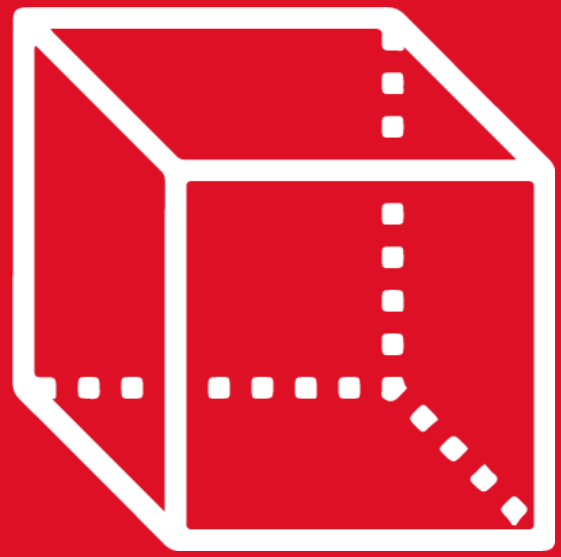
GEOMETRÍA

Chapter 13



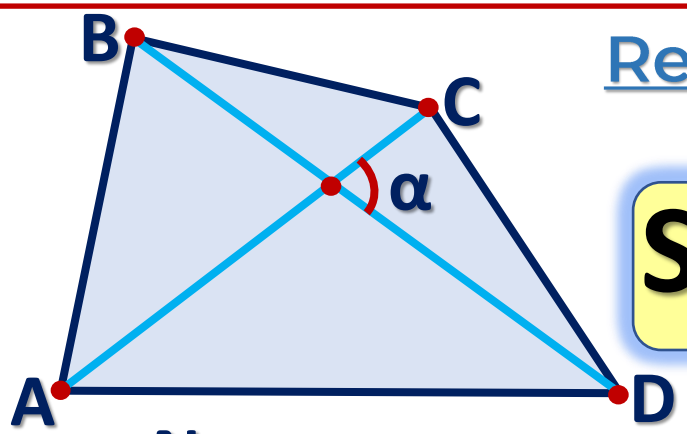
5th
SECONDARY

ÁREA DE REGIONES CUADRANGULARES

SACO OLIVEROS

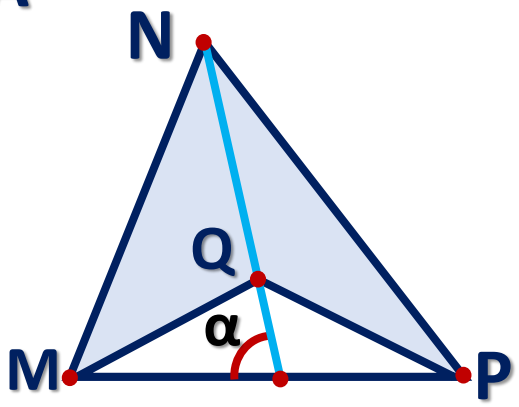
MOTIVATING | STRATEGY

ÁREAS DE REGIONES CUADRANGULARES



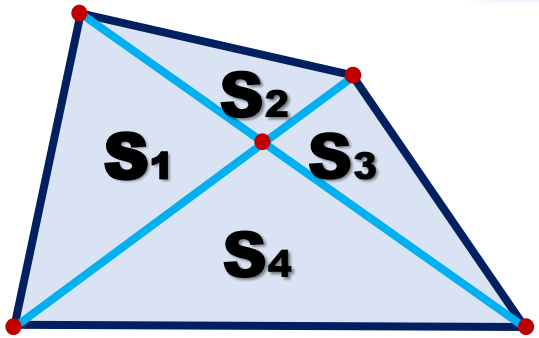
Región cuadrangular convexa

$$S_{ABCD} = \frac{(AC)(BD)}{2}.\text{Sen}\alpha$$



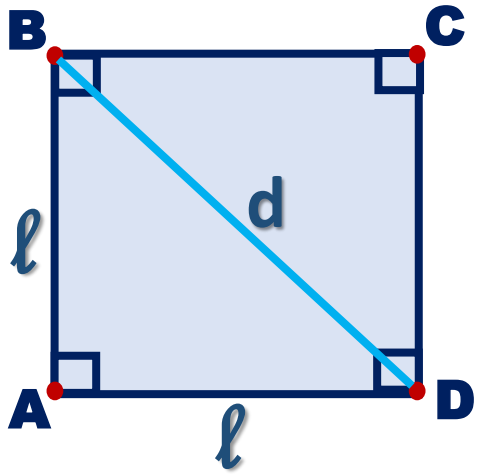
Región cuadrangular no convexa

$$S_{MNPQ} = \frac{(NQ)(MP)}{2}.\text{Sen}\alpha$$



$$S_1.S_3 = S_2.S_4$$

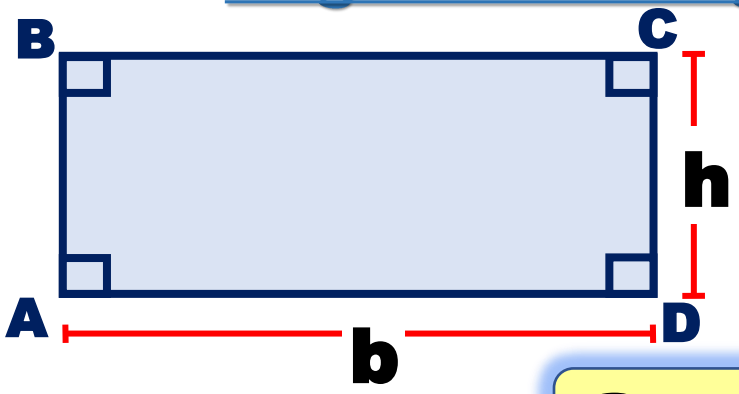
Región Cuadrada



$$S_{ABCD} = \ell^2$$

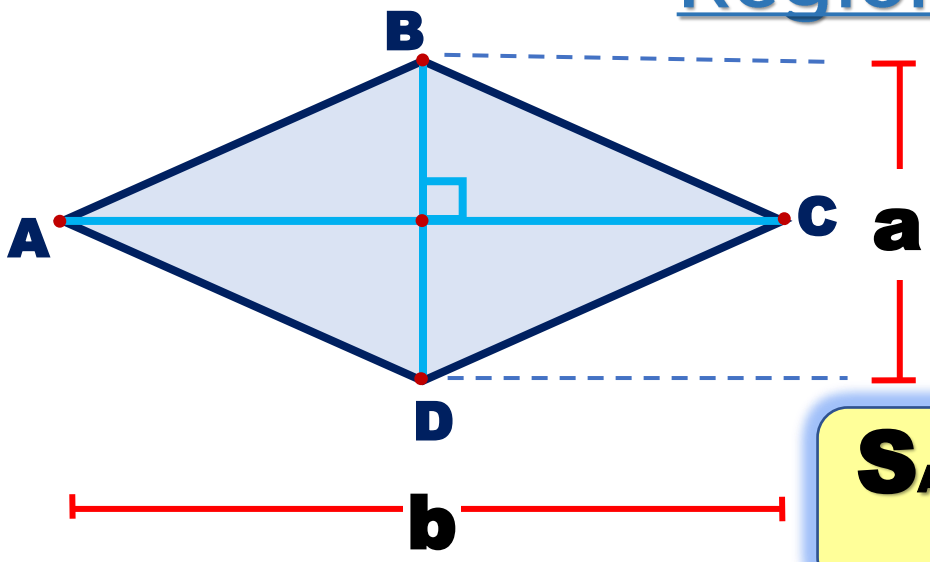
$$S_{ABCD} = \frac{d^2}{2}$$

Región Rectangular

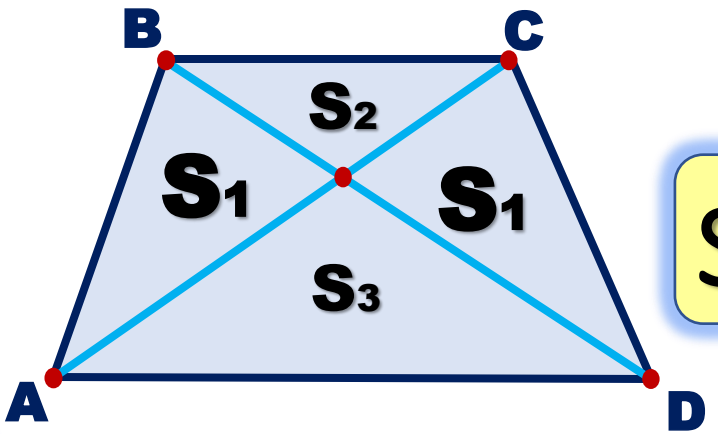


$$S_{ABCD} = b.h$$

Región Rombal



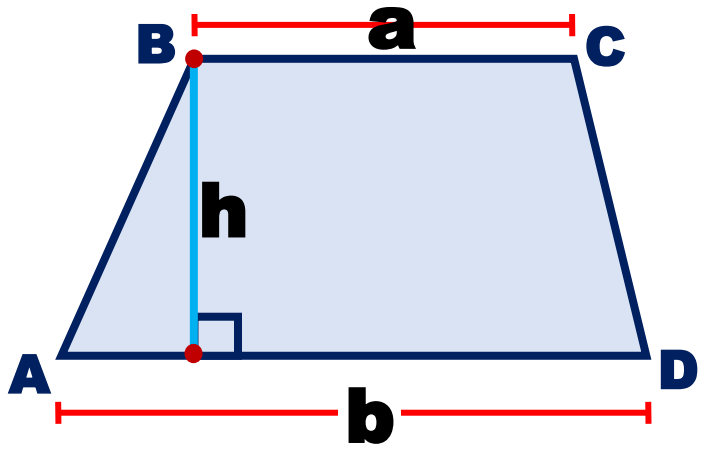
$$S_{ABCD} = \frac{a.b}{2}$$



$\overline{BC} \,//\, \overline{AD}$

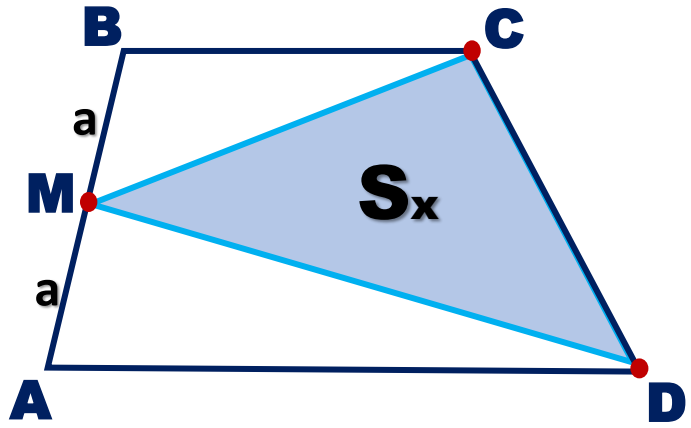
$$S_1^2 = S_2.S_3$$

Región Trapecial



$\overline{BC} \,//\, \overline{AD}$

$$S_{ABCD} = \frac{(a+b)h}{2}$$

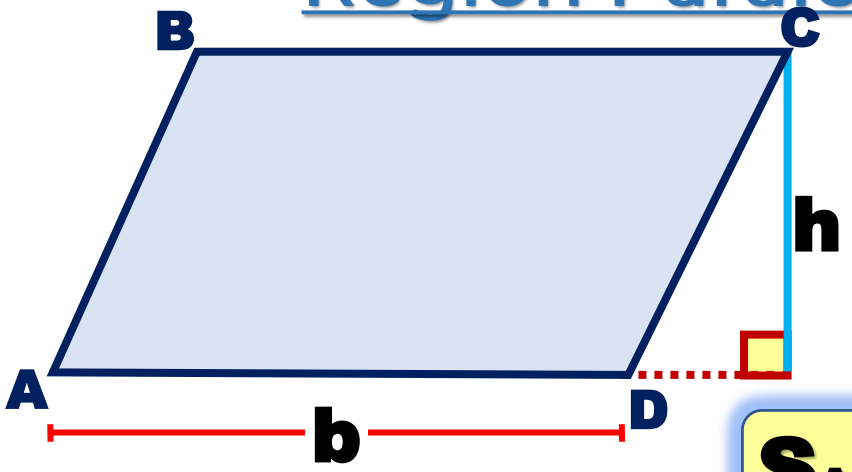


$\overline{BC} \,//\, \overline{AD}$

AM = BM

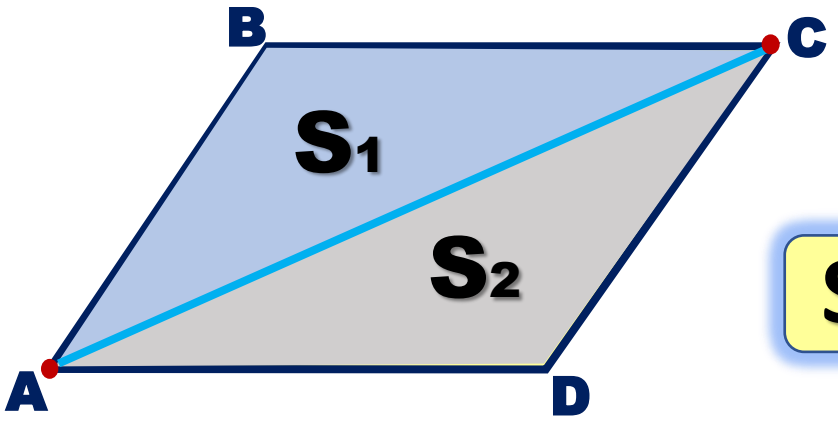
$$S_X = \frac{S_{ABCD}}{2}$$

Región Paralelográmica

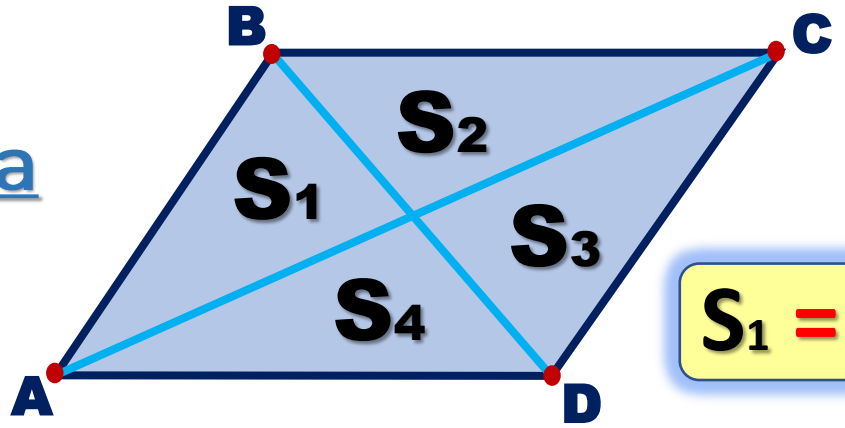


$$S_{ABCD} = b.h$$

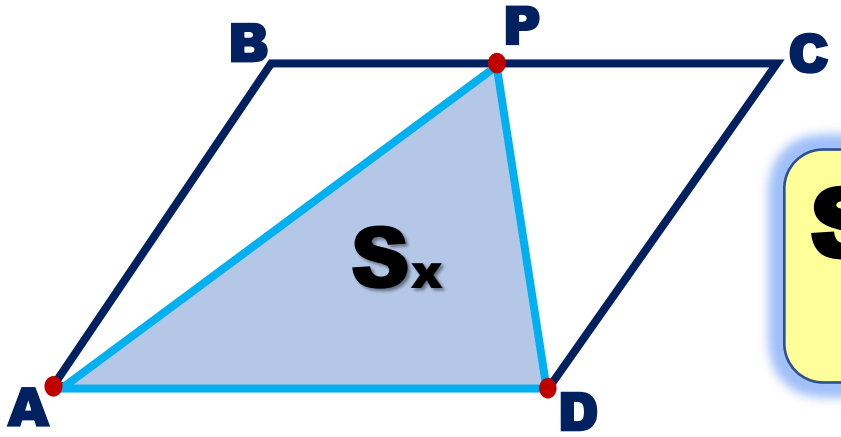
▱ABCD : Región paralelogràmica



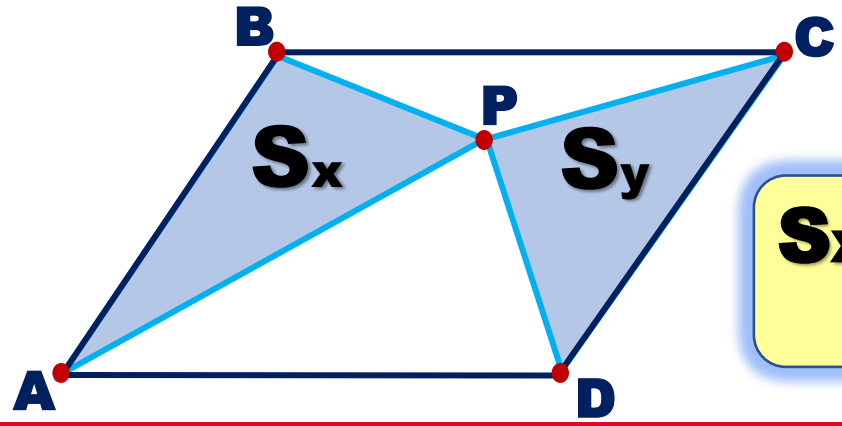
$$S_1 = S_2$$



$$S_1 = S_2 = S_3 = S_4$$

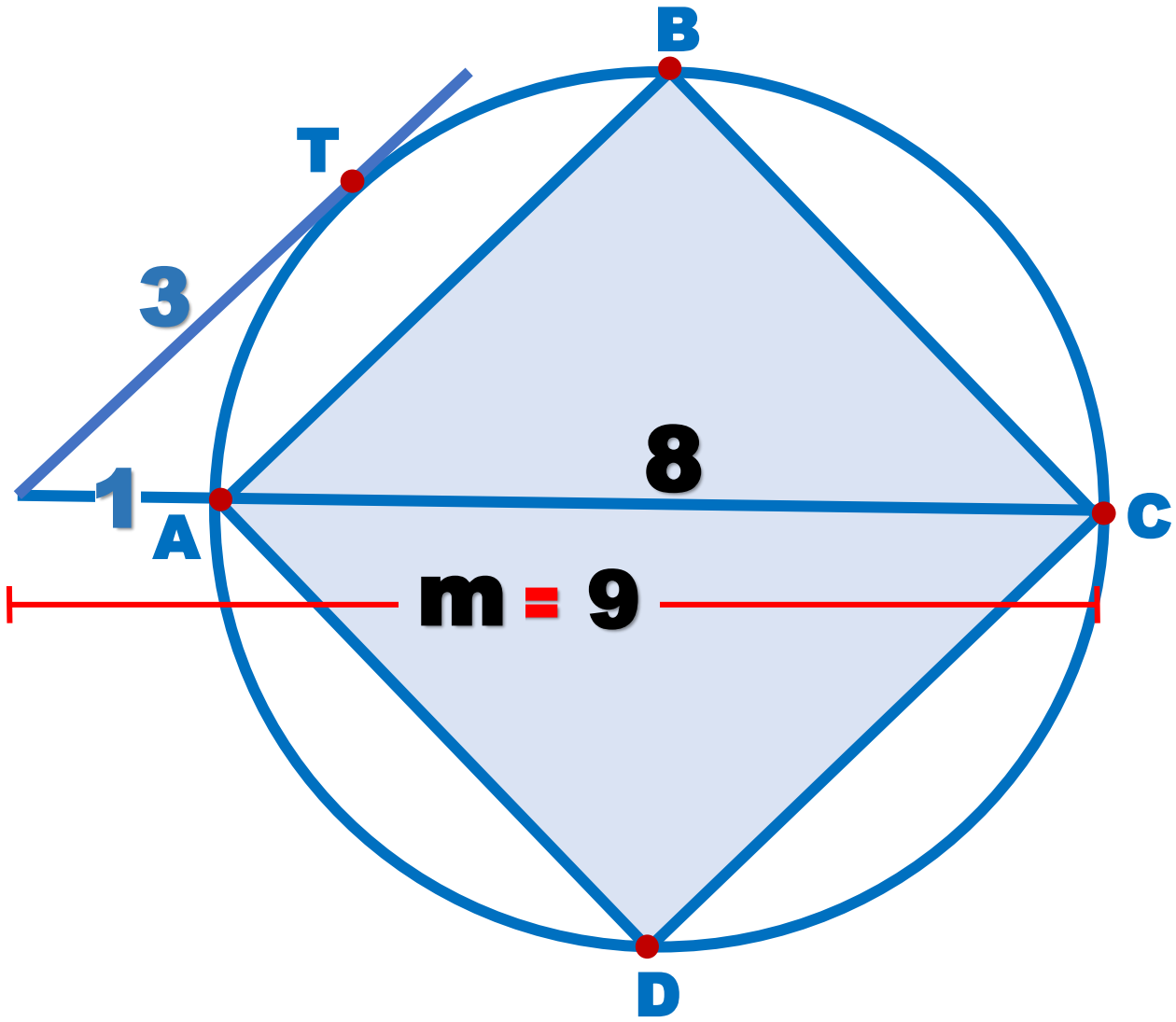


$$S_x = \frac{S_{ABCD}}{2}$$

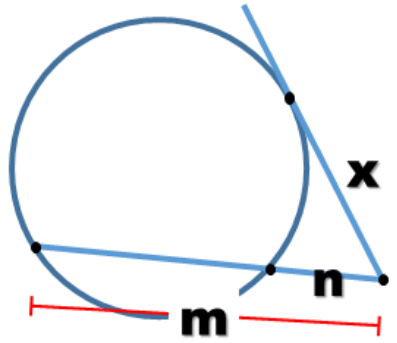


$$S_x + S_y = \frac{S_{ABCD}}{2}$$

1. Halle el área de la región cuadrada ABCD, T punto de tangencia.



Resolución

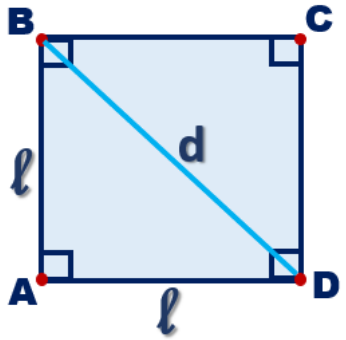


T. de la Tangente

$x^2 = m.n$

$3^2 = m(1)$

$9 = m$



Región Cuadrada

Nos piden

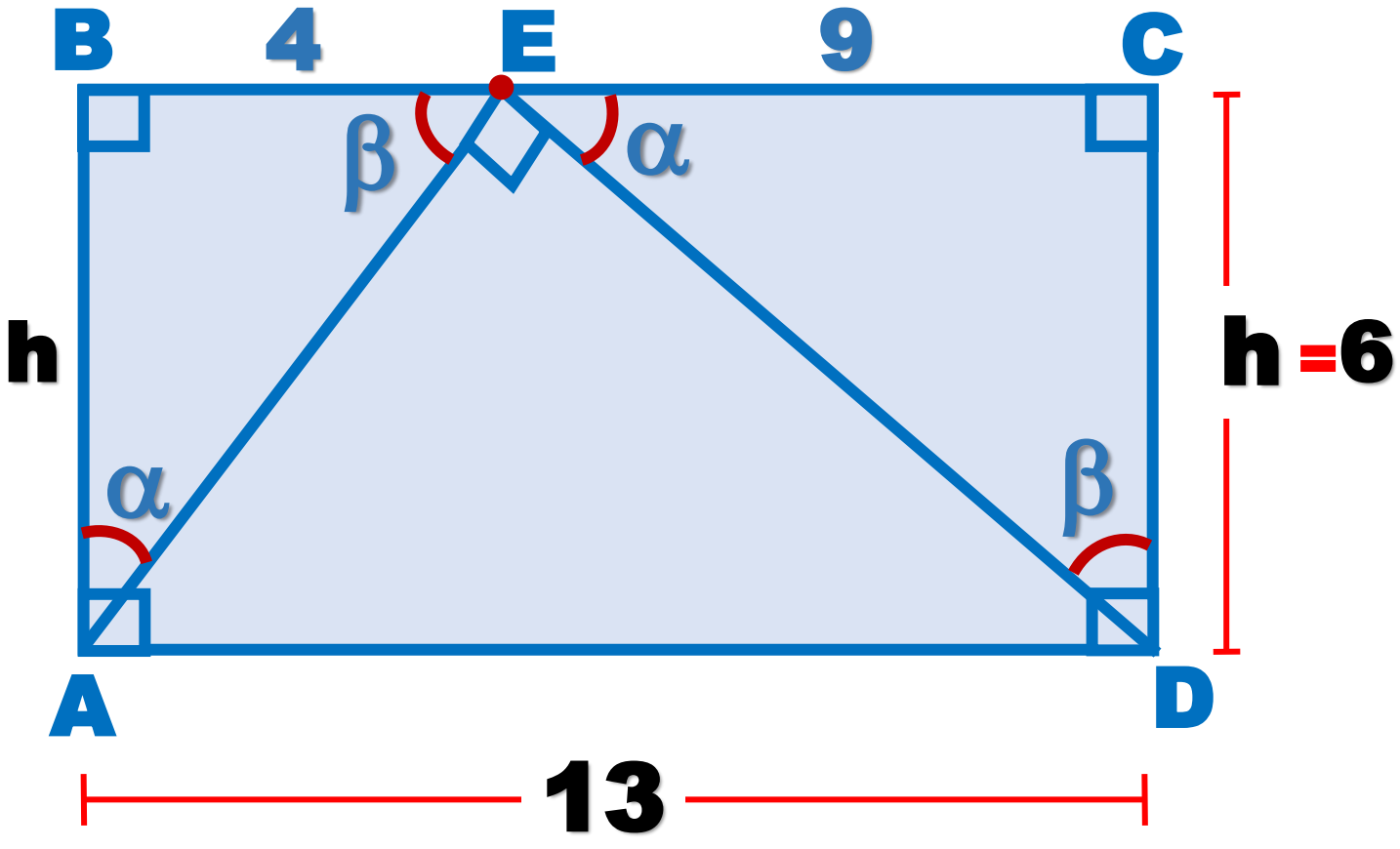
$S_{ABCD} = \frac{8^2}{2}$

$S_{ABCD} = \ell^2$

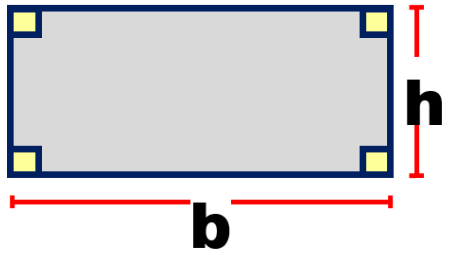
$S_{ABCD} = \frac{d^2}{2}$

$S_{ABCD} = 32u^2$

2. En un rectángulo ABCD, en $\overline{BC}$ se ubica el punto E, tal que m<AED = 90°, BE = 4 y EC = 9. Halle el área de la región rectangular ABCD.



Resolución



Región Rectangular

$S_{\square} = b.h$

$\triangle ABE \sim \triangle ECD$

$$\frac{h}{9} = \frac{4}{h} \quad | \quad h^2 = (9)(4)$$

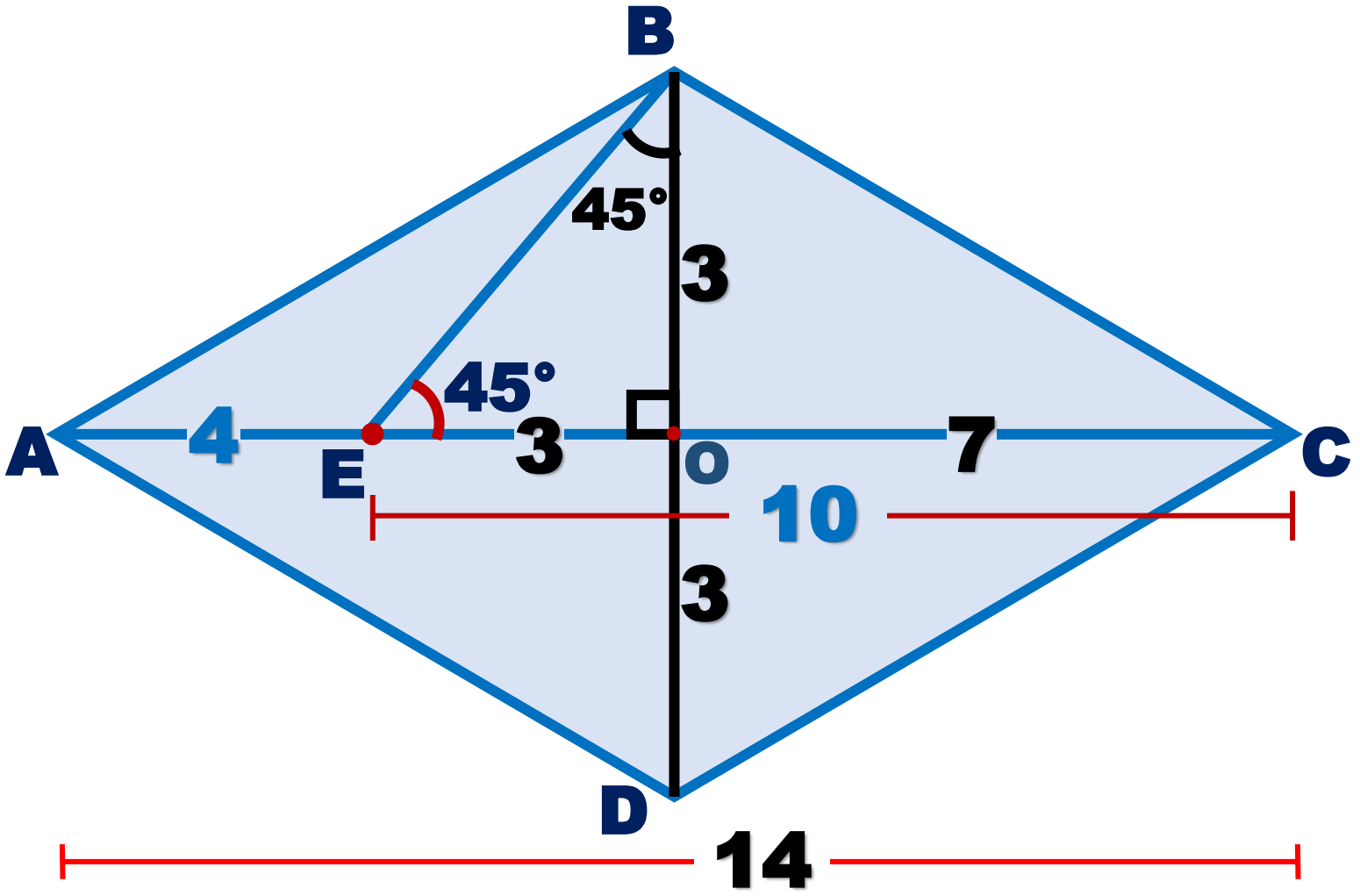
$$h = 6$$

Nos piden

$$S_{ABCD} = (13)(6)$$

$$S_{ABCD} = 78u^2$$

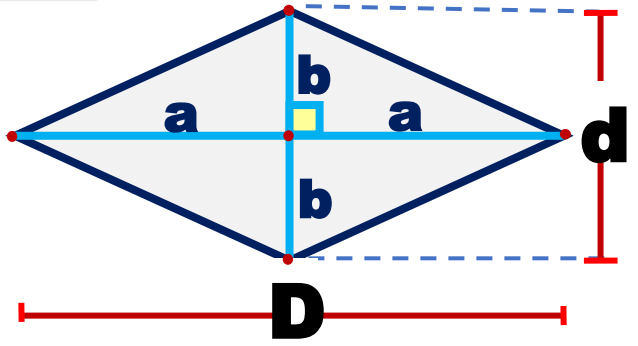
3. En un rombo ABCD, en $\overline{AC}$ se ubica el punto E, tal que AE = 4, EC = 10 y m<BEC = 45°. Halle el área de la región rombal ABCD.



Resolución

Región Rombal

$$S_{\diamond} = \frac{D.d}{2}$$

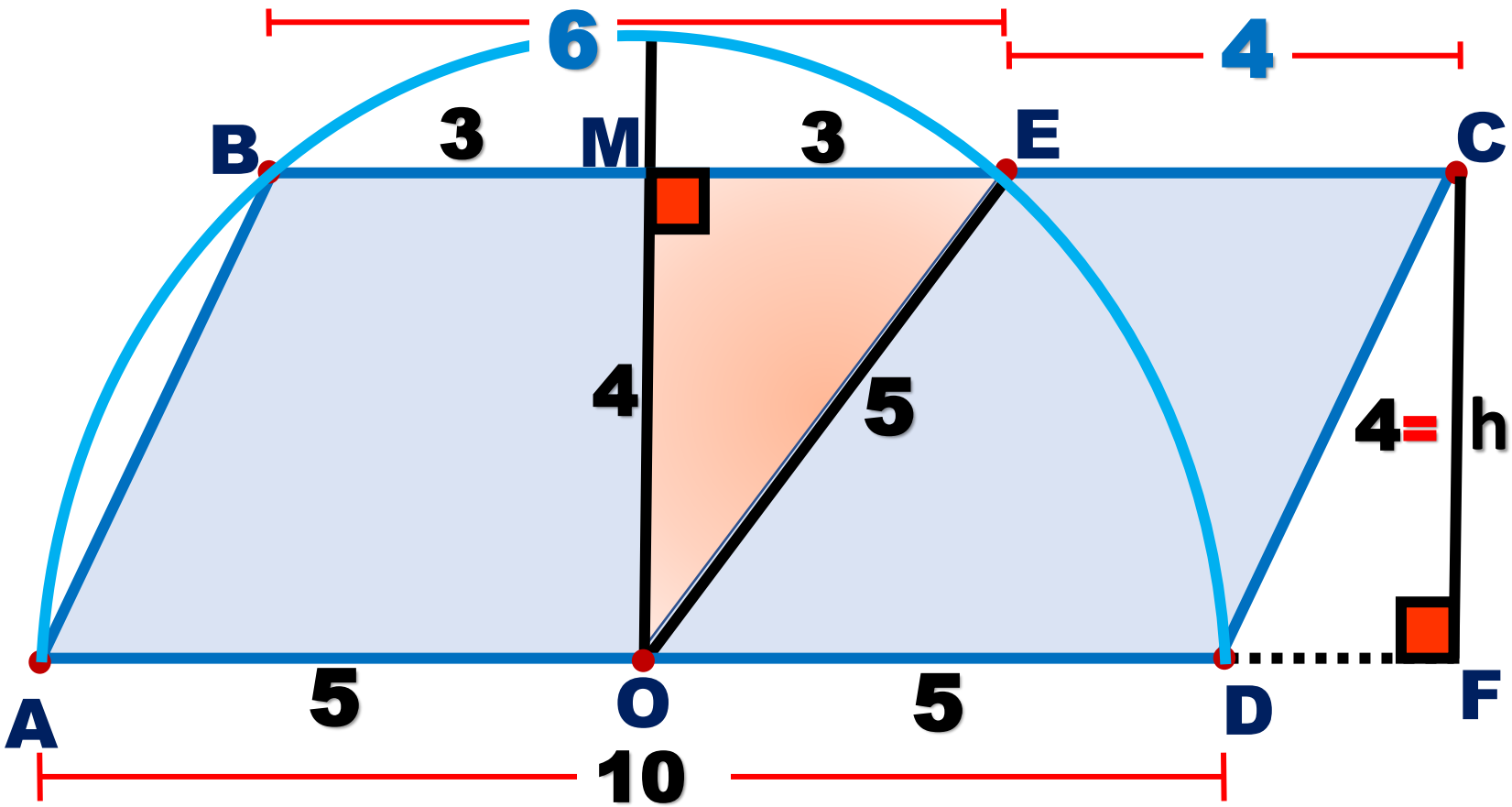


- Trazamos la diagonal $\overline{BD}$.
- Nos piden

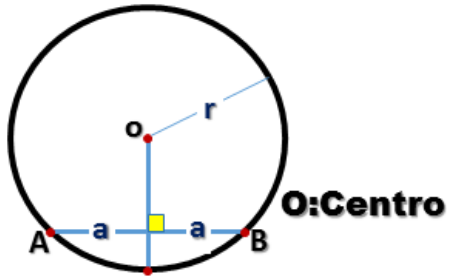
$$S_{ABCD} = \frac{14.6}{2}$$

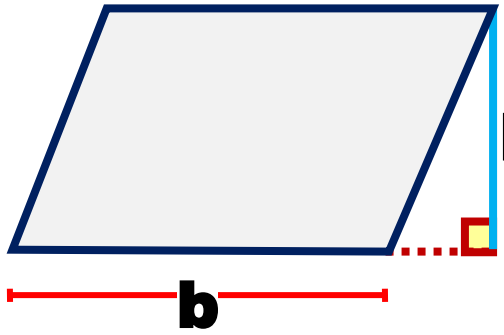
$$S_{ABCD} = 42u^2$$

4. Se tiene un romboide ABCD, luego tomando como diámetro a $\overline{AD}$ se traza una semicircunferencia que pasa por B e interseca a $\overline{BC}$ en E. Si BE = 6 y EC = 4, halle el área de la región romboidal ABCD.



Resolución





$S_{\square} = b.h$

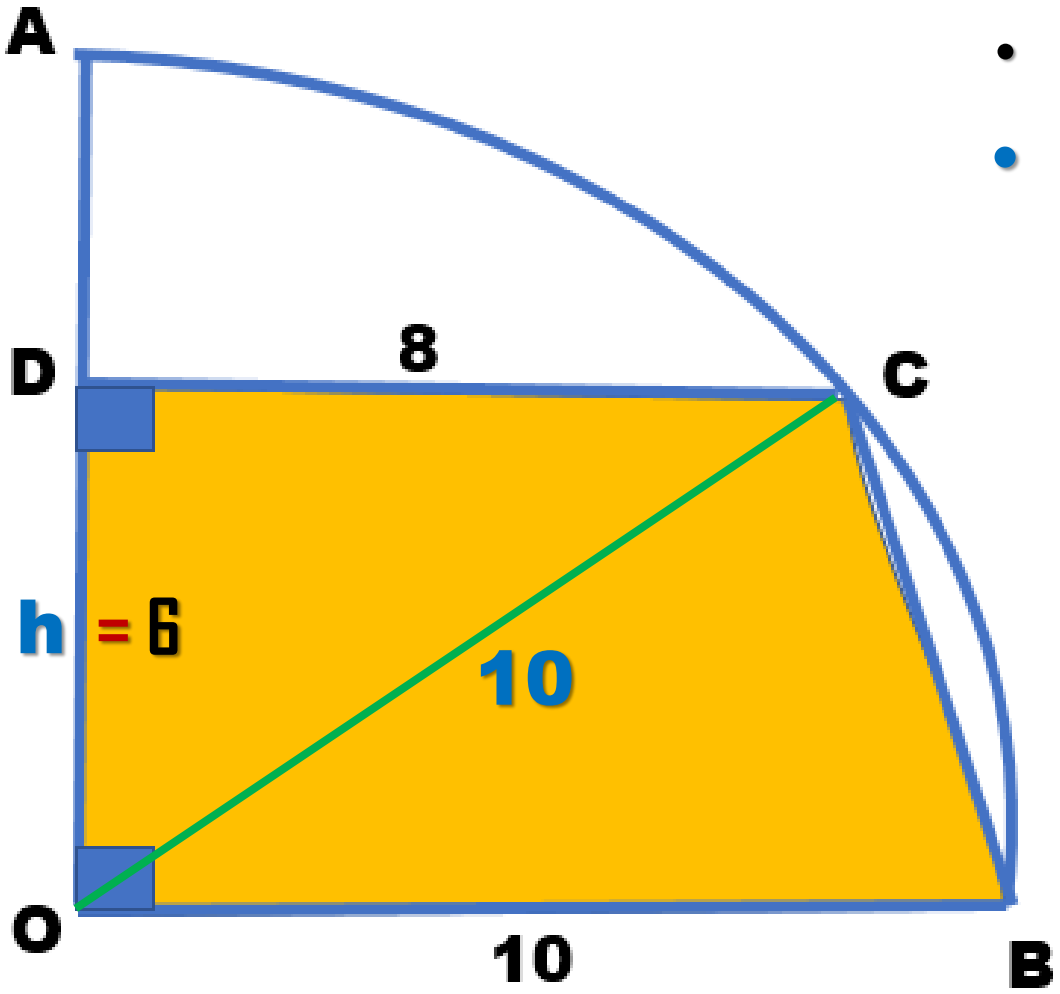
OME : Notable de 37° y 53°

$S_{ABCD} = 10.4$

$S_{ABCD} = 40u^2$

5. Halle el área de la región trapecial ODCB si O es centro.

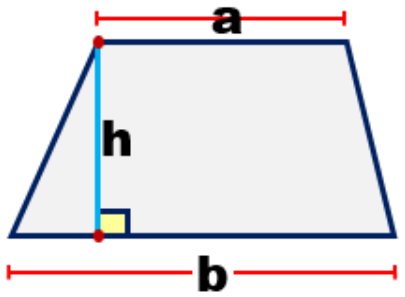
Resolución



- Trazamos $\overline{OC}$.
- $\triangle ODC$: T. Pitágoras (Notable de 37° y 53°)

$$10^2 = h^2 + 8^2$$
$$36 = h^2$$
$$6 = h$$

Región Trapecial



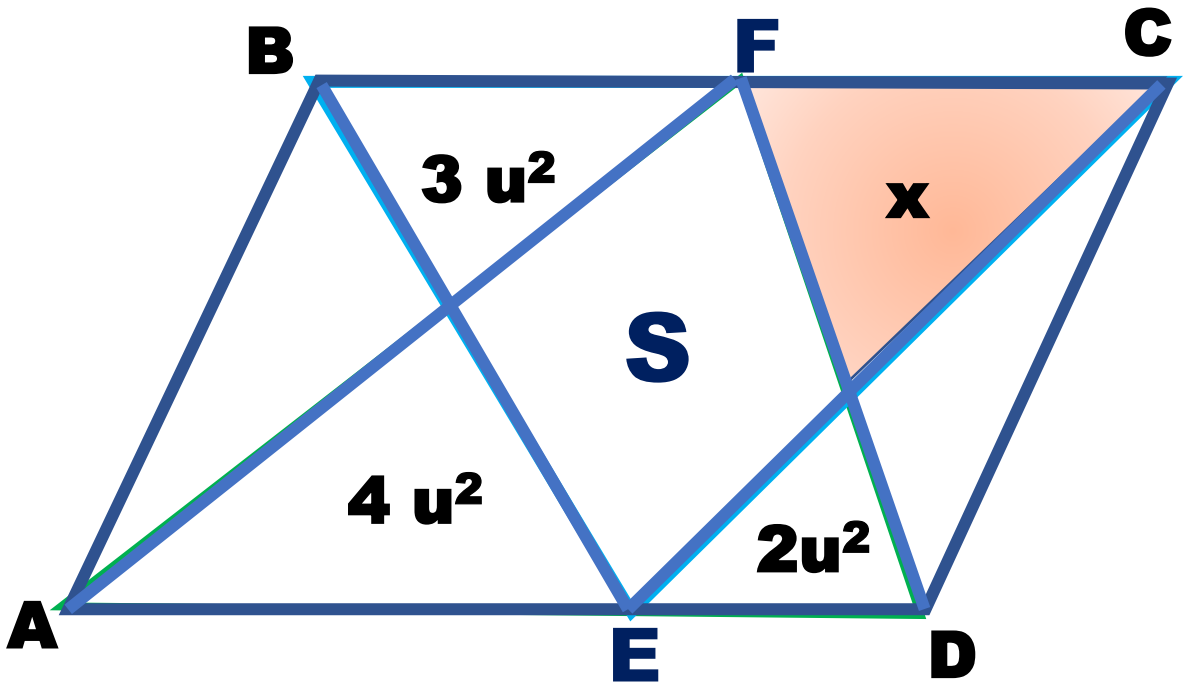
$$S_{\square} = \frac{(a+b).h}{2}$$

$$S_{\square} = \frac{(8+10).6}{2}$$

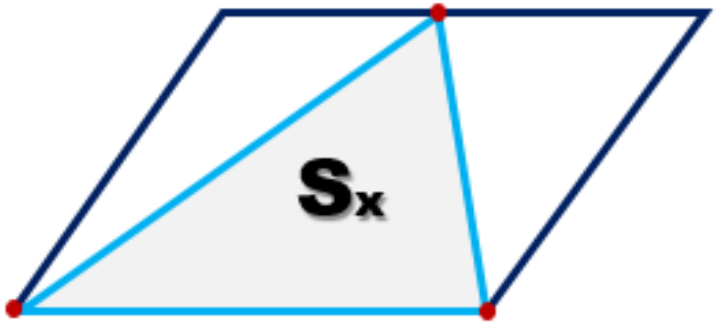
$$S_{\square} = \frac{(18).6}{2}$$

$$S_{\square} = 54u^2$$

6. Si ABCD es un paralelogramo, halle el área de la región sombreada.



Resolución



$$S_x = \frac{S_{\square}}{2}$$

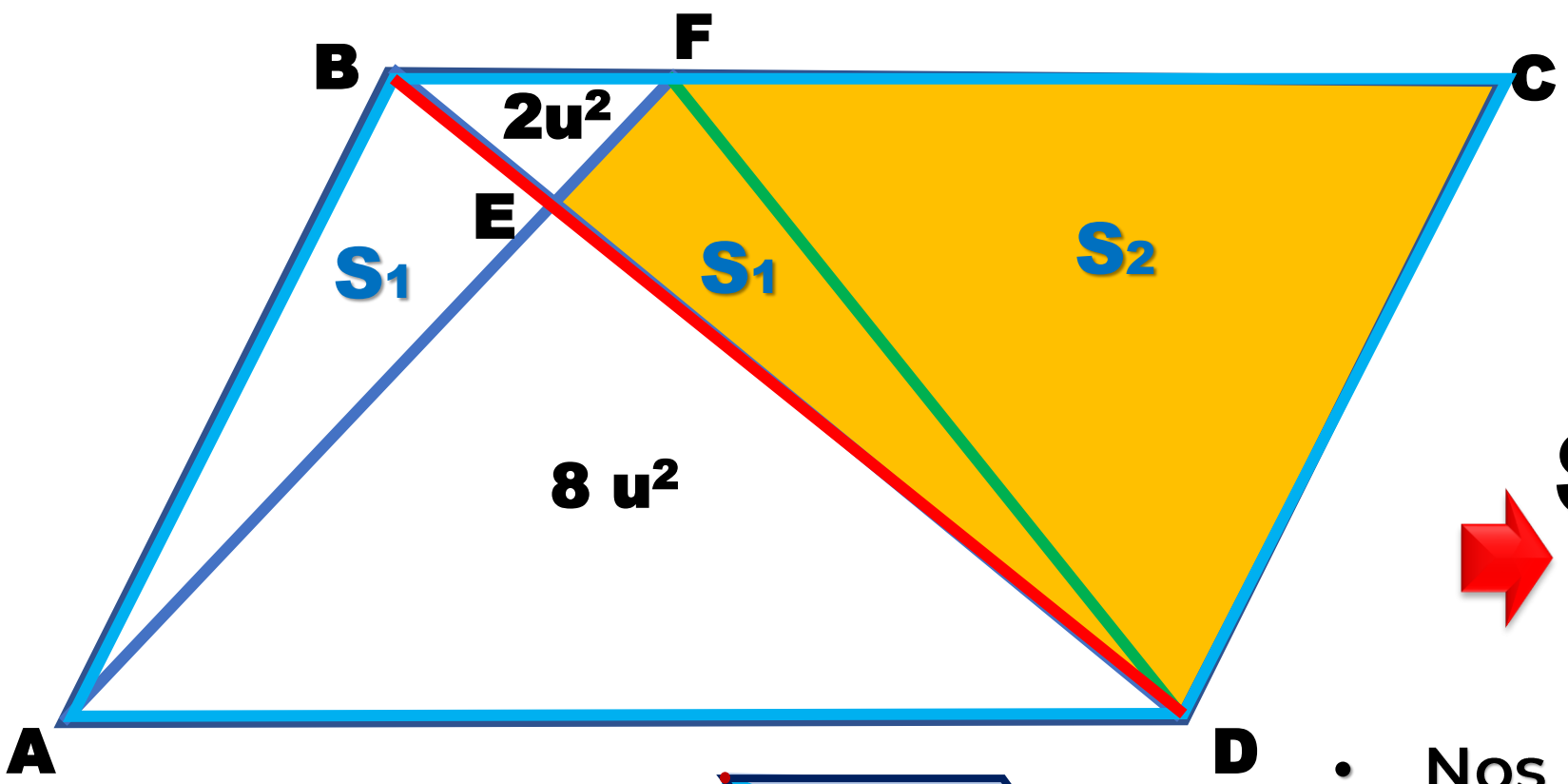
$$S_{\triangle AFD} = S_{\triangle BCE}$$

$$4 + S + 2 = 3 + S + x$$

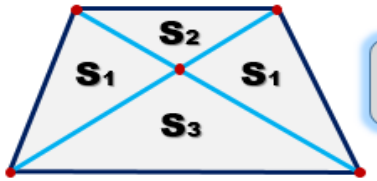
$$6 = 3 + x$$

$$3u^2 = x$$

7. Halle el área de la región sombreada si ABCD es un romboide.



Resolución



$S_1^2 = S_2 . S_3$

$(S_1)^2 = 2 . 8$

$(S_1)^2 = 16$

$S_1 = 4u^2$

$S_{\triangle ABD} = S_{\triangle BCD}$

$S_1 + 8 = 2 + S_1 + S_2$

$6u^2 = S_2$

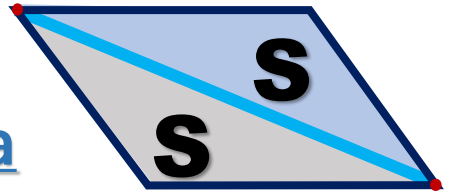
- Nos piden

$S_x = S_1 + S_2$

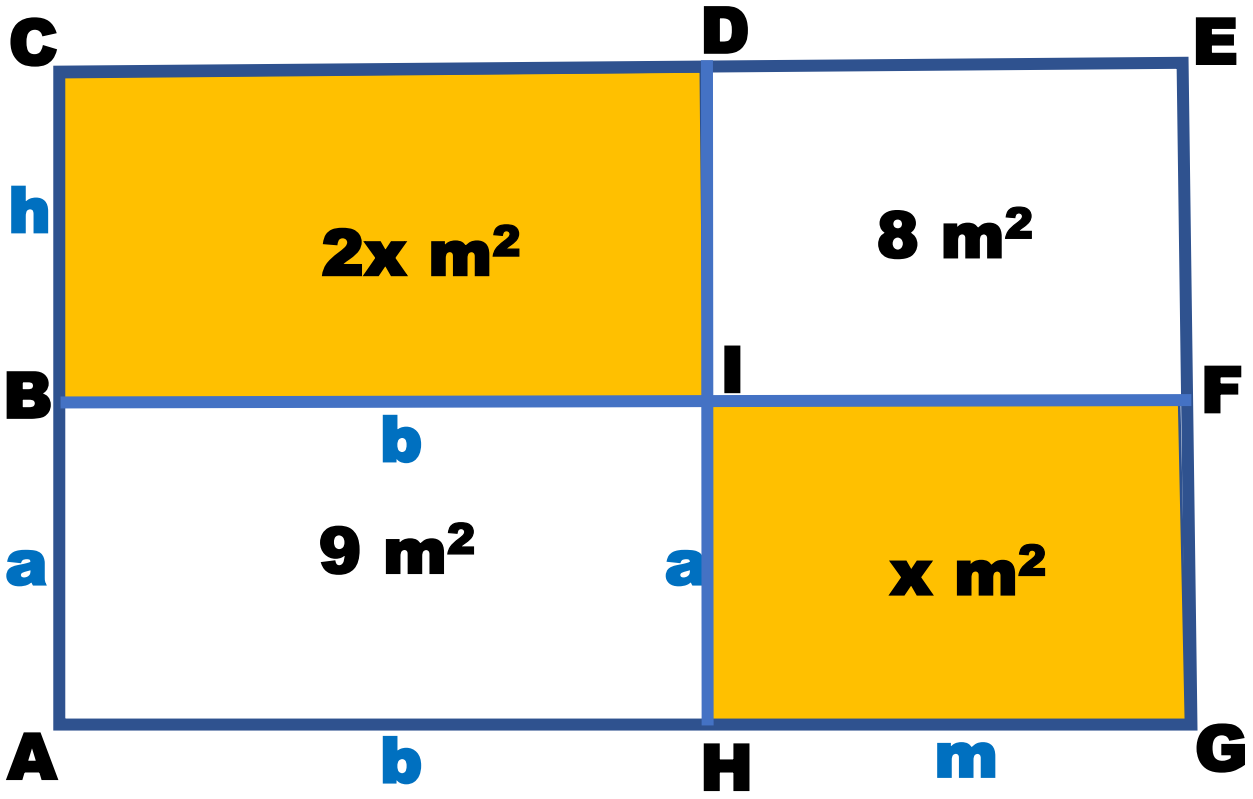
$S_x = 4 + 6$

$S_x = 10u^2$

Región Paralelográmica



8. Un jardín de forma rectangular esta dividido en cuatro rectángulos como se muestra en la figura, cuyas áreas se muestran en cada una. Halle el valor de x.



Resolución

$b.h = 2x$

$m.a = x$

$a.b.m.h = 2x^2$ ..... (1)

$a.b = 9$

$m.h = 8$

$a.b.m.h = 72$ ..... (2)

Igualando 1 y 2

$2x^2 = 72$

$x^2 = 36$

$x = 6$

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