Problem 1

Compute the determinant of the following matrix: $A = \begin{pmatrix} 1 & 2 & -1 & 3 \\ 4 & -1 & 2 & 2 \\ 1 & 3 & -4 & 5 \\ 2 & 4 & 1 & 4 \end{pmatrix}$.

Problem 2

Use Cramer's rule to solve the following system of equations:

$$x_1 + x_2 + x_3 - x_4 = 0$$
$$x_1 + 2x_2 - x_3 - x_4 = 0$$
$$3x_1 - x_2 + 2x_3 + 2x_4 = 3$$
$$5x_1 + 7x_2 + x_3 + x_4 = 0$$