

08

$M_{AB} = 69.3 \text{ ft-kip}$
 $M_{BA} = 76.8 \text{ ft-kip}$
 $M_{BC} = -52.6 \text{ ft-kip}$
 $M_{BE} = 55.8 \text{ ft-kip}$

$\rightarrow K_{B8} = 15, K_{E8} = -4.19$
 $58K_{B8} + 3K_{E8} = 746.67$
 $6K_{B8} + 177K_{E8} = -7200$

or $6K_{B8} + 177K_{E8} = -7200$

$\rightarrow -\frac{8}{3}K_{B8} - \frac{177}{16}K_{E8} = 450$

$\rightarrow 2M_{AB} + 2M_{BA} - 3M_{BC} = 450$

$\rightarrow 3M_{AB} + 45L - 2(M_{AB} + M_{BA}) = 0$

$\rightarrow \frac{L}{N_{BC}} + 15 - \frac{2}{3L}(M_{AB} + M_{BA}) = 0$

or $58K_{B8} + 3K_{E8} = 746.67$

At point B: $M_{BA} + M_{BC} + M_{BE} = 80$
 $\frac{8}{29}K_{B8} + \frac{1}{3}K_{E8} = 76.67$

$M_{BE} = F'_{BE} + K'_{3B} - K'_{3E} = 33.33 + \frac{2}{3}K_{E8}$

$M_{BC} = F'_{BC} + K'_{2B} - K'_{2E} = \frac{8}{9}K_{B8} - \frac{8}{9}K_{E8} = \frac{8}{9}(K_{B8} + \frac{16}{27}K_{E8})$

$M_{BA} = F_{BA} + K_{1B} + K'_{1B} - \frac{2}{3}K_{E8} = K_{B8} - \frac{2}{3}K_{E8}$

$M_{AB} = F_{AB} + K_{1B} + \frac{2}{3}K_{E8} - \frac{2}{3}K_{E8} = \frac{2}{3}K_{E8}$

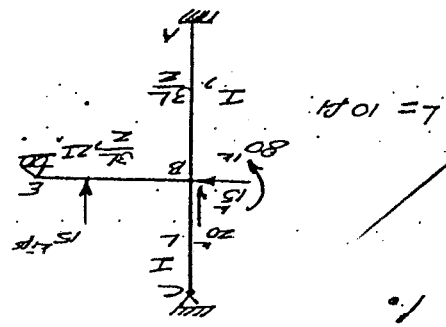
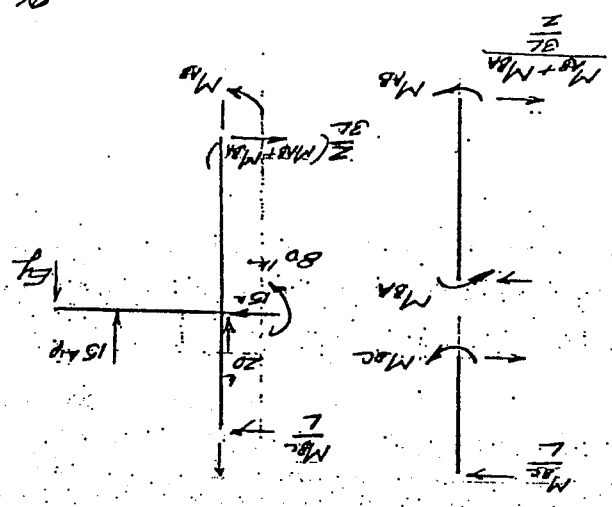
$e_{BC} = -\frac{L}{\Delta} = -\frac{L}{-5} = \frac{L}{5}$
 $e_{CE} = 0$

Assuming a Δ sway to the left:

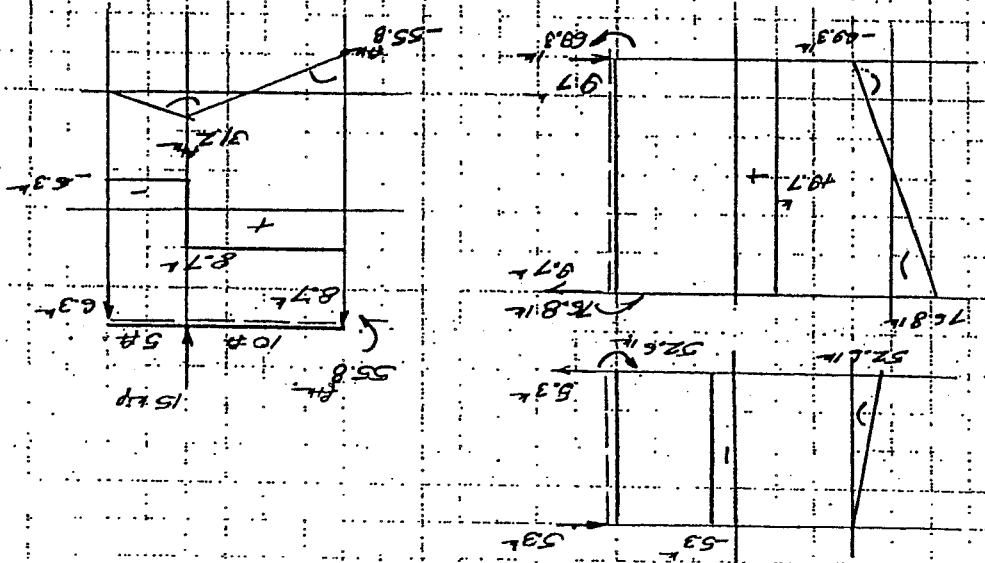
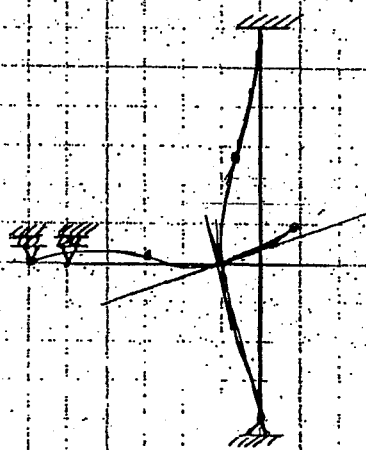
$K_1 = K, K_2 = \frac{8}{9}L, K_3 = \frac{3L}{2}$
 $F_{AB} = 0, F_{BA} = 0, F_{BC} = 0, F_{BE} = 33.33 \text{ ft-kip}$

similar to the third problem of HW #8:

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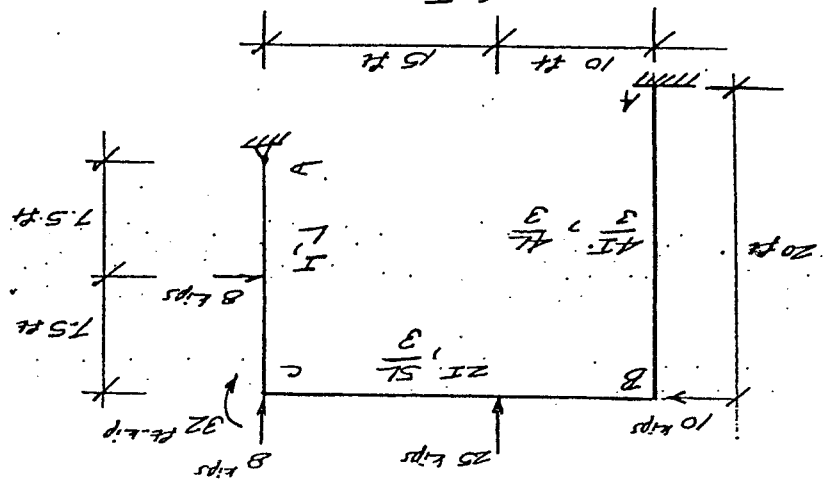
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Solution to H.L. ②

Fig 1

FE 1

2.



$$K_B = K_1 = \frac{4E(I)}{L_1} = \frac{4E(I)}{20} = K$$

$$K_{BC} = K_2 = \frac{4E(I)}{L_2} = \frac{4E(2I)}{24} = \frac{5}{6} \frac{EI}{L} = \frac{5}{6} K = 12K$$

$$K'_{CD} = K'_3 = \frac{3EI}{L_3} = \frac{3EI}{8} = \frac{1}{8} K = 0.75K$$

Assume a Δ sway to the left:
 $\frac{\Delta}{L_1} = \frac{\Delta}{L_2} = \frac{\Delta}{L_3} = \theta_c = 0$

$$F_{BA} = 0, F_{AB} = 0$$

$$F_{BC} = \frac{Pab^2}{Dab^3} = \frac{90 \text{ ft-kip}}{D60^3} = -\frac{12}{D60^2} = -60 \text{ ft-k}$$

$$F'_{CD} = \frac{1}{3} PL_3 = 22.5 \text{ ft-kip}$$

$$M_B = F_{AB} + K_B \Delta + \frac{2}{3} K'_3 \theta_c - \frac{2}{3} K'_3 L_3 \theta_c = \frac{2}{3} K \theta_c - \frac{2}{3} K L_3 \theta_c$$

$$M_A = F_{BA} + \frac{2}{3} K_B \Delta + K'_3 \theta_c - \frac{2}{3} K'_3 L_3 \theta_c = K_B \theta_c - \frac{2}{3} K L_3 \theta_c$$

$$M_C = F_{CB} + F_{BC} + K_B \Delta + \frac{2}{3} K'_3 \theta_c - \frac{2}{3} K'_3 L_3 \theta_c = 90 + 12K \theta_c + 0.6L_3 \theta_c$$

$$M_B = F_{BA} + F_{AB} + K_B \Delta + K'_3 \theta_c - \frac{2}{3} K'_3 L_3 \theta_c = -60 + 0.6L_3 \theta_c + 12K \theta_c$$

$$M_{CD} = F'_{CD} + K'_3 \theta_c - K'_3 L_3 \theta_c = 22.5 + 0.75L_3 \theta_c - K L_3 \theta_c$$

At B: $M_B + M_C = 0 \rightarrow 22K \theta_c + 0.6K L_3 \theta_c - \frac{2}{3} K L_3 \theta_c = -90$

At C: $M_C + M_D + 32 = 0 \rightarrow 0.6K L_3 \theta_c + 1.95L_3 \theta_c - K L_3 \theta_c = 5.5$

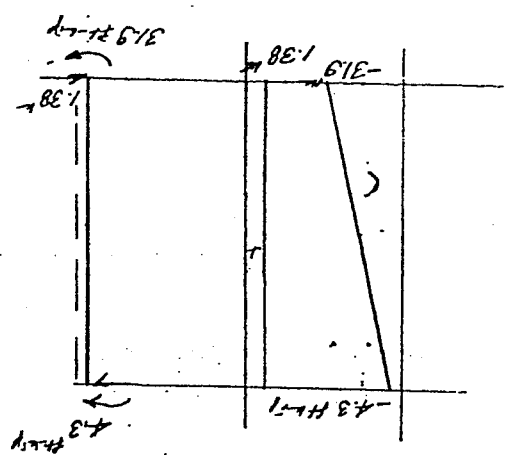
Solution to HW 1 (3)

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$M_{AB} = 31.9 \text{ ft-kip}$
 $M_{BA} = -4.3 \text{ ft-kip}$
 $M_{BC} = 4.3 \text{ ft-kip}$
 $M_{CB} = -101.3 \text{ ft-kip}$
 $M_{CD} = 69.3 \text{ ft-kip}$

$K_B = -72.35$
 $K_C = +1.80$
 $K_D = -45.29$

$2.2K_B + 0.6K_C - 15K_D = -90$
 $0.6K_B + 1.95K_C - K_D = 5.5$
 $4.5K_B + 3K_C - 13K_D = 270$

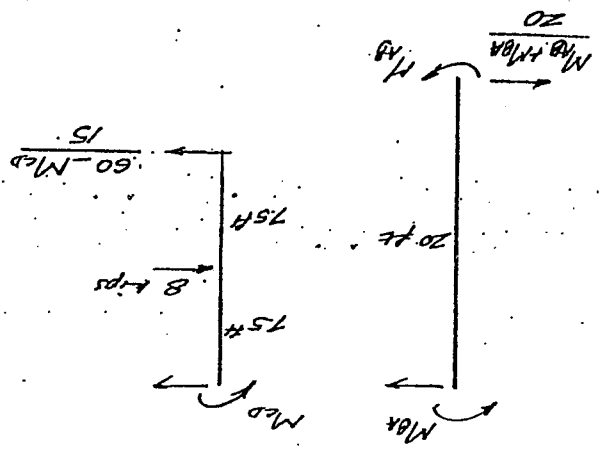
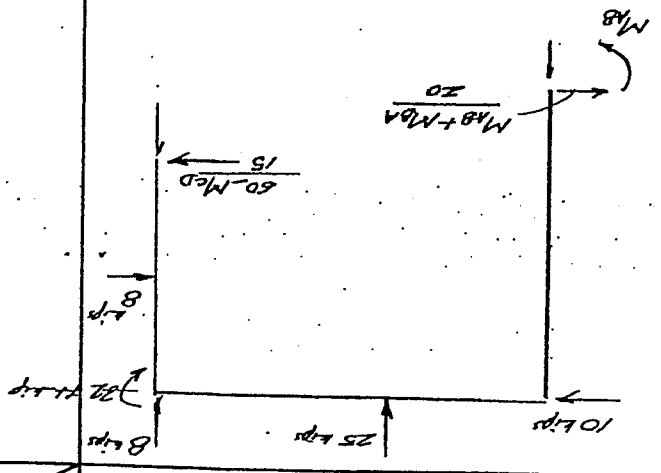
or $4.5K_B + 3K_C - 13K_D = 270$

$\rightarrow 3M_{AB} + 3M_{BA} + 4M_D = 360$

$\rightarrow -3M_{AB} - 3M_{BA} + 240 + 4M_D + 120 = 0$

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$\rightarrow \sum F_x = 0 \rightarrow \frac{(M_{AB} + M_{BA})}{20} + \frac{60 - M_D}{15} + 8 = 0$



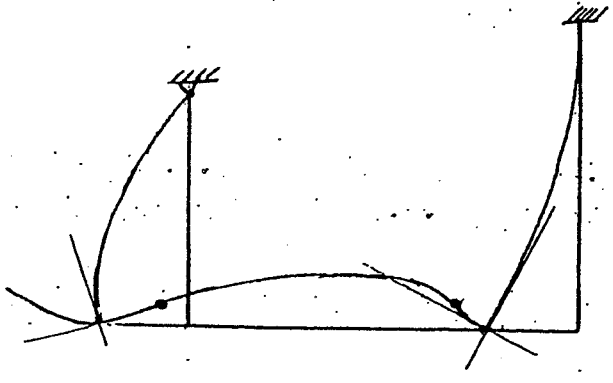
Assumed

Solution to #11 (3)

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FE 1

Solution to HW 1 ⑨

H. H. M. A. S.