Answers to even-numbered problems on Assignments 8, 9, and 10

Asst. 8

4.3 #8: (a) 7 (b) 0 (c) -9

4.3 #12: (a) 22 (b) 18 (c) 1

Asst. 9

4.4 #4: $\left\{ \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ -1 \\ 1 \end{bmatrix} \right\}$

4.4 #10: $\left\{ \begin{bmatrix} 1/\sqrt{3} \\ 1/\sqrt{3} \\ 1/\sqrt{3} \end{bmatrix}, \begin{bmatrix} -2/\sqrt{6} \\ 1/\sqrt{6} \\ 1/\sqrt{6} \end{bmatrix}, \begin{bmatrix} 0 \\ -1/\sqrt{2} \\ 1/\sqrt{2} \end{bmatrix} \right\}$

4.4 #28: $\begin{bmatrix} 2 \\ -3 \\ 1 \end{bmatrix} = \frac{4}{\sqrt{5}} \begin{bmatrix} 1/\sqrt{5} \\ 0 \\ 2/\sqrt{5} \end{bmatrix} + \frac{-3}{\sqrt{5}} \begin{bmatrix} -2/\sqrt{5} \\ 0 \\ 1/\sqrt{5} \end{bmatrix} + (-3) \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$

Asst. 10

5.2 #16: A basis for ker L is $\left\{ \begin{bmatrix} -2 \\ 0 \\ 1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \\ 0 \\ 0 \end{bmatrix} \right\}$. The dimension of ker L is 2.

A basis for range L is $\left\{ \begin{bmatrix} 1 \\ 1 \\ 2 \\ 0 \end{bmatrix}, \begin{bmatrix} -1 \\ 0 \\ -1 \\ -1 \end{bmatrix}, \begin{bmatrix} -1 \\ -1 \\ -1 \\ 0 \end{bmatrix} \right\}$. The dimension of range L is 3.