

RREF

Echelon form:

$$Ax = b$$

$$\left[\begin{array}{cccc|c} 2 & 3 & 5 & 9 & -1 \\ 0 & 6 & 2 & -3 & 5 \\ 0 & 0 & 1 & 7 & -3 \end{array} \right]$$

Stair step

$$[A \ b]$$

Reduced Row Echelon form

$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & 4 & -7 \\ 0 & 1 & 0 & 3 & 2 \\ 0 & 0 & 1 & 7 & 4 \end{array} \right]$$

$$Ax = b$$

$$x_1 + 4x_4 = -7$$

$$x_2 + 3x_4 = 2$$

$$x_3 + 7x_4 = 4$$

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} -7 \\ 2 \\ 4 \\ 0 \end{bmatrix} + a \begin{bmatrix} -4 \\ -3 \\ -7 \\ 1 \end{bmatrix}$$

A is Over-D
A is 5×3
 A^T is 3×5
 $A^T A$ is 3×3
 $x = (A^T A)^{-1} A^T b$

parametric