

## 1.4 Handwrite Practice

Handwrite your responses to 1. and 2. below and collate them into a PDF for submission into ASULearn.

1. Let  $A = \begin{bmatrix} 3 & -1 \\ -9 & 3 \end{bmatrix}$  and  $\vec{b} = \begin{bmatrix} b_1 \\ b_2 \end{bmatrix}$ .

- a) Show that the equation  $A\vec{x} = \vec{b}$  does not have a solution for all possible  $\vec{b}$ . (Hint: Gaussian!)
- b) Describe the set of all  $\vec{b}$  for which  $A\vec{x} = \vec{b}$  does have a solution. Show work/reasoning.

2. Suppose  $A$  is a  $4 \times 3$  matrix and  $\vec{b}_1$  is a vector in  $\mathbb{R}^4$  with the property that  $A\vec{x} = \vec{b}_1$  has a unique solution.

- a) How many pivots does  $A$  have? Justify your response.
- b) What will the reduced row echelon form (Gauss-Jordan) of  $A$ , the coefficient matrix, be?
- c) Do the columns of  $A$  span all of  $\mathbb{R}^4$ ?