HW08

express the given system of differential equations in matrix notation.

$$\begin{aligned} x' &= x + y + z, \\ y' &= 2z - x, \\ z' &= 4y \end{aligned}$$

express the given system of higherorder differential equations as a matrix system in normal form.

$$\begin{aligned} x'' + 3x + 2y &= 0\,, \\ y'' - 2x &= 0 \end{aligned}$$

find all solutions to the system using the Gauss–Jordan elimination algorithm

$$\begin{aligned} x_1 + 2x_2 + x_3 &= -3\,, \\ 2x_1 + 4x_2 - x_3 &= 0\,, \\ x_1 + 3x_2 - 2x_3 &= 3 \end{aligned}$$

Find: **(a) AB .** **(b) BA .**

Let $\mathbf{A} := \begin{bmatrix} 2 & 1 \\ 0 & 4 \\ -1 & 3 \end{bmatrix}$ and $\mathbf{B} := \begin{bmatrix} 1 & 1 & -1 \\ 0 & 3 & 1 \end{bmatrix}$.

compute the inverse of the given matrix

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 0 & 1 & 1 \end{bmatrix}$$