Quiz 2 (12 pm)

1. Write the vector $b = \begin{bmatrix} 5 \\ 1 \\ 4 \end{bmatrix}$ as a linear combination of $v_1 = \begin{bmatrix} -1 \\ 4 \\ 1 \end{bmatrix}$ and $v_2 = \begin{bmatrix} 1 \\ 3 \\ 2 \end{bmatrix}$, or state that

this is not possible. Clearly show your work and be clear about what is your answer. (10 pts.)

2. For each matrix below, determine if the matrix is in rref or not. If it is, state whether the associated system of linear equations has a unique solution, no solution, or infinitely many solutions.   (1 pt. each part, 10 total)

(a) $\begin{bmatrix} 0 & 1 & | & 0 \\ 0 & 0 & | & 1 \\ 0 & 0 & | & 0 \end{bmatrix}$ **rref/not rref   unique/none/infinitely many**

(b) $\begin{bmatrix} 1 & 2 & | & -1 \\ 0 & 0 & | & 0 \\ 0 & 0 & | & 0 \end{bmatrix}$ **rref/not rref   unique/none/infinitely many**

(c) $\begin{bmatrix} 1 & 1 & | & 0 \\ 0 & 0 & | & 1 \end{bmatrix}$ **rref/not rref   unique/none/infinitely many**

(d) $\begin{bmatrix} 1 & 0 & | & 1 \\ 0 & 1 & | & 0 \\ 1 & 0 & | & 1 \end{bmatrix}$ **rref/not rref   unique/none/infinitely many**

(e) $\begin{bmatrix} 1 & 0 & 0 & | & 0 \\ 0 & 1 & 0 & | & 0 \\ 0 & 0 & 1 & | & 0 \end{bmatrix}$ **rref/not rref   unique/none/infinitely many**