QUIZ 3

1. **Find the parabola $y = A + Bx + Cx^2$ that passes through the three points $(1, 1), (2, -1)$ and $(3, 1)$.**

   - By elimination:

$$\begin{array}{rcl} A + B + C = 1 & & (1) : A + B + C = 1 \\ A + 2B + 4C = -1 & \mapsto & (2) - (1) : B + 3C = -2 \\ A + 3B + 9C = 1 & & (3) - (1) : 2B + 8C = 0 \end{array} \mapsto$$

$$\begin{array}{r} A + B + C = 1 \\ B + 3C = -2 \\ (3) - 2 * (2) : 2C = 4 \end{array}$$

     The final system is upper triangular. The parabola is $y = 7 - 8x + 2x^2$

   - By augmented matrix

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 4 & -1 \\ 1 & 3 & 9 & 1 \end{bmatrix}, \begin{array}{l} \\ R_2 - (1/1)R_1 \to \\ R_3 - (1/1)R_1 \to \end{array}, \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 3 & -2 \\ 0 & 2 & 8 & 0 \end{bmatrix}$$

$$R_3 - (2/1)R_2 \to \quad , \begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 3 & -2 \\ 0 & 0 & 2 & 4 \end{bmatrix}$$

     The final system is upper triangular. The parabola is $y = 7 - 8x + 2x^2$