EXERCISE 1

- Write two Matlab functions:
  - `[x,its] = bisection(f,a,b,tol,maxits)`, that implements the bisection method.
  - `[x,its] = newton(f,derf,x0,tol,maxits)`, that implements the Newton method.

  Implement suitable stopping criteria for the two methods. Use both functions to solve the equation $e^x + cos(x) - 2 = 0$, whose exact solution is $x = 0$ (choose appropriately the initial guess $x_0 \neq 0$ or the initial interval). Plot the error $|x_k - 0|$ vs k. Repeat the same for solving $e^x - cos(x) - 2 = 0$ whose solution is not known analytically and can be approximated by the previous methods with small tolerance or by `fsolve(@(x) exp(x)-cos(x)-2,0)` which calls the MATLAB solver.

- Use both methods to solve the equation $\sqrt[3]{x - \pi} = 0$ (use the function `nthroot` to compute cubic roots). Plot the error $|x_k - \pi|$ vs k. Discuss the results.