Metodos Computacionales **Name:** *Sergio David Lopez Becerra*
Taller 4 - Punto 2 *Sergio Montoya Ramírez*
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Sea $f(x)$ una función y por el metodo del trapecio simple nos quedaria $f(x) = p(x) + \epsilon(x)$, tal que,

$$\epsilon(x) = \frac{f'''(\xi)}{2}(x-a)(x-b), \qquad a \leq \xi \leq b$$

Entonces el error de la integral de $f(x)$ es

$$E = \int_a^b \epsilon(x)dx = \frac{f'''(\xi)}{2}(x-a)(x-b) = \frac{f'''(\xi)}{2}(x^2 - (a+b)x + ab$$

$$\int_a^b \epsilon(x)dx = \frac{f''(\xi)}{2}\left(\frac{x^3}{3} - \frac{(a+b)x^2}{2} + abx\right)|_a^b$$

$$= \frac{f''(\xi)}{2}\left(\left(\frac{b^3}{3} - \frac{(a+b)b^2}{2} + ab^2\right) - \left(\frac{a^3}{3} - \frac{(a+b)a^2}{2} + a^2b\right)\right)$$

$$= \frac{f''(\xi)}{2}\left(\left(\frac{b^3}{3} - \frac{(ab^2+b^3)b^2}{2} + ab^2\right) - \left(\frac{a^3}{3} - \frac{a^3+a^2b}{2} + a^2b\right)\right)$$

$$\frac{f''(\xi)}{2}\left(\frac{-b^3}{6} + \frac{a^2b}{2} + \frac{a^3}{6} - \frac{ab^2}{2}\right)$$

$$\frac{f''(\xi)}{2}\left(\frac{-2b^3 + 6a^2b - 6ab^2 + 2a^3}{12}\right)$$

$$\frac{f''(\xi)}{2} \cdot \frac{h^3}{12}$$