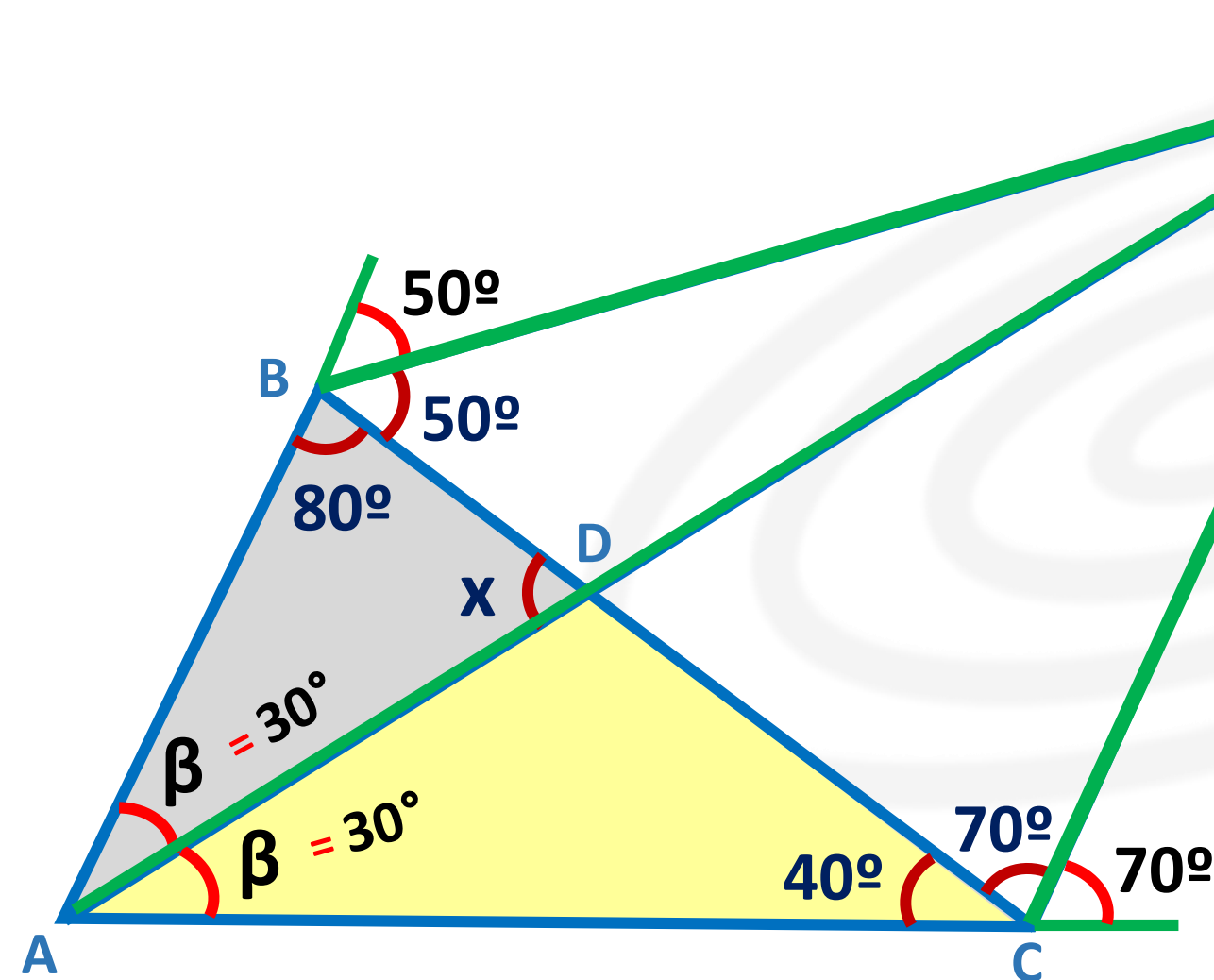
$$2\beta + 80^\circ + 40^\circ = 180^\circ$$

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

$$\beta = 30^\circ$$

- $\triangle ADC$ :  $x = 30^\circ + 40^\circ$

$$x = 70^\circ$$



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

Resolución

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

$$BG = 2(GM)$$

$$AM = MC$$

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

$$PM = 6$$

- $PA + AM = PM$

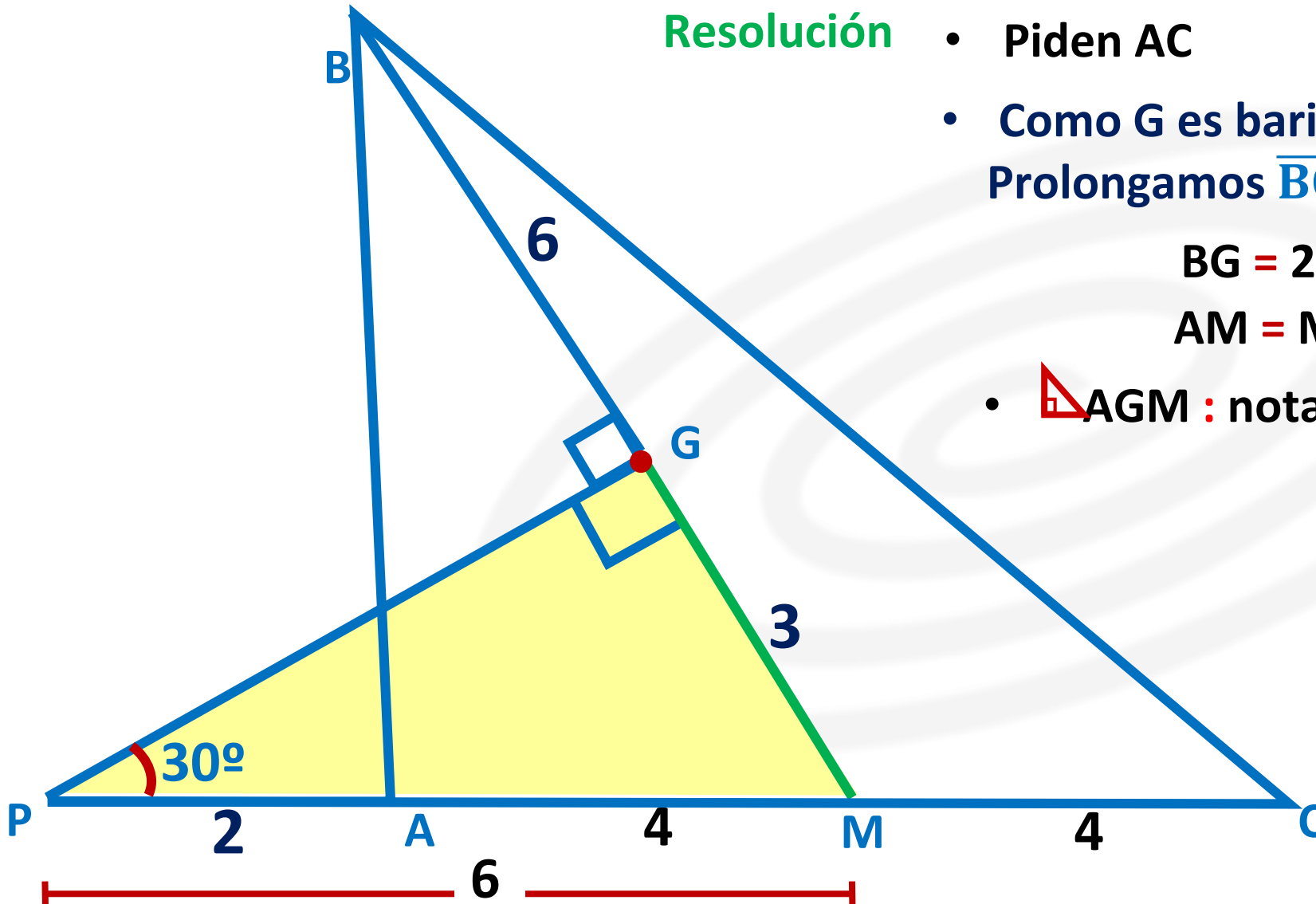
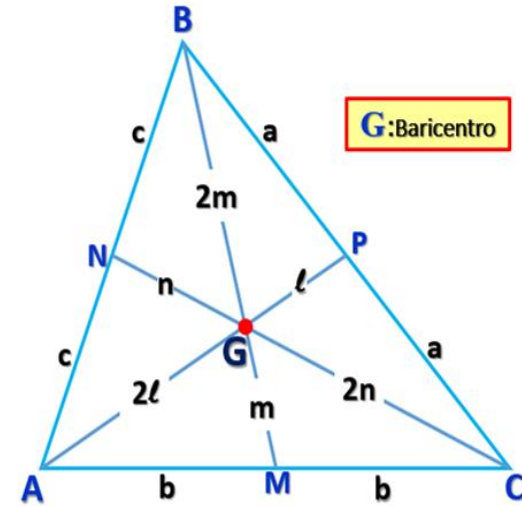
$$2 + AM = 6$$

$$AM = 4$$

- $AC = AM + CM$

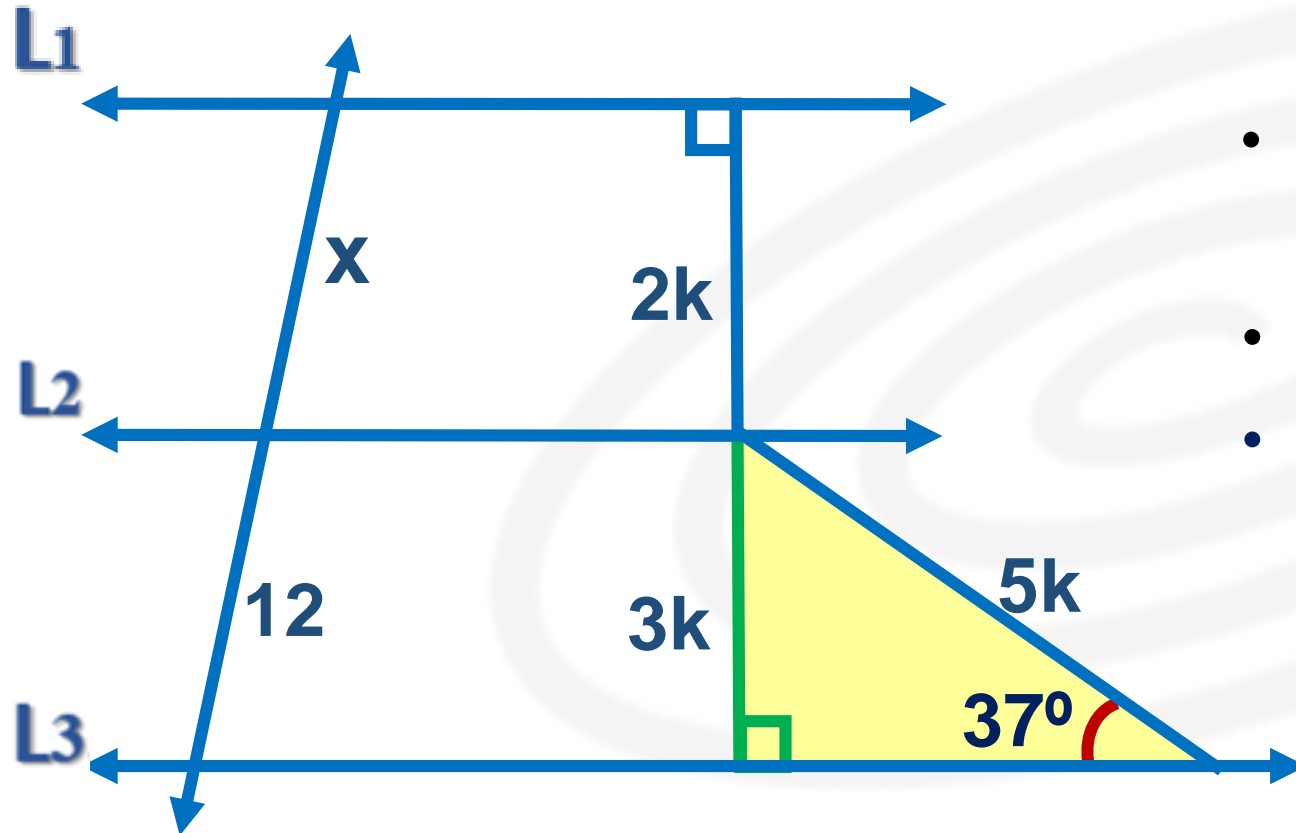
$$AC = 4 + 4$$

$$AC = 8$$






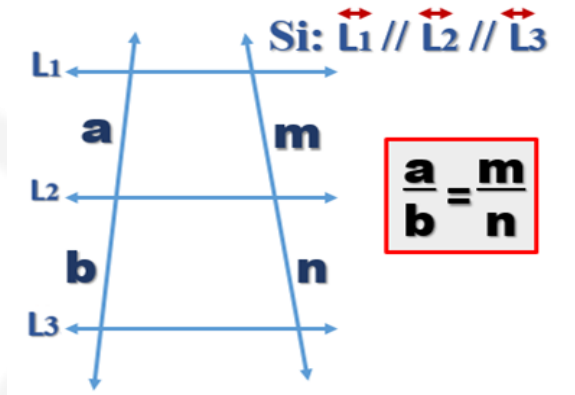
8. En la figura, si  $\vec{L}_1 \parallel \vec{L}_2 \parallel \vec{L}_3$ . Halle el valor de x.



### Resolución

- Piden x
-  notables de  $37^\circ$  y  $53^\circ$ .
- Por teorema de Tales

### Teorema de Tales

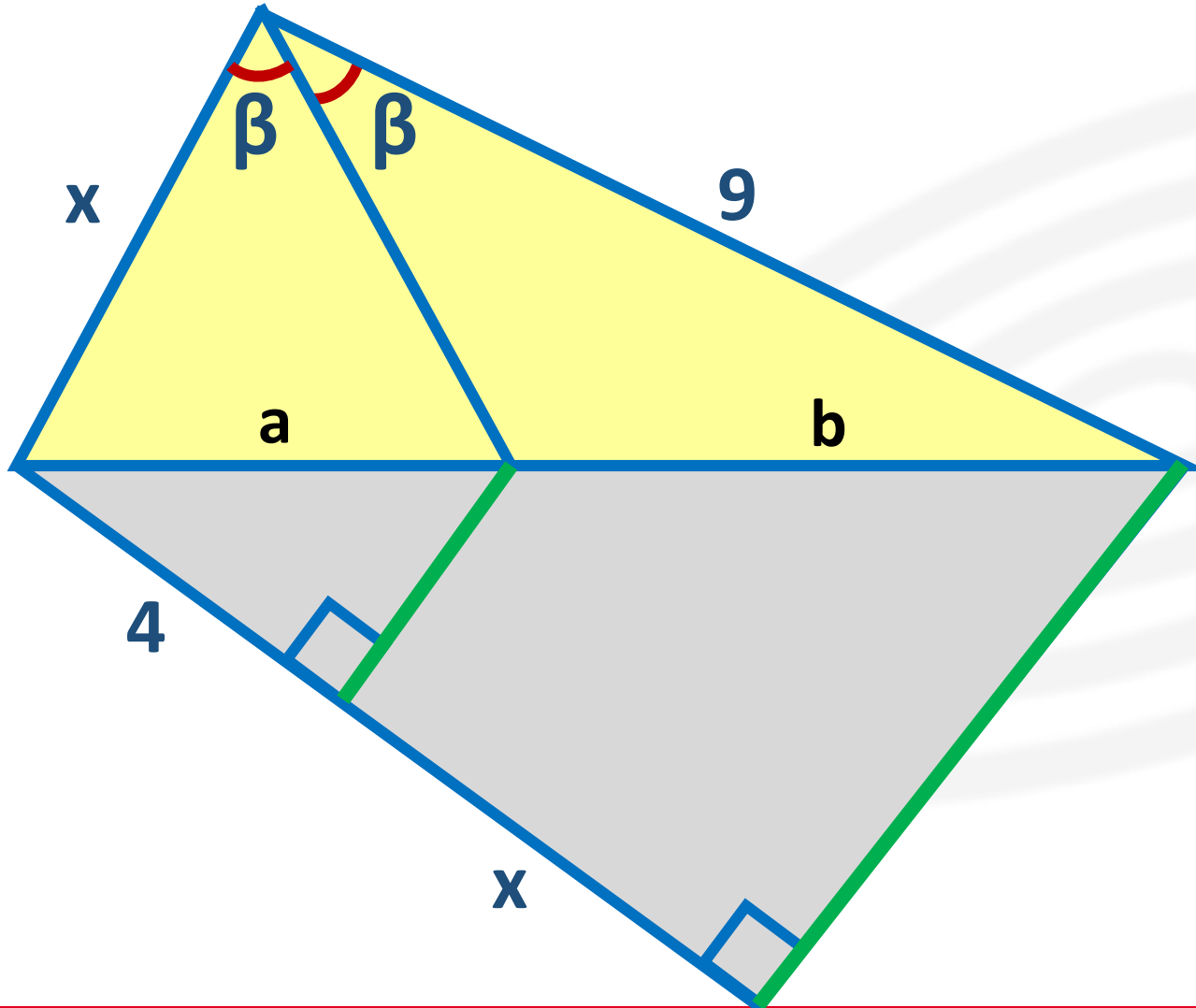


$$\frac{x}{12} = \frac{2k}{3k}$$

$$3x = 2(12)$$

$$x = 8$$

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



### Resolución

- Piden  $x$
- Teorema de la bisectriz interior

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

- Corolario de Tales

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

- 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  $m\angle BAC$ .

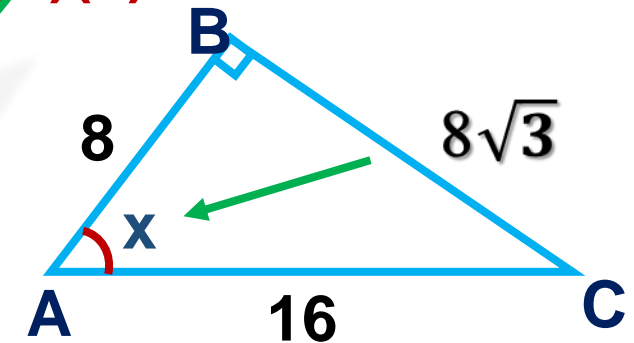
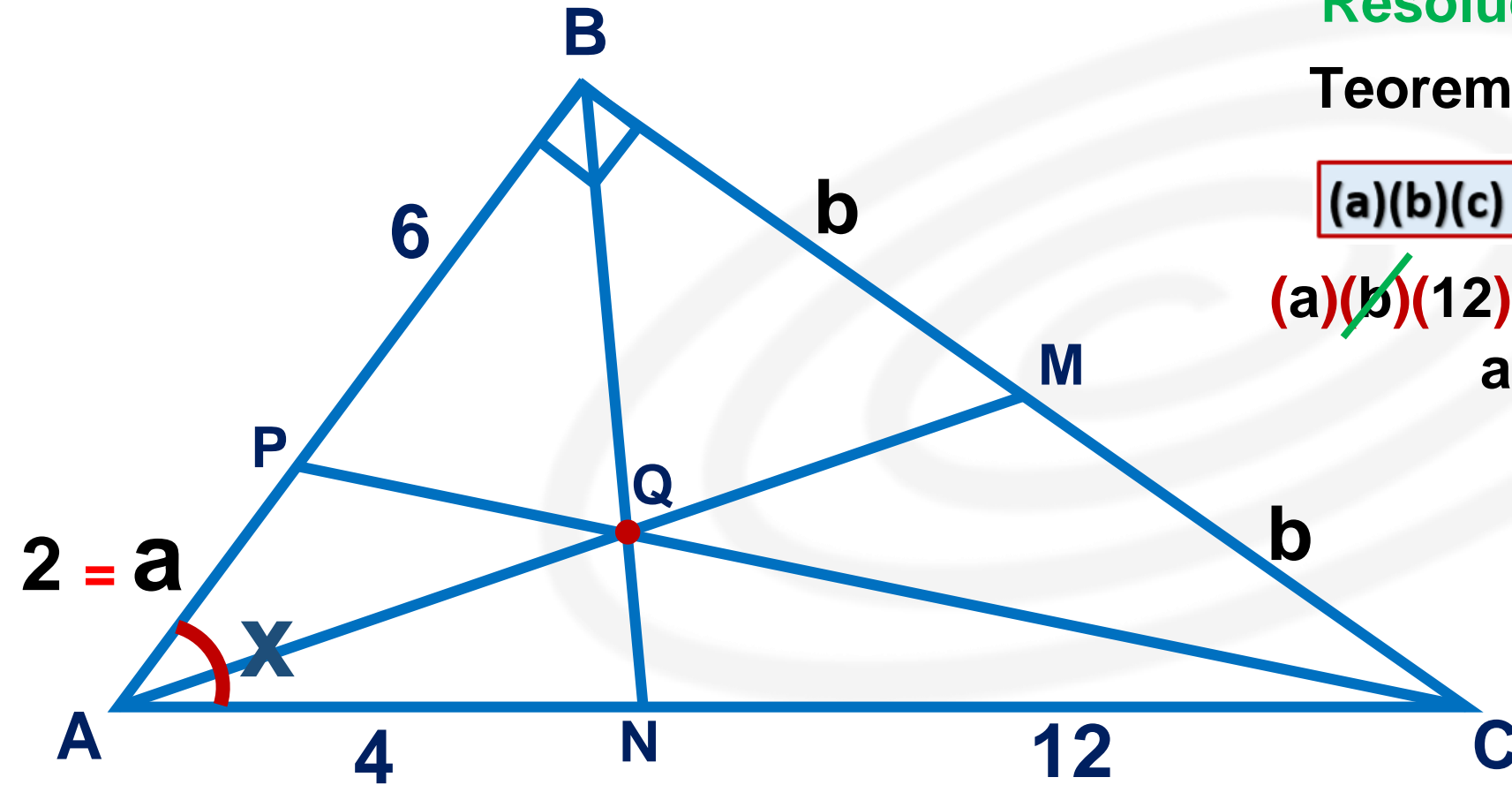
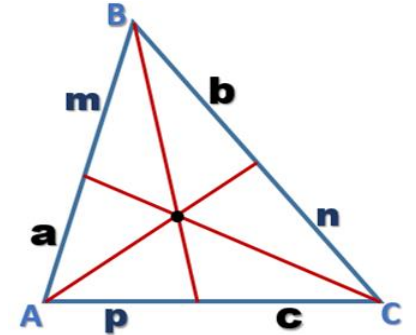
### Resolución

Teorema de Ceva

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

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

$$a = 2$$



$\triangle ABC$ :

Notable de  $30^\circ$  y  $60^\circ$

$$x = 60^\circ$$