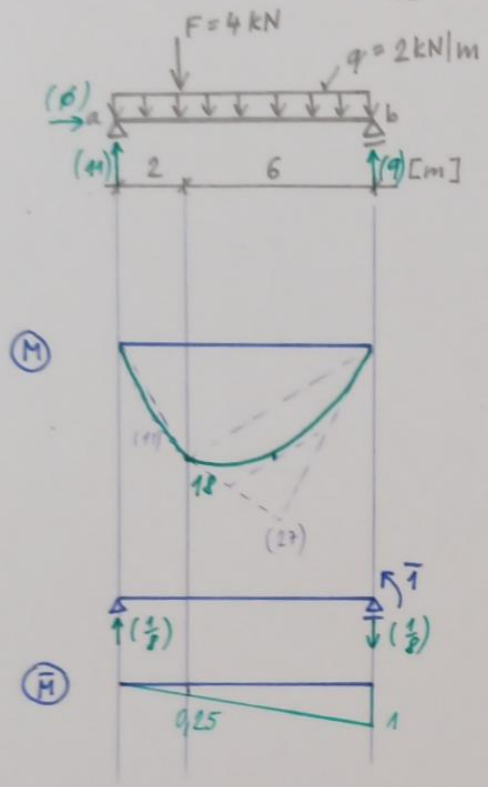
(A)



$\varphi_b = ?$

$EI = 10\,800\ kPa \cdot m^4$

$\oplus \circlearrowleft \Sigma M_{ia} = 0:$

$-q\,8\,4 - F\,2 + R_b\,8 = 0$

$R_b = \frac{2 \cdot 8 \cdot 4 + 4 \cdot 2}{8}$

$R_b = 9\ kN$

$\oplus \circlearrowright \Sigma M_{ib} = 0:$

$-R_a\,8 + F\,6 + q\,8\,4 = 0$

$R_a = \frac{4 \cdot 6 + 2 \cdot 8 \cdot 4}{8}$

$R_a = 11\ kN$

$\Sigma F_{ix} = 0 \quad R_{ax} = 0$

KO: $\Sigma F_{iz} = 0$

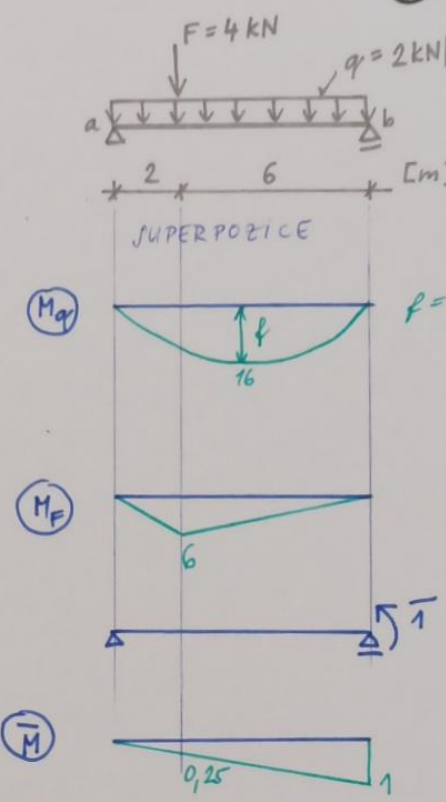
$R_a + R_b - F - q\,8 = 0$

$11 + 9 - 4 - 2 \cdot 8 = 0$ ✓

$$\varphi_b = \frac{1}{EI}\left\{\left(\tfrac{1}{2}\cdot 11\cdot 2\right)\cdot\left[\tfrac{1}{3}\cdot 0{,}25\right] + \left(\tfrac{2}{3}\left(\tfrac{1}{8}\cdot 2\cdot 2^2\right)\cdot 2\right)\cdot\left[\tfrac{1}{2}\cdot 0{,}25\right] + \left(\tfrac{1}{2}\cdot 11\cdot 6\right)\cdot\left[\tfrac{2}{3}\cdot 0{,}25 + \tfrac{1}{3}\cdot 1\right] + \left(\tfrac{2}{3}\cdot\left(\tfrac{1}{8}\cdot 2\cdot 6^2\right)\cdot 6\right)\cdot\left[\tfrac{1}{2}\,0{,}25 + \tfrac{1}{2}\,1\right]\right\}$$

$$\varphi_b = \frac{158}{3EI} = \frac{158}{3 \cdot 10800} = 4{,}8765 \cdot 10^{-3}\ rad$$

(A)



$\varphi_b = ?$

$EI = 10\,800\ kPa \cdot m^4$

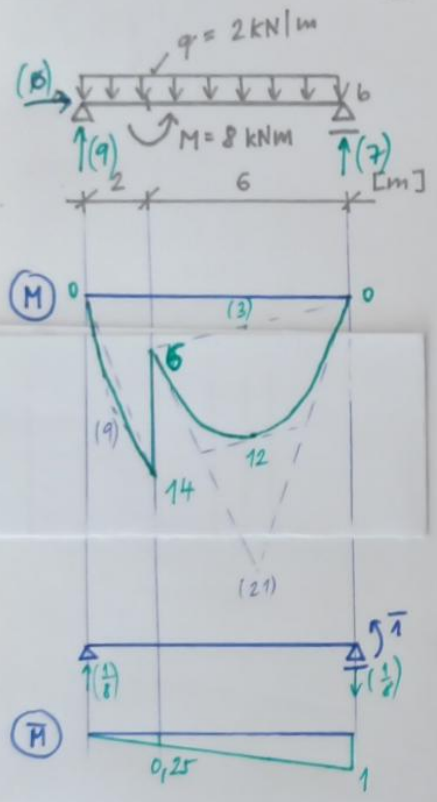
$f = \frac{1}{8} \cdot 2 \cdot 8^2 = 16$

$$\varphi_b = \frac{1}{EI}\left\{\left(\tfrac{2}{3}\cdot 16\cdot 8\right)\cdot\left[\tfrac{1}{2}\cdot 1\right] + \left(\tfrac{1}{2}\cdot 2\cdot 6\right)\cdot\left[\tfrac{2}{3}\cdot 0{,}25\right] + \left(\tfrac{1}{2}\cdot 6\cdot 6\right)\cdot\left[\tfrac{2}{3}\cdot 0{,}25 + \tfrac{1}{3}\cdot 1\right]\right\} = \frac{158}{3EI}$$

(16) (1) (6) (0,25) (6) (0,25) (1)

$$\varphi_b = \frac{158}{3 \cdot 10800} = 4{,}8765 \cdot 10^{-3}\ rad$$

(B)



$\varphi_b = ?$

$EI = 10800\ kPa \cdot m^4$

$\Sigma F_{ix} = 0 : \quad R_{ax} = 0$

$\oplus \circlearrowleft \Sigma M_{ia} = 0:$

$-q \cdot 8 \cdot 4 + M + R_b \cdot 8 = 0$

$R_b = \dfrac{2 \cdot 8 \cdot 4 - 8}{8}$

$R_b = 7\ kN$

$\oplus \circlearrowleft \Sigma M_{ib} = 0:$

$-R_a \cdot 8 + M + q \cdot 8 \cdot 4 = 0$

$R_a = \dfrac{8 + 2 \cdot 8 \cdot 4}{8}$

$R_a = 9\ kN$

Kontrola: $\Sigma F_{iz} = 0:$

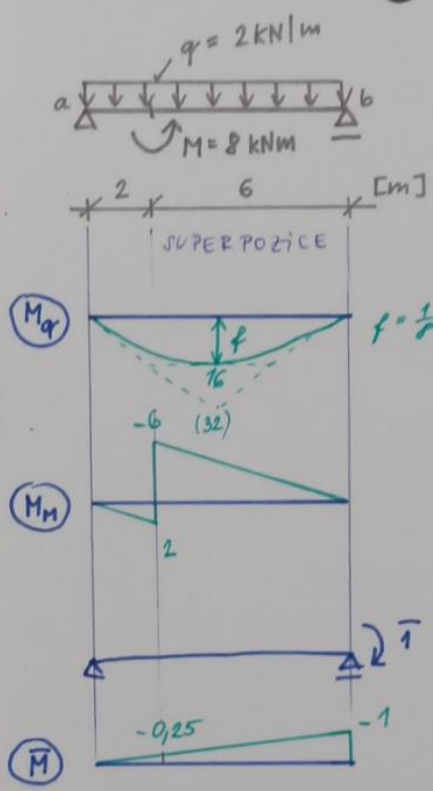
$R_a + R_b - q \cdot 8 = 0$

$9 + 7 - 2 \cdot 8 = 0$ ✓

$$\varphi_b = \frac{1}{EI}\left\{\left(\tfrac{1}{2}\cdot 14\cdot 2\right)\left[\tfrac{2}{3}\,0{,}25\right] + \left(\tfrac{2}{3}\left(\tfrac{1}{8}\cdot 2\cdot 2^2\right)\cdot 2\right)\left[\tfrac{1}{2}\cdot 0{,}25\right] + \left(\tfrac{1}{2}\cdot 6\cdot 6\right)\left[\tfrac{2}{3}\,0{,}25 + \tfrac{1}{3}\,1\right] + \left(\tfrac{2}{3}\left(\tfrac{1}{8}\cdot 2\cdot 6^2\right)\cdot 6\right)\left[\tfrac{1}{2}\,0{,}25 + \tfrac{1}{2}\cdot 1\right]\right\}$$

$$\varphi_b = \frac{34}{EI} = \frac{34}{10800} = 3{,}\overline{148}\cdot 10^{-3}\ rad$$

(B)



$\varphi_b = ?$

$EI = 10800\ kPa \cdot m^4$

$f = \frac{1}{8} \cdot 2 \cdot 8^2 = 16$

$$\varphi_b = \frac{1}{EI}\left\{\left(\tfrac{2}{3}\cdot 16\cdot 8\right)\left[\tfrac{1}{2}\cdot(-1)\right] + \left(\tfrac{1}{2}\cdot 2\cdot 2\right)\left[\tfrac{2}{3}(-0{,}25)\right] + \left(\tfrac{1}{2}\cdot(-6)\cdot 6\right)\left[\tfrac{2}{3}(-0{,}25) + \tfrac{1}{3}(-1)\right]\right\}$$

(16, -1; 2; -0,25; -6; -0,25, -1)

$$\varphi_b = \frac{-34}{EI} = \frac{-34}{10800} = -3{,}\overline{148}\cdot 10^{-3}\ rad$$