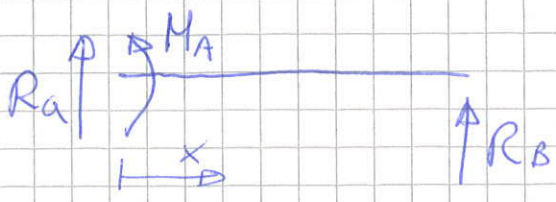
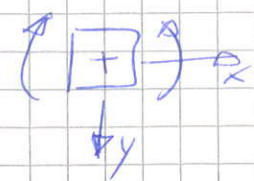
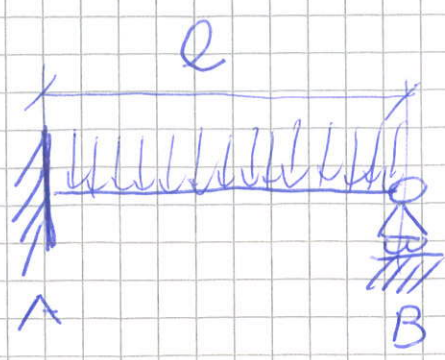


(A)



EQUILIBRIO

$$R_A = pl - R_B$$

$$M_A = \frac{pl^2}{2} - R_B l$$

$$M(x) = -\frac{px^2}{2} - \frac{pl^2}{2} + R_B l + plx - R_B x$$

EQ LINEAR ELASTICA

$$\frac{d^2v}{dx^2} = -\frac{M(x)}{EJ}$$

$$-EJ \frac{dv}{dx} = -\frac{px^3}{6} - \frac{pl^2}{2}x + R_B lx + \frac{pl}{2}x^2 - \frac{R_B x^2}{2} + C_1$$

$$-EJ v = -\frac{px^4}{24} - \frac{pl^2}{4}x^2 + R_B l \frac{x^2}{2} + \frac{pl}{6}x^3 - \frac{R_B x^3}{6} + C_1 x + C_2$$

$$x=0 \begin{cases} v=0 \rightarrow C_2=0 \\ \frac{dv}{dx}=0 \rightarrow C_1=0 \end{cases}$$

$$x=l \begin{cases} v=0 \rightarrow -\frac{pl^4}{24} - \frac{pl^4}{4} + R_B l \frac{l^2}{2} + \frac{pl^4}{6} - \frac{R_B l^3}{6} = 0 \end{cases}$$

$\hookrightarrow (R_B = \frac{3}{8}pl)$

(B)

$$EJ \frac{d^4 v}{dx^4} = p(x) = p \quad (\text{cost.})$$

$$EJ \frac{d^3 v}{dx^3} = -T(x) = px + C_1$$

$$EJ \frac{d^2 v}{dx^2} = -M(x) = \frac{px^2}{2} + C_1 x + C_2$$

$$EJ \frac{dv}{dx} = \frac{px^3}{6} + C_1 \frac{x^2}{2} + C_2 x + C_3$$

$$EJ v = \frac{px^4}{24} + C_1 \frac{x^3}{6} + C_2 \frac{x^2}{2} + C_3 x + C_4$$

CONDIZIONI

$$\left. \begin{array}{l} v(0) = \phi \\ \frac{dv}{dx}(0) = \phi \\ v(l) = \phi \end{array} \right\} \text{CINEMATICHE} \qquad \left. \begin{array}{l} M(x=l) = \phi \end{array} \right\} \text{STATICHE}$$

$$C_4 = \phi \qquad C_3 = \phi$$

$$C_2 = -C_1 l - \frac{pl^2}{2}$$

$$C_1 = -\frac{5}{8} pl \qquad \rightarrow \qquad C_2 = \frac{1}{8} pl^2$$

$$T(x=l) = pl - \frac{5}{8} pl = \frac{3}{8} pl \quad \text{OK} \quad \uparrow$$