

Name

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Section

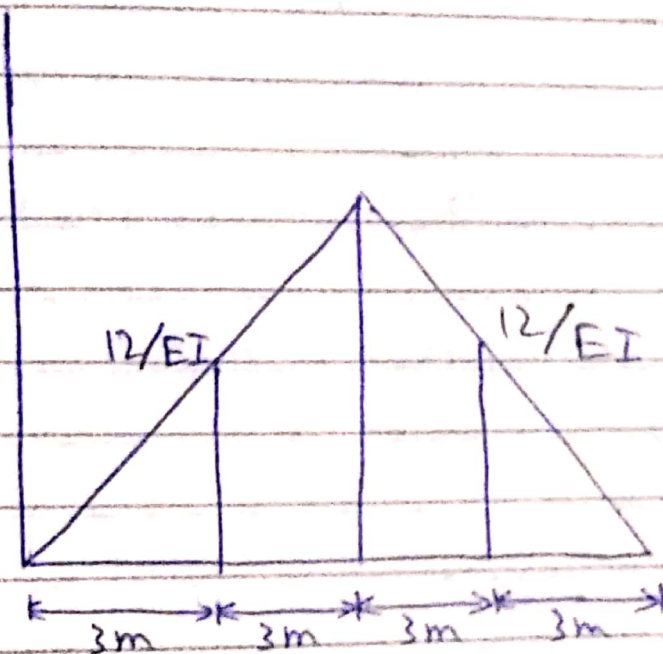
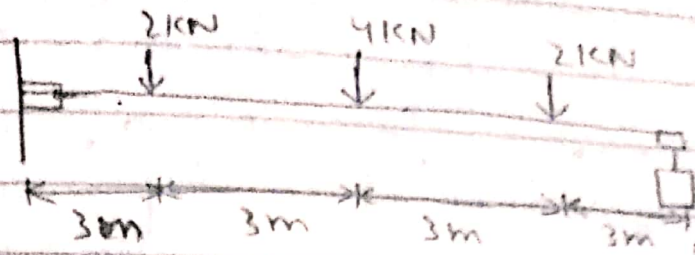
A

Assignment #:

03

# Question No 2

Solution:



$$Q_{A/C} = \frac{1}{2} \left( \frac{12}{EI} \right) (3) + \left( \frac{36}{EI} \right) (3) + \frac{1}{2} \left( \frac{12}{EI} \right) (3)$$

$$Q_{A/C} = \left( \frac{18}{EI} \right) + \left( \frac{108}{EI} \right) + \left( \frac{18}{EI} \right)$$

$$Q_{A/C} = \frac{144}{EI} = \frac{144}{(200 \times 10^6)(6 \times 10^6)(1000)^{-4}}$$

$$Q_{A/c} = 0.0525 \text{ rad}$$

$$Q_A = 0.0525 \text{ rad}$$

$$t_{A/c} = \left[ \frac{1}{2} \left( \frac{12}{EI} \right) (3) \right] \left( \frac{2}{3} (3) \right)$$

$$+ \left[ \frac{12}{EI} (3) \right] \left( 3 + \frac{1}{2} (3) \right) + \left[ \frac{1}{2} \left( \frac{6}{EI} \right) (3) \right]$$

$$\left( 3 + \frac{2}{3} (3) \right)$$

$$= 0.202 \text{ m}$$

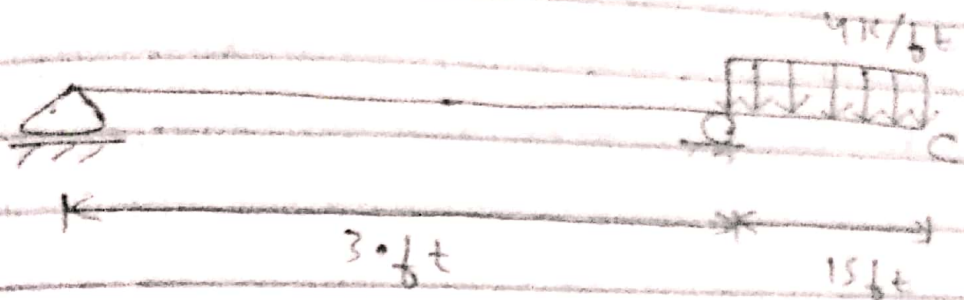
So,

$$\Delta C = t_A / t_c = 0.202 \text{ m}$$

$$= 202 \text{ mm AM}$$

# Question # 07

Solution:



$$\sum M_A = 0$$

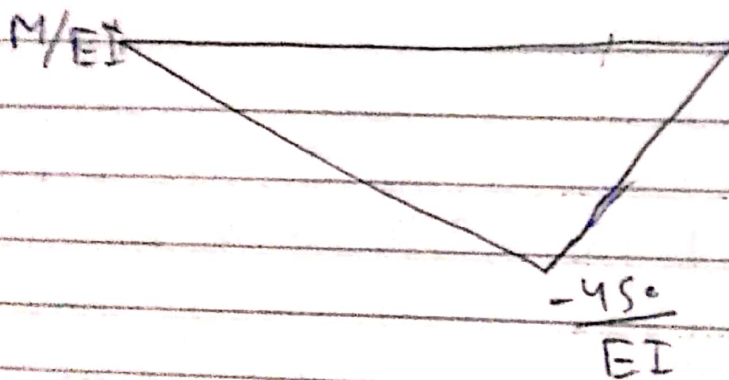
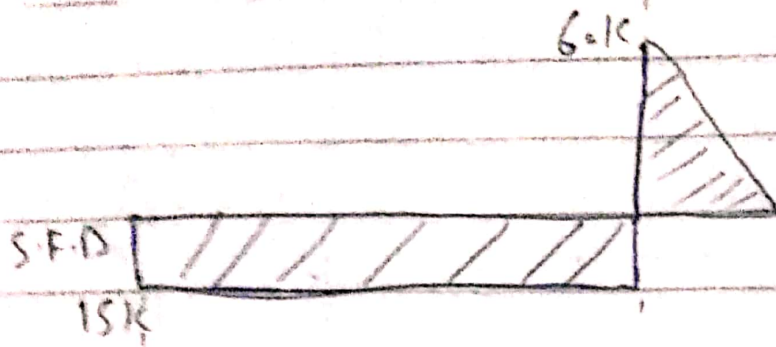
$$-V_B \times 30 + (4 \times 15) \times 3.75 = 0$$

$$V_B = 75 \text{ k}$$

$$\sum M_B = 0$$

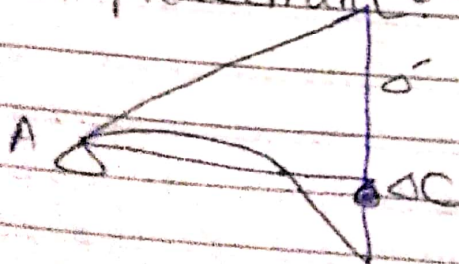
$$V_A \times 30 + (4 \times 15) \times 7.5 = 0$$

$$V_A = -15 \text{ k}$$



This M/EI consist of triangle and parabolic segment

For displacement  $t_{BA}$



$$t_{BA} = \delta C + \delta'$$

$$\Delta_c = t_{c/A} - \delta' \quad \text{--- (1)}$$

$$\frac{\delta'}{45} = \frac{t_{c/A}}{30}$$

$$\delta' = \frac{3}{3} t_{c/A}$$

e.v (1)

$$\Delta_c = \frac{t_c}{A} - \frac{3}{2} t_{B/A}$$

$$t_{c/A} = \left[ \frac{-450}{EI} \times 30 \times \frac{1}{2} \right] \times \left[ \frac{15 + \frac{1}{3} \times 30}{3} \right]$$
$$+ \left[ \frac{3}{4} \times 15 \right] \times \left[ \frac{1}{3} \times \frac{450}{EI} \times 15 \right]$$

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

For  $t_{B/A}$  :-

$$t_{B/A} = \left[ \frac{-4500}{EI} \times \frac{30}{2} \right] \times \left[ \frac{1}{3} \times 30 \right]$$

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

$$\Delta_c = \frac{-19406.5}{2} - \left( \frac{67500}{EI} \right) \times \frac{3}{2}$$

$$\Delta_c = \frac{-295312.5 \text{ k}\cdot\text{ft}^3}{EI}$$

For slope at B

$$\theta_B = \frac{\Delta_c}{15}$$

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

$$\theta_B = \frac{19687.5 \text{ k}/\text{ft}^3}{EI}$$