



# GEOMETRÍA

Tomo 4

**4th**  
SECONDARY

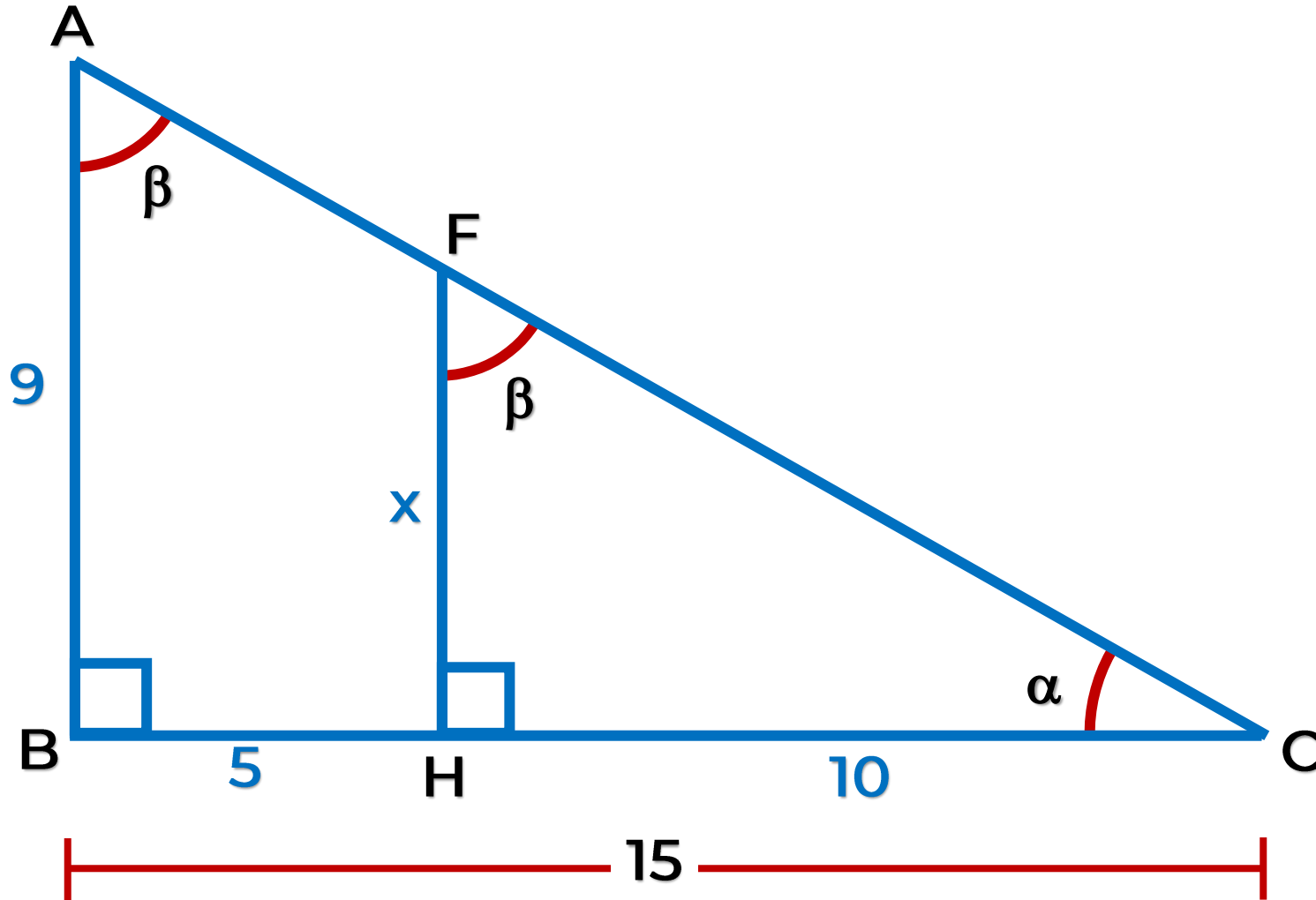
Retroalimentación



 **SACO OLIVEROS**



1. En la figura, calcule x.



$$\overline{AB} \parallel \overline{FH}$$

$$\triangle FHC \sim \triangle ABC$$

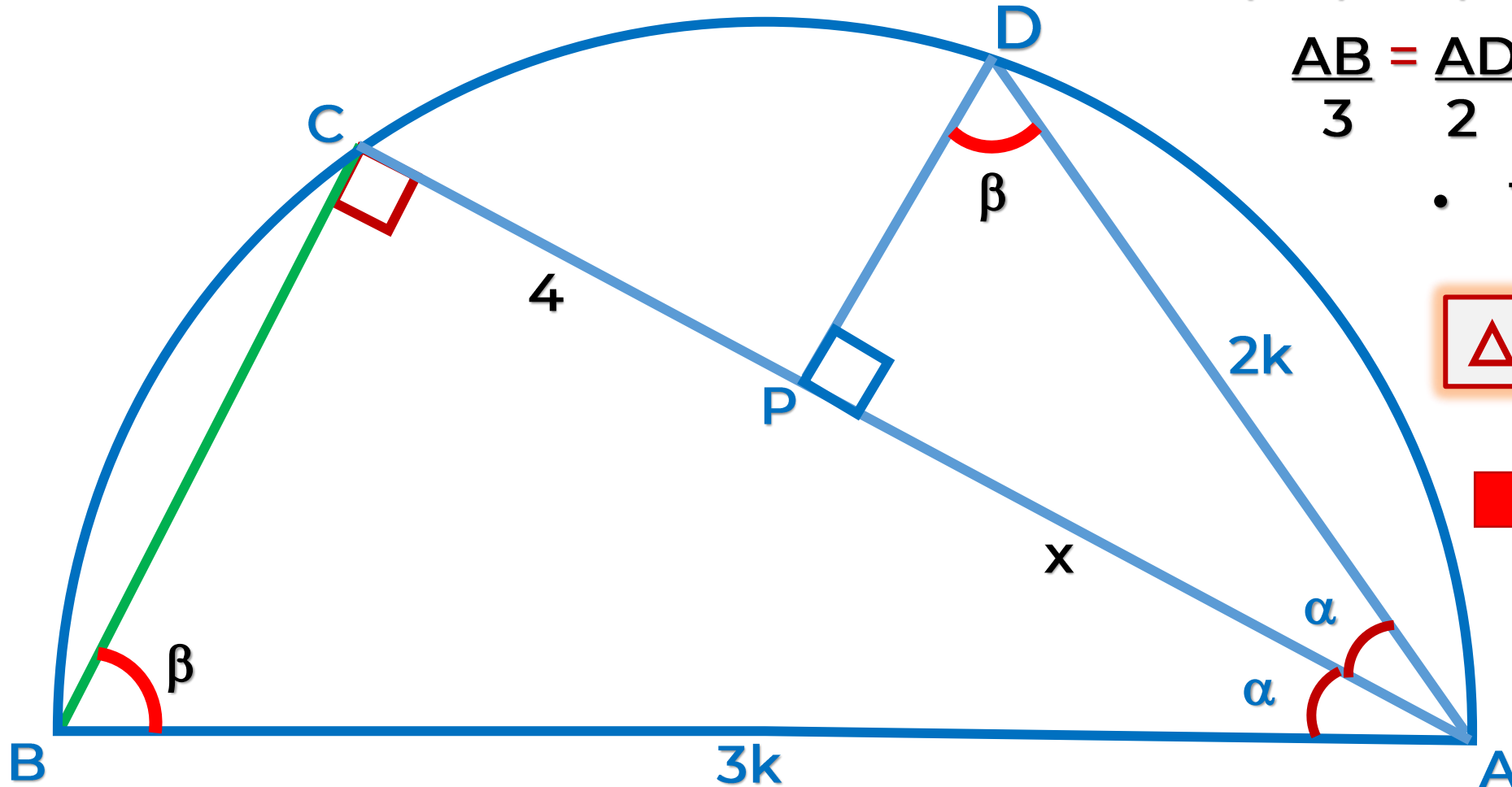
$$\Rightarrow \frac{x}{9} = \frac{10}{15}$$

$$3x = 18$$

$$x = 6$$



02. En la semicircunferencia,  $2(AB) = 3(AD)$  y  $PC = 4$ . Calcule AP.



- $2(AB) = 3(AD)$   $AB = 3K$

$$\frac{AB}{3} = \frac{AD}{2} = k \quad \left| \quad \begin{array}{l} AD = 2K \end{array} \right.$$

- Trazamos  $\overline{BC}$ .

$$\triangle ABC \sim \triangle ADP$$

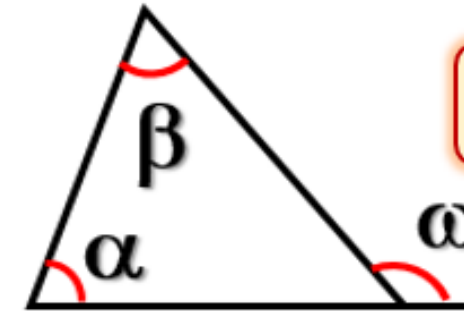
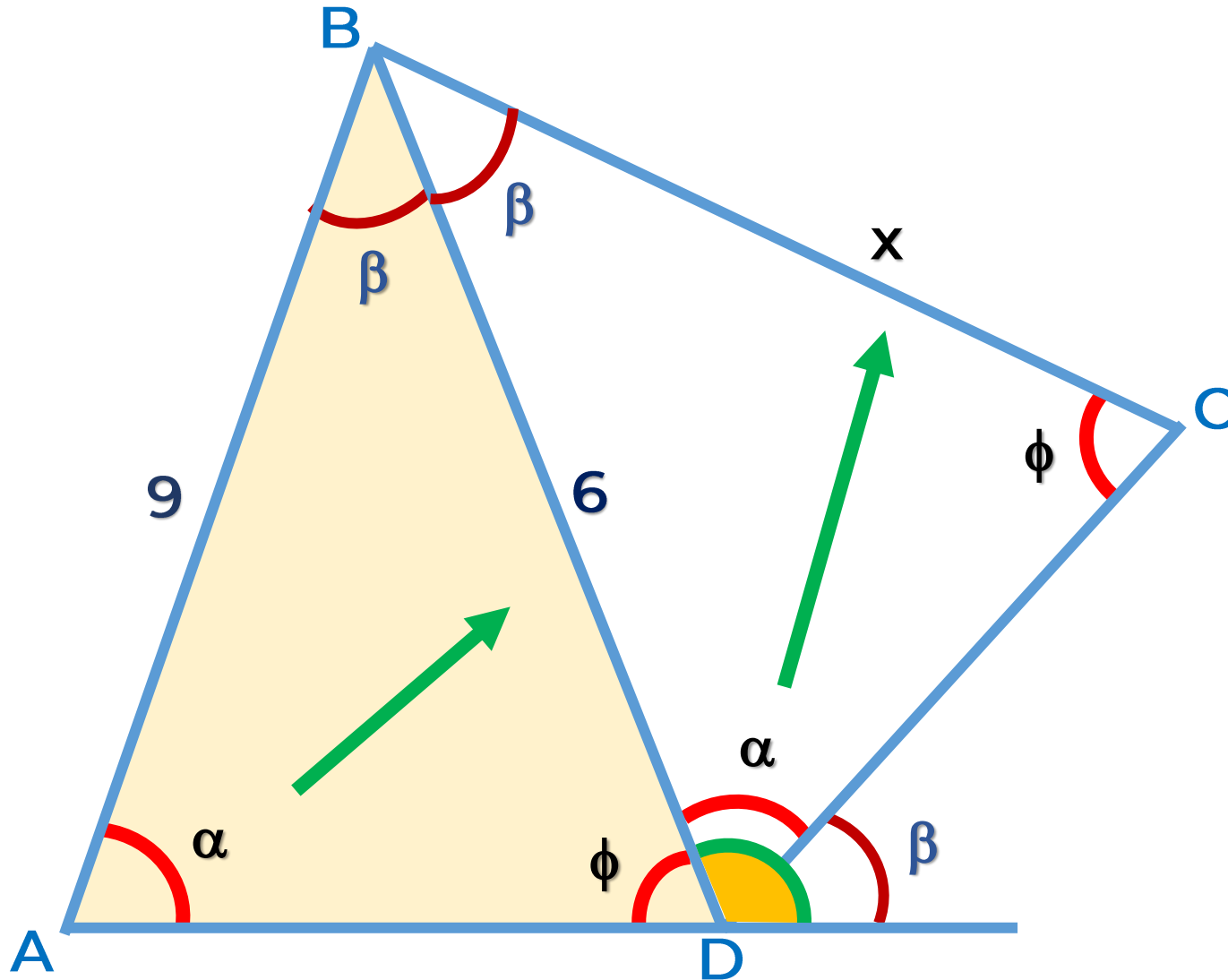
$$\Rightarrow \frac{3k}{2k} = \frac{x+4}{x}$$

$$3x = 2x + 8$$

$$x = 8$$



03. En la figura, calcule x.



$$\omega = \alpha + \beta$$

$$\triangle ABD \sim \triangle BDC$$

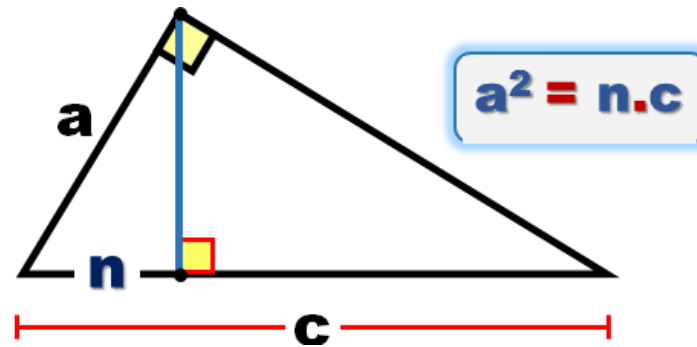
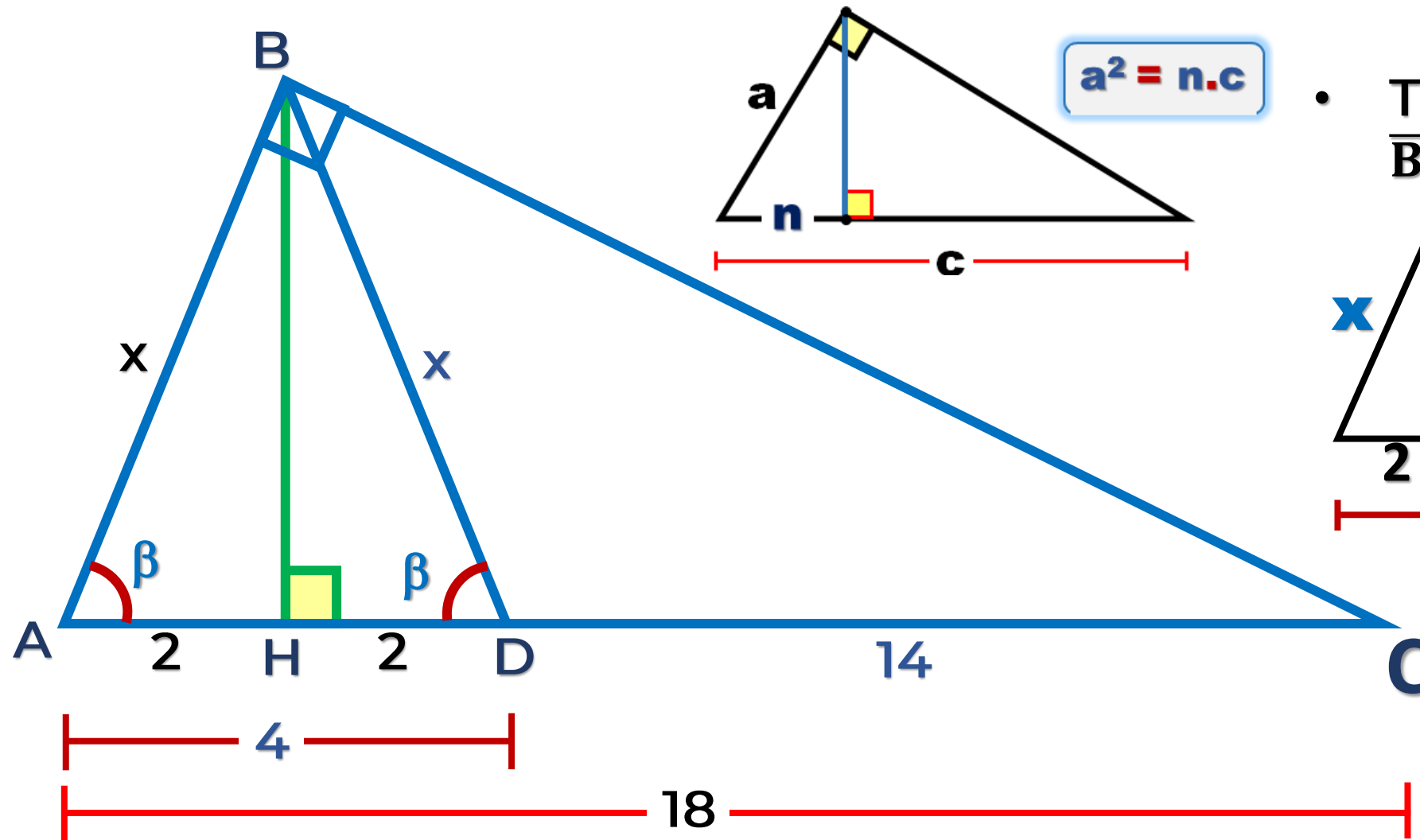
$$\Rightarrow \frac{x}{6} = \frac{6}{9}$$

$$3x = 12$$

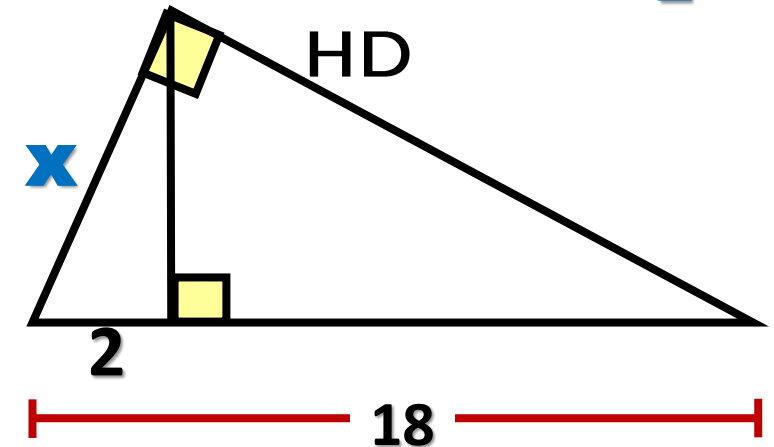
$$x = 4$$



04. En la figura, calcular x.



- $\triangle ABD$  : Isósceles  
 $AB = BD = x$
- Trazamos la altura  $\overline{BH}$   
 $AH = 2$   
 $HD = 18$



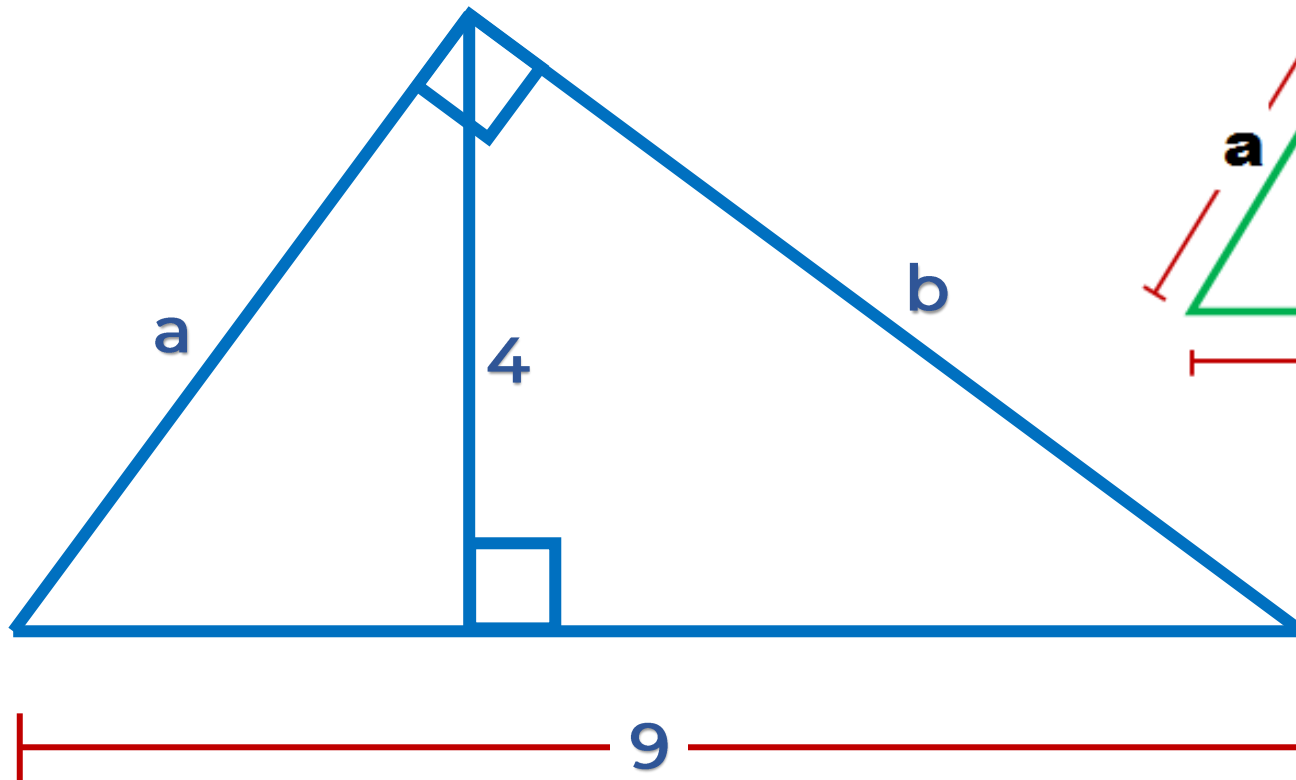
$$x^2 = 2(18)$$

$$x^2 = 36$$

$$x = 6$$



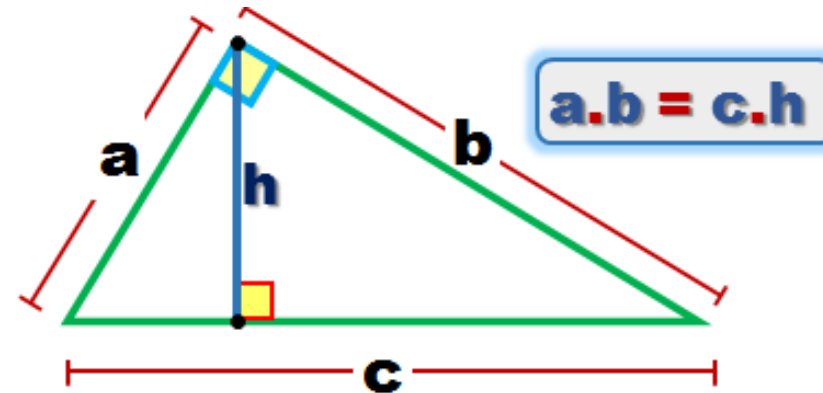
05. En la figura, calcular  $a + b$ .



- T. Pitágoras

$$9^2 = a^2 + b^2$$

$$81 = a^2 + b^2$$



- $a.b = 9.4$   
 $a.b = 36$

- Binomio al cuadrado

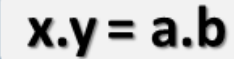
$$\Rightarrow (a + b)^2 = a^2 + b^2 + 2ab$$

$$(a + b)^2 = 81 + 2(36)$$

$$(a + b)^2 = 153$$

$$a + b = 3\sqrt{17}$$

The diagram shows a complex graph structure with blue nodes and edges. The nodes are labeled with letters:  $a$ ,  $b$ ,  $m$ ,  $n$ ,  $x$ , and  $T$ . The edges are labeled with numbers: 2, 6, and 8. There are also red and green lines with perpendicular markers. The red lines are labeled with the numbers 2, 6, and 8, and the green lines are labeled with the letters  $a$ ,  $b$ ,  $m$ , and  $n$ . The graph consists of several interconnected cycles and paths. The blue nodes are arranged in a roughly circular pattern, with edges connecting them in a complex manner. The red and green lines are drawn over the blue graph, indicating specific relationships or measurements. The red lines are labeled with the numbers 2, 6, and 8, and the green lines are labeled with the letters  $a$ ,  $b$ ,  $m$ , and  $n$ . The graph is a complex structure with many edges and nodes, and the labels provide a way to identify specific parts of the graph.

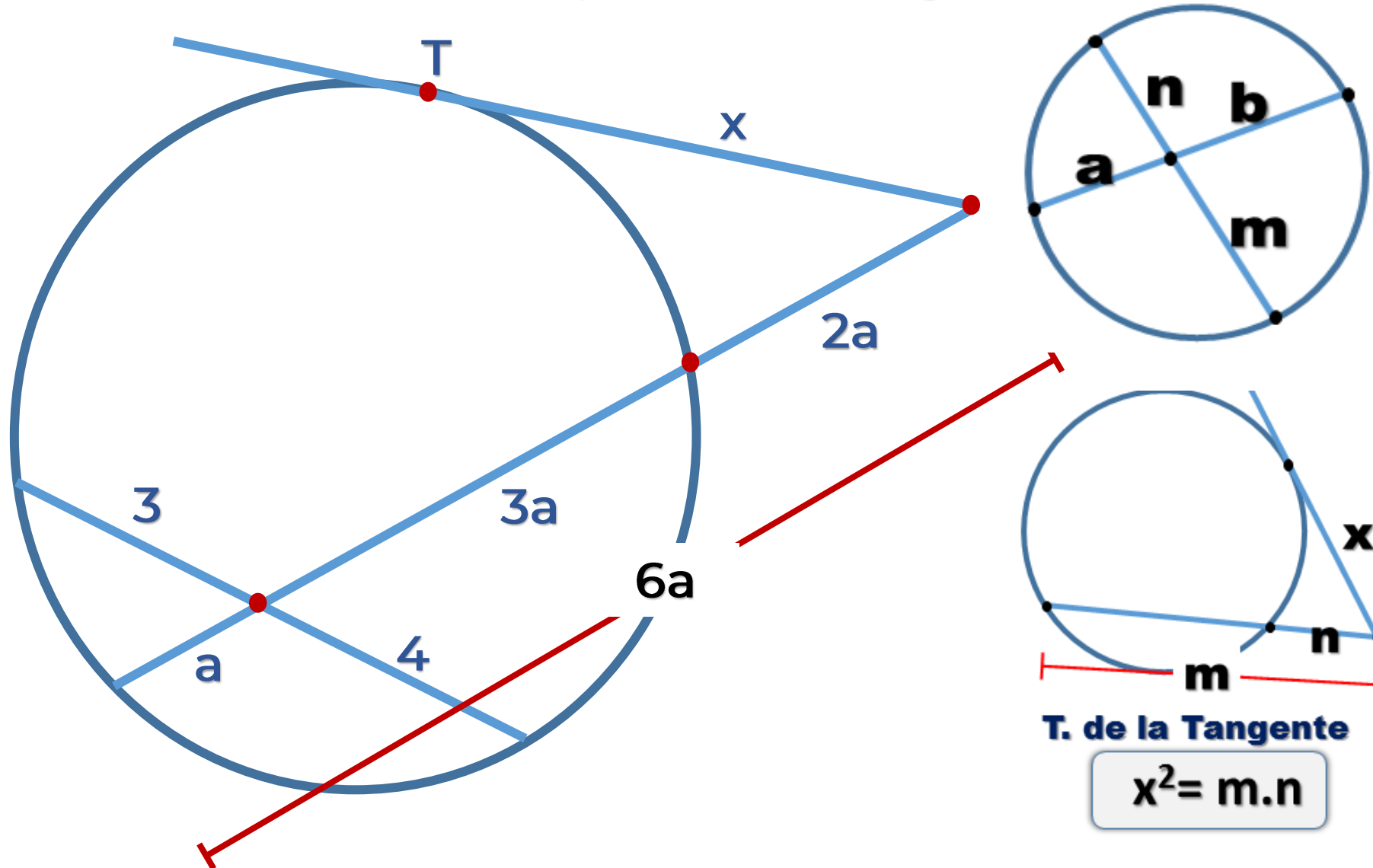


- $$x^2 = m \cdot n$$

**x = 4**



07. Calcule x, si T es punto de tangencia.



**T. de Cuerdas**

$$a \cdot b = m \cdot n$$

$$(3a) \cdot (a) = (4) \cdot (3)$$

$$a^2 = 4$$

$$a = 2$$

$$\Rightarrow x^2 = 6a \cdot 2a$$

$$x^2 = 12 \cdot 4$$

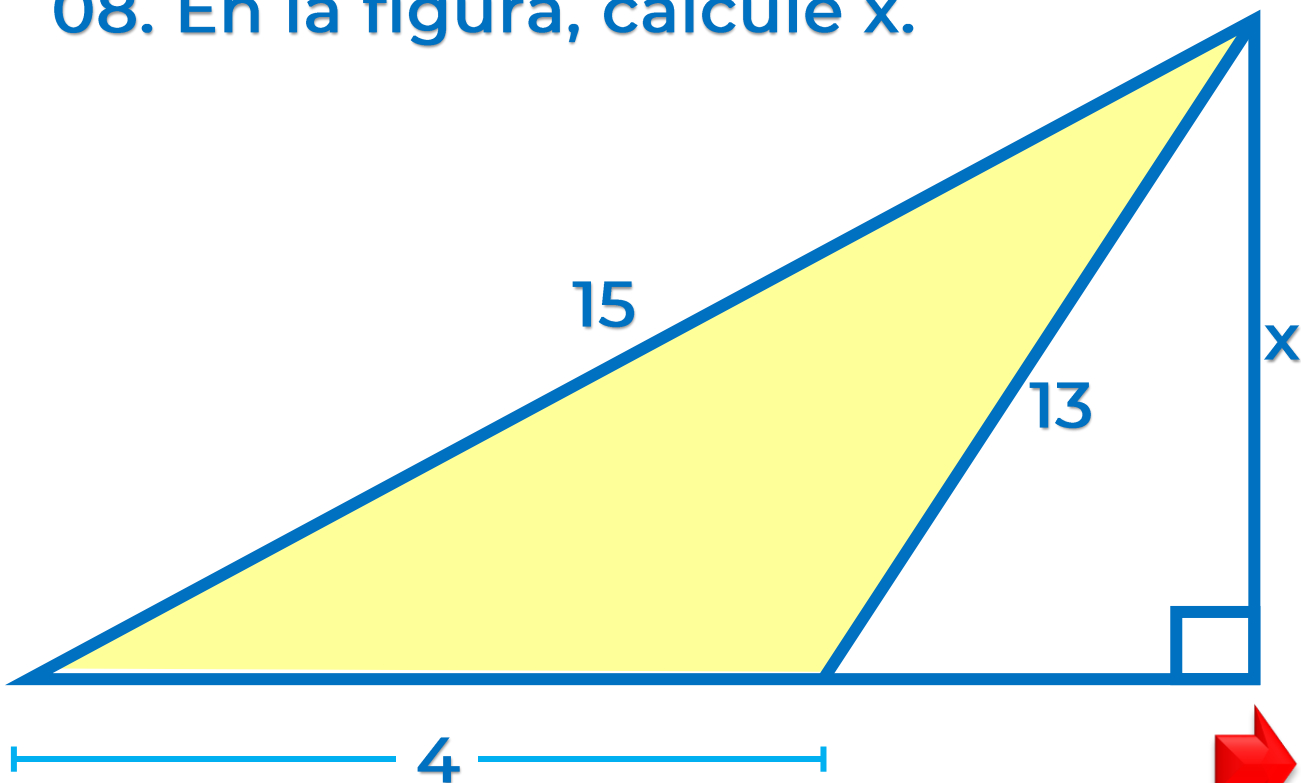
$$x^2 = (3 \cdot 4) \cdot 4$$

$$x = 4\sqrt{3}$$





08. En la figura, calcule x.

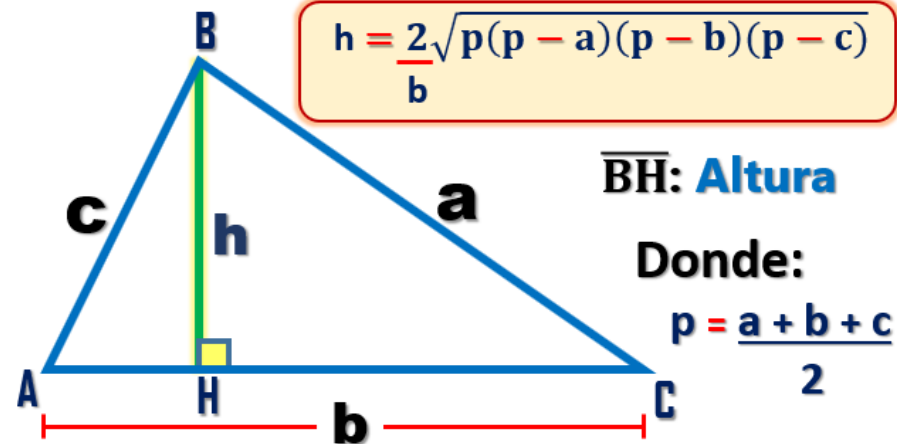


• Calculamos el semiperímetro

$$p = \frac{15 + 13 + 4}{2} \quad p = 16$$

### TEOREMA DE HERÓN

$$h = \frac{2\sqrt{p(p-a)(p-b)(p-c)}}{b}$$



• Por teorema de Herón

$$x = \frac{2\sqrt{16(16-13)(16-4)(16-15)}}{4}$$

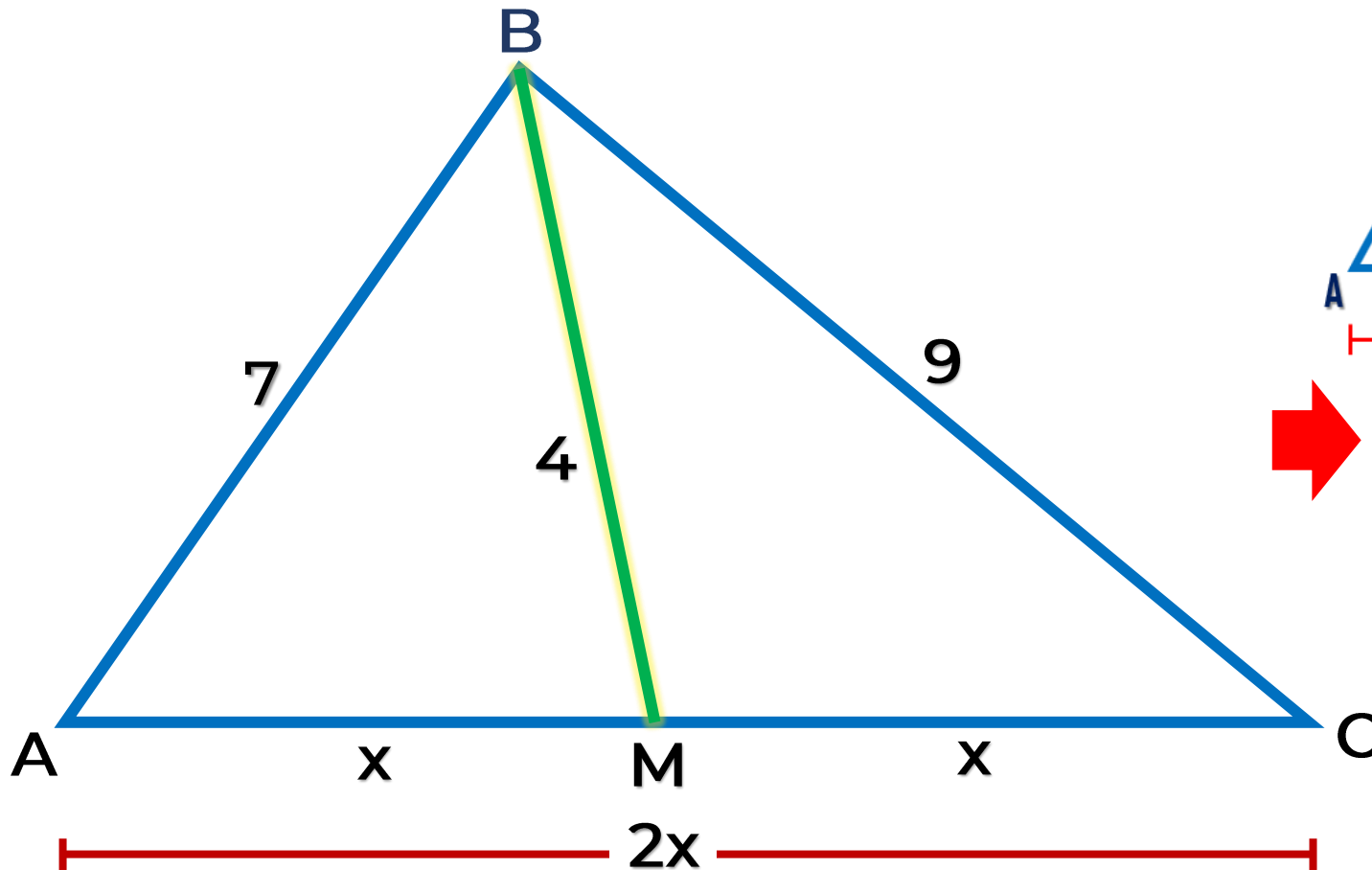
$$x = \frac{1\sqrt{16(3)(12)(1)}}{2} \quad x = \frac{1(4)(6)(1)}{2}$$

36

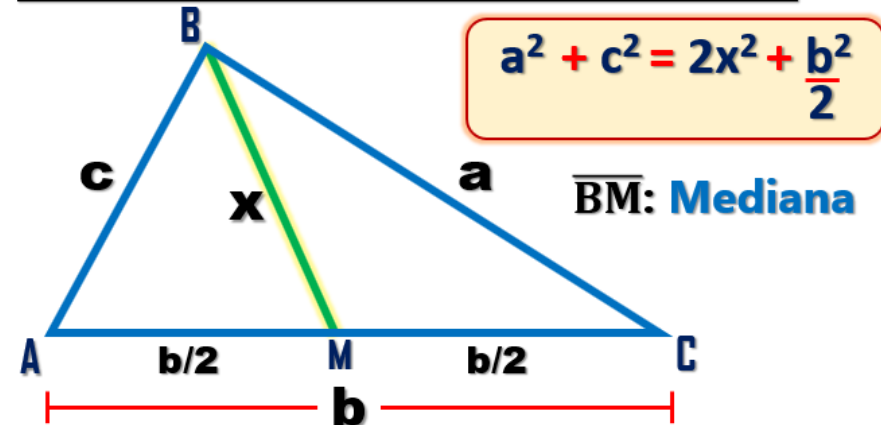
$$x = 12$$



9. En un triángulo ABC se traza la mediana  $\overline{BM}$ ,  $AB = 7$ ,  $BC = 9$  y  $BM = 4$ . Calcule  $AM$ .



### TEOREMA DE LA MEDIANA



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

$\overline{BM}$ : Mediana



$$9^2 + 7^2 = 2(4)^2 + \frac{(2x)^2}{2}$$

$$81 + 49 = 32 + 2x^2$$

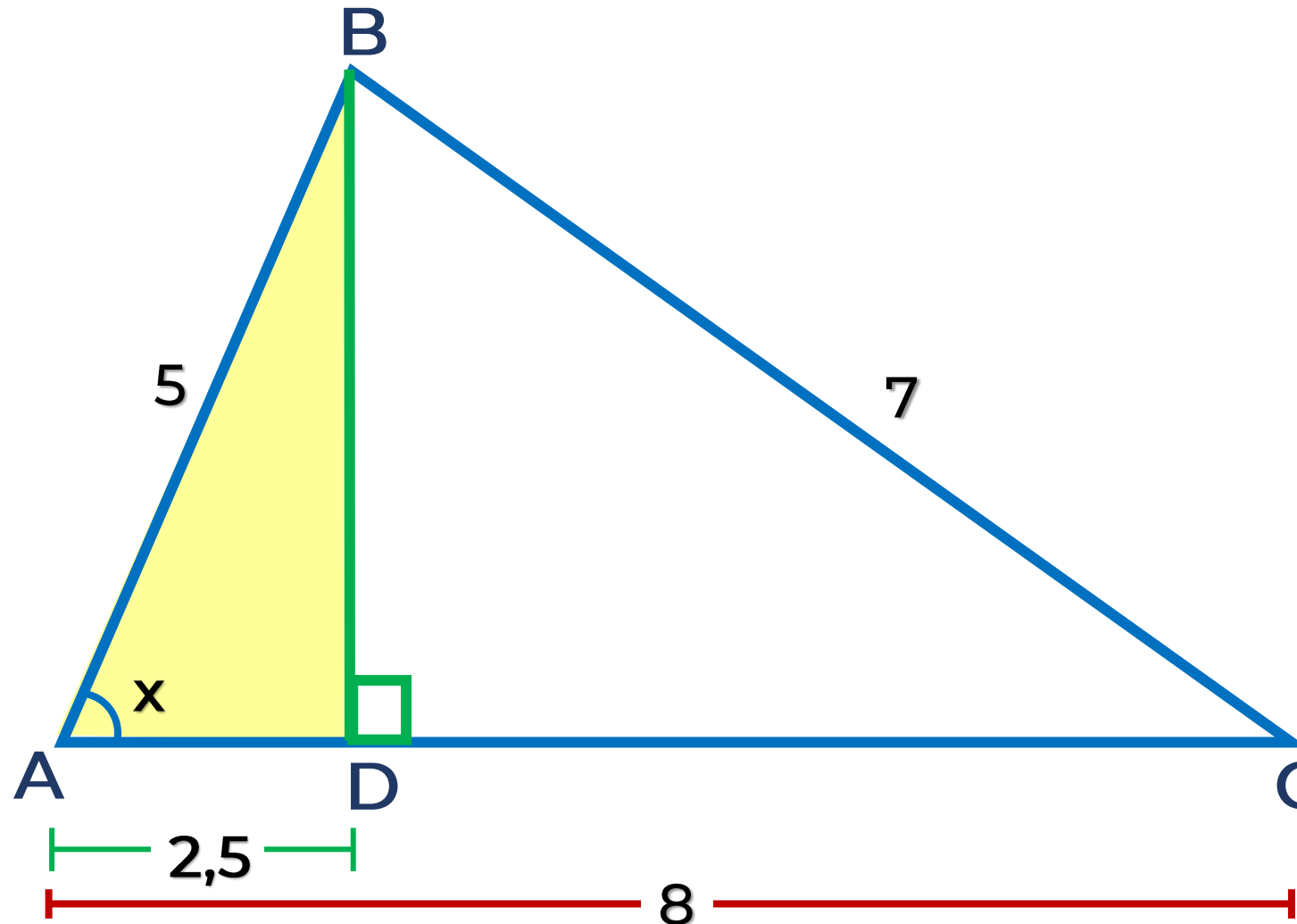
$$98 = 2x^2$$

$$49 = x^2$$

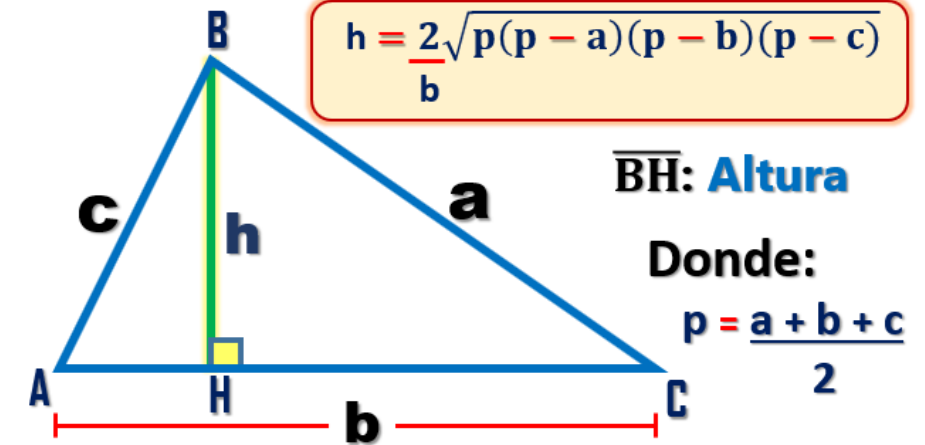
$$x = 7$$



10. En la figura, calcule x.



- Trazamos la altura  
**TEOREMA DE HERÓN**



$\rightarrow 7^2 = 8^2 + 5^2 - 2(8)(m)$   
 $49 = 64 + 25 - 16m$   
 $16m = 40$   
 $m = 2,5$

•  $\triangle ABD$ : Notable de  $30^\circ$  y  $60^\circ$   
 $x = 60^\circ$