$$I = \int_a^b F(x)\,dx \rightarrow F(x) \text{ se Aproxima mediante}$$

$$f \approx P_1(x) = \frac{x-b}{a-b} f(a) + \frac{x-a}{b-a} f(b) \quad \forall x \in [a,b]$$

- I se Aproxima mediante

$$I = \int_a^b F(x)\,dx \cong \int_a^b P_1(x)\,dx = \int_a^b \frac{x-b}{a-b} f(a) + \frac{x-a}{b-a} f(b)\,dx$$

$$I \cong \int_a^b \frac{x-b}{a-b} f(a)\,dx + \int_a^b \frac{x-a}{b-a} f(b)\,dx$$

$$I \cong \frac{F(a)}{a-b} \int_a^b x-b\,dx + \frac{f(b)}{b-a} \int_a^b x-a\,dx$$

$$I \cong \frac{F(a)}{a-b} \left(\frac{x^2}{2} - bx \Big|_a^b \right) + \frac{F(b)}{b-a} \left(\frac{x^2}{2} - ax \right]_a^b \Bigg)$$

$$I \cong \frac{F(a)}{a-b} \left[\left(\frac{b^2}{2} - b^2 \right) - \left(\frac{a^2}{2} - ab \right) \right] +$$

$$\frac{F(b)}{b-a} \left[\left(\frac{b^2}{2} - ab \right) - \left(\frac{a^2}{2} - a^2 \right) \right]$$

$$I \cong \frac{F(a)}{a-b} \left(-\frac{b^2}{2} - \frac{a^2}{2} + ab \right) + \frac{F(b)}{b-a} \left(\frac{b^2}{2} - ab + \frac{a^2}{2} \right)$$

$$I \cong \frac{F(a)}{a-b}\left(\frac{-b^2+2ab-a^2}{2}\right) + \frac{F(b)}{b-a}\left(\frac{b^2-2ab+a^2}{2}\right)$$

$$I \cong -\frac{F(a)}{a-b}\,\frac{(a-b)^2}{2} + \frac{F(b)}{b-a}\,\frac{(b-a)^2}{2}$$

$$I \cong -F(a)\frac{(a-b)}{2} + F(b)\frac{(b-a)}{2}$$

$$I \cong F(a)\frac{(b-a)}{2} + F(b)\frac{(b-a)}{2}$$

$$\boxed{I \cong \frac{b-a}{2}\left(F(a)+F(b)\right)}$$