GEOMETRÍA

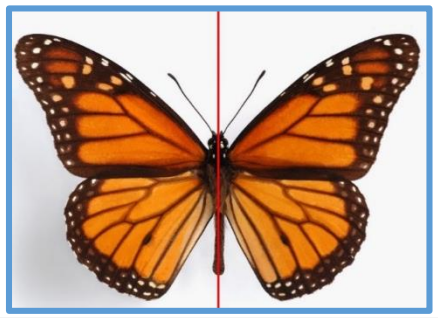
Capítulo 9

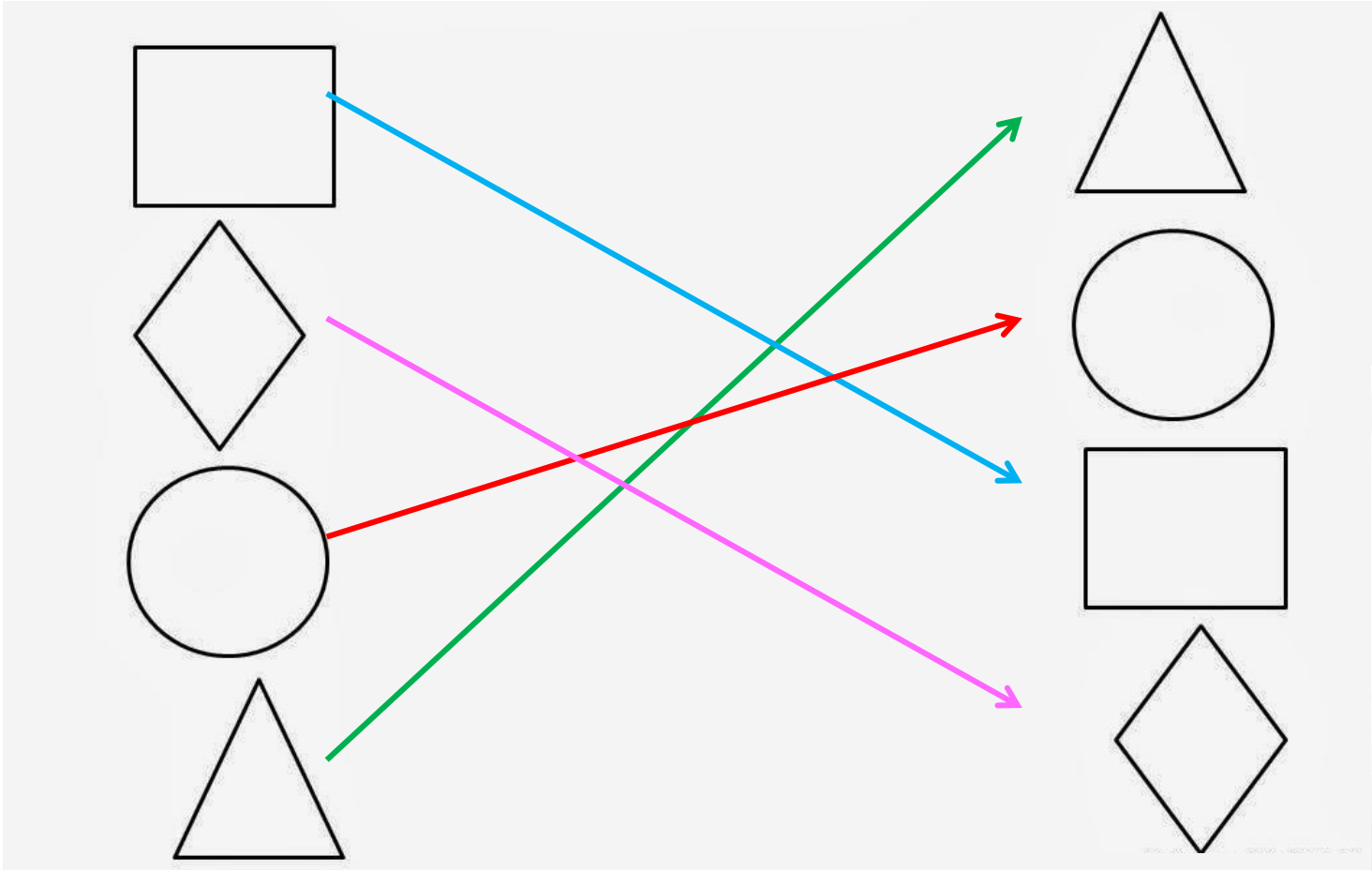
3rd
SECONDARY

APLICACIONES DE LA CONGRUENCIA

SACO OLIVEROS

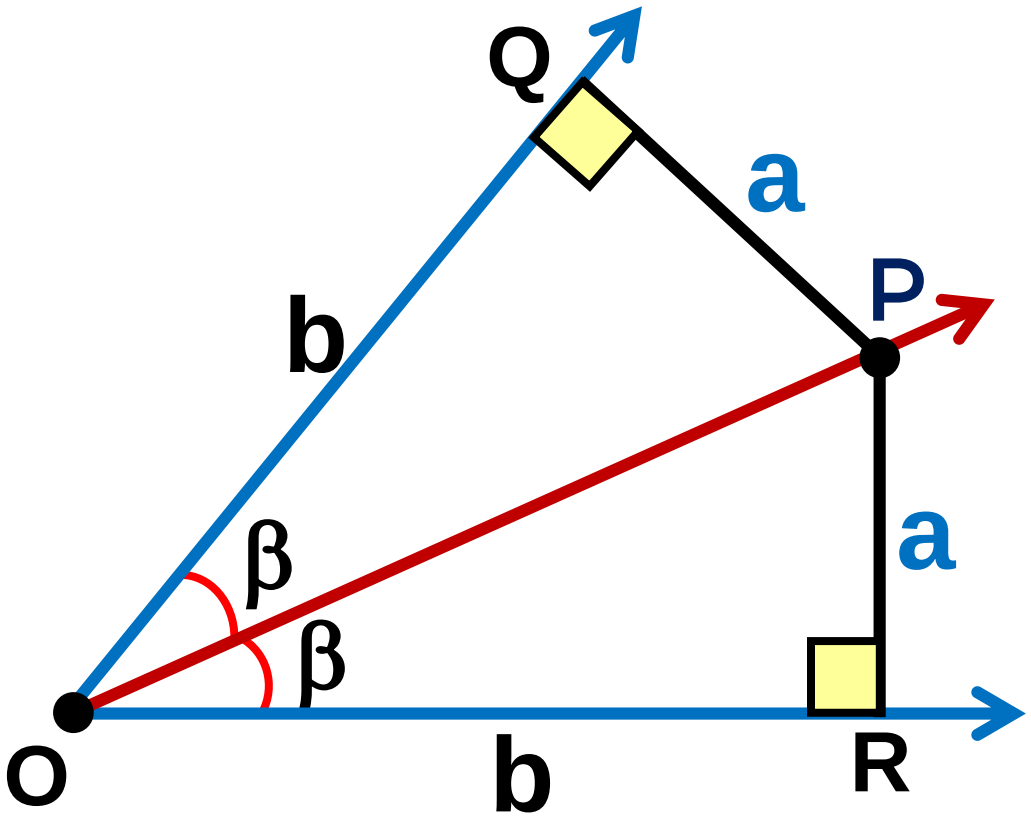
MOTIVATING | STRATEGY



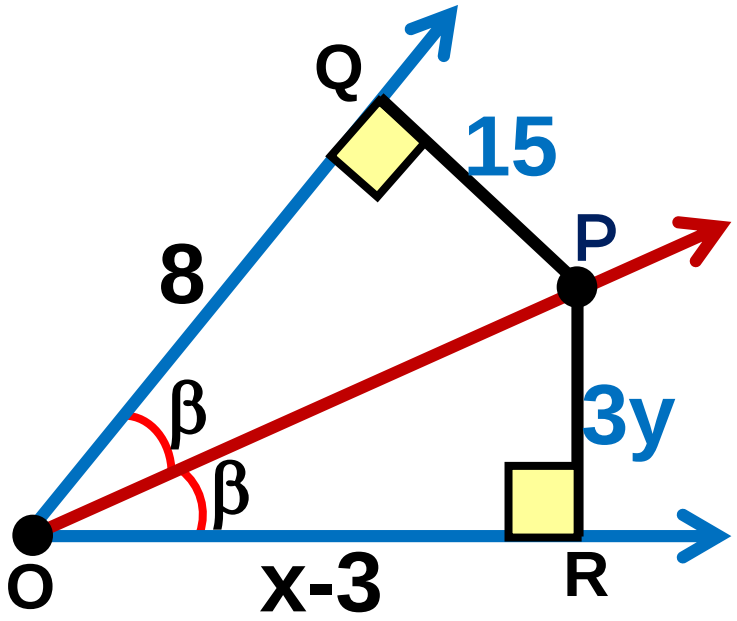


Aplicaciones de la congruencia

1 TEOREMA DE LA BISECTRIZ



Ejemplo: Del gráfico, calcule x + y.



$OR = OQ$ $\quad PQ = PR$

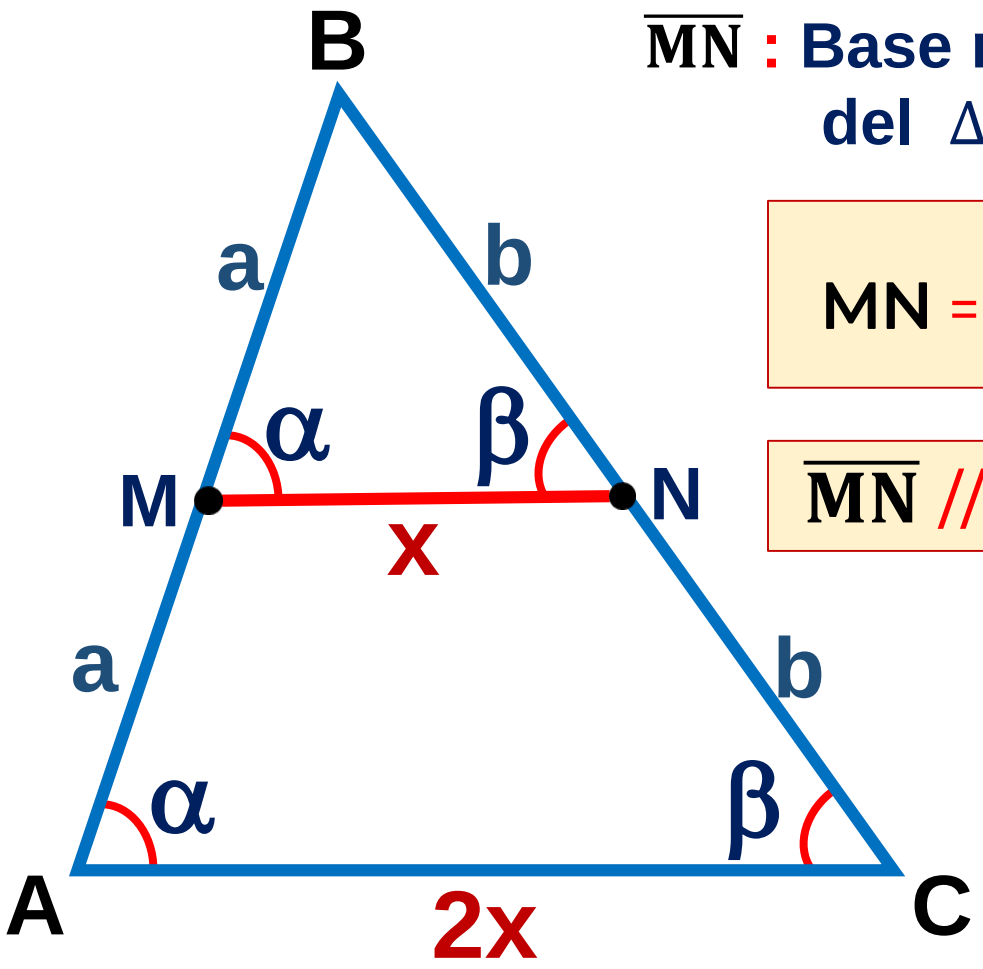
$x - 3 = 8$ $\quad 3y = 15$

$x = 11$ $\quad y = 5$

$x + y = 16$

Aplicaciones de la congruencia

2 TEOREMA DE LA BASE MEDIA

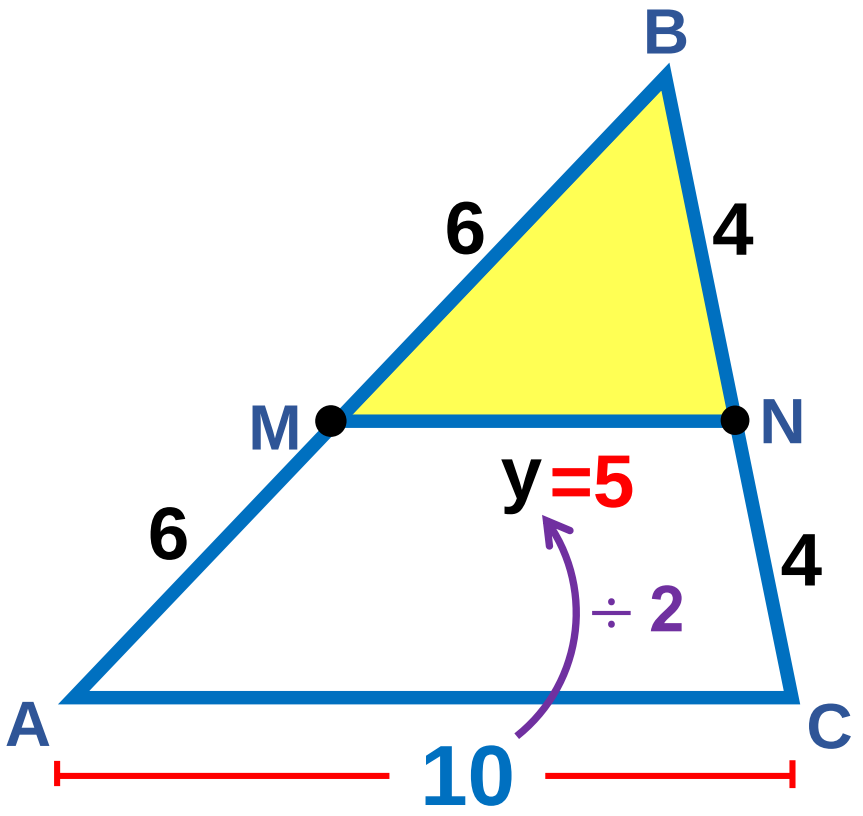


$\overline{MN}$: Base media del ΔABC.

$$MN = \frac{AC}{2}$$

$$\overline{MN} \parallel \overline{AC}$$

Ejemplo: En el gráfico, calcule el perímetro de la región triangular MBN.



$\overline{MN}$: base media

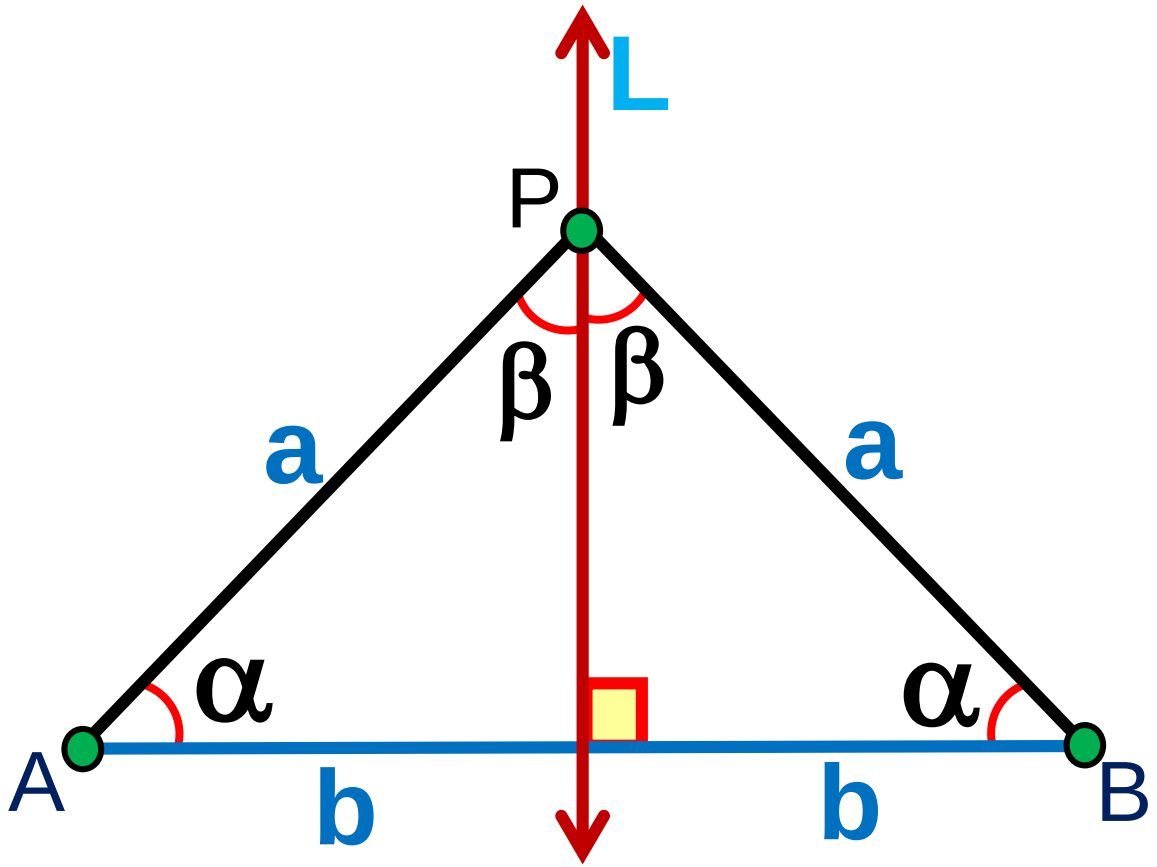
$2p = 6+4+5$

$2p = 15$

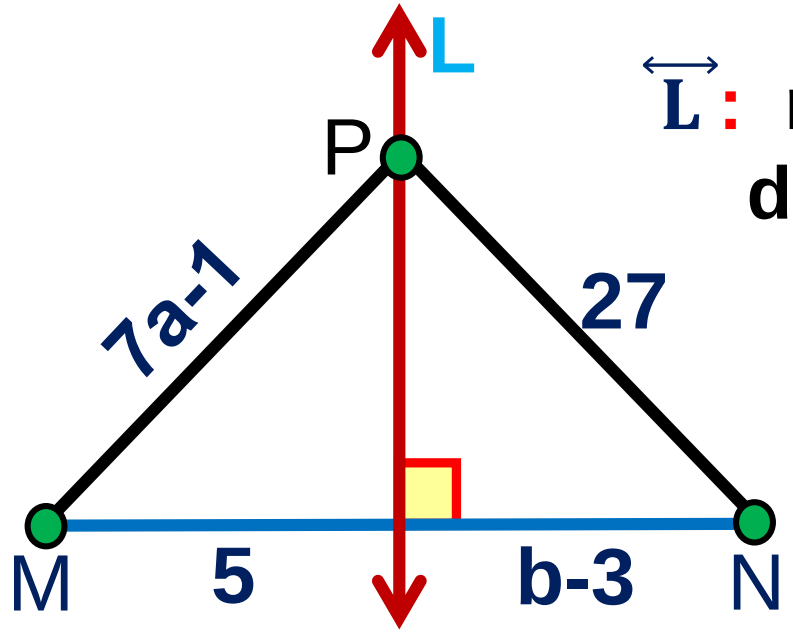
Aplicaciones de la congruencia

3 TEOREMA DE LA MEDIATRIZ

$\overleftrightarrow{L}$: Mediatriz del $\overline{AB}$



Ejemplo: En el gráfico, $\overleftrightarrow{L}$ es mediatriz de $\overline{MN}$, calcule a + b.



$\overleftrightarrow{L}$: mediatriz de $\overline{MN}$.

$7a - 1 = 27$

$7a = 28$

$a = 4$

$b - 3 = 5$

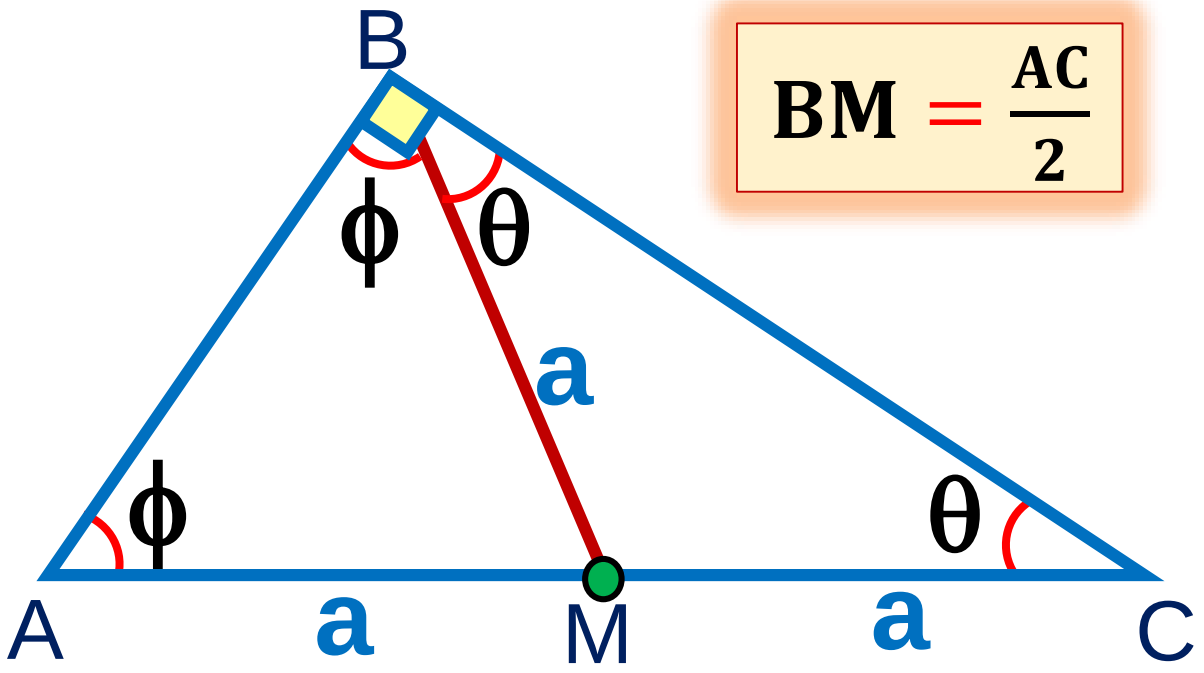
$b = 8$

$a + b = 12$

Aplicaciones de la congruencia

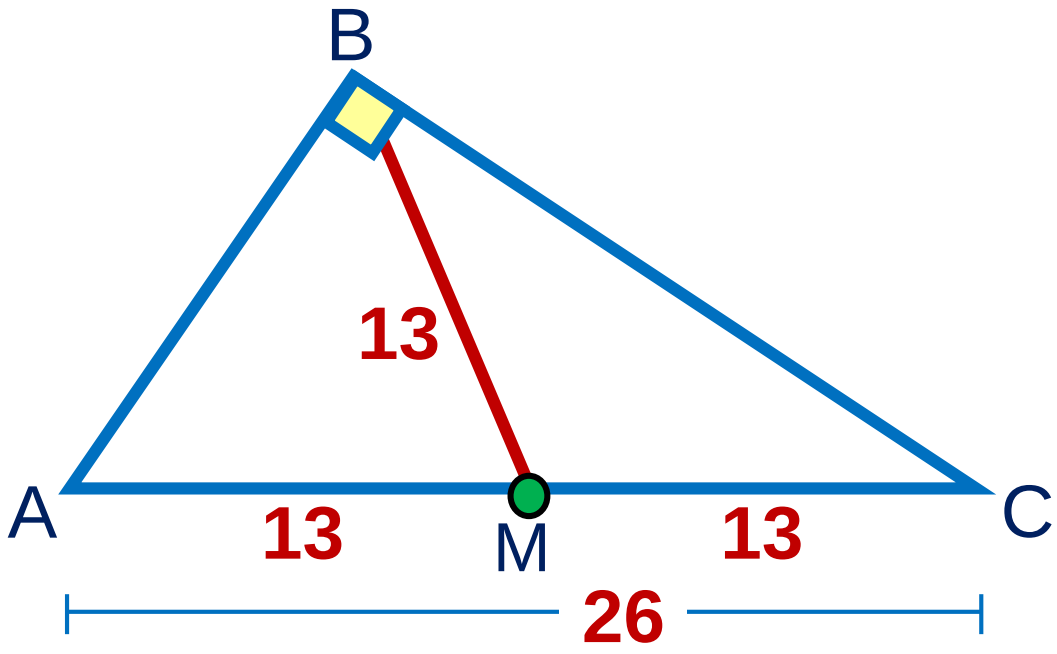
4 TEOREMA DE LA MEDIANA RELATIVA A LA HIPOTENUSA

$\overline{BM}$: **Mediana relativa a la hipotenusa.**



$$BM = \frac{AC}{2}$$

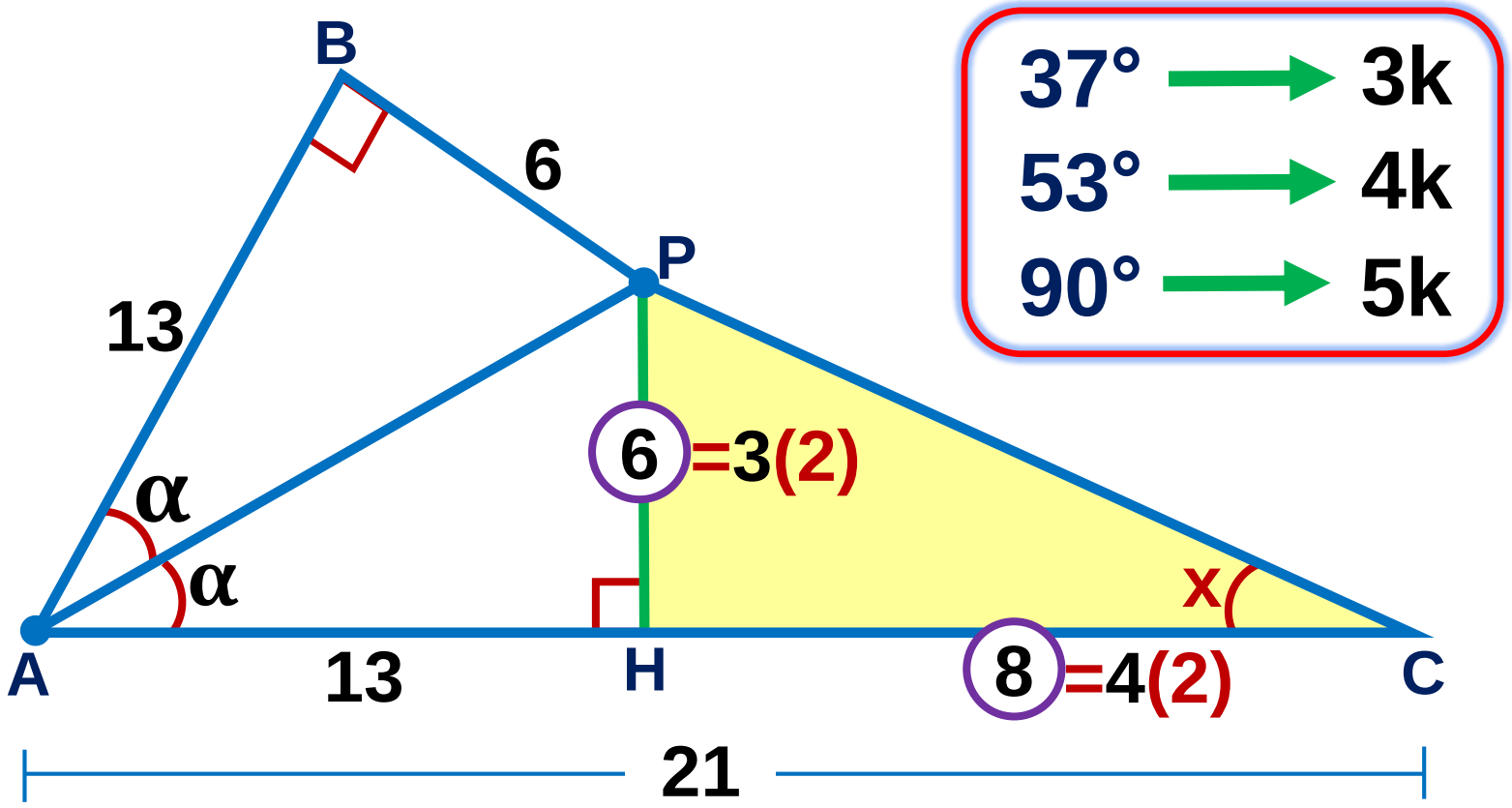
Ejemplo: En el gráfico, $\overline{BM}$ es mediana, calcule AC.



$\overline{BM}$: mediana relativa a la hipotenusa

AC = 26

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

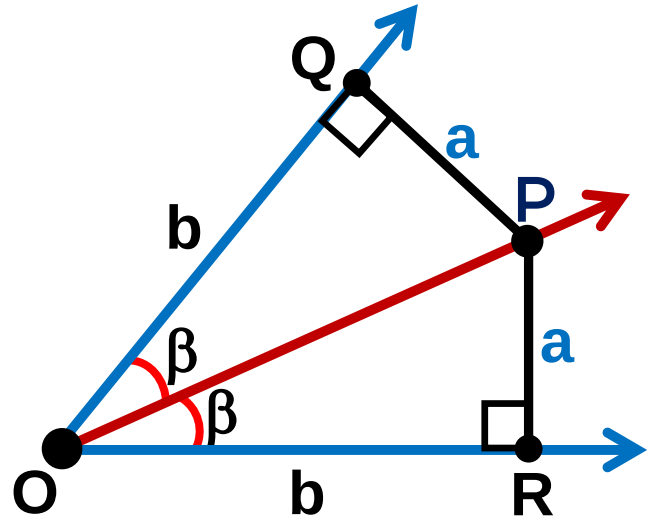


37° → 3k
53° → 4k
90° → 5k

RESOLUCIÓN:

- Piden: x

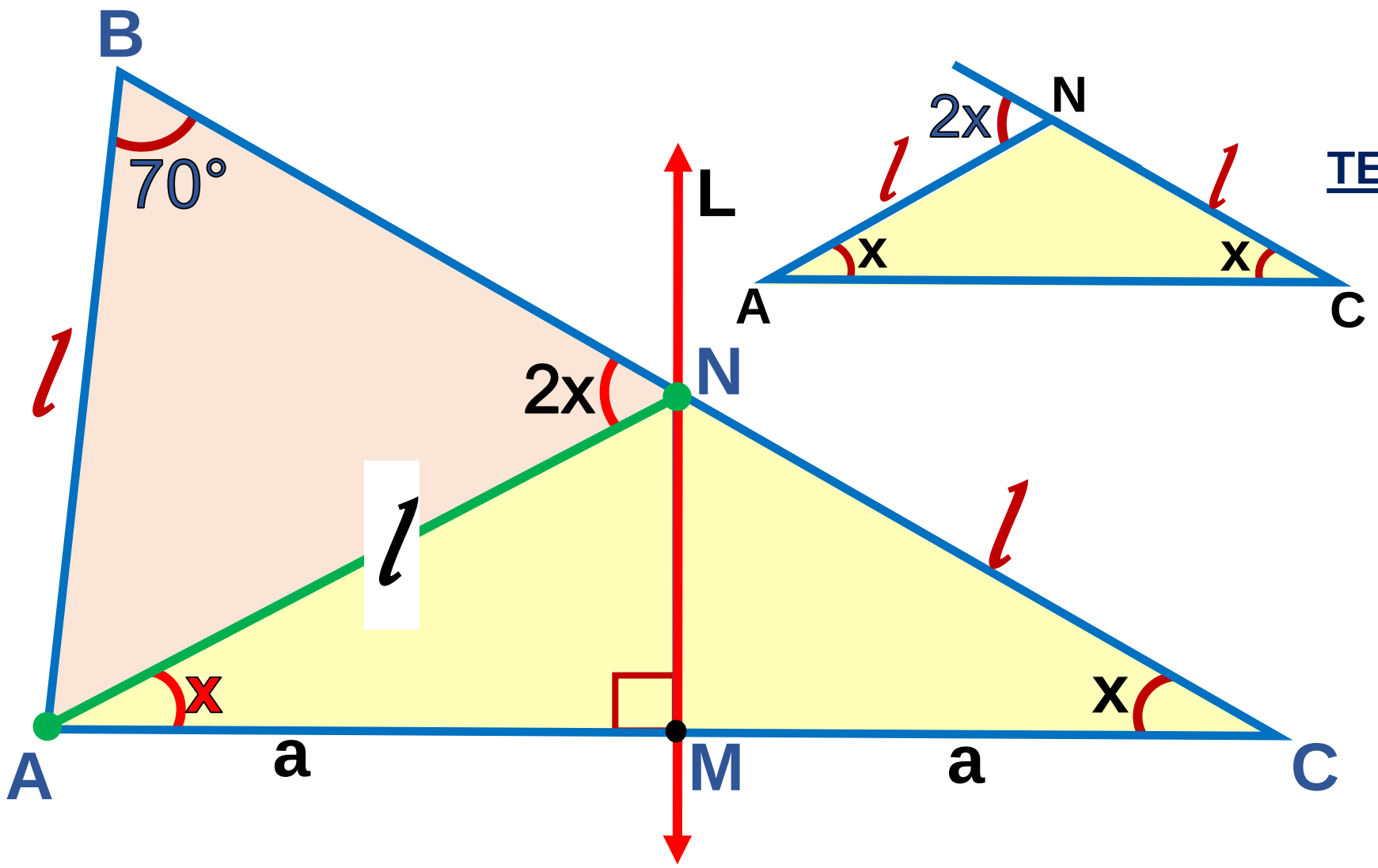
TEOREMA DE LA BISECTRIZ



- ⊿PHC: notable 37° y 53°

x = 37°

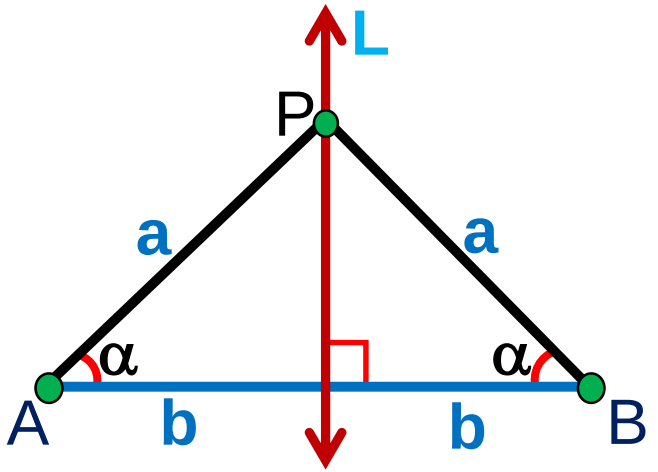
2. Halle el valor de x.



RESOLUCIÓN:

- Piden: x
- $\overleftrightarrow{L}$: Mediatriz del $\overline{AC}$

TEOREMA DE LA MEDIATRIZ



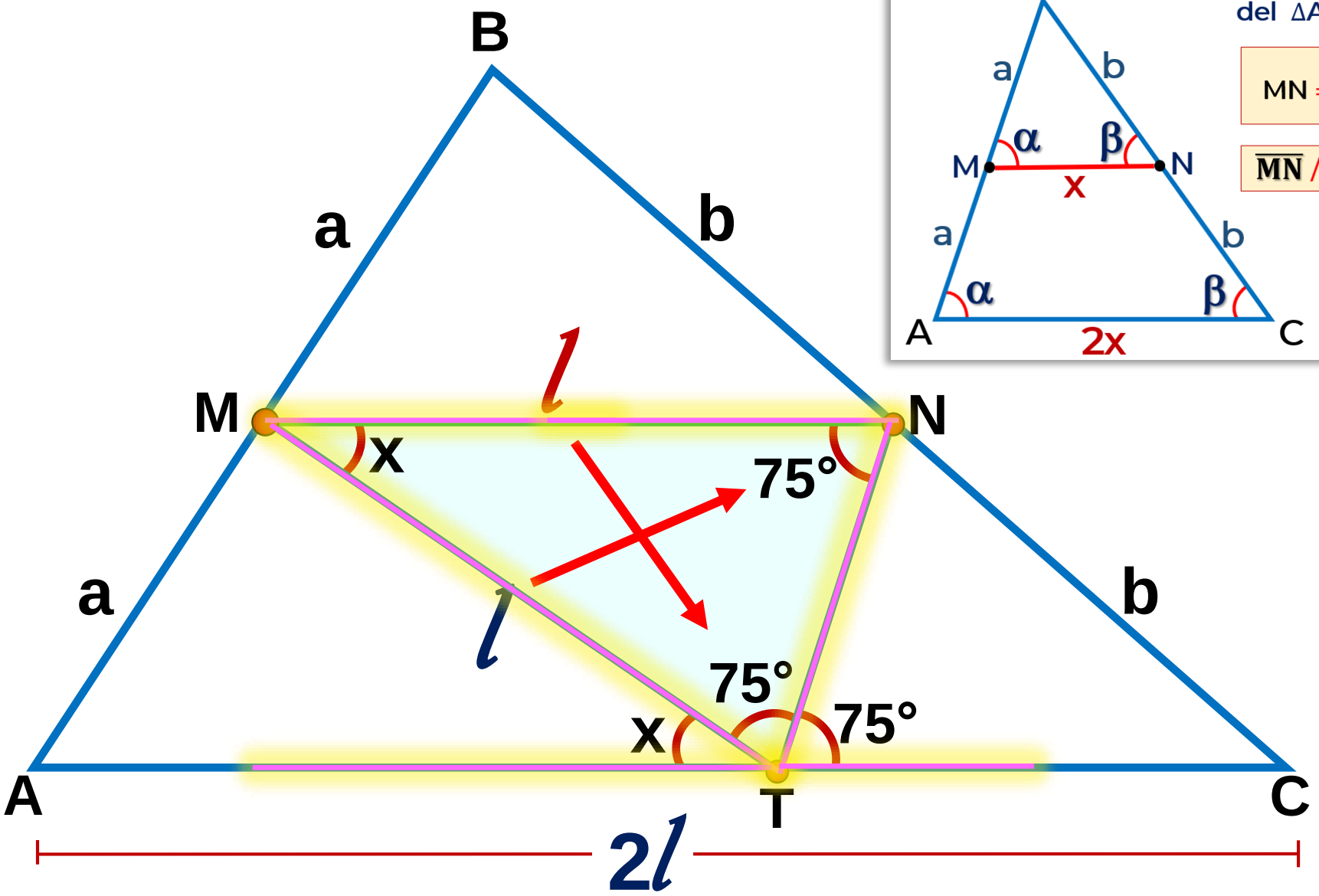
$\overleftrightarrow{L}$: Mediatriz del $\overline{AB}$

- ΔBAN: isósceles

$2x = 70°$

$x = 35°$

3. Halle el valor de x.



RESOLUCIÓN:

- Piden: x
- Trazamos $\overline{MN}$ (Base media)
- $\overline{MN}$ // $\overline{AC}$
- ΔMNT: Isósceles

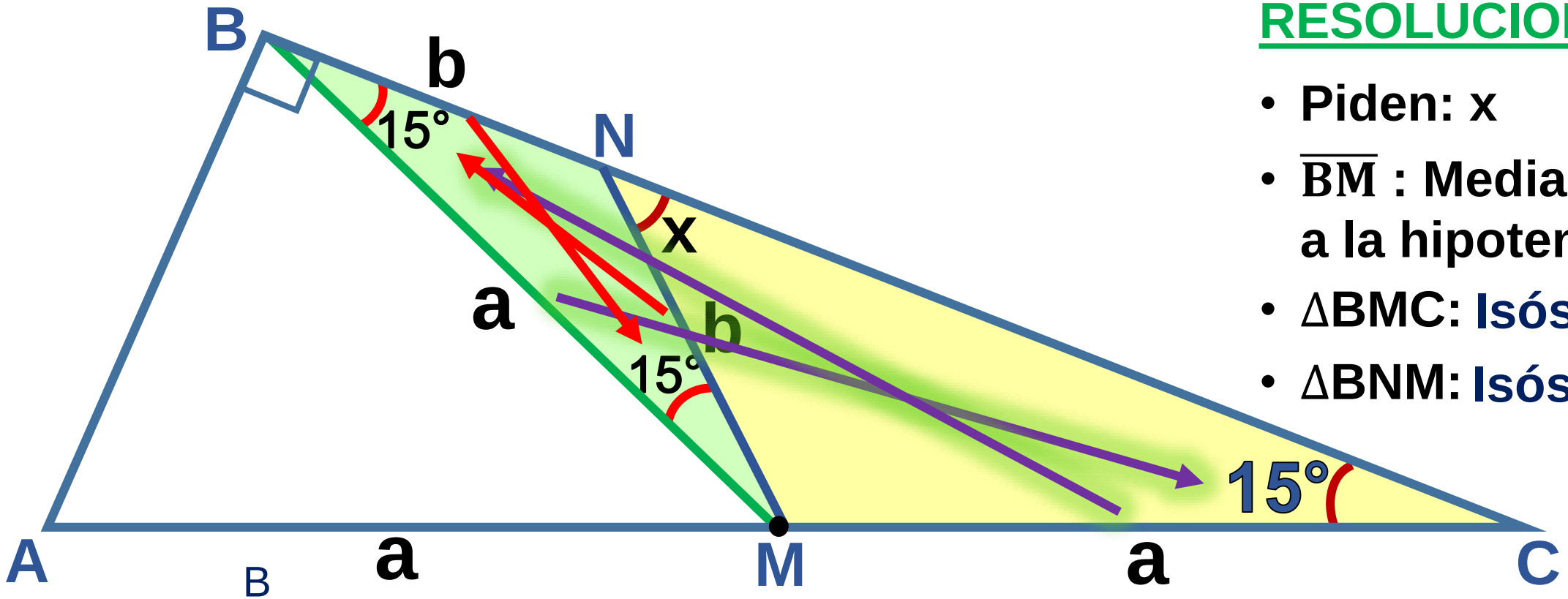
ÁNGULOS ALTERNOS

$x + 75° + 75° = 180°$

$x + 150° = 180°$

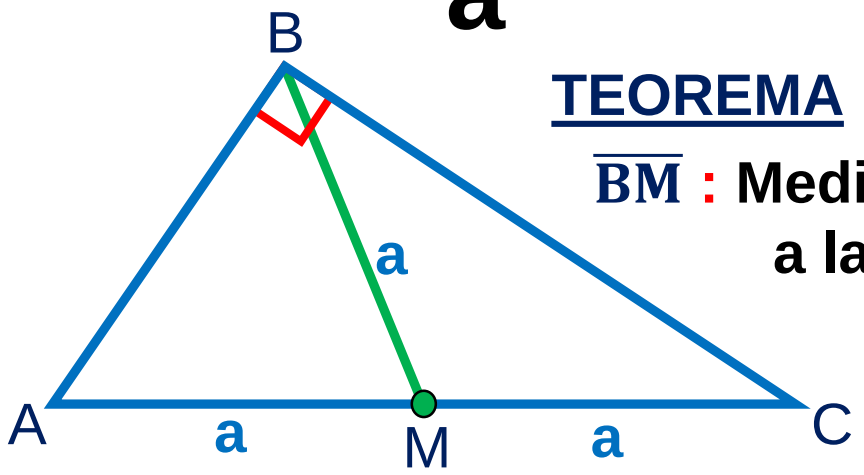
$x = 30°$

4. Halle el valor de x.



RESOLUCIÓN:

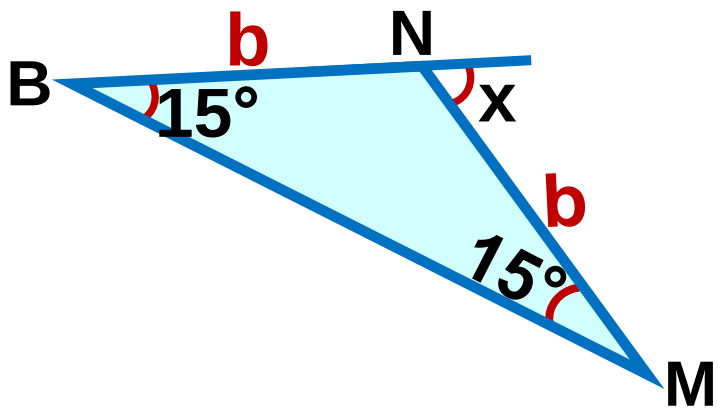
- Piden: x
- $\overline{BM}$: Mediana relativa a la hipotenusa.
- ΔBMC: Isósceles
- ΔBNM: Isósceles



TEOREMA

$\overline{BM}$: Mediana relativa a la hipotenusa.

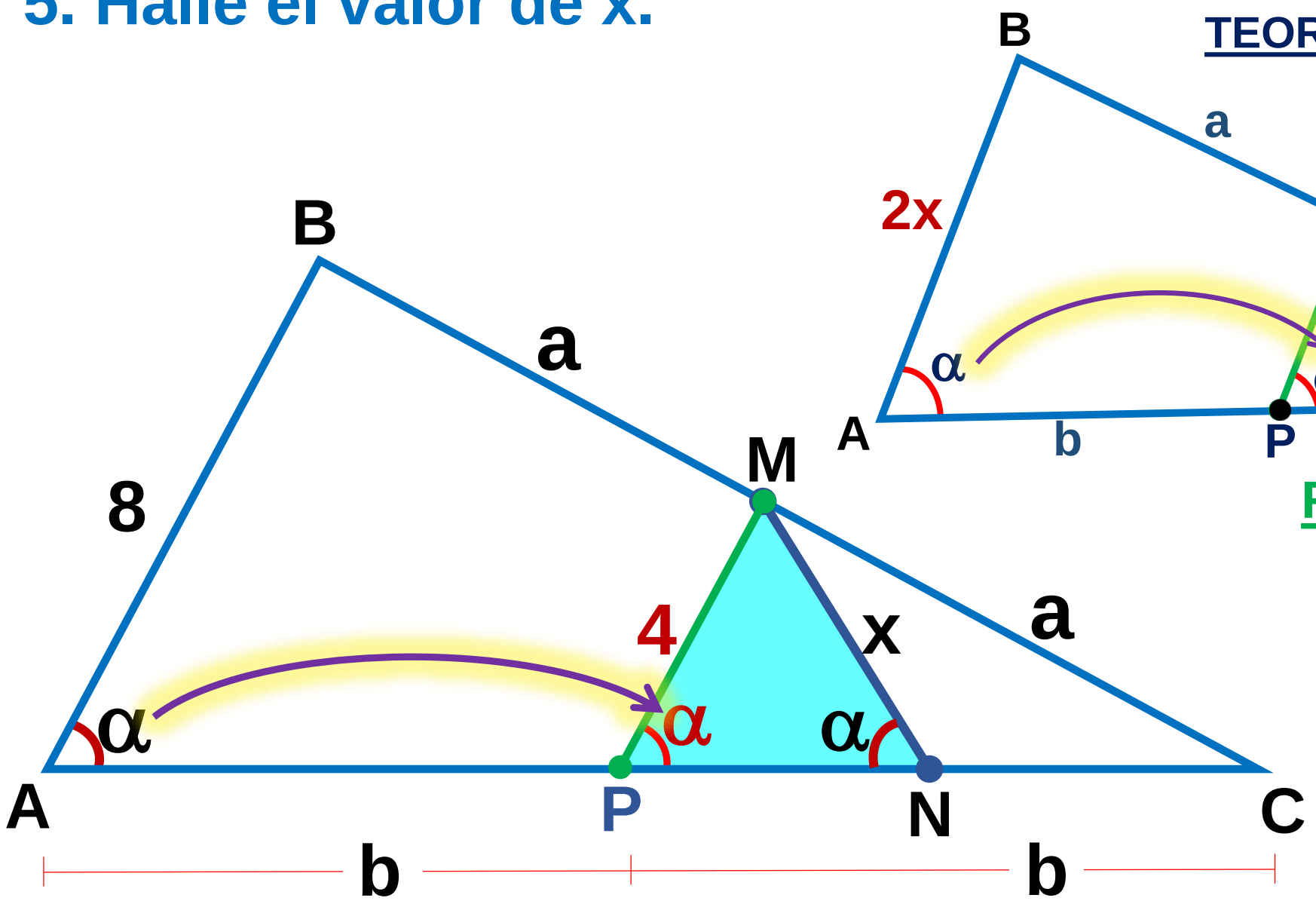
$$BM = \frac{AC}{2}$$



$x = 15° + 15°$

$x = 30°$

5. Halle el valor de x.



TEOREMA DE LA BASE MEDIA

$\overline{MN}$: Base media del ΔABC

$$MN = \frac{AC}{2}$$

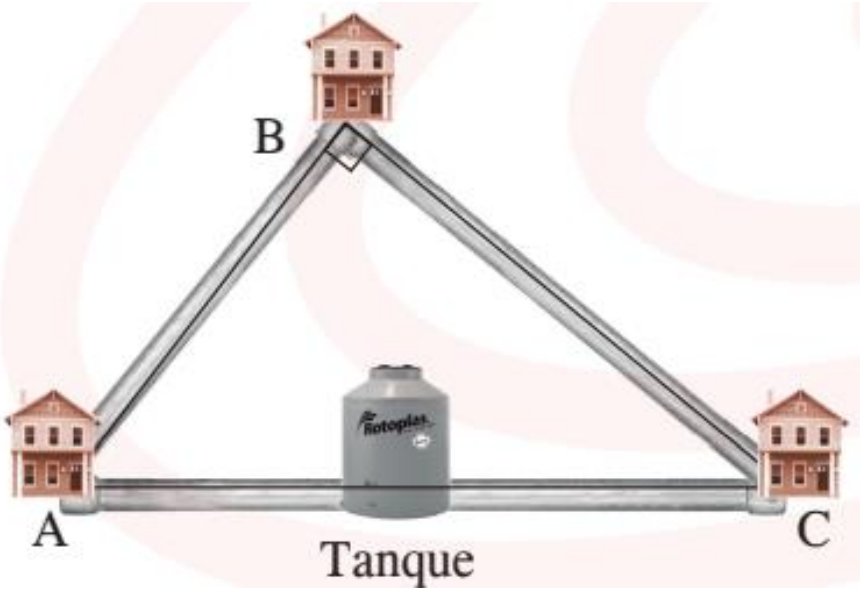
$\overline{MN} \parallel \overline{AC}$

RESOLUCIÓN:

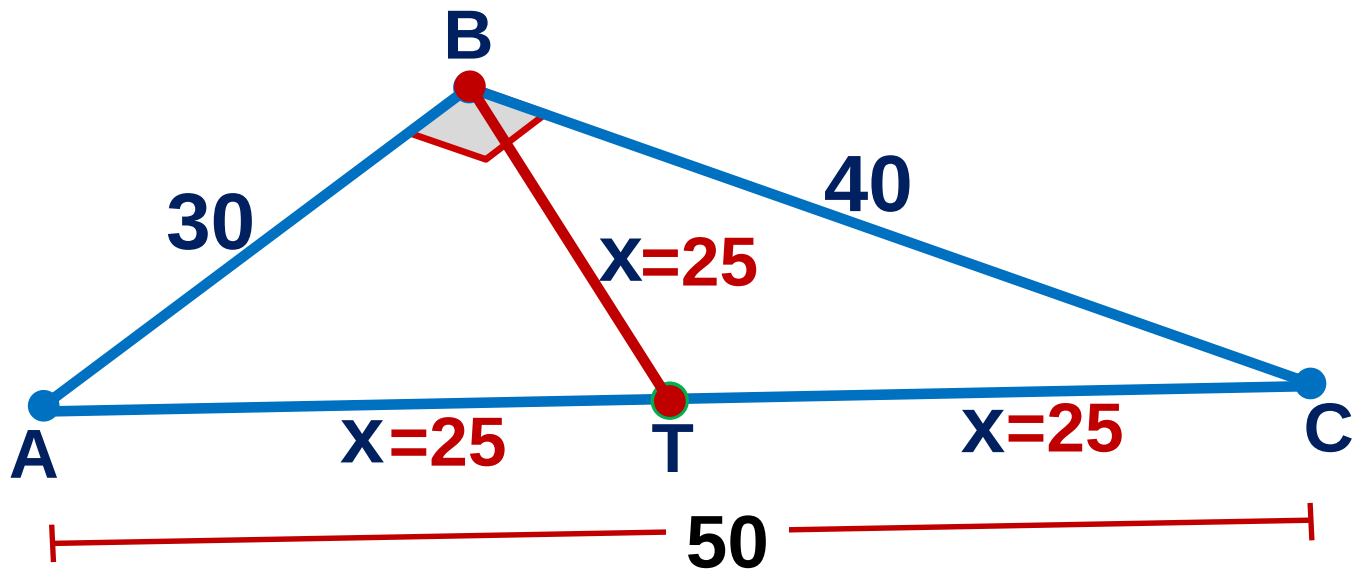
- Piden: x
- Trazamos $\overline{MP} \parallel \overline{AB}$
- $\overline{MP}$ (Base media)
- ΔMPN: Isósceles

x = 4

6. Se instala un tanque con agua para abastecer las casas A, B y C tal que equidiste de dichas casas. Si la casa A está a 30 m de la casa B y B a 40 m de la casa C, halle la distancia entre el tanque y la casa B.



RESOLUCIÓN:



- Piden: BT
- $\overline{BT}$ mediana relativa a la hipotenusa.
- $\triangle$ABC: Teorema de Pitágoras

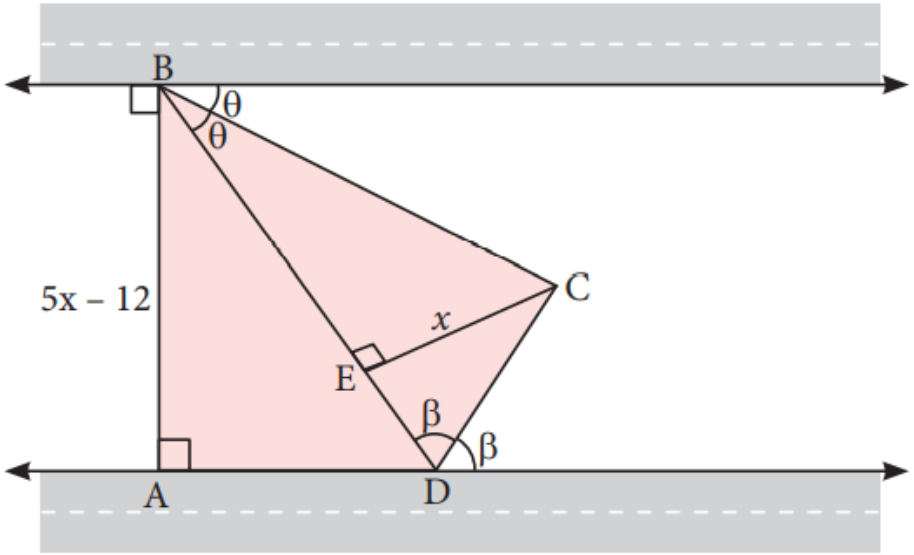
$AC^2 = 30^2 + 40^2$

$AC^2 = 2500$

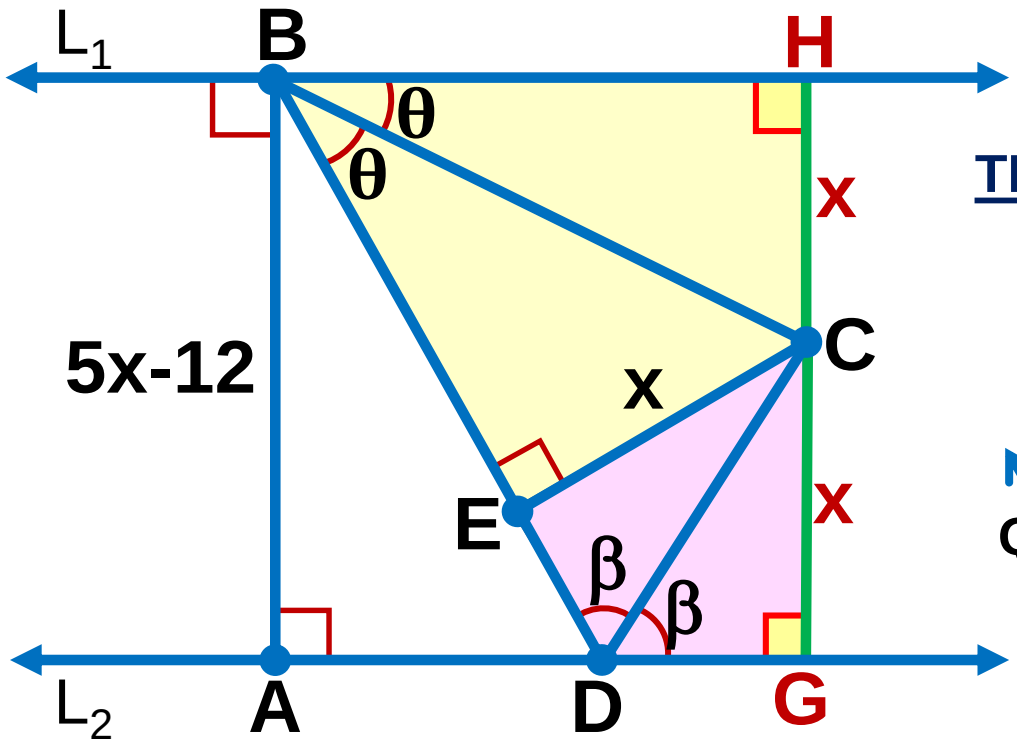
$AC = 50$

BT = 25 m

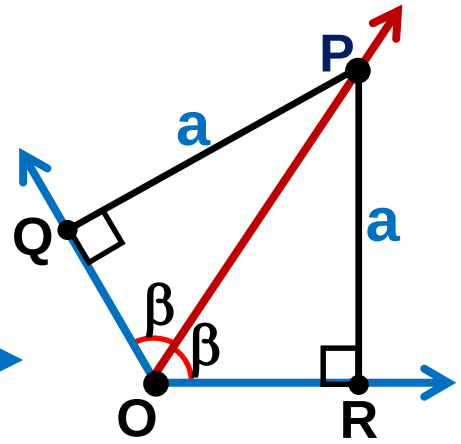
7. Entre 2 carreteras paralelas hay un terreno que está dividido en 3 partes para poder cosechar variedades de vegetales, con dicha información determine la distancia entre C y el cerco $\overline{BD}$.



RESOLUCIÓN:



TEOREMA DE LA BISECTRIZ



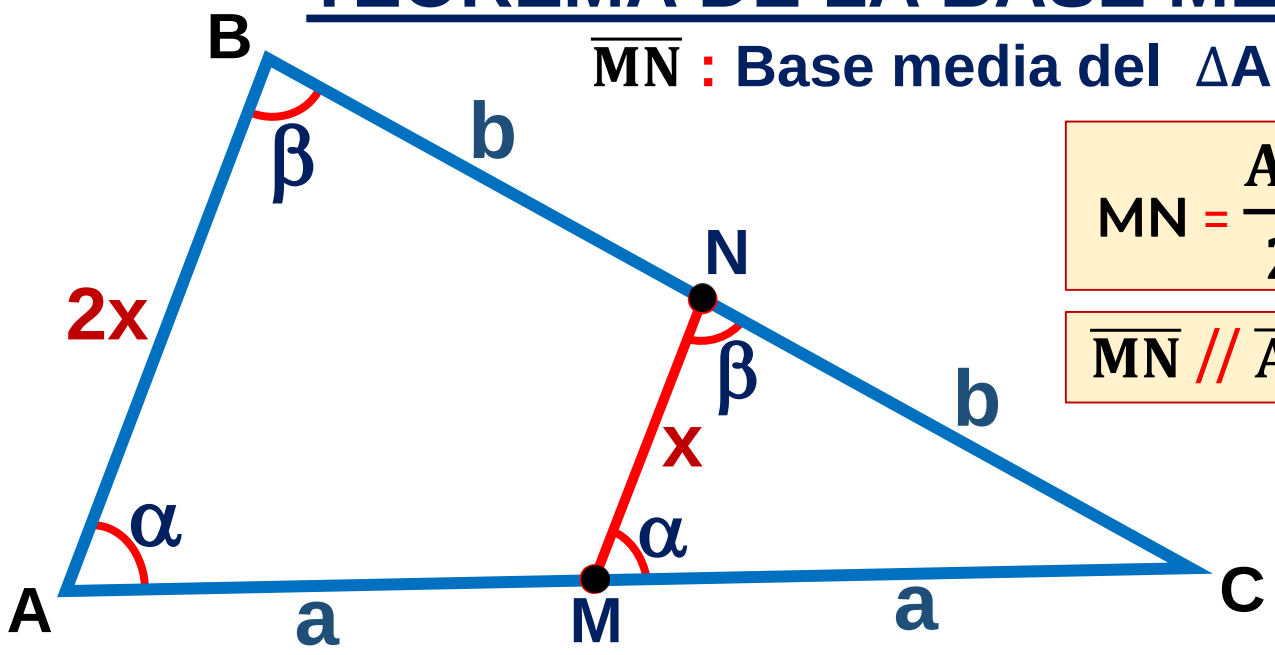
- Piden: CE = x
- CE = CH = x
- CE = CG = x
- Del gráfico:

$$AB = GH$$
$$5x - 12 = 2x$$
$$3x = 12$$
$$x = 4$$

CE = 4 m

TEOREMA DE LA BASE MEDIA

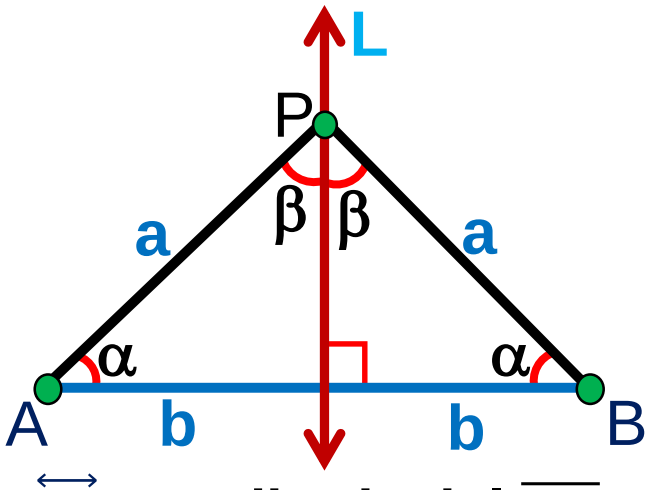
$\overline{MN}$: Base media del ΔABC



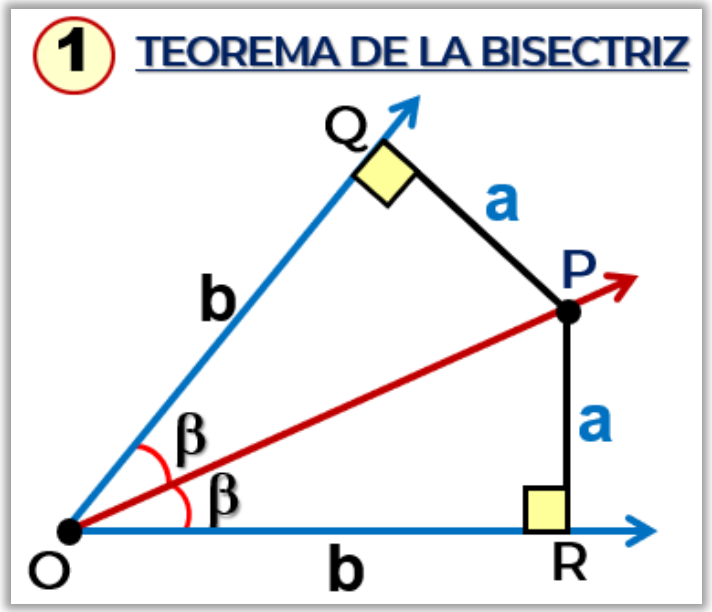
$$MN = \frac{AC}{2}$$

$$\overline{MN} \,//\, \overline{AC}$$

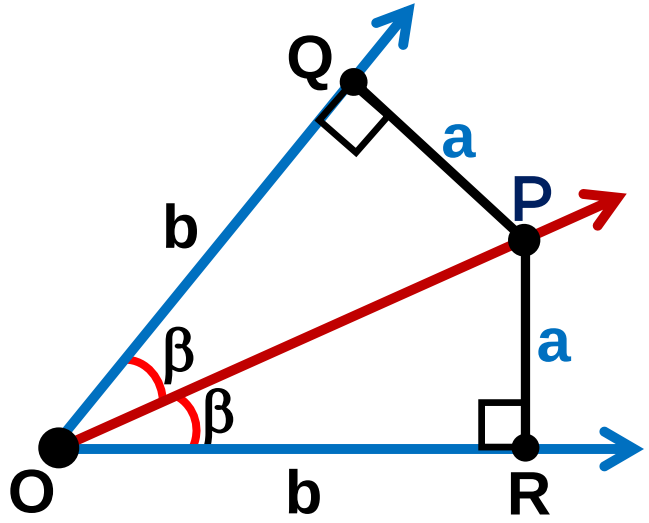
TEOREMA DE LA MEDIATRIZ

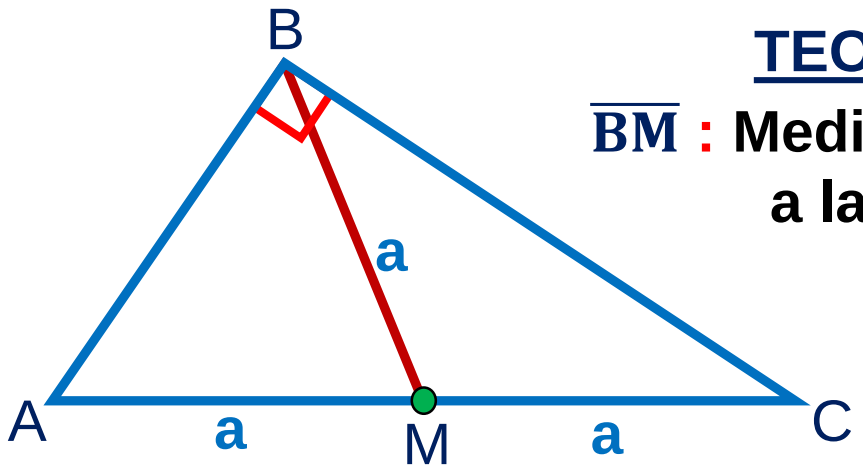


$\overleftrightarrow{L}$: Mediatriz del $\overline{AB}$



TEOREMA DE LA BISECTRIZ





TEOREMA

$\overline{BM}$: **Mediana relativa a la hipotenusa.**

$$BM = \frac{AC}{2}$$