Math 103-920 Quiz 6

KEY

Show your work to receive full credit!

1. Set-up but do not evaluate left and right approximations of

$$\int_0^2 x^3 dx$$

with $n = 10$.

In this case, $\Delta x = \frac{b-a}{n} = \frac{2-0}{10} = \frac{1}{5} = .2$.

So the intervals used are $[0,0.2],[0.2,0.4],[0.4,0.6],[0.6,0.8],[0.8,1],[1,1.2],[1.2,1.4],[1.4,1.6],[1.6,1.8],[1.$

$$L_{10} = 0.2\left[0^3 + (0.2)^3 + (0.4)^3 + (0.6)^3 + (0.8)^3 + 1^3 + (1.2)^3 + (1.4)^3 + (1.6)^3 + (1.8)^3\right]$$
$$R_{10} = 0.2\left[(0.2)^3 + (0.4)^3 + (0.6)^3 + (0.8)^3 + 1^3 + (1.2)^3 + (1.4)^3 + (1.6)^3 + (1.8)^3 + 2^3\right]$$

2. Evaluate the following integral

$$\int_1^{10} (x^3 + x^2 + 1) dx$$

The antiderivative of $(x^3 + x^2 + 1)$ is $x^4/4 + x^3/3 + x$.

Therefore,

$$\int_1^{10} (x^3 + x^2 + 1) dx = \left.\frac{x^4}{4} + \frac{x^3}{3} + x\right|_1^{10}$$
$$= \frac{10000}{4} + \frac{1000}{3} + 10 - \frac{1}{4} - \frac{1}{3} - 1 = 2841.75$$