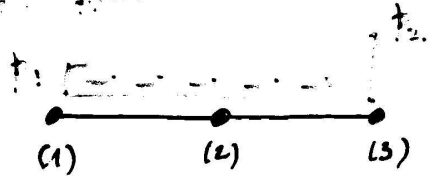
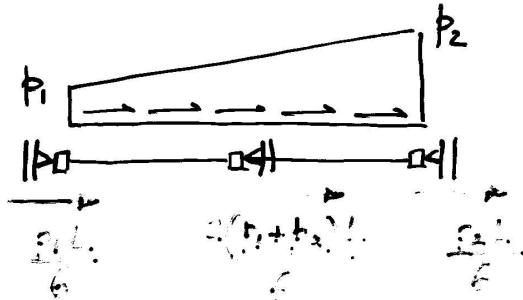


ELEMENTO DE BARRA → FORÇAS NODAIS

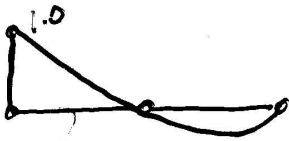
ref. [1] p. 100



$$F^{(el)} = \frac{L}{6} \begin{bmatrix} P_1 \\ 2(P_1 + P_2) \\ P_2 \end{bmatrix}$$

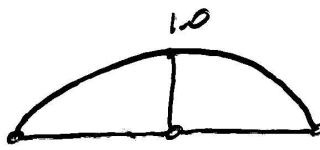


FUNÇÕES DE APROXIMAÇÃO



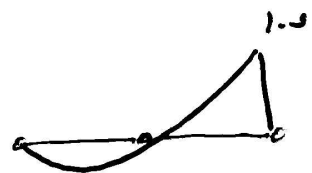
$$\psi_1(x) = \frac{L-x}{L}$$

$$\frac{d\psi_1(x)}{dx} = \frac{1}{L^2}(4x-3L)$$



$$\psi_2(x) = \frac{4x^2 - 6xL + 3L^2}{L^2}$$

$$\frac{d\psi_2(x)}{dx} = \frac{4}{L^2}(L-2x)$$



$$\psi_3(x) = \frac{3x^3 - 3x^2L + L^2x}{L^3}$$

$$\frac{d\psi_3(x)}{dx} = \frac{1}{L^2}(4x-L)$$