Solve the following system using partial Gaussian elimination,

with maximal pivoting:
$$\begin{cases} 4x + z & = 5 \\ x + 4y + z & = 3 \\ x + 4z & = -10 \end{cases}$$

a) Establish the error bound for the approximation of $f(x) = e^x$ by Taylor polynomial of 8-th degree $(T_8 f)(x)$ on the interval $|x| \leq 1$, with x_0 being the center of the interval.

b) Write the expression of Taylor polynomial $(T_8 f)(x)$ from a).

Find the coefficients A, B and C of the following quadrature formula:

$$\int_0^1 f(x)dx = Af'(0) + Bf''(0) + Cf(1) + R(f)$$

Solve the following using partial Gaussian elimination, with maximal pivoting:

$$\begin{cases} 2x_1 + 4x_2 - 2x_3 = 2 \\ 4x_1 + 9x_2 - 3x_3 = 8 \\ -2x_1 - 3x_2 + 7x_3 = 10 \end{cases}$$

Find the polynomial interpolating the function $f(x) = e^{-x^2}$ at the nodes $x_0 = -1$ double, $x_1 = 0$ double and $x_2 = 1$ double.