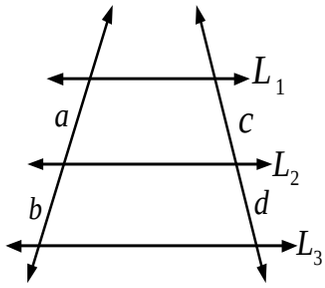
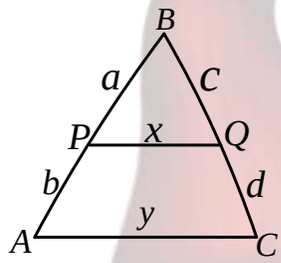
Curso: Geometría

Ciclo Invierno 2020
TEMA N° 05

6) PROPORCIONALIDAD Y SEMEJANZA

TEOREMA DE THALES





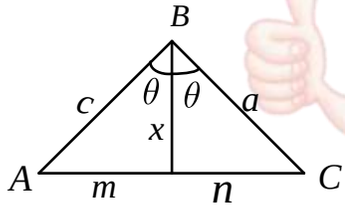
Si $\overleftrightarrow{L_1} // \overleftrightarrow{L_2} // \overleftrightarrow{L_3}$ y $\overline{PQ} // \overline{AC}$

$\frac{a}{b} = \frac{c}{d}$, $\frac{a}{b} = \frac{c}{d}$

$\frac{a+b}{b} = \frac{c+d}{d}$, $\frac{a}{x} = \frac{a+b}{y}$

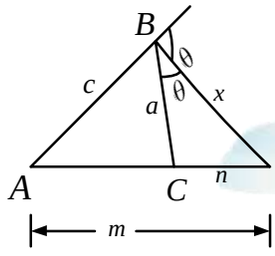
TEOREMAS DE LA BISECTRIZ

1) INTERIOR:



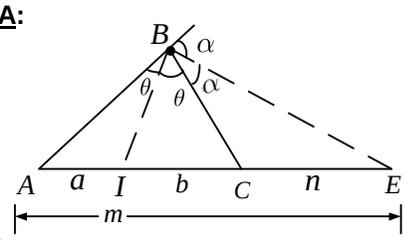
$$\frac{c}{a} = \frac{m}{n} \wedge x^2 = ac - mn$$

2) EXTERIOR:



$$\frac{c}{a} = \frac{m}{n} \wedge x^2 = mn - ac$$

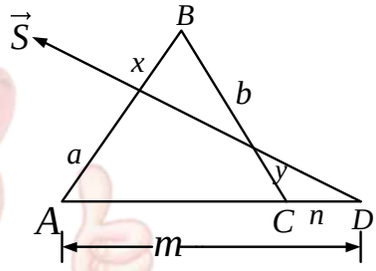
NOTA:



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

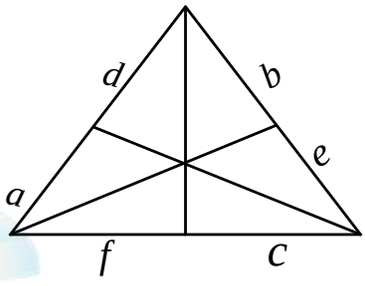
TEOREMA DE:

1) MENELAO



$$a.b.n = x.y.m$$

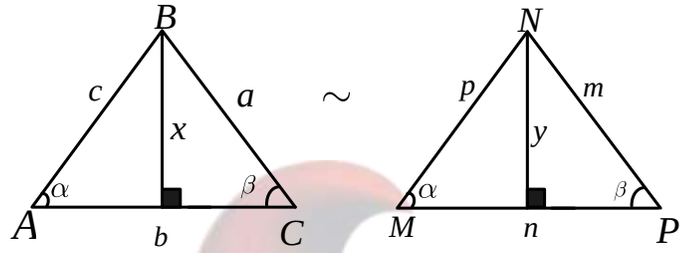
2) CEVA



$$a.b.c = d.e.f$$

SEMEJANZA DE TRIÁNGULOS

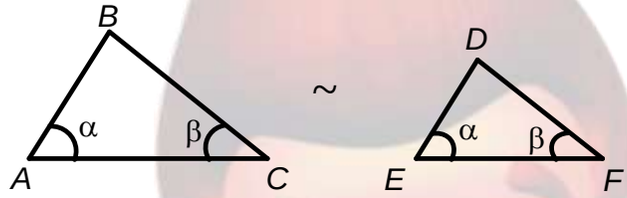
Dos triángulos son semejantes si sus ángulos interiores son congruentes o sus lados homólogos son segmentos proporcionales.



$$\frac{c}{p}=\frac{a}{m}=\frac{b}{n}=\frac{x}{y}=k \rightarrow \text{ constante de proporcionalidad}$$

Casos de semejanza

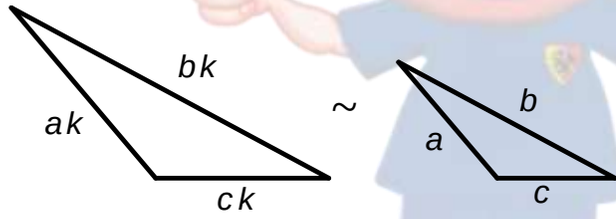
***Primer Caso*.** Si tienen dos pares de ángulos interiores congruentes.



***Segundo Caso*.** Si tienen un par de ángulos interiores congruentes y los lados que forman respectivamente proporcionales.

$$\frac{ak}{a}=\frac{bk}{b}$$

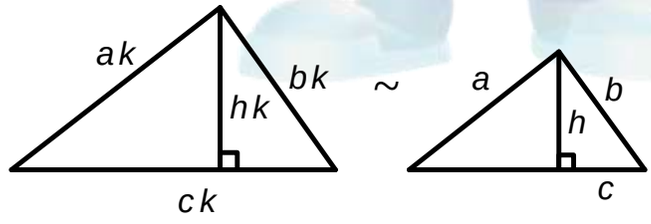
***Tercer Caso*.** Si los tres pares de lados son proporcionales.



$$\frac{ak}{a}=\frac{bk}{b}=\frac{ck}{c}$$

Propiedades.

1. Si dos triángulos son semejantes, también son proporcionales los perímetros, las alturas, las medianas y las bisectrices.



$$\frac{ak}{a}=\frac{hk}{h}$$