1. Suppose $A$ is a $3 \times 3$ invertible matrix with columns $A = [v_1|v_2|v_3]$.

Consider the linear system $A \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = v_1$. Use Cramer’s rule to find $x_2$ and $x_3$.

2. Suppose $A$ is an $n \times n$ matrix with integer entries and $\det A = 1$. Does $A^{-1}$ also have only integer entries?

Hint: use the formula $A^{-1} = \frac{1}{\det A} \text{adj}(A)$ to find the inverse.

3. Find the volume of the ellipsoid $\frac{x^2}{25} + \frac{y^2}{4} + \frac{z^2}{9} = 1$ by using a linear transformation to stretch the unit sphere.