

$$\left(\sum M_c = 0\right)$$

$$\frac{2.4 \times (8.23)^2}{2} - R_A \times 8.23 - R_B \times 3.795 - 1.1 = 0$$

$$- 1.4 \times (1)^2 = 0$$

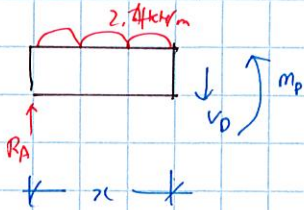
$$81.28 - 8.23 R_A - 3.795 R_B - 1.1 = 0$$

$$80.08 - 8.23 R_A - 3.795 R_B = 0$$

$$3.795 R_B = 80.08 - 8.23 R_A$$

$$R_B = 21.1 - 2.17 R_A \quad (1)$$

$$0 < x < 4.435 \text{ m}$$



$$\left(\sum M_D = 0\right)$$

$$- R_A x + \frac{2.4 x^2}{2} + m_D = 0$$

$$m_D = -1.2 x^2 + R_A x$$

$$EI \frac{d^2 y}{dx^2} = -1.2 x^2 + R_A x$$

$$EI \frac{dy}{dx} = -\frac{1.2}{3} x^3 + \frac{R_A x^2}{2} + C_1 \quad (4)$$

$$\text{At } x = 4.435, \quad 0 = -0.1(4.435)^4 + 0.25 R_A (4.435)^3 + C_1 (4.435)$$

$$0 = -38.69 + 21.8 R_A + 4.435 C_1$$

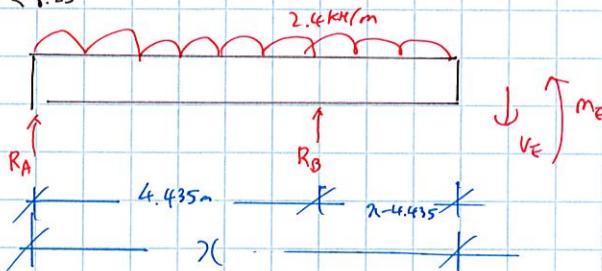
$$C_1 = 8.72 - 4.92 R_A$$

$$EI \frac{dy}{dx} = -0.4 x^3 + 0.5 R_A x^2 + C_1$$

$$EI y = \frac{-0.4}{4} x^4 + \frac{0.5}{2} R_A x^3 + C_1 x + C_2$$

$$EI y = -0.1 x^4 + 0.25 R_A x^3 + C_1 x + C_2$$

$$4.435 < x < 8.23$$



$$\left(\sum M_E = 0\right)$$

$$- R_A x + R_B (x - 4.435) + 2.4 \frac{x^2}{2} + m_E = 0$$

$$- R_A x - R_A x + 4.435 R_B + 1.2 x^2 + m_E = 0$$

$$m_E = -1.2 x^2 + R_A x + R_B x - 4.435 R_B$$

$$EI \frac{d^2 y}{dx^2} = -1.2 x^2 + R_A x + R_B x - 4.435 R_B$$

$$EI \frac{dy}{dx} = -\frac{1.2}{3} x^3 + \frac{R_A x^2}{2} + \frac{R_B x^2}{2} - 4.435 R_B x + C_3$$

$$EI \frac{dy}{dx} = -0.4 x^3 + 0.5 R_A x^2 + 0.5 R_B x^2 - 4.435 R_B x + C_3 \quad (5)$$

$$EI y = \frac{-0.4}{4} x^4 + \frac{0.5}{3} R_A x^3 + \frac{0.5}{3} R_B x^3 - \frac{4.435}{2} R_B x^2 + C_3 x + C_4$$

$$EI y = -0.1 x^4 + 0.167 R_A x^3 + 0.167 R_B x^3 - 2.22 R_B x^2 + C_3 x + C_4$$

Substitute eq ①,

$$EI \frac{dy}{dx} = -0.1x^4 + 0.167 R_A x^3 + 0.167 (21.1 - 2.17 R_A) x^3 - 2.22 (21.1 - 2.17 R_A) x^2 + C_3 x + C_4$$

$$\begin{aligned} EI \frac{dy}{dx} &= -0.1x^4 + 0.167 R_A x^3 + (3.5 - 0.36 R_A) x^3 - (46.8 - 4.8 R_A) x^2 + C_3 x + C_4 \\ &= -0.1x^4 + 0.167 R_A x^3 + 3.5x^3 - 0.36 R_A x^3 - 46.8x^2 + 4.8 R_A x^2 + C_3 x + C_4 \\ &= -0.1x^4 - 0.193 R_A x^3 + 3.5x^3 - 46.8x^2 + 4.8 R_A x^2 + C_3 x + C_4 \end{aligned}$$

At $x = 4.435, y = 0$, then $0 = -0.1(4.435)^4 - 0.193 R_A (4.435)^3 + 3.5(4.435)^3 - 46.8(4.435)^2 + 4.8 R_A (4.435)^2 + C_3(4.435) + C_4$

$$0 = -38.7 - 16.8 R_A + 395.3 - 926.5 + 94.4 R_A + 4.435 C_3 + C_4$$

$$0 = -653.9 + 77.6 R_A + 4.435 C_3 + C_4 \quad (2)$$

At $x = 8.23, y = 0$, then $0 = -0.1(8.23)^4 - 0.193 R_A (8.23)^3 + 3.5(8.23)^3 - 46.8(8.23)^2 + 4.8 R_A (8.23)^2 + C_3(8.23) + C_4$

$$0 = -458.8 - 107.6 R_A + 1951 - 3169.9 + 325.1 R_A + 8.23 C_3 + C_4$$

$$0 = -1677.7 + 217.5 R_A + 8.23 C_3 + C_4 \quad (3)$$

② + ③

$$0 = -653.9 + 77.6 R_A + 4.435 C_3 + C_4$$

$$0 = -1677.7 + 217.5 R_A + 8.23 C_3 + C_4$$

$$0 = 1023.8 - 139.9 R_A - 3.795 C_3, \quad C_3 = 269.8 - 36.9 R_A$$

Eq ④

$$EI \frac{dy}{dx} = -0.4x^3 + 0.5 R_A + 9.72 - 4.42 R_A$$

$$= -0.4x^3 - 4.42 R_A + 9.72$$

Eq ⑤

$$\begin{aligned} EI \frac{dy}{dx} &= -0.4x^3 + 0.5 R_A x^2 + 0.5 (21.1 - 2.17 R_A) x^2 \\ &\quad - 4.435 (21.1 - 2.17 R_A) x + 269.8 - 36.9 R_A \\ &= -0.4x^3 + 0.5 R_A x^2 + 5.55 x^2 - 1.085 R_A x^2 \\ &\quad - 93.8 x + 9.6 R_A x + 269.8 - 36.9 R_A \\ &= -0.4x^3 + 1.585 R_A x^2 + 5.55 x^2 - 93.6 x \\ &\quad - 27.5 R_A + 9.6 R_A x + 269.8 - 36.9 R_A \end{aligned}$$

At $x = 4.435$

Eq ④

$$\begin{aligned} EI \frac{dy}{dx} &= -0.4(4.435)^3 - 4.42 R_A + 9.72 \\ &= -34.9 - 4.42 R_A + 9.72 \\ &= -26.2 - 4.42 R_A \end{aligned}$$

Eq ⑤

$$\begin{aligned} EI \frac{dy}{dx} &= -0.4(4.435)^3 + 1.585 R_A (4.435)^2 + 5.55 (4.435)^2 \\ &\quad - 93.6 (4.435) + 9.6 R_A (4.435) + 269.8 \\ &\quad - 36.9 R_A \\ &= -34.9 + 31.2 R_A + 109.1 - 415.1 \\ &\quad + 42.6 R_A + 269.8 - 36.9 R_A \\ &= -71.1 + 36.9 R_A \end{aligned}$$

$$\text{Let } e_6 \textcircled{4} = e_9 \textcircled{5}$$

$$-26.2 - 44.2 R_A = -71.1 + 36.9 R_A$$

$$44.9 = 37.51 R_A$$

$$R_A = 1.2 \text{ kN}$$