

Nr. 4)

$$a) E: \vec{x} = \begin{pmatrix} 0 \\ 2 \\ -1 \end{pmatrix} + r \begin{pmatrix} 6-0 \\ -5-2 \\ 0-(-1) \end{pmatrix} + s \begin{pmatrix} 1-0 \\ 0-2 \\ 1-(-1) \end{pmatrix}$$

$$E: \vec{x} = \begin{pmatrix} 0 \\ 2 \\ -1 \end{pmatrix} + r \begin{pmatrix} 6 \\ -7 \\ 1 \end{pmatrix} + s \begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix}$$

$$\vec{n} = \begin{pmatrix} 6 \\ -7 \\ 1 \end{pmatrix} \times \begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix} = \begin{pmatrix} -14+2 \\ 1-12 \\ -12+7 \end{pmatrix} = \begin{pmatrix} -12 \\ -11 \\ -5 \end{pmatrix}$$

$$\begin{array}{r} \cancel{6} \quad \cancel{1} \\ \cancel{-7} \quad \cancel{-2} \\ \cancel{1} \quad \cancel{2} \\ \cancel{6} \quad \cancel{1} \\ \cancel{-7} \quad \cancel{-2} \\ \cancel{1} \quad \cancel{2} \end{array}$$

$$E: \left[ \vec{x} - \begin{pmatrix} 0 \\ 2 \\ -1 \end{pmatrix} \right] \cdot \begin{pmatrix} -12 \\ -11 \\ -5 \end{pmatrix} = 0 \Rightarrow -12x_1 - 11x_2 - 5x_3 = -22 + 5 = -17$$

$$\underline{\underline{12x_1 + 11x_2 + 5x_3 = +17}}$$

$$b) E: \vec{x} = \begin{pmatrix} 7 \\ 2 \\ -1 \end{pmatrix} + r \begin{pmatrix} 4-7 \\ 1-2 \\ 3-(-1) \end{pmatrix} + s \begin{pmatrix} 1-7 \\ 3-2 \\ 2-(-1) \end{pmatrix}$$

$$E: \vec{x} = \begin{pmatrix} 7 \\ 2 \\ -1 \end{pmatrix} + r \begin{pmatrix} -3 \\ -1 \\ 4 \end{pmatrix} + s \begin{pmatrix} -6 \\ 1 \\ 3 \end{pmatrix}$$

$$\vec{n}^* = \begin{pmatrix} -3 \\ -1 \\ 4 \end{pmatrix} \times \begin{pmatrix} -6 \\ 1 \\ 3 \end{pmatrix} = \begin{pmatrix} -3-4 \\ -24+9 \\ -3-6 \end{pmatrix} = \begin{pmatrix} -7 \\ -15 \\ -9 \end{pmatrix}$$

$$\begin{array}{r} \cancel{-3} \quad \cancel{-6} \\ \cancel{-1} \quad \cancel{1} \\ \cancel{4} \quad \cancel{3} \\ \cancel{-3} \quad \cancel{-6} \\ \cancel{-1} \quad \cancel{1} \\ \cancel{4} \quad \cancel{3} \end{array}$$

$$\vec{n} = -1 \cdot \vec{n}^* = -1 \cdot \begin{pmatrix} -7 \\ -15 \\ -9 \end{pmatrix} = \begin{pmatrix} 7 \\ 15 \\ 9 \end{pmatrix}$$

$$E: \left[ \vec{x} - \begin{pmatrix} 7 \\ 2 \\ -1 \end{pmatrix} \right] \cdot \begin{pmatrix} 7 \\ 15 \\ 9 \end{pmatrix} = 0 \Rightarrow \underline{\underline{7x_1 + 15x_2 + 9x_3 = 49 + 30 - 9 = 70}}$$

$$c) \underline{\underline{-7x_1 + 19x_2 + 14x_3 = 17}}$$

$$d) \underline{\underline{14x_1 - 4x_2 - 3x_3 = 123}}$$