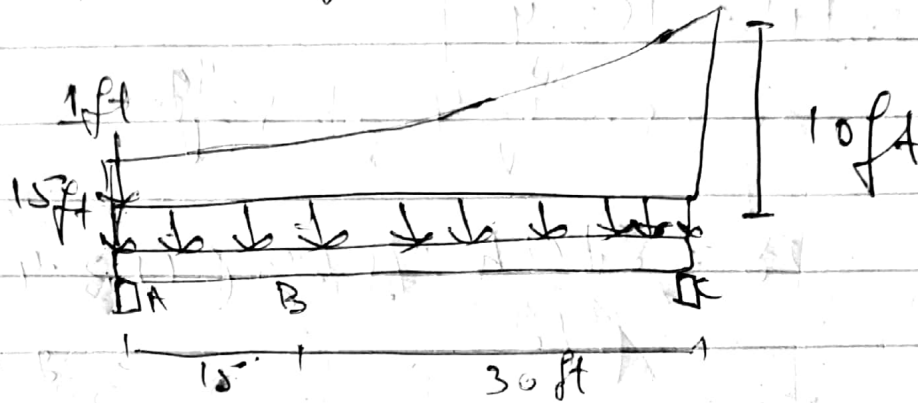


Assignment No 1

Q No 1



Solution

member BC

$$\sum F_x = 0$$

$$B_x = 0$$

member AB

$$\sum F_x = 0$$

$$A_x = 0$$

moment At A

$$\sum M_A^+ = 0$$

$$F_x(1) - B_y(15) - 45(7.5) = 0 \rightarrow$$

FBD

$$\sum M_C^+ = 0 - F_H(10) - B_y(30) + (45)(30) = 0$$

$$\boxed{FH = 153.4}$$

$$B_y = 0$$

$$w_D = \frac{2FHh}{L^2} = \frac{2(153.4)(10)}{30^2}$$

$$= \frac{3068}{900} = 3.40$$

$$\boxed{w_D = 3.40 \text{ k/ft}}$$

$$F_{max} = w_D L \sqrt{1 + \left(\frac{L}{24}\right)^2}$$

$$= 3.4(30) \sqrt{1 + \left(\frac{30}{24}\right)^2}$$

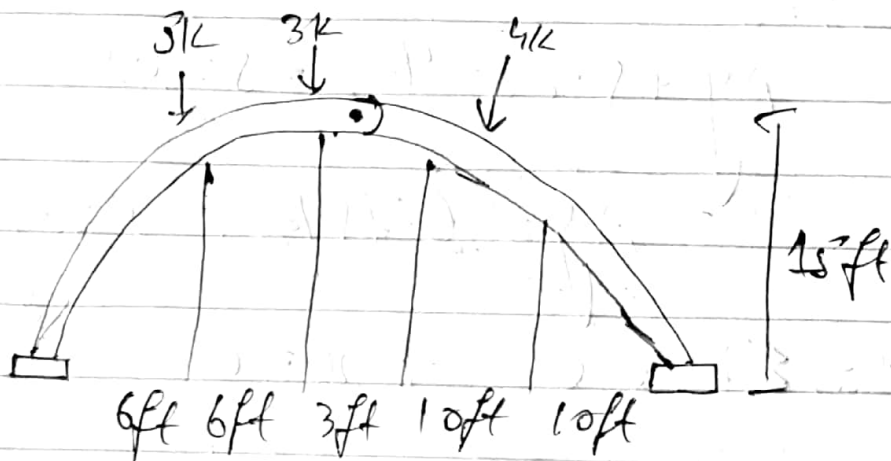
$$F_{max} = 183.6 \text{ k}$$

Each hanger carries 5 ft of

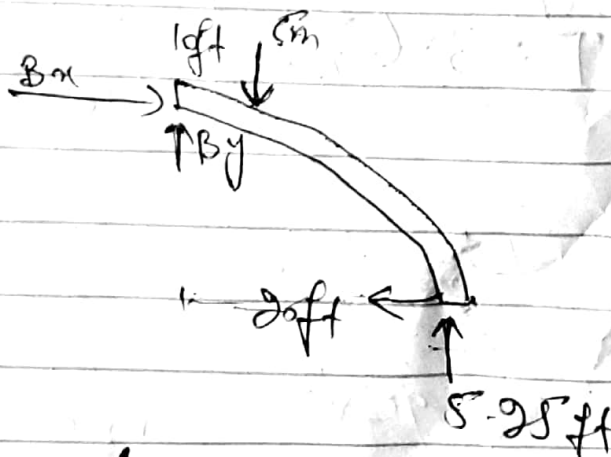
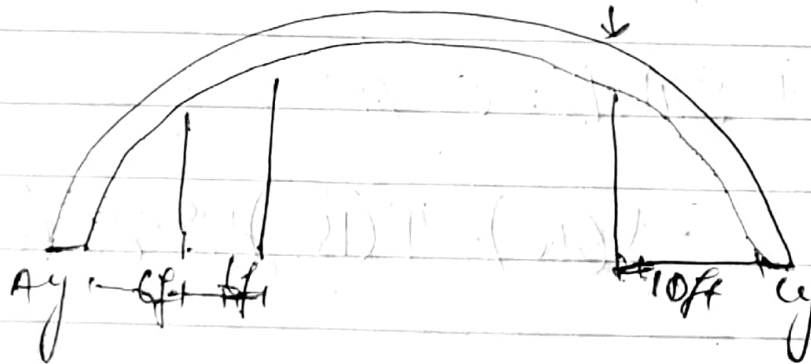
$$T = (5 \text{ ft}) (3.4 \text{ k/ft})$$

$$\boxed{T = 17 \text{ k}}$$

Q No 2



Solution



Entire arch :-

$$\sum M_A = 0; \quad -4(6) - 3(2) - 5(30) + C_y(40) = 0$$

$$C_y = 5.25 \text{ k}$$

$$+\uparrow \Sigma F_y = 0$$

$$A_y + 5 \cdot 25 - 4 - 3 - 5 = 0$$

$$A_y = 6.75 \text{ k}$$

$$\rightarrow \Sigma F_x = 0 \quad A_x = 0$$

Section BC :-

$$\hookrightarrow \Sigma M_B = 0$$

$$-5(10) - T(15) + 5 \cdot 25(20) = 0$$

$$T = 3.67 \text{ L}$$