Submitting HW Tips

HW # 2

1 Page 63: **#1.65(a)**. (Find **RREF**).

2 Page 64: **#1.67(a)**.

3 For what value(s) of k, if any, will this system be **inconsistent** ?

$$\begin{cases} 2x + ky &= 4 \\ x + k^2 y &= 2 + k \end{cases} .$$

4 Which sets are **linearly independent** and which are **linearly dependent** ?

(a) $S = \left\{ \begin{bmatrix} 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} -1 \\ 2 \end{bmatrix} \right\}$ ($\mathbf{v}_1$, $\mathbf{v}_2$, $\mathbf{v}_3$)

(b) $S = \left\{ \begin{bmatrix} 1 & 2 & -1 \end{bmatrix}, \begin{bmatrix} 2 & 2 & 1 \end{bmatrix}, \begin{bmatrix} 0 & 1 & 0 \end{bmatrix} \right\}$ ($\mathbf{v}_1$, $\mathbf{v}_2$, $\mathbf{v}_3$)

(c) $S = \left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 2 & 2 \\ 2 & 2 \end{bmatrix}, \begin{bmatrix} 1 & 3 \\ -2 & 0 \end{bmatrix} \right\}$ (A_1, A_2, A_3)

(d) $S = \left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 2 & 2 \\ 2 & 2 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} \right\}$ (A_1, A_2, A_3)

(e) $S = \left\{ (1+x)^2, (1+x^2), (1-2x+x^2) \right\}$ ($\boldsymbol{f_1}$, $\boldsymbol{f_2}$, $\boldsymbol{f_3}$)

5 **TRUE or FALSE** Questions:

(a) If $S = \left\{ \mathbf{v}_1, \mathbf{v}_2, \cdots, \mathbf{v}_k, \mathbf{0} \right\}$ is a set of vectors which contains the zero vector $\mathbf{0}$ (i.e., $\mathbf{0} \in S$), then S is always a linearly dependent set.

(b) If $S = \left\{ \mathbf{v}_1, \mathbf{v}_2, \cdots, \mathbf{v}_k \right\}$ is a **linearly dependent** set of vectors, then every subset of S is also linearly dependent.

(c) If $S = \left\{ \mathbf{v}_1, \mathbf{v}_2, \cdots, \mathbf{v}_k \right\}$ is a **linearly independent** set of vectors, then every subset of S is also linearly independent.