6. GAUSS-JORDAN ELIMINATION

$$\begin{aligned} x - 5z &= -4 \\ 3x + 4y - 2z &= 9 \\ 2x - 4y + 3z &= -3 \end{aligned}$$

GOAL

$$\begin{bmatrix} 1 & 0 & 0 & \sim \\ 0 & 1 & 0 & \sim \\ 0 & 0 & 1 & \sim \end{bmatrix}$$

REDUCED ROW ECHELON FORM

RREF

$$\begin{bmatrix} x & y & z & \\ 1 & 0 & -5 & -4 \\ 3 & 4 & -2 & 9 \\ 2 & -4 & 3 & -3 \end{bmatrix} \rightarrow \begin{matrix} -3R_1 + R_2 = \text{NEW } R_2 \\ -2R_1 + R_3 = \text{NEW } R_3 \end{matrix} \begin{bmatrix} 1 & 0 & -5 & -4 \\ 0 & 4 & 13 & 21 \\ 0 & -4 & 13 & 5 \end{bmatrix}$$

$R_2 \div 4 = \text{NEW } R_2$

$$\begin{bmatrix} 1 & 0 & -5 & -4 \\ 0 & 1 & \frac{13}{4} & \frac{21}{4} \\ 0 & -4 & 13 & 5 \end{bmatrix} \rightarrow \begin{matrix} 4R_2 + R_3 = \text{NEW } R_3 \end{matrix} \begin{bmatrix} 1 & 0 & -5 & -4 \\ 0 & 1 & \frac{13}{4} & \frac{21}{4} \\ 0 & 0 & 26 & 26 \end{bmatrix}$$

$R_3 \div 26 = \text{NEW } R_3$

$$\begin{bmatrix} 1 & 0 & -5 & -4 \\ 0 & 1 & \frac{13}{4} & \frac{21}{4} \\ 0 & 0 & 1 & 1 \end{bmatrix} \rightarrow \begin{matrix} -\frac{13}{4}R_3 + R_2 = \text{NEW } R_2 \end{matrix} \begin{bmatrix} 1 & 0 & -5 & -4 \\ 0 & 1 & 0 & \frac{8}{4} \\ 0 & 0 & 1 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & -5 & -4 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 1 \end{bmatrix} \rightarrow \begin{matrix} 5R_3 + R_1 = \text{NEW } R_1 \end{matrix} \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 1 \end{bmatrix} \begin{matrix} \leftarrow x \\ \leftarrow y \\ \leftarrow z \end{matrix}$$

$(1, 2, 1)$

6. $\begin{aligned} x - 5z &= -4 \\ 3x + 4y - 2z &= 9 \\ 2x - 4y + 3z &= -3 \end{aligned}$

$$\begin{bmatrix} 1 & 0 & -5 & -4 \\ 3 & 4 & -2 & 9 \\ 2 & -4 & 3 & -3 \end{bmatrix}$$

$x = 1 \quad y = 2 \quad z = 1$

$(1, 2, 1)$

TI-83/84 INSTRUCTIONS FOR SOLVING LINEAR SYSTEMS OF EQUATIONS

1. INPUT MATRIX [2ND] [MODE]
2. [2ND] [x^{-1}]
   RIGHT ARROW TO MATH
   UP ARROW TO RREF
   [ENTER]
   [EDIT] [2ND] [x^{-1}]
   [ENTER] ON A
   [ENTER]
3. IF DECIMALS
   [MATH] [ENTER] [ENTER]