

## 2.1 Handwrite Practice

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

1. Let  $A = \begin{bmatrix} -1 & 3 \\ 2 & 4 \\ 5 & -3 \end{bmatrix}$  and  $B = \begin{bmatrix} 4 & -2 \\ -2 & 3 \end{bmatrix}$

- Compute  $AB$  by  $A$  times each column of  $B$  and then the linear combinations of the columns of  $A$  for each of those products and show work.
- Compute  $AB$  by the row-column multiplications directly (dot products) and show work.

2. Suppose that  $CA = I_{n \times n}$ .

- Show that the columns of  $A$  are linearly independent by showing that the equation  $A\vec{x} = \vec{0}$  has only the trivial solution by multiplying by  $C$  on the left of each side of the equation  $A\vec{x} = \vec{0}$ . Next apply properties of matrix multiplication to reduce and show we have only the trivial solution. Show the properties and name them.
- Use part a) to explain why  $A$  cannot have more columns than rows.
- Show that  $C = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$  and  $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{bmatrix}$  satisfy the condition  $CA = I_{n \times n}$ , i.e. that they don't need to be square matrices.