1. Briefly explain what the following types of errors measure and how they are affected by the choice of algorithm and its implementation.
   
a) Data propagation error.

b) Computation error.
2. Briefly discuss the difference between stability and sensitivity. What do they measure and what are they influenced by?

3. The equation \((2 + x^2) - (2x/sin(x))\) suffer from loss of significance (cancellation) for \(x \to 0\). Provide a reformulation that avoids this problem.
4. For each of the following fixed point functions determine whether fixed point iteration would converge near the indicated solution.

   a) \( g(x) = \frac{2}{x^2} \), Fixed point: \( \sqrt{2} \)

   b) \( g(x) = 6 - x^2 \), Fixed point: 2

5. Illustrate the operation of the secant method for root finding for a single equation in one variable by showing two iterations on the function \( f(x) = x^2 - 2 \) starting with the two initial points \( x_0 = 4, x_1 = 3 \).
6. Briefly compare some of the key attributes of the interval bisection method and Newton’s method for root finding, detailing their respective advantages and disadvantages. Also briefly discuss how this motivates hybrid methods that combine them.

7. Perform Gaussian Elimination on the following system of equations.

\[
\begin{align*}
2x + y + 3z &= 0 \\
6x + 4y + 7z &= 2 \\
4x + 4y + 7z &= 14
\end{align*}
\]
8. The Multivariate Newton method solves a system of nonlinear equations by iteratively solving a sequence of linear systems of equations. List the basic operation steps of the Multivariate Newton method.
9. Polynomial interpolation can be achieved using different sets of polynomial basis functions. Discuss what some of the differences in terms of computation complexity and stability of the solution algorithm for coefficient finding are between Monomial basis, Lagrange basis, and Newton basis.

10. Derive the integrating polynomial for the data points (0, 2), (2, 7), (4, -2) using the Lagrange basis.
11. Briefly discuss why the choice of data points can change whether an interpolation function converges to the correct function as data points increase.

12.* Provide a Hermite interpolation for the data points (1, 2), (2, 4), (3, −2).