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SUBMITTED TO

SHOMAILA

QUIZ

1st

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(1)

① Estimate $\int_{0.5}^{1.3} e^{x^2}$

Use trapezoidal rule a strip with of 0.2.

Solution: As we know that

$$a = 0.5, \quad b = 1.3, \quad \Delta x = 0.2$$

Now divide the interval into 0.2 subintervals with the following endpoints.

$$a = 0.5, 0.7, 0.9, 1.1, 1.3 = b$$

$$f(x_0) = f(0.5) = 1.28$$

$$2f(x_1) = 2f(0.7) = 3.265$$

$$2f(x_2) = 2f(0.9) = 4.496$$

$$2f(x_3) = 2f(1.1) = 6.707$$

$$f(x_4) = f(1.3) = 5.419$$

$$\int_{0.5}^{1.3} e^{x^2} = \frac{\Delta x}{2} \left[f(x_0) + 2f(x_1) + 2f(x_2) + 2f(x_3) + 2f(x_4) \right]$$

putting the values

$$= \frac{0.2}{2} \left[1.28 + 3 \cdot 2.65 + 4.496 + 6.707 + 5.419 \right]$$

$$\int_{0.5}^{1.3} e^{x^2} = 2.117$$

Answer

Estimate $\int_{0.5}^{1.3} e^{x^2}$

Use Simpsons Rule a strip

width of 0.1.

SOLUTION:

By using Simpsons Rule;

$$a = 0.5, \quad b = 1.3, \quad \Delta x = 0.1$$

Now divide the interval into 0.1

Sub intervals with the following

ends point.

$$2n = \frac{b-a}{\Delta x}$$

$$2n = \frac{1.3 - 0.5}{0.1}$$

$$\boxed{n = 4}$$

0.1	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3
$f(x)$	1.28	1.43	1.63	1.89	2.24	2.71	3.35	4.22	5.41

$$A = \frac{\Delta x}{3} \left[f(x_0) - 4f(x_2) + f(x_3) + f(x_5) + f(x_8) \right. \\ \left. + 2f(x_4) + f(x_6) + f(x_8) \right]$$

putting the values

$$A = \frac{0.1}{3} \left[1.28 + 4(1.43 + 1.39 + 2.71 + 4.22) \right. \\ \left. + 2(1.63 + 2.24 + 3.35 + 5.41) \right]$$

$$A = \frac{0.1}{3} [1.28 + 41 + 14.44 + 5.41]$$

$$A = 2.071$$