Name: _____ ID #:_____

Fill in all the gaps

Q1) For the AM $\begin{pmatrix} 1 & 0 & 0 & 3 & 4 & 5 \\ 1 & 1 & 3 & 4 & 6 & 5 \\ 3 & 0 & 2 & 1 & 4 & 1 \\ 0 & 0 & 2 & 1 & 1 & 4 \end{pmatrix}$ the sol is $x = \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \end{pmatrix} = \begin{pmatrix} \quad \end{pmatrix} + x_5 \begin{pmatrix} \quad \end{pmatrix}$

$$\begin{pmatrix} 1 & 0 & 0 & 3 & 4 & 5 \\ 0 & 1 & 3 & 1 & 2 & 0 \\ 0 & 0 & 2 & -8 & -8 & -14 \\ 0 & 0 & 2 & 1 & 1 & 4 \end{pmatrix} \begin{matrix} \text{row}_1 \\ \text{row}_2 \to \text{row}_2 + (-1\ \text{row}_1) \\ \text{row}_3 \to \text{row}_3 + (-3\ \text{row}_1) \\ \text{row}_4 \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 0 & 3 & 4 & 5 \\ 0 & 1 & 3 & 1 & 2 & 0 \\ 0 & 0 & 2 & -8 & -8 & -14 \\ 0 & 0 & 0 & 9 & 9 & 18 \end{pmatrix} \begin{matrix} \text{row}_1 \\ \text{row}_2 \\ \text{row}_3 \\ \text{row}_4 \to \text{row}_4 + (-1\ \text{row}_3) \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 0 & 3 & 4 & 5 \\ 0 & 1 & 3 & 1 & 2 & 0 \\ 0 & 0 & 2 & -8 & -8 & -14 \\ 0 & 0 & 0 & 1 & 1 & 2 \end{pmatrix} \begin{matrix} \text{row}_1 \\ \text{row}_2 \\ \text{row}_3 \\ \text{row}_4 \to \frac{1}{9}\ \text{row}_4 \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 1 & -1 \\ 0 & 1 & 3 & 0 & 1 & -2 \\ 0 & 0 & 2 & 0 & 0 & 2 \\ 0 & 0 & 0 & 1 & 1 & 2 \end{pmatrix} \begin{matrix} \text{row}_1 \to \text{row}_1 + (-3\ \text{row}_4) \\ \text{row}_2 \to \text{row}_2 + (-1\ \text{row}_4) \\ \text{row}_3 \to \text{row}_3 + (8\ \text{row}_4) \\ \text{row}_4 \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 1 & -1 \\ 0 & 1 & 3 & 0 & 1 & -2 \\ 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 2 \end{pmatrix} \begin{matrix} \text{row}_1 \\ \text{row}_2 \\ \text{row}_3 \to \frac{1}{2}\ \text{row}_3 \\ \text{row}_4 \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 1 & -1 \\ 0 & 1 & 0 & 0 & 1 & -5 \\ 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 2 \end{pmatrix} \begin{matrix} \text{row}_1 \\ \text{row}_2 \to \text{row}_2 + (-3\ \text{row}_3) \\ \text{row}_3 \\ \text{row}_4 \end{matrix}$$

Q2) Is {1, 2, 3} in the span of {3, 1, 2} and {1, −4, 2}. You do not need to show arithmetic. You do need to show your set up and explain what you are doing using standard terminology.

In[•]:=
$$\text{Aug} = \text{REF} = \begin{pmatrix} 1 & 0 & 0 & 3 & 4 & 5 \\ 1 & 1 & 3 & 4 & 6 & 5 \\ 3 & 0 & 2 & 1 & 4 & 1 \\ 0 & 0 & 2 & 1 & 1 & 4 \end{pmatrix};$$

```
REF = RowAdd[REF, {{{2, -1}, {3, -3}}, 1}];
REF = RowAdd[REF, {{{4, -1}}, 3}];
REF = RowScale[REF, {4, 1/9}];
REF = RowAdd[REF, {{{3, 8}, {2, -1}, {1, -3}}, 4}];
REF = RowScale[REF, {3, 1/2}];
REF = RowAdd[REF, {{{2, -3}}, 3}];
```

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# Row Op Code