

**3.16** Write a MATLAB user-defined function that solves for a root of a nonlinear equation  $f(x) = 0$  using the bisection method. Name the function `Xs = BisectionRoot(Fun, a, b)`. The output argument `Xs` is the solution. The input argument `Fun` is a name for the function that calculates  $f(x)$  for a given  $x$  (it is a dummy name for the function that is imported into `BisectionRoot`); `a` and `b` are two points that bracket the root. The iterations should stop when the tolerance in  $f(x)$  (Eq. (3.5)) is smaller than 0.000001. The program should check if points `a` and `b` are on opposite sides of the solution. If not, the program should stop and display an error message. Use `BisectionRoot` to solve Problem 3.2.