Áreas de quadriláteros e triângulos

Naihara-317

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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:

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

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

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

$$\boxed{Aq = \ell^2 = 0{,}09\ m^2}$$

b). Perímetro de um quadrado:

$$P = lado + lado + lado + lado$$

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

- Dado a área, é possível descobrir o lado:

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

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

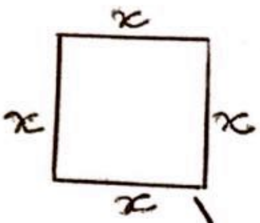
$$l = 0{,}03\ m$$

Então:

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

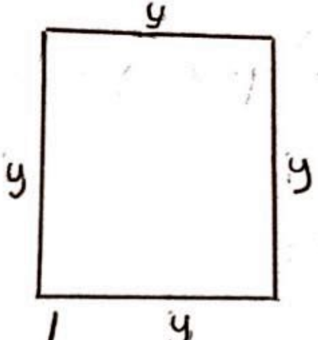
$$\boxed{P = 1{,}2\ m}$$

(2)



$A = l^2$

$A_I = x^2$



$A_{II} = y^2$

$$A_{II} = 2A_I$$

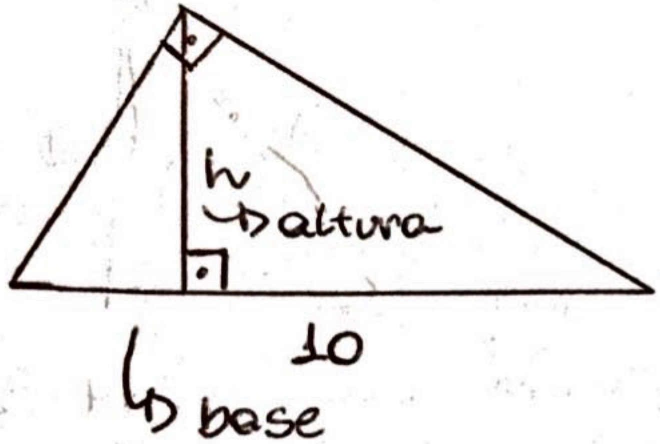
$$y^2 = 2 \cdot x^2$$

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

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

(3)

$A = 15$



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

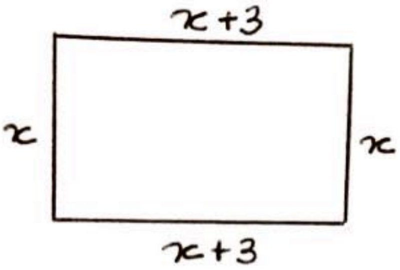
$$15 = \frac{10 \cdot h}{2}$$

$$30 = 10h$$

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

$$h = 3$$

4

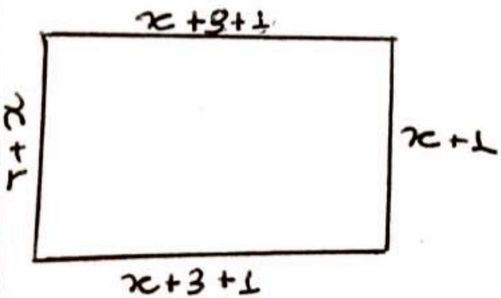


$A = b . h$

$A_I = (x+3) . x$

$A_I = x^2 + 3x$

Atotal:



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

$A_{total} = A_I + 16$

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

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

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

$5x + 4 = 3x + 16$

$5x - 3x = 16 - 4$

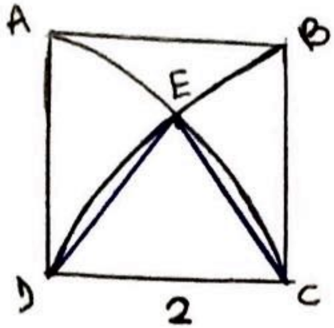
$2x = 12$

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

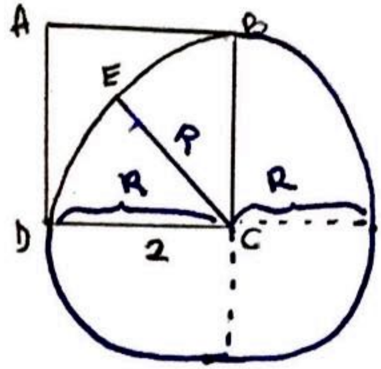
$A_{total} = 6^2 + 3.6 + 16 \Rightarrow 36 + 18 + 16$

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

⑤



Sendo o setor inscrito no quadrado:



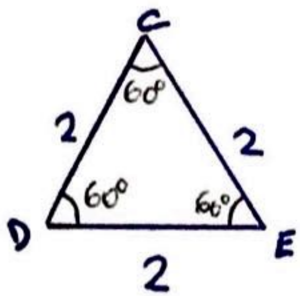
↳ Sendo assim, os segmentos $\overline{DC}$ e $\overline{EC}$ são os raios da circunferencia. Como o setor tangencia o quadrado, $L = R$

$$2 = R$$

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:

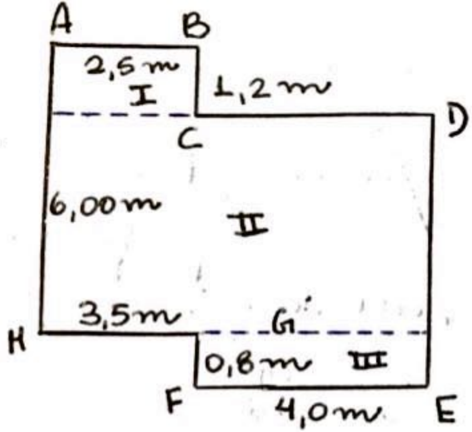
$$A = \frac{L^2 \cdot \sqrt{3}}{4}$$

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

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

$$A = \sqrt{3}$$

(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 $= 3{,}0 + 36 + 3{,}2$

$\boxed{\text{Área} = 42{,}2\,m}$

(7)

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

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

$$24 = DC\cdot h$$

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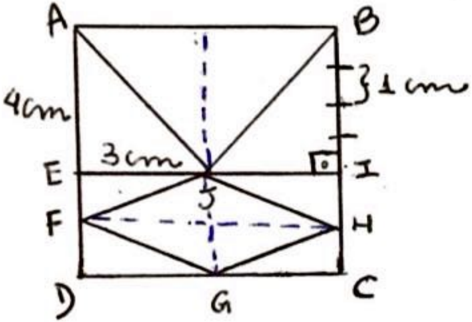


$A_{losango} = \dfrac{D \cdot d}{2}$

$D = FH = 6\ cm$

$d = JG = 2\ cm$

$A_{losango} = \dfrac{6 \cdot 2}{2} = 6\ cm$

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

$x^2 = 16 + 9$

$x^2 = 25$

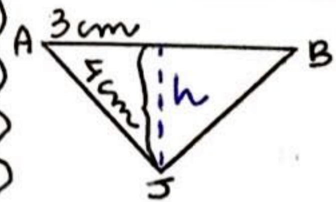
$x = \sqrt{25}$

$x = 5\ cm$

$\Delta AEJ = \Delta BJI$

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

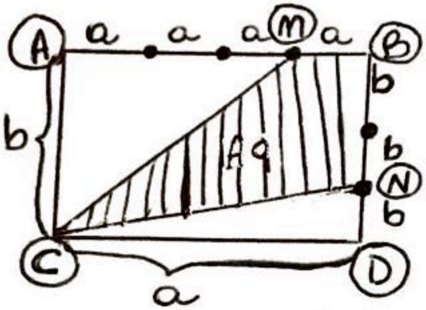
$R = \dfrac{6 : 6}{12} = \dfrac{1}{2}$



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

$A_{ABJ} = 12\ cm$

9)



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

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

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

$\Big\} A = \frac{b.h}{2}$

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

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

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

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

$$Aq = 48 - \frac{3 \cdot 48}{8} - \frac{48}{6}$$

$$Aq = 48 - 18 - 8$$

$$\boxed{Aq = 22}$$

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Dada a relação:

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

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

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

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

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

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

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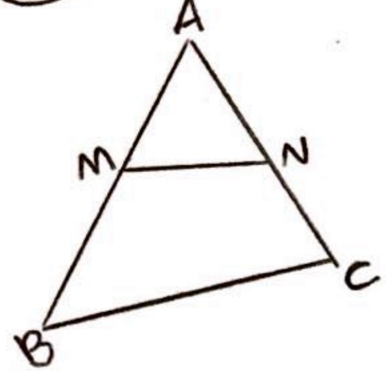

AMN = base média de ABC

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

AMN ~ ABC (semelhantes)

Então, a razão é de:

R = k = 1 : 2

· Dada a relação:

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

A área de ΔAMN é:

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

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

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

$\boxed{A_{\Delta AMN} = 72 \text{ m}}$