

Revision Number 1

Q4. Revision question. Performing elementary row operations to the matrix A gives the matrix B as follows:

$$A = \begin{bmatrix} 1 & 2 & 1 & 4 & 3 \\ -1 & -2 & 1 & -2 & -1 \\ 2 & 4 & -3 & 3 & 1 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & 2 & 0 & 3 & 2 \\ 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

Use this information or otherwise to answer the following questions.

- (i) What is the dimension of the column space of A ? Give a reason.
- (ii) Do the vectors $(1, -1, 2), (1, 1, -3), (4, -2, 3)$ span \mathbb{R}^3 ? Give a reason. (iii) Are the vectors $\{(1, -1, 2), (1, 1, -3), (3, -1, 1)\}$ linearly dependent? Give a reason.
- (iv) Write $(4, -2, 3)$ as a linear combination of the vectors $(1, -1, 2)$ and $(1, 1, -3)$.