Hw 9

Sec 4.2

14. $M_{1,1}$ with the standard operation is a vector space

16. The set of all fifth degree polynomial with the standard operations is not a vector space.

$u = x^5$, $v = -x^5$ $\quad u+v = 0 \notin V$ (Prop 1 failed)

22. The set $\{(x,y) : x \geq 0,\ y \geq 0\}$ with the standard operations in $\mathbb{R}^2$ is not a vector space

$u = (1,1)$ $\quad -u = (-1,-1) \notin V$ (Prop 5 failed)

28. The set of all 3X3 matrices of the form $\begin{bmatrix} 1 & a & b \\ c & 1 & d \\ e & f & 1 \end{bmatrix}$ with the standard operations is not a vector space

$u = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ $\quad v = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ $\quad u+v = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 1 & 1 & 2 \end{bmatrix} \notin V$ (Prop 1 failed)

30. The set of all 2X2 nonsingular matrices with the standard operations is not a vector space.

$u = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ $\quad v = \begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$ $\quad u+v = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \notin V$ (Prop 1 failed)