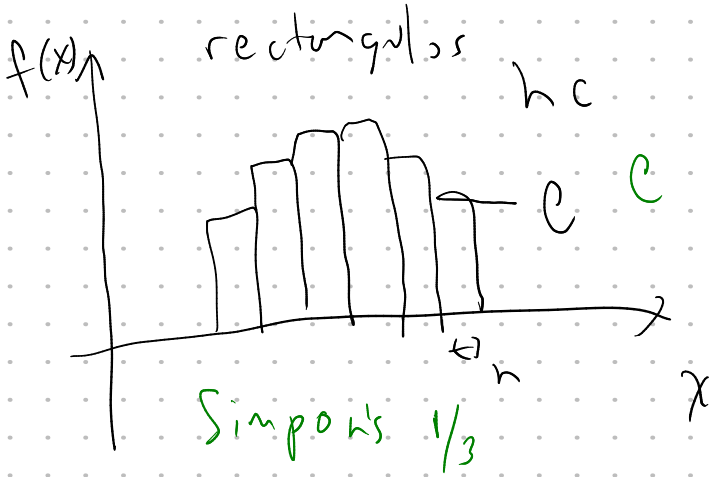
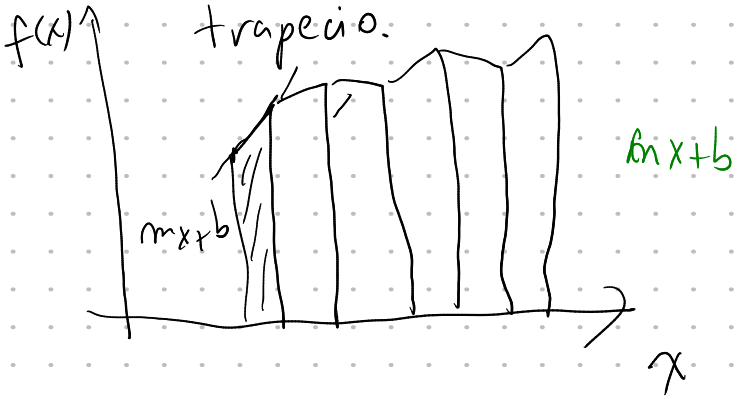
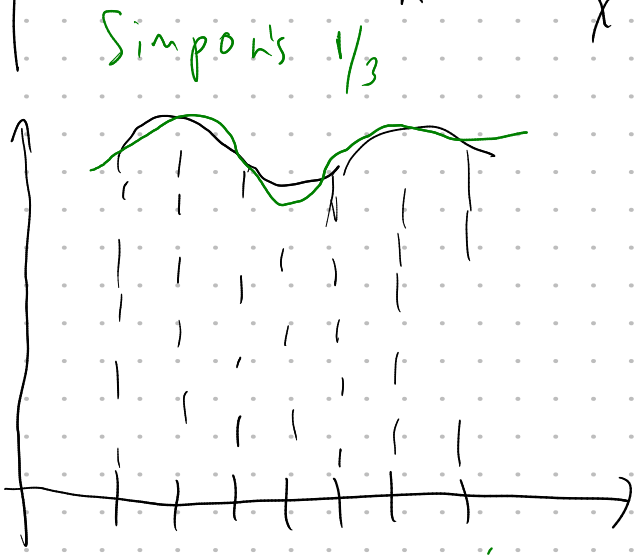
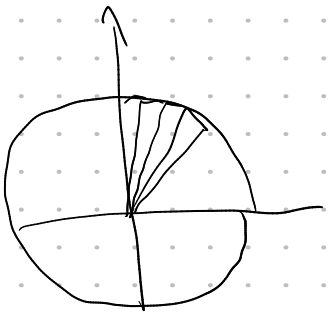


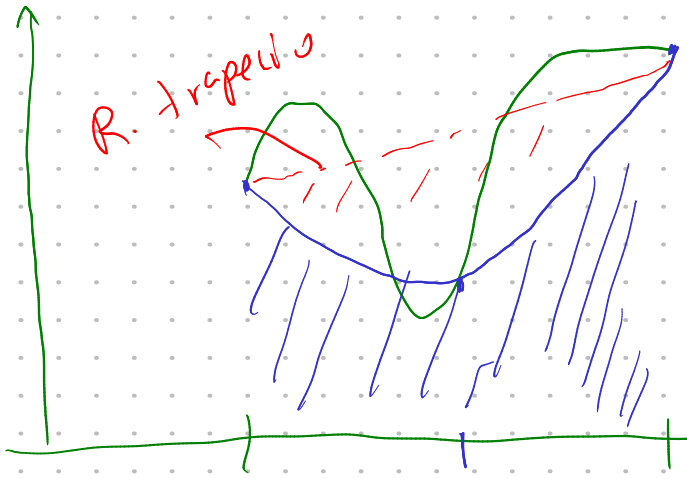




$ax^2 + bx + c$



Regla de Simpson 1/3



$f(x) = c + dx + ex^2$

$$\int f(x)\,dx = cx + \frac{dx^2}{2} + \frac{ex^3}{3}\Big]_a^b$$

$$\left(a, f(a)\right), \left(\frac{a+b}{2}, f\left(\frac{a+b}{2}\right)\right), \left(b, f(b)\right)$$

$$f(x) = \frac{\left(x - \left(\frac{a+b}{2}\right)\right)(x-b)}{\left(a - \left(\frac{a+b}{2}\right)\right)(a-b)} f(a) + \frac{(x-a)(x-b)}{\left(\left(\frac{a+b}{2}\right)-a\right)\left(\frac{a+b}{2}-b\right)} f\left(\frac{a+b}{2}\right)$$

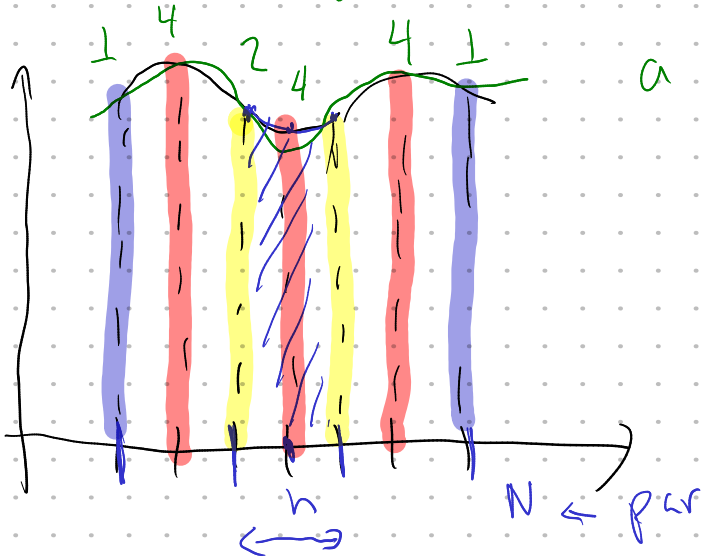
$$+ \frac{(x-a)\left(x - \left(\frac{a+b}{2}\right)\right)}{(b-a)\left(b - \left(\frac{a+b}{2}\right)\right)} f(b)$$

$$f(x) = c + dx + ex^2$$

$$\int_a^b f(x)\,dx = cx + \frac{dx^2}{2} + \frac{ex^3}{3}\Big]_a^b$$

$$\int_a^b f(x)\,dx = \frac{(a-b)}{3}\left[f(a) + 4f\left(\frac{a+b}{2}\right) + f(b)\right]$$

Regla de Simpson's Compuesta



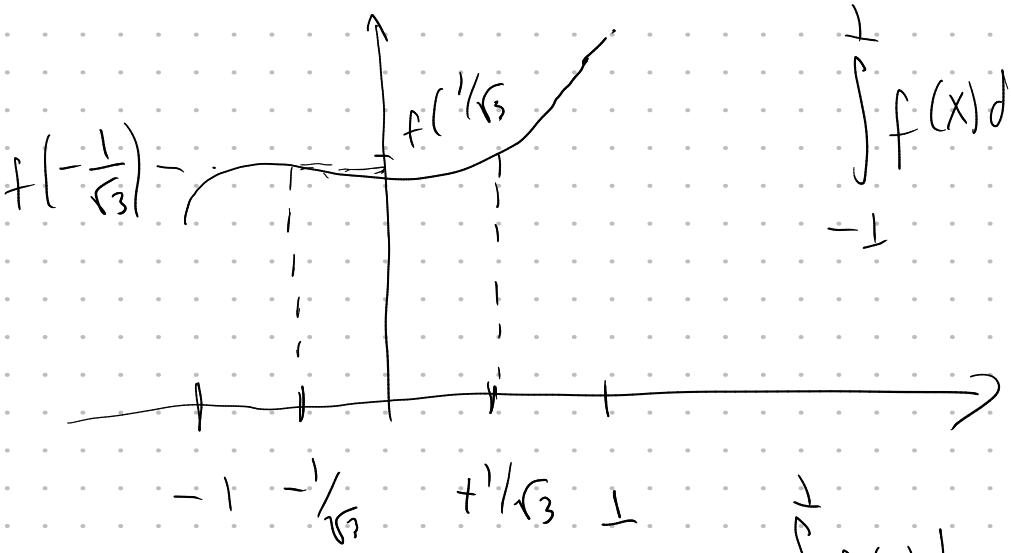
$$\int_{x_i}^{x_{i+2}} f_j(x)\,dx = \frac{h}{3}\left[f(x_i) + 4f(x_{i+1}) + f(x_{i+2})\right]$$

$$\int_a^b f(x)\,dx = \sum_{i=0}^{N-2} \frac{h}{3}\left[f(x_i) + 4f(x_{i+1}) + f(x_{i+2})\right]$$

$x_i \quad x_{i+1} \quad x_{i+2}$

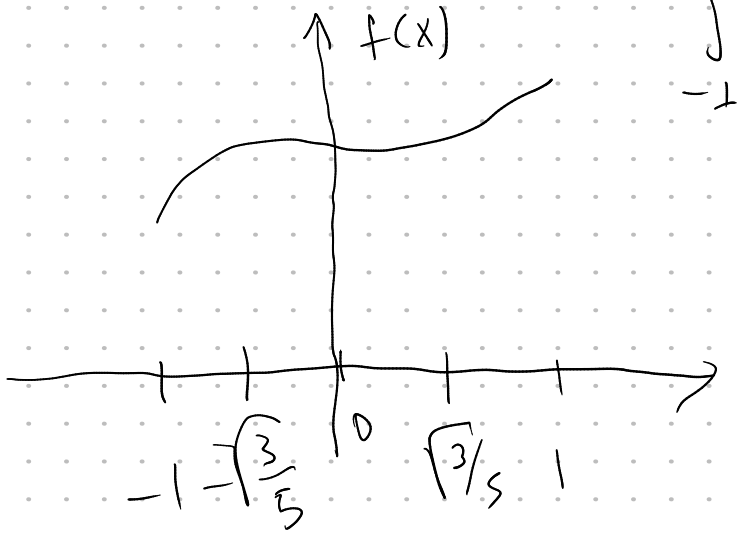
$$\int_a^b f(x)\,dx = \frac{h}{3}\left[f(x_0) + f(x_N) + 2\sum_{i=1}^{N/2} f(x_{2i}) + 4\sum_{i=0}^{N/2-2} f(x_{2i+1})\right]$$

Introduccion a la Cuadratura Gaussiana



$$\int_{-1}^{1} f(x)\,dx = W_0 f\left(-\frac{1}{\sqrt{3}}\right) + W_1 f\left(\frac{1}{\sqrt{3}}\right)$$

$$= 1 f\left(-\frac{1}{\sqrt{3}}\right) + 1 f\left(\frac{1}{\sqrt{3}}\right)$$



$$\int_{-1}^{1} f(x)\,dx$$

$$= W_0 f\left(-\sqrt{\frac{3}{5}}\right) + W_1 f(0) + W_2 f\left(\sqrt{\frac{3}{5}}\right)$$

$$\chi = \frac{5}{9} f\left(-\sqrt{\frac{3}{5}}\right) + \frac{8}{9} f(0) + \frac{5}{9} f\left(\sqrt{\frac{3}{5}}\right)$$

$$\int_{-1}^{1} f(x)\,dx = \sum_{i=1}^{N} W_i f(x_i)$$

N: Grado de la cuadratura.

References

http://mathforcollege.com/nm/mws/gen/07int/mws_gen_int_txt_simpson13.pdf