Differential Equation Python Quiz 5

1 (Complex Eigenvalues) For the system of equations below do the following:

$$\mathbf{x}' = \begin{pmatrix} -\frac{1}{2} & 1 \\ -1 & -\frac{1}{2} \end{pmatrix} \mathbf{x} \tag{1}$$

a) Find the eigenvalues of the given system (Numerically)

b) Find a fundamental set of a real-valued solutions of the system (Symbolic solution)

c) Plot direction fields and a phase portrait

d) Plot graphs of components of typical solutions. First, do it Numerically, and plot 2 solutions. Then do it symbolically and plot 4 solutions.

Upload your Python script as "StudentID_python_quiz5.py" to new E3 before Monday 12:00 AM.
No late submissions will be possible.