

1. Let $A = \begin{bmatrix} 1 & 2 & 4 & 25 \\ 2 & 4 & 2 & 8 \\ 0 & 0 & 1 & 7 \\ 1 & 2 & 3 & 18 \end{bmatrix}$. Use that $\text{REF}(A) = \begin{bmatrix} 1 & 2 & 0 & -3 \\ 0 & 0 & 1 & 7 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

to give a basis for $\text{col}(A)$ and $\text{nul}(A)$

2. Let $\mathbf{v}_1 = \begin{bmatrix} 2 \\ 4 \\ -2 \\ 8 \end{bmatrix}$, $\mathbf{v}_2 = \begin{bmatrix} 1 \\ 5 \\ -4 \\ 7 \end{bmatrix}$, $\mathbf{v}_3 = \begin{bmatrix} 1 \\ 2 \\ -1 \\ 4 \end{bmatrix}$, and

$$\mathcal{H} = \text{Span}\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3\}.$$

Give a basis for \mathcal{H}