B. CSOPORT: (LÁSD A CSOPORT)

① a) LÁSD 80. OLDAL

b) $y = \frac{2}{5}$

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② a)
$$\begin{pmatrix} 1 & -3 & 2 & 0 \\ 0 & 3 & 6 & -6 \\ 2 & -3 & -2 & 6 \\ 3 & -3 & 6 & 0 \end{pmatrix} \to \begin{pmatrix} 1 & -3 & 2 & 0 \\ 0 & 3 & 6 & -6 \\ 0 & 3 & -6 & 6 \\ 0 & 6 & 0 & 0 \end{pmatrix} \to$$

$$\to \begin{pmatrix} 1 & -3 & 2 & 0 \\ 0 & 1 & 2 & -2 \\ 0 & 1 & -2 & 2 \\ 0 & 1 & 0 & 0 \end{pmatrix} \to \begin{pmatrix} 1 & -3 & 2 & 0 \\ 0 & 1 & 2 & -2 \\ 0 & 0 & -4 & 4 \\ 0 & 1 & 0 & 0 \end{pmatrix} \to$$

$$\begin{pmatrix} 1 & -3 & 2 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 1 & 2 & -2 \\ 0 & 0 & -4 & 4 \end{pmatrix} \to \begin{pmatrix} 1 & -3 & 2 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 2 & -2 \\ 0 & 0 & -4 & 4 \end{pmatrix} \to$$

$$\to \begin{pmatrix} 1 & -3 & 2 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 0 \end{pmatrix} \to \text{BÁZIS: } \begin{pmatrix} 1 \\ -3 \\ 2 \\ 0 \end{pmatrix}, \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 0 \\ 0 \\ 1 \\ -1 \end{pmatrix}$$

b) 3

1. OLDAL

(3) a) $\underline{m} = (-1, 2, 0)$ $\quad \lambda = \frac{\langle \underline{x}, \underline{m} \rangle}{\langle \underline{m}, \underline{m} \rangle} = \frac{-x+2y}{5}$

$T(\underline{x}) = \underline{x} - \lambda \cdot \underline{m}$

$$T(\underline{e}_1) = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} - \frac{-1}{5} \cdot \begin{pmatrix} -1 \\ 2 \\ 0 \end{pmatrix} = \begin{pmatrix} 4/5 \\ 2/5 \\ 0 \end{pmatrix}$$

$$T(\underline{e}_2) = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} - \frac{2}{5} \cdot \begin{pmatrix} -1 \\ 2 \\ 0 \end{pmatrix} = \begin{pmatrix} 2/5 \\ 1/5 \\ 0 \end{pmatrix}$$

$$T(\underline{e}_3) = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} \qquad \underline{\underline{A}} = \begin{pmatrix} 4/5 & 2/5 & 0 \\ 2/5 & 1/5 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

b) $\underline{\underline{A}}^{100} = \underline{\underline{A}}$, $\operatorname{rang}(\underline{\underline{A}}) = 2$

(4) $\boxed{x' = \frac{1}{\sqrt{5}} x + \frac{2}{\sqrt{5}} \cdot y}$ $\quad \boxed{y' = \frac{2}{\sqrt{5}} \cdot x + \frac{-1}{\sqrt{5}} \cdot y}$

$$2x^2 + 5y^2 + 4xy = 6 \cdot (x')^2 + 1 \cdot (y')^2$$

2.0CDAC