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Section: A

Assignment 2 ~~3~~

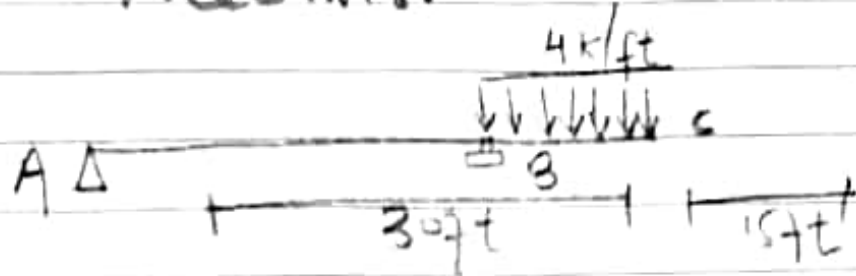
Eng: - Amjad Islam

Date :- 18 July 2020.

(2)

Prob 10.10

Determine the slope and displacement at C. EI is constant use the moment-area theorems.



Solution $\uparrow \sum M_A = 0$

$$-U_B \times 30 + (4 \times 15) \times 3.75 = 0$$

$$U_B = 75 \text{ K}$$

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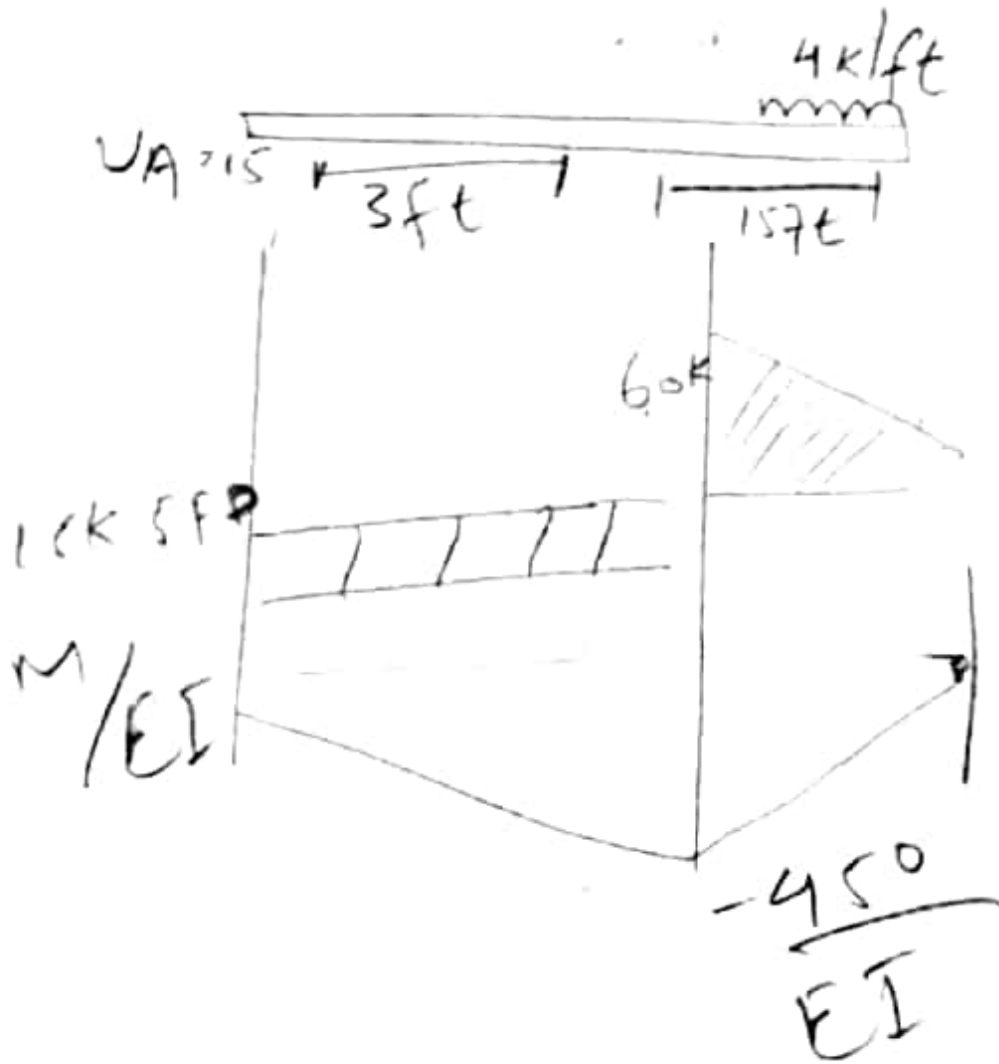
$\downarrow \sum M_B = 0$

$$U_A \times 30 + (4 \times 15) \times 7.5 = 0$$

$$U_A = -15 \text{ K}$$



(2)

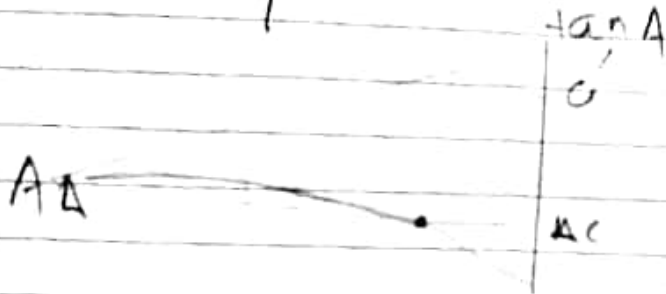


Thus M/EI consists of straight and parabolic segments.

Date: _____

(3)

For displacement t_0



$$t_0/A = \Delta C + \Delta'$$

$$\Delta C = t_0/A - \Delta' \rightarrow \textcircled{1}$$

$$\frac{D}{45} = \frac{t_0/A}{30}$$

$$D' = \frac{3}{3} t_0/A$$

e and (1)

$$D C = t_0/A - \frac{3}{2} + B/A$$

$$t_0/a_0$$

(4)

$$t_{C/A} = \left[\frac{-450}{EI} \times 30 \times \frac{1}{2} \right] \times \left(15 + \frac{1}{3} \times 30 \right)$$

$$+ \left(\frac{3}{4} \times 15 \right) \times \left[\frac{1}{3} \times \frac{450}{EI} \times 15 \right]$$

$$\frac{t_C}{0} = \frac{168750}{EI} - \frac{25312.5}{EI}$$

$$t_{C/A} = -194062.5/EI$$

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For $t_{B/A}$:-

$$t_{B/A} = \left(\frac{-450}{EI} \times \frac{30}{2} \right) \times \left(\frac{1}{3} \times 30 \right)$$

$$t_{B/A} = -67500/EI$$

Date:

$$DC = -194065 - \left(\frac{67500}{EI} \right) \times \frac{1}{2}$$

K · ft³

$$DC = \frac{-295312.5}{EI}$$

For Slope E at B

$$Q_B = \frac{DC}{15}$$

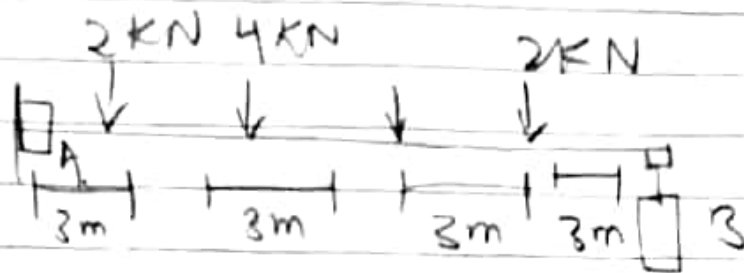
$$= \left(\frac{295312.5}{EI} \right) / 15$$

$$Q_B = \frac{19687.5}{EI} \text{ K/ft}^3$$

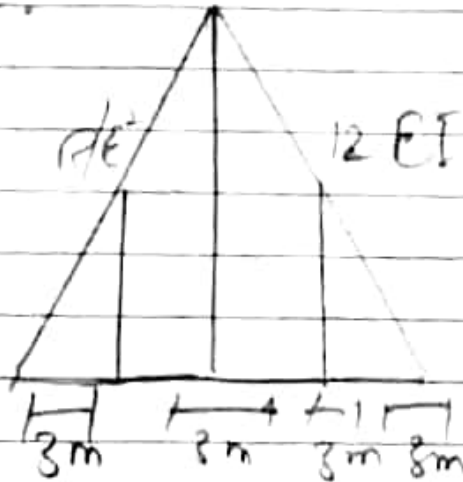
Slope of the force is nearly zero at equal point to end.

Qn/02:-

Solution:-



Solution:-



$$\frac{\psi_A}{C} = \frac{1}{2} \left(\frac{12}{EI} \right) (3) + \left(\frac{12}{EI} \right) (3) + \frac{1}{2} \left(\frac{6}{EI} \right) (3)$$

$$\psi_A/C = (18/EI) + (36/EI) + (9/EI)$$

(7)

$$\textcircled{Q} A/c = \frac{63}{EI} = 63 \frac{(1200 \times 10^4)}{(6 \times 10^4) \cdot (1000)^3}$$

$$\textcircled{Q} A/c = 0.0525 \text{ rad.}$$

$$\textcircled{Q} A = 0.525 \text{ rad.}$$

$$\begin{aligned} t_{A/c} &= \left[\frac{1}{2} \left(\frac{12}{EI} \right) (2) \right] \left(\frac{2}{3} (3) \right) \\ &+ \left(\frac{12}{EI} (3) \right) \left(3 + \frac{1}{2} (3) \right) + \left[\frac{1}{2} \left(\frac{6}{EI} \right) (3) \right] \\ &\quad \left(3 + \frac{2}{3} (3) \right) \end{aligned}$$

$$= 0.202 \text{ m}$$

$$\begin{aligned} \text{So, } \Delta_c &= t_{A/c} = 0.202 \text{ m} \\ &= 202 \text{ mm Ans} \end{aligned}$$