Problem 1. (3 points) Use Gauss-Jordan elimination method to solve (if solution exists) the system of equations:

\[
\begin{align*}
10x_1 + 15x_2 &= 4 \\
3x_1 + 2x_2 &= -2
\end{align*}
\]

Problem 2. (2 points) Use inverse of the coefficient matrix in question (1) to solve the system and show that your answer is same in both questions.
Problem 3 (3 points) Find rank of the given matrix:

\[
A = \begin{pmatrix}
  1 & 1 & 0 \\
  1 & 0 & 4 \\
  1 & 4 & 1
\end{pmatrix}.
\]