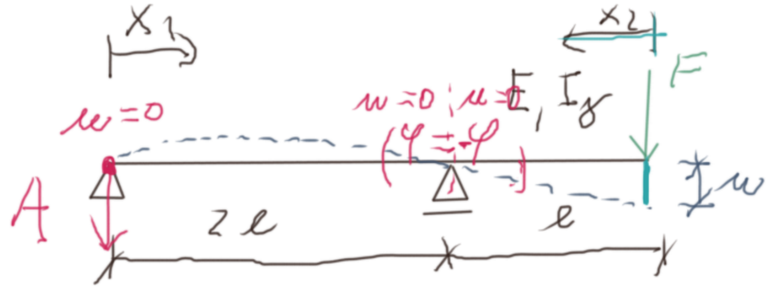


$\curvearrowleft B: \; A\cdot 2\ell - F\cdot\ell = 0 \rightarrow \boxed{A = \frac{F}{2}}$

$M(x_1) = -A\cdot x_1$

$EI_y\, w''(x_1) = A\cdot x_1$

$EI_y\, w'(x_1) = A\,\frac{x_1^2}{2} + C_1$

$EI_y\, w(x_1) = A\cdot\frac{x_1^3}{6} + C_1 x_1 + C_2$

$w(0) = 0 \rightarrow C_2 = 0$

$w(2\ell) = 0 \rightarrow A\cdot\frac{8\ell^3}{6} + C_1\cdot 2\ell = 0$

$\frac{F}{2}\cdot\frac{4}{3}\ell^3 + C_1\cdot 2\ell = 0$

$C_1 = -\frac{1}{3}F\ell^2$

$M(x_2) = -F\cdot x_2$

$EI_y\, w''(x_2) = F\cdot x_2$

$EI_y\, w'(x_2) = F\,\frac{x_2^2}{2} + C_3$

$EI_y\, w(x_2) = \frac{Fx_2^3}{6} + C_3 x_2 + C_4$

$w(\ell) = 0$

$\varphi_1(2\ell) = -\varphi(\ell)$

$\frac{F\cdot 4\ell^2}{4} - \frac{1}{3}F\ell^2 = -\frac{F\ell^2}{2} - C_3$

$F\ell^2 - \frac{1}{3}F\ell^2 + F\frac{\ell^2}{2} = C_3 \rightarrow C_3 = -\frac{7}{6}F\ell^2$

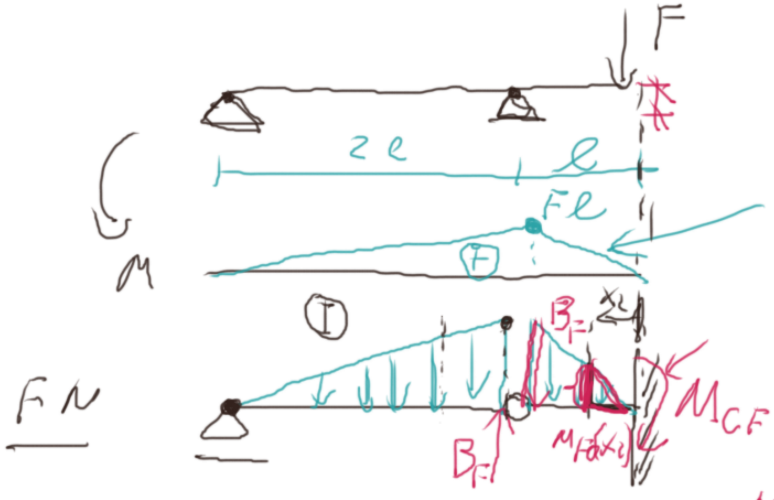
$w(\ell) = 0$

$0 = \frac{F\ell^3}{6} - \frac{7}{6}F\ell^3 + C_4$

$C_4 = F\ell^3$

$w(0) = \frac{1}{EI_y}\left(\frac{F\cdot 0}{6} - \frac{7}{6}F\ell^2\cdot 0 + F\ell^3\right)$

$\boxed{w(0) = \frac{F\ell^3}{EI_y}}$



$$\mathrm{I}\quad B_F \cdot 2\cancel{l} - \frac{1}{\cancel{2}}\cancel{2l} \cdot Fl\left(\frac{4l}{3}\right) = 0$$

$$\boxed{B_F = \frac{2}{3}Fl^2}$$

$$\mathrm{II}.\quad M_{CF} - B_F \cdot l - \frac{1}{\cancel{2}}l \cdot Fl \cdot \frac{\cancel{2}}{3}l = 0$$

$$M_{CF} = \frac{2}{3}Fl^3 + \frac{1}{3}Fl^3 = Fl^3$$

$$\frac{M_{F0}(x_2)}{x_2} = \frac{Fl}{l}$$

$$M_{F0}(x_2) = F \cdot x_2$$

$$M_R(x_2) = -M_{CF} + \underbrace{\frac{1}{2}x_2 \cdot F \cdot x_2 \cdot \frac{2}{3}x_2}$$

$$w(x_2) = \frac{M_R(x_2)}{EI_y} = \frac{-M_{CF}}{EI_y} = \boxed{-\frac{Fl^3}{EI_y}}$$

$\underline{x_2 = 0}$

$$A = \frac{F}{2}$$

$$w = ?$$

$$F \rightarrow \underline{\frac{1}{2} F \cdot w = W}$$

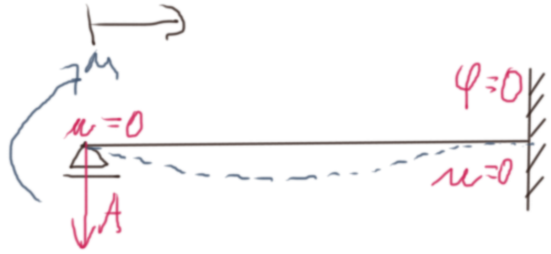
$$\frac{1}{3} + \frac{1}{6} \qquad \frac{2}{6} + \frac{1}{6} = \frac{3}{6}$$

$$\frac{1}{2}$$

$$U = \int \frac{M^2_{(x)}}{2EI_y} = \int_0^{2l} \frac{F^2 \cdot x_1^2}{4 \cdot 2EI_y} dx_1 + \int_0^{l} \frac{F^2 \cdot x_2^2}{2EI_y} dx_2 =$$

$$= \frac{F^2}{8EI_y}\left[\frac{x_1^3}{3}\right]_0^{2l} + \frac{F^2}{2EI_y}\left[\frac{x_2^3}{3}\right]_0^{l} = \frac{F^2 \cdot \cancel{8} l^3}{\cancel{8} \cdot EI_y \cdot 3} + \frac{F^3 l^3}{6EI_y}$$

$$\frac{\cancel{1}\, F^{\cancel{2}} l^3}{2EI_y} = \frac{\cancel{1}}{\cancel{2}} \cancel{F} \cdot w \qquad \boxed{w = \frac{Fl^3}{EI_y}}$$



BDR

$$M(x) = M - A \cdot x$$

$$EI_y w''(x) = A \cdot x - M$$

$$EI_y w'(x) = A\frac{x^2}{2} - M \cdot x + C_1$$

$$EI_y w(x) = A\frac{x^3}{6} - M\frac{x^2}{2} + C_1 x + \underbrace{C_2}_{=0}$$

$$w(0) = 0 \longrightarrow \underline{\underline{C_2 = 0}}$$

$$\varphi(l) = 0 ; \quad A\frac{l^2}{2} - Ml + C_1 = 0$$

$$C_1 = Ml - A\frac{l^2}{2}$$

$$w(l) = 0$$

$$0 = A\frac{l^3}{6} - M\frac{l^2}{2} + C_1 \cdot l$$

$$0 = A\frac{l^3}{6} - M\frac{l^2}{2} + Ml^2 - A\frac{l^3}{2}$$

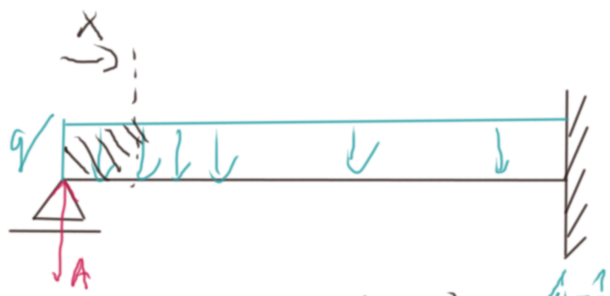
$$0 = \frac{Ml^2}{2} - \frac{1}{3}Al^3$$

$$\boxed{A = \frac{3M}{2l}}$$

$$\boxed{M = A\cdot x + M}$$

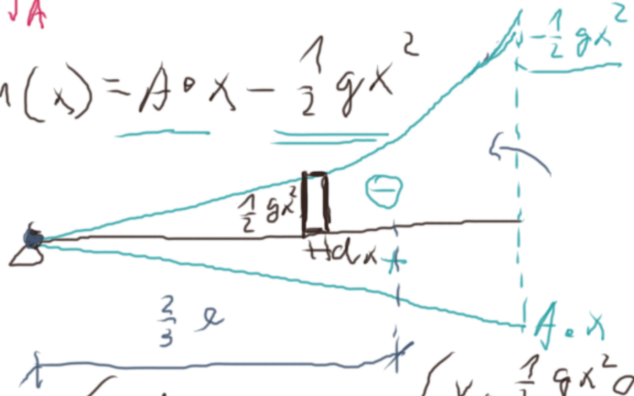
$$\curvearrowright a: \quad M\cdot \cancel{l}\,\frac{\cancel{l}}{2} - \frac{A\cdot \cancel{l}\cdot \cancel{l}}{\cancel{2}}\cdot \frac{\cancel{2}}{3}\,l = 0$$

$$\boxed{A = \frac{3M}{2l}}$$



$$M(x) = A \cdot x - \frac{1}{2} g x^2$$

EN



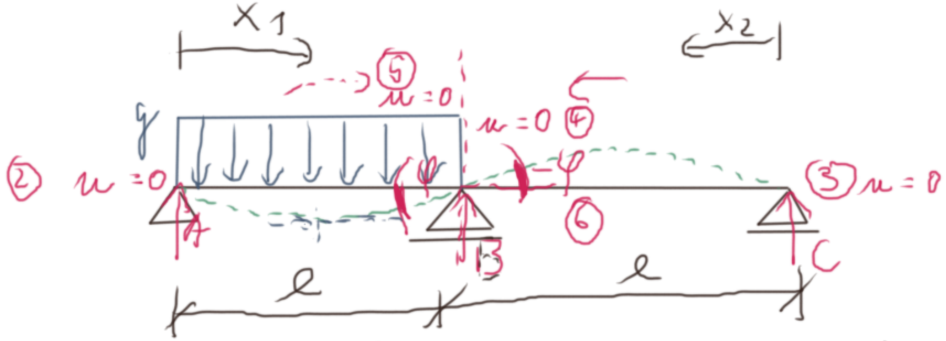
$$0 = \frac{1}{EI_0}\left(\frac{g\ell^3}{6} \cdot \frac{3}{4}\ell - \frac{A\ell^2}{2} \cdot \frac{2}{3}\ell \right)$$

$$\frac{g \cdot \ell^4}{8} = \frac{A \cdot \ell^3}{3}$$

$$\boxed{A = \frac{3}{8} g \ell}$$

$$x_T = \frac{\int x \, dA}{\int dA} = \frac{\int x \cdot \frac{1}{2} g x^2 dx}{\int \frac{1}{2} g x^2 dx} = \frac{\frac{g}{2}\left[\frac{x^4}{4}\right]_0^{\ell}}{\frac{g}{2}\left[\frac{x^3}{3}\right]_0^{\ell}} = \frac{3}{4}\ell$$

$$dA = \frac{1}{2} g x^2 \cdot dx$$



$$A\cdot l - ql\cdot\frac{l}{2} - C\,l = 0$$

① $$\boxed{A - \frac{ql}{2} = C}$$

NEZNÁME: A, C, C_1, C_2, C_3, C_4

$$M(x_1) = A\cdot x_1 - \frac{1}{2}q x_1^2$$

$$EI_y w''(x_1) = \frac{1}{2}q x_1^2 - A\cdot x_1$$

$$EI_y w'(x_1) = \frac{1}{6}q x_1^3 - A\frac{x_1^2}{2} + C_1$$

$$EI_y w(x_1) = \frac{1}{24}q x_1^4 - A\cdot\frac{x_1^3}{6} + C_1\cdot x_1 + C_2$$

② $w(0) = 0 \longrightarrow \boxed{C_2 = 0}$

⑤ $w(l) = 0$

$$\boxed{C_1 = \frac{A l^2}{6} - \frac{1}{24} q l^3}$$

$$M(x_2) = C\cdot x_2$$

$$EI_y w''(x_2) = -C x_2$$

$$EI_y w'(x_2) = -C\frac{x_2^2}{2} + C_3$$

$$EI_y w(x_2) = -C\frac{x_2^3}{6} + C_3 x_2 + C_4$$

③ $w(0) = 0 \longrightarrow \boxed{C_4 = 0}$

④ $w(l) = 0 \longrightarrow -C\frac{l^3}{6} + C_3\cdot l = 0 \longrightarrow \boxed{C_3 = \frac{1}{6}C\cdot l^2}$