

## 2.8 Handwrite Practice

Handwrite your responses to the following and collate them into a single PDF for submission into ASULearn.

1. Given  $A = \begin{bmatrix} 1 & 2 & 3 & 3 \\ 2 & 4 & 9 & 3 \\ 2 & 4 & 6 & 6 \end{bmatrix}$

- Show the elementary row operations (like  $r'_2 = -5r_1 + r_2$ ) to use the strict method of Gaussian elimination and provide the row echelon form of  $A$  (stop at ref and don't scale the rows but do use replacement!).
- Use part a) to find a basis for the column space and show reasoning for the pivot columns.
- What is the geometry of the column space? Fill in the 2 blanks:

The column space is a \_\_\_\_\_ inside of  $\mathbb{R}$ ——

- Use part a) to find a basis for the null space by hand and show work for a basis for the solutions to  $A\vec{x} = \vec{0}$ . (Note that if you augment a matrix with  $\vec{0}$  and reduce it the equal column will stay all 0)
- What is the geometry of the null space? Fill in the 2 blanks:

The null space is a \_\_\_\_\_ inside of  $\mathbb{R}$ ——