Assignment 3

Chuan Lu, 13300180056, chuanlu13@fudan.edu.cn

Code can be obtained at https://github.com/orcuslc/Learning/

Problem 1. Display the Runge Phenomenon.

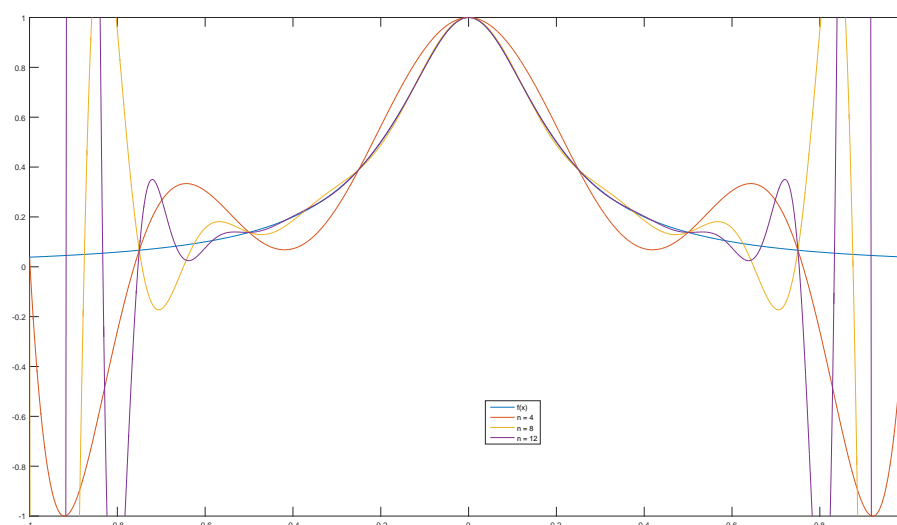*Solution.* The result is as follows.

Figure 1: The Runge Phenomenon

Problem 2. Calculate the integral of x^n with Newton-Cotes Formula.

Solution. The result is shown as the table.

	Exact Value	medium formula	trapezium formula	Simpson formula	3/8 formula	Cotes formula
x^1	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000
x^2	0.3333	0.2500	0.5000	0.3333	0.3333	0.3333
x^3	0.2500	0.1250	0.5000	0.2500	0.2500	0.2500
x^4	0.2000	0.0625	0.5000	0.2083	0.2037	0.2000
x^5	0.1667	0.0313	0.5000	0.1875	0.1759	0.1667
x^6	0.1429	0.0156	0.5000	0.1771	0.1584	0.1432
x^7	0.1250	0.0078	0.5000	0.1719	0.1471	0.1263

Table 1: Integral of x^n using Newton-Cotes Formula