



UNIVERSIDADE ESTADUAL DO PIAUÍ – UESPI

CENTRO DE TECNOLOGIA E URBANISMO - CTU

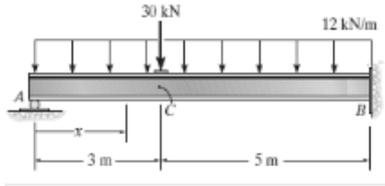
CURSO DE ENGENHARIA CIVIL

MECÂNICA DOS SÓLIDOS II – Lista de Exercícios nº 2 – Prof. Fernando Jufat

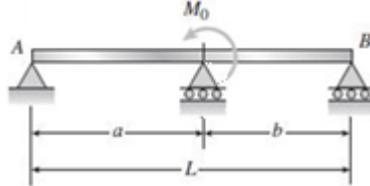
Para as vigas prismáticas a seguir, determine:

- a) a equação da linha elástica;
b) as inclinações e deflexões indicadas.

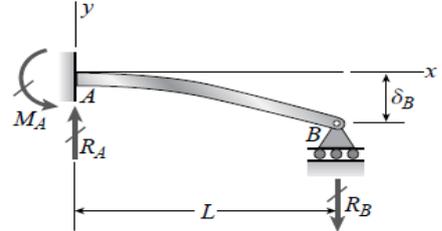
1) δ_C e θ_A



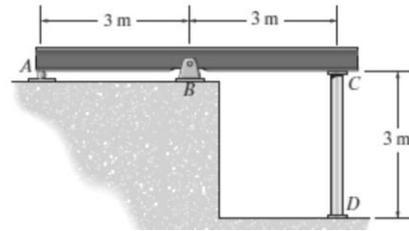
2) θ_A e θ_B com $a = 3\text{m}$ e $b = 2\text{m}$



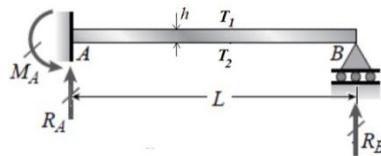
3) θ_B



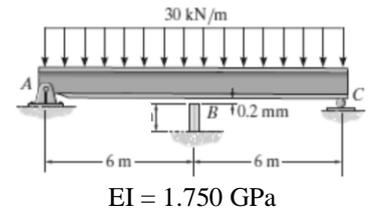
- 4) Determine a força no pilar CD quando sua temperatura é aumentada de ΔT .



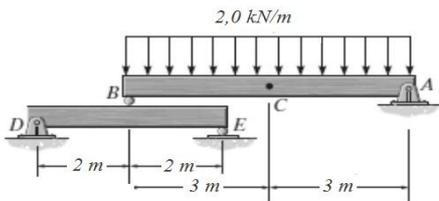
- 5) Determine a equação da linha elástica da viga abaixo, submetidas à temperatura T_1 no topo e T_2 na base. $T_2 > T_1$.



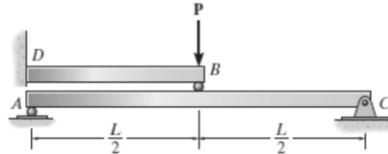
- 6) Determine as reações de apoio da viga ABC, considerando que, antes da aplicação do carregamento, há uma folga de 0,2 mm no apoio rígido B.



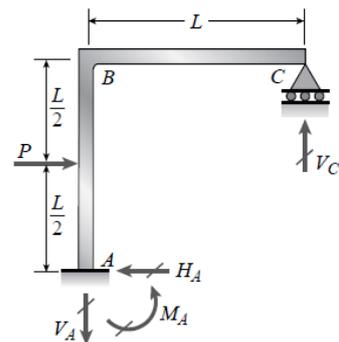
- 7) Determine a deflexão no ponto C da viga BCA.



- 8) Determine a deflexão no ponto B da viga ABC.



- 9) Determine as reações de apoio do pórtico abaixo.



RESPOSTAS:

1) $EI.v = 8,319 x^3 - 0,5 x^4 - (5(x-3)^3) - 198,3125 x$

$\delta_C = -\frac{410,82}{EI}$

$\theta_A = -\frac{198,3125}{EI}$

2) $EI.v = \frac{M_0}{45} x^3 + \left(\frac{M_0}{36} (x-3)^3 - \frac{M_0}{2} (x-3)^2\right) - 0,20.M_0 x$

$\theta_A = -\frac{M_0}{5.EI}$

$\theta_B = -\frac{M_0}{5.EI}$

3) $v = -\frac{3.\delta_B}{2L^2} x^2 + \frac{\delta_B}{2L^3} x^3$ $\theta_B = -\frac{3 \delta_B}{2.L}$

4) $F_{CD} = \frac{\alpha.E.\Delta T.A.I}{(6A+I)}$

5) $v = \frac{\alpha(T_2-T_1)}{2h} \left(L^2 + \frac{x^3}{2.L} - \frac{3x^2}{2}\right)$

6) $R_B = 224,03 \text{ kN}$, $R_A = R_C = 67,985 \text{ kN}$

7) $\delta_C = -\frac{37,75}{EI}$

8) $\delta_B = -\frac{PL^3}{72.EI}$

9) $V_A = \frac{3P}{32}$, $H_A = P$, $M_A = \frac{13PL}{32}$, $V_C = \frac{3P}{32}$