F14106155 張言薰 數值方法 HW4

1.

```
(ipcvdl) (base) iris@Yen-Hsun-2 F14106155_numerical_hw4 % /User
Library/CloudStorage/GoogleDrive-iriscdrive@gmail.com/我的雲端硬
te.py

(a) Composite Trapezoidal Rule: 0.396147592214901

(b) Composite Simpson's Rule:   0.385663596023745

(c) Composite Midpoint Rule:    0.364695603641432
```

2.

```
(ipcvdl) (base) iris@Yen-Hsun-2 F14106155_numerical_hw4 % /Users/iris/anaconda3/envs/ip
Library/CloudStorage/GoogleDrive-iriscdrive@gmail.com/我的雲端硬碟/NCKU/大四下/數值/F14
n.py

Exact value:              0.192259357732796

Gaussian Quadrature (n=3):  0.192259377256879 , Error: 1.95e-08

Gaussian Quadrature (n=4):  0.192259357804156 , Error: 7.14e-11
```

3.

```
(ipcvdl) (base) iris@Yen-Hsun-2 F14106155_numerical_hw4 % /Users/iris/anaconda
Library/CloudStorage/GoogleDrive-iriscdrive@gmail.com/我的雲端硬碟/NCKU/大四下
e.py

(a) Simpson's Rule (n=4, m=4)  = 0.511987544012125

(b) Gaussian Quadrature (n=3, m=3)  = 0.511865539945296

(c) Exact value  = 0.511844635310913
    Simpson's Rule Error  = 1.429087012125851e-04
    Gaussian Quadrature Error  = 2.090463438308987e-05
```

4.

```
(ipcvdl) (base) iris@Yen-Hsun-2 F14106155_numerical_hw4 %
Library/CloudStorage/GoogleDrive-iriscdrive@gmail.com/我的
.py

(a) Approximation (n=4) = 1.069660008255300

(b) Approximation (n=4) = 0.274481619378042
```