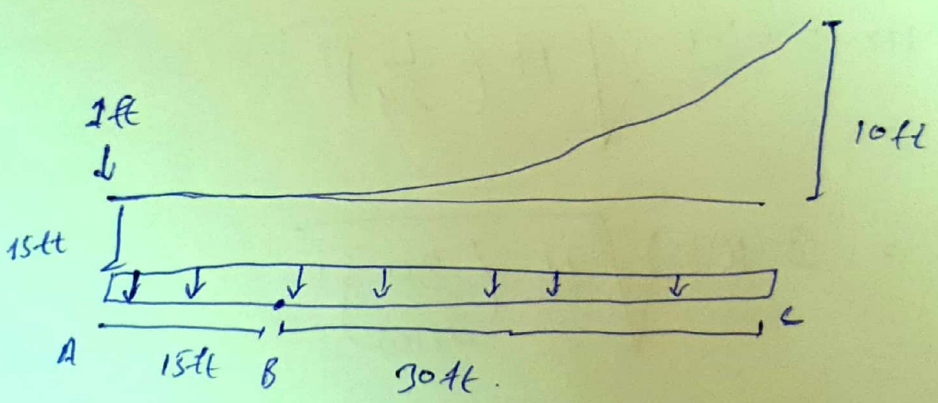
QUESTION NO 1 :- Determine the maximum & minimum tension in the parabolic cable & the force in each of the hanges. The girder is subjected to the uniform load & is pin connected at B.




Member AB

$\rightarrow +$

$\{ F_X = 0$

$A_X = 0$

moment At A.

$\{ \overset{+}{\Sigma} M_A = 0 \quad F_H(1) - B_y(15) - 45(7.5) = 0 \rightarrow ①$

FBD

$\overset{+}{M_L} = 0 - F_H(10) - B_y(30) + (45)(30) = 0.$

$F_H = 153.4 \Rightarrow B_y = 0$

$$w_{oz} \quad \frac{2FH}{L^2}$$

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

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

$$= 3.40$$

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

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

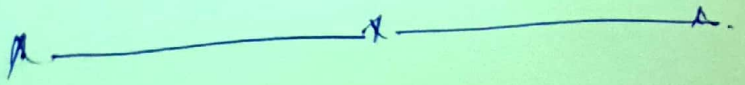
$$= 3.4(30)\sqrt{1+\left(\frac{30}{2(10)}\right)^2}$$

$$F_{max} = 183.6k$$

→ Each hanger carries 5ft after

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

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



QUESTION 02:

The tired three-hinged is subjected to the loading shown. Determine the components of reaction at A & C and the tension in the road.

Entire arch:

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

$C_y = 5.25\text{K}.$

$+\uparrow \Sigma F_y = 0$

$A_y + 5.25 - 4 - 3 - 5 = 0$

$A_y = 6.75\text{K}$

$\pm \rightarrow \Sigma F_y = 0;\quad A_x = 0.$

→ Section BC

$\curvearrowright \Sigma M_B = 0$

$-5(10) - T(15) + 5.25(20)\,20.$

$\boxed{T = 3.67\text{K}}$

$+\uparrow \Sigma F_y = 0$

$A_y + 5.25 - 4 - 3 - 5 = 0$

$A_y = 6.75 k.$

$\pm \rightarrow \Sigma F_y = 0, \quad A_x = 0$

SECTION BC:

$\curvearrowright \Sigma M_B = 0$

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

$\boxed{T = 3.672}$