

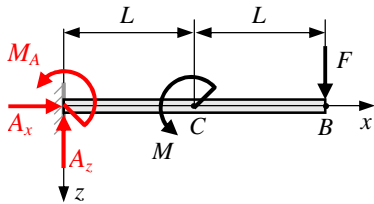
$F; M = FL; L; EI = \text{const.}$

1.

$M = FL, \dots$

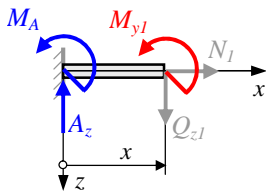
2.

$$B,z = \frac{\partial U}{\partial F} = \int_{L_1} \frac{M_{y1}}{EI_{y1}} \frac{\partial M_{y1}}{\partial F} dx + \int_{L_2} \frac{M_{y2}}{EI_{y2}} \frac{\partial M_{y2}}{\partial F} dx. \quad (1)$$



3.

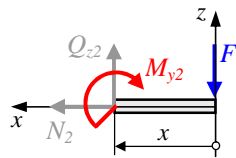
$$\begin{aligned} x_i = 0: & & A_x = 0. \\ M_{Ai} = 0: & M_A + M - 2LF = 0; & M_A = 2LF - M. \\ z_i = 0: & A_z - F = 0; & A_z = F. \end{aligned}$$



4.

4.1. (AC), $x \in [0; L]$

$$\begin{aligned} M_{yi} = 0: & M_{y1} + M_A - A_z x = 0; & M_{y1} = Fx - 2LF + M; \\ & & M_{y1}/F = x - 2L. \end{aligned}$$



4.2. (BC), $x \in [0; L]$

$$\begin{aligned} M_{yi} = 0: & M_{y2} + Fx = 0; & M_{y2} = -Fx; \\ & & M_{y2}/F = -x. \end{aligned}$$

5.

(1)

$$\begin{aligned} B,z &= \frac{1}{EI_y} \int_0^L M_{y1} \frac{\partial M_{y1}}{\partial F} dx + \frac{1}{EI_y} \int_0^L M_{y2} \frac{\partial M_{y2}}{\partial F} dx = \frac{1}{EI_y} \int_0^L (Fx - FL)(x - 2L) dx + \frac{1}{EI_y} \int_0^L (-Fx)(-x) dx; \\ B,z &= \frac{1}{EI_y} \left[\int_0^L (Fx^2 - FLx - 2FLx + 2FL^2) dx + \int_0^L Fx^2 dx \right] = \frac{1}{EI_y} \left[F \frac{L^3}{3} - 3FL \frac{L^2}{2} + 2FL^2 \cdot L + F \frac{L^3}{3} \right]; \\ B,z &= \frac{7 FL^3}{6 EI_y}. \end{aligned}$$