

PROBLEME - TEOREMA LUI PITAGORA
SI RECIPROCA

8/71. $\Delta ABC =$ dreptunghic ? cu $m(\hat{BAC}) = 90^\circ$

a) $AB = 6\text{ cm}$
 $AC = 8\text{ cm}$
 $BC = 10\text{ cm}$

In ΔABC : $AB^2 = 6^2 = 36$
 $AC^2 = 8^2 = 64$
 $BC^2 = 10^2 = 100$ } \Rightarrow

$\Rightarrow AB^2 + AC^2 = BC^2 \xrightarrow{\text{R.T.P.}} \Delta ABC$ este dreptunghic cu $m(\hat{BAC}) = 90^\circ$

9/71. $\Delta ABC =$ dreptunghic cu $m(\hat{BAC}) = 90^\circ$?

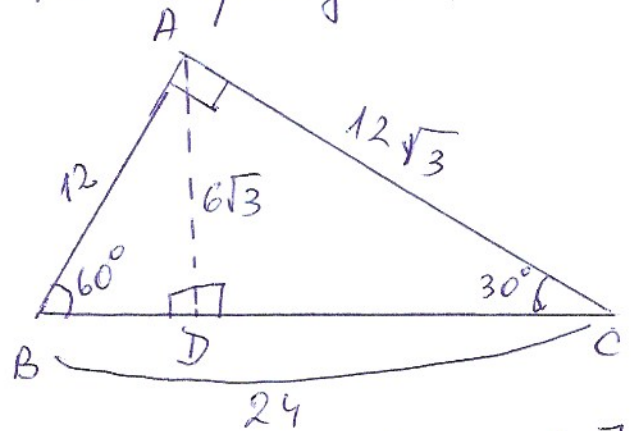
a) $AB = 12\text{ cm}$
 $AC = 16\text{ cm}$
 $BC = 24\text{ cm}$

In ΔABC : $AB^2 = 12^2 = 144$
 $AC^2 = 16^2 = 256$
 $BC^2 = 24^2 = 576$ } \Rightarrow

$\Rightarrow AB^2 + AC^2 = 144 + 256 = 400 \neq 576 \Rightarrow$

$\Rightarrow \Delta ABC$ nu este dreptunghic.

10/71 Ip:
 ΔABC - dr.
 $m(\hat{A}) = 90^\circ$
 $AB = 12\text{ cm}$
 $m(\hat{B}) = 60^\circ$



Cl: $AC, BC, AD = ?$

$AD \perp BC$

Dem:

In ΔABC : $m(\hat{C}) = 180^\circ - [m(\hat{A}) + m(\hat{B})] =$
 $= 180^\circ - (90^\circ + 60^\circ) =$
 $= 180^\circ - 150^\circ = 30^\circ \Rightarrow AB = \frac{BC}{2} \Rightarrow$

$\Rightarrow BC = 2 \cdot AB = 2 \cdot 12 = 24\text{ cm}$

$$\text{T.P.} \Rightarrow AC^2 = BC^2 - AB^2$$

$$AC^2 = 24^2 - 12^2$$

$$AC^2 = 12^2(2^2 - 1^2)$$

$$AC^2 = 12^2 \cdot 3 \Rightarrow AC = \sqrt{12^2 \cdot 3} = 12\sqrt{3} \text{ cm}$$

$$\text{In } \triangle ABC, \left. \begin{array}{l} m(\hat{D}) = 90^\circ \\ m(\hat{C}) = 30^\circ \end{array} \right\} \Rightarrow AD = \frac{AC}{2} = \frac{12\sqrt{3}}{2} = 6\sqrt{3} \text{ cm}$$

13/71 J.P.:

$\triangle ABC$ - echil

$$h = 6\sqrt{3} \text{ cm}$$

Cl.: $l = ?$

Dem.:

$$\text{Din } \triangle ABC \text{ - echil.} \Rightarrow \left. \begin{array}{l} AB = BC = AC = l \\ AD = \text{mediana} \end{array} \right\} \Rightarrow$$

$$\Rightarrow BD = DC = \frac{l}{2}$$

$$\text{In } \triangle ADC, \text{ m}(\hat{D}) = 90^\circ \text{ T.P.} \Rightarrow AD^2 = AC^2 - DC^2$$

$$AD^2 = l^2 - \left(\frac{l}{2}\right)^2$$

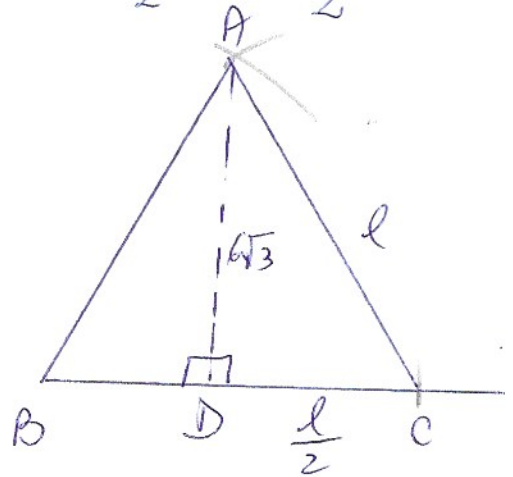
$$AD^2 = \frac{4}{4}l^2 - \frac{l^2}{4}$$

$$AD^2 = \frac{4l^2 - l^2}{4}$$

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

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

$$l\sqrt{3} = 12\sqrt{3} \Rightarrow \boxed{l = 12 \text{ cm}}$$



$$\boxed{h_{\triangle \text{ echil.}} = \frac{l\sqrt{3}}{2}}$$

14/71

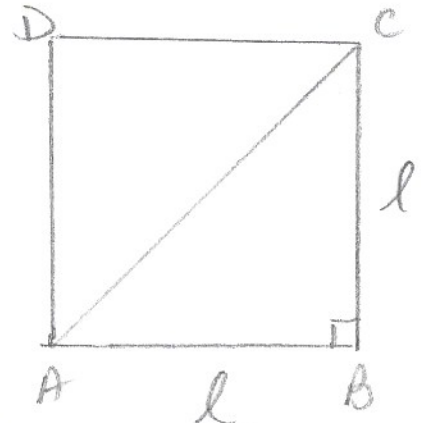
Ip:

ABCD = pătrat

$d = 12\sqrt{6} \text{ cm}$

Cl: P = ?

Dem:



In ΔABC , $m(\hat{B}) = 90^\circ \stackrel{TP}{\Rightarrow} AC^2 = AB^2 + BC^2$

$AC^2 = l^2 + l^2$

$AC^2 = 2l^2 \Rightarrow AC = \sqrt{2}l^2$

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

$\Rightarrow l\sqrt{2} = 12\sqrt{6} \Rightarrow l = \frac{12\sqrt{6}}{\sqrt{2}}$

$l = 12\sqrt{3} \text{ cm}$

$P = 4 \cdot l = 4 \cdot 12\sqrt{3} = 48\sqrt{3} \text{ cm}$

$d_{\text{pătrat}} = l\sqrt{2}$

15/71

Ip:

ABCD - dreptunghi

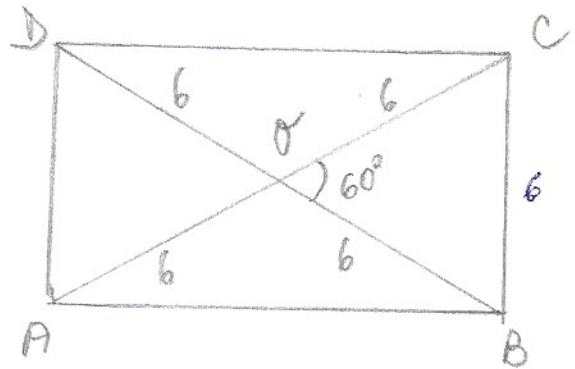
$d = 12 \text{ cm}$

$m(\hat{d}_1, \hat{d}_2) = 60^\circ$

Dem:

Cl: L, l = ?

Din ABCD - dreptunghi } $\Rightarrow AC \cap BD = \{O\}$



$\Rightarrow AO = BO = CO = DO = \frac{12}{2} = 6 \text{ cm}$

Din ΔOBC - isoscel } $\Rightarrow \Delta OBC = \text{echilateral} \Rightarrow$
 $m(\hat{O}) = 60^\circ$
 $\Rightarrow \boxed{BC = 6 \text{ cm}}$

In ΔABC , $m(\hat{B}) = 90^\circ \stackrel{TP}{\Rightarrow} AB^2 = AC^2 - BC^2$

$AB^2 = 12^2 - 6^2$

$AB = 6^2 \cdot (2^2 - 1^2) = 6^2 \cdot 3 \Rightarrow \boxed{AB = 6\sqrt{3} \text{ cm}}$

17/71. Ip:

ΔABC

$AB = AC = 40 \text{ cm}$

$BC = 48 \text{ cm}$

$h_{\Delta} = ?$

Dem:

Dim ΔABC - is.

$AD = h$

$\Rightarrow AD = \text{mediana} \Rightarrow$

$BD = DC = \frac{BC}{2} = \frac{48}{2} = 24 \text{ cm}$

In ΔADC , $m(\hat{D}) = 90^\circ \text{ T.P.} \Rightarrow AD^2 = AC^2 - DC^2$

$AD^2 = 40^2 - 24^2$

$AD^2 = 8^2 \cdot (5^2 - 3^2)$

$AD^2 = 8^2 \cdot 4^2$

Fie $BE \perp AC$

$AD = \sqrt{8^2 \cdot 4^2} = 8 \cdot 4 = \boxed{32 \text{ cm}}$

$A_{\Delta ABC} = \frac{BC \cdot AD}{2}$

$= \frac{AC \cdot BE}{2}$

$\Rightarrow BC \cdot AD = AC \cdot BE \Rightarrow$

\Rightarrow într-un Δ : $b_1 \cdot h_1 = b_2 \cdot h_2 = b_3 \cdot h_3$

$48 \cdot 32 = 40 \cdot BE$

$BE = \frac{48 \cdot 32}{40} = \frac{384}{10} = 38,4 \text{ cm}$

Dim ΔABC - is. cu $AB = AC$

$\Rightarrow \boxed{BE = CF = 38,4 \text{ cm}}$

15/71) ΔABC = dr. cu $m(\hat{BAC}) = 90^\circ$,

a) $AB = 6\sqrt{3} \text{ cm}$, $AC = 6\sqrt{6} \text{ cm}$, $BC = 18 \text{ cm}$

R: In ΔABC : $AB^2 = (6\sqrt{3})^2 = 36 \cdot 3$

$AC^2 = (6\sqrt{6})^2 = 36 \cdot 6$

$BC^2 = (6 \cdot 3)^2 = 36 \cdot 9$

$\Rightarrow AB^2 + AC^2 = BC^2 \Rightarrow$
 ΔABC - dr. cu $m(\hat{A}) = 90^\circ$

TEMA: cul pag 71
cu: 8bc, 9b, 11, 12,
19bcd.

