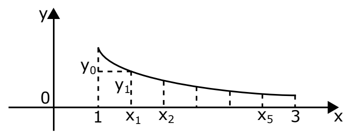
Example 0.1.

Solution.

1. By rectangular rule:



[1]

$$A \cong h(\frac{3}{4}+\frac{3}{5}+\frac{1}{2}+\frac{3}{7}+\frac{3}{8}+\frac{1}{3})$$
$$=\frac{1}{3}(0,750+0,600+0,500+0,429+0,375+0,333)$$
$$=\frac{1}{3}\times 2,987=\underline{0,996} \quad \text{(lower sum)}$$
$$A=h(1,000+0,750+0,600+0,500+0,429+0,375)$$
$$=\frac{1}{3}\times 3,654=\underline{1,218} \quad \text{(upper sum)}$$

The average of these two results is $\underline{1{,}107}$.

2.

$$A=\frac{h}{2}(1+2\times 0,750+2\times 0,600+2\times 0,500+2\times 0,429+2\times 0,375+0,333)$$
$$=\frac{1}{6}\times 6,641=\underline{1,107}$$

3. By Simpson's rule: It is applicable since n is even.

$$A=\frac{h}{3}(1+4\times 0,750+2\times 0,600+4\times 0,500+2\times 0,429+4\times 0,375+0,333)$$
$$=\frac{1}{9}\times 9,791=\underline{1,088} \quad \text{Then } \ln 3\cong 1,088.$$

In the same way $\ln 2$ can be computed and one gets

$$\ln 2=\int_1^2 \frac{\mathrm{d}x}{x}\cong \underline{0,69}$$

Example 0.2. For the function given in tabular form

x_i	0	1/4	1/2	3/4	1
$f(x_i)$	1	17/16	5/4	25/16	2

evaluate the definite integral

$$B=\int_0^1 f(x)\,\mathrm{d}x$$

approximately by SIMPSON's rule with n necessarily equal to 2 or 4.

[1]Corrected the figure: In the question in previous page the integral is from 1 to 3 but in the figure it is from 1 to 6

Solution.
Taking $n = 4$, we have $h = 1/4$, and

$$\begin{aligned} B &= \frac{1}{12}(1,000 + 4 \times \frac{17}{16} + 2 \times \frac{5}{4} + 4 \times \frac{25}{16} + 2) \\ &= \frac{1}{12} \times 16,000 = \underline{1,333} \end{aligned}$$

[2]

Note: When a function is given in tabular form and $x_i - x_{i+1}$

[2] The place of the bracket corrected. B=(1/12... to B=1/12(...