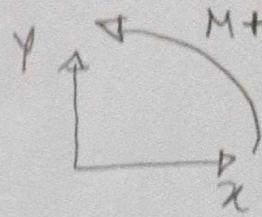
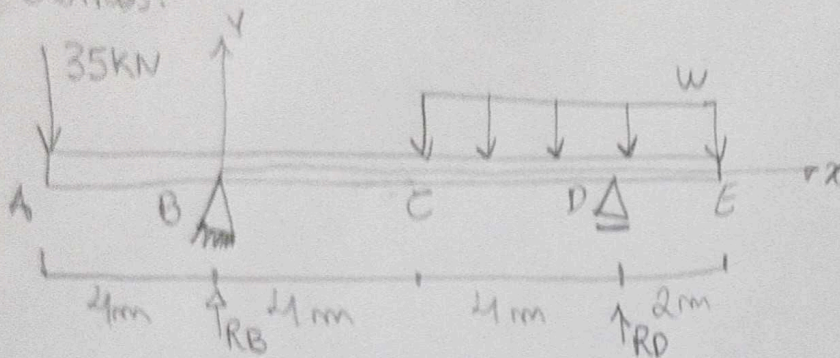


Mecânica dos Sólidos 3 - AB1-P2

José Santos S. Júnior

1º) Termos:



Reações de Apoio:

$$\sum F_H = 0$$

$$\sum F_V = 0$$

$$-35 + R_B - 480 + R_D = 0$$

$$R_B + R_D = 515$$

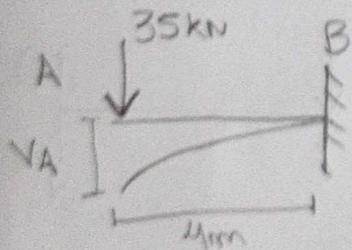
$$\sum M_B = 0$$

$$35 \cdot 4 - 480 \cdot 7 + R_D \cdot 8 = 0$$

$$R_D = 402,5 \text{ kN}$$

$$R_B + 402,5 = 515 \Rightarrow R_B = 112,5 \text{ kN}$$

Pela superposição dos efeitos termos:



$$P = 35 \text{ kN}$$

$$L = 4 \text{ m}$$

$$EI = 7,02 \cdot 10^4 \text{ kN} \cdot \text{m}^2$$

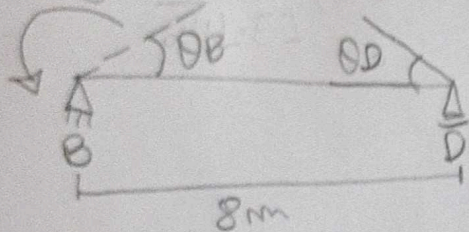
$$V_{A_1} = -\frac{PL^3}{8EI} = -0,031 \text{ m}$$

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3ª) Continuação

Considerando a rotação em B e a deflexão em A, temos Pontos AB, Calculando o momento em B.

$$M = 140 \text{ KN}\cdot\text{m}$$

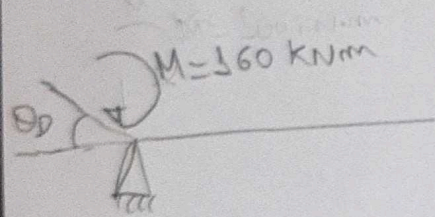


$$\theta_B = -\frac{ML}{3EI} = -0,305^\circ$$

$$V_{AXAB} = \theta_B \cdot (-4) = 0,021 \text{ m}$$

$$\theta_D = \frac{WL^3}{24EI} = \theta_D = 0,005 \text{ rad ou } 0,284^\circ$$

$$V_{AXAD} = \theta_D \cdot 4 = -0,021 \text{ m}$$



$$M = -160 \text{ KN}\cdot\text{m}$$

$$L = 8 \text{ m}$$

$$\theta_{D2} = \frac{ML}{6EI} = -0,003 \text{ ou } \theta_D = -0,174^\circ$$

$$V_{AXDE} = -\theta_{D2} \cdot (4 \text{ m}) = 0,012 \text{ m}$$

Portanto:

A deflexão em A é

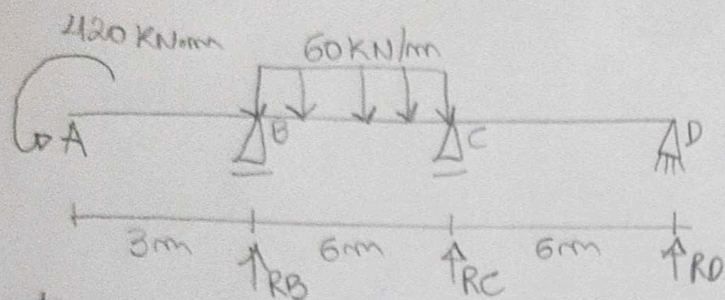
$$V_A = V_{A1} + V_{AXAB} + V_{AXAD} + V_{AXDE} = -0,031 + 0,021 - 0,021 + 0,012$$

$$V_A = 0,020 \text{ m}$$

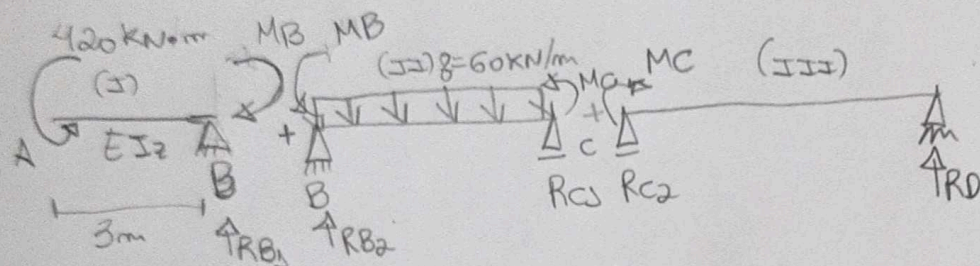
$$\theta_D = \theta_{D1} + \theta_{D2} = 0,005 - 0,003 = 0,002 \text{ rad ou } 0,116^\circ$$

20)

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+ dados:

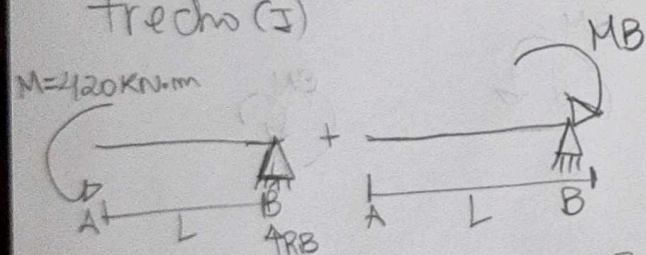


Condições de contorno:

$$V_B = 0 \text{ e } V_C = 0$$

grau de estaticidade $g = 1$

trecho (I)



Consultando os tabelas, temos:

$$R_B = \frac{M \cdot L}{2EI} + \frac{MB \cdot L}{2EI} = \frac{8 \cdot L^3}{24EI} + \frac{MB \cdot L}{2EI} = MB = 410 \text{ KN·m}$$

Encontrando as reações

$$\sum MB = 0$$

$$-MB + R_C \cdot 6 + R_D \cdot 12 = 0$$