

Dualitate

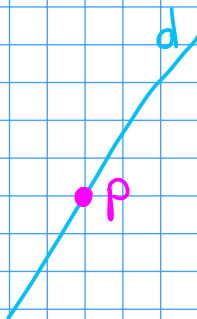
Fie $*$ o funcție bijectivă de la \mathbb{R}^2 la \mathbb{R}^2 , a.s. $*(x, y) = (x, -y)$
 $I^* = I^{-1} \Rightarrow *(*(a)) = a$

$P = \begin{pmatrix} a \\ b \end{pmatrix}$ P^* va fi o dreaptă coadunată la $*(P)$

$P = \begin{pmatrix} a \\ b \end{pmatrix} \Rightarrow P^*: y = ax - b$

$d: y = ax + b \Rightarrow d^* = \begin{pmatrix} a \\ -b \end{pmatrix}$

$P^{**} = P$



$d: y = ax + b$

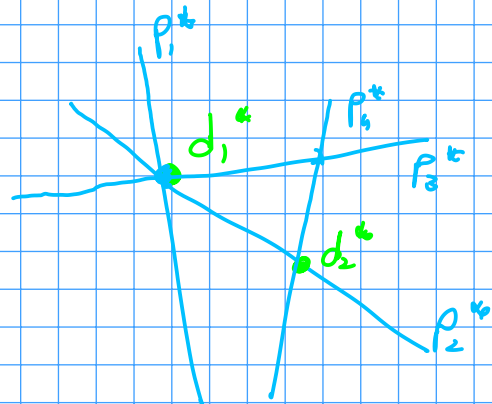
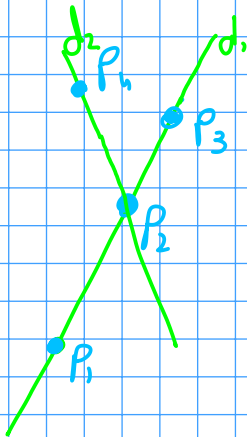
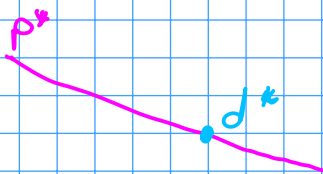
$P = \begin{pmatrix} \alpha \\ \beta \end{pmatrix}$

$P^*: y = \alpha x - \beta$

$d^* = \begin{pmatrix} a \\ -b \end{pmatrix}$

$P \in d \Leftrightarrow \alpha a + b = \beta \Leftrightarrow \alpha a - \beta = -b$

$\alpha a - \beta = -b \Leftrightarrow \begin{pmatrix} a \\ -b \end{pmatrix} \in P^* \Leftrightarrow d^* \in P^*$



$$p = \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$

$$3 \cdot (-1) + 4 = 1$$

$$d: y = 3x + 4$$

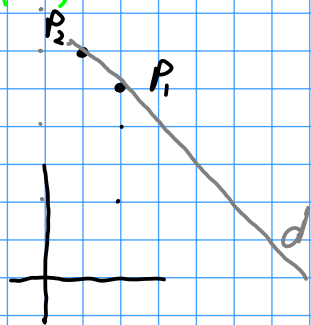
$$p \in d$$

$$p^*: y = -x - 1$$

$$-3 - 1 = -4 \checkmark$$

$$d^* = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$$

$$\Rightarrow d^0 \in p^*$$



$$d: y = -x + 7$$

$$p_1^*: y = 2x - 5$$

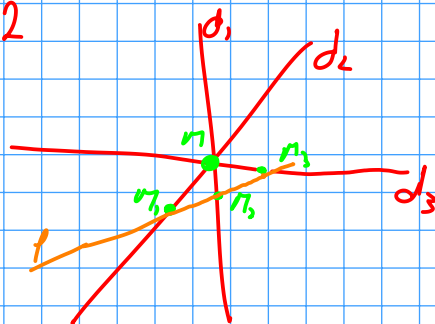
$$p_2^*: y = x - 6$$

$$d^* = \begin{pmatrix} -1 \\ -7 \end{pmatrix}$$

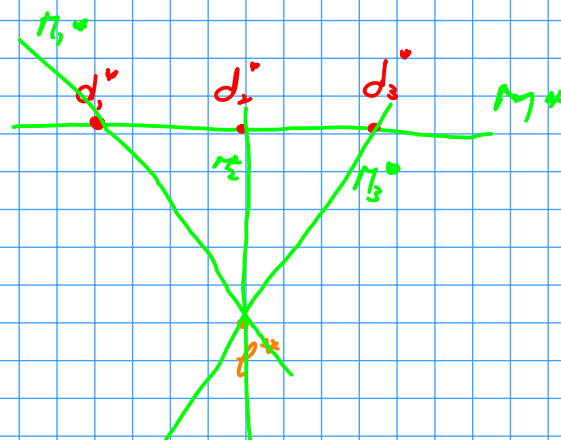
$$d^* \in p_1^* \Leftrightarrow -7 = 2 \cdot (-1) - 5 \checkmark$$

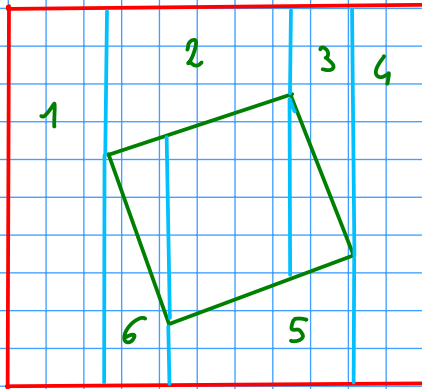
$$d^* \in p_2^* \Leftrightarrow -7 = -1 - 6 \checkmark$$

6.5.2



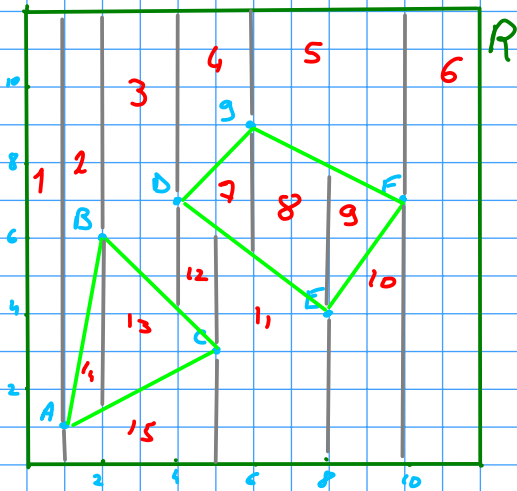
$\xrightarrow{*}$



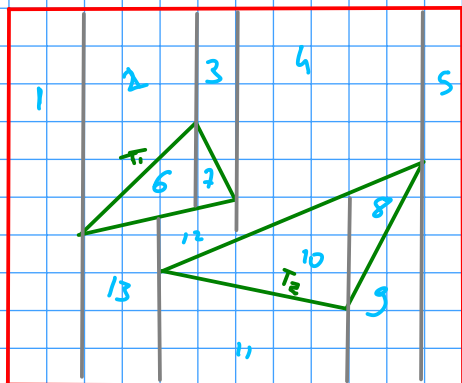


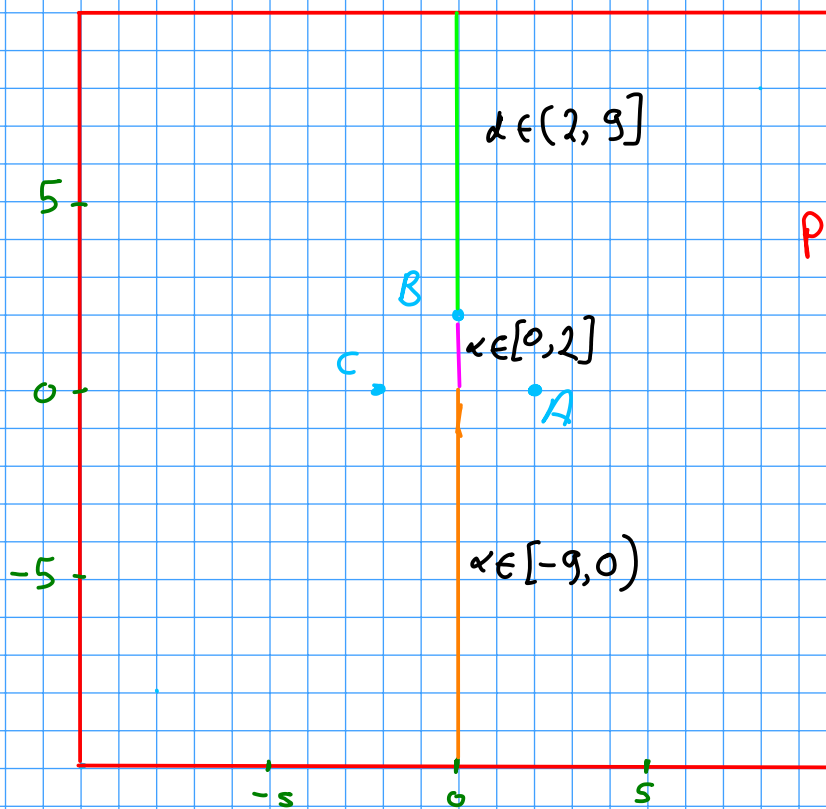
6 trapex M₁ & p₁ at
2 degenerat


8.2



8.3



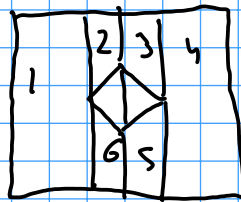


I $\alpha \in (2, 9) \Rightarrow$  5 trapeze

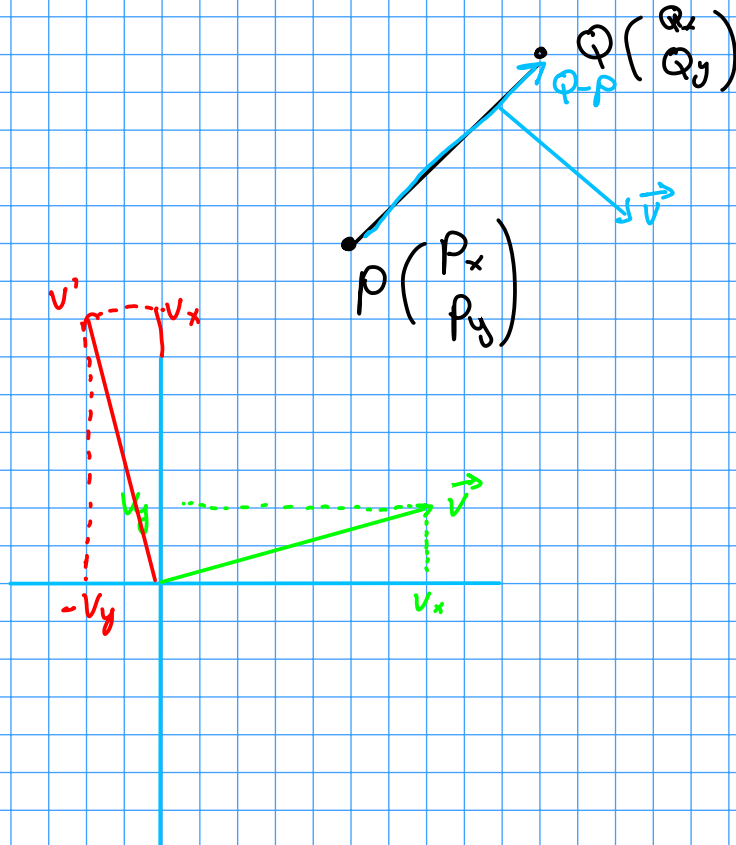
II $\alpha \in [0, 2) \Rightarrow \mathcal{Q} = \{A, B, C\} \Rightarrow$

III $\alpha = 2$

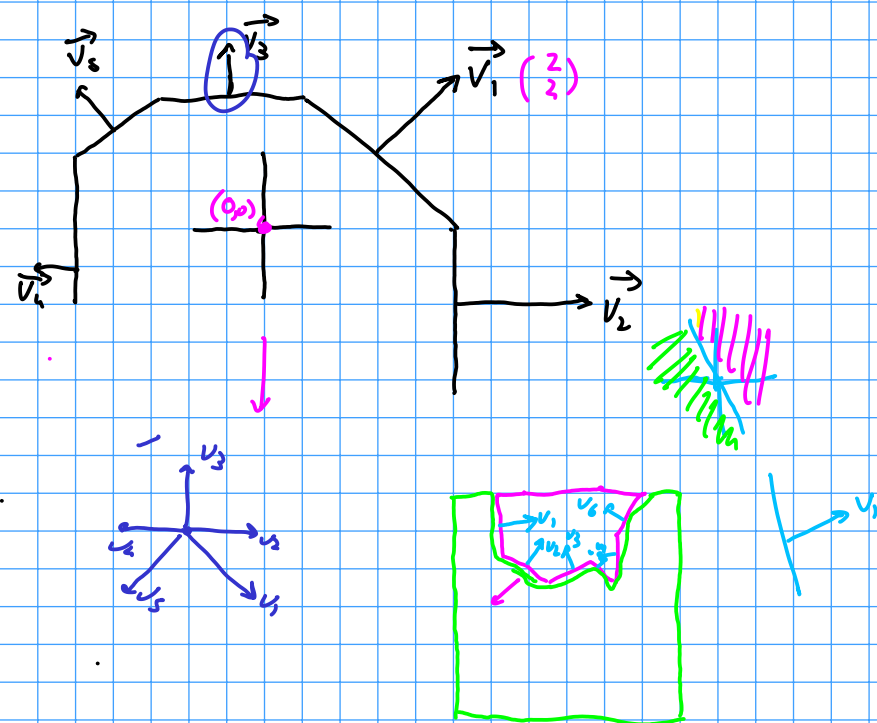
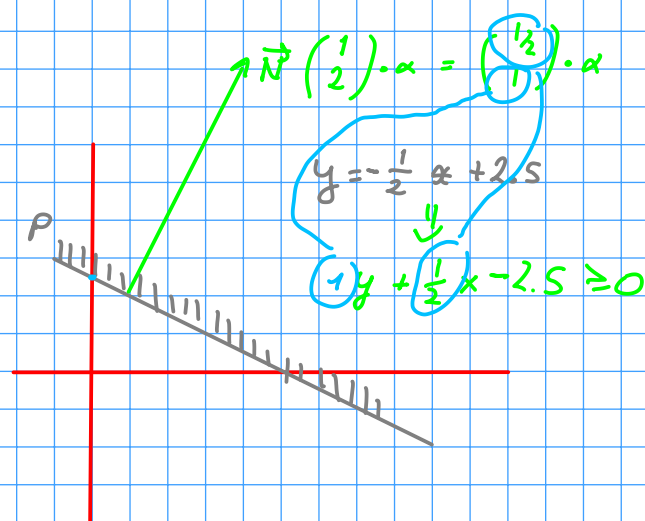
IV $\alpha < 0$

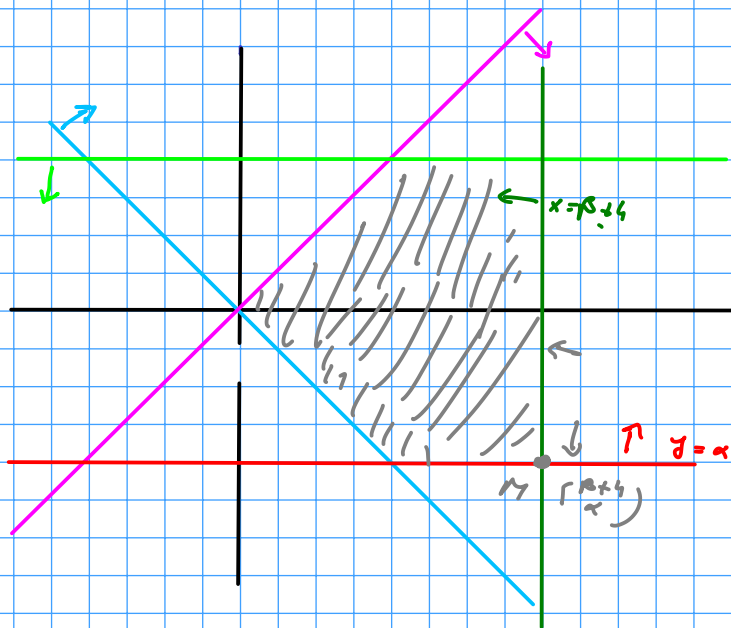


6 trapeze



$$\vec{v} = \alpha \cdot \begin{pmatrix} P_y - Q_y \\ Q_x - P_x \end{pmatrix} = \alpha \cdot \begin{pmatrix} (Q-P)_y \\ -(Q-P)_x \end{pmatrix}$$





I $\beta < -4 \Rightarrow \cap = \emptyset$

II $\alpha > 4 \Rightarrow \cap \emptyset$

I M est în zona ● ●

II M nu est în rot albastru