Assignment 10 answers

Page 448, #10. $p(\lambda) = \lambda^3 - \lambda^2 - \lambda + 1$, eigenvalues are $1, -1$ (or $1, 1, -1$)

Page 448, #26. $\mathbf{y}_1(t) = e^{-3t}\begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix}, \mathbf{y}_2(t) = e^{-2t}\begin{bmatrix} 2 \\ -1 \\ 3 \end{bmatrix}, \mathbf{y}_3(t) = e^{t}\begin{bmatrix} 3 \\ 3 \\ 1 \end{bmatrix}$

Page 463, #2. $\mathbf{y}(t) = C_1 e^{2t}\begin{bmatrix} 2 \\ 1 \end{bmatrix} + C_2 e^{5t}\begin{bmatrix} 1 \\ 1 \end{bmatrix}$

Page 463, #24 $\mathbf{y}(t) = C_1 e^{t}\begin{bmatrix} \cos 2t + \sin 2t \\ -2\cos 2t \end{bmatrix} + C_2 e^{t}\begin{bmatrix} \cos 2t - \sin 2t \\ 2\sin 2t \end{bmatrix}$

An equivalent answer is

$\mathbf{y}(t) = C_1 e^{t}\begin{bmatrix} \sin 2t \\ -\sin 2t - \cos 2t \end{bmatrix} + C_2 e^{t}\begin{bmatrix} \cos 2t \\ \sin 2t - \cos 2t \end{bmatrix}$

Page 463, #42 $\mathbf{y}(t) = C_1 e^{3t}\begin{bmatrix} 1 \\ -2 \end{bmatrix} + C_2 e^{3t}\begin{bmatrix} t \\ 1 - 2t \end{bmatrix}$