

Due Thursday, April 14 at the beginning of class.

1. Transform the given equation/initial value problem into a system of first order equations.

(a) $y'' + 0.5y' + 2y = 3 \sin t$

(b) $y'' + 0.25y' + 4y = 2 \cos 3t$, $y(0) = 1$, $y'(0) = -2$.

2. If $A = \begin{pmatrix} 1+i & -1+2i \\ 3+2i & 2-i \end{pmatrix}$ and $B = \begin{pmatrix} i & 3 \\ 2 & 2i \end{pmatrix}$, find

(a) $3A - 2B$

(b) AB

(c) BA

3. If $A = \begin{pmatrix} 1 & 4 \\ -2 & 3 \end{pmatrix}$, find A^{-1} .

4. Find the determinant of the matrix $A = \begin{pmatrix} 3 & 2 & 4 \\ 2 & 0 & 2 \\ 4 & 2 & 3 \end{pmatrix}$.

5. Find eigenvalues and eigenvectors of the matrix

(a) $A = \begin{pmatrix} 1 & -2 \\ 3 & -4 \end{pmatrix}$

(b) $B = \begin{pmatrix} 2 & -5 \\ 1 & -2 \end{pmatrix}$

(c) $C = \begin{pmatrix} 2 & -1 \\ 3 & -2 \end{pmatrix}$