GEOMETRÍA

Capítulo 4

3th

SECONDARY

RECTAS PARALELAS

SACO OLIVEROS

MOTIVATING | STRATEGY








ÁNGULOS ENTRE DOS RECTAS PARALELAS Y UNA SECANTE

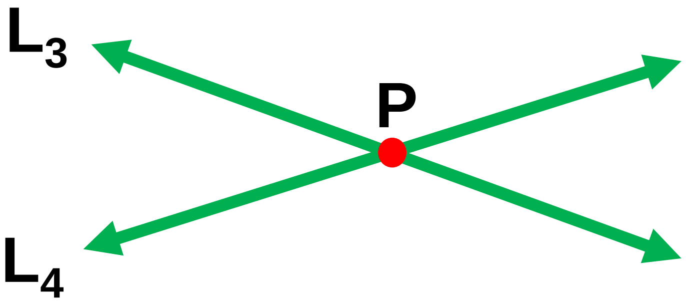
RECTAS PARALELAS:

Dos rectas son paralelas si están contenidas en un plano y no tienen ningún punto en común.

$\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}$

RECTAS SECANTES:

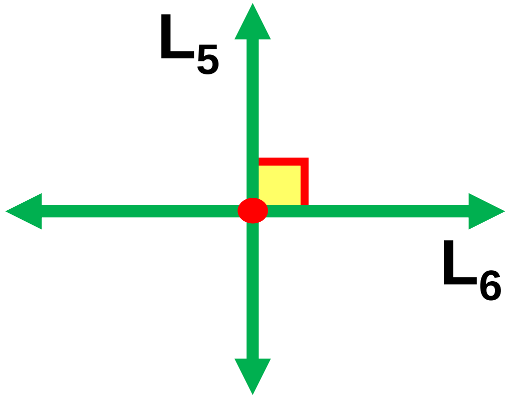
Dos rectas son secantes si tienen un punto en común.



$\overleftrightarrow{L_3} \nparallel \overleftrightarrow{L_4}$

RECTAS PERPENDICULARES:

Son aquellas rectas secantes que forman ángulos rectos.

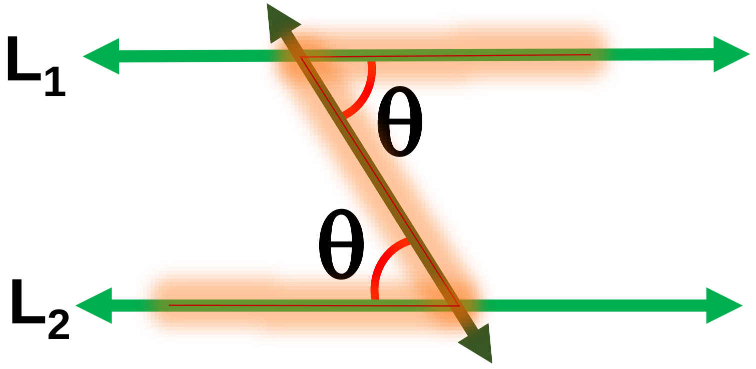


$\overleftrightarrow{L_5} \perp \overleftrightarrow{L_6}$

ÁNGULOS ALTERNOS INTERNOS

Si

$\overleftrightarrow{L_1} // \overleftrightarrow{L_2}$



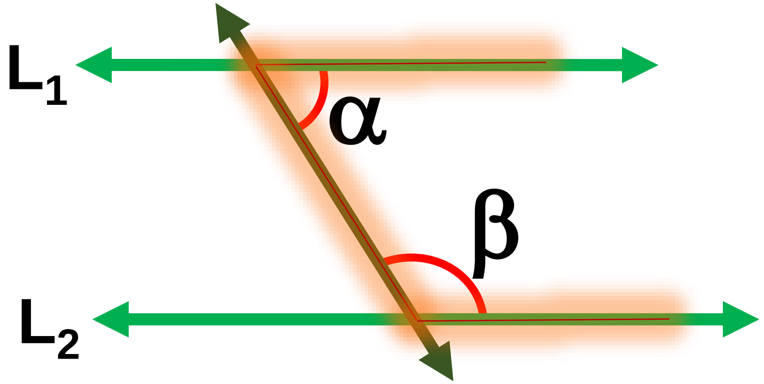
ÁNGULOS CONJUGADOS INTERNOS

Si

$\overleftrightarrow{L_1} // \overleftrightarrow{L_2}$

entonces

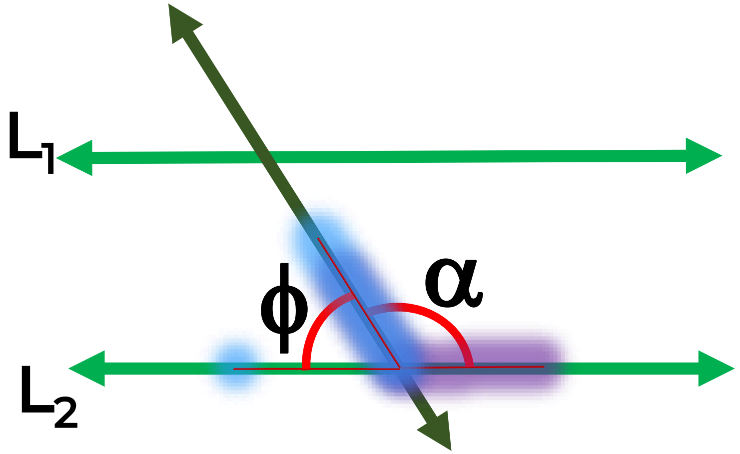
$\alpha + \beta = 180°$



ÁNGULOS CORRESPONDIENTES

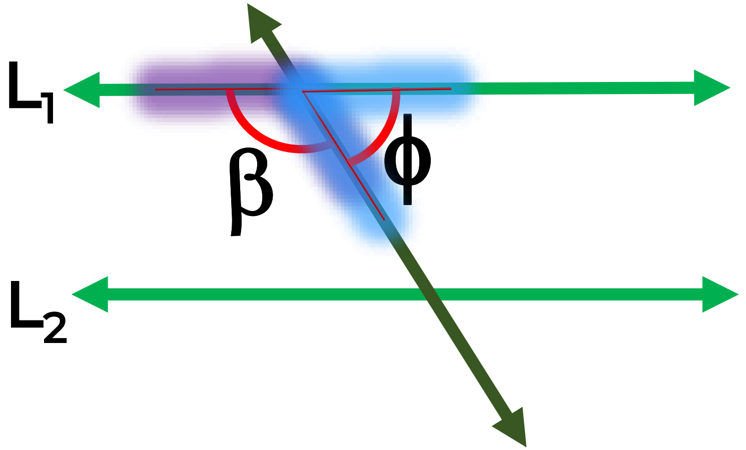
Si

$\overleftrightarrow{L_1} // \overleftrightarrow{L_2}$

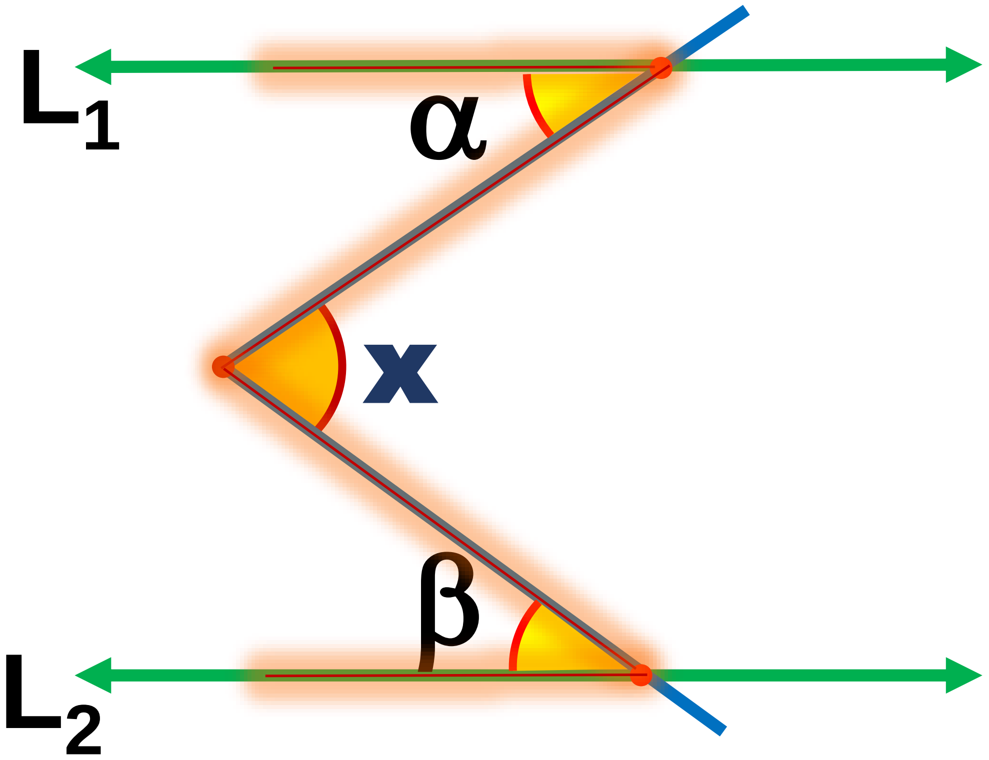


Si

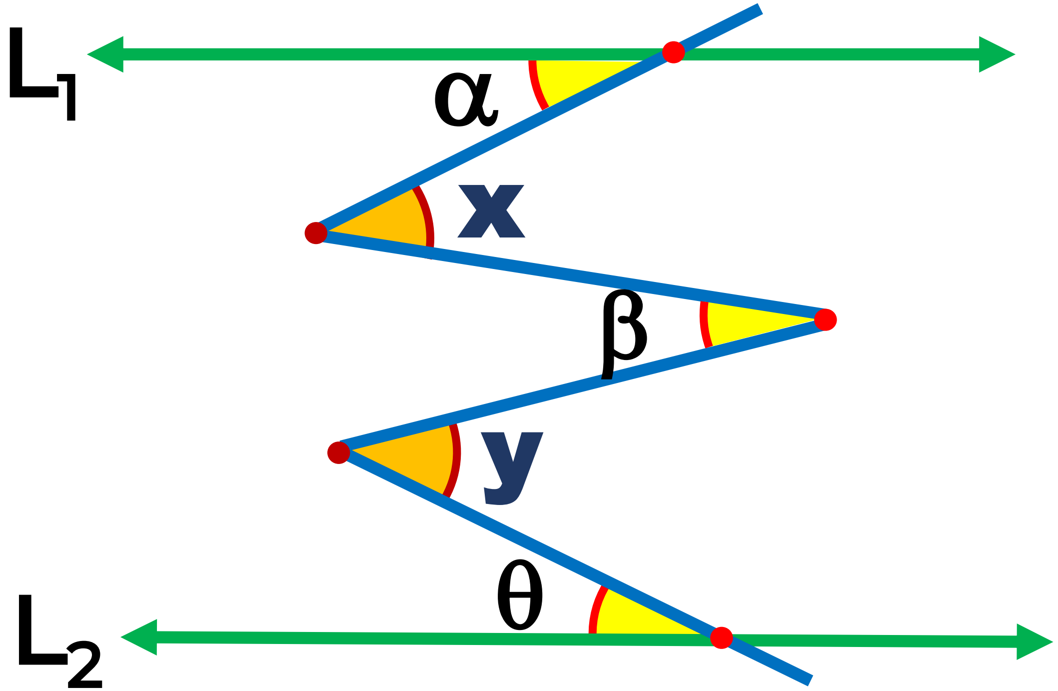
$\overleftrightarrow{L_1} // \overleftrightarrow{L_2}$



TEOREMAS



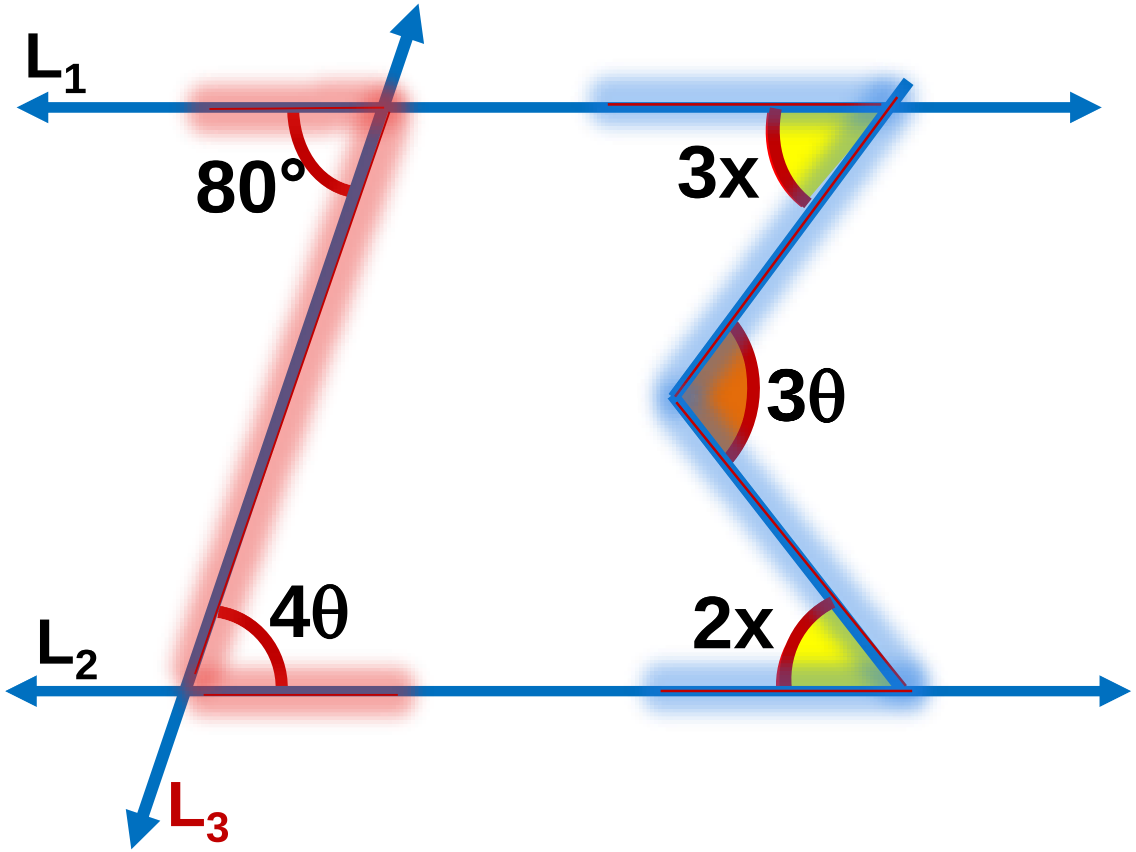
Si $\boxed{\overleftrightarrow{L_1} \,//\, \overleftrightarrow{L_2}}$ entonces $\boxed{x = \alpha + \beta}$



Si $\boxed{\overleftrightarrow{L_1} \,//\, \overleftrightarrow{L_2}}$

entonces $\boxed{\alpha + \beta + \theta = x + y}$

1. En la figura, $\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}$. Halle el valor de x.

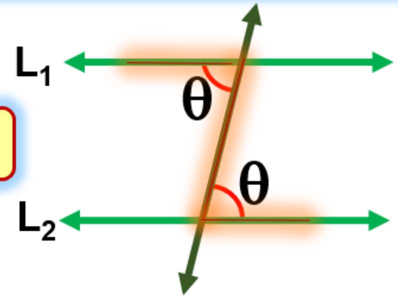


Resolución:

- En $\overleftrightarrow{L_3}$: ángulos alternos.

ÁNGULOS ALTERNOS INTERNOS

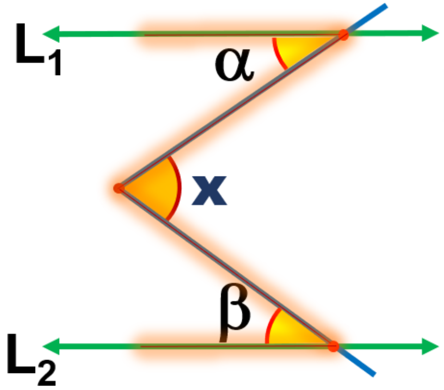
Si $\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}$



$$80° = 4\theta$$

$$\boxed{20° = \theta}$$

- En el gráfico:



TEOREMA

Si $\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}$

$\rightarrow$ $\boxed{x = \alpha + \beta}$

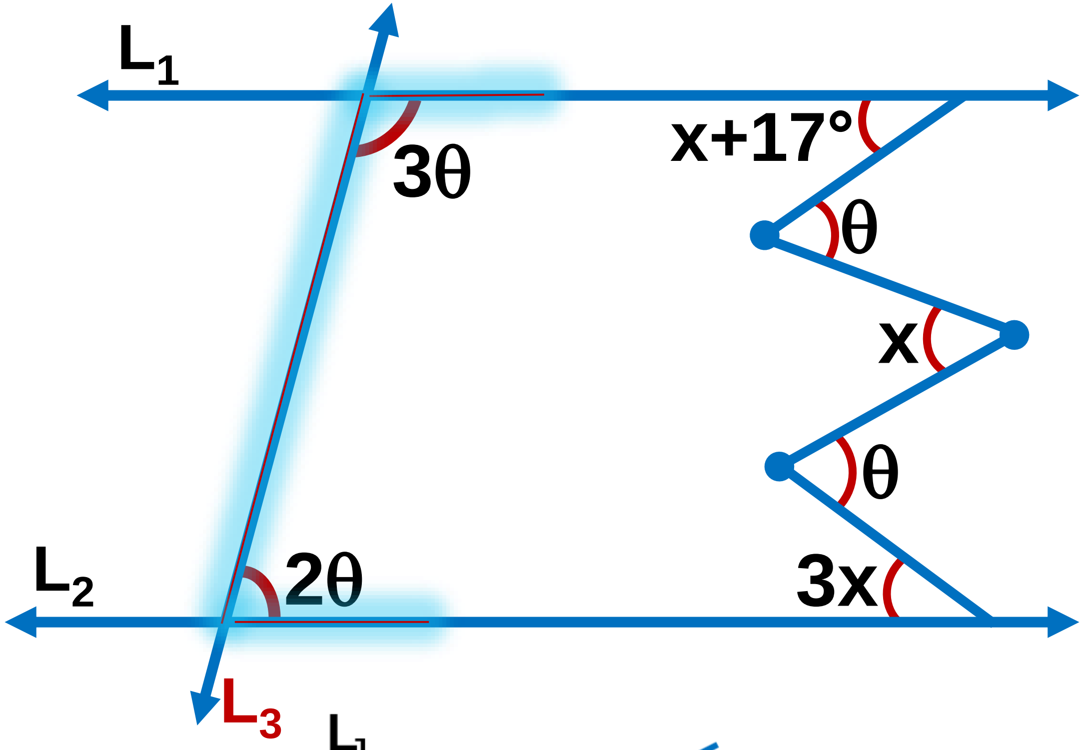
$$3\theta = 3x + 2x$$

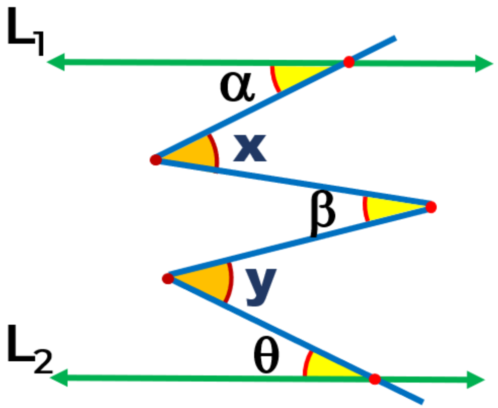
$$3(20°) = 5x$$

$$60° = 5x$$

$$\boxed{x = 12°}$$

2. En la figura, $\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}$. Halle el valor de x.





TEOREMA

Si $\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}$

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

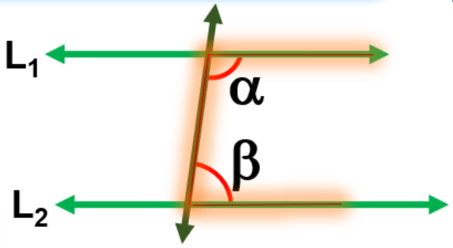
Resolución:

- En $\overleftrightarrow{L_3}$: ángulos conjugados.

ÁNGULOS CONJUGADOS INTERNOS

Si $\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}$

entonces $\alpha+\beta = 180°$

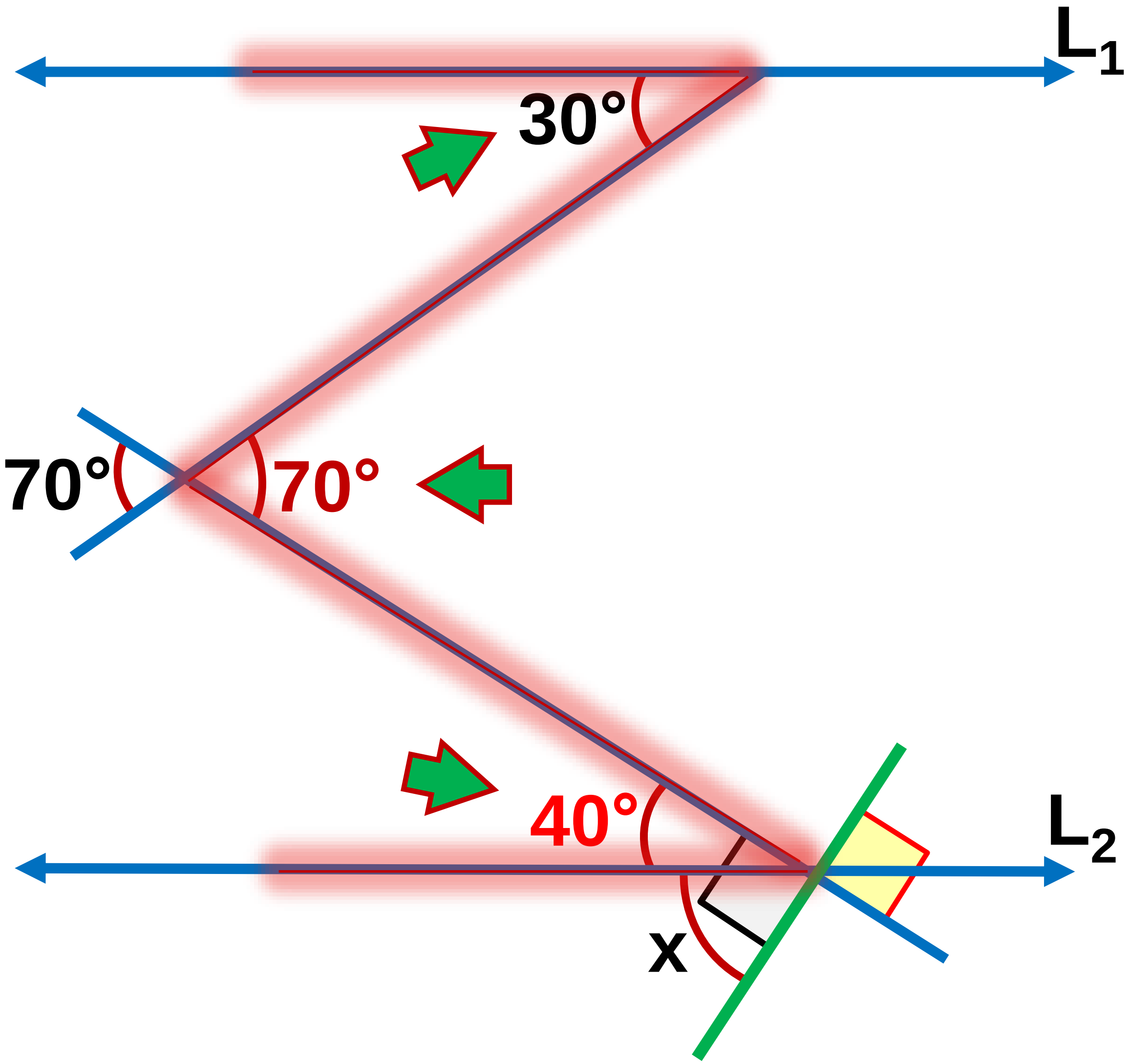


$$3\theta + 2\theta = 180°$$
$$5\theta = 180°$$
$$\boxed{\theta = 36°}$$

- En el gráfico:

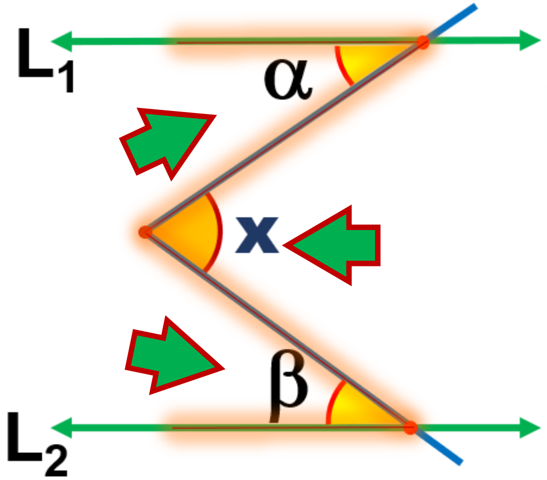
$$x+17° + x + 3x = \theta + \theta$$
$$5x + 17° = 2\theta$$
$$5x = 2(36°) - 17°$$
$$\boxed{x = 11°}$$

3. Si $\overleftrightarrow{L_1}$ // $\overleftrightarrow{L_2}$, halle el valor de x.



Resolución:

- Piden: x
- Recordemos:



TEOREMA

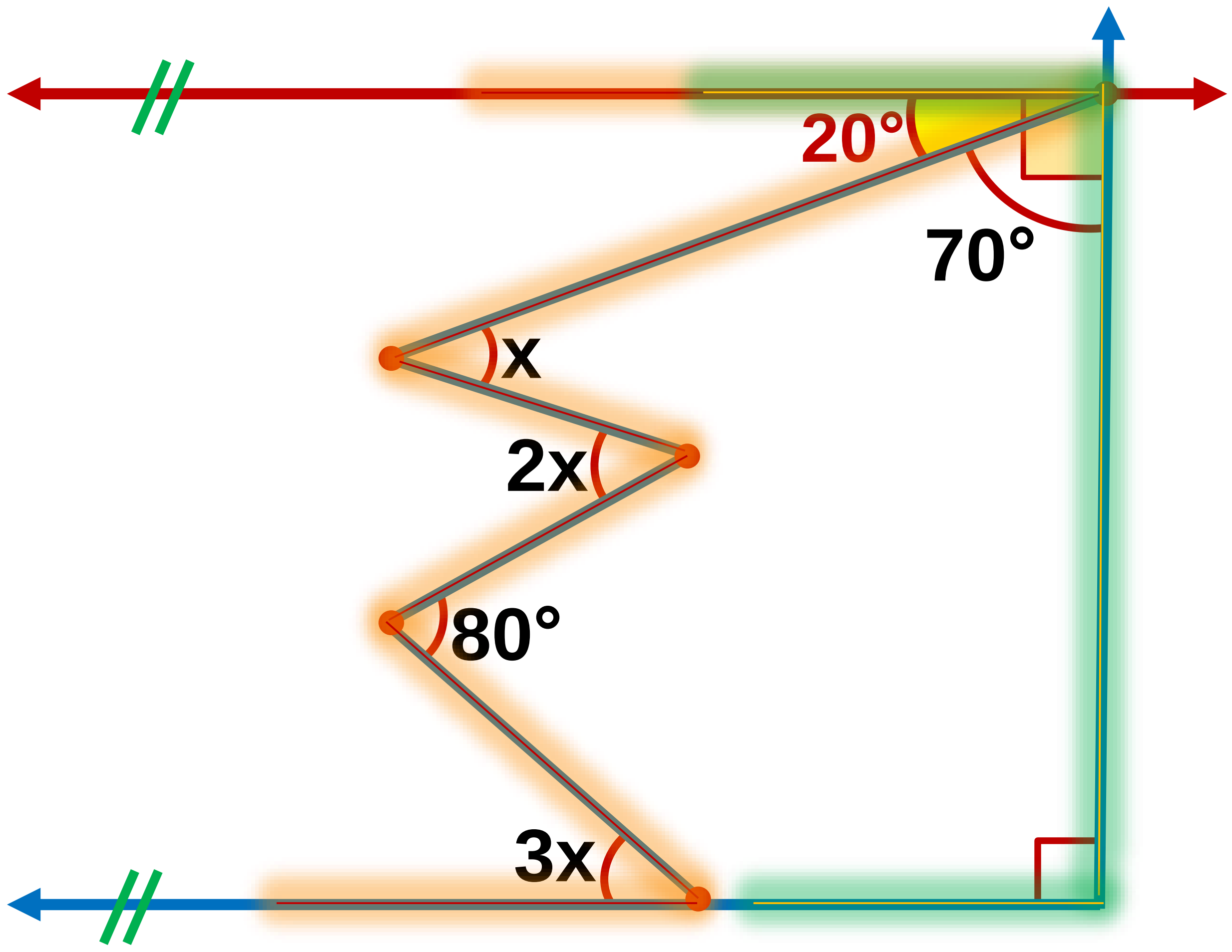
Si $\overleftrightarrow{L_1}$ // $\overleftrightarrow{L_2}$

→ $x = \alpha + \beta$

$$x + 40° = 90°$$

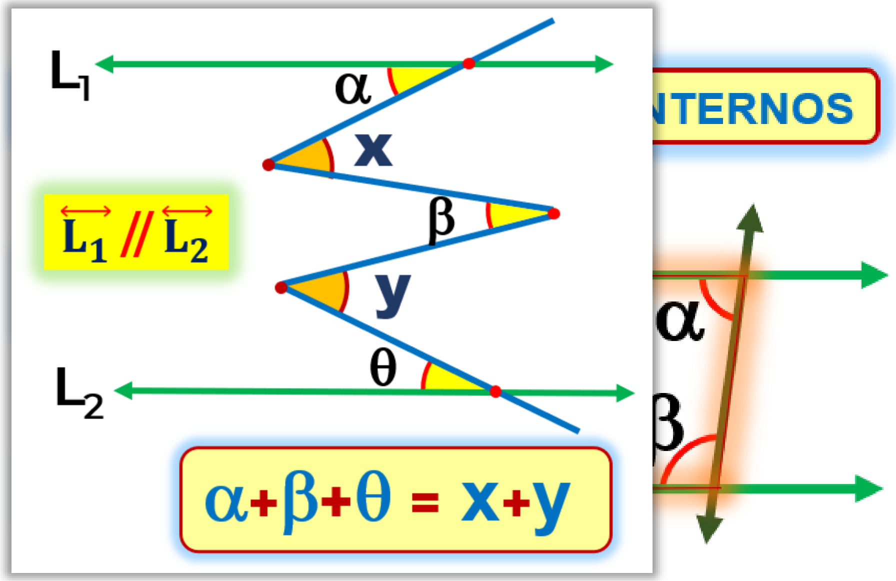
$$\boxed{x = 50°}$$

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



Resolución:

- Piden: x
- Recordemos:



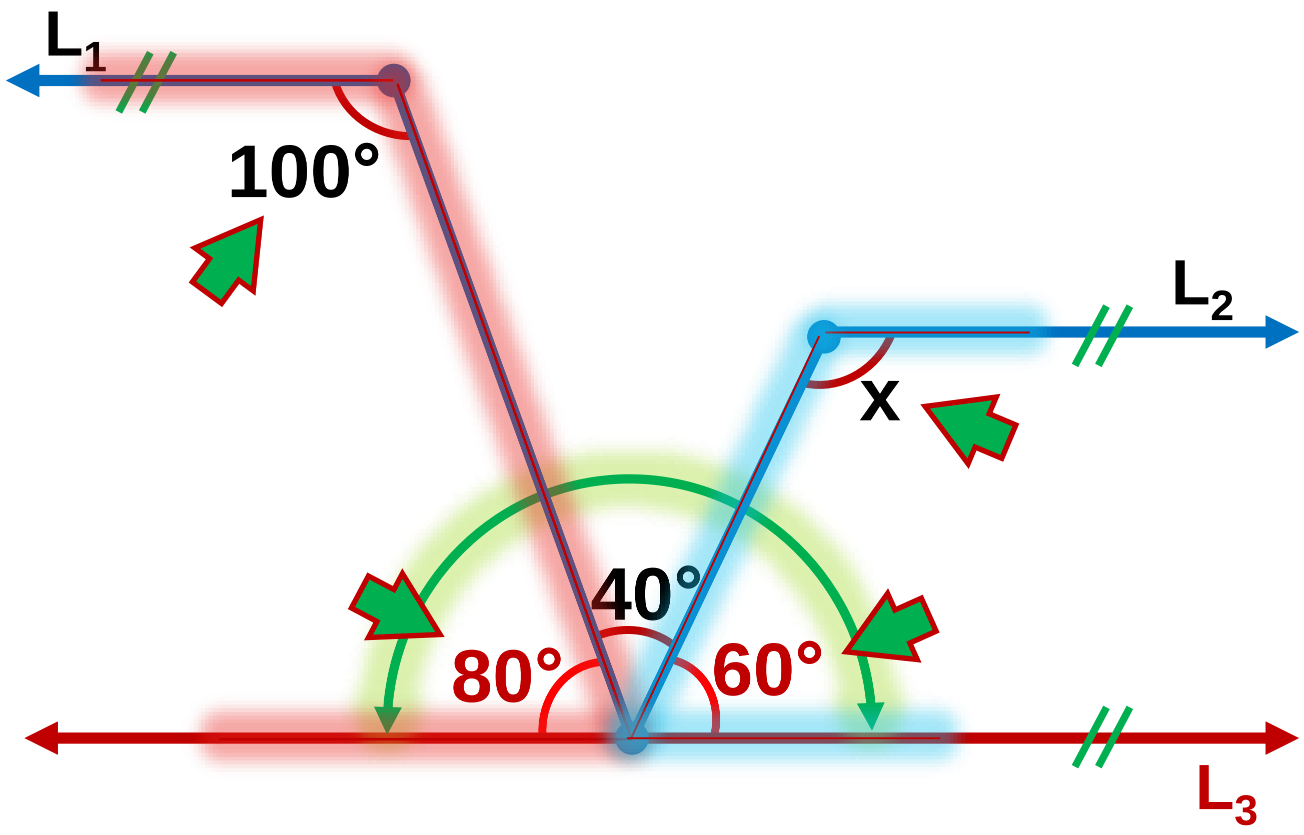
$$20° + 2x + 3x = x + 80°$$

$$20° + 5x = x + 80°$$

$$4x = 60°$$

$$\boxed{x = 15°}$$

5. Si $\overleftrightarrow{L_1}$ // $\overleftrightarrow{L_2}$, halle el valor de x.



Resolución:

- Piden: x
- $\overleftrightarrow{L_1}$ // $\overleftrightarrow{L_2}$ // $\overleftrightarrow{L_3}$

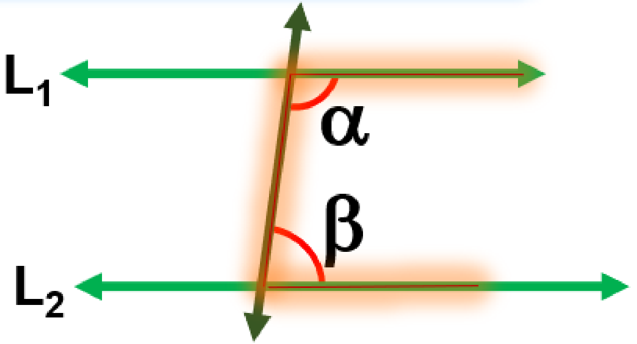
ÁNGULOS CONJUGADOS INTERNOS

Si

$\overleftrightarrow{L_1}$ // $\overleftrightarrow{L_2}$

entonces

$\alpha+\beta = 180°$

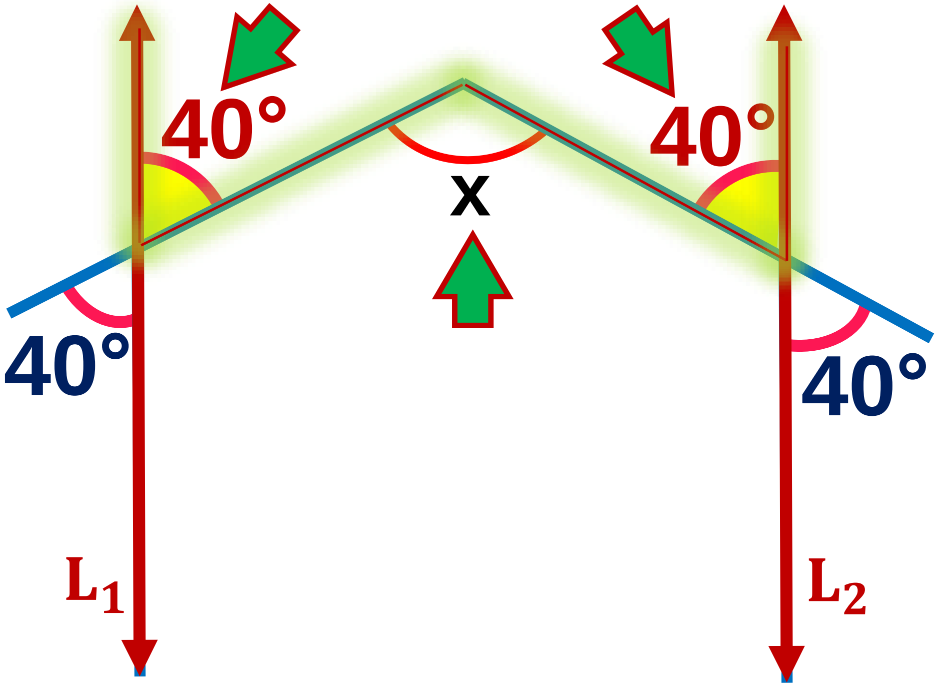


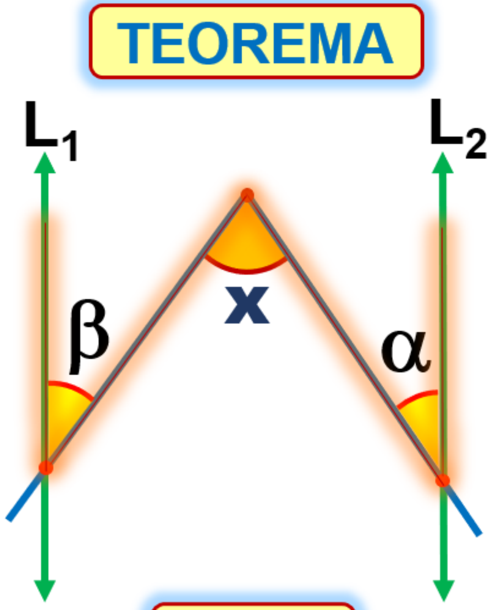
$$x + 60° = 180°$$

$$\boxed{x = 120°}$$

6. En la figura se muestra el frontis de una casa. Si el techo forma ángulos iguales a 40° con las paredes laterales, halle la medida del ángulo que forman dichos techos.

Resolución:



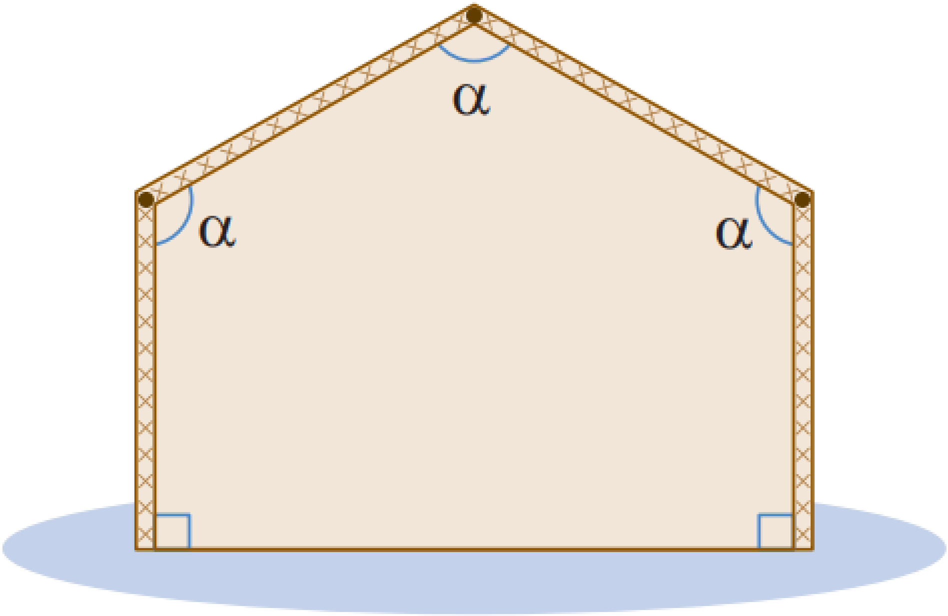


- Piden: x
- Trazamos $\overleftrightarrow{L_1}$ y $\overleftrightarrow{L_2}$ ($\overleftrightarrow{L_1}$ // $\overleftrightarrow{L_2}$)
- Por teorema:

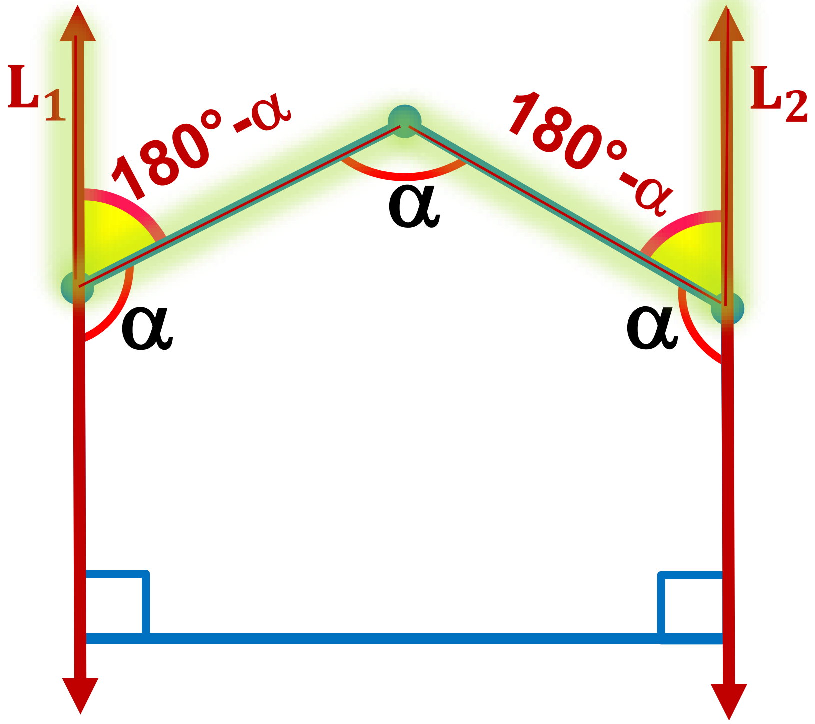
x = 40° + 40°

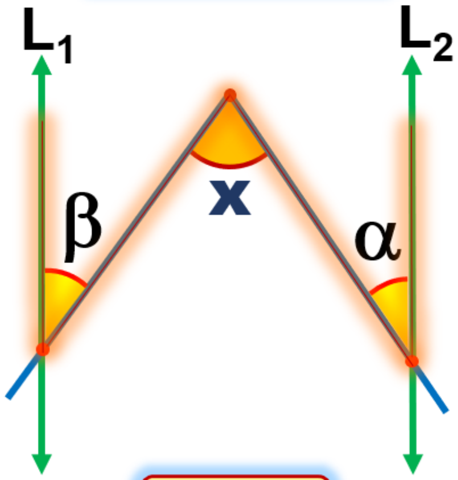
$\boxed{x = 80°}$

7. La figura representa el corte transversal de la estructura del techo de un depósito de mercancías. Halle el valor de α para construir dicho techo.



Resolución:





Si $\overleftrightarrow{L_1} // \overleftrightarrow{L_2}$

→ $x = \alpha + \beta$

- **Piden:** α
- **Trazamos** $\overleftrightarrow{L_1}$ **y** $\overleftrightarrow{L_2}$ $(\overleftrightarrow{L_1} // \overleftrightarrow{L_2})$
- **Por teorema:**

$$\alpha = 180° - \alpha + 180° - \alpha$$

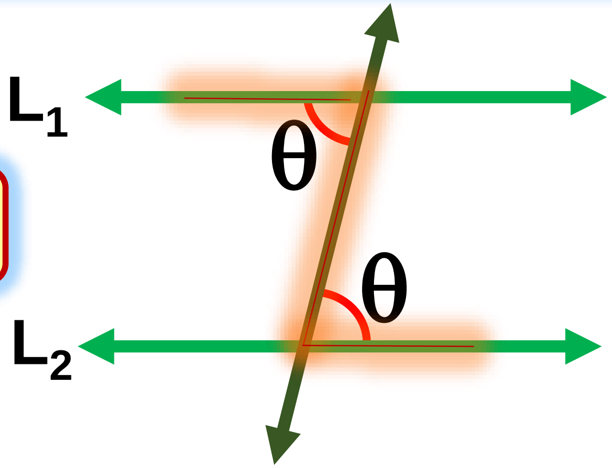
$$3\alpha = 360°$$

$$\boxed{\alpha = 120°}$$

ÁNGULOS ALTERNOS INTERNOS

Si

$\overleftrightarrow{L_1} \,//\, \overleftrightarrow{L_2}$



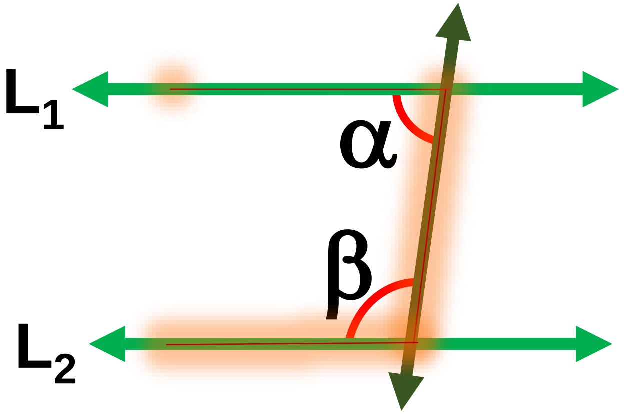
ÁNGULOS CONJUGADOS INTERNOS

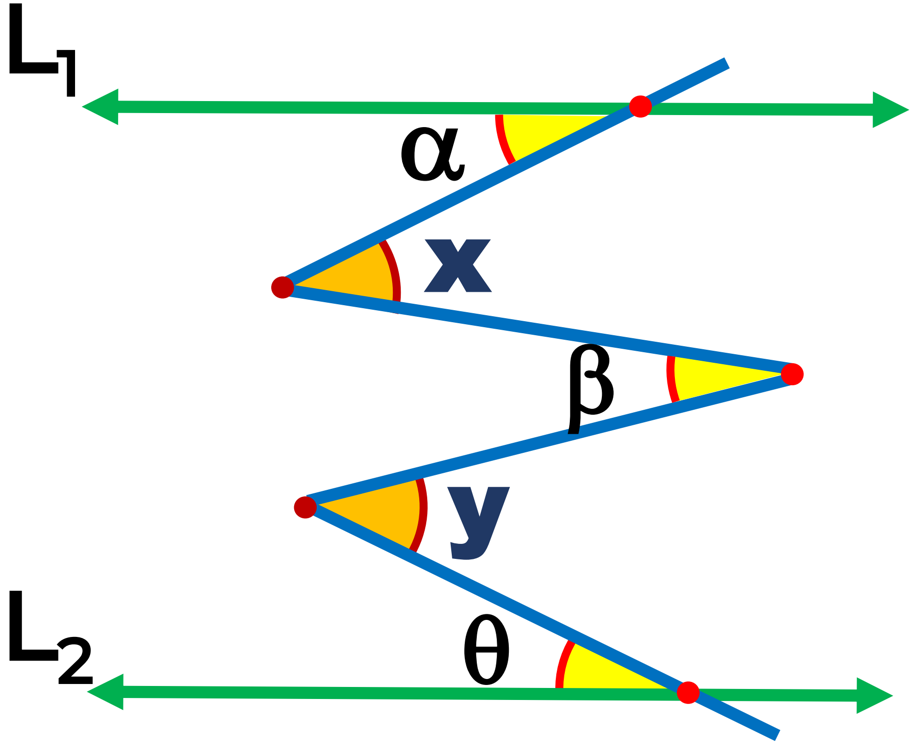
Si

$\overleftrightarrow{L_1} \,//\, \overleftrightarrow{L_2}$

entonces

$\alpha+\beta = 180°$



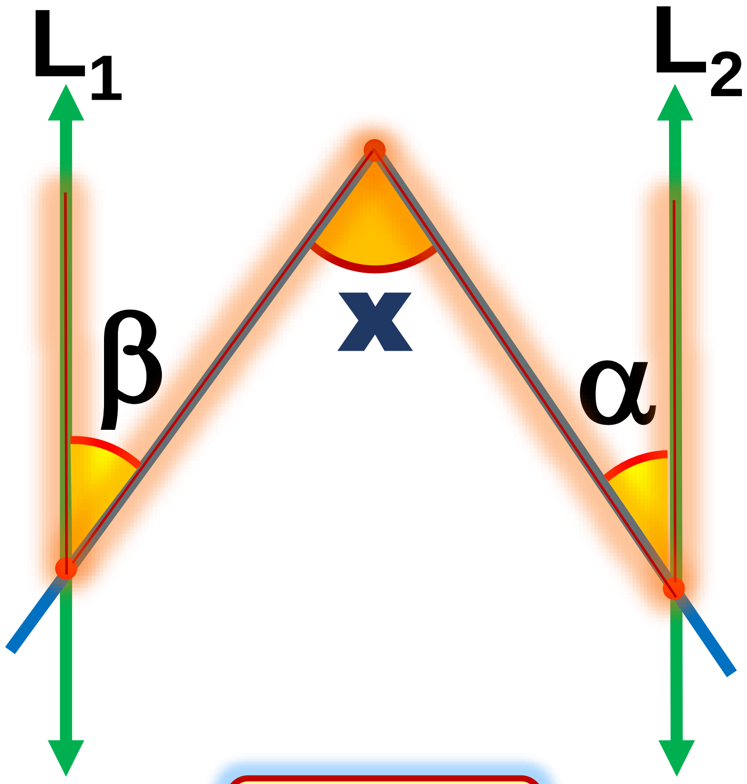


TEOREMA

Si $\overleftrightarrow{L_1} \,//\, \overleftrightarrow{L_2}$

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

TEOREMA



Si $\boxed{\overleftrightarrow{L_1} \parallel \overleftrightarrow{L_2}}$

$\rightarrow$ $\boxed{x = \alpha + \beta}$