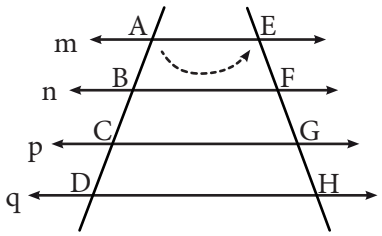
EJERCICIOS DE LÍNEAS PROPORCIONALES

1. Teorema de Tales

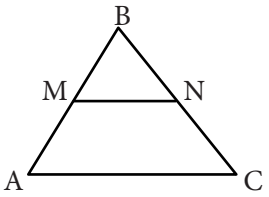
Si $\overleftrightarrow{m}//\overleftrightarrow{n}//\overleftrightarrow{p}//\overleftrightarrow{q}$



$$\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH}$$

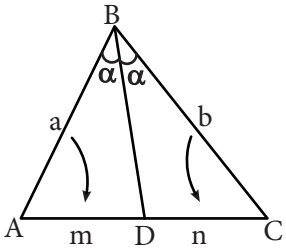
Observación:

- Si $\overline{MN}//\overline{AC}$.



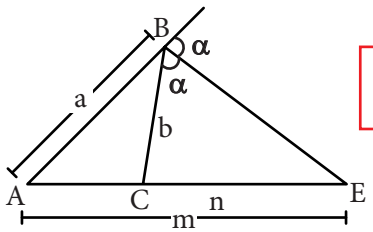
$$\frac{BM}{AM} = \frac{BN}{NC}$$

2. Teorema de la bisectriz interior



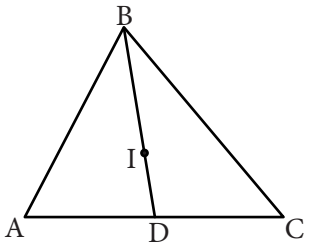
$$\frac{a}{m} = \frac{b}{n}$$

3. Teorema de la bisectriz exterior



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

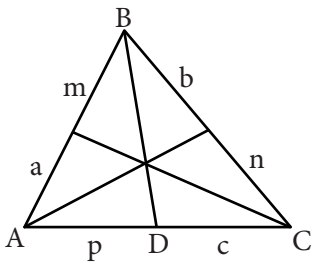
4. Teorema del incentro



Si I es el incentro del triángulo ABC, entonces se cumple:

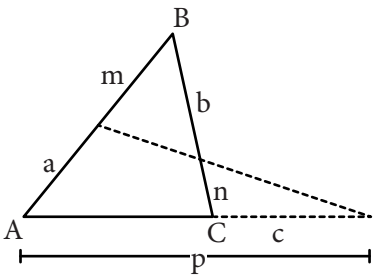
$$\frac{BI}{ID} = \frac{AB + BC}{AC}$$

5. Teorema de Ceva



$$a \bullet b \bullet c = m \bullet n \bullet p$$

6. Teorema de Menelao

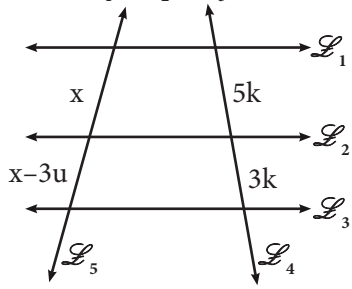


$$a \bullet b \bullet c = m \bullet n \bullet p$$

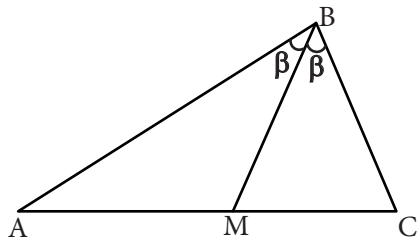
Trabajando en clase

Integral

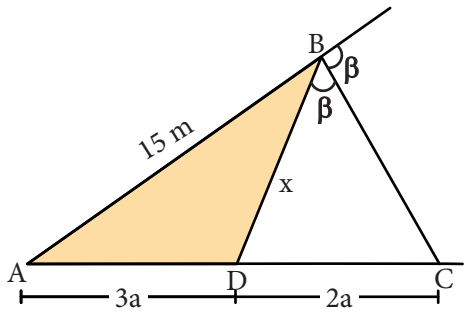
1. Calcula "x", si $\overleftrightarrow{\mathscr{L}_1} // \overleftrightarrow{\mathscr{L}_2} // \overleftrightarrow{\mathscr{L}_3}$



2. Calcula AM si AB = 8 m, BC = 6 m y AC = 7 m.

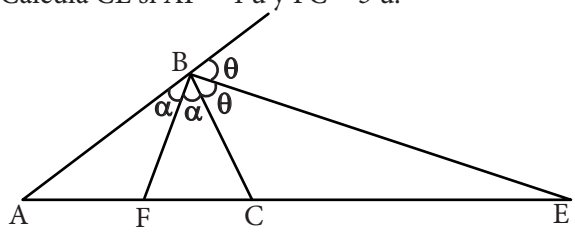


3. Calcula "x".

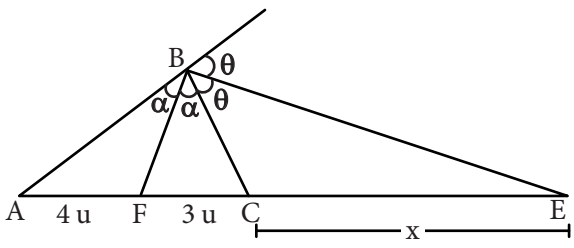


PUCP

4. Calcula CE si AF = 4 u y FC = 3 u.



Resolución:



ΔABC:

Teorema de la bisectriz interior

$$\frac{AB}{BC} = \frac{4}{3}$$

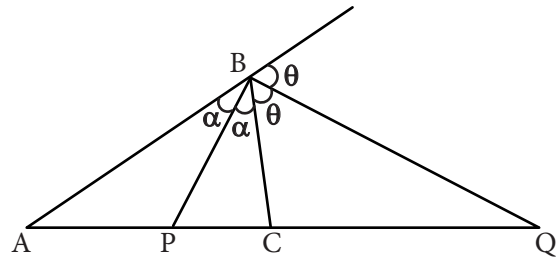
Teorema de la bisectriz exterior

$$\frac{AB}{BC} = \frac{x+7}{x}$$

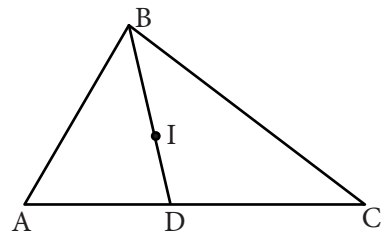
$$\frac{x+7}{x} = \frac{4}{3} \Rightarrow 3x + 21 = 4x$$

$$\boxed{x = 21u}$$

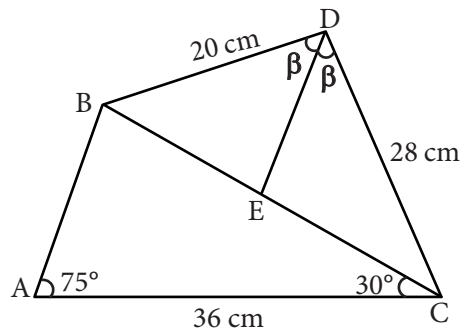
5. Calcula CQ si: AP = 3 u y PC = 2 u.



6. Calcula BI, si BD = 5 u, AC = 10 u y el perímetro del triángulo ABC es 25 u; además, I es el incentro de dicho triángulo.



7. Calcula BE.



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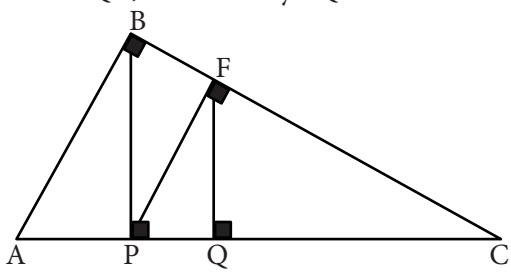
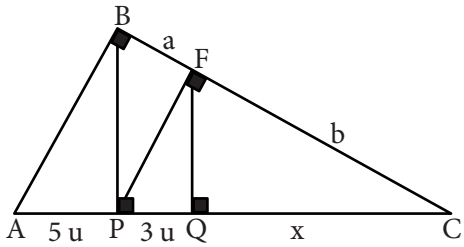
8. Calcula QC, si AP = 5 u y PQ = 3 u.



Resolución:



$\overline{AB}//\overline{PC}$ $\qquad$ $\overline{BP}//\overline{FQ}$

$\frac{a}{b} = \frac{5}{x+3}$ $\qquad$ $\frac{a}{b} = \frac{3}{x}$

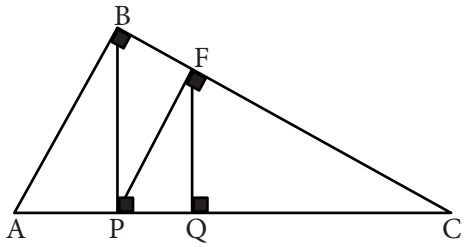
$\frac{5}{x+3} = \frac{3}{x} \Rightarrow 5x = 3x + 9$

$2x = 9$

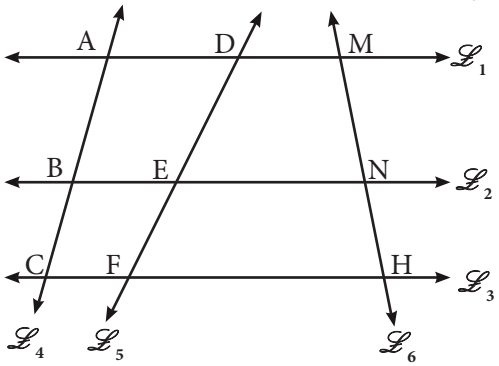
$x = \frac{9}{2}$

$\boxed{x = 4{,}5 \text{ u}}$

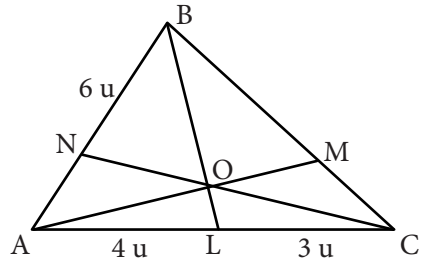
9. Calcula QC, si AP = 4 u y PQ = 3 u.



10. Calcula BC + NH si AB = 24 u, DE = 27 u, EF = 18 u, MN = BC + 14 y $\overleftrightarrow{\mathscr{L}_1}//\overleftrightarrow{\mathscr{L}_2}//\overleftrightarrow{\mathscr{L}_3}$.



11. Calcula BM, si AN = MC.



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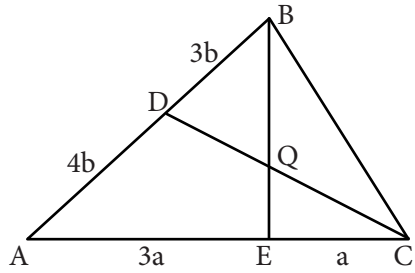
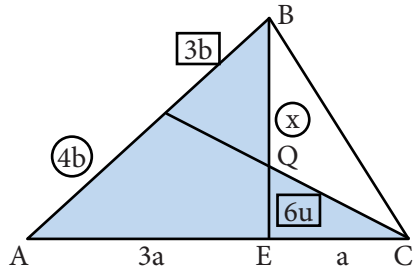
12. Calcula BQ si QE = 6 u.



Resolución:

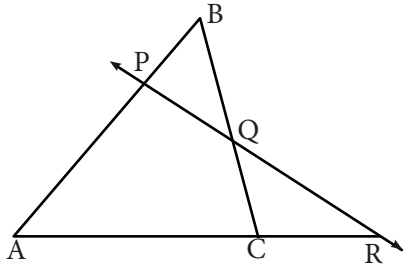


Por teorema de Menelao:

$\cancel{AB}.x.\cancel{a} = 3\cancel{b}.6.\cancel{Aa}$

$\boxed{x = 18}$

13. Calcula CR, si AP = 9 u, PB = 3 u, AC = 8 u y BQ = QC.



14. Calcula "x" si $\overline{EF}//\overline{AC}$.