

HOMEWORK ASSIGNMENT 4 (due Friday, February 15th)

Section 1.8: 4

Section 3.1: 16, 22

Section 3.2: 2, 6, 8, 10

Section 3.3: 4, 6, 10, 12, 14, 16, 18, 20

In addition, do the following problems:

A: The matrix $S = \begin{bmatrix} 1/3 & 2/3 & 2/3 \\ 2/3 & 1/3 & -2/3 \\ 2/3 & -2/3 & 1/3 \end{bmatrix}$ is a reflection matrix. When a vector in \mathbf{R}^3 is multiplied by this matrix, the effect is to reflect the vector in a certain plane. Find an equation for that plane.

B: Let $V_1 = \begin{bmatrix} 3 \\ 4 \\ 1 \end{bmatrix}$, $V_2 = \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$, $V_3 = \begin{bmatrix} 3 \\ -4 \\ 1 \end{bmatrix}$. Let $\mathbf{b} = \begin{bmatrix} 150,000 \\ 100,000 \\ 50,000 \end{bmatrix}$.

Find scalars c_1 , c_2 , and c_3 such that $c_1V_1 + c_2V_2 + c_3V_3 = \mathbf{b}$.