

1. Let $A = \begin{bmatrix} -5 & -3 & -15 \\ 1 & 0 & 2 \\ 2 & 1 & 6 \end{bmatrix}$.

(a) Compute A^{-1} .

(b) Use (a) to solve the system

$$\begin{aligned} -5x_1 - 3x_2 - 15x_3 &= 3 \\ x_1 + 0x_2 + 2x_3 &= 2 \\ 2x_1 + x_2 + 6x_3 &= 1 \end{aligned}$$

2. Find all solutions to

$$\begin{aligned} x_1 - x_2 + x_3 &= 2 \\ -2x_1 + 6x_2 - 3x_3 &= 5 \end{aligned}$$

3. Find all eigenvector/eigenvalue pairs for the following matrices.

(a) $\begin{bmatrix} 7 & 8 \\ -4 & -5 \end{bmatrix}$.

(b) $\begin{bmatrix} 4 & -3 \\ 6 & -2 \end{bmatrix}$.

(c) $\begin{bmatrix} 1 & 2 & 0 \\ 0 & -1 & 0 \\ -4 & 4 & 3 \end{bmatrix}$