MALEK ALISMAIL / 20253833 / Z

$\boxed{3}$

$$\left.\begin{aligned} x - 2y + 3z &= 1 \\ 2x + \lambda y + 6z &= 6 \\ -x + 3y + (\lambda-3)z &= 0 \end{aligned}\right\} \Rightarrow \left[\begin{array}{ccc|c} 1 & -2 & 3 & 1 \\ 2 & \lambda & 6 & 6 \\ -1 & 3 & \lambda-3 & 0 \end{array}\right]$$

$$\xrightarrow[R_3 \to R_3 + R_1]{R_2 \to R_2 - 2.R_1} \left[\begin{array}{ccc|c} 1 & -2 & 3 & 1 \\ 0 & \lambda+4 & 0 & 4 \\ 0 & 1 & \lambda & 1 \end{array}\right] \qquad \lambda \neq -4$$

$$\xrightarrow{R_2 \leftrightarrow R_3} \left[\begin{array}{ccc|c} 1 & -2 & 3 & 1 \\ 0 & 1 & \lambda & 1 \\ 0 & \lambda+4 & 0 & 4 \end{array}\right]$$

$$\xrightarrow{R_3 \to R_3 - (\lambda+4).R_2} \left[\begin{array}{ccc|c} 1 & -2 & 3 & 1 \\ 0 & 1 & \lambda & 1 \\ 0 & 0 & -\lambda^2 - 4\lambda & -\lambda \end{array}\right] \qquad \lambda \neq 0$$

$$\xrightarrow{R_3 \to \left(\frac{1}{-\lambda^2 - 4\lambda}\right).R_3} \left[\begin{array}{ccc|c} 1 & -2 & 3 & 1 \\ 0 & 1 & \lambda & 1 \\ 0 & 0 & 1 & \frac{1}{\lambda+4} \end{array}\right]$$

$$\xrightarrow[R_1 \to R_1 - 3.R_3]{R_2 \to R_2 - \lambda.R_3} \left[\begin{array}{ccc|c} 1 & -2 & 0 & \frac{\lambda+1}{\lambda+4} \\ 0 & 1 & 0 & \frac{4}{\lambda+4} \\ 0 & 0 & 1 & \frac{1}{\lambda+4} \end{array}\right]$$

CamScanner ile tarandı

MALEK ALiSMAiL / 20253833 / Z

3 $R_1 \xrightarrow{} R_1 + 2 \cdot R_2$

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & \frac{\lambda+9}{\lambda+4} \\ 0 & 1 & 0 & \frac{4}{\lambda+4} \\ 0 & 0 & 1 & \frac{1}{\lambda+4} \end{array}\right]$$

(i) Tek çözüm: $x = \frac{\lambda+9}{\lambda+4}$, $y = \frac{4}{\lambda+4}$, $z = \frac{1}{\lambda+4}$

$Ç.K = \left\{ \frac{\lambda+9}{\lambda+4}, \frac{4}{\lambda+4}, \frac{1}{\lambda+4} \right\}$ katsayılar matırisi tersinir olduğundan sistemin tek çözümü vardır.

(ii) $\lambda^2 + 4\lambda = 0$ ise: $\boxed{a}$ $\lambda = -4 \Rightarrow$

$$\left[\begin{array}{ccc|c} 1 & -2 & 3 & 1 \\ 0 & 1 & -4 & 1 \\ 0 & 0 & 0 & 4 \end{array}\right]$$

$4 \neq 0$ Dolaysıyla çözüm yoktur (çözümsüzdür).

$\boxed{b}$ $\lambda = 0 \Rightarrow$

$$\left[\begin{array}{ccc|c} 1 & -2 & 3 & 1 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{array}\right]$$

$3-2=1$
keyfi değer

$y = 1$, $x - 2 + 3z = 1 \Rightarrow x = 3 - 3z$

Sonsuz çözüm vardır

$Ç.K. = \{3-3z, 1, z\}$