GEOMETRÍA

Capítulo 5

Sesión 1

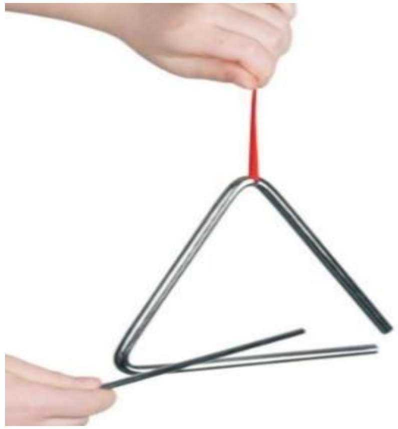
3th

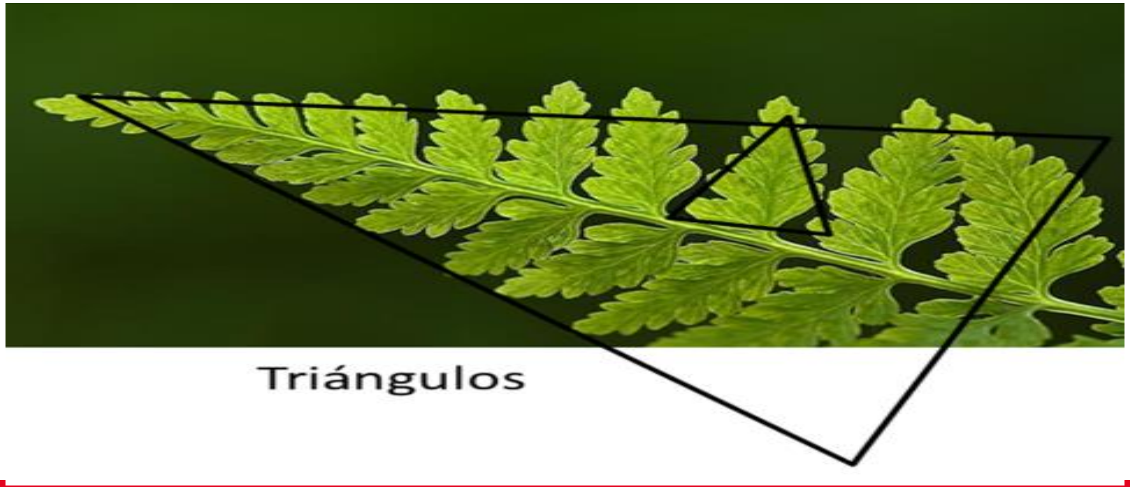
SECONDARY

TRIÀNGULOS

SACO OLIVEROS

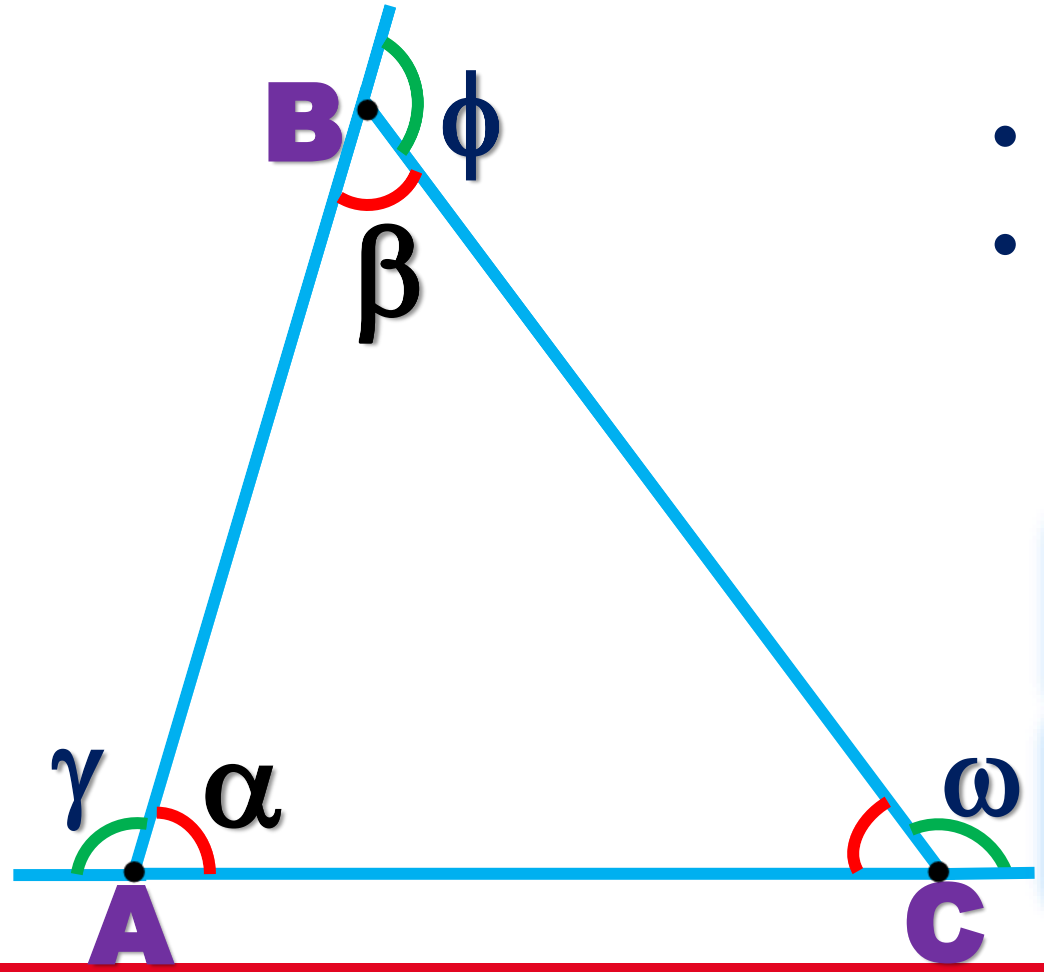
El triángulo es una de las figuras geométricas elementales y, por lo tanto, el conocimiento de sus teoremas, clases, etc., es básico para comprender mejor a las demás figuras geométricas que estudiaremos posteriormente. Esta figura tiene en la actualidad diferentes usos y aplicaciones como podemos observar.





TRIÁNGULOS

Definición: Es aquella figura geométrica formada al unir 3 puntos no colineales mediante segmento de recta.



- **VÉRTICES : A , B y C**
- **LADOS : $\overline{AB}$, $\overline{BC}$ y $\overline{AC}$**

TEOREMAS

$$\alpha + \beta + \theta = 180°$$

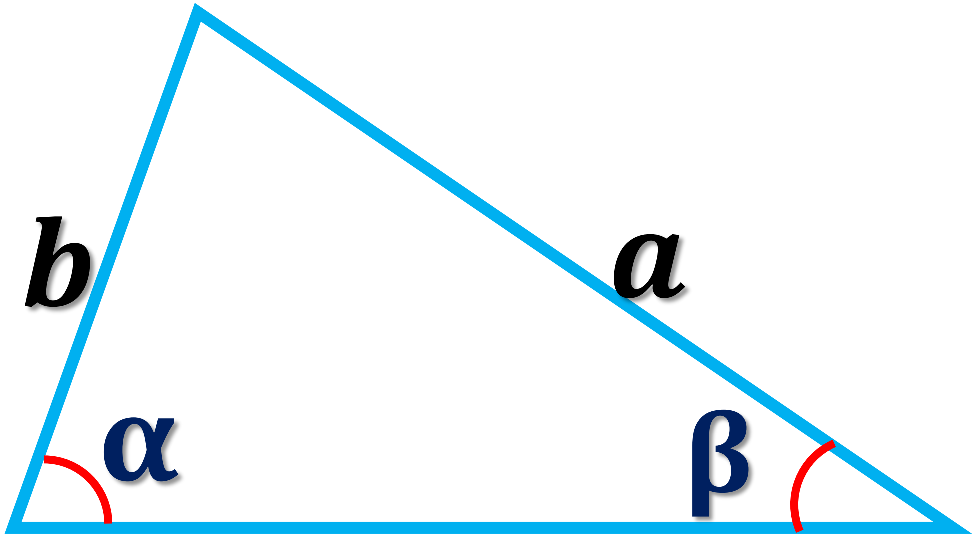
$$\omega + \phi + \gamma = 360°$$

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

$$\phi = \alpha + \theta$$

$$\gamma = \beta + \theta$$

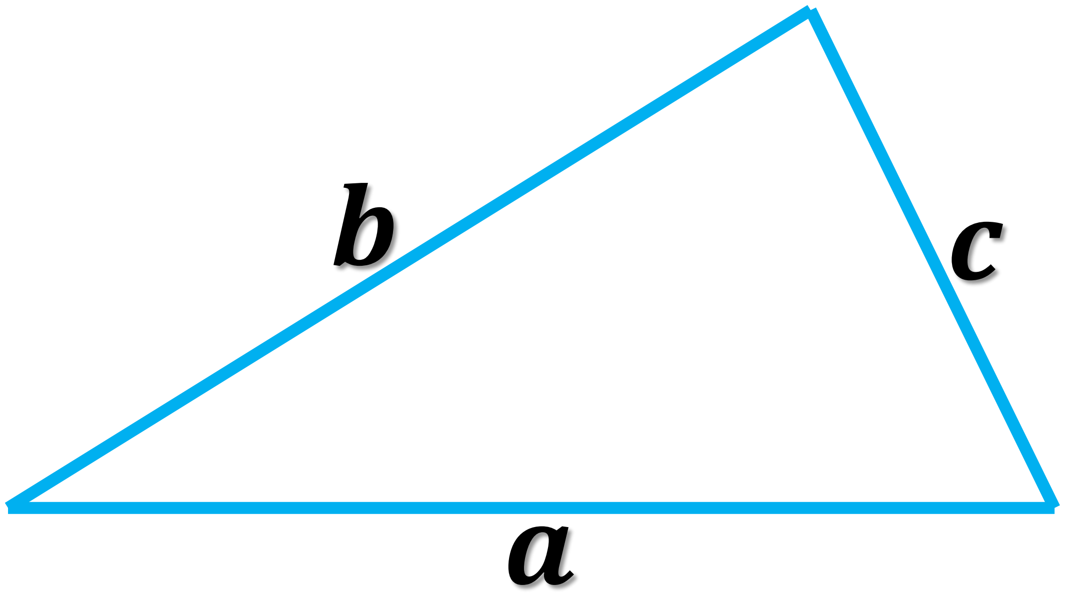
- **Teorema de la correspondencia**



Si: $\beta < \alpha$

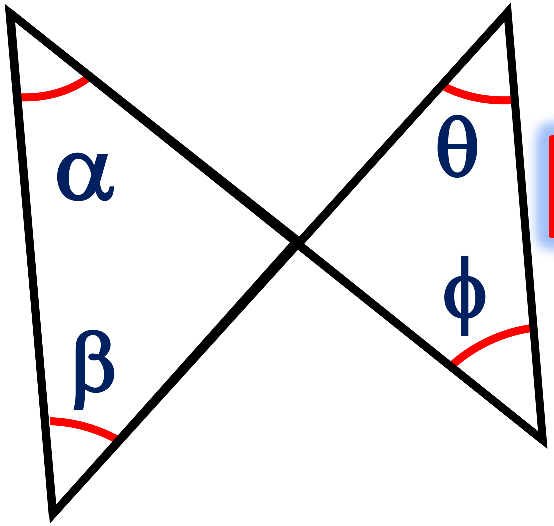
$\boxed{b < a}$

- **Teorema de la existencia**

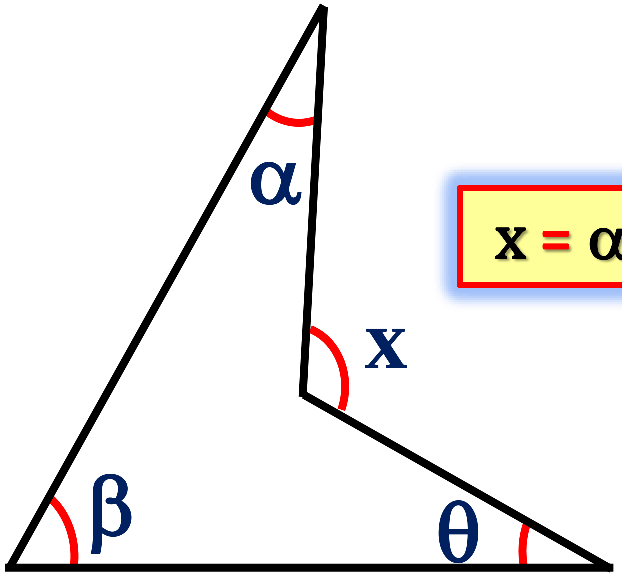


donde: $c < b < a$

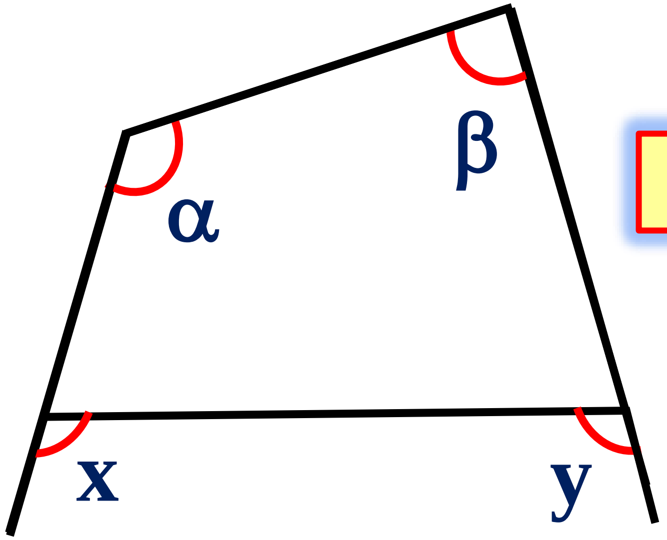
$\boxed{b - c < a < b + c}$



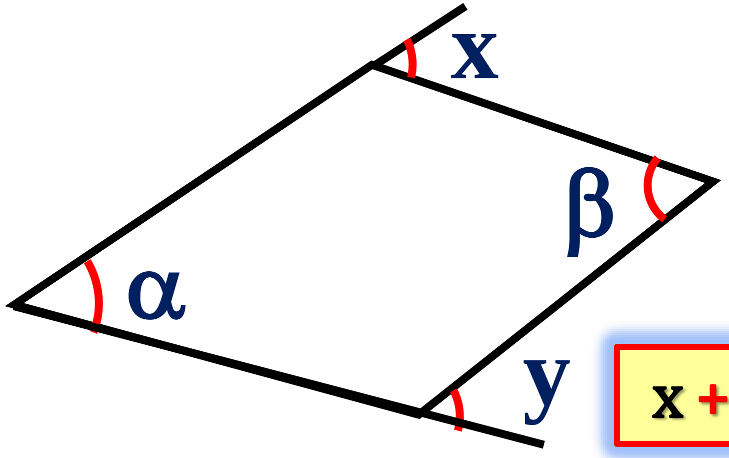
$\alpha + \beta = \theta + \phi$



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

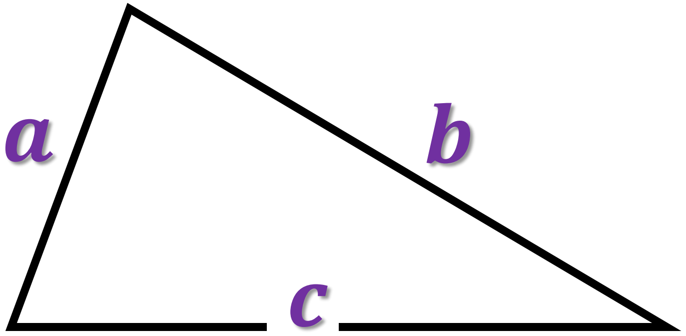


$x + y = \alpha + \beta$

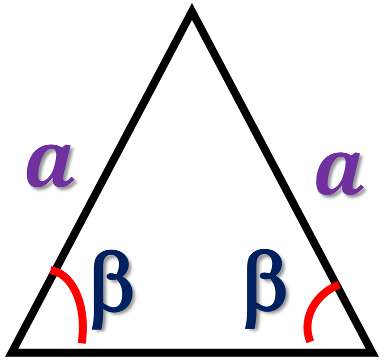


$x + y = \alpha + \beta$

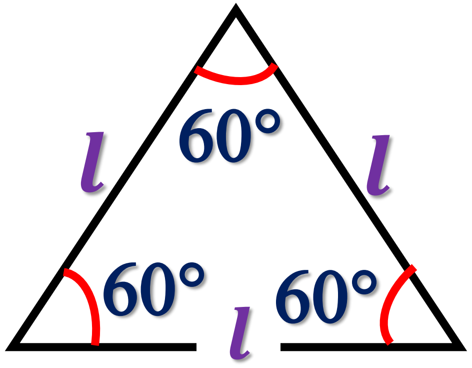
1.- *Clasificación según las medidas de los lados.*



△ Escaleno

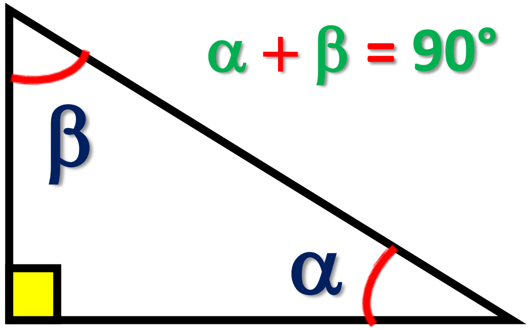


△ Isósceles

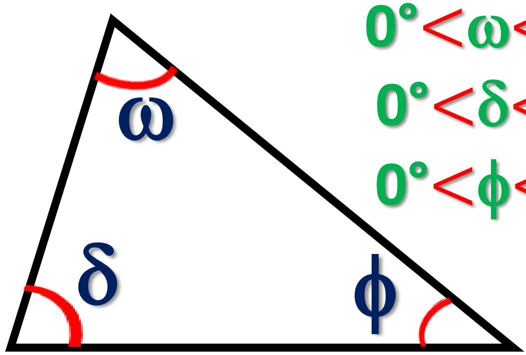


△ Equilátero

2.- *Clasificación según las medidas de sus ángulos.*



$\alpha + \beta = 90°$

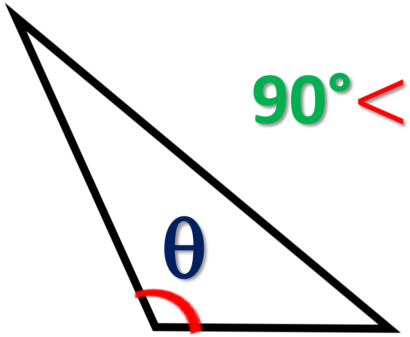


$0° < \omega < 90°$

$0° < \delta < 90°$

$0° < \phi < 90°$

△ Acutángulo



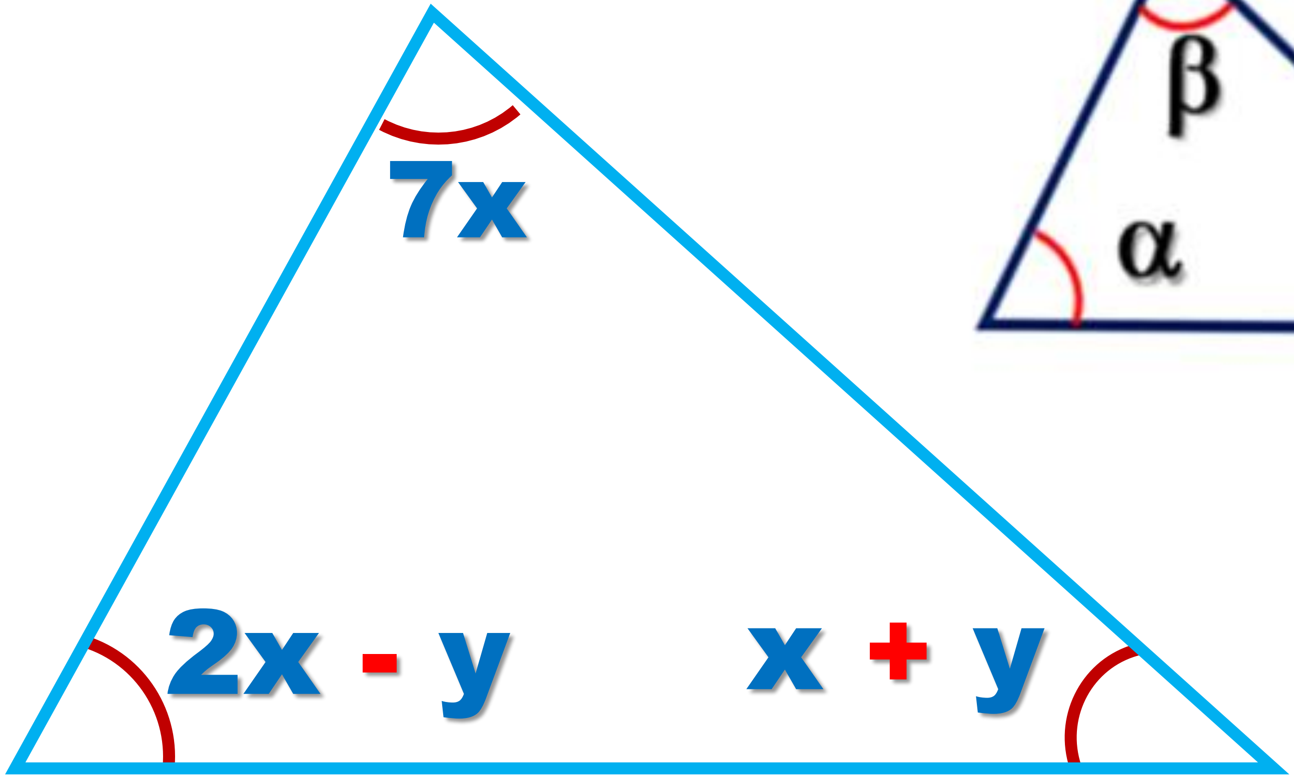
$90° < \omega < 180°$

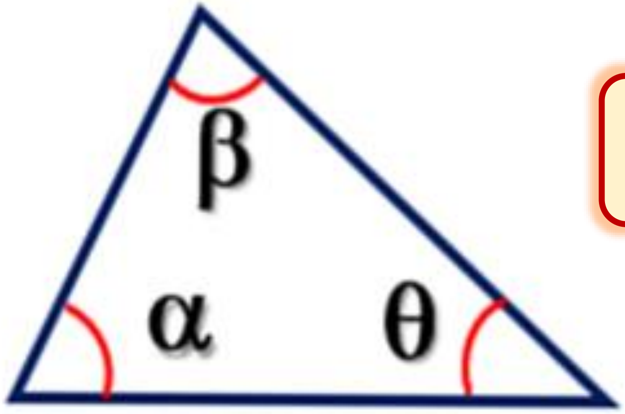
△ Obtusángulo

△ Rectángulo

△ Oblicuángulo

1. Los ángulos internos de un triángulo miden 2x – y, 7x, x + y, halle el valor de x:





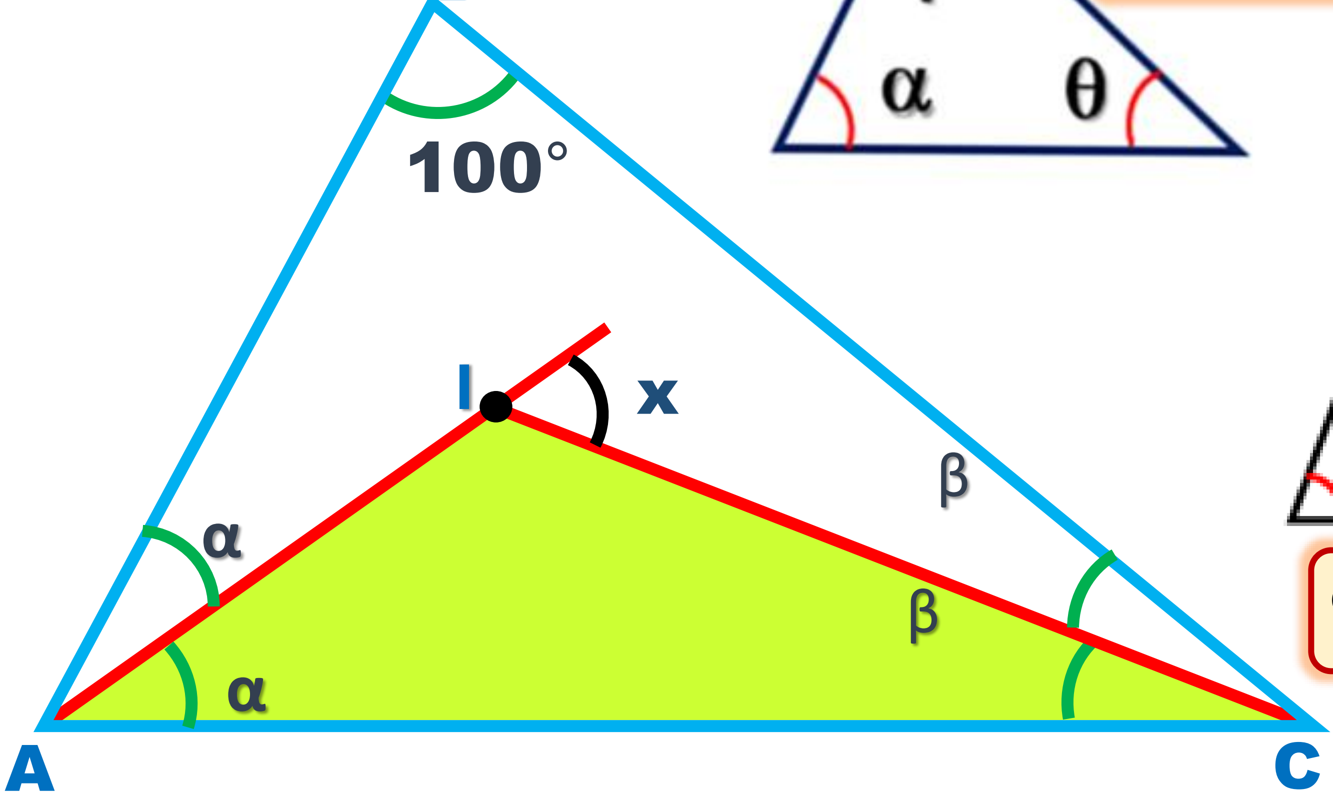
$$\boxed{\omega + \phi + \gamma = 180°}$$

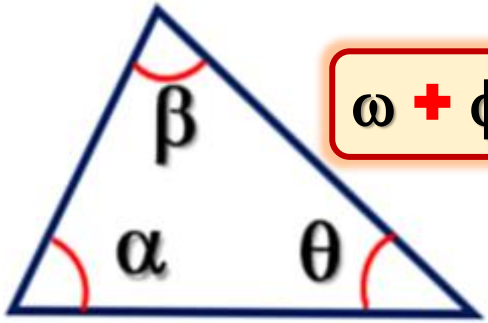
$$2x - \cancel{y} + 7x + x + \cancel{y} = 180°$$

$$10x = 180°$$

$$\boxed{x = 18°}$$

2. El ángulo de un triángulo mide 100°, halle la medida del menor ángulo que forman las bisectrices interiores de los otros dos ángulos.





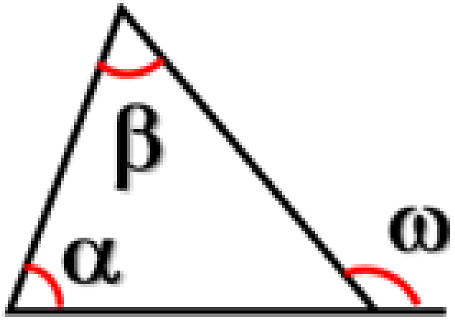
$\omega + \phi + \gamma = 180°$

- **En el △ABC**

$2\alpha + 2\beta + 100° = 180°$

$2\alpha + 2\beta = 80°$

$\alpha + \beta = 40°$



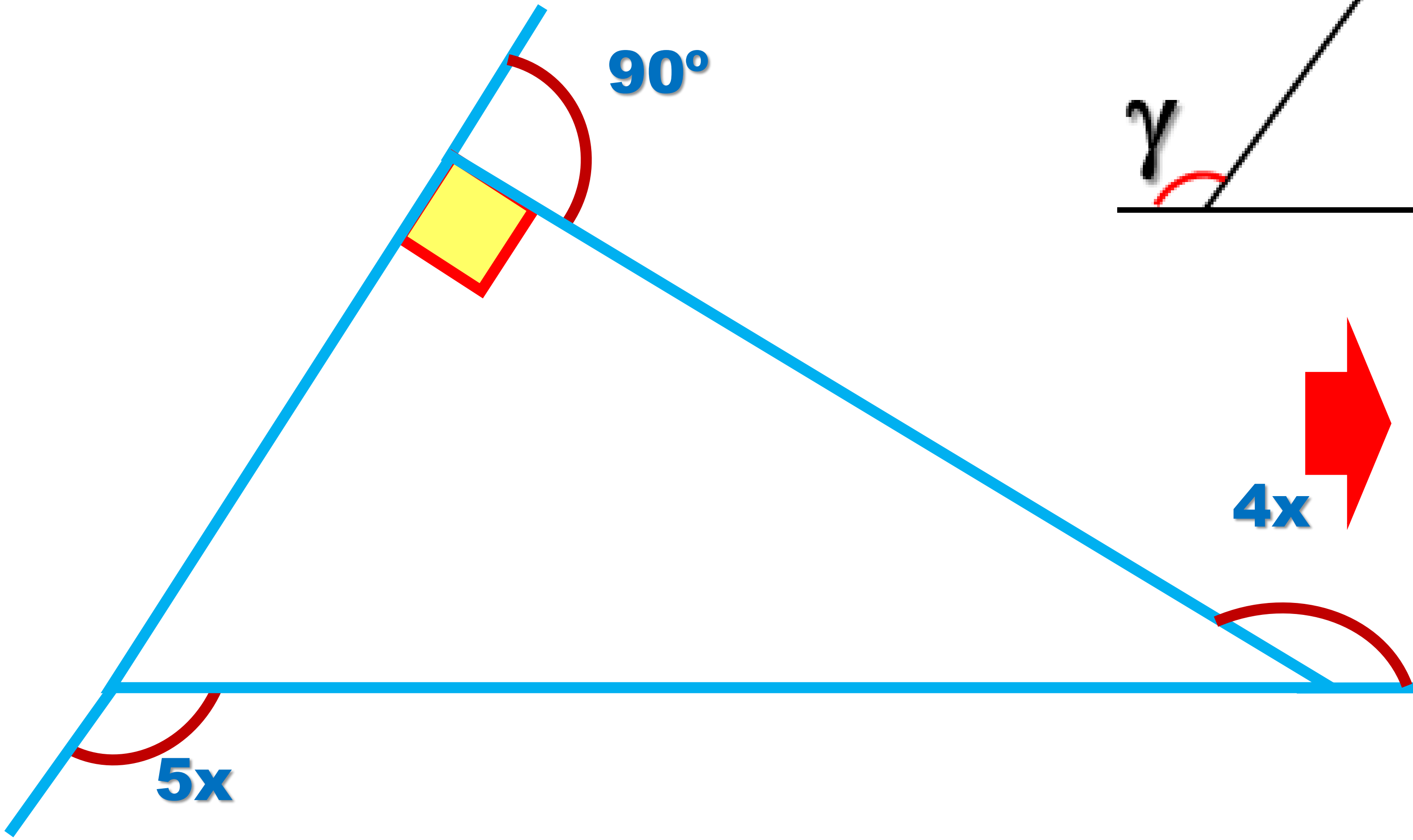
$\omega = \alpha + \beta$

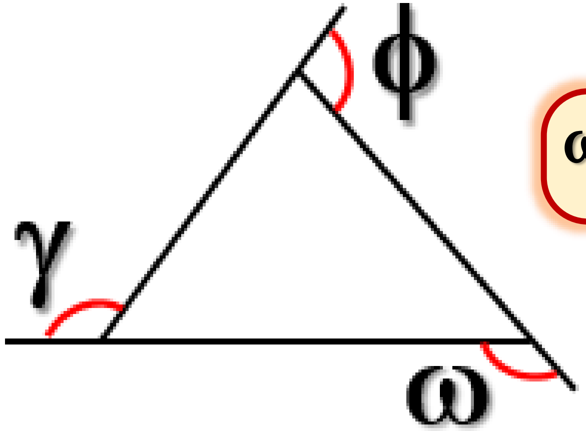
En el △AIC

$x = \alpha + \beta$

$x = 40°$

3. Halle el valor de *x*.



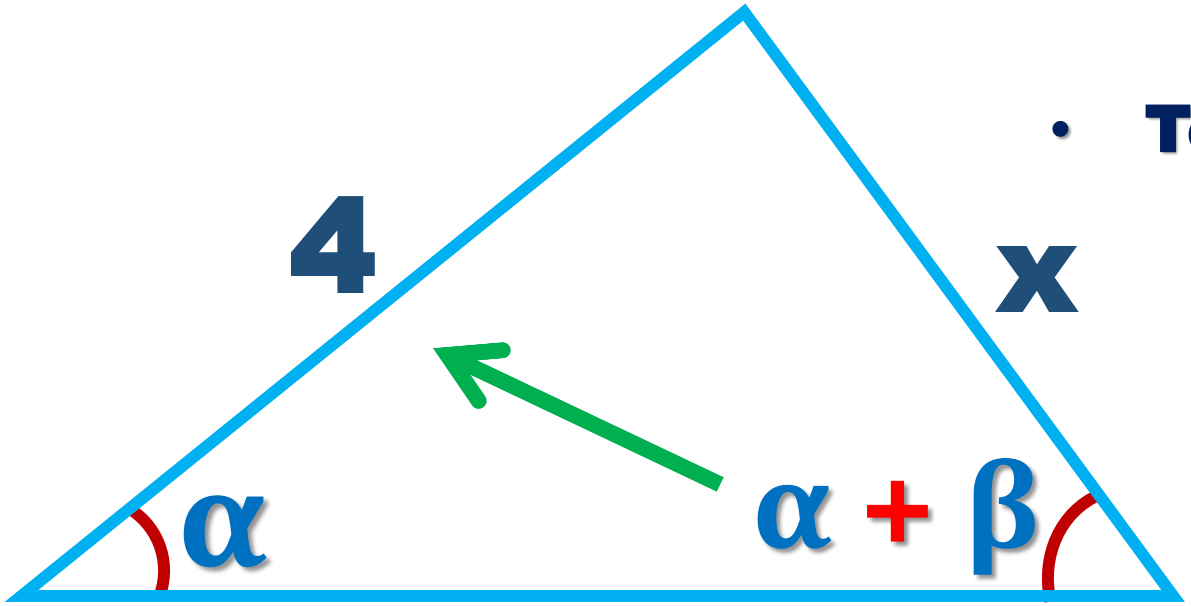


$\omega + \phi + \gamma = 360°$

$$5x + 4x + 90° = 360°$$
$$9x = 270°$$

$$x = 30°$$

4. Halle el mayor valor entero de *x*.



- **Teorema de la correspondencia**

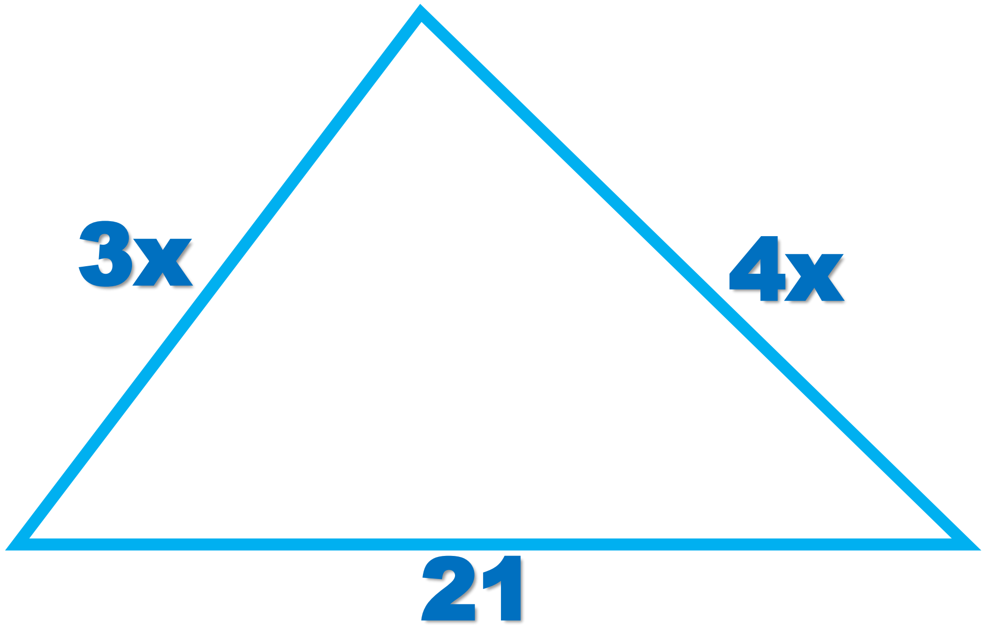
Si: $\alpha < \alpha + \beta$

$\Rightarrow$ $x < 4$

$x = 1, 2$ y 3

$\boxed{x_{mayor} = 3}$

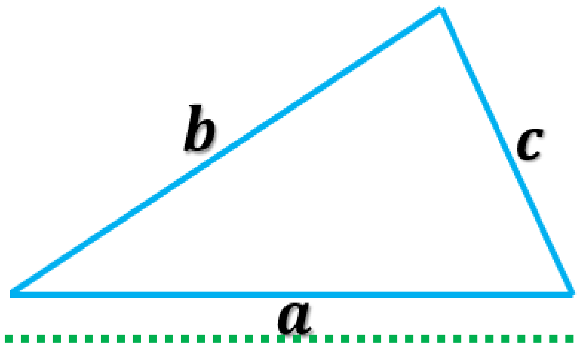
5. Halle el menor valor entero de *x*.



- **Teorema de la existencia**

donde: $c < b < a$

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



$$4x - 3x < 21 < 4x + 3x$$

$$x < 21 < 7x$$

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

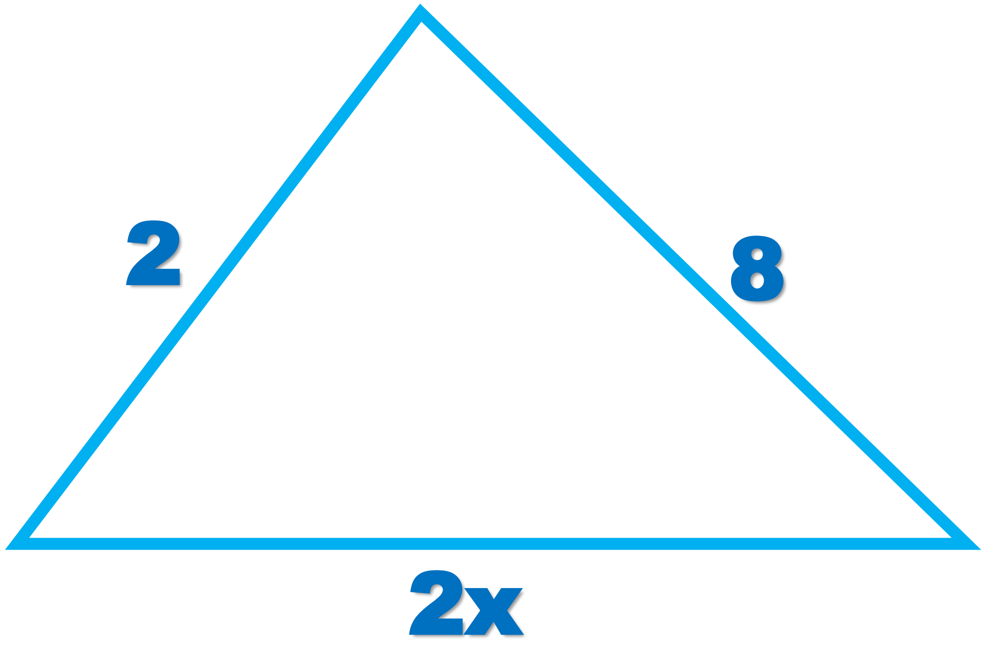
  $3 < x$

$$3 < x < 21$$

$x = 4 ; 5 ; 6 ;...; 19 ; 20$

$$\boxed{x_{mín} = 4}$$

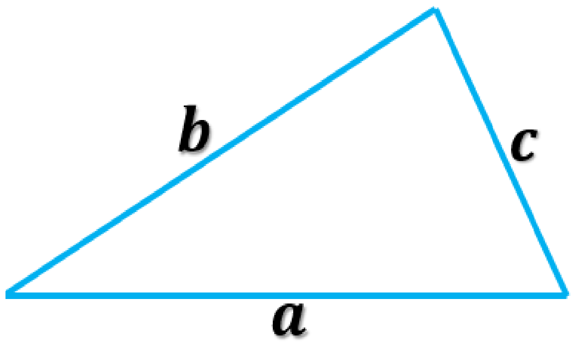
6. Halle el valor entero de x.



- **Teorema de la existencia**

donde: $c < b < a$

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



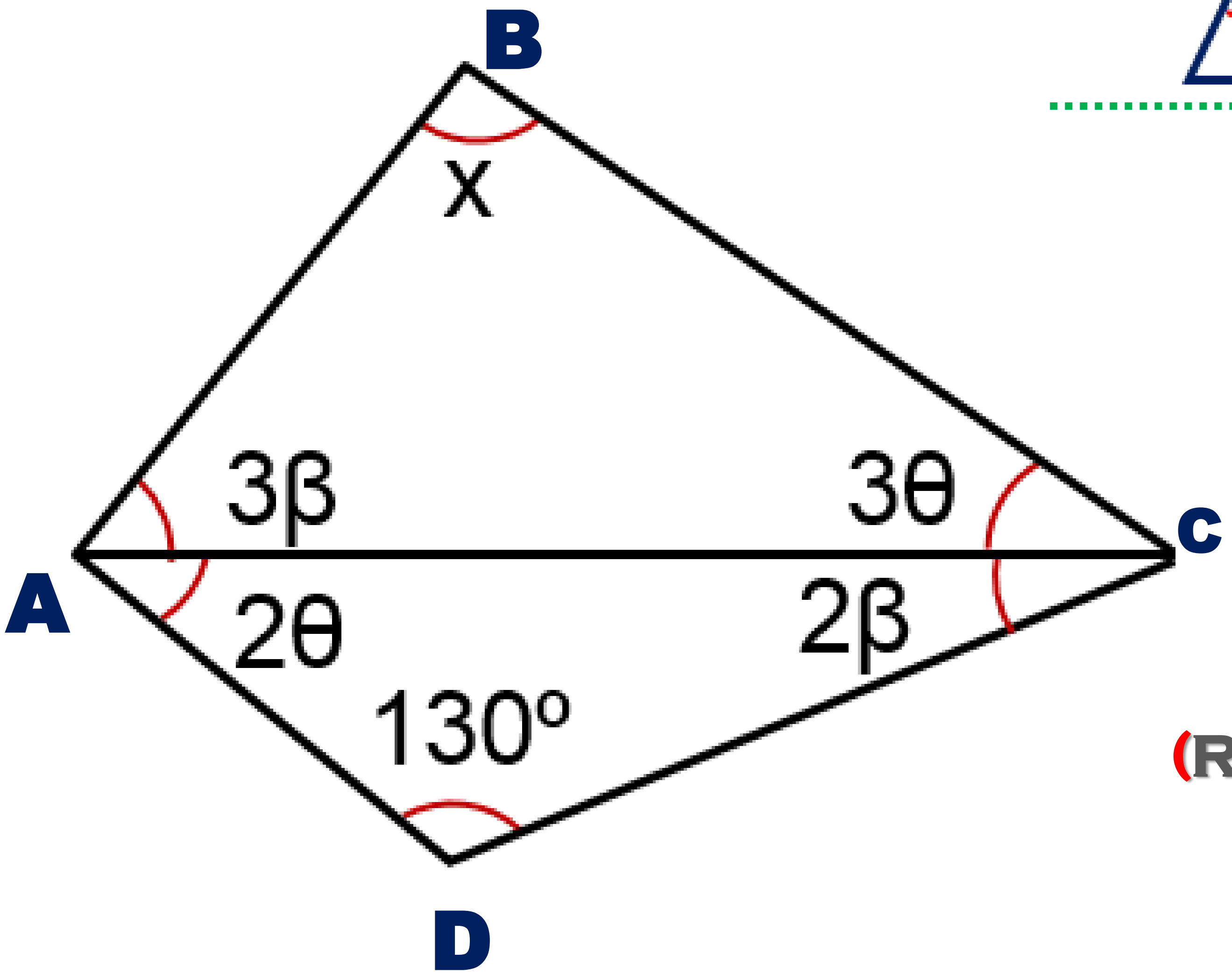
$$8 - 2 < 2x < 8 + 2$$

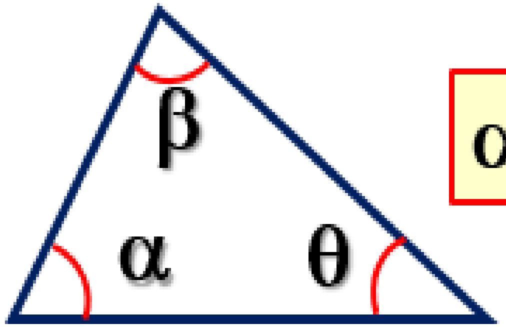
$$6 < 2x < 10$$

$$3 < x < 5$$

$$\boxed{x = 4}$$

7. Halle el valor de *x*.





$$\alpha + \beta + \theta = 180°$$

△ACD :

$$2\theta + 2\beta + 130° = 180°$$

$$2\theta + 2\beta = 50°$$

$$\theta + \beta = 25°$$

△ABC :

$$3\theta + 3\beta + x = 180°$$

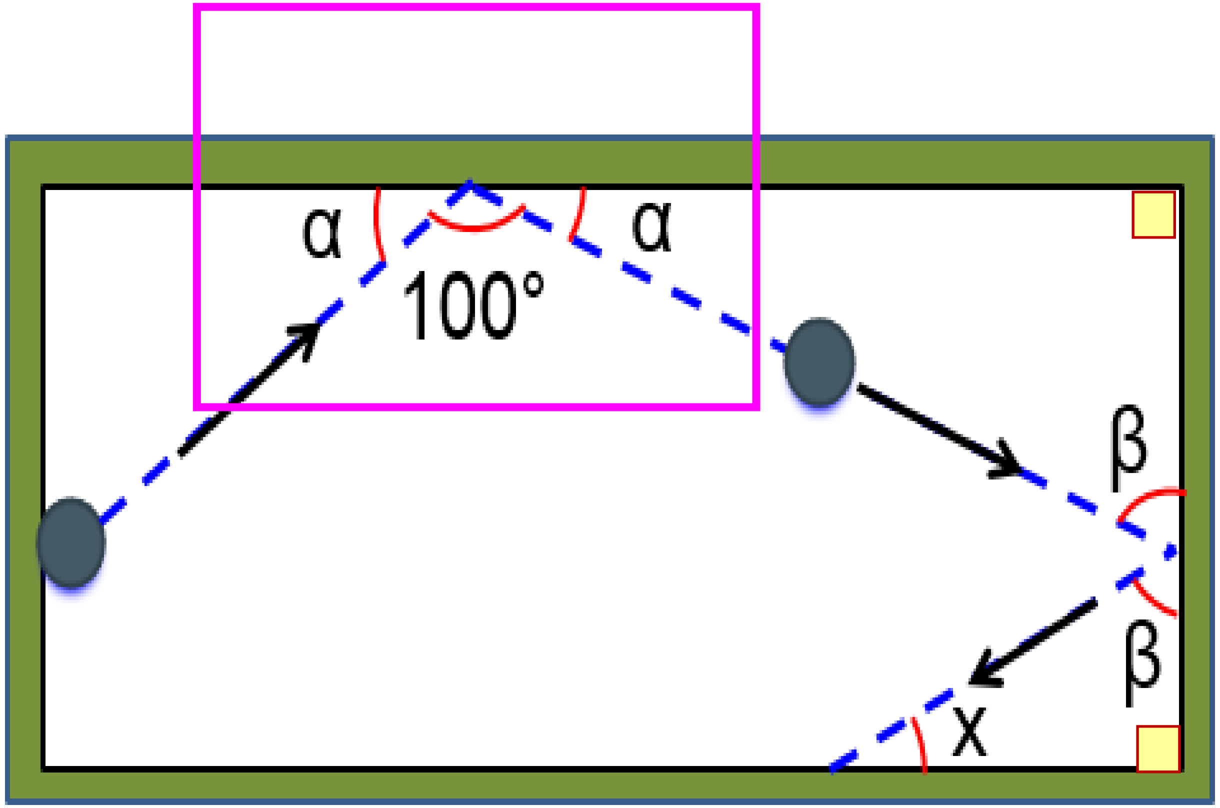
$$3\underbrace{(\theta + \beta)}_{25°} + x = 180°$$

(REEMPLAZANDO)

NOS PIDEN

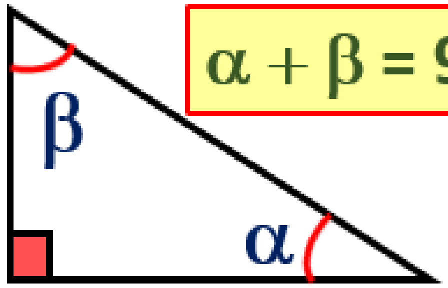
$$\boxed{x = 105°}$$

8. En la figura se muestra una mesa de fulbito y la trayectoria que sigue la pelota. Halle el valor de x.



$$\alpha + \alpha + 100° = 180°$$
$$2\alpha = 80°$$
$$\alpha = 40°$$

△Rectángulo



$\boxed{\alpha + \beta = 90°}$

$$\alpha + \beta = 90°$$
$$x + \beta = 90°$$

$$\alpha = x$$

$$\boxed{x = 40°}$$