

數值方法作業 HW8

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Q1:

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● chenyian@chenyiandeMacBook-Air-2 F54091196_numerical_hw8
Desktop/F54091196_numerical_hw8/question1.py
=== Least Squares Approximation Results ===
(a) Quadratic:  $y = 6.6912x^2 + -1.8837x + 3.0864$ 
    Error = 0.0052
(b) Exponential:  $y = 21.4445 * e^{(0.3985x)}$ 
    Error = 94.9830
(c) Power:  $y = 6.2390 * x^{2.0196}$ 
    Error = 0.0117
```

Q2:

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Least Squares Polynomial Approximation (degree 2):
P2(x) = 0.4983 + 0.3263x + -0.2326x^2
L2 Error = 0.003241
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Q3:

```
(a) S_4(x) coefficients
a_0 = 0.4592
a_1 = -0.1468    b_1 = 0.2323
a_2 = 0.0546    b_2 = -0.1249
a_3 = -0.0389   b_3 = 0.0829
a_4 = 0.0335    b_4 = -0.0609

(b)
Inregal ≈ 0.2296

(c)
Inregal ≈ 0.2232

Compare with (b):
Absolute error = 0.0064, Relative error = 2.8482%

(d)
Error ≈ 0.5056
```