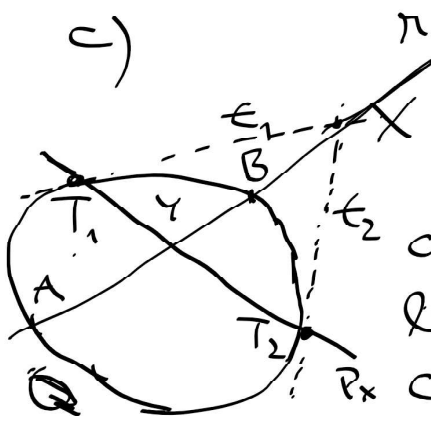


9.6:  $Q: (x_1, x_2, x_3) \begin{pmatrix} 2 & -2 & -1 \\ -2 & 1 & 3 \\ -1 & 3 & -3 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = 0$

a)  $\det A = -1$   
 $\det A_1 = 2$   $\det A_2 = 7$   $\Rightarrow$  signature  $A$  je  $(2, 1, 0)$

b)  $X = (3, 4, 1)$   $P_X: (3, 4, 1) \begin{pmatrix} 2 & -2 & -1 \\ -2 & 1 & 3 \\ -1 & 3 & -3 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = 0$   
 $(-3, 1, 6)$

c)



$T_{1,2} = S \begin{pmatrix} 1 \\ 3 \\ 0 \end{pmatrix} + \epsilon \begin{pmatrix} 0 \\ -6 \\ 1 \end{pmatrix} \in Q \Rightarrow a^2 s^2 + 2bs\epsilon + c\epsilon^2 = 0$   
 $a = (1, 3, 0) \begin{pmatrix} 2 & -2 & -1 \\ -2 & 1 & 3 \\ -1 & 3 & -3 \end{pmatrix} \begin{pmatrix} 1 \\ 3 \\ 0 \end{pmatrix} = -1$   
 $b = (1, 3, 0) \begin{pmatrix} 2 & -2 & -1 \\ -2 & 1 & 3 \\ -1 & 3 & -3 \end{pmatrix} \begin{pmatrix} 0 \\ -6 \\ 1 \end{pmatrix} = +2$   
 $c = (0, -6, 1) \begin{pmatrix} 2 & -2 & -1 \\ -2 & 1 & 3 \\ -1 & 3 & -3 \end{pmatrix} \begin{pmatrix} 0 \\ -6 \\ 1 \end{pmatrix} = -3$

$\left(\frac{s}{\epsilon}\right)^2 - 4\left(\frac{s}{\epsilon}\right) + 3 = 0 \Rightarrow 1; 3$   
 $T_1 = \begin{pmatrix} 1 \\ -3 \\ 1 \end{pmatrix} \quad \epsilon_1: 7x_1 - 2x_2 - 13x_3 = 0$   
 $T_2 = \begin{pmatrix} 3 \\ 3 \\ 1 \end{pmatrix} \quad \epsilon_2: x_1 - 3x_3 = 0$

$$2) \quad n = (1, 1, -7)^* \quad 3 \cdot 1 + 4 \cdot 1 + 1 \cdot (-7) = 0 \rightarrow X \in n$$

$$\ker \begin{pmatrix} 1 & 1 & -7 \\ -3 & 1 & 6 \end{pmatrix} = \underbrace{\mathbb{C} (13, 15, 4)}_Y \quad n = \mathbb{C} \left\{ \begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix}, \begin{pmatrix} 0 \\ 7 \\ 1 \end{pmatrix} \right\}$$

$$X = (3, 4, 1)$$

$$as^2 + 2bs + ct^2 = 0 \quad \text{pro} \quad a = (1-10) \begin{pmatrix} +2 & -2 & 1 \\ -2 & 1 & 3 \\ 1 & 3 & -3 \end{pmatrix} \begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix}$$

$$7 \left( \frac{s}{t} \right)^2 - 50 \left( \frac{s}{t} \right) + 88 = 0$$

$$b = \text{---} \text{---} \text{---} \begin{pmatrix} 0 \\ 7 \\ 1 \end{pmatrix}$$

$$\frac{s}{t} = \begin{matrix} 4 \\ 22 \\ 7 \end{matrix} \quad A = \begin{pmatrix} 4 \\ 3 \\ 1 \end{pmatrix} \quad B = \begin{pmatrix} 22 \\ 27 \\ 7 \end{pmatrix}$$

$$c = (0 \ 7 \ 1) \text{---} \text{---} \text{---}$$

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$$2) \quad A = \alpha X + 15Y$$

$$B = \gamma X + 5Y$$

$$(X, \gamma, A, B) = \frac{\frac{3}{2}}{\frac{5}{8}} = \frac{\frac{1}{(-3)}}{\frac{1}{3}} = -1$$