

$$\begin{aligned} 3. \quad X - 2y - 3z &= 4 \\ X + 5y - 4z &= 7 \\ 2X - 4y - 6z &= 8 \end{aligned}$$

$$\begin{bmatrix} 1 & -2 & -3 & 4 \\ 1 & 5 & -4 & 7 \\ 2 & -4 & -6 & 8 \end{bmatrix}$$

$$\begin{aligned} -1R_1 + R_2 &= \text{NEW } R_2 \\ -2R_1 + R_3 &= \text{NEW } R_3 \end{aligned} \quad \begin{bmatrix} 1 & -2 & -3 & 4 \\ 0 & 7 & -1 & 3 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$$R_2 \div 7 = \text{NEW } R_2 \quad \begin{bmatrix} 1 & -2 & -3 & 4 \\ 0 & 1 & -\frac{1}{7} & \frac{3}{7} \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$$2R_2 + R_1 = \text{NEW } R_1 \quad \begin{bmatrix} X & Y & Z & \\ 1 & 0 & -\frac{23}{7} & \frac{34}{7} \\ 0 & 1 & -\frac{1}{7} & \frac{3}{7} \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$$-\frac{2}{7} - 3 \quad \frac{6}{7} + 4$$

CALC

$$\begin{bmatrix} 1 & -2 & -3 & 4 \\ 1 & 5 & -4 & 7 \\ 2 & -4 & -6 & 8 \end{bmatrix}$$

LAST ROW [0 0 ... 0] INFINITE SOLUTIONS



$$\begin{aligned} 1X + 0Y - \frac{23}{7}Z &= \frac{34}{7} & 0X + 1Y - \frac{1}{7}Z &= \frac{3}{7} \\ X - \frac{23}{7}Z &= \frac{34}{7} & Y - \frac{1}{7}Z &= \frac{3}{7} \\ X &= \frac{23}{7}Z + \frac{34}{7} & Y &= \frac{1}{7}Z + \frac{3}{7} \end{aligned}$$

ANS: (x, y, z)

$$\left(\frac{23}{7}z + \frac{34}{7}, \frac{1}{7}z + \frac{3}{7}, z \right)$$

$$\left(\frac{23}{7}t + \frac{34}{7}, \frac{1}{7}t + \frac{3}{7}, t \right)$$