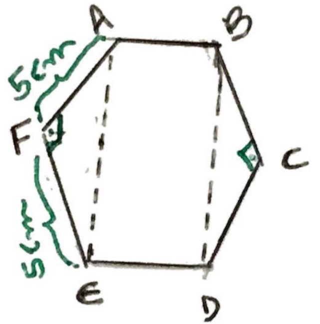
Áreas de Polígonos

Naihara-317

1



AE e BD são hipotenusas de ΔAFE e ΔBCD

$$AE = BD \Rightarrow AE^2 = 5^2 + 5^2$$

$$AE^2 = 25 + 25$$

$$AE^2 = 50$$

$$AE = \sqrt{50}$$

$$AE = BD = 5\sqrt{2}$$

b) I. soma dos ângulos internos

$$S = (n-2)180^\circ$$

$$S = (6-2)180^\circ$$

$$S = 4 \cdot 180^\circ$$

$S = 720^\circ$ internos

$$A + B + D + E = 540^\circ$$

$$720 - 540^\circ = 180^\circ$$

Os ângulos A, B, D, E somam 540°, então, $F + C = 180^\circ$

$$F = \frac{180}{2} = 90^\circ$$

$$C = \frac{180}{2} = 90^\circ$$

Área de $\square$ ABED

$$A_{ABED} = \frac{b \cdot h}{2}$$

$$A = \frac{5\sqrt{2} \cdot 5}{2}$$

$$A_{ABDE} = 25\sqrt{2}$$

Altura de ΔAFE e ΔBCD

$$h = \frac{\cancel{5} \cdot 5}{\cancel{5}\sqrt{2}} \Rightarrow h = \frac{5}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$h = \frac{5\sqrt{2}}{2}$$

Área de ΔAFE e ΔBCD

$$A = \frac{(5\sqrt{2}) \cdot \left(\frac{5\sqrt{2}}{2}\right)}{2} \Rightarrow \frac{25}{2}$$

Área do hexágono:

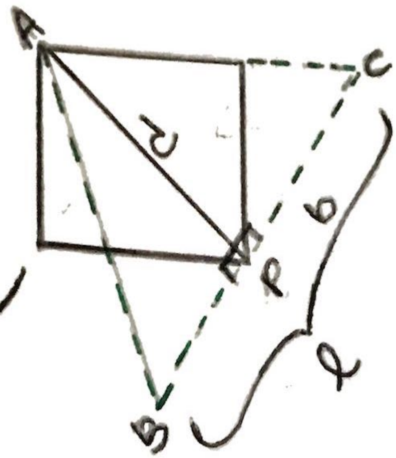
$$A = A\Delta AFE + A\Delta BCD + A\square ABDE$$

$$A = \left(2 \cdot \frac{25}{2}\right) + 25\sqrt{2}$$

$$A = 25 + 25\sqrt{2}$$

$$A = 25(\sqrt{2} + 1)$$

(2)



$$A_\triangle = \frac{l^2\sqrt{3}}{4}$$

$$16\sqrt{3} = \frac{l^2\sqrt{3}}{4}$$

$$4(16\sqrt{3}) = l^2\sqrt{3}$$

$$64\sqrt{3} = l^2\sqrt{3}$$

$$l^2 = \frac{64\cancel{\sqrt{3}}}{\cancel{\sqrt{3}}}$$

$$l = \sqrt{64}$$

$$\Rightarrow l = 8$$

$$A_{APC} = \frac{b \cdot d}{2}$$

$$A_{APC} = \frac{A_{BC}}{2}$$

$$A_{APC} = \frac{16\sqrt{3}}{2}$$

$$A_{APC} = 8\sqrt{3}$$

$$8\sqrt{3} = \frac{b \cdot d}{2}$$

$$b = \frac{l}{2} = \frac{8}{2} = 4$$

$$8\sqrt{3} = \frac{4d}{2} \Rightarrow 16\sqrt{3} = 4d$$

$$d = \frac{16\sqrt{3}}{4}$$

$$d = 4\sqrt{3}$$

$$\Rightarrow d = l\sqrt{2}$$

$$4\sqrt{3} = l\sqrt{2}$$

$$l = \frac{4\sqrt{3}}{\sqrt{2}}$$

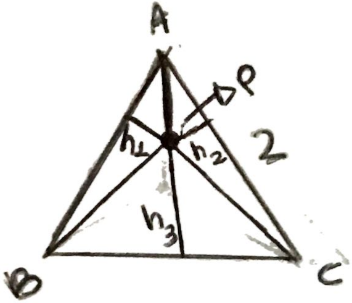
$$l = \frac{4\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4 \cdot 6}{2} = \frac{24}{2} = 12$$

$$A_\square = l^2$$

$$A_\square = 12^2$$

$$\boxed{A_\square = 24\ m^2}$$

③



Os vértices formam:

ΔAPB, ΔBPC e ΔAPC

Área $ABC = \Delta APB + \Delta BPC + \Delta APC$

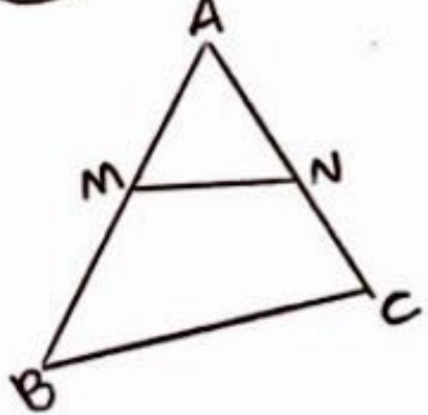
$A_{APB} = \dfrac{2 . h_1}{2}$ $\quad A_{APC} = \dfrac{2h_2}{2}$ $\quad A_{BPC} = \dfrac{2h_3}{2}$

$$\frac{\cancel{2}h_1}{\cancel{2}} + \frac{\cancel{2}h_2}{\cancel{2}} + \frac{\cancel{2}h_3}{\cancel{2}} = APB + APC + BPC$$

$$APB + APC + BPC = A_{ABC} = \sqrt{3}$$

$$h_1 + h_2 + h_3 = \sqrt{3}$$

4.



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

A área de ΔAMN é:

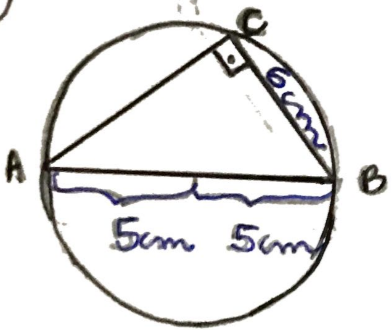
$A_{\Delta MN} = \Delta ABC - \Delta AMN$

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

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

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

5



$$A = \frac{b.h}{2} \Rightarrow A = \frac{BC \cdot AC}{2}$$

$$AB^2 = CB^2 + AC^2$$

$$10^2 = 6^2 + AC^2$$

$$100 = 36 + AC^2$$

$$100 - 36 = AC^2$$

$$64 = AC^2$$

$$AC = \sqrt{64}$$

$$AC = 8$$

$$\Rightarrow A = \frac{6 . 8}{2}$$

$$A = \frac{48}{2}.$$

$$\boxed{A = 24\ cm^2}$$

⑥

$$A_\Delta = \frac{l^2\sqrt{3}}{4} \Rightarrow A_\Delta = \frac{4^2\sqrt{3}}{4} \Rightarrow A_\Delta = \frac{16\sqrt{3}}{4}$$

$$A_\Delta = 4\sqrt{3}\,cm^2$$

$$A^2 = (4\sqrt{3})^2$$

$$A^2 = 16 . 3$$

$$A^2 = 48\ cm^2$$