

$$\text{Let } A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 4 & 5 \\ -1 & -2 & -4 \\ 4 & 8 & 7 \end{bmatrix}$$

- Find a set of vectors that spans $\text{nul}(A)$
 - Describe $\text{nul}(A)$ geometrically
 - Give a specific vector \mathbf{v} that is in $\text{nul}(A)$
 - Give a specific vector \mathbf{v} that is *not* in $\text{nul}(A)$
- Find a set of vectors that spans $\text{col}(A)$
 - Describe $\text{col}(A)$ geometrically
 - Give a specific vector \mathbf{v} that is in $\text{col}(A)$
 - Give a specific vector \mathbf{v} that is *not* in $\text{col}(A)$