

Clase 4

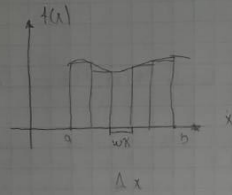
Plan

27/10/2020

- Repaso
- Integral definida
 - Área bajo la curva
 - Forma elemental de integrar
- Tarea

Integral definida

$$\lim_{\Delta x \rightarrow 0} \sum_{k=1}^n f(w_k) \Delta x$$



- la norma es el mayor de los Δx_k , se denota por $\|P\|$

$$A = \int_a^b f(x) dx = \lim_{\|P\|} \sum_{k=1}^n f(w_k) \Delta x$$

Ejemplo

- Evaluar $2x+3$ usando la antiderivada desde 2 hasta 4 con 2 particiones

$$\sum_{k=1}^n f(w_k) \Delta x$$

$$b-a = 4-2 = 2$$

$$\frac{b-a}{\# \text{ por }} = \frac{2}{2} = 1$$



$$\Delta x_1 = 1$$

$$\Delta x_2 = 1$$

$$\|P\| = 1 \rightarrow \text{norma}$$

$$f(w_1) = 2(2) + 3 = 7$$

$$f(w_2) = 2(3) + 3 = 9$$

$$f(w_3) = 2(4) + 3 = 11$$

$$\Delta x = 1$$

$$\approx f(2) \cdot 1 + f(3) \cdot 1 + f(4) \cdot 1$$

$$\approx 21$$

$$\int_1^4 (2x+1) dx = 18 \quad \int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$\int_1^4 2x dx + \int_1^4 1 dx$$

$$2 \int_1^4 x dx + \int_1^4 1 dx$$

$$2 \left[\frac{x^2}{2} \right]_1^4 + \left[x \right]_1^4$$

$$2 \left(\frac{4^2}{2} - \frac{1^2}{2} \right) + (4-1)$$

- Evaluar la integral de 1 hasta 4 de $f(x) = (5x - 2\sqrt{x} + \frac{32}{x^3})$

$$\int_1^4 (5x - 2(x^{1/2}) + \frac{32}{x^3}) dx$$

$$= \left[\frac{5x^2}{2} - \frac{2x^{3/2}}{3/2} + \frac{x^{-2}}{-2} \right]_1^4$$

$$= \left[\frac{5(4)^2}{2} - \frac{2(4)^{3/2}}{3/2} + \frac{4^{-2}}{-2} \right] - \left[\frac{5(1)^2}{2} - \frac{2(1)^{3/2}}{3/2} + \frac{1^{-2}}{-2} \right]$$

$$= 23.0 \overline{6}$$

- Método de sustitución

$$\int u^n du = \frac{u^{n+1}}{n+1} + C$$

donde $u = g(x)$

$$\int (2x^3+1)^7 x^2 dx$$

$$u = 2x^3+1$$

$$\int u^7 \frac{du}{6}$$

$$du = 6x^2 dx \rightarrow x^2 dx = \frac{du}{6}$$

$$\frac{u^8}{8} \cdot \frac{1}{6} = \frac{u^8}{48} = \frac{(2x^3+1)^8}{48} + C$$