Course 2E01 2016 (SF Engineers & MSISS & MEMS)

S h e e t 5

Due: at the end of the tutorial

Exercise 1

Write the general solution of the system as a sum of its partial solution and a linear combination of basis vectors of the associated homogenous system:

$$\begin{cases} x + y - t = 1 \\ z + 2t = -1 \end{cases}.$$

Exercise 2

Find bases and dimensions for the row, column and null spaces of the matrix:

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

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

Exercise 3

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