Discussion — July 5

1. Compute $\text{Null}(A)$ and $\text{Col}(A)$ for the following (ie., write as a span)

(a) $\begin{pmatrix} 1 & 2 & 3 & 4 \end{pmatrix}$

(b) $\begin{pmatrix} 1 & 2 \\ 1 & 1 \end{pmatrix}$

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

(d) $\begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \end{pmatrix}$

(e) $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}$

(f) $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 4 \\ 1 & 3 & 9 \end{pmatrix}$

2. Find an A so W is (a) $\text{Null}(A)$ (b) $\text{Col}(A)$

(i) $\left\{ \begin{pmatrix} 2a \\ 3b \\ a+b \end{pmatrix} \;\middle|\; a, b \in \mathbb{R} \right\}$

(ii) $\left\{ \begin{pmatrix} a \\ b \\ c \end{pmatrix} \;\middle|\; a + 2b = c \right\}$

(iii) $\left\{ \begin{pmatrix} a+2b \\ c \\ a+c \end{pmatrix} \;\middle|\; \begin{array}{l} a+b+c = 0 \\ 2a - c = 0 \end{array} \right\}$