NAME: OWAIS USMAN

ID: 7897

SECTION: A

SEMESTER: 4th

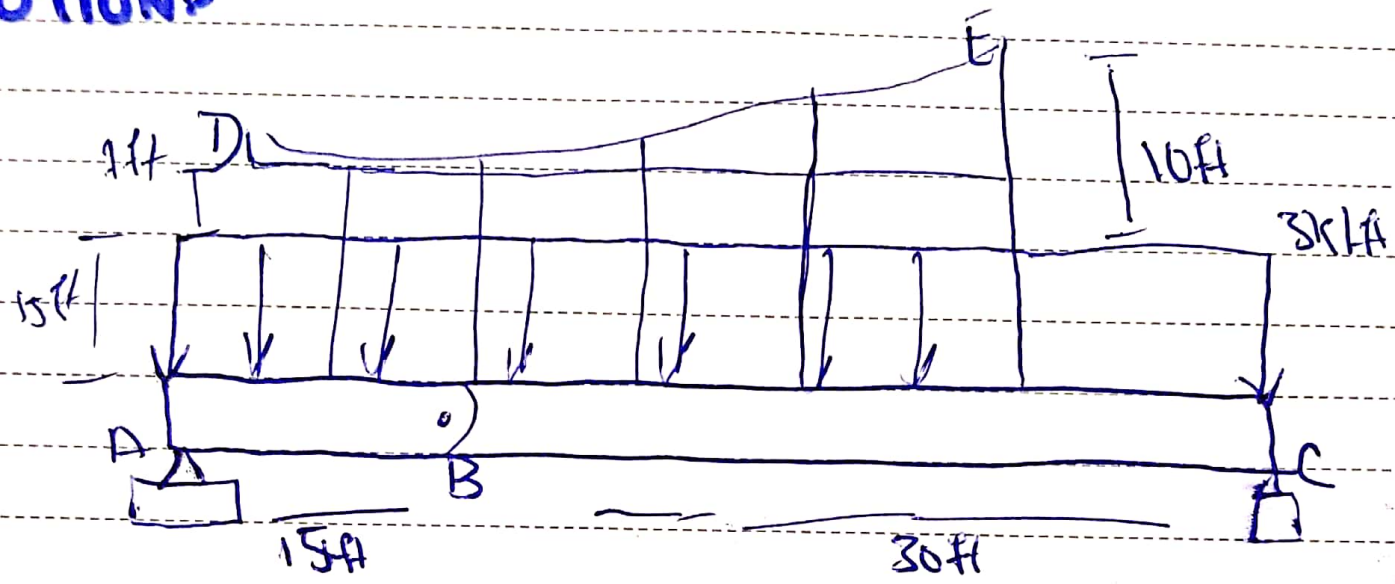
ASSIGNMENT: 4

SUBMITTED TO: SIR AMJAD ISL

DATE: 13th JULY 2020

QUESTION #1

SOLUTION:-



Member BC

$$\rightarrow^{+} \sum F_x = 0$$

$$B_x = 0$$

Member AB

$$\rightarrow^{+} \sum F_x = 0$$

$$A_x = 0$$

Moment At A

$$\circlearrowleft \sum M_A = 0 \quad F_H(1) - B_y(15) - 45(7.5) = 0 \quad \rightarrow (1)$$

FBD

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

$$F_H = 153.4 \qquad B_y = 0$$

$$w_o = \frac{2F_H h}{L^2} = \frac{2(153.4)(10)}{30^2}$$

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

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

$$F_{max} = w_o L \sqrt{1 + \left(\frac{30}{2(10)}\right)^2}$$

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

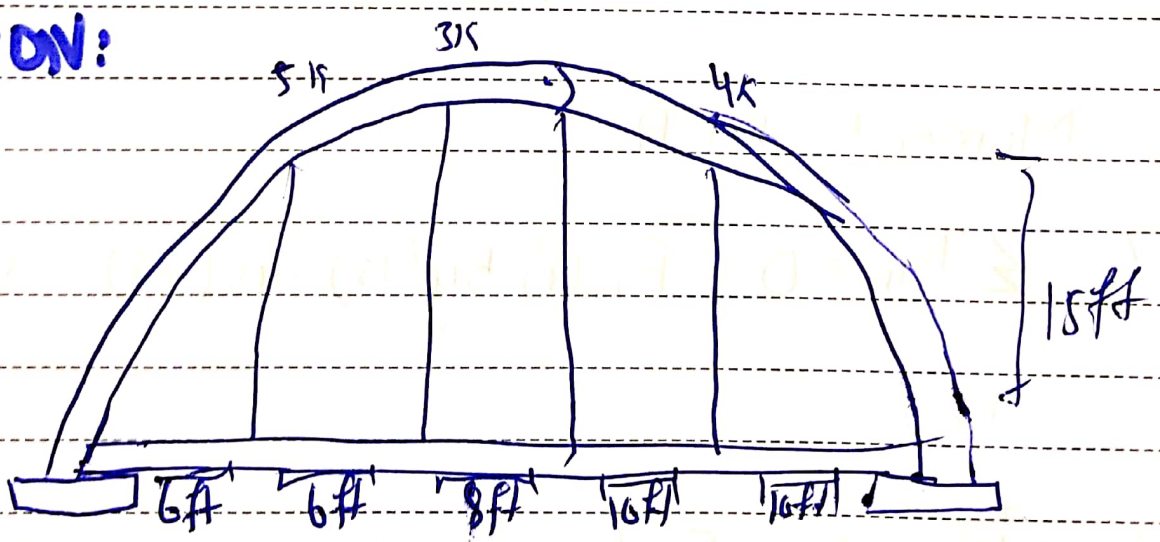
Each hanger carries 5 ft of w_o

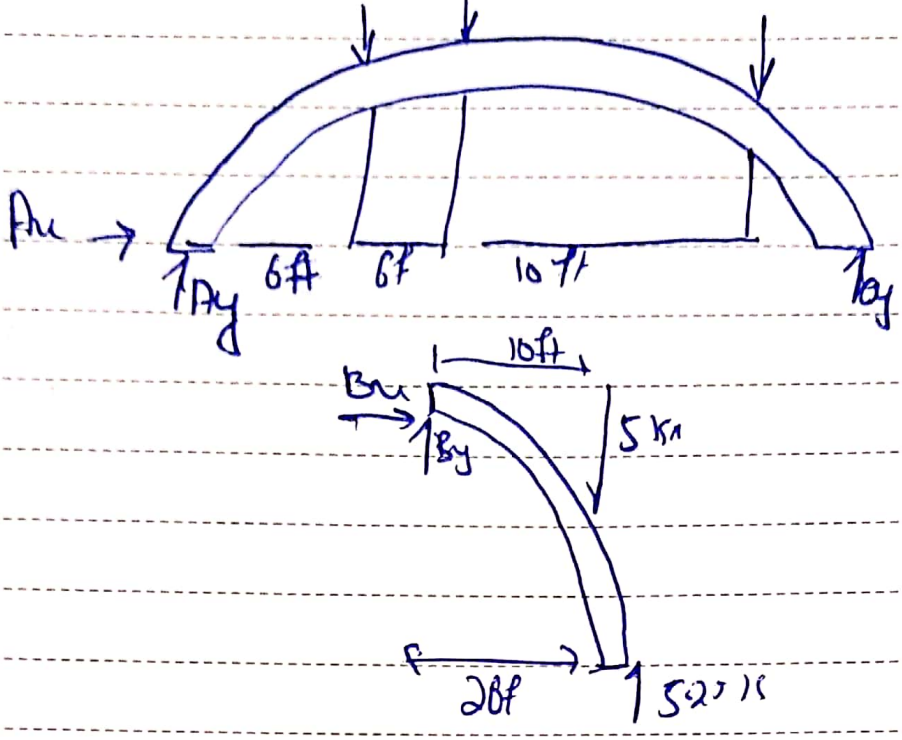
$$T = (5\text{ft})(3.4 \text{ k/ft})$$

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

QUESTION # 2

SOLUTION:





ENTIRE ARCH :

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

$C_y = 5.25k$

$+\uparrow \Sigma F_y = 0$

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

$A_y = 6.75k$

$\xrightarrow{+} \Sigma F_y = 0 \qquad A_x = 0$

Section BC:

$\circlearrowright + \Sigma M_B = 0$

$-5(10) - T(15) + 5.25(20) = 0$

$\boxed{T = 3.67L}$