

MAC2311 Class Number 15534

QUIZ 13 (Last Quiz, Wooahoo!)

4/18/2019

Name: SOLUTIONS

1. For the function $f(x) = x^2 + 1$ on $[0, 3]$ and using $n = 3$, calculate the right endpoint approximation.

$$\Delta x = \frac{b-a}{n} = \frac{3-0}{3} = \frac{3}{3} = 1$$

SINCE $\Delta x = 1 \Rightarrow x_0 = 0, x_1 = 1, x_2 = 2, x_3 = 3$

$$\cdot f(x_1) = x_1^2 + 1 = 1^2 + 1 = 2$$

$$\cdot f(x_2) = x_2^2 + 1 = 2^2 + 1 = 5$$

$$\cdot f(x_3) = x_3^2 + 1 = 3^2 + 1 = 10$$

↓ RIGHT END POINT APPROXIMATION

$$\Rightarrow R_3 = f(x_1)\Delta x + f(x_2)\Delta x + f(x_3)\Delta x$$

$$R_3 = (2)(1) + (5)(1) + (10)(1)$$

$$R_3 = 2 + 5 + 10 \Rightarrow \boxed{R_3 = 17}$$

2. Calculate the following integral:

$$\int_0^2 (x+1)(3x-1) dx$$

FoIL!

$$\int_0^2 (x+1)(3x-1) dx = \int_0^2 (3x^2 + 2x - 1) dx = \frac{3x^{2+1}}{2+1} + \frac{2x^{1+1}}{1+1} - x \Big|_0^2$$

$$= \frac{3x^3}{3} + \frac{2x^2}{2} - x \Big|_0^2 = x^3 + x^2 - x \Big|_0^2 = [2^3 + 2^2 - 2] - [0^3 + 0^2 - 0] = 8 + 4 - 2 = \boxed{10}$$

3. Calculate the following integral:

$$\int_0^{\ln(2)} 4e^x dx$$

$$= 4e^x \Big|_0^{\ln(2)}$$

$$= 4e^{\ln(2)} - 4e^0$$

$$= 4(2) - 4(1) = 8 - 4 = \boxed{4}$$