Áreas de quadriláteros e triângulos

Naihara-317

(1)

a) A área da sala, se dá pela junção de todas as áreas dos quadradinhos (Aq):

$$400\,Aq = 36\ m^2$$

$Aq = \ell^2$, então:

$$400 \cdot \ell^2 = 36$$

$$\ell^2 = \frac{36}{400}$$

$$\ell^2 = 0,09\ m^2$$

$$Aq = \ell^2 = 0,09\ m^2$$

b). Perímetro de um quadrado:

$$P = \text{lado} + \text{lado} + \text{lado} + \text{lado}$$

$$P = l + l + l + l \quad \text{ou} \quad P = 4l$$

• Dado a área, é possível descobrir o lado:

$$P = l^2 \Rightarrow Aq = 0{,}09\ m^2$$

$$l = \sqrt{0{,}09}$$

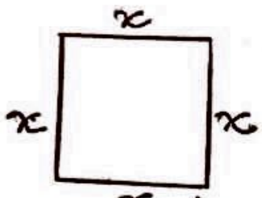
$$l = 0{,}03\ m$$

Então:

$$P = 0{,}03 . 4$$

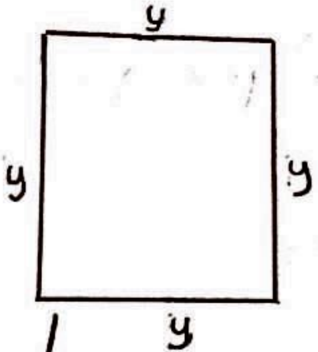
$$P = 1{,}2\ m$$

②



$A = l^2$

$A_I = x^2$



$A_{II} = y^2$

$A_{II} = 2\,A_I$

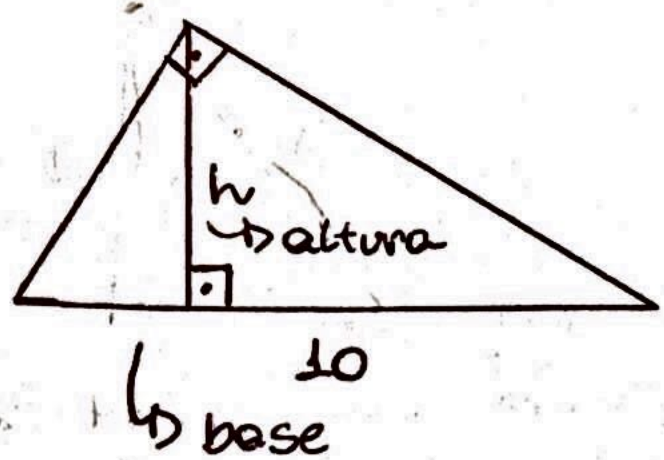
$y^2 = 2 \cdot x^2$

$y = \sqrt{2x^{\cancel{2}}}$

$\boxed{y = \sqrt{2} \cdot x}$

(3)

$A = 15$



$$A = \frac{b \cdot h}{2}$$

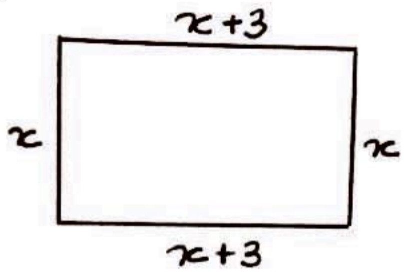
$$15 = \frac{10 \cdot h}{2}$$

$$30 = 10h$$

$$h = \frac{30}{10}$$

$$h = 3$$

④

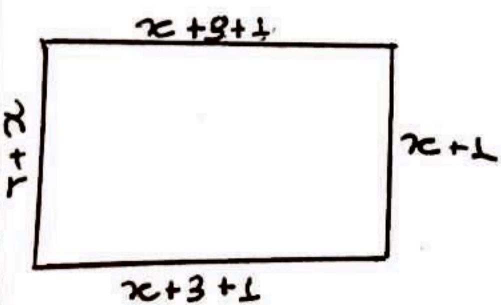


$A = b.h$

$A_I = (x+3).x$

$A_I = x^2 + 3x$

Atotal:



$(x+1).(x+4)$

$$A_{total} = A_I + 16$$

$$(x+1)(x+4) = x^2 + 3x + 16$$

$$\cancel{x^2} + x + 4x + 4 = \cancel{x^2} + 3x + 16$$

$$x + 4x + 4 = 3x + 16$$

$$5x + 4 = 3x + 16$$

$$5x - 3x = 16 - 4$$

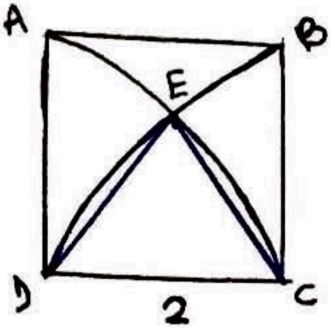
$$2x = 12$$

$$x = \frac{12}{2} \Rightarrow x = 6$$

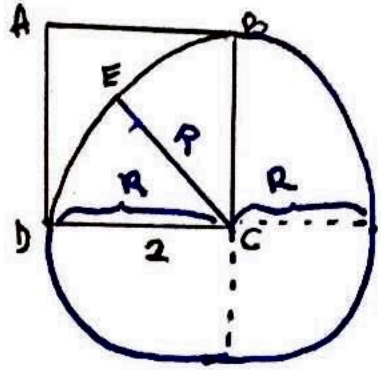
$$A_{total} = 6^2 + 3.6 + 16 \Rightarrow 36 + 18 + 16$$

$$A_{total} = 70\ m^2$$

5



Sendo o setor inscrito no quadrado:



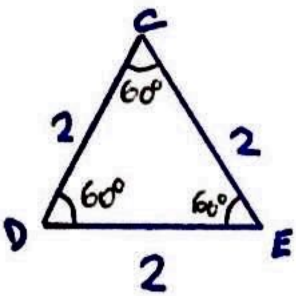
↳ Sendo assim, os segmentos $\overline{DC}$ e $\overline{EC}$ são os raios da circunferencia. Como o setor tangencia o quadrado, $L = R$

$$2 = R$$

Então: $\overline{DC} = \overline{EC} = R = 2$

O segmento $\overline{DE}$ também está num setor, portanto, também é o raio de uma circunferência:

$$\overline{DE} = R = 2$$



↳ O triângulo inscrito é equilátero, então:

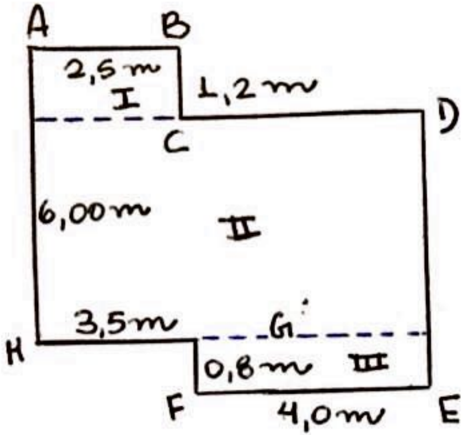
$$A = \frac{L^2 \cdot \sqrt{3}}{4}$$

$$A = \frac{2^2 \cdot \sqrt{3}}{4}$$

$$A = \frac{\cancel{4}\sqrt{3}}{\cancel{4}}$$

$$\boxed{A = \sqrt{3}}$$

6



I → $1,2 * 2,5 = 3,0\ m$

II → $(6 - 1,2) \cdot (4 + 3,5)$

$= 4,8 \cdot 7,5 = 36\ m$

III → $0,8 \cdot 4 = 3,2\ m$

Área $= 3,0 + 36 + 3,2$

Área $= 42,2\ m^2$

(7)

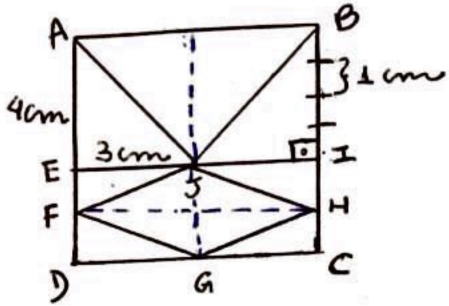
$$36 = \frac{(B+b) \cdot h}{2} \Rightarrow 36 = \frac{(DC + 2DC) \cdot h}{2} \Rightarrow 36 = \frac{3DC \cdot h}{2}$$

$\therefore$

$$\left.\begin{array}{l} 72 = 3DC \cdot h \\ \text{Área } CDEF = DC \cdot h \end{array}\right\} A_{CDEF} \Rightarrow \frac{72}{3} = DC \cdot h$$

$$\boxed{\begin{array}{l} 24 = DC \cdot h \\ A_{CDEF} = 24\,cm^2 \end{array}}$$

(8)

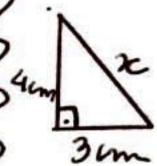


$$A_{losango} = \frac{D \cdot d}{2}$$

$$D = FH = 6 \text{ cm}$$

$$d = JG = 2 \text{ cm}$$

$$A_{losango} = \frac{6 \cdot 2}{2} = 6 \text{ cm}^2$$



$$x^2 = 4^2 + 3^2$$

$$x^2 = 16 + 9$$

$$x^2 = 25$$

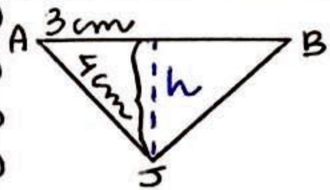
$$x = \sqrt{25}$$

$$x = 5 \text{ cm}$$

$$\Delta AEJ = \Delta BJI$$

$$\overline{AJ} = \overline{BJ} = 5 \text{ cm}$$

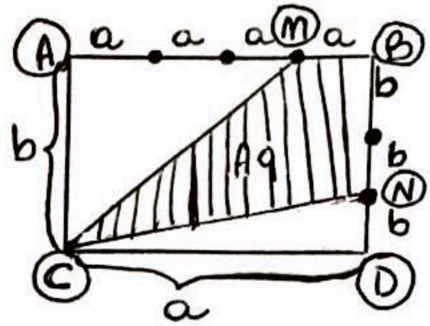
$$R = \frac{6 : 6}{12} = \frac{1}{2}$$



$$\text{Área } ABJ = 2 \cdot \left(\frac{3 \cdot 4}{2}\right)$$

$$A_{ABJ} = 12 \text{ cm}^2$$

9)



$$A_q = A_{ABCD} - A_{ACM} - A_{CDN}$$

$$A\Delta ACM \Rightarrow base = \frac{3a}{4} \,/\, altura = b$$

$$A\Delta CDN \Rightarrow base = a \,/\, altura = \frac{b}{3}$$

$$\left.\right\} A = \frac{b.h}{2}$$

$$A_{ABCD} = ab = 48$$

$$A_q = ab - \left(\frac{\frac{3a}{4}.b}{2}\right) - \left(\frac{a.\frac{b}{3}}{2}\right)$$

$$A_q = ab - \left(\frac{3ab}{4} \cdot \frac{1}{2}\right) - \left(\frac{ab}{3} \cdot \frac{1}{2}\right)$$

$$A_q = ab - \frac{3ab}{8} - \frac{ab}{6}$$

$$A_q = 48 - \frac{3.48}{8} - \frac{48}{6}$$

$$A_q = 48 - 18 - 8$$

$$\boxed{A_q = 22m^2}$$

6

Dada a relação:

$\frac{A}{A'} = k^2$, tem-se:

$$\frac{A_{\Delta ADE}}{A_{\Delta ABC}} = \left(\frac{AD}{AB}\right)^2$$

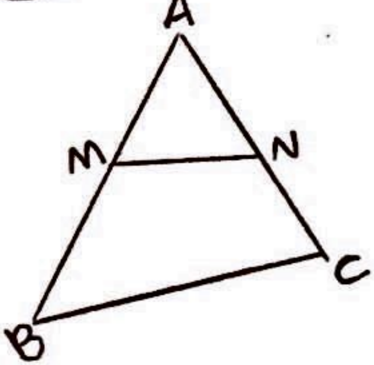
$$\frac{\frac{1}{2}\cancel{ABC}}{\cancel{ABC}} = \left(\frac{AD}{8}\right)^2 \Rightarrow \frac{1}{2} = \frac{AD^2}{64} \Rightarrow 64 = 2AD^2$$

$$AD^2 = \frac{64}{2}$$

$$\begin{array}{r|l} 32 & 2 \rangle 2 \\ 16 & 2 \\ 8 & 2 \rangle 2 \\ 4 & 2 \\ 2 & 2 \\ & 4\sqrt{2} \end{array}$$

$$AD = \sqrt{32} \Rightarrow AD = 4\sqrt{2}$$

(11)



AMN = base média de ABC

$MN = \frac{1}{2} BC$

$AMN \sim ABC$ (semelhantes)

Então, a razão é de:

$R = k = 1:2$

· Dada a relação:

$\frac{A}{A'} = k^2$, tem-se : $\frac{\Delta AMN}{\Delta ABC} = \left(\frac{1}{2}\right)^2 \Rightarrow \frac{\Delta AMN}{\Delta ABC} = \frac{1}{4}$ → A área de ΔAMN é $\frac{1}{4}$ de ΔABC (96 m).

A área de ΔAMN é :

$A_{\Delta MN} = \Delta ABC - \Delta AMN$

$A_{\Delta} = 96 - \frac{1}{4} \cdot 96$

$A_{\Delta AMN} = 96 - 24$

$A_{\Delta AMN} = 72 \ m^2$