

1

- (1)  $\varphi_1^{-1} = \varphi_1, \varphi_2^{-1} = \varphi_2, \varphi_3^{-1} = \varphi_5, \varphi_4^{-1} = \varphi_4, \varphi_5^{-1} = \varphi_3, \varphi_6^{-1} = \varphi_6.$   
 (2)  $\text{sign}(\varphi_1) = +1, \text{sign}(\varphi_2) = -1, \text{sign}(\varphi_3) = +1,$   
 $\text{sign}(\varphi_4) = -1, \text{sign}(\varphi_5) = +1, \text{sign}(\varphi_6) = -1.$   
 (3)  $\varphi_1\varphi_5 = \varphi_5, \varphi_2\varphi_5 = \varphi_4, \varphi_3\varphi_5 = \varphi_1, \varphi_4\varphi_5 = \varphi_6, \varphi_5\varphi_5 = \varphi_3, \varphi_6\varphi_5 = \varphi_2,$

2

- (1) 2 (2) 0 (3) 8 (4) 3

3

$$x = 1, y = \frac{1}{2}, z = -2$$

基本変形の例を下に示す。どのように変形しているか考察しなさい。

$$\begin{aligned} \left( \begin{array}{ccc|c} 2 & 0 & -1 & 4 \\ 1 & -2 & 1 & -2 \\ 3 & 4 & 2 & 1 \end{array} \right) &\longrightarrow \left( \begin{array}{ccc|c} 1 & -2 & 1 & -2 \\ 2 & 0 & -1 & 4 \\ 3 & 4 & 2 & 1 \end{array} \right) \longrightarrow \left( \begin{array}{ccc|c} 1 & -2 & 1 & -2 \\ 0 & 4 & -3 & 8 \\ 0 & 6 & 2 & -1 \end{array} \right) \\ &\longrightarrow \left( \begin{array}{ccc|c} 1 & -2 & 1 & -2 \\ 0 & 4 & -3 & 8 \\ 0 & 2 & 5 & -9 \end{array} \right) \longrightarrow \left( \begin{array}{ccc|c} 1 & 0 & 6 & -11 \\ 0 & 0 & -13 & 26 \\ 0 & 2 & 5 & -9 \end{array} \right) \\ &\longrightarrow \left( \begin{array}{ccc|c} 1 & 0 & 6 & -11 \\ 0 & 2 & 5 & -9 \\ 0 & 0 & -13 & 26 \end{array} \right) \longrightarrow \left( \begin{array}{ccc|c} 1 & 0 & 6 & -11 \\ 0 & 2 & 5 & -9 \\ 0 & 0 & 1 & -2 \end{array} \right) \\ &\longrightarrow \left( \begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 2 & 0 & 1 \\ 0 & 0 & 1 & -2 \end{array} \right) \longrightarrow \left( \begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & -2 \end{array} \right) \end{aligned}$$