## 问题1

a：

|  |  |  |
| --- | --- | --- |
| x | f(x) | f’(x) |
| 1.1 | 9.025013 |  |
| 1.2 | 11.02318 |  |
| 1.3 | 13.46374 |  |
| 1.4 | 16.44465 |  |

计算过程：

b:

|  |  |  |
| --- | --- | --- |
| x | f(x) | f’(x) |
| 8.1 | 16.94410 | 3.09205 |
| 8.3 | 17.56492 | 3.11615 |
| 8.5 | 18.19056 | 3.139975 |
| 8.7 | 18.82091 | 3.163525 |

计算过程：

## 问题2

由①②消去h2可得：

由②③消去h2可得：

由④⑤消去h4可得：

## 问题3

a：

对x求导：将x0=x0-2h,x1=x0-h,x2=x0,x3=x0+h,x4=x0+2代入可得：

化简可得：

b:

当且仅当：

所以：

## 问题4

a: Trapezoidal rule：

Simpson’s rule:

b: Trapezoidal rule：

Simpson’s rule:

c: Trapezoidal rule：

Simpson’s rule:

d: Trapezoidal rule：

Simpson’s rule:

**问题5**

a;

b:

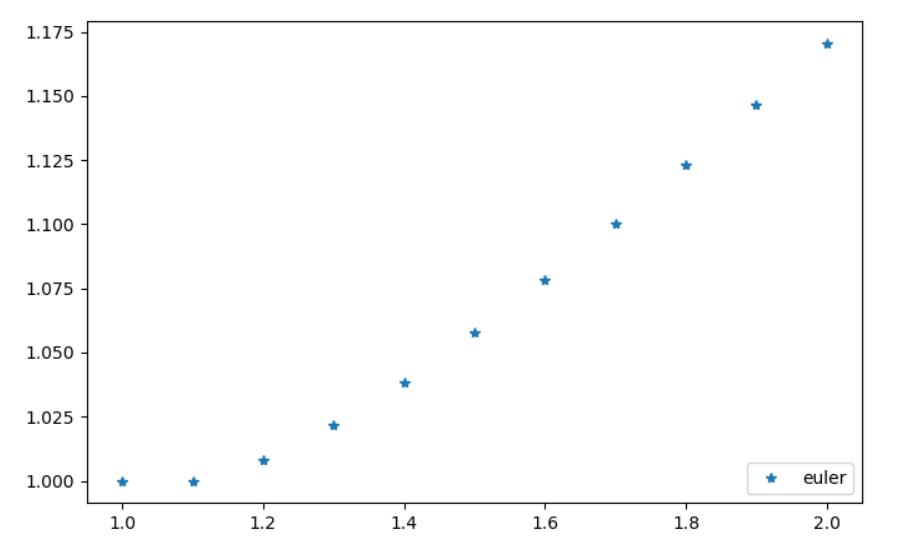
c:

d：

**问题6**

a:

|  |  |
| --- | --- |
|  |  |
| 1.0 | 1.0 |
| 1.1 | 1.0 |
| 1.2 | 1.0082644628099173 |
| 1.3 | 1.0216894717270375 |
| 1.4 | 1.038514734248178 |
| 1.5 | 1.0576681921408762 |
| 1.6 | 1.0784610936317547 |
| 1.7 | 1.100432164699466 |
| 1.8 | 1.1232620515812632 |
| 1.9 | 1.1467235965295264 |
| 2.0 | 1.1706515695646647 |

b:

|  |  |
| --- | --- |
|  |  |
| 1.0 | 0 |
| 1.2 | 0.2 |
| 1.4 | 0.4388888888888889 |
| 1.6 | 0.721242756361804 |
| 1.8 | 1.0520380316573712 |
| 2.0 | 1.4372511475238394 |
| 2.2 | 1.884260805329153 |
| 2.4 | 2.4022695885615417 |
| 2.6 | 3.002837164557213 |
| 2.8 | 3.700600704932798 |
| 3.0 | 4.5142774281767 |

