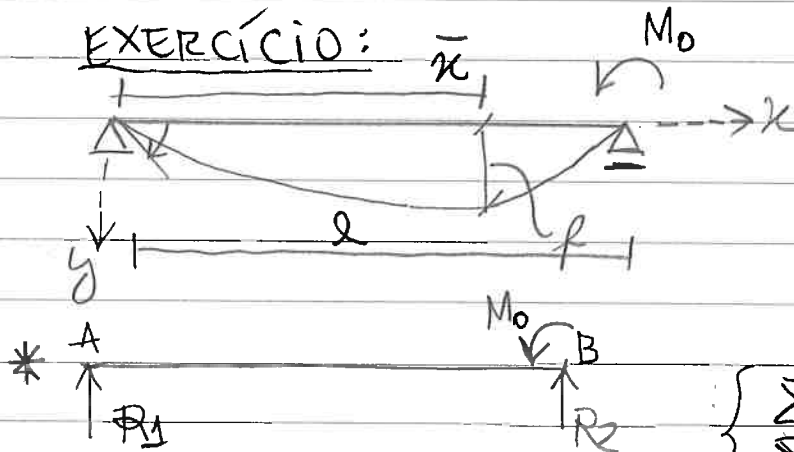


PEF 320L

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EXERCÍCIO:

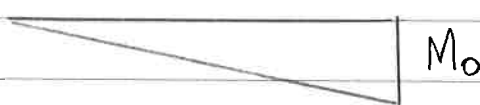
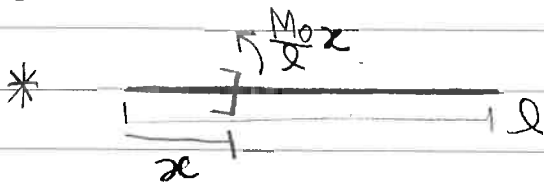
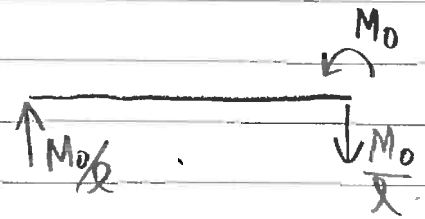


$v(x) = ?$
 $f = ?$
 $v'(0) = ?$
 $v'(l) = ?$

$$\begin{cases} \sum F_y = 0 \\ \sum M(B) = 0 \end{cases}$$

(↑) $R_1 + R_2 = 0$

(↻) $R_1 \cdot l = M_0 \therefore R_1 = M_0/l \therefore R_2 = -M_0/l$



$$\therefore M(x) = \begin{cases} \frac{M_0}{l}x, & 0 \leq x < l \\ \frac{M_0}{l}x - M_0, & x = l \end{cases}$$

* $v''(x) = -\frac{M(x)}{EI}, \quad 0 \leq x < l$

p/ $0 \leq x < l$: $v'' = -\frac{M_0 x}{lEI} \therefore v' = -\frac{M_0}{lEI} \left(\frac{x^2}{2} + C_1 \right)$

$\therefore v = -\frac{M_0}{lEI} \left(\frac{x^3}{6} + C_1 x + C_2 \right)$

$v(0) = 0 \therefore C_2 = 0 \therefore v = -\frac{M_0}{lEI} \left(\frac{x^3}{6} + C_1 x \right)$

* $v(x \rightarrow l) : v \rightarrow 0$

$C_1 = -\frac{l^2}{6}$

* $v(x) = \frac{M_0}{6lEI} (l^2 x - x^3)$

$v'(0) = \frac{M_0 l}{6EI}$

$v'(l) = -\frac{M_0 l}{3EI}$

$$* \quad v'(\bar{x}) = 0$$

$$\therefore -\frac{M_0}{2EI} \left(\frac{\bar{x}^2}{2} - \frac{l^2}{6} \right) = 0$$

$$\therefore \bar{x} = \frac{1}{\sqrt{3}} l$$

$$\therefore v(\bar{x}) = f = \frac{M_0}{6EI} \left(l^2 \cdot \frac{l}{\sqrt{3}} - \frac{l^3}{3\sqrt{3}} \right)$$

$$= \frac{M_0 l^2}{6EI} \cdot \frac{2}{\sqrt{3}} \therefore \boxed{f = \frac{M_0 l^2 \sqrt{3}}{9EI}}$$