

Instructions: Please answer the following legibly, logically, and **show all work**. Please use a **separate sheet of paper** to write all work. No credit will be given for unjustified or unclear work. When you are finished, please scan your work (or take pictures) and submit via the Assignments or Quiz link on Canvas.

$$\text{Let } A = \begin{bmatrix} 1 & 2 & 3 & -4 & 8 \\ 1 & 2 & 0 & 2 & 8 \\ 2 & 4 & -3 & 10 & 9 \\ 3 & 6 & 0 & 6 & 9 \end{bmatrix}$$

1. Find a basis for  $\text{Col } A$ , and give a non-zero vector in  $\text{Col } A$ .
2. We learned that for any matrix  $B$ ,  $\text{Col } B$  is always a subspace of a vector space. What vector space is  $\text{Col } A$  a subspace of?
3. Find a basis for  $\text{Nul } A$ , and give a non-zero vector in  $\text{Nul } A$ .
4. We learned that for any matrix  $B$ ,  $\text{Nul } B$  is always a subspace of a vector space. What vector space is  $\text{Nul } A$  a subspace of?