

$$11. \quad A = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 4 & 2 & 1 & 3 & 5 \\ 1 & 3 & 2 & 4 & 6 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 0 & -2 & -3 & -1 & 1 \\ 0 & 2 & 1 & 3 & 5 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 0 & -2 & -3 & -1 & 1 \\ 0 & 0 & -2 & 2 & 6 \end{pmatrix} \text{ (5)}$$

$$\begin{cases} x_1 + x_2 + x_3 + x_4 = 1 \\ -2x_2 - 3x_3 - x_4 = 1 \\ -2x_3 + 2x_4 = 6 \end{cases}$$

$$x_4 = S \text{ とおく,}$$

$$x_3 = S - 3$$

$$x_2 = -2S + 4$$

$$x_1 = -0.1$$

$$\therefore \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{pmatrix} = \begin{pmatrix} 0 \\ 4 \\ -3 \\ 0 \end{pmatrix} + S \begin{pmatrix} 0 \\ -2 \\ 1 \\ 1 \end{pmatrix}$$

(S ∈ ℝ)

$$\text{rank } A = 3 \text{ (5)}$$

$$\text{自由度は } 4 - 3 = 1$$

$$12. \quad A = \begin{pmatrix} 1 & 0 \\ 2 & 1 \\ a & a \end{pmatrix}$$

$$= \begin{pmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{pmatrix}$$

$$x_1 =$$

$$x_2 =$$

$$a =$$

$$a =$$

$$a \perp x$$

$$(2) \text{ } \perp$$