

**MAU22E01 2019 (SF Engineers & MSISS & MEMS)****S h e e t 6**

---

Due: at the end of the tutorial

---

**Exercise 1**

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

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

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

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

**Exercise 2**

Find the rank and the nullity of the matrix:

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

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

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