

1. (3 pts.) Find the inverse of the following matrix.

$$\begin{bmatrix} 1 & 2 \\ 1 & 4 \end{bmatrix}$$

2. (2 pts.) Solve the following system of linear equations using the fact that

$$\begin{bmatrix} 5 & -2 \\ -2 & 1 \end{bmatrix}^{-1} = \begin{bmatrix} 1 & 2 \\ 2 & 5 \end{bmatrix} .$$

$$\begin{cases} 5x - 2y = 3 \\ -2x + y = 4 \end{cases}$$

3. (3 pts.) Use the Gauss-Jordan method to calculate the inverse of the following matrix.

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

4. (2 pts.) Solve the following system of linear equations

$$\begin{cases} x + 2y + 4z = -2 \\ y + z = 4 \\ z = 3 \end{cases}$$