

MAU22E01 2020 (SF Engineers & MSISS & MEMS)**S h e e t 5**

Assignment sheet - will be marked - due next Monday, November 9

Exercise 1

Find bases and dimensions for the null space of the matrix:

(i) $\begin{pmatrix} 1 & 2 & 1 \\ 1 & 1 & 0 \end{pmatrix};$

(ii) $\begin{pmatrix} 3 & 6 \\ 1 & 2 \\ -4 & -8 \\ -1 & -2 \end{pmatrix}.$

Exercise 2

Find a subset of the vectors that forms a basis of their span:

(i) $\mathbf{v}_1 = (-1, 1, -2), \mathbf{v}_2 = (2, -2, 4);$

(ii) $\mathbf{v}_1 = (2, 1), \mathbf{v}_2 = (1, 2), \mathbf{v}_3 = (-1, 1), \mathbf{v}_4 = (-1, 2).$

Exercise 3

Find the rank and the nullity of the matrix:

(i) $\begin{pmatrix} -2 & 2 & -4 \\ 3 & 3 & 6 \end{pmatrix};$

(ii) $\begin{pmatrix} 4 & 3 & -6 \\ 1 & -1 & 2 \\ -11 & 0 & 0 \end{pmatrix}.$