HOMEWORK 4. NUMERICAL METHODS

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(1) Implement the following algorithms: Bisection, Newton, ans Secant methods.
(2) Use the previous methods to compute a zero of the following functions:

$$\begin{aligned} e^x + 2^{-x} + 2\cos x - 6 &= 0,\ 1 \leq x \leq 2 \\ \ln(x-1) + \cos(x-1) &= 0,\ 1.3 \leq x \leq 2 \end{aligned}$$

(3) The fourth-degree polynomial

$$f(x) = 230x^4 + 18x^3 + 9x^2 - 221x - 9$$

has two real zeros, one in $[-1, 0]$ and the other in $[0, 1]$. Attempt to approximate these zeros to within 10^{-6} using the algorithms implemented in exercise (1). Use the endpoints of each interval as the initial approximations in the Bisection and Secant algorithms and the midpoints as the initial approximation for the Newton Method.