GEOMETRÍA

Chapter 13

5th
SECONDARY

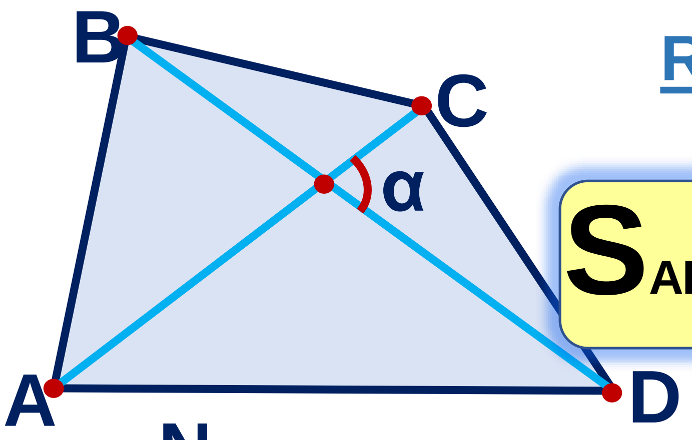
ÁREA DE REGIONES CUADRANGULARES

SACO OLIVEROS


MONOPOLY
Nintendo
MONOPOLY
Nintendo
GO

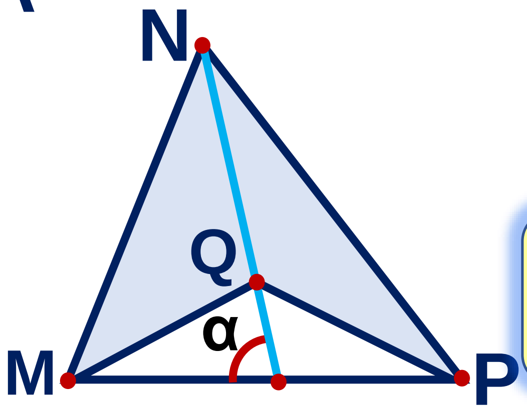

HYUNDAI
RE/MAX

ÁREAS DE REGIONES CUADRANGULARES



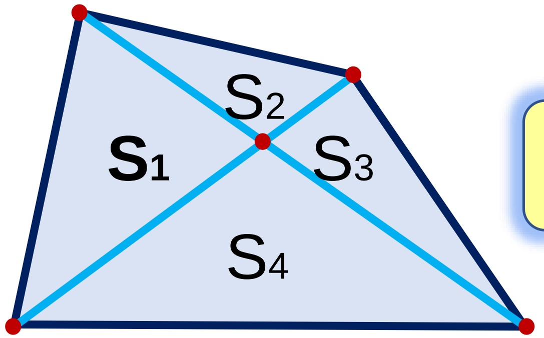
Región cuadrangular convexa

$$S_{ABCD} = \frac{(AC)(BD)}{2}.\operatorname{sen}\alpha$$



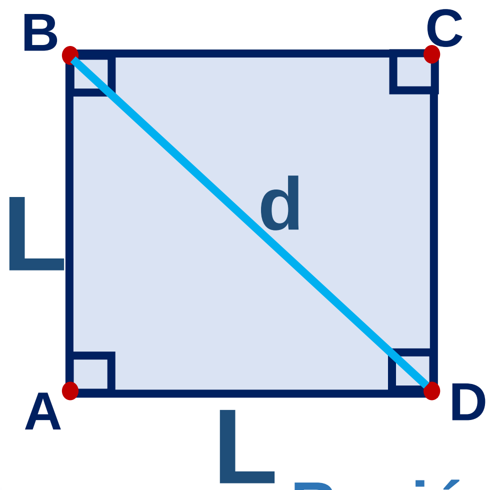
Región cuadrangular no convexa

$$S_{MNPQ} = \frac{(NQ)(MP)}{2}.\operatorname{sen}\alpha$$



$$S_1.S_3 = S_2.S_4$$

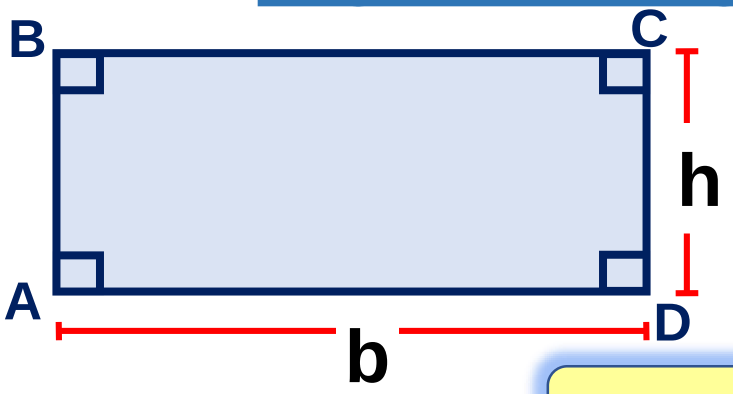
Región Cuadrada



$$S_{ABCD} = L^2$$

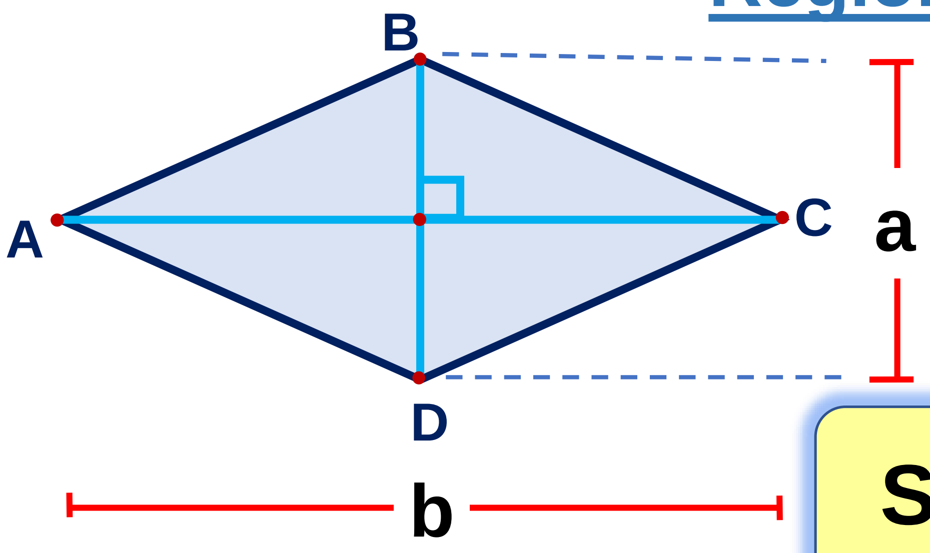
$$S_{ABCD} = \frac{d^2}{2}$$

Región Rectangular

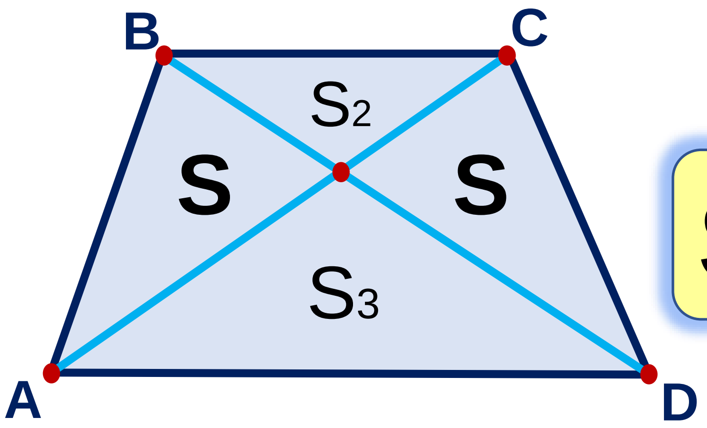


$$S_{ABCD} = b.h$$

Región Rombal



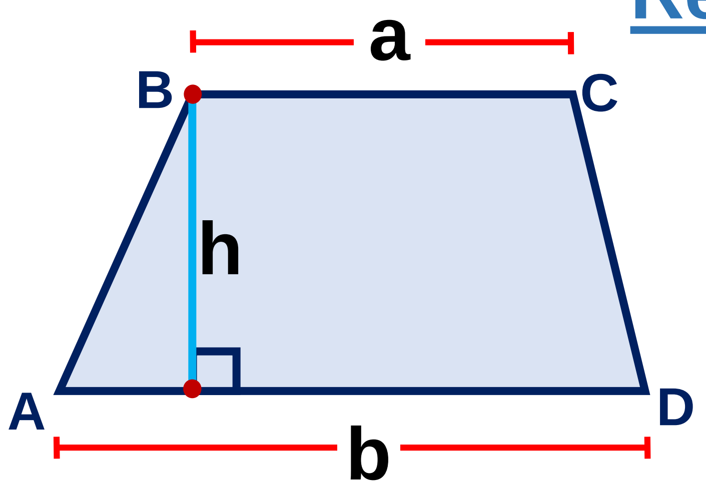
$$S_{ABCD} = \frac{b.a}{2}$$



$\overline{BC} \parallel \overline{AD}$

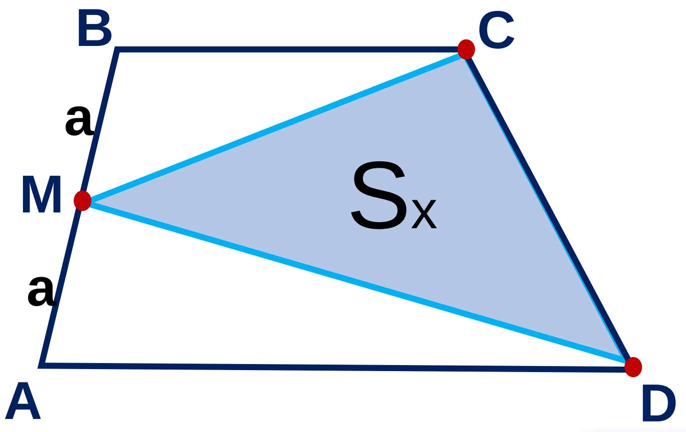
$$S^2 = S_2 . S_3$$

Región Trapecial



$\overline{BC} \parallel \overline{AD}$

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

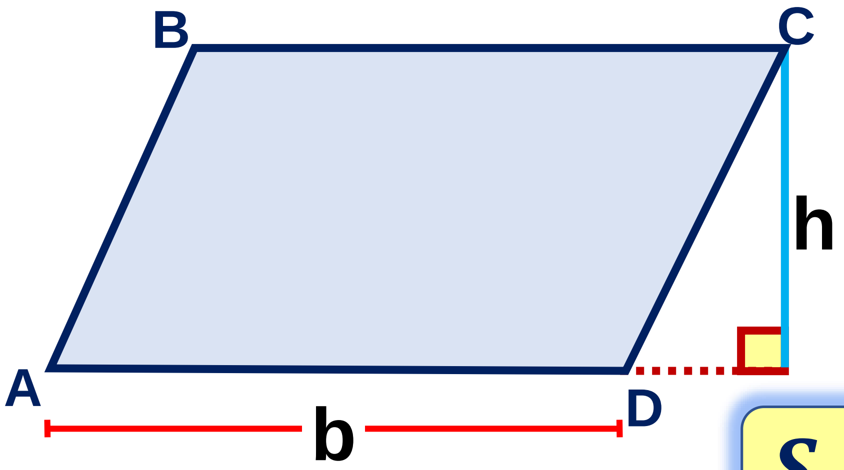


$\overline{BC} \parallel \overline{AD}$

AM = BM

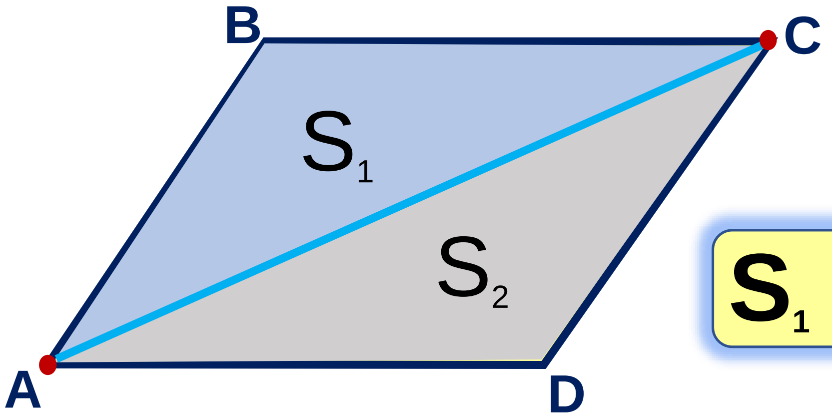
$$S_x = \frac{S_{ABCD}}{2}$$

Región Paralelográmica

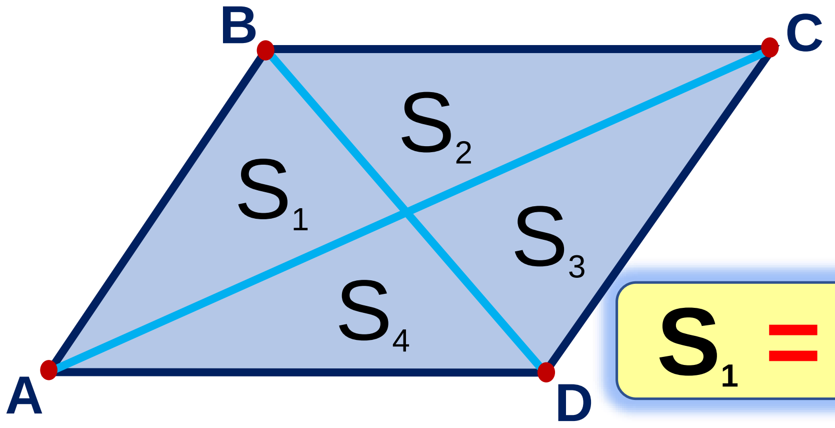


$$S_{ABCD} = b.h$$

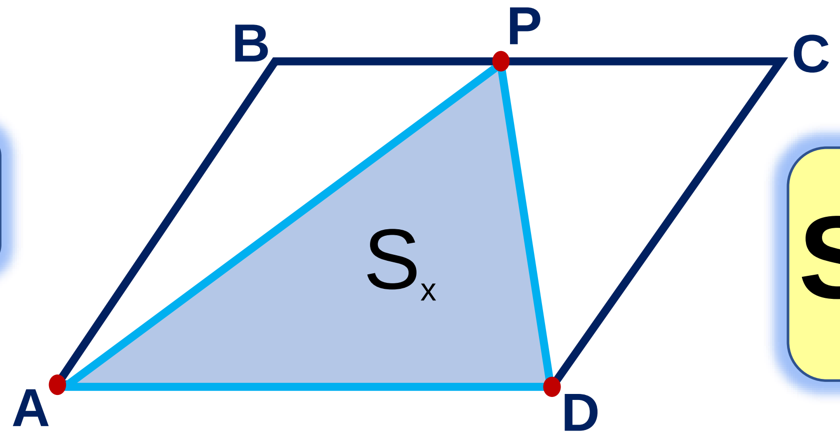
ABCD : Región paralelográmica



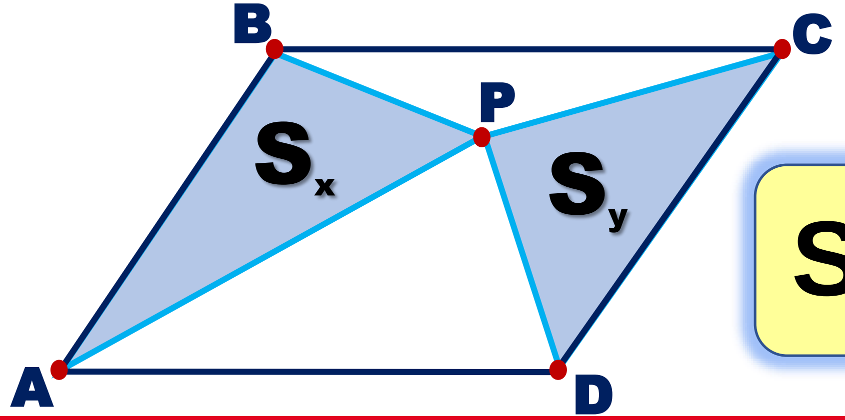
$$S_1 = S_2$$



$$S_1 = S_2 = S_3 = S_4$$

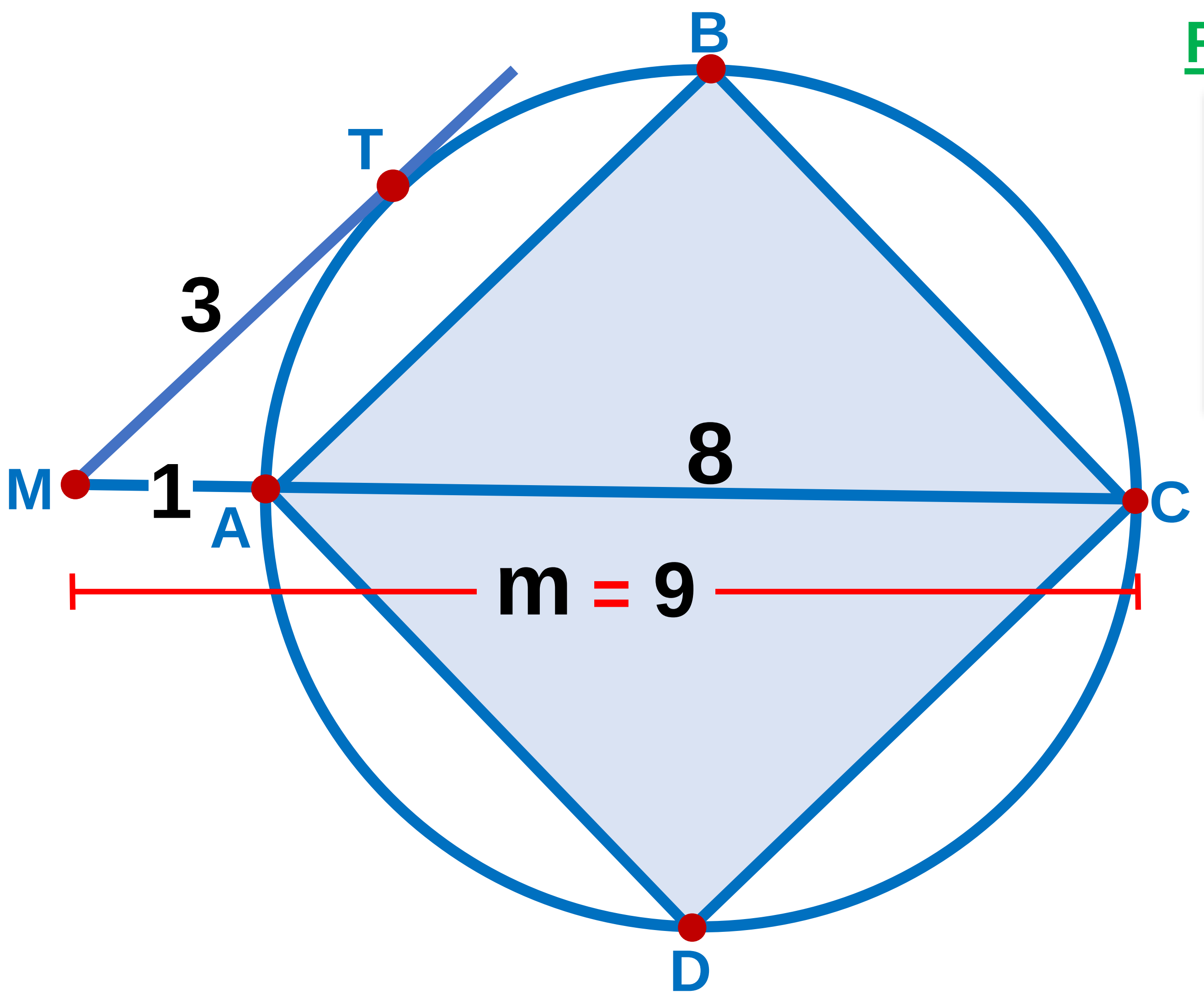


$$S_x = \frac{S_{ABCD}}{2}$$

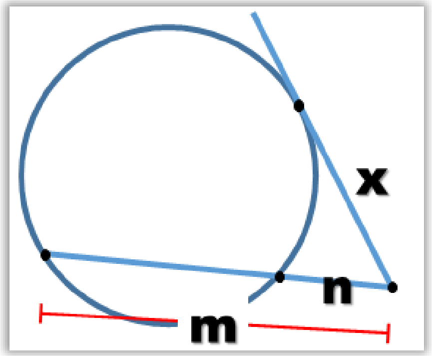


$$S_X + S_Y = \frac{S_{ABCD}}{2}$$

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



Resolución

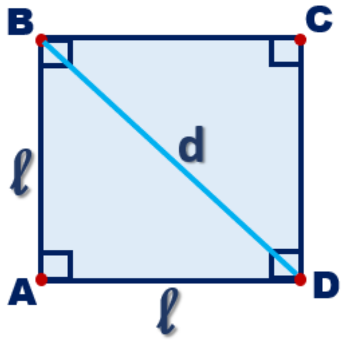


T. de la Tangente

$$\boxed{x^2 = m.n}$$

$3^2 = m(1)$

$9 = m$



$S_{ABCD} = \ell^2$

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

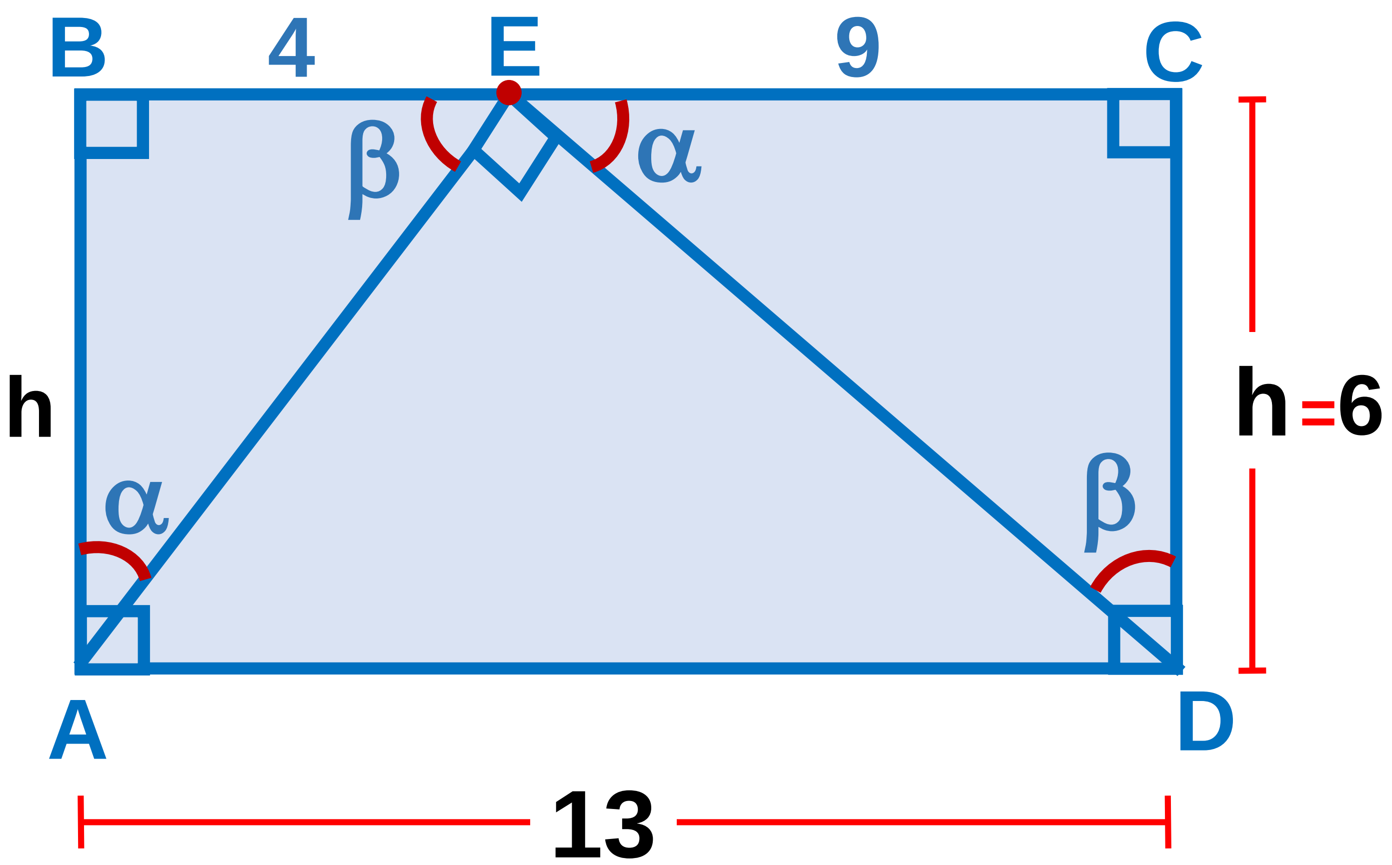
Región Cuadrada

Nos piden

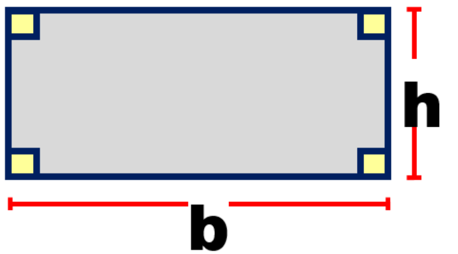
$$S_{ABCD} = \frac{8^2}{2}$$

$$S_{ABCD} = 32u^2$$

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

$S_{\square} = b.h$

$\triangle ABE \sim \triangle ECD$

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

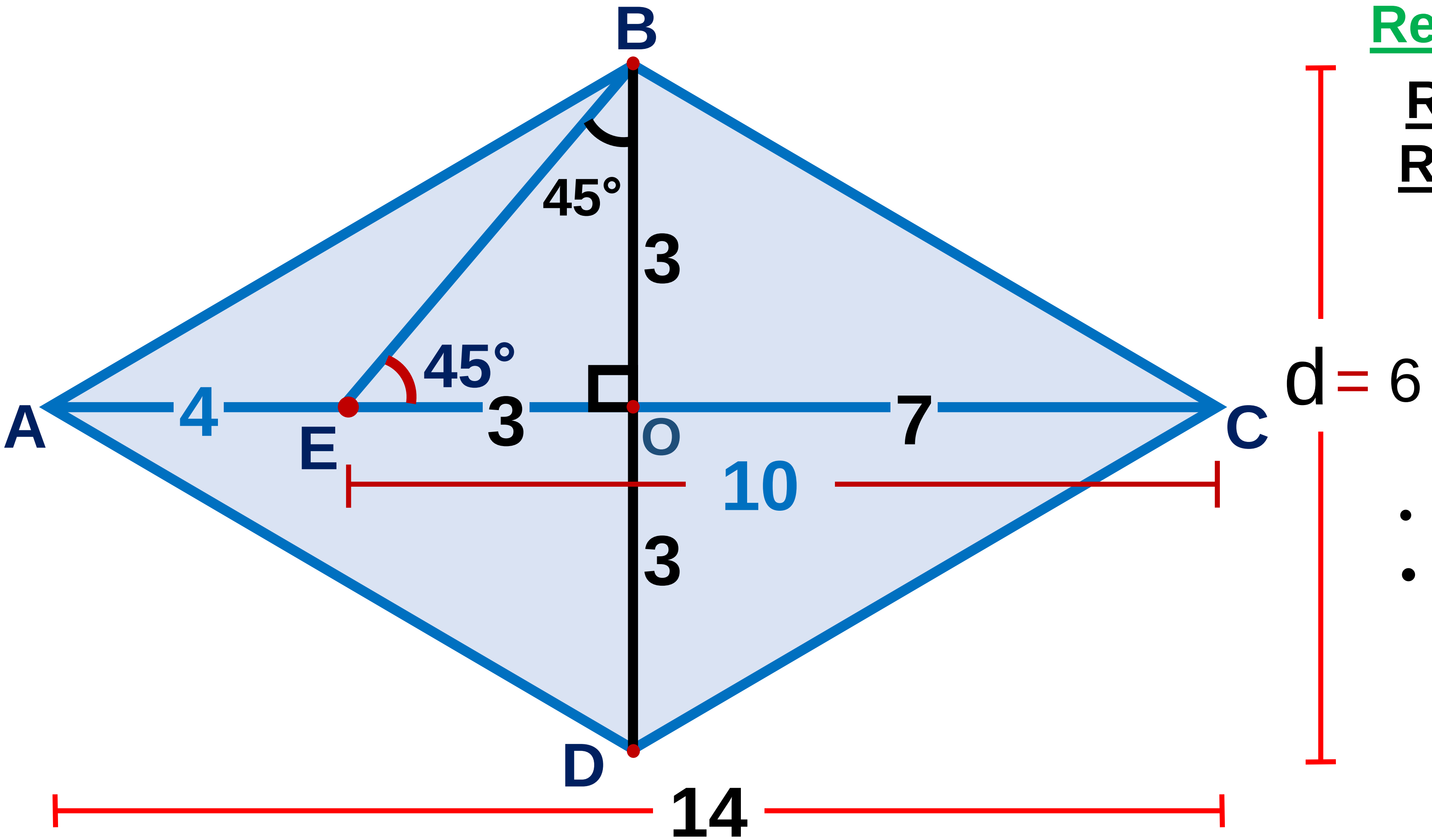
$$h = 6$$

Nos piden

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

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

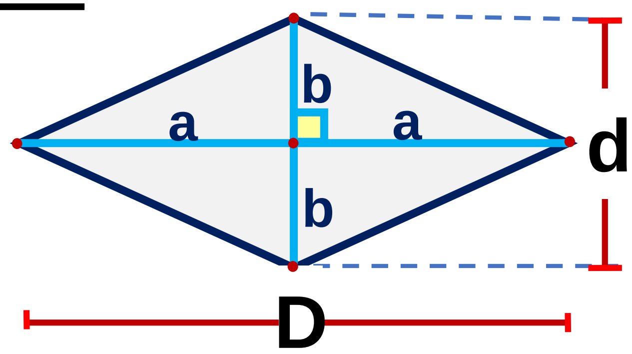
3. En un rombo ABCD, en $\overline{AC}$ se ubica el punto E, tal que AE = 4, EC = 10 y m∢BEC = 45°. Halle el área de la región rombal ABCD.



Resolución

Región Rombal

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

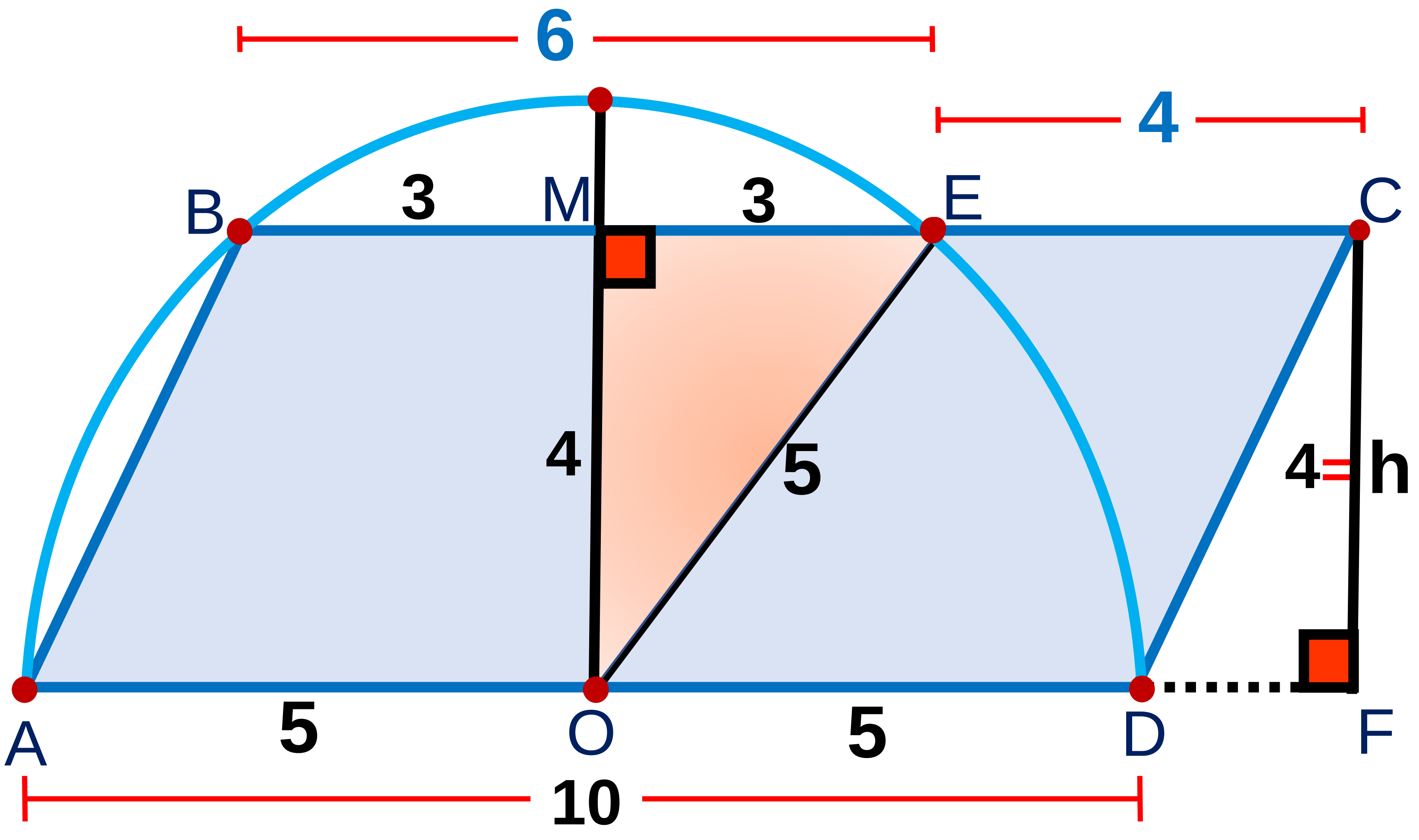


- Trazamos la diagonal $\overline{BD}$.
- Nos piden

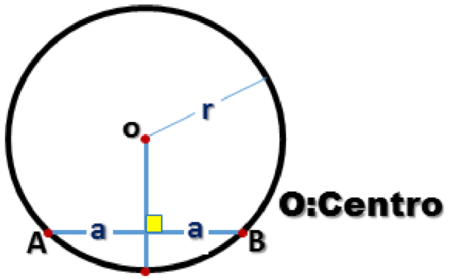
$$S_{ABCD} = \frac{14(6)}{2}$$

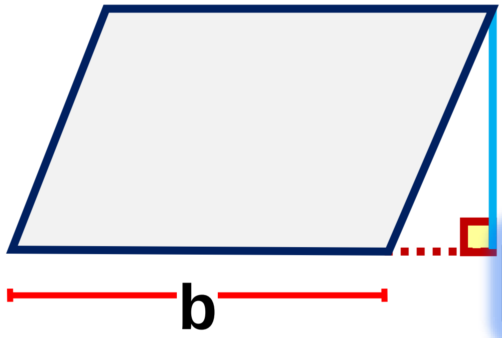
$$S_{ABCD} = 42\ u^2$$

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





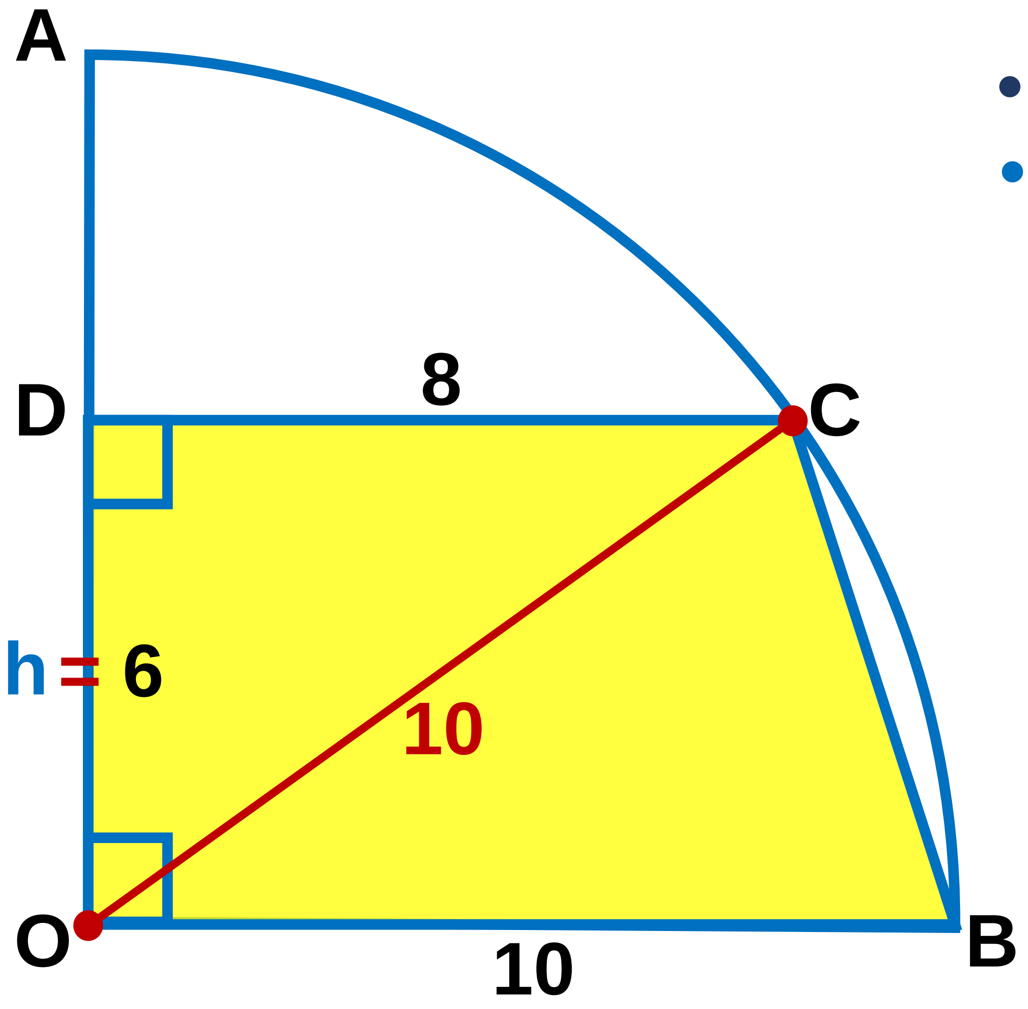
$S_{▱} = b.h$

⊿OME : Notable de 37° y 53°

$\Rightarrow S_{ABCD} = 10.4$

$S_{ABCD} = 40\ u^2$

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



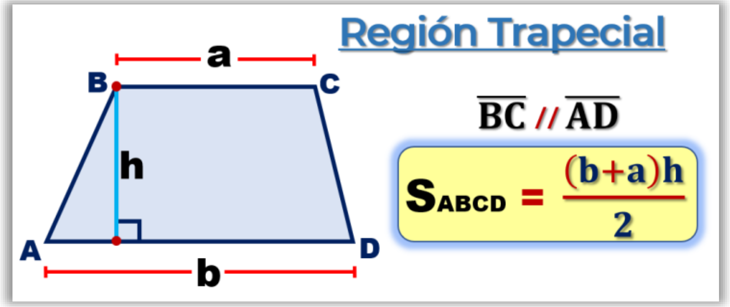
Resolución

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

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

$$36 = h^2$$

$$6 = h$$

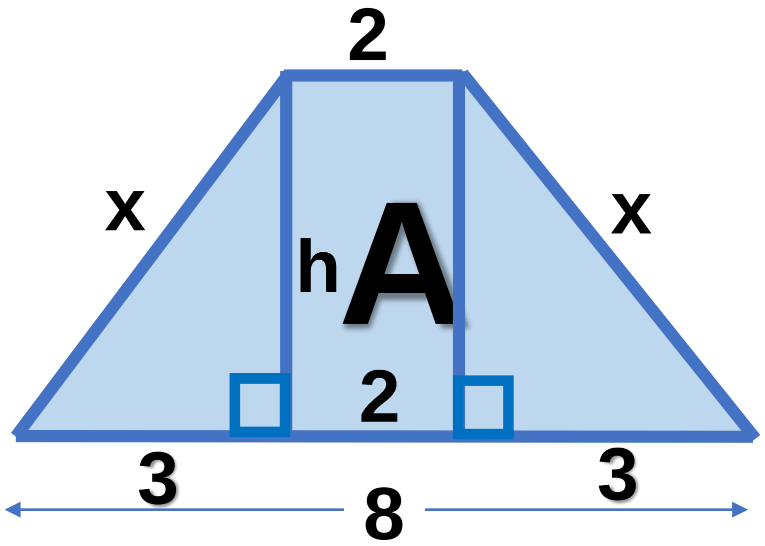


$$S = \frac{(8+10)6}{2}$$

$$S = \frac{(18)6}{2}$$

$$\boxed{S = 54u^2}$$

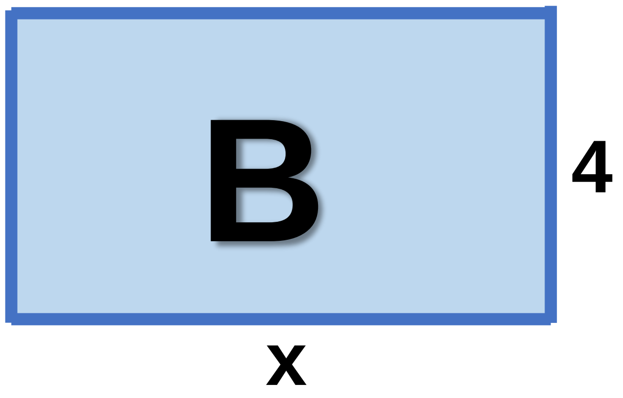
6. En la figura se muestran dos jardines que un padre de familia tiene en el patio de su casa; si los contornos de dichos jardines tienen forma, uno de trapecio isósceles y el otro de rectángulo, y además las áreas de dichos jardines son iguales; halle el valor de x.



$$\rightarrow\ x^2 = h^2 + 3^2$$

$$h = \sqrt{x^2 - 3^2}$$

<u>Resolución</u>



• **Dato:** A = B

$$\underbrace{\left(\frac{2+8}{2}\right)\sqrt{x^2 - 3^2}}_{A} = \underbrace{4.x}_{B}$$

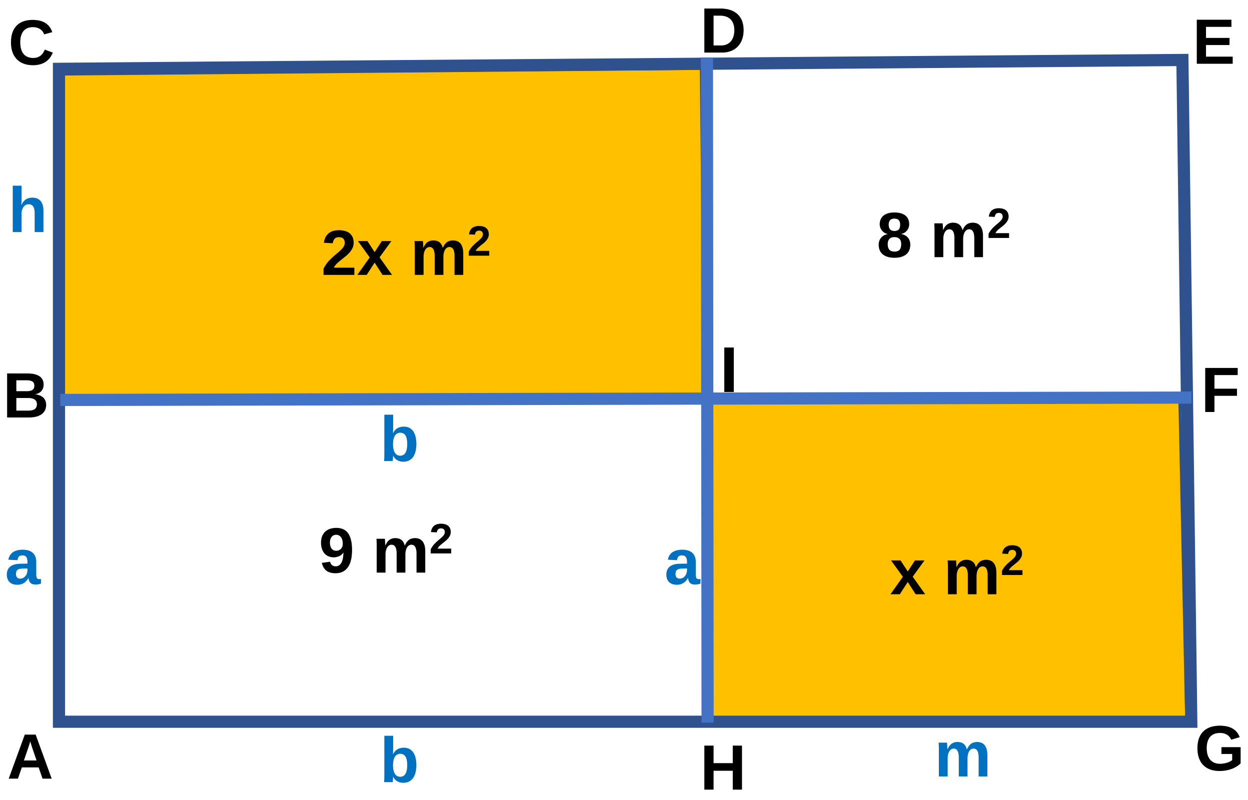
$$25(x^2 - 9) = 16x^2$$

$$25x^2 - 225 = 16x^2$$

$$9x^2 = 225$$

$$\boxed{x = 5}$$

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

$$b.h = 2x$$
$$m.a = x$$
$$a.b.m.h = 2x^2 \quad \text{........ (1)}$$

$$a.b = 9$$
$$m.h = 8$$
$$a.b.m.h = 72 \quad \text{........ (2)}$$

Igualando 1 y 2

$$2x^2 = 72$$
$$x^2 = 36$$
$$\boxed{x = 6}$$

SACO OLIVEROS