

Assignment = ~~1034~~ 4

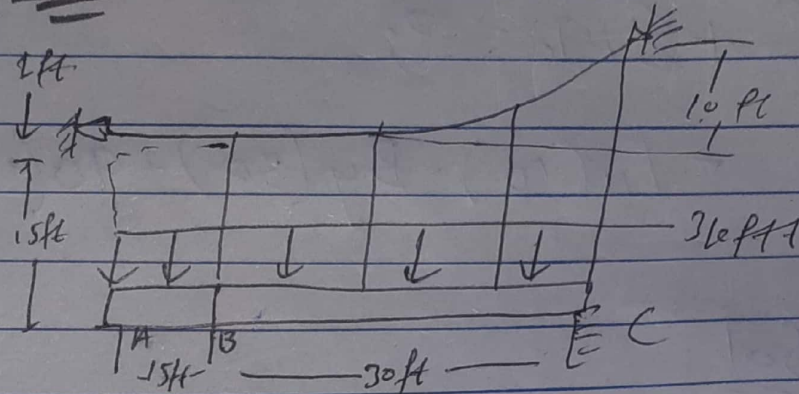
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Section = B.

Subject = S.A.

Q = 1 :-

Given :-Sol :-

Member BC:

$$\begin{aligned} \rightarrow \sum F_x &= 0; \\ B_x &= 0 \end{aligned}$$

Member AB;

$$\begin{aligned} \rightarrow \sum F_x &= 0; \\ A_x &= 0. \end{aligned}$$

FBD I:

$$\curvearrowright + \sum M_A = 0;$$

$$F_H (1) - B_y (15) - 30(7.5) = 0$$

FBD 2:-

$$\sum \Sigma M_c = 0;$$

$$-F_H(10) - B_y(30) + 90(15) = 0$$

Sol 1-

$$B_y = 0;$$

$$F_H = F_{min} = 225 \text{ k}$$

Max cable force occurs at E. Where slope is the maximum.

From eq 5-8.

$$w_0 = \frac{2F_H h}{L^2} = \frac{3(225)(10)}{30^2}$$

$$= 7.5 \text{ k/ft}$$

from eq 5-11.

$$F_{\max} = w_0 L \sqrt{1 + \left(\frac{L}{2h}\right)^2}$$

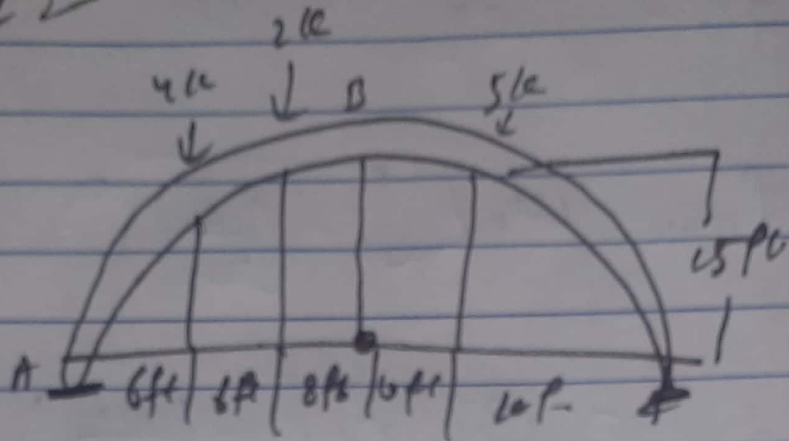
$$= 3(30) \sqrt{1 + \left(\frac{30}{3(10)}\right)^2}$$

$$F_{\max} = 127.2 \text{ k.}$$

Each hanger carries
5 ft of w_0

$$T = (3 \text{ k/ft})(5) = 10 \text{ k.}$$

Q. 22



Entire Arch;

$$\curvearrowright + \sum M_A = 0;$$

$$-4(6) - 3(12) - 5(30) + C_y(40) = 0$$

$$C_y = 5.5 \text{ k.}$$

$$+\uparrow \sum F_y = 0;$$

$$A_y + 5.5 - 4 - 3 - 5 = 0$$

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

$$\rightarrow \sum F_x = 0;$$

$$A_x = 0.$$

Section BC.

$$\hookrightarrow + \sum M_B = 0;$$

$$-5(10) - T(15) + 5 \cdot 0.5(20) = 0.$$

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