platform

python 3.7 + numpy

how to run

```
sh run.sh

# question 1 (b)
python PolynomialEvaluation.py

# question 2 (d)
python PolynomialMultiplication.py

# question 4 (b)
python PolynomialRoots.py

# question 3 (b)
python MullerMethod.py
```

result

```
(py36) ➜  Assignment5 git:(master) ✗ sh run.sh

Assignment 5 CS577

++++++++++++ question 1 (b) ++++++++++++++
evaluation at 1.414214
(-0.015041687198390719, -34371.01227099436)
evaluation at (1+2j)
((98175-343400j), (-446260-177000j))


++++++++++++ question 2 (d) ++++++++++++++
==== p ====
x^0    -6.8
x^1    10.8
x^2    -10.8
x^3    7.4
x^4    -3.7
x^5    2.4
x^6    -70.1
x^7    1
==== q ====
x^0    51200
```

```
x^1    0
x^2    -39712
x^3    104.2
x^4    7392
x^5    0.614
x^6    -170
x^7    0
x^8    1
=== p*q ===
x^0    -348160.0
x^1    552960.0
x^2    -282918.4
x^3    -50718.16
x^4    190309.36
x^5    -92284.74
x^6    -3520085.49
x^7    8363.83
x^8    2758544.62
x^9    -30525.09
x^10    -517455.33
x^11    6948.36
x^12    11913.91
x^13    -167.6
x^14    -70.1
x^15    1.0

++++++++++++ question 3 (b) ++++++++++++++
 * root of p(x)
-0.04531644762684002
(0.12720367835887453+0.8867114258752085j)
(0.12720367835887453-0.8867114258752085j)
 * real root of p(x)
[-0.04531644762684002]

 * root of q(x)
(-0.007719280999608855+2.9683186117467355j)
(-0.007719280999696092186-2.9683186117467355j)
2.9878131414382425
-3.0035373701366987
 * real root of p(x)
[2.9878131414382425, -3.0035373701366987]

++++++++++++ question 4 (b) ++++++++++++++
=== roots of p(x) ===
(1-1j)
(1+1j)
(1.7+0j)
1.41421356j
-1.41421356j
=== roots of q(x) ===
(0.32100086+0j)
(1.57647054+0j)
(1.18667446+0j)
(1.92745775+0j)
(0.04348657+0j)
(0.26742188+0j)
```

```
(-0.12541056+0j)
(-1.90209383+0j)
(-2.45188666+0j)
```