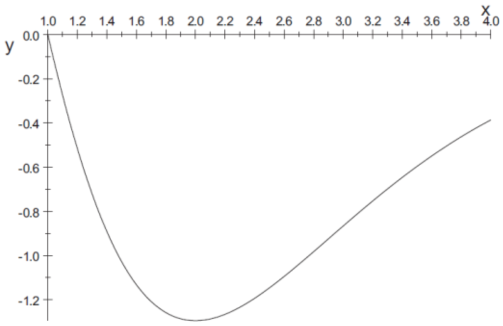
## SAYISAL İNTEGRAL ÖRNEK

A) $I=\int_1^4 \frac{13(x-x^2)}{\sqrt{e^{3x}}}dx$ integralini h=0.5 olmakla **Simpson Yöntemi** yardımı ile hesaplayınız.




Bu durumda $n=\frac{b-a}{h}=\frac{4-1}{0.5}=\frac{3}{0.5}=6$ olur

Ve ya $I=\int_1^4 \frac{13(x-x^2)}{\sqrt{e^{3x}}}dx$ n=6 olmakla hesaplayınız . Bu durumda $h=\frac{b-a}{n}=\frac{4-1}{6}=\frac{3}{6}=0.5$ olur.

| i | Xi | | | Fi= F(Xi) | |
|---|---|---|---|---|---|
| **0** | $x_0$ | = | 1 | $f_0=$ 0 | |
| | $x_{1/2}$ | | | $f_{1/2}=$ 0.623 | ** |
| **1** | $x_1$ | = | 1.5 | $f_1=$ −1.0276 | |
| | $x_{3/2}$ | | | $f_{3/2}=$ -1.236 | ** |
| **2** | $x_2$ | = | 2 | $f_2=$ −1.2945 | |
| | $x_{5/2}$ | | | $f_{5/2}=$ -1.2511 | ** |
| **3** | $x_3$ | = | 2.5 | $f_3=$ −1.1465 | |
| | $x_{7/2}$ | | | $f_{7/2}=$ -1.0112 | ** |
| **4** | $x_4$ | = | 3 | $f_4=$−0.8665 | |
| | $x_{9/2}$ | | | $f_{9/2}=$ -0.7259 | ** |
| **5** | $x_5$ | = | 3.5 | $f_5=$ −0.5969 | |
| | $x_{11/2}$ | | | $f_{11/2}=$ -0.4835 | ** |
| **6** | $x_6$ | = | 4 | $f_6=$ −0.3867 | |

## Simpson Yöntemi

$$\int_1^4 \frac{13\left(x-x^2\right)}{\sqrt{e^{3x}}}dx \cong \frac{1}{3}h\left(f\left(x_0\right)+2\sum_{i=1}^{n-1} f\left(x_i\right)+4\sum_{i=1}^{n} f\left(\overline{x}_i\right)+f\left(x_n\right)\right)$$

$$=\frac{1}{6}*\left(\begin{array}{c} 0+2*(-1.0276-1.2945-1.1465-0.8665-0.59691) \\ +4*(-0.623-1.236-1.2511-1.0112-0.72581-0.4835)-0.38669 \end{array}\right)=-5.2622$$