$$\Sigma M_A = 0 ; \qquad -50 \cdot 10^3 \cdot 5.4 \cdot (2.7) + B_y(2.4) + 50 \cdot 10^3 \cdot 3 \cdot (3.9) + C_y(5.4) = 0$$

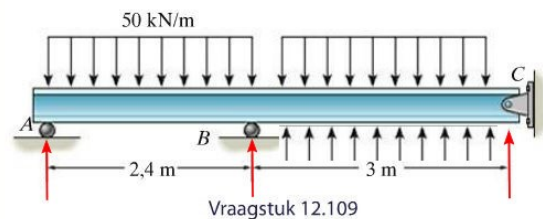$$-144 \cdot 10^3 + 2.4 \cdot B_y + 5.4 \cdot C_y = 0 \quad [1]$$

$$\Sigma F_y = 0 ;$$

$$A_y - 50 \cdot 10^3 \cdot 5.4 + B_y + 50 \cdot 10^3 \cdot 3 + C_y = 0$$

$$A_y + B_y - 120 \cdot 10^3 + C_y = 0 \quad [2]$$

•12.109 Gebruik discontinuïteitsfuncties en bepaal de reactiekrachten in de ondersteuningen. Teken daarna de dwarskrachten- en buigmomentenlijnen. *EI* is constant.

Vraagstuk 12.109

$$EIv(x) = -\frac{50 \cdot 10^3}{24} \cdot (x-0)^4 + \frac{1}{6} A_y (x-0)^3 + \frac{1}{6} B_y (x-2.4)^3 + \frac{50 \cdot 10^3}{24} \cdot (x-2.4)^4 + C_1 \cdot x + C_2$$

$\qquad x = 0 = 2.4 = 5.4 \qquad dan \qquad v = 0$

$EIv(0)$ elke term met x = 0 $C_2 = 0$

$$EIv(2.4) = -\frac{50 \cdot 10^3}{24} \cdot (2.4-0)^4 + \frac{1}{6} A_y (2.4-0)^3 \; C_1 \cdot 2.4 = 0 \qquad C_1 = 28800 - 0.96\, A_y$$

$$EIv(5.4) = -\frac{50 \cdot 10^3}{24} \cdot (5.4-0)^4 + \frac{1}{6} A_y (5.4-0)^3 \; \frac{1}{6} B_y (5.4-2.4)^3 + \frac{50 \cdot 10^3}{24} \cdot (5.4-2.4)^4 + $$

$$(28800 - 0.96\, A_y) \cdot 5.4 = 0$$

$$-1447200 + 21.06\, A_y + \frac{9}{2} B_y = 0 \qquad B_y = 321600 - 4.68\, A_y \qquad [3]$$

$$-144 \cdot 10^3 + 2.4 \cdot B_y + 5.4 \cdot C_y = 0 \qquad [1]$$

$$B_y = 321600 - 4.68\, A_y \qquad [3]$$

$$A_y + B_y - 120 \cdot 10^3 + C_y = 0 \qquad [2]$$

$$\Sigma M_C = 0 \; ; \quad 50 \cdot 10^3 \cdot 5.4 \cdot (2.7) - 50 \cdot 10^3 \cdot 3 \cdot (1.5) - B_y(3) - A_y(5.4) = 0$$

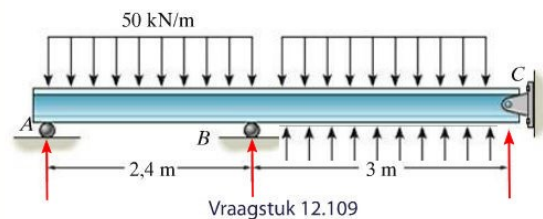$$504 \cdot 10^3 - 3 \cdot B_y - 5.4 \cdot A_y = 0 \quad [1]$$

•12.109 Gebruik discontinuïteitsfuncties en bepaal de reactiekrachten in de ondersteuningen. Teken daarna de dwarskrachten- en buig-momentenlijnen. EI is constant.

$$\Sigma F_y = 0 \; ;$$

$$C_y - 50 \cdot 10^3 \cdot 5.4 + B_y + 50 \cdot 10^3 \cdot 3 + A_y = 0$$

$$A_y + B_y - 120 \cdot 10^3 + C_y = 0 \quad [2]$$

50 kN/m

2,4 m   3 m

Vraagstuk 12.109

$$EIv(x) = -\frac{50 \cdot 10^3}{24} \cdot (x-0)^4 + \frac{1}{6} A_y(x-0)^3 + \frac{1}{6} B_y(x-2.4)^3 + \frac{50 \cdot 10^3}{24} \cdot (x-2.4)^4 + C_1 \cdot x + C_2$$

$x = 0 = 2.4 = 5.4 \quad dan \quad v = 0$

$EIv(0)$ $C_2 = 0$

$$EIv(2.4) = -\frac{50 \cdot 10^3}{24} \cdot (2.4-0)^4 + \frac{1}{6} A_y(2.4-0)^3 \, C_1 \cdot 2.4 = 0 \qquad C_1 = 28800 - 0.96 \, A_y$$

$$EIv(5.4) = -\frac{50 \cdot 10^3}{24} \cdot (5.4-0)^4 + \frac{1}{6} A_y(5.4-0)^3 \, \frac{1}{6} B_y(5.4-2.4)^3 + \frac{50 \cdot 10^3}{24} \cdot (5.4-2.4)^4 + $$

$$\langle 28800 - 0.96 \, A_y \rangle \cdot 5.4 = 0$$

$$-1447200 + 21.06 \, A_y + \frac{9}{2} B_y = 0 \qquad B_y = 321600 - 4.68 \, A_y \quad [3]$$

$$504 \cdot 10^3 - 3 \cdot B_y + 5.4 \cdot A_y = 0 \qquad [1]$$

$$B_y = 321600 - 4.68 \, A_y \qquad [3]$$

$$A_y + B_y - 120 \cdot 10^3 + C_y = 0 \qquad [2]$$

$\Sigma M_A = 0$;

$C_y := 1 \qquad B_y := 1 \qquad A_y := 1 \qquad A_m := 0$

$A_y + B_y - 120 \cdot 10^3 + C_y = 0$

$-144 \cdot 10^3 + 2.4 \cdot B_y + 5.4 \cdot C_y = 0$

$B_y = 321600 - 4.68 \; A_y$

$$\text{find}\,(A_y, B_y, C_y, \mathbf{A_m}) = \begin{bmatrix} 5.333 \cdot 10^4 \\ 7.2 \cdot 10^4 \\ -5.333 \cdot 10^3 \\ 0 \end{bmatrix}$$

$\Sigma M_C = 0$;

$C_y := 1 \qquad B_y := 1 \qquad A_y := 1 \qquad C_m := 0$

$A_y + B_y - 120 \cdot 10^3 + C_y = 0$

$504 \cdot 10^3 - 3 \cdot B_y - 5.4 \cdot A_y = 0$

$B_y = 321600 - 4.68 \; A_y$

$$\text{find}\,(A_y, B_y, C_y, \mathbf{C_m}) = \begin{bmatrix} 5.333 \cdot 10^4 \\ 7.2 \cdot 10^4 \\ -5.333 \cdot 10^3 \\ 0 \end{bmatrix}$$