

COMPUTER SCIENCES FOR ENGINEERS

EXERCISES – NOVEMBER 5, 2020

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Calculate the tasks to four decimal places.

- 1) The tabular below shows the values of function f at some points.

| | | | | | | | | | |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| x | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| $f(x)$ | 1.5 | 2.2 | 3.6 | 3.9 | 4.2 | 4.4 | 4.1 | 3.6 | 2.9 |

Give an approximation the value of the integral on the interval $[-2, 6]$ by trapezoidal rule.

Also calculate the error of the approximation by ex-post error estimation.

- 2) Approximate the value of the following integral by trapezoidal rule, when the number of the subintervals is 8.

$$\int_1^5 \ln(x^3) dx$$

How many parts must the interval be divided so that the approximation error is less than 0.001?