

PROBLEME - Notii trigonometrice (1)19/85  $\nabla$ :

$$\Delta ABC, m(\hat{A}) = 90^\circ$$

$$m(\hat{B}) = 60^\circ$$

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

$$AD \perp BC$$

 $\{BE - \text{bis. } \Delta ABC$ 

$$E \in (AC)$$

$$Q: P_{\Delta ABC} = ?$$

$$AD, BE = ?$$

$$\text{TP} \Rightarrow AB^2 = BC^2 - AC^2$$

$$AB^2 = 12^2 - (6\sqrt{3})^2$$

$$= 12^2 - 6^2 \cdot 3$$

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

$$AD = h_{\Delta dr} = \frac{c_1 \cdot c_2}{i_p} = \frac{AB \cdot AC}{BC} = \frac{6 \cdot 6\sqrt{3}}{12} = 3\sqrt{3} \text{ cm}$$

Din  $\{BE = \text{bis. } \Delta B \} \Rightarrow$  T. bis

$$\frac{AE}{EC} = \frac{AB}{BC} \Rightarrow \frac{AE}{12} = \frac{6}{12} \Rightarrow AE = 6$$

$$\text{In } \Delta ABE, m(\hat{B}) = 90^\circ$$

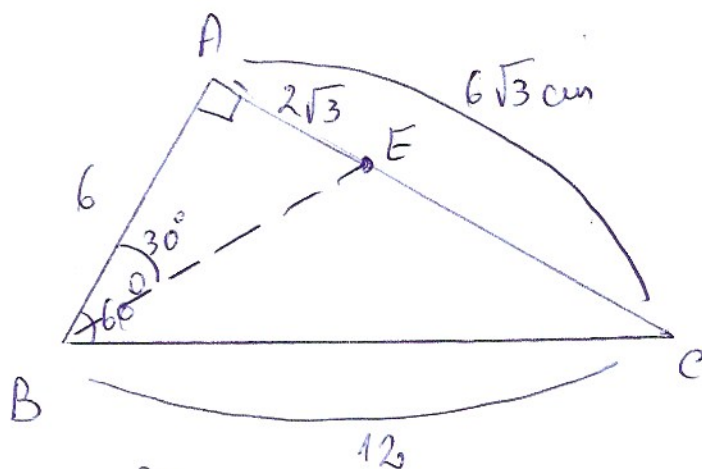
$$m(\hat{ABE}) = 30^\circ$$

$$\Rightarrow AE = \frac{BE}{2} \Rightarrow BE = 2 \cdot 2\sqrt{3}$$

$$\boxed{BE = 4\sqrt{3} \text{ cm}}$$

$$\frac{AE}{AE+EC} = \frac{1}{1+2} \Rightarrow \frac{AE}{6\sqrt{3}} = \frac{1}{3}$$

$$\Rightarrow AE = \frac{6\sqrt{3}}{3} = 2\sqrt{3} \text{ cm} \Rightarrow EC = 4\sqrt{3} \text{ cm}$$

Dem:

$$\text{In } \Delta ABC, m(\hat{A}) = 90^\circ \Rightarrow \sin B = \frac{AC}{BC}$$

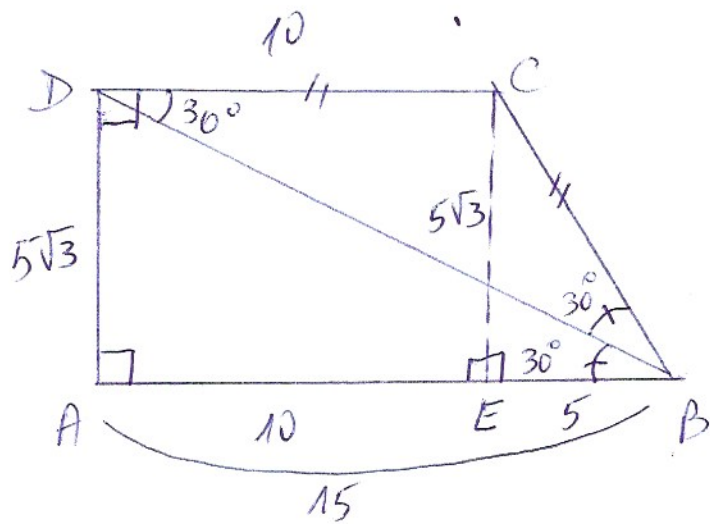
$$\sin 60^\circ = \frac{6\sqrt{3}}{BC}$$

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

$$\boxed{BC = 12 \text{ cm}}$$

39/87 7p:

ABCD - tr. dr.  
 $AB \parallel CD$   
 $AB > CD$   
 $m(\hat{A}) = m(\hat{D}) = 90^\circ$   
 $BD = \text{bis. } \angle ABC$   
 $AB = 15 \text{ cm}$   
 $m(\hat{ABC}) = 60^\circ$   
Ql:  $P_{ABCD} = ?$



Dem:

În  $\triangle BDC - \text{bis. } \angle B \Rightarrow m(\hat{ABD}) = m(\hat{CBD}) = 30^\circ$

În  $\triangle DAB, m(\hat{A}) = 90^\circ$   
 $m(\hat{ABD}) = 30^\circ \Rightarrow \text{tg } \angle ABD = \frac{c \cdot \text{op}}{c \cdot \text{al}} \Rightarrow \text{tg } 30^\circ = \frac{AD}{AB}$

În  $AB \parallel CD$   
 $BD - \text{secantă} \Rightarrow \Rightarrow AD = \frac{\frac{\sqrt{3}}{15}}{\frac{1}{\sqrt{3}}} = \frac{15\sqrt{3}}{3} = 5\sqrt{3} \text{ cm}$

$\Rightarrow \angle ABD \equiv \angle BDC$  (alt. int.)

$\Rightarrow m(\hat{BDC}) = 30^\circ \Rightarrow \triangle DCB - \text{is.} \Rightarrow DC = CB$

Fie  $CE \perp AB \Rightarrow \triangle CEB - \text{dr.} \Rightarrow \text{tg } \angle CBE = \frac{CE}{EB}$

În  $\triangle CEB, m(\hat{E}) = 90^\circ \text{ T.P.} \Rightarrow \boxed{CB = 10 \text{ cm}} \quad \text{tg } 60^\circ = \frac{5\sqrt{3}}{EB}$

$\frac{\sqrt{3}}{1} = \frac{5\sqrt{3}}{EB} \Rightarrow EB = \frac{5\sqrt{3}}{\sqrt{3}} = 5$

$P_{ABCD} = 15 + 10 \cdot 2 + 5\sqrt{3} = 35 + 5\sqrt{3} = 5(7 + \sqrt{3}) \text{ cm}$

$\Rightarrow AE = 15 - 5 = 10 \text{ cm} \Rightarrow$   
 $\Rightarrow DC = 10 \text{ cm}$

44/87)

Pr:

ABCD - tr. is.

AB || CD

AB > CD

[AD] ≡ [BC]

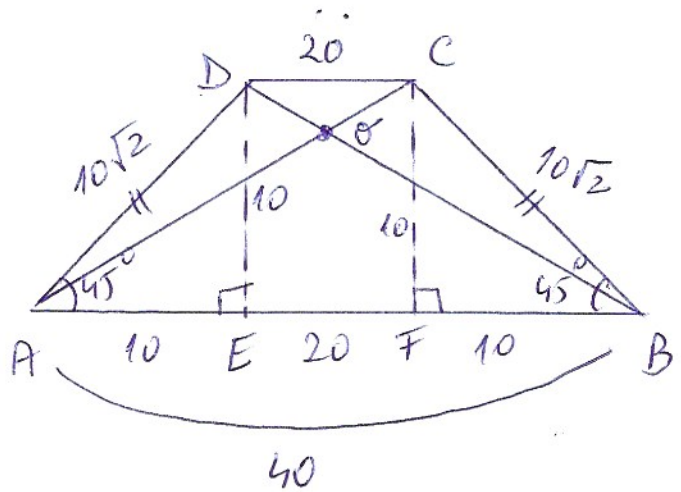
AD = 10√2 cm

m(∠A) = 45°

AB = 40 cm

Cl: CD, diag = ?

AC ∩ BD = {O} ⇒ AO, BO, CO, DO = ?



Dem:

Dim ABCD - tr. is. ⇒ m(∠B) = m(∠A) = 45°

Fi DE, CF ⊥ AB ⇒ AE = FB

In ΔAED, m(∠E) = 90°  
m(∠A) = 45° } ⇒ m(∠ADE) = 45° ⇒ ΔAED - is.  
⇒ AE = DE

$$\Rightarrow \sin \angle DAE = \frac{DE}{AD} \Rightarrow \sin 45^\circ = \frac{DE}{10\sqrt{2}}$$

$$\frac{\sqrt{2}}{2} = \frac{DE}{10\sqrt{2}} \Rightarrow$$

$$\Rightarrow DE = \frac{10\sqrt{2} \cdot \sqrt{2}}{2} = 10 \Rightarrow AE = FB = 10 \text{ cm}$$

$$\Rightarrow EF = 20 \text{ cm}$$

$$\Rightarrow DC = 20 \text{ cm}$$

In ΔAFC, m(∠F) = 90°  
FP) AC² = AF² + FC²  
AC² = 30² + 10²  
= 10² · (3² + 1²)  
= 10² · 10 ⇒

$$\Rightarrow AC = 10\sqrt{10} \text{ cm} \Rightarrow BD = 10\sqrt{10} \text{ cm}$$

Dim ΔDOC ≡ ΔBOA (op. la. of.) } V.V. ⇒ ΔDOC ~ ΔBOA  
∠OCB ≡ ∠OAB (alt. int.) }  
↓

$$\frac{DO}{BO} = \frac{OC}{OA} = \frac{DC}{BA}$$

$$\left\{ \frac{DO}{OB} = \frac{OC}{OA} = \frac{20}{40} = \frac{1}{2} \right\}$$

$$\frac{DO}{DO+OB} = \frac{OC}{OC+OA} = \frac{1}{1+2}$$

$$\frac{DO}{DB} = \frac{OC}{AC} = \frac{1}{3} \Rightarrow \frac{DO}{10\sqrt{10}} = \frac{OC}{10\sqrt{10}} = \frac{1}{3} \Rightarrow \boxed{DO = OC = \frac{10\sqrt{10}}{3} \text{ cm}}$$

$$OB = \frac{3}{10\sqrt{10}} - \frac{10\sqrt{10}}{3}$$

$$OB = \frac{30\sqrt{10} - 10\sqrt{10}}{3}$$

$$OB = \frac{20\sqrt{10}}{3} \Rightarrow \boxed{OA = \frac{20\sqrt{10}}{3} \text{ cm}}$$

TEMĂ

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