Homework *Sec 2.7*

1. Explain why $S = \{(-4,\ 5),\ (0,\ 0)\}$ is ***not*** a basis for $\mathbb{R}^2$

2. Explain why $S = \{(1,\ 2),\ (1,\ 0),\ (0,\ 1)\}$ is ***not*** a basis for $\mathbb{R}^2$

3. Explain why $S = \{(1,\ 3,\ 0),\ (4,\ 1,\ 2),\ (-2,\ 5,\ -2)\}$ is ***not*** a basis for $\mathbb{R}^3$

4. Explain why $S = \{(7,\ 0,\ 3),\ (8,\ -4,\ 1)\}$ is ***not*** a basis for $\mathbb{R}^3$

5. Explain why $S = \{1,\ 2x,\ -4 + x^2,\ 5x\}$ is ***not*** a basis for $\mathbb{P}_2$

6. Explain why $S = \left\{\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix},\ \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}\right\}$ is ***not*** a basis for $M_{2\times 2}$

7. Determine whether the set $S = \{(4,\ -3),\ (5,\ 2)\}$ is a basis for $\mathbb{R}^2$

8. Determine whether the set $S = \{(1,\ 5,\ 3),\ (0,\ 1,\ 2),\ (0,\ 0,\ 6)\}$ is a basis for $\mathbb{R}^3$

9. Determine whether the set $S = \{(0,\ 3,\ -2),\ (4,\ 0,\ 3),\ (-8,\ 15,\ -16)\}$ is a basis for $\mathbb{R}^3$

10. Determine whether the set $S = \{1 - 2t^2 + t^3,\ -4 + t^2,\ 2t + t^3,\ 5t\}$ is a basis for $\mathbb{P}_3$

11. Determine whether the set $S = \left\{\begin{pmatrix} 2 & 0 \\ 0 & 3 \end{pmatrix},\ \begin{pmatrix} 1 & 4 \\ 0 & 1 \end{pmatrix},\ \begin{pmatrix} 0 & 1 \\ 3 & 2 \end{pmatrix},\ \begin{pmatrix} 0 & 1 \\ 2 & 0 \end{pmatrix}\right\}$ is a basis for $M_{2,2}$