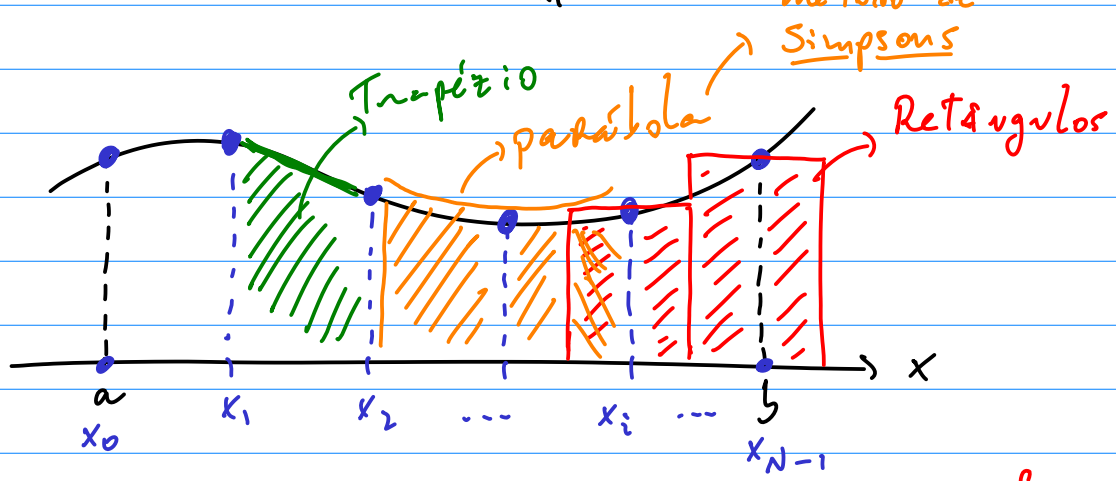
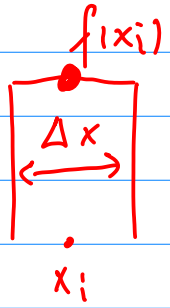
Integração Numérica

↳ "Quadratura"

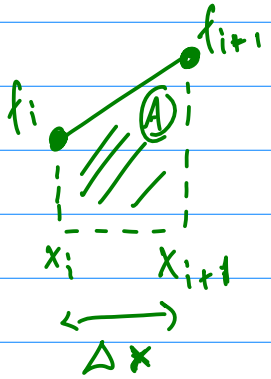
$$\int_a^b f(x)\,dx = \lim_{\Delta x \to 0} \sum_{x_i = a}^{b} f(x_i)\,\Delta x$$



Retângulo: $\int_a^b f(x)\,dx \approx \sum_i f(x_i)\,\Delta x$



Trapézio:



interpolar:

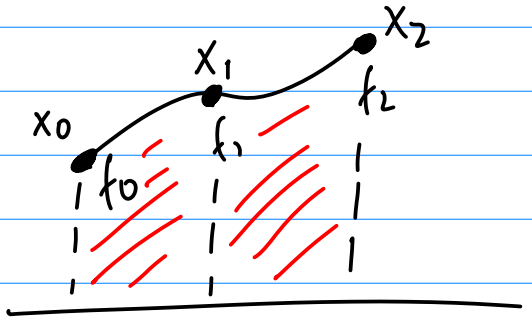
$$f(x) \approx f_i + \frac{(x - x_i)}{(x_{i+1} - x_i)} \cdot (f_{i+1} - f_i)$$

$$A_i = f_i\,\Delta x - x_i (f_{i+1} - f_i) + \frac{(f_{i+1} - f_i)}{\Delta x} \frac{x^2}{2}\Big|_{x_i}^{x_{i+1}} =$$

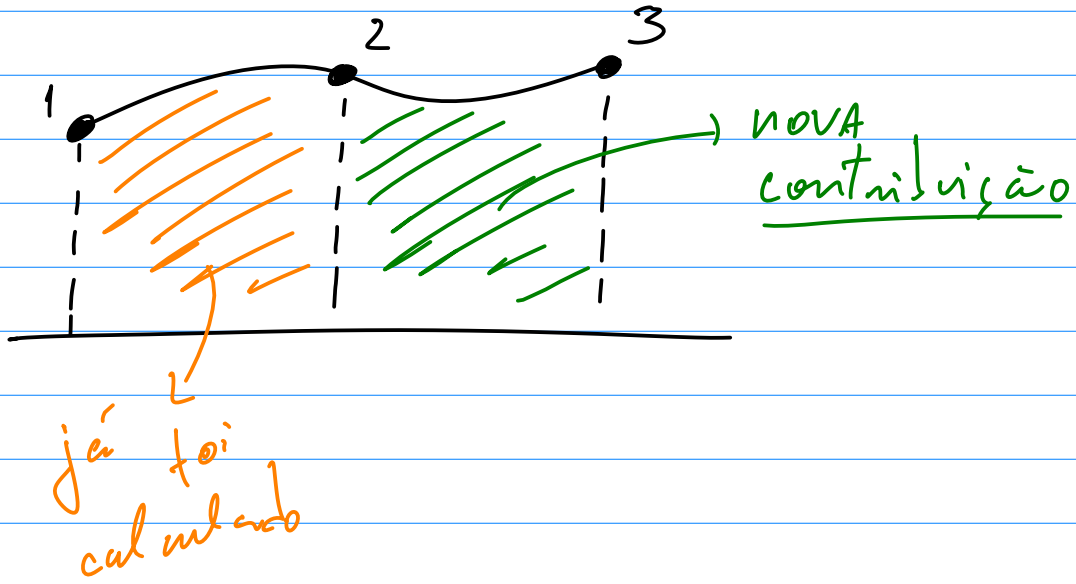
$$A_i = \frac{(f_i + f_{i+1})\,\Delta x}{2} \longrightarrow \int_a^b f(x)\,dx \approx \sum_i A_i$$

Parábola

1ª etapa: primeiros 3 pontos



2ª etapa: só área direita



Hoje: fazer integral retângulo e trapézio