Problem 1

Using the method given in class, find the inverse of

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

Problem 2

Using the method given in class, find the inverse of

$$A = \begin{bmatrix} 0 & -1 & 3 \\ 0 & -4 & 1 \\ 2 & -1 & 3 \end{bmatrix}$$

Problem 3

Express the matrices from problems 1 and 2 as a product of elementary matrices.

Problem 4

Use the result from problem 1 to solve the matrix equation $AX = B$ where $X = \begin{bmatrix} x \\ y \end{bmatrix}$, and $B = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$.

Problem 5

Use the result from problem 2 to solve the matrix equation $AX = B$ where $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$, and $B = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$.

Problem 6

Show that a square matrix with a zero row is not invertible.