

## 8\_1

```

1a. 二次多項式 ( $y = ax^2 + bx + c$ )
係數:  $a = 6.691184$ ,  $b = -1.883746$ ,  $c = 3.086393$ 
誤差 (SSE): 0.005246

1b. 指數形式 ( $y = be^{(ax)}$ )
係數:  $a = 0.398495$ ,  $b = 21.444544$ 
誤差 (SSE): 94.983021

1c. 冪函數形式最小平方逼近 ( $y = bx^a$ )
係數:  $a = 2.019634$ ,  $b = 6.238952$ 
誤差 (SSE): 0.011721

```

## 8\_2

```

二階多項式:  $p(x) = -0.232296 x^2 + 0.323568 x + 0.498212$ 
誤差 (近似積分): 0.003253

```

## 8\_3

```

a. Fourier Coefficients:
a0 = 0.242447
a1 = -0.171361, b1 = 0.230343
a2 = 0.078811, b2 = -0.117717
a3 = -0.064587, b3 = 0.072355
a4 = 0.059973, b4 = -0.047353

b. Integral of S4(x) over [0,1]: 0.12122367561388495
c. Integral of  $f(x) = x \sin(x^2)$  over [0,1]: 0.22984884706593015
   Difference: 0.1086251714520452
d. Discrete least squares error E(S4): 0.6275094552105454

```