

Lecția 2: Determinarea planului

6/117 ABCD trapez, $AB \parallel CD$, $BC \subset \alpha$, $AD \cap \alpha = \{M\}$

a) M, B, C coliniare; b) $AB = 24 \text{ cm}$, $DC = 18 \text{ cm}$, $BC = 15 \text{ cm}$, $AD = 12 \text{ cm}$

Soluție: a) $(ABC) \cap \alpha = BC$

$M \in AD \subset (ABC) \Rightarrow M \in \alpha \Rightarrow M \in BC \Rightarrow M, B, C$ coliniare

b) $CD \parallel AB \Rightarrow \triangle MDC \sim \triangle MAB$

$$\frac{MD}{MA} = \frac{MC}{MB} = \frac{CD}{AB} \Rightarrow \frac{CD}{AB} = \frac{18}{24} \Rightarrow \frac{CD}{AB} = \frac{3}{4}$$

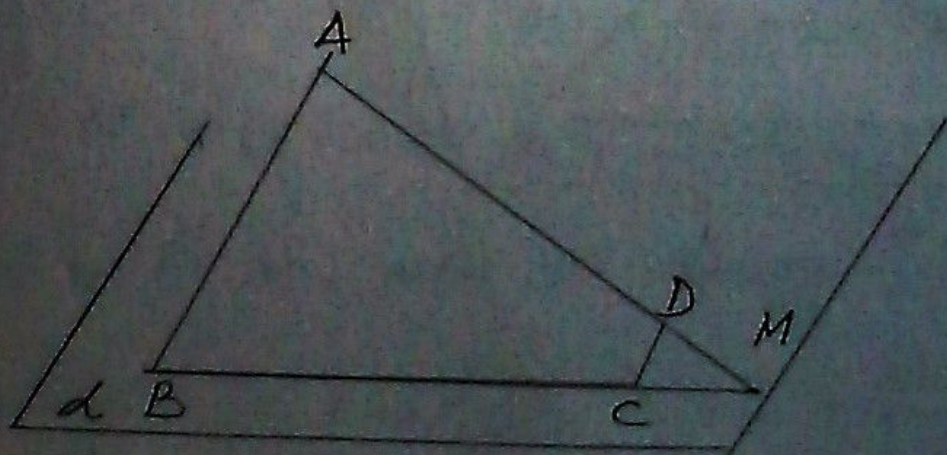
$$\Rightarrow \frac{MD}{AD} = \frac{3}{1} \Rightarrow MD = 3AD \Rightarrow MD = 3 \cdot 12 \Rightarrow MD = 36 \text{ cm}$$

$$\frac{MC}{BC} = \frac{3}{1} \Rightarrow MC = 3BC \Rightarrow MC = 3 \cdot 15 \Rightarrow MC = 45 \text{ cm}$$

$$MA = AD + MD = 12 + 36 = 48 \text{ cm}$$

$$MB = MC + CB = 45 + 15 = 60 \text{ cm}$$

$$P_{MAB} = MA + MB + AB = 48 + 60 + 24 = 132 \text{ cm} \quad \square$$



7/117 $\triangle ABC: AB=24\text{cm}, AC=32\text{cm}, BC=40\text{cm}$

$$AB^2 + AC^2 = BC^2; 576 + 1024 = 1600 = 40^2$$

$\Rightarrow \triangle ABC$ dreptunghic in A

a) P, B, C coliniare

$$EF \cap \alpha = \{P\}, P \in EF \subset (ABC)$$

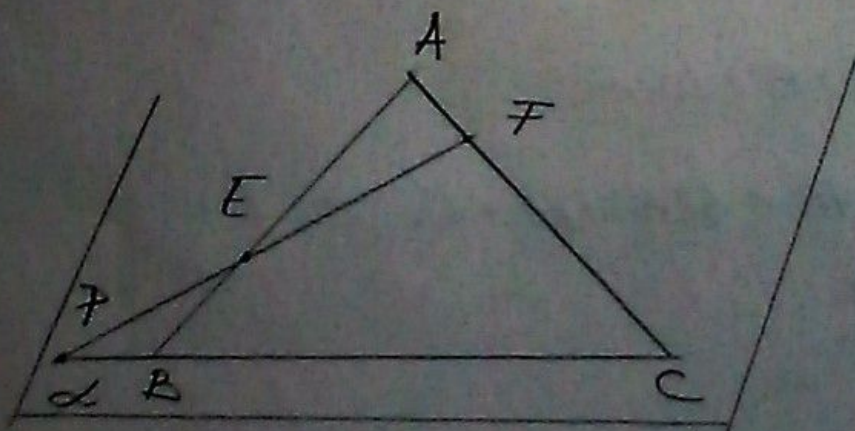
$$P \in \alpha, (ABC) \cap \alpha = BC \Rightarrow P \in BC$$

$\Rightarrow P, B, C$ coliniare

b) $P_{BEFC} = BE + EF + FC + BC$

$$AE = 8\text{cm}, AF = 6\text{cm} \Rightarrow EF = 10\text{cm}$$

$$P_{BEFC} = (24 - 8) + (32 - 6) + 10 + 40 = 92\text{cm}$$



9/117 ABCD trapez dreptunghic, $AD \perp \alpha$

a) $BC \cap \alpha = \{M\} \Rightarrow M \in AD$; b) \hat{A}_{MAB} ; $AB = 30 \text{ cm}$, $DC = 15 \text{ cm}$, $m(\angle B) = 60^\circ$

Soluție:

a) $M \in BC \subset (ABC)$, $(ABC) \cap \alpha = AD \Rightarrow M \in AD$
 $M \in \alpha$

b) $CD \parallel AB$: $\Delta MCD \sim \Delta MBA$

$$\frac{CD}{AB} = \frac{MC}{MB} = \frac{MD}{AD}; \quad \frac{CD}{AB} = \frac{15}{30} \Rightarrow \frac{CD}{AB} = \frac{1}{2}$$

$$\frac{MC}{MB} = \frac{1}{2} \Rightarrow C \text{ este mijlocul lui } MB$$

$$\Rightarrow BC = CM$$

$CE \perp AB$: ΔBCE dreptunghic în E

$$BE = 15 \text{ cm} \quad \begin{matrix} \text{în } 30^\circ \\ \Rightarrow \end{matrix} \quad BC = 2BE \Rightarrow BC = 30 \text{ cm}$$
$$m(\angle C) = 30^\circ$$

$$BC^2 = BE^2 + CE^2 \Rightarrow CE^2 = BC^2 - BE^2 \Rightarrow CE^2 = 900 - 225$$

$$CE^2 = 675 \Rightarrow CE = \sqrt{675} \Rightarrow CE = 15\sqrt{3} \text{ cm}$$

$$\Rightarrow AD = 15\sqrt{3} \text{ cm} \Rightarrow AM = 2AD \Rightarrow AM = 30\sqrt{3} \text{ cm}$$

$$\Delta MAB \text{ dreptunghic în } A \Rightarrow \hat{A}_{MAB} = \frac{C_1 C_2}{2} = \frac{30 \cdot 30\sqrt{3}}{2} = 450\sqrt{3} \text{ cm}^2$$

