1, Using Theorem 7.10 to determine wether the matrix is nonsingular. If it is,
use Theorem 7.11 to find its inverse.

$$\begin{pmatrix} 0 & -4 & 3 \\ 2 & -1 & 6 \\ 1 & -1 & 7 \end{pmatrix}$$

2, Compute the indicated power of the matrix, using the idea of Porblem 14.

$$A = \begin{pmatrix} 0 & -2 \\ 1 & 0 \end{pmatrix}; \; A^{43}$$

3, Find the eigenvalues of the matrix and for each eigenvalue a corresponding eigenvector.
   Check that eigenvectors associated with distinct eigenvalues are orthogonal.
   Find an orthogonal matrix that diagonalizes the Matrix.

(1) $\begin{pmatrix} 6 & 1 \\ 1 & 4 \end{pmatrix}$

(2) $\begin{pmatrix} 5 & 0 & 2 \\ 0 & 0 & 0 \\ 2 & 0 & 0 \end{pmatrix}$