1 **Let** $A = \begin{bmatrix} 1 & 4 & 5 & 2 \\ 2 & 1 & 3 & 0 \\ -1 & 3 & 2 & 2 \end{bmatrix}$

1.a **Find a basis for each of null(A), row(A), col(A), and state the dimension of each of these subspaces.**

1.b **Is the vector** $\vec{b} = \begin{bmatrix} 4 \\ 6 \\ -2 \end{bmatrix}$ **in the column space of** A**? If so, write** $\vec{b}$ **as a linear combination of the columns of** A**.**