Aerospace Computing

Assignment 5

Due: 2/16/24

1. Write Python functions for the following text algorithms and add them to your personal numerical analysis module.
   a. rootsearch
   b. bisection
   c. newtonRaphson
   d. newtonRaphson2
2. For the $\theta - \beta - M$ relation relating shock angle, flow deflection angle, and Mach number, write a function so that given any two parameters it solves for the third. Use the newtonRaphson algorithm as the root finding approach when needed.
   a. Demonstrate your approach by computing the solutions about a 5° wedge at Mach 1.8. Use your shock angle result to demonstrate the other 2 problems, i.e., shock angle and Mach number, shock and deflection angles.
3. Solve text Problem Set 4.1 number 19.
4. Solve text Problem Set 4.2 numbers:
   a. 3
   b. 10