1. Give the size of the matrix: $\begin{pmatrix} 2 & -1 \\ 8 & 1 \\ -4 & 6 \\ 9 & -1 \\ 0 & 3 \end{pmatrix}$

2. Solve the system using matrix notation and showing each step of the Gaussian Elimination Process. Express the solution set in vector notation.

$$\begin{aligned} -x - 2y - 3z &= 0 \\ w + x + 4y + 4z &= 7 \\ w + 3x + 7y + 9z &= 4 \\ -w - 2x - 4y - 6z &= 6 \end{aligned}$$

3. The vector is in the set What values for the parameters produce that vector?

$$\begin{pmatrix} -2 \\ 29 \\ 4 \\ 23 \end{pmatrix}, \left\{ i \begin{pmatrix} 2 \\ 4 \\ -1 \\ 4 \end{pmatrix} + j \begin{pmatrix} -2 \\ 7 \\ 2 \\ 5 \end{pmatrix} \mid i, j \in \mathbb{R} \right\}$$

4. i. Describe all functions $f(x) = ax^2 + bx + c$ such that $f(-1) = 1$ and $f(-3) = 5$

ii. Describe all functions $f(x) = ax^2 + bx + c$ such that $f(-1) = 1$