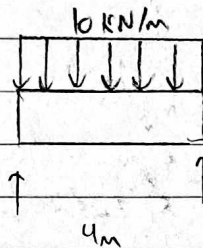
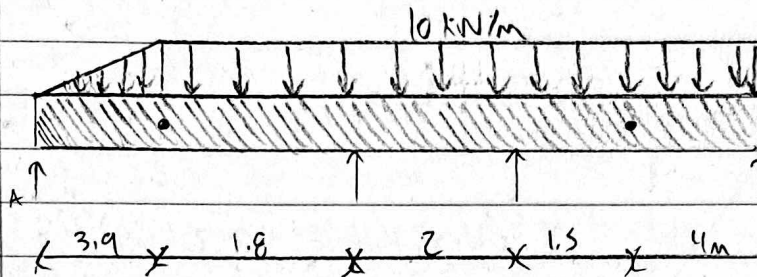
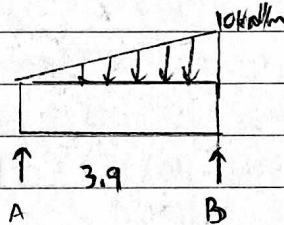


Solutions: 21-S-7.3-MK-01



$$10 \text{ kN} \times 4 = 40 \text{ kN} \rightarrow E_y = f_y = 20 \text{ kN}$$

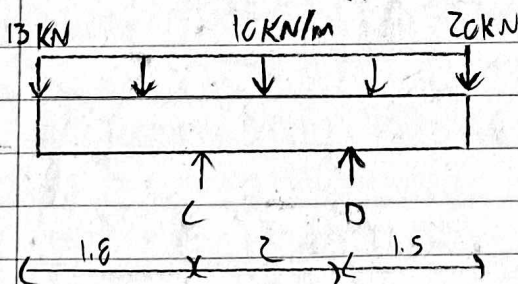


$$\frac{(10 \text{ kN/m} \times 3.9)}{2} = 19.5 \text{ kN/m} @ 2.6 \text{ m from left}$$

$$\sum M_A = -(2.6 \text{ m})(19.5 \text{ kN/m}) + B_y(3.9 \text{ m})$$

$$B_y = \frac{(2.6)(19.5 \text{ kN/m})}{3.9} = B_y = 13 \text{ kN}$$

$$\sum M_B = (1.3 \text{ m})(19.5 \text{ kN/m}) - A_y(3.9) \rightarrow A_y = \frac{(1.3)(19.5 \text{ kN/m})}{3.9} \quad A_y = 6.5 \text{ kN}$$



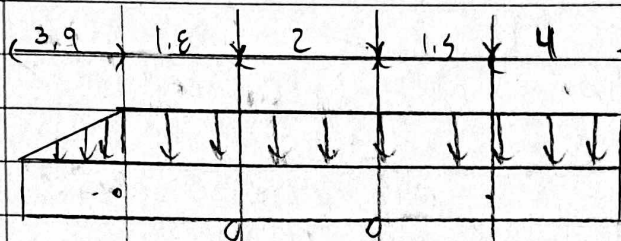
$$\text{force} = (10 \text{ kN/m})(1.8 + 2 + 1.5) = 53 \text{ kN} @ 2.65 \text{ m}$$

$$\sum M_c = (13 \text{ kN})(1.8 \text{ m}) - (53 \text{ kN})(0.85 \text{ m}) + D_y(2) - (20 \text{ kN})(3.5)$$

$$D_y = \frac{(53)(0.85) + (20)(3.5) - (13)(1.8)}{2} = 45.825 \text{ kN}$$

$$\sum M_D = -(20)(1.5) + (53)(1.15) - C_y(2) + (13)(3.8)$$

$$C_y = \frac{(53)(1.15) + (13)(3.8) - 20(1.5)}{2} \rightarrow C_y = 40.175 \text{ kN}$$

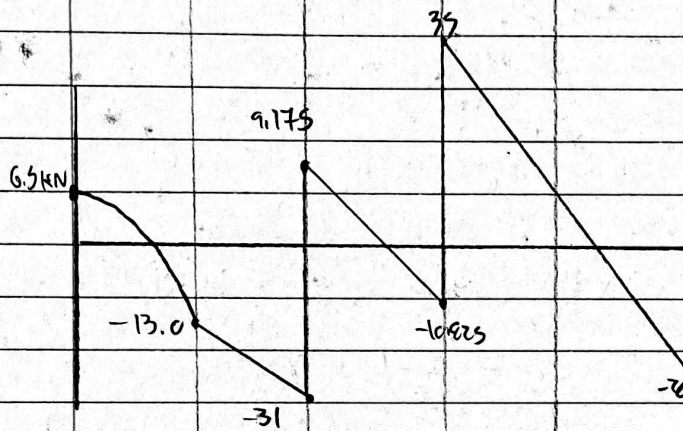


$$V_A = 6.5 \text{ kN}$$

$$= \left(\frac{10 \times}{3.9} \right) \frac{x}{2} \quad 1.282x^2$$

$$V_B = 6.5 - 1.282(3.9)^2 \rightarrow V_B = -13.000$$

$$0 = 6.5 - 1.282x^2 \rightarrow \sqrt{\frac{6.5}{1.282}} = x_1 = 2.25$$



$$V_C = -13.00 - 10x = -13.00 - (10 \times 1.8)$$

$$V_C = -31 \text{ kN}$$

$$+31 \text{ kN} + 40.175 = 9.175 \text{ kN}$$

$$V_D = 9.175 \text{ kN} - (10 \times 2\text{m}) = -10.825$$

$$x_2 = \frac{9.175 \text{ kN}}{10} \Rightarrow x_2 = 0.9175 + 1.8 + 3.9$$

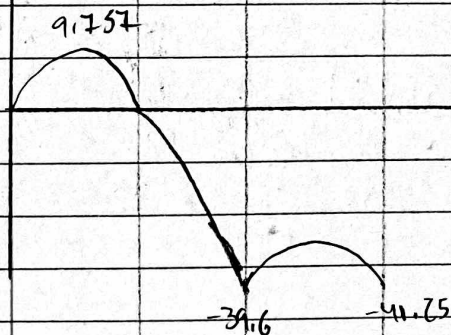
$$x_2 = 6.6175$$

$$-10.825 + 45.825 = 35$$

$$V_F = 35 - (5.5 \times 10) = -20 \quad + F_y = 0$$

$$x_3 = 35 - (10)x + 3.9 + 1.8 + 2 = 6.1$$

$$x_3 = 11.2 \text{ m}$$



$$M_B = \int 6.5 - 1.282x^2 \rightarrow 6.5x - \frac{1.282x^3}{3}$$

$$M_B = 6.5(3.9) - \frac{1.282(3.9)^3}{3} = 0$$

$$M_{x_1} = 6.5(2.25) - \frac{1.282(2.25)^3}{3} = 9.757 \text{ kNm}$$

$$M_C = 0 + \int -13 + 10x \rightarrow -13x - \frac{10x^2}{2}$$

$$M_C = -13(1.8) - \frac{10(1.8)^2}{2} = -39.6 \text{ kNm}$$

$$M_D = -39.6 + \int 9.175 - 10x$$

$$M_D = -39.6 + 9.175x - \frac{10x^2}{2} \rightarrow -39.6 + 9.175(2) - \frac{10(2)^2}{2}$$

$$M_D = -41.25 \text{ kNm}$$

$$M_{x_2} = -39.6 + 9.175(0.9175) - \frac{10(0.9175)^2}{2} = -35.39 \text{ kNm}$$

$$M_F = -41.25 + \int 35 - 10x \rightarrow -41.25 + 35x - \frac{10x^2}{2}$$

$$M_F = -41.25 + 35(5.5) - \frac{10(5.5)^2}{2}$$

$$M_{x_3} = -41.25 + 35(3.5) - \frac{10(3.5)^2}{2} = 20$$