

Clasa a 8-a

Problema 1

Soluție Avans

$$(a-2)^2 + (3b-4)^2 = 4 \quad \dots \quad 2 \text{ puncte}$$

$$\Downarrow$$

$$|a-2| \leq 2 \quad \dots \quad 1 \text{ punct}$$

$$|3b-4| \leq 2 \quad \dots \quad 1 \text{ punct}$$

$$\Downarrow$$

$$0 \leq a \leq 4 \quad \dots \quad 1 \text{ punct}$$

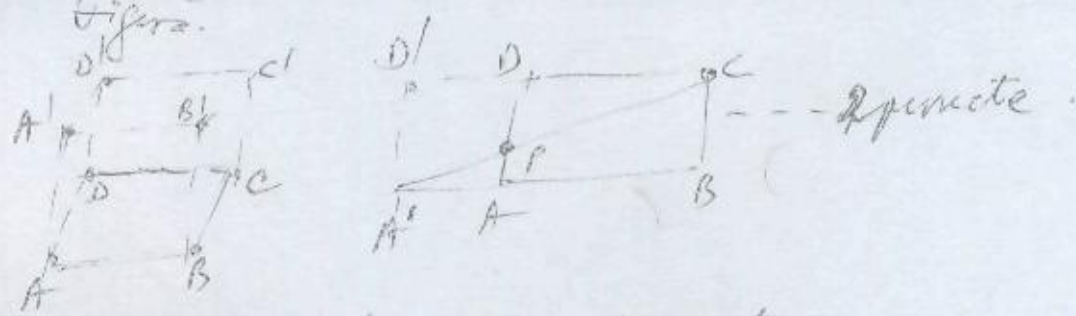
$$\frac{2}{3} \leq b \leq 2 \quad \dots \quad 1 \text{ punct}$$

$$\text{Finalizare} \quad \dots \quad 1 \text{ punct}$$

~~3 puncte~~

Problema 2.

Figura.



$$CP = 15 \text{ cm}, A'P = 5 \text{ cm} \quad \dots \quad 2 \text{ puncte}$$

$$AA' = 4 \text{ cm} \quad \dots \quad 1 \text{ punct}, \Delta A'AP \sim \Delta A'BC \Rightarrow AB = 12 \text{ cm}, BC = 12 \text{ cm}$$

\dots \dots \dots 1 punct

$$V = 576 \text{ cm}^3 \quad \dots \quad 1 \text{ punct}$$

Problema 3

Soluție. Rădicând la pătrat relația din enunț

obținem: $\overline{abc} = \overline{ab}^2 - 2\overline{ab}\sqrt{c} + c \quad \dots \quad 1 \text{ punct}$

$$\Rightarrow 100a + 10b + c = \overline{ab}(\overline{ab} - 2\sqrt{c}) + c \Rightarrow 10(10a + b) = \overline{ab}(\overline{ab} - 2\sqrt{c})$$

$$\Rightarrow 10 \cdot \overline{ab} = \overline{ab} \cdot (\overline{ab} - \sqrt{c}) \Rightarrow \sqrt{c} = \frac{\overline{ab} - 10}{2} \in \mathbb{Q} \quad \dots \quad 3 \text{ puncte}$$

$$\Rightarrow \sqrt{c} \in \mathbb{N} \Rightarrow \sqrt{c} \in \{0, 1, 2, 3\} \text{ deoarece } c \text{ este cifra} \quad \dots \quad 2 \text{ puncte}$$

$$\text{Pentru } c = 0 \Rightarrow \overline{ab} = 10, c = 1 \Rightarrow \overline{ab} = 12, c = 4 \Rightarrow \overline{ab} = 14,$$

$$c = 9 \Rightarrow \overline{ab} = 16$$

Numerele care dau soluția problemei sunt: 100, 121, 144.