Project 1. Finding all zeros of a polynomial Due on March 15

Make an algorithm to compute numerically all complex zeros of a polynomial. This algorithm should implement the methods such as

(1) Complex arithmetics
(2) Good initial approximation
(3) Horner's method
(4) Newton's method
(5) Deflation
(6) Refinement

Inputs:
(1) tolerance $= 10^{-8}$; Newton's method iterates until $|\frac{x_n - x_{n-1}}{x_n}| <$ tolerance.
(2*) Temporarily, use the polynomial in page 98 of your text book

$$f(x) = 16x^4 - 40x^3 + 5x^2 + 20x + 6,$$

so that you may debug your program with the known solutions. Final input polynomials will be given one day before the due date.

(2) Final Inputs; Three polynomial of degree 4 will be given in March 14 when one day before the due date.

Outputs: For each given input polynomial with order n make an output table, where p_i for $1 \le i \le n$ denotes the final i-th computed root by Newton's method without refinement and r_i for $1 \le i \le n$ denotes the i-th final computed root through through refining process with the initial guess of p_i already obtained. Thus, the output table contains very simple final results only.

Turn in a printed copy of your source code and your output tables. Each subprogram should contain some comments to explain what the inputs and the outputs are and what the purpose of the subprogram is. Briefly, write down some comments about your results.

Table 1 (Table 2, Table 3)

i	p_i	r_i
1	????e??? + ????e??? i	????e??? + ????e??? i
2		
⋮		
n		