以高斯消去法求解

試解 $\begin{cases} x-y+z=8 \\ 2x+3y-z=-2 \\ 3x-2y-9z=9 \end{cases}$

$$\left[\begin{array}{ccc|c} \textcircled{1} & -1 & 1 & 8 \\ 2 & 3 & -1 & -2 \\ 3 & -2 & -9 & 9 \end{array}\right] \begin{matrix} \\ \swarrow \times -2 \\ \swarrow \times -3 \end{matrix}$$

$$\left[\begin{array}{ccc|c} \textcircled{1} & -1 & 1 & 8 \\ 0 & 5 & -3 & -18 \\ 0 & 1 & -12 & -15 \end{array}\right] \swarrow$$

$$\left[\begin{array}{ccc|c} \textcircled{1} & -1 & 1 & 8 \\ 0 & \textcircled{1} & -12 & -15 \\ 0 & 5 & -3 & -18 \end{array}\right] \swarrow \times -5$$

$$\left[\begin{array}{ccc|c} \textcircled{1} & -1 & 1 & 8 \\ 0 & \textcircled{1} & -12 & -15 \\ 0 & 0 & 57 & 57 \end{array}\right] \times \frac{1}{57}$$

$$\left[\begin{array}{ccc|c} 1 & -1 & 1 & 8 \\ 0 & 1 & -12 & -15 \\ 0 & 0 & 1 & 1 \end{array}\right] \Rightarrow \begin{cases} x-y+z=8 \\ y-12z=-15 \\ \boxed{z=1} \end{cases}$$

-24
9

15
-18

$$\Rightarrow \begin{cases} x-y+1=8 \\ y-12=-15 \end{cases}$$

$$\Rightarrow \begin{cases} x-y=7 \\ \boxed{y=-3} \end{cases}$$

$$\Rightarrow x-(-3)=7$$

$$\Rightarrow x+3=7$$

$$\Rightarrow \boxed{x=4}$$

$$\left[\begin{array}{ccc|c} 1 & x & x & x \\ 0 & 1 & x & x \\ 0 & 0 & 1 & x \end{array}\right]$$

$x=4$

Ans: $y=-3$

$z=1$ //