

Ex: Solve $\begin{bmatrix} 1 & 4 & 0 & | & 7 \\ 2 & 7 & 0 & | & 10 \end{bmatrix}$

$$\begin{bmatrix} 1 & 4 & 0 & | & 7 \\ 2 & 7 & 0 & | & 10 \end{bmatrix} \sim \begin{bmatrix} 1 & 4 & 0 & | & 7 \\ 0 & -1 & 0 & | & -4 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & 4 & 0 & | & 7 \\ 0 & 1 & 0 & | & 4 \end{bmatrix} \sim \begin{bmatrix} 1 & 0 & 0 & | & -9 \\ 0 & 1 & 0 & | & 4 \end{bmatrix}$$

$$x_1 = -9$$

$$x_2 = 4$$

x_3 is free

18
8

Ex: Solve $\begin{bmatrix} 1 & -2 & -1 & | & 3 \\ 3 & -6 & -2 & | & 2 \end{bmatrix}$

$$\begin{bmatrix} 1 & -2 & -1 & | & 3 \\ 3 & -6 & -2 & | & 2 \end{bmatrix} \sim \begin{bmatrix} 1 & -2 & -1 & | & 3 \\ 0 & 0 & 1 & | & -7 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & -2 & 0 & | & -4 \\ 0 & 0 & 1 & | & -7 \end{bmatrix}$$

$$x_1 = 2x_2 - 4$$

x_2 is free

$$x_3 = -7$$

18
3

Ex: Solve $\begin{bmatrix} 1 & -7 & 0 & 6 & | & 5 \\ 0 & 0 & 1 & -2 & | & -3 \\ -1 & 7 & -4 & 2 & | & 7 \end{bmatrix}$

$$\begin{bmatrix} 1 & -7 & 0 & 6 & | & 5 \\ 0 & 0 & 1 & -2 & | & -3 \\ -1 & 7 & -4 & 2 & | & 7 \end{bmatrix} \sim \begin{bmatrix} 1 & -7 & 0 & 6 & | & 5 \\ 0 & 0 & 1 & -2 & | & -3 \\ 0 & 0 & -4 & 8 & | & 12 \end{bmatrix} \sim$$

$$\begin{bmatrix} 1 & -7 & 0 & 6 & | & 5 \\ 0 & 0 & 1 & -2 & | & -3 \\ 0 & 0 & 0 & 0 & | & 0 \end{bmatrix}$$

$$x_1 = 7x_2 - 6x_4 + 5$$

x_2 is free

$$x_3 = 2x_4 - 3$$

x_4 is free

1-8
4

Ex: Solve
$$\begin{bmatrix} 1 & 2 & -5 & -6 & 0 & -5 \\ 0 & 1 & -6 & -3 & 0 & 2 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 2 & -5 & -6 & 0 & -5 \\ 0 & 1 & -6 & -3 & 0 & 2 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\sim \begin{bmatrix} 1 & 0 & 7 & 0 & 0 & -9 \\ 0 & 1 & -6 & -3 & 0 & 2 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$x_1 = -7x_2 - 9$$

$$x_2 = 6x_3 + 3x_4 + 2$$

x_3 is free

x_4 is free

$$x_5 = 0$$