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Prova 2° Bimestre

1- a) $A = b \cdot h \rightarrow A = 8 \cdot 4 \rightarrow A = 32 \ cm^2$
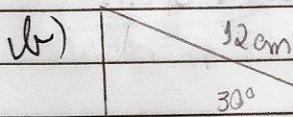
b)

$A = CA \cdot CO$

$A = 6\sqrt{3} \cdot 6$

$Sen \ 30° = \dfrac{CO}{hip} \rightarrow CO = 0,5 \cdot 12 \rightarrow \boxed{CO = 6}$

$\boxed{A = 36\sqrt{3} \ cm^2}$

$Cos \ 30° = \dfrac{CA}{hip} \rightarrow CA = \dfrac{\sqrt{3}}{2} \cdot 12 \rightarrow \boxed{CA = 6\sqrt{3}}$

2- a) $A = l^2 \rightarrow A = 8^2 \rightarrow A = 64 \ cm^2$

b) $A = l^2 \rightarrow A = 7,1^2 \rightarrow A = 50,41 \ cm^2$
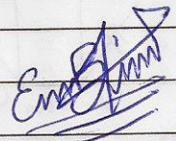
c) $A = l^2 \rightarrow A = \sqrt{3}^2 \rightarrow A = 3 \ cm^2$

d) $A = \dfrac{d^2}{2} \rightarrow A = \dfrac{6^2}{2} \rightarrow A = \dfrac{36}{2} \rightarrow A = 18 \ cm^2$

3- a) $A = l^2 \rightarrow l = \sqrt{A} \rightarrow l = \sqrt{25} \rightarrow l = 5 \ cm$

b) $l = \sqrt{A} \rightarrow l = \sqrt{12} \rightarrow l = \sqrt{2^2 \cdot 3} \rightarrow l = 2\sqrt{3} \ cm$

4- a) $A = \dfrac{D \cdot d}{2} \rightarrow A = \dfrac{8 \cdot 5}{2} \rightarrow A = \dfrac{40}{2} \rightarrow A = 20 \ cm^2$

b)

$l^2 = \left(\dfrac{d}{2}\right)^2 + \left(\dfrac{D}{2}\right)^2 \rightarrow D^2 = 16 \cdot 4 \rightarrow A = \dfrac{8 \cdot 6}{2}$

$25 = 9 + \dfrac{D^2}{4} \qquad D = \sqrt{64}$

$\dfrac{D^2}{4} = 16 \qquad D = 8 \ cm \qquad A = 24 \ cm^2$

$d = 6 \ cm$
$l = 5 \ cm$

c)

$$A = \frac{D \cdot d}{2}$$

$$Sen\ 60° = \frac{d/2}{8} \rightarrow \frac{\sqrt{3}}{2} = \frac{d}{16} \rightarrow d = 8\sqrt{3}$$

$$A = \frac{64\sqrt{3}}{2}$$

$$Cos\ 60° = \frac{D/2}{8} \rightarrow \frac{1}{2} = \frac{D}{16} \rightarrow D = 8$$
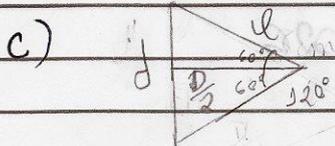
$$A = 32\sqrt{3}\ cm^2$$

5- $A = \frac{(B+b) \cdot h}{2} \rightarrow A = \frac{(7+5)}{2} \cdot 4 \rightarrow A = 24\ cm^2$

6- $A = \left(\frac{P}{4}\right)^2 \rightarrow A = \left(\frac{72}{4}\right)^2 \rightarrow A = 18^2 \rightarrow A = 324\ cm^2$
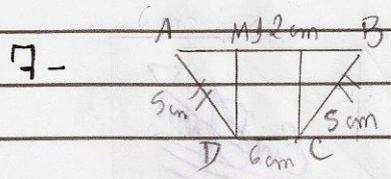
7-

$$A = \frac{(B+b) \cdot h}{2}$$

$$A = \frac{18 \cdot 4}{2}$$

$$A = \frac{18 \cdot 2}{2}$$

$AD^2 = AM^2 + MD^2$

$5^2 = AM^2 + \left(\frac{(12-6)}{2}\right)^2 \rightarrow AM = \sqrt{16}$

$AM^2 = 25 - 9 \qquad AM = 4\ cm$

$AM = h$

$$A = 36\ cm^2$$

8- a)

$A = B \cdot h$

$A = 6 \cdot 4$

$A = 24\ cm^2$

b)
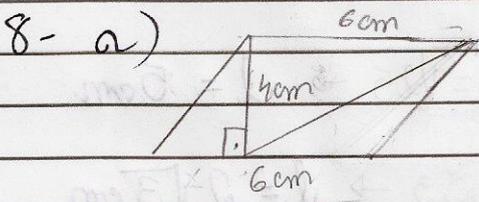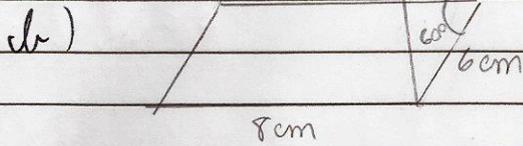

$$Sen60 = \frac{CO}{6} \Rightarrow \frac{\sqrt{3}}{2} \cdot 6 = 3\sqrt{3}$$

$$A = 8 \cdot 3\sqrt{3}$$

$$A = 24\sqrt{3}\,cm^2$$
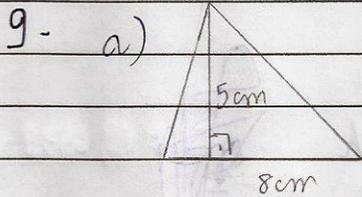
9 - a)

$$A = \frac{B \cdot h}{2} \Rightarrow A = 20\,cm^2$$

$$A = \frac{8 \cdot 5}{2}$$

$$A = 4.5$$

b)

$$13^2 = x^2 + 5^2 \qquad A = \frac{12 \cdot 5}{2}$$

$$B = \sqrt{144}$$

$$B = 12\,cm \qquad A = 30\,cm^2$$

c)
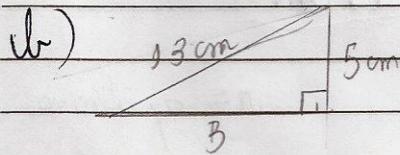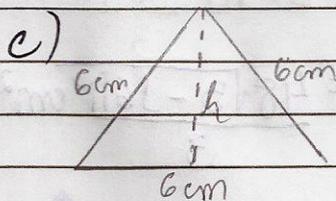
$$6^2 = 3^2 + h^2 \qquad A = \frac{B \cdot h}{2} \Rightarrow A = 3 \cdot 3\sqrt{3}$$

$$h^2 = 36 - 9 \qquad\qquad\qquad A = 9\sqrt{3}\,cm^2$$

$$h = \sqrt{27} \qquad A = \frac{6 \cdot 3\sqrt{3}}{2}$$

$$h = 3\sqrt{3}$$

d)

$$\text{Sen } 45° = \frac{X}{6} \rightarrow X = 3\sqrt{2} \text{ cm}$$

$$\frac{\sqrt{2}}{2} = \frac{X}{6}$$
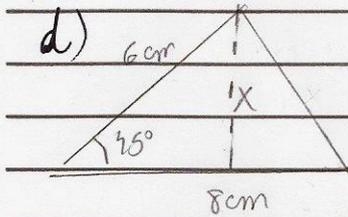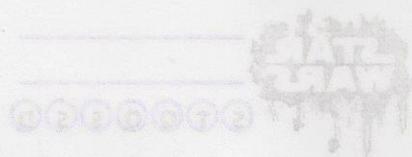
$$A = \frac{B \cdot h}{2} \rightarrow A = \frac{8 \cdot 3\sqrt{2}}{2} \rightarrow A = 12\sqrt{2} \text{ cm}^2$$

10 -
$$A = \frac{B \cdot h}{2} \rightarrow B = \sqrt{900} \rightarrow A = B \cdot h$$
$$450 = \frac{B \cdot B}{2} \quad B = 30 \text{ cm} \quad 450 = 30h$$
$$450 = \frac{B^2}{2} \qquad\qquad h = \frac{450}{30}$$
$$\qquad\qquad\qquad h = 15 \text{ cm}$$
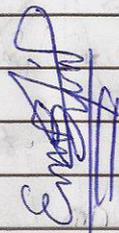
11 -

$$A = B \cdot h \rightarrow A = 25 \cdot 4 \rightarrow A = 100 \text{ cm}^2 \checkmark$$
$$B' = 25 - (25 \cdot 0,1) = 22,5 \text{ cm}$$
$$h' = 4 - (4 \cdot 0,1) = 4,4 \text{ cm}$$
$$A' = 22,5 \cdot 4,4 = 99 \text{ cm}^2$$

12 - a)
$$r = \frac{h}{3} \rightarrow A = \frac{l^2 \sqrt{3}}{4} \qquad r = \text{apótema}$$

$$r = \frac{4\sqrt{3}}{3} \qquad A = \frac{8^2 \cdot \sqrt{3}}{4} \rightarrow A = 16\sqrt{3} - \frac{16\pi}{3}$$

$$A = \pi \left(\frac{4\sqrt{3}}{3}\right)^2 \qquad A = \frac{64 \cdot \sqrt{3}}{4} \qquad A = \frac{48\sqrt{3} - 16\pi}{3} \text{ cm}^2$$

$$A = \frac{\pi \cdot 16 \cdot 3}{9} \qquad A = 16\sqrt{3}$$

$$A = \frac{16\pi}{3}$$

b) $A_R = A_\square - A_O$

$A_B = 100 - \dfrac{100\pi}{4}$

$$\boxed{A = 100 - 25\pi \ cm^2 \ ou \ 25(4-\pi)\ cm^2}$$

$A_\square = l^2 \rightarrow A_\square = 100 \ cm^2$

$A_O = \dfrac{\pi r^2}{4} \rightarrow A_O = \dfrac{100\pi}{4} \ cm^2$

↳ pois é ¼ de um O

c) $\alpha = 180° - 60°$

$\alpha = 120° \rightarrow \dfrac{10}{3}$

$\rightarrow A_R = \dfrac{\pi r^2}{3} \rightarrow A_A = \dfrac{36\pi}{3} \rightarrow A_R = 12\pi \ cm^2$

13 - 20% de 30 = 6 cm

20% de 15 = 3 cm

Área antiga = 450 cm²

Nova largura = 30 - 6 = 24 cm

Novo comprimento = 15 - 3 = 12 cm

Área nova = 288 cm²

$R = \dfrac{A_{antiga} - A_{nova}}{A_{antiga}}$

$R = \dfrac{450 - 288}{450}$

$R = 0,36 \rightarrow 36\%$

∴ Letra C : 36%
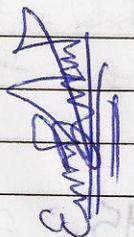
14 - a) $A_{setor \ circular} = \frac{1}{2}\theta r^2$

$\theta rad = \dfrac{\theta \cdot \pi}{180} = \dfrac{135}{180} \cdot \pi = \dfrac{3\pi}{4}$

$A = \frac{1}{2}\left(\dfrac{3\pi}{4}\right)(64) = \dfrac{3\pi}{8}(64) = 24\pi \ cm^2$

$A_\Delta = \frac{1}{2}B h \ ; \ B = 8 \ cm \ ; \ h = 8 sen 135°$

$h = 8 \cdot \dfrac{\sqrt{2}}{2} = 4\sqrt{2} \ cm$

$A = \frac{1}{2}(8)(4\sqrt{2}) = 16\sqrt{2} \ cm^2$

$$A_f = 24\pi - 16\sqrt{2} \ cm^2$$

b)
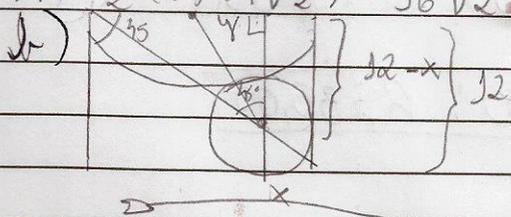
$(12-x)^2 + y^2 = (6+x)^2$

$144 - 24x + x^2 + y^2 = 36 + 12x + x^2$

$y^2 + 108 = 36x$

$y^2 = 36x - 108$

$6 = 12 - y - x$

$y = 6 - x$

$36 - 12 + x^2 = 3(x - 108)$

$x^2 - 48x + 144 = 0$

$x = \dfrac{48 \pm \sqrt{2304 - 576}}{2}$

$x = \dfrac{48 \pm \sqrt{1728}}{2}$

$x = \dfrac{48 \pm 24\sqrt{3}}{2}$

$x = \dfrac{48 + 24\sqrt{3}}{2}$

$x = 24 + 12\sqrt{3}$

$x \approx 44,78 \ cm$

$$X = \frac{48 - 24\sqrt{3}}{2} \rightarrow x \approx 3,21 \, cm \; \checkmark$$

$$\begin{cases} A = \pi r^2 \\ A = 1008\pi - 576\pi\sqrt{3} \end{cases} \rightarrow \boxed{A \approx 32,48 \, cm^2}$$

c)

$$16 = 4 + x^2 - 2x \cos 90° \rightarrow \frac{2\sqrt{3}}{sen\theta} = \frac{4}{sen \, 90°}$$

$$x^2 = 16 - 4$$

$$x = \sqrt{12} = 2\sqrt{3}$$

$$\frac{2\sqrt{3}}{sen\theta} = 4$$

$$sen\theta = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$$

θ em rad $= \frac{2\pi}{3}$
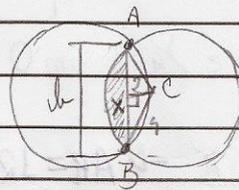
$$\theta = 60° \rightarrow \hat{A}_{setor} = 2\theta = 120°$$

$$A_{setor} = \frac{1}{2}\alpha r^2 \qquad \rightarrow Calculo \; de \; ABC$$

$$A_{setor} = \frac{1}{2}\left(\frac{2\pi}{3}\right)(16) \qquad A_\Delta = \frac{1}{2}Bh \qquad \rightarrow A_{\hat{AB}} = A_{setor} - A_\Delta \qquad \rightarrow A_f = 2A_{\hat{AB}}$$

$$A_{setor} = \frac{16\pi}{3} \qquad A_\Delta = \frac{1}{2}(4\sqrt{3})(2) \qquad A_{\hat{AB}} = \frac{16\pi}{3} - 4\sqrt{3} \qquad A_f = \frac{32\pi - 24\sqrt{3}}{3}$$

$$A_\Delta = 4\sqrt{3} \, cm^2 \qquad A_{\hat{AB}} = \frac{16\pi}{3} - \frac{12\sqrt{3}}{3} \, cm^2 \qquad A_f \approx 19,6539 \, cm^2$$

15 -

$$A_1 = y \cdot 5 \rightarrow 5y \qquad\qquad A_p = A_1 + A_2 \qquad \rightarrow letra \; E$$

$$A_2 = (3-y)x = 3x - xy \qquad \boxed{A_p = 5y + 3x - xy}$$

16 - Cinza: $30 \, m^2$ $A_{cinza} = 1 - 0,25$

Branco: $50 \, m^2$ $A_{cinza} = 0,75 \, m^2$

$$A = \ell^2$$

$$A = 1 \, m^2$$

$$C = 0,75 \cdot 30 + 0,25 \cdot 50$$

$$A = B \cdot \frac{h}{2} \cdot 4 \qquad C = 22,50 + 12,50$$

$h = \frac{1}{2}$

$h = \frac{1}{2}$ $A = \left(\frac{0,25 \cdot 0,5}{2}\right)4 \qquad C = 35,00 \rightarrow R\$ \, 35,00$

$$A = 0,125 \cdot 2$$

$$A = 0,25 \, m^2 \qquad\qquad \boxed{\therefore \; Letra \; B: \; R\$ \, 35,00}$$

17 -

$$b^2 = 1^2 + 1^2 - 2 \cdot \cos 150 \rightarrow A = b^2$$

$$b = \frac{2 + 2\sqrt{3}}{2} \qquad A = (\sqrt{2} + \sqrt{3})^2$$

$$\boxed{A = 2 + \sqrt{3}}$$

$$b^2 = 2 + \sqrt{3}$$
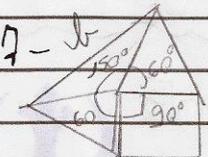
$$b = \sqrt{2 + \sqrt{3}} \qquad\qquad \therefore \; Letra \; C: \; 2 + \sqrt{3}$$

18 - a) AM, BE, CF, DG = 3x → 4x
         AE, BF, CG, HD = x

$$FE, GF, GH, HE = 1,5x^2$$

$$A_{ABCD} = 4x \cdot 4x = 16x^2$$

$$A_{EFGH} = 16x^2 - 4(1,5x^2) = 16x^2 - 6x^2 = 10x^2$$

$$R_f = \frac{A_{EFGH}}{A_{ABCD}} \to R_f = \frac{10x^2}{16x^2} \to R_f = \frac{10}{16}$$

$$\therefore EFGH = \frac{10}{16} ABCD$$

b) $A = \frac{EFGH}{2} \to A = \frac{\frac{10}{16}}{2} \cdot 80 \to A = \frac{10}{16} \cdot 40 \to \boxed{A = 25 \, cm^2}$

19 - a) $(10-2)^2 + 2^2 = \ell^2$ $A = \ell^2$

$\quad\quad 8^2 + 4 = \ell^2$ $A = \left(\sqrt{68}\right)^2$

$\quad\quad \ell = \sqrt{68}$ $\mathbf{A = 68 \, m^2}$

b) $A = \frac{(10-x)x}{2} \to A = 100 - 20x + 2x^2$

$\quad\quad A = 100 - \frac{4(10-x)x}{2}$ $A = 2x^2 - 20x + 100 \, m^2$

c) $P_{TOTAL} = P_{CANTEIRO} + P_{CALÇADA} = 4(2x^2 - 20x + 100) + 3(20x - 2x^2) \to$

$\to 8x^2 - 80x + 400 + 60x - 6x^2 \to 2x^2 - 20x + 400$

$\Delta = 400 - 3200 = -2800$

$P_{min} = \frac{-\Delta}{4a} = \frac{2800}{8} = 350$ $\therefore R\$ 350,00$

20- $A = (24 + 18 + 8)^2$ → ∴ Letra D : 100 cm²
$A = 100$ cm²

21- a) $A_{ABC} = \frac{1}{2} BD h - A_{ABD}$ — BD // CE logo, base, altura e área
$A_{ADE} = \frac{1}{2} BD h - A_{ABD}$ / são iguais
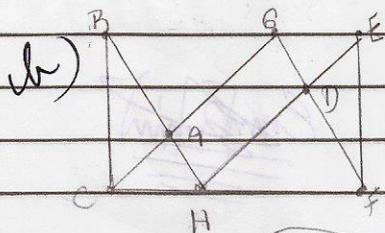
b)

$A_{ABC} = \frac{1}{2} CH h - A_{ACH}$
$A_{AGH} = \frac{1}{2} CH h - A_{ACH}$
∴ $A_{ABC} = A_{AGH}$

$A_{DEF} = \frac{1}{2} EGH - A_{DEG}$ → $A_{AGDH} = A_{ABC} + A_{DEF}$
$A_{DGH} = \frac{1}{2} EGH - A_{DEG}$ $A_{AGDH} = 5 + 4$
∴ $A_{DGH} = A_{DEF}$ $A_{AGDH} = 9$ cm²
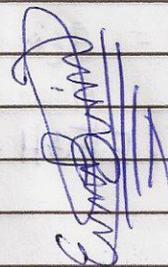
22- $A_T = \dfrac{160 . 120 - 50 . 60}{2}$ → $A_T = 16200$ → $A_T = 8100$ m²

$A_{ABCP} = 8100$
$\dfrac{(AP + 50) 100}{2} = 8100$ → $50 AP + 2500 = 8100$ → $AP = 112$
$50 AP = 5600$ $\Delta S = 120 - 112 = 8$ m

∴ Letra B : 8 m
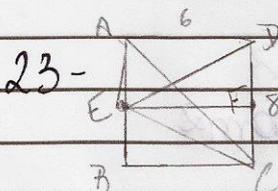
23-

$A_{AEC} = A_{ADCE} - A_{ACD} = A_{ADFE} + A_{CEF} - A_{ACD}$
$A_{AEC} = A_{ADCE} - A_{ACD} = \dfrac{(B + h) 4}{2} + \dfrac{4 . 4\sqrt{3}}{2} - \dfrac{6.8}{2}$

$A_{AEC} = A_{ADCG} - A_{ACD} = (12 + 8\sqrt{3}) + (8\sqrt{3}) - (24)$
$A_{AEC} = A_{ADCG} - A_{ACD} = 12 + 16\sqrt{3} - 24$
$A_{AEC} = A_{ADCG} - A_{ACD} = 16\sqrt{3} - 12$
$A_{AEC} = 16\sqrt{3} - 12$
$A_{AEC} = 4(4\sqrt{3} - 3)$

24 -
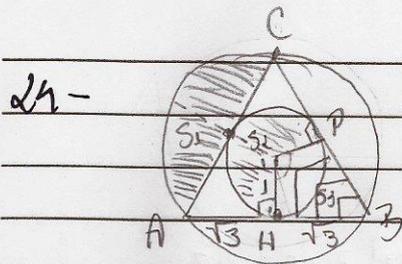
$\triangle ABC$ é equilátero

$$S_T = S_1 + S_2 + S_3$$

Cálculo S_1	Cálculo S_2	Cálculo S_3

$$S_1 = S_0 - \frac{S_{ABC}}{3}$$

$$S_2 = \frac{\pi \cdot 1^2 \cdot 2}{3}$$

$$S_3 = \frac{1\sqrt{3} \cdot 2}{2}$$

$$S_1 = \frac{\pi \cdot 2^2 - \frac{(2\sqrt{3})^2 \sqrt{3}}{4}}{3}$$

$$S_2 = \frac{2\pi}{3}$$

$$S_3 = \sqrt{3}$$

$$S_1 = \frac{4\pi - \sqrt{3}}{3}$$

$$S_T = \frac{4\pi - \sqrt{3}}{3} + \frac{2\pi + \sqrt{3}}{3}$$

$$S_0 = 2\pi r$$

$$S_T = \frac{6\pi}{3} \to S_T = 2\pi$$

$$S_0 = 2\pi \cdot 1$$

$$S_0 = 2\pi$$

$$S_0 = S_T \to 2\pi = 2\pi \quad \therefore \text{ letra A}$$

25 -
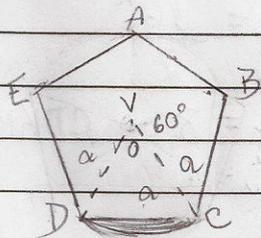
DOC é uma parte de uma circunferencia ÷ em 6.
DVC forma um $\triangle$ equilatero.

$$S_P = 5 \cdot (A_{DOC} - A_{DVC})$$

$$S_P = 5 \left(\frac{60°}{360°} \pi a^2 - \frac{a^2 \sqrt{3}}{4} \right) \to \boxed{S_P = \frac{5a^2}{2} \left(\frac{\pi}{3} - \frac{\sqrt{3}}{4} \right)}$$

$$S_P = 5 \left(\frac{\pi a^2}{6} - \frac{a^2 \sqrt{3}}{4} \right)$$

26 -
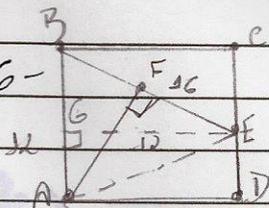
$$A_{ABE} \to \frac{AB \cdot GE}{2} = \frac{BE \cdot AF}{2} \to \frac{3 \cdot 3}{2} = AF$$

$$AF = 9$$

$$\frac{12 \cdot 12}{2} = \frac{16 \, AF}{2}$$

$$6 \cdot 12 = 8 \, AF$$

$$(3 \cdot 2) \cdot (4 \cdot 3) = 4 \cdot 2 \, AF$$

27-   Proporções

FH = GE ;

HO = FO - FH = OE - GE = OG

Área do semicírculo de diametro HO é igual a de OG
‖   ‖   ‖ FG e HO ‖   ‖ GO e HE

Com isso podemos visualizar a figura da seguinte forma

Logo, devemos calcular a área do semicírculo de diametro FE. Como FE vale 4, seu raio vale 2:

$$A = \frac{2^2 \pi}{2} \rightarrow A = \frac{4\pi}{2} \rightarrow A = 2\pi$$

28-
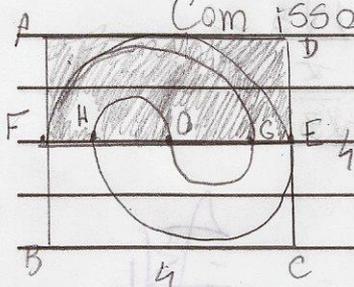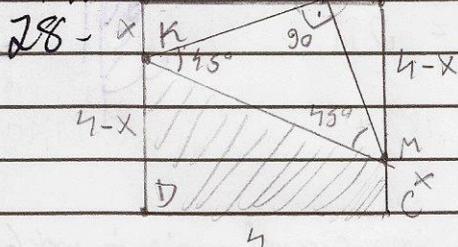
ABMK = CDKM , então

ABCD = ABMK + CDKM

chamando ABMK + CDKM de $2y$:

$2y = ABCD \rightarrow y = \frac{16}{2}$

$y = \frac{4^2}{2}$

$y = 8 \rightarrow CDKM = 8$

∴ Letra B : 8

Justificativa:
↓

Se o △ é isósceles então:

KL = LM, logo o ângulo de BLM = ao de LKA,

configurando uma congruência por LAA, tendo

suas áreas iguais. Nota-se a presença

de dois trapézios (ABMK e CDKM) com áreas

(Considere: LB = MC = AK = x e AL = KD = BM = 4-x)

$ABMK \rightarrow \frac{[(4-x)-x].4}{2} = 16$

$CDKM \rightarrow \frac{[(4-x)+x].4}{2} = 16$

∴ ABMK = CDKM