

Problem 1 - 5 Points

Consider the matrix

$$A = \begin{bmatrix} 4 & -2 \\ 2 & -1 \\ 0 & 0 \end{bmatrix}$$

1. Find all singular values of the matrix.
2. Find the singular value decomposition of the matrix.

Problem 2 - 5 Points

Consider the following ODE:

$$y''(t) + 4y'(t) + 4y = 0$$

1. Find the general solution to the above equation.
2. Find the solution of the equation for $y(0) = 1, y'(0) = 0$.