GEOMETRÍA

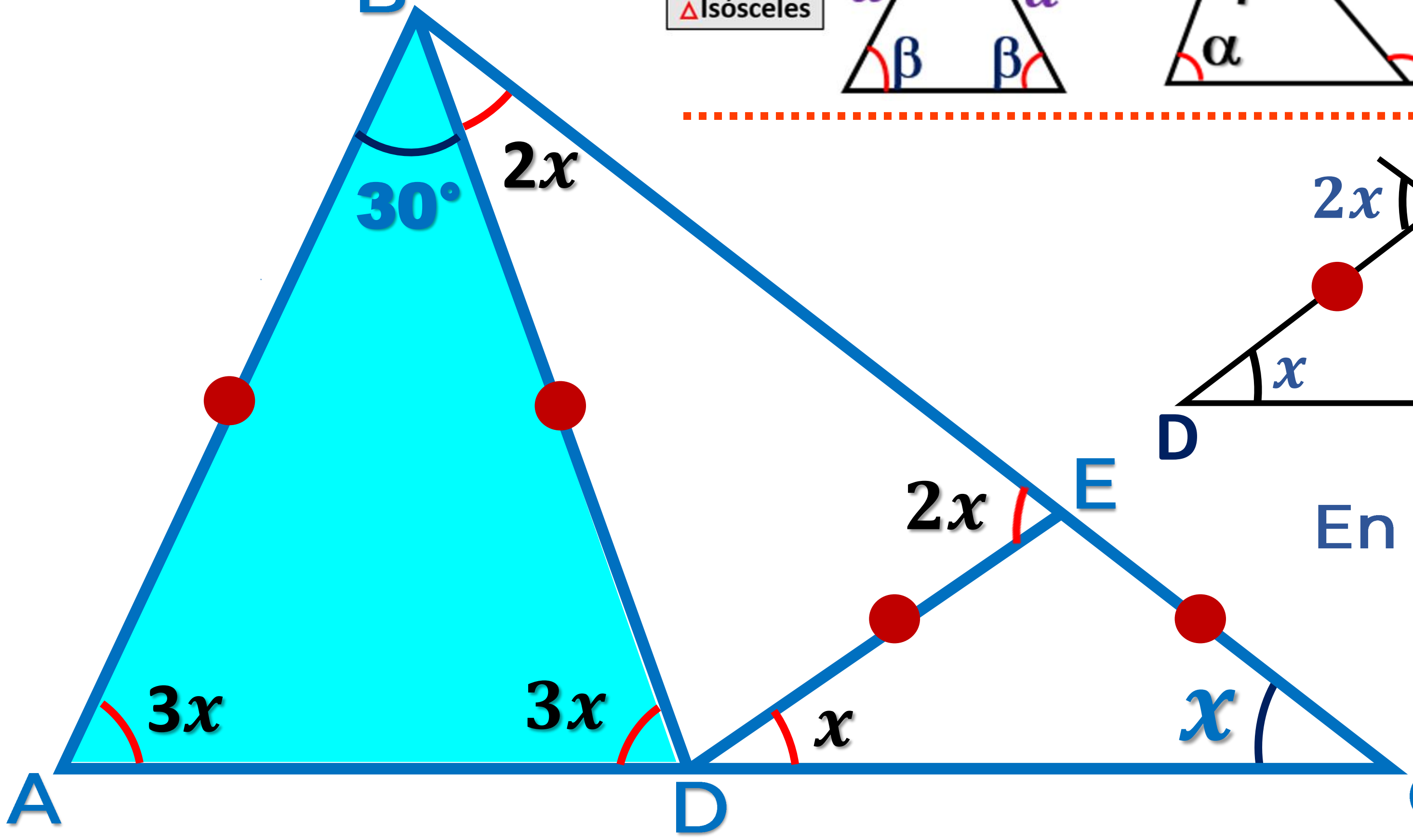
Tomo 1

5th
SECONDARY

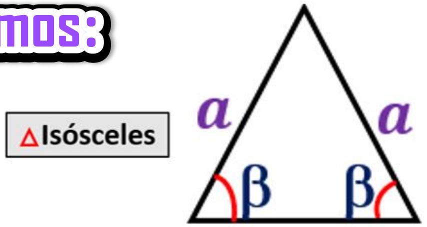
ASESORÌA

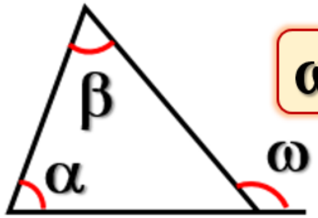
SACO OLIVEROS

1. En el gráfico, halle el valor de x, si: AB = BD = DE = CE.

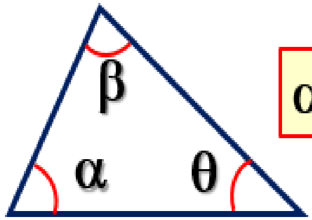


Recordemos:

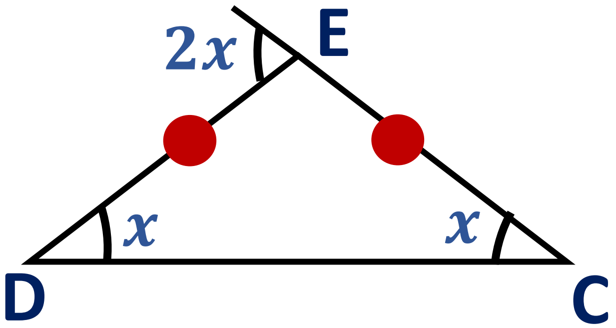


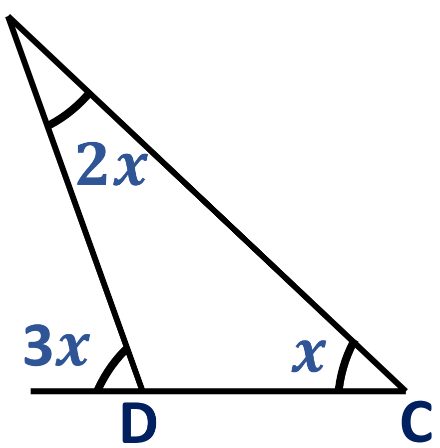


$\omega = \alpha + \beta$



$\alpha + \beta + \theta = 180°$





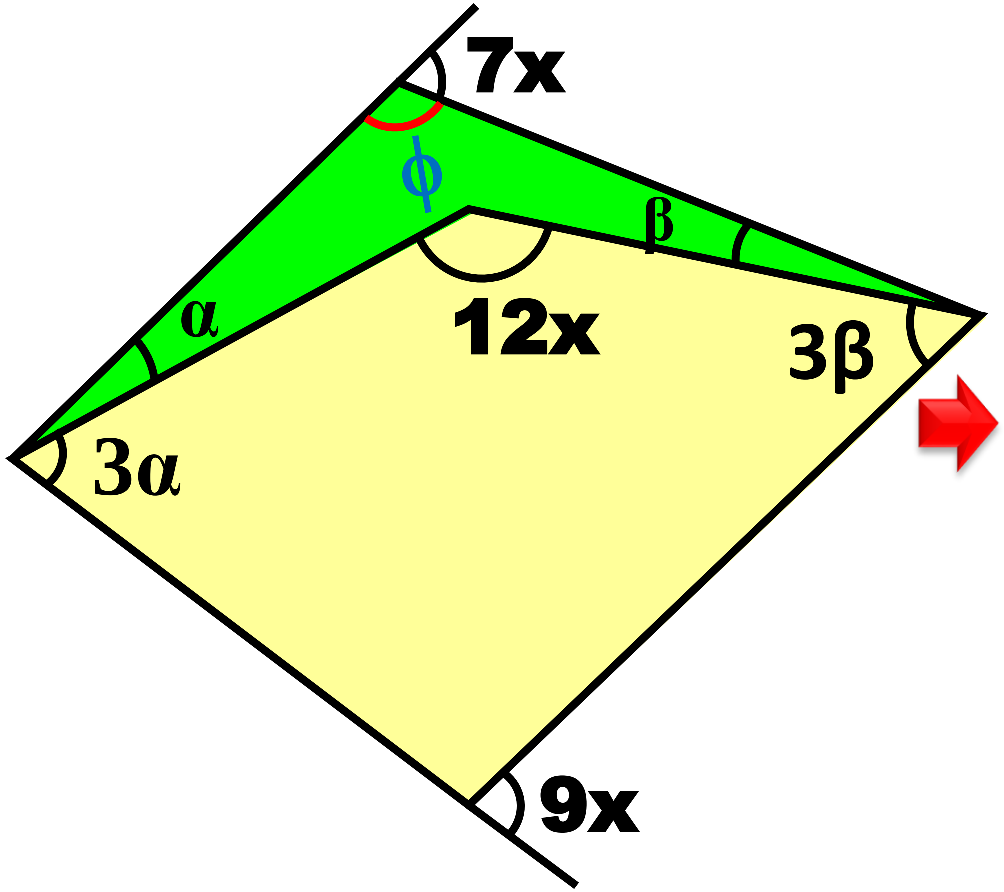
En el △ ABD:

$3x + 3x + 30° = 180°$

$6x = 150°$

$\boxed{x = 25°}$

2. En la figura, halle el valor de *x*.



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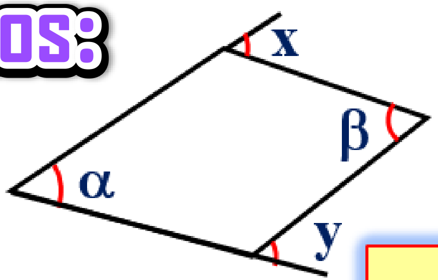
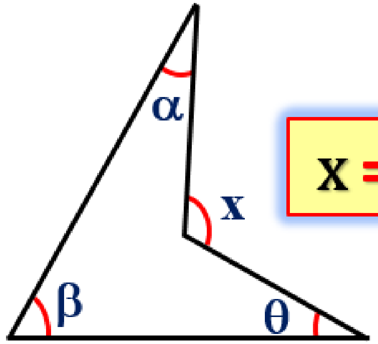


$$x + y = \alpha + \beta$$



$$x = \alpha + \beta + \theta$$

- $4\alpha + 4\beta = 7x + 9x$

  $\cancel{4}\alpha + \cancel{4}\beta = 1\cancel{6}x$

  $\alpha + \beta = 4x$

- $12x = \underbrace{\alpha + \beta}_{4x} + \phi$

  $8x = \phi$

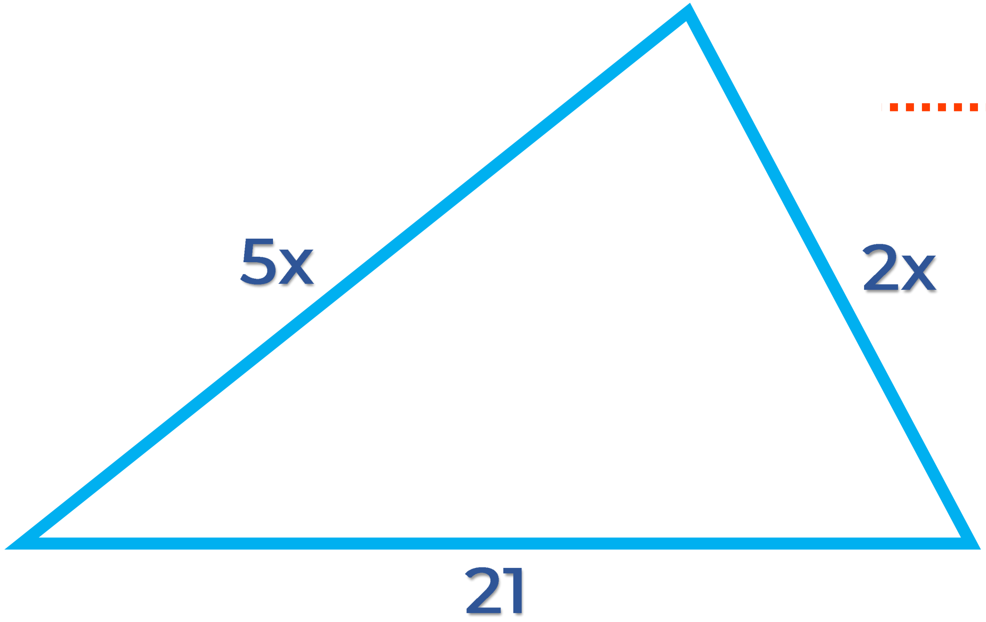
- $7x + \underbrace{\phi}_{8x} = 180°$

  $15x = 180°$

  $\boxed{x = 12°}$

SACO OLIVEROS

3. Si los lados de un triangulo miden 5x , 2x y 21, halle la suma de los valores enteros que puede tomar x.



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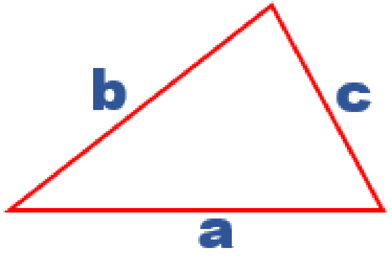


Teorema de la existencia

$$\boxed{b - c < a < b + c}$$

$$5x - 2x < 21 < 5x + 2x$$

$$3x < 21 < 7x$$

- $3x < 21$
  $x < 7$
- $21 < 7x$
  $3 < x$

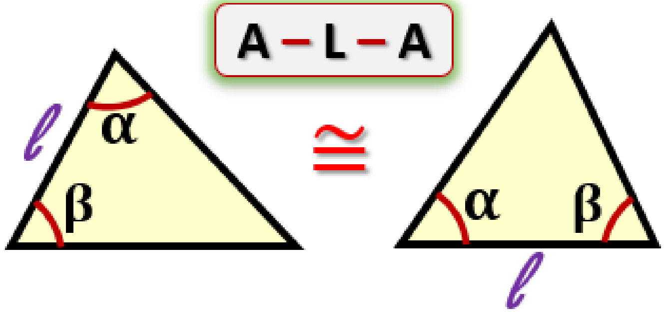
$$3 < x < 7$$

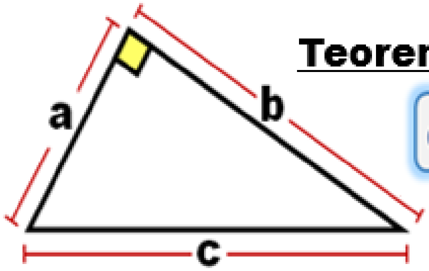
$$x = 4\ ;\ 5\ ;\ 6$$

$$\boxed{4 + 5 + 6 = 15}$$

4. En un triángulo ABC, se traza la mediana $\overline{BM}$. Si BM = 4, AB = 15 y m∡ABM = 90°, halle BC.

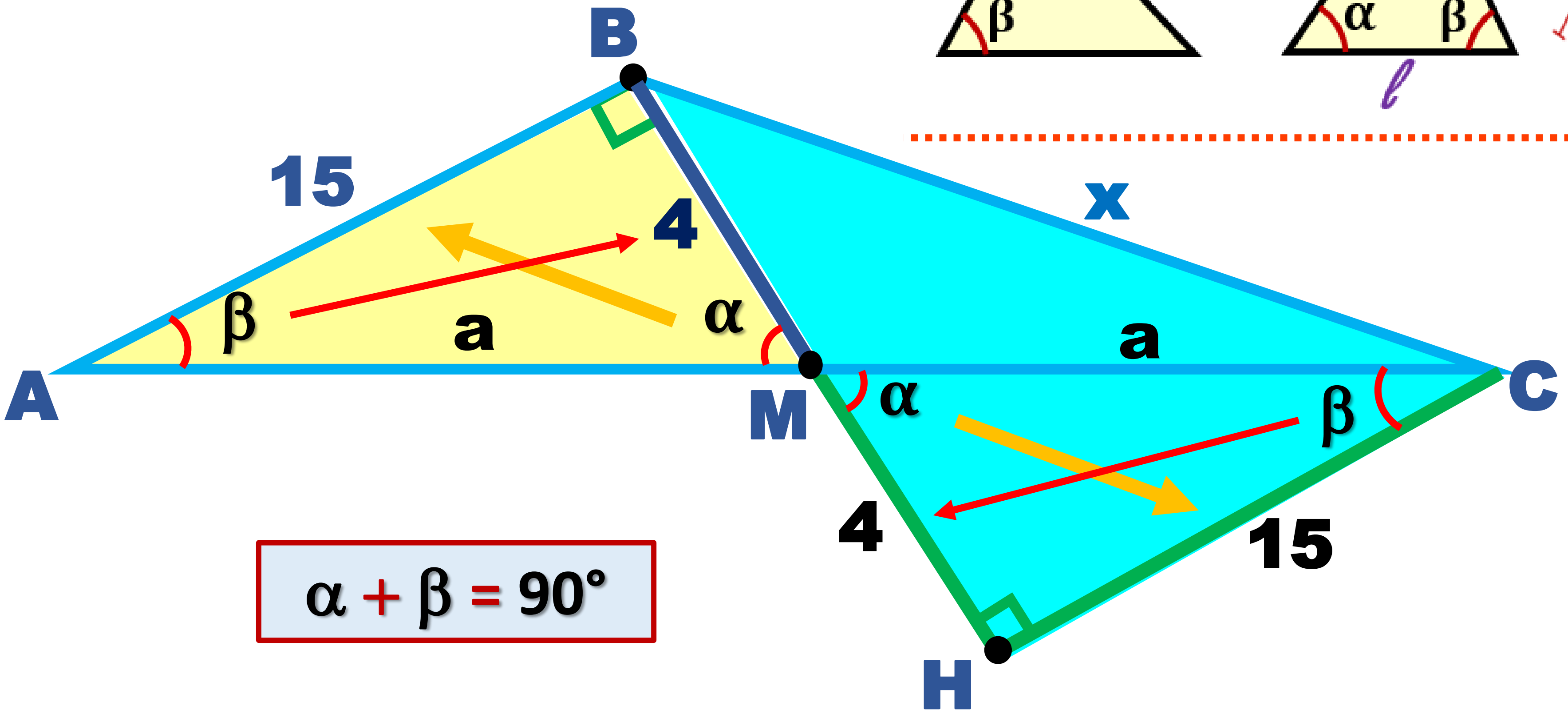
Recordemos:





Teorema de Pitágoras

$c^2 = a^2 + b^2$



$\alpha + \beta = 90°$

◺ ABM ≅ ◺ CMH (A-L-A)

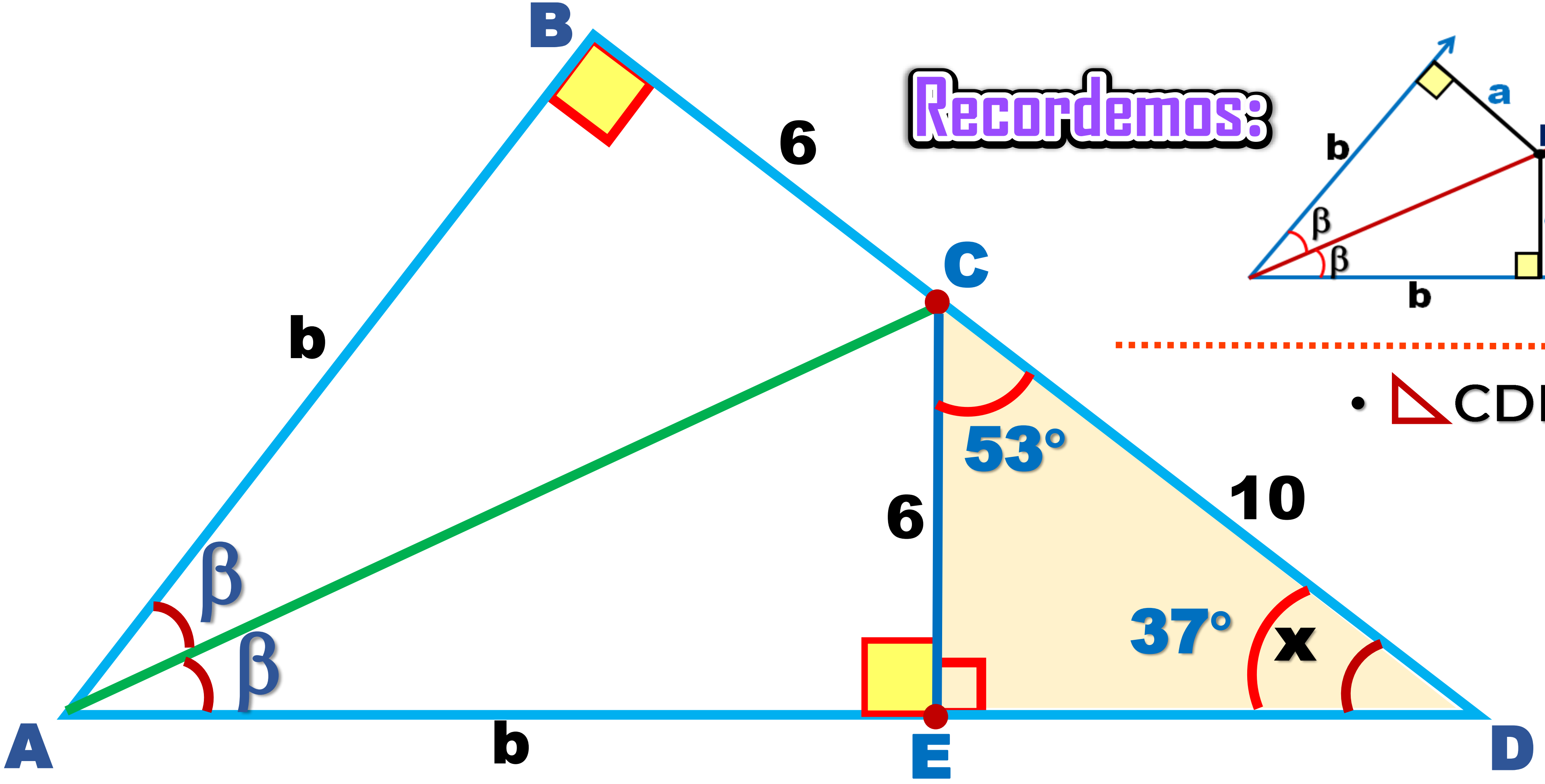
◺ BCH: Pitágoras

$x^2 = 8^2 + 15^2$

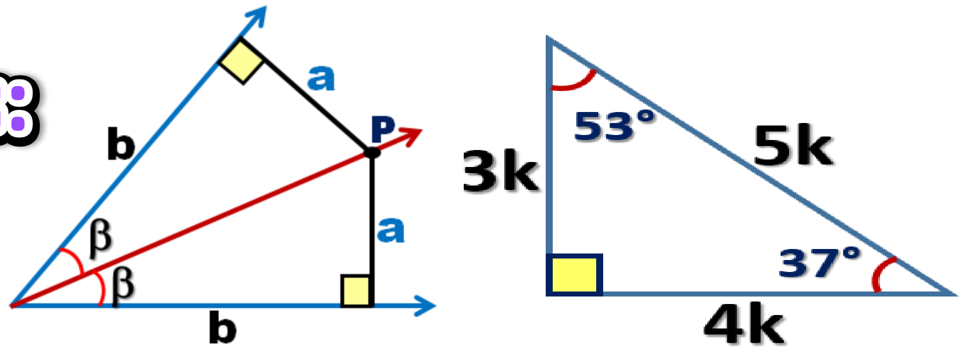
$x^2 = 289$

$\boxed{x = 17}$

5. En un triángulo rectángulo ABD, recto en B, se traza la bisectriz interior $\overline{AC}$. Si BC = 6 y CD = 10, halle m<ADC.



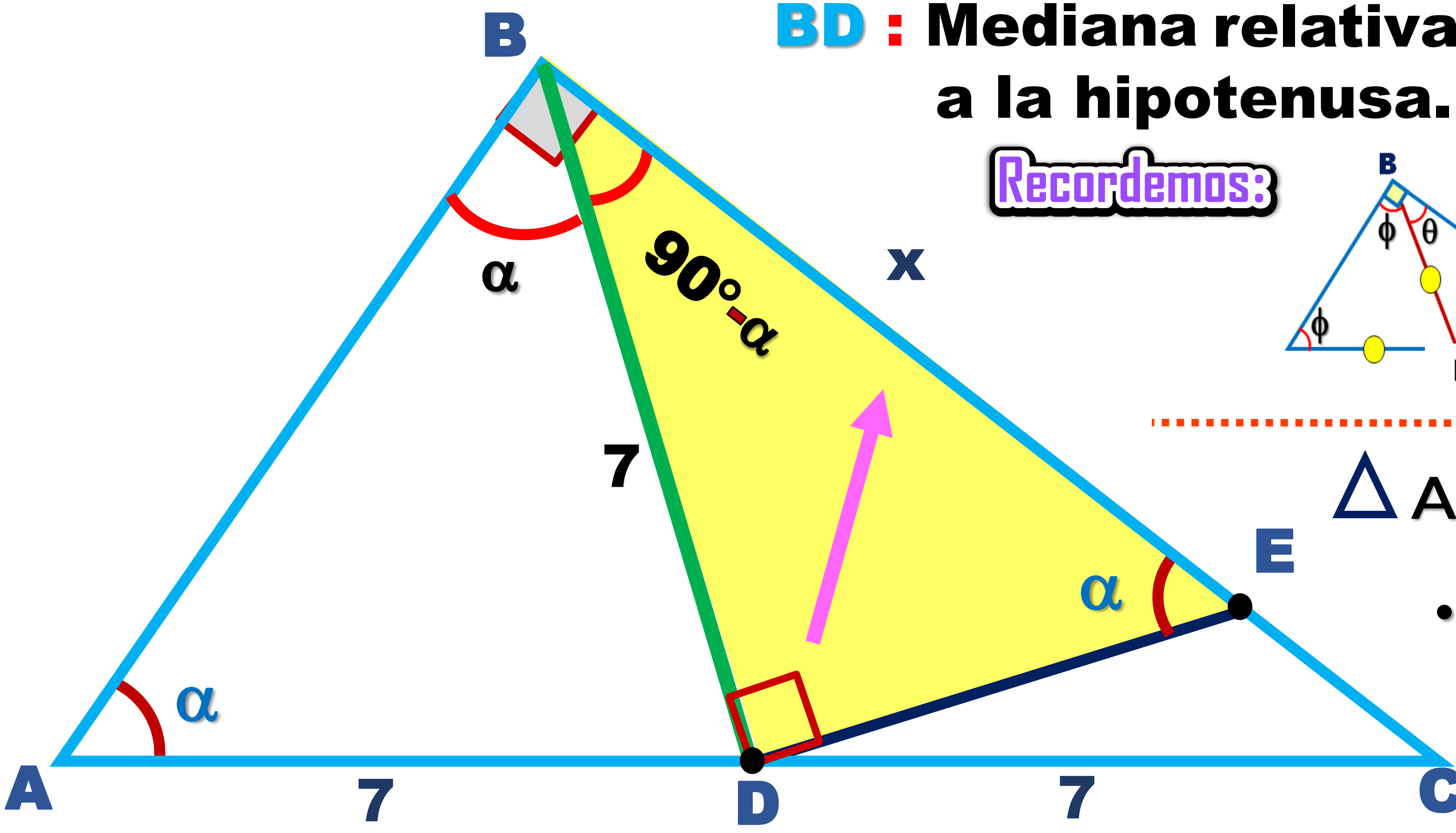
Recordemos:



• ◺CDE: Notable de 37°y 53°

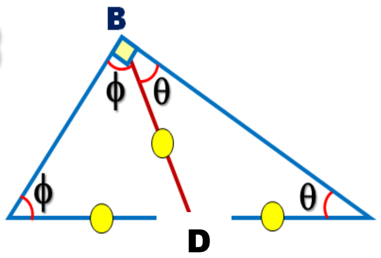
$\boxed{x = 37°}$

6. En un triángulo rectángulo ABC recto en B, en $\overline{AC}$ y $\overline{BC}$ se ubican los puntos D y E respectivamente, tal que: AD = DC = 7 y m∡BAD = m∡BED = α, halle el mínimo valor que puede tomar $\overline{BE}$.

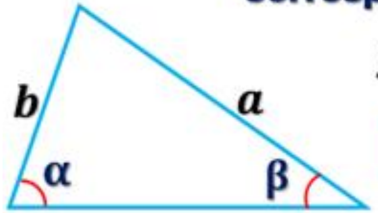


$\overline{BD}$: Mediana relativa a la hipotenusa.

Recordemos:



- Teorema de la correspondencia



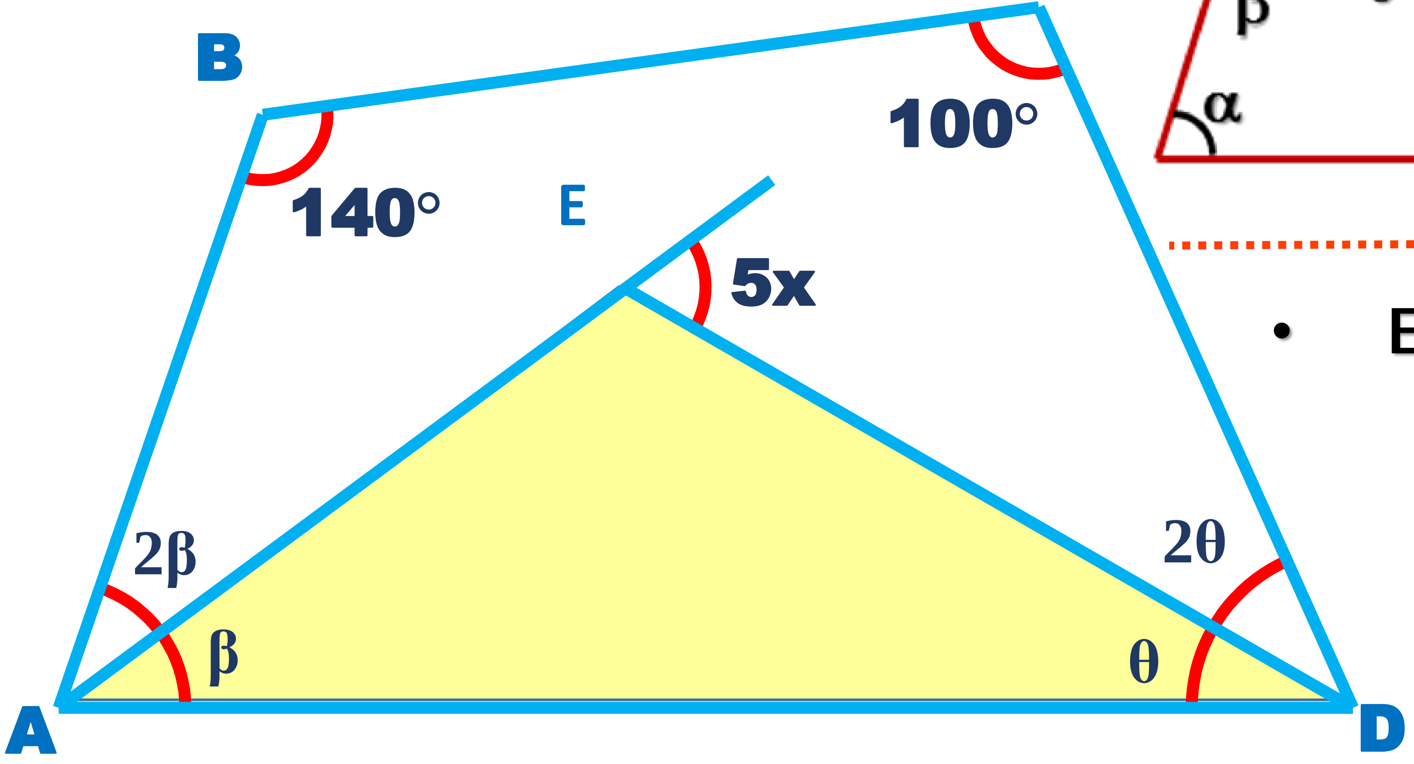
Si: β < α ⇒ b < a

△ABD y △BCD : Isósceles

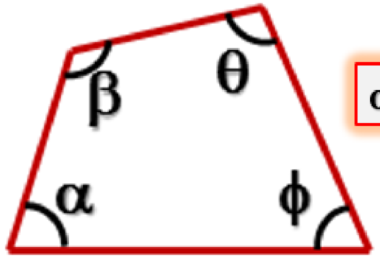
- ◺ BDE: 7 < x

$\boxed{X_{(min)} = 8}$

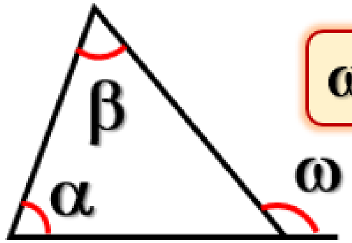
7. En la figura, halle el valor de *x*.



Recordemos:



$\alpha + \beta + \theta + \phi = 360°$



$\omega = \alpha + \beta$

- En el cuadrilátero ABCD:

$$3\theta + 3\beta + 100° + 140° = 360°$$

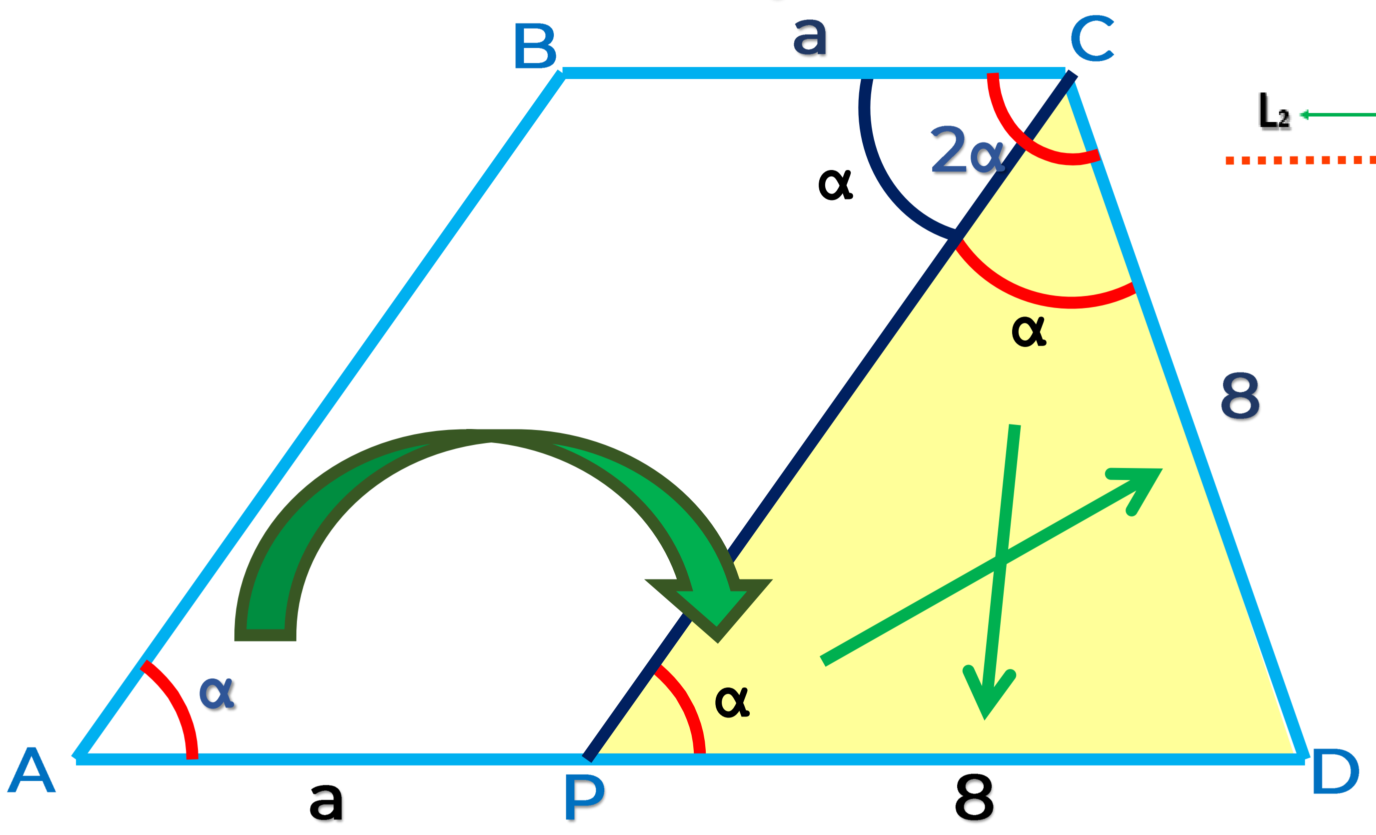
$$3\theta + 3\beta = 120°$$

$$\theta + \beta = 40°$$

$$5x = \underbrace{\theta + \beta}_{40°}$$

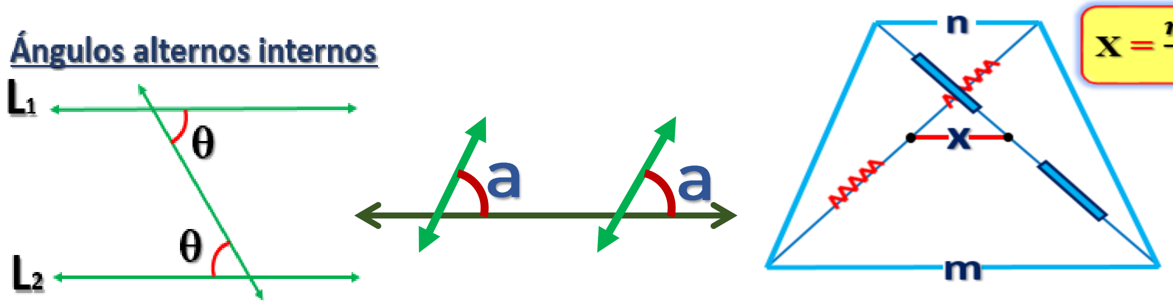
$$\boxed{x = 8°}$$

8. En un trapecio ABCD donde $\overline{BC} // \overline{AD}$, m∡BCD = 2(m∡BAD) y CD = 8. Halle la longitud del segmento que une los puntos medios de sus diagonales.



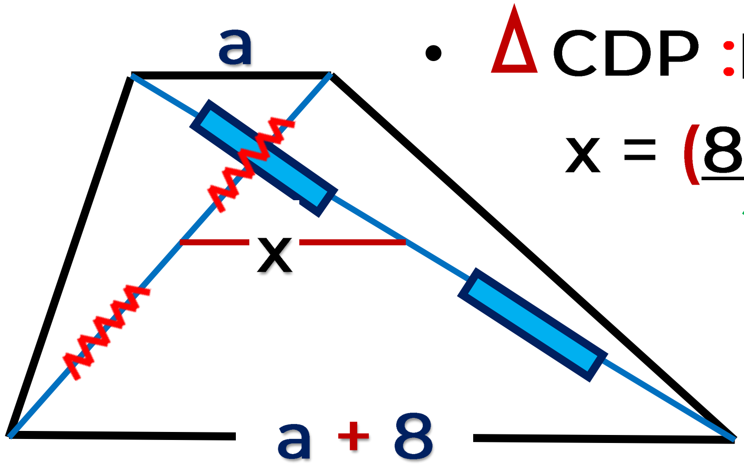
Recordemos:

Ángulos alternos internos



$x = \frac{m-n}{2}$

- Trazamos $\overline{CP} // \overline{BA}$
- ▱ABCP (PARALELOGRAMO)
- △CDP : ISÓSCELES

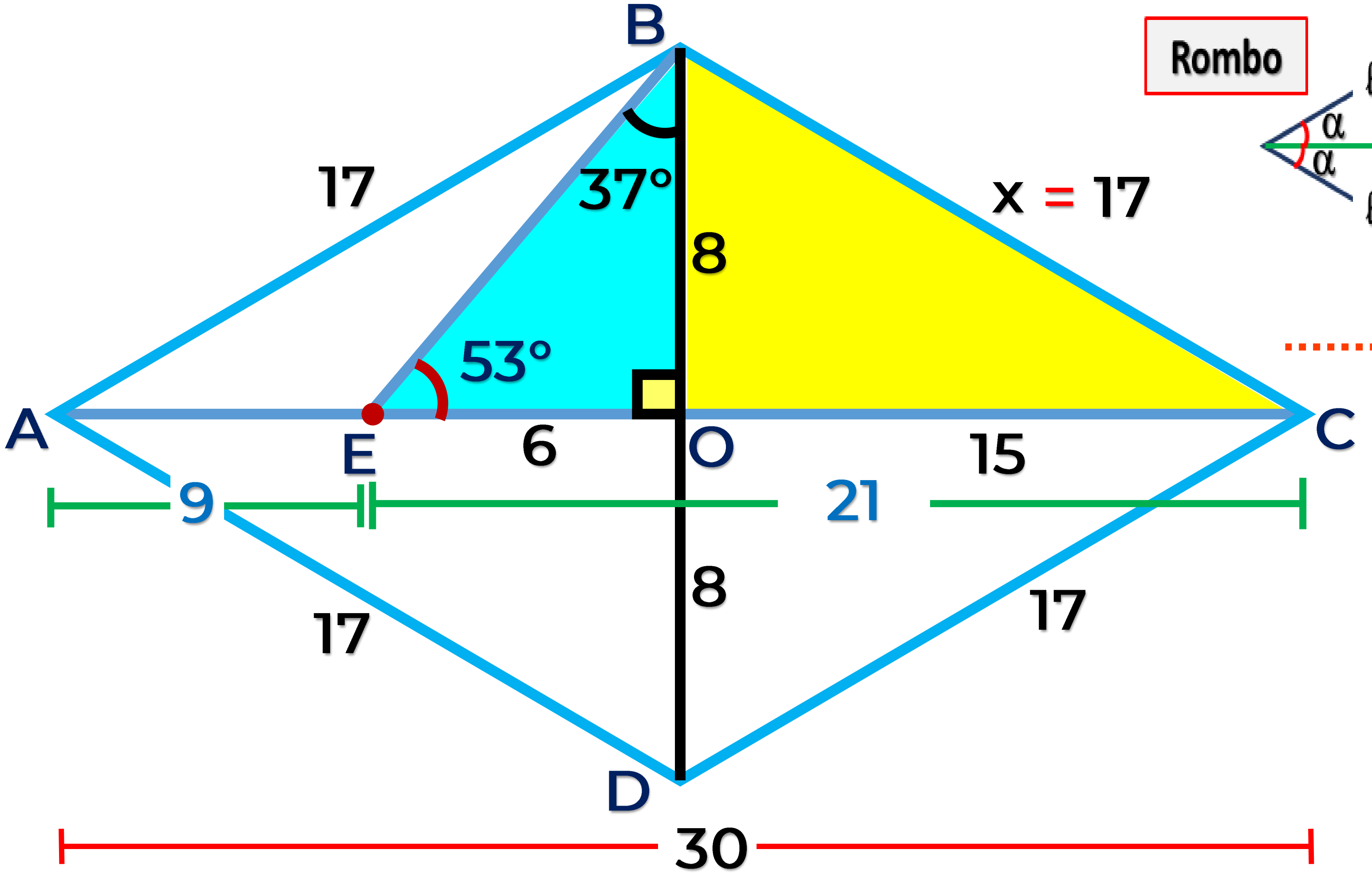


$x = \frac{(8+\cancel{a}) - \cancel{a}}{2}$

$\boxed{x = 4}$

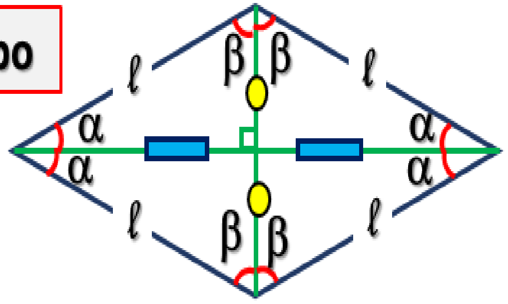
SACO OLIVEROS

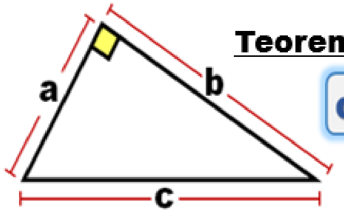
9. En un rombo ABCD, en $\overline{AC}$ se ubica el punto E, tal que m<BEC=53°, AE = 9 y EC = 21. Calcular el perímetro de dicha figura.



Recordemos:

Rombo





Teorema de Pitágoras

$c^2 = a^2 + b^2$

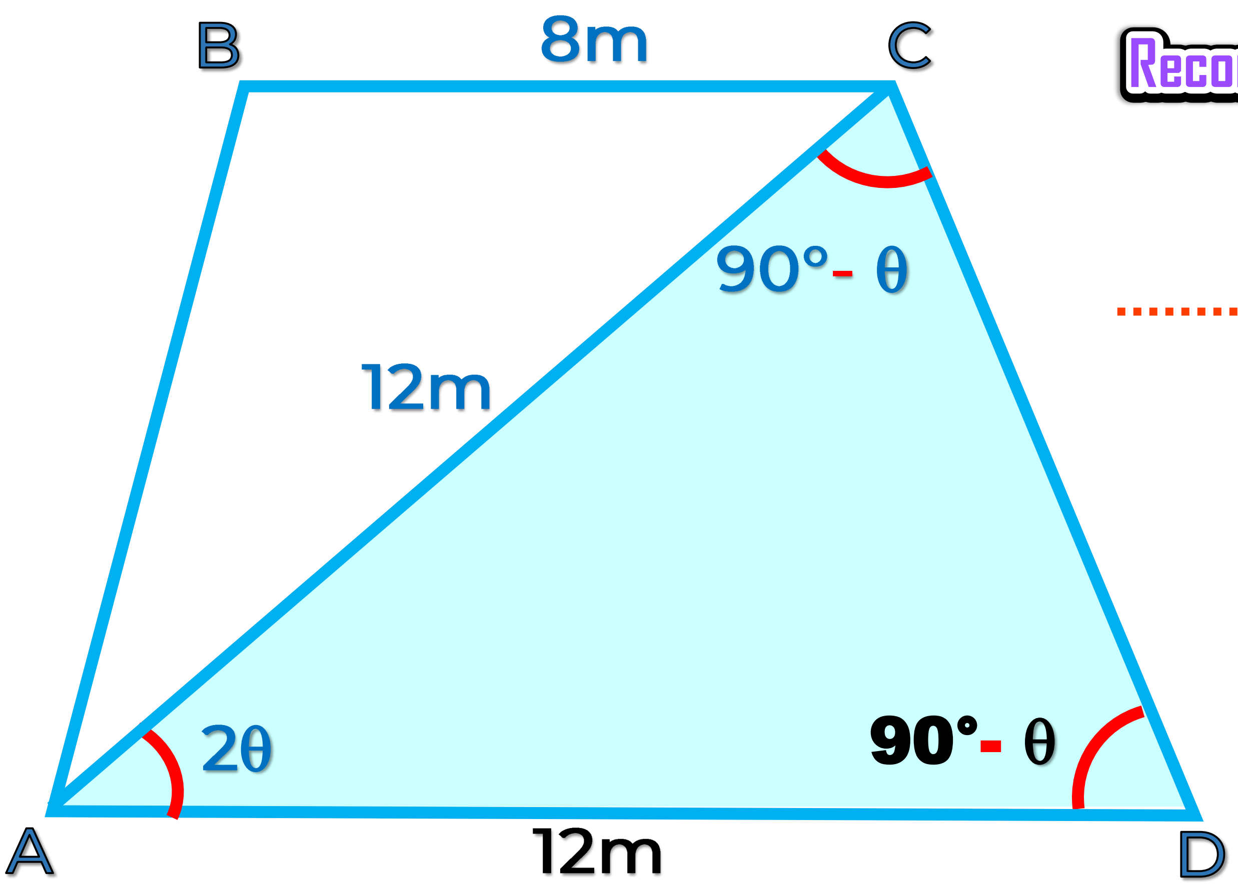
◺BOC: Pitágoras

$$x^2 = 8^2 + 15^2$$
$$x^2 = 289$$
$$x = 17$$

$$2p_{ABCD} = 17 + 17 + 17 + 17$$

$$\boxed{2p_{ABCD} = 68}$$

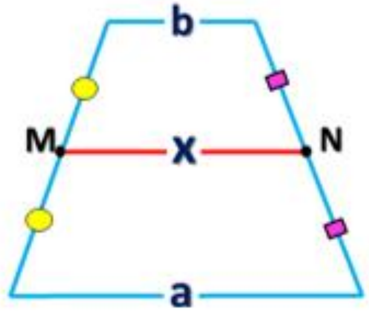
10. **Luis desea dividir con una cerca un jardín que tiene forma trapecial uniendo los puntos medios de $\overline{AB}$ y $\overline{CD}$. Cuanto debe medir dicha cerca.**



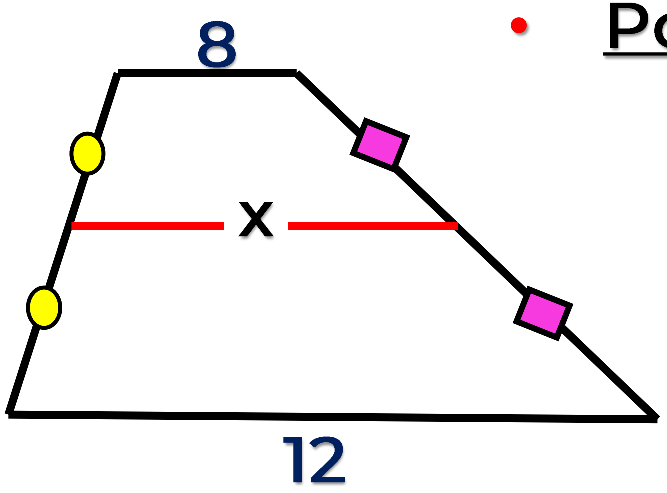
Recordemos:

$\overline{MN}$: Base media

$$x = \frac{a+b}{2}$$



- $\triangle$ACD: ISÓSCELES



- <u>Por base media</u>

$$x = \frac{12+8}{2}$$

$$\boxed{x = 10m}$$