# Quiz 5 - March 7

Find a basis for $\mathrm{Col}\left(\begin{bmatrix} 1 & -2 & 3 & 1 \\ -1 & 3 & 1 & 2 \\ 0 & 1 & 4 & 5 \end{bmatrix}\right)$.

Solution:

$$\begin{bmatrix} 1 & -2 & 3 & 1 \\ -1 & 3 & 1 & 2 \\ 0 & 1 & 4 & 5 \end{bmatrix} \xrightarrow{R_2 += R_1} \begin{bmatrix} 1 & -2 & 3 & 1 \\ 0 & 1 & 4 & 3 \\ 0 & 1 & 4 & 5 \end{bmatrix}$$

$$\xrightarrow{R_3 -= R_2} \begin{bmatrix} 1 & -2 & 3 & 1 \\ 0 & 1 & 4 & 3 \\ 0 & 0 & 0 & 2 \end{bmatrix}$$ is in echelon form.

Pivots in columns 1, 2, 4.

Basis: $\left\{ \begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}, \begin{bmatrix} -2 \\ 3 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 2 \\ 5 \end{bmatrix} \right\}$.