MATH 100, Fall 2021
Tutorial Worksheet
Tutorial Section (T01, T02 etc) T11
Tutorial Instructor Name: Marcus Xie
Question Number Attempted (Q1, Q2, etc) Q4

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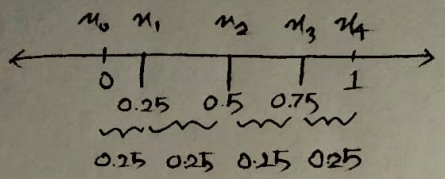
Today's Date:

Q1: Given, the domain of integration is $[0, 1]$

(1) Dividing it into 4 intervals, we get,



$\Delta x = 0.25 = 1/4$

$x_0 = 0$
$x_1 = 0.25$
$x_2 = 0.5$
$x_3 = 0.75$
$x_4 = 1$

(2) Given, $\int_0^1 xe^{x^3}\,dx$

According to simpson's rule, $\int_a^b f(x)\,dx = \frac{\Delta x}{3}\left[f(x_0) + 4f(x_1) + 2f(x_2) + 4f(x_3)\right]$

Now, $\frac{\Delta x}{3}\left[f(x_0) + 4f(x_1) + 2f(x_2) + 4f(x_3)\right]$

$= \frac{0.25}{3}\left[0e^{0^3} + 4(0.25)e^{(0.25)^3} + 2(0.5)e^{(0.5)^3} + 4(0.75)e^{(0.75)^3} + (1)e^{(1)^3}\right]$

$= 0.7868026435 \approx 0.79$

(Ans)