You are encouraged to work in groups of two to four on this assignment and make a single group submission. Each problem is worth 5 points. For full credit you must submit something.

1. Find the solution (in scalar form) of the initial-value problem $\dfrac{d^2y}{dt^2} + 5\dfrac{dy}{dt} + 6y = 0$, with

    $y(0) = 0,\ y'(0) = 2$.

2. Find the solution (in scalar form) of the initial-value problem $\dfrac{d^2y}{dt^2} + 2\dfrac{dy}{dt} + y = 0$, with

    $y(0) = 1,\ y'(0) = 1$.

3. Find the general solution to the linear system $\dfrac{d\mathbf{Y}}{dt} = \begin{pmatrix} 1 & 3 \\ 1 & -1 \end{pmatrix}\mathbf{Y}$, and then the particular

    solution satisfying $\mathbf{Y}(0) = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$.

4. Find the general solution to the linear system $\dfrac{d\mathbf{Y}}{dt} = \begin{pmatrix} -2 & 3 \\ -2 & 2 \end{pmatrix}\mathbf{Y}$, and then the particular

    solution satisfying $\mathbf{Y}(0) = \begin{pmatrix} -2 \\ 2 \end{pmatrix}$.