

$$F'_{BA} = -\frac{wL^2}{8} = -\frac{2 \times 6^2}{8} = -9 \text{ kN-m}$$

$$F_{CD} = \frac{wL^2}{12} = \frac{3 \times 8^2}{12} = 16 \text{ kN-m}, \quad F_{DC} = -\frac{wL^2}{12} = -16 \text{ kN-m}$$

$$K'_{AB} = K_1 = \frac{3EI}{L} \rightarrow 3$$

$$K_{BC} = K_2 = \frac{4EI_2}{L_2} = \frac{4E(2I)}{\frac{8}{3}} = \frac{6EI}{L} \rightarrow 6$$

$$K_{CD} = K_3 = \frac{4EI_3}{L_3} = \frac{6EI}{L} \rightarrow 6$$

$$\rightarrow \text{D. Factors: } D.F._{BA} = \frac{3}{3+6} = 1/3$$

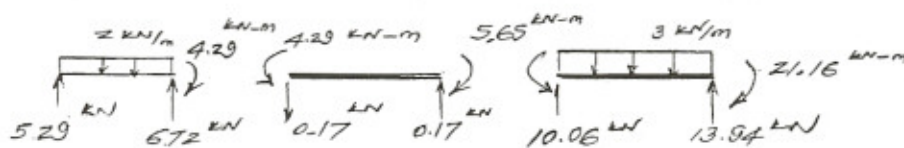
$$\rightarrow D.F._{BC} = \frac{6}{3+6} = 2/3$$

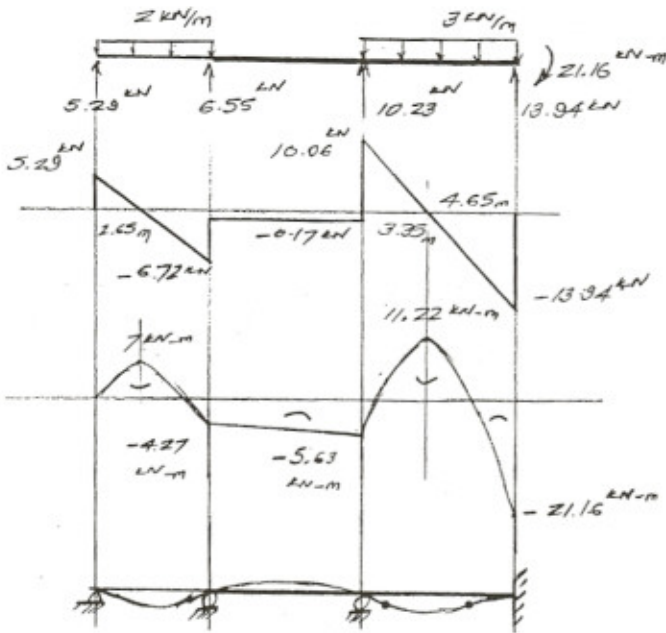
$$\rightarrow D.F._{CB} = \frac{6}{6+6} = 1/2 = D.F._{CD}$$

$$\rightarrow D.F._{DC} = 0$$

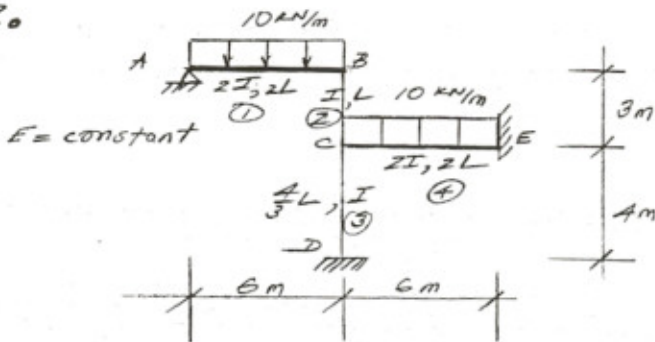
joint	B		C		D
Member	BA	BC	CB	CD	DC
D. Factors	1/3	2/3	1/2	1/2	0
FEM	-9	0	0	16	-16
Bal. Moments	3	6	-8	-8	0
Carry Over	0	-4	3	0	-4
Bal. Moments	1.33	2.67	-1.5	-1.5	0
Carry Over	0	-0.75	1.34	0	-0.75
Bal. Moments	+0.25	0.50	-0.67	-0.67	0
Carry over	0	-0.34	0.25	0	-0.34
Bal. Moments	0.11	0.23	-0.13	-0.13	0
Carry over	0	-0.07	0.12	0	-0.07
Bal. Moments	0.02	0.05	-0.06	-0.06	0
	-4.29	4.29	-5.65	5.64	-21.16

AMN	4.71	4.29	-5.65	-10.36	-5.16
$-\frac{1}{2} \Delta MF$	0	+2.83	-2.15	+2.58	+5.18
Krel	4	6	6	6	6
Stiff	1.18	1.19	-1.3	-1.3	∞





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$$F'_{BA} = -\frac{wL^2}{8} = -45 \text{ ft-kip}$$

$$F_{CE} = \frac{wL^2}{12} = 30 \text{ ft-kip}, F_{EC} = -30 \text{ ft-kip}$$

$$K'_{AB} = K_1 = \frac{3EI_1}{L_1} = \frac{3E(2I)}{2L} = \frac{3EI}{L} \rightarrow 3$$

$$K_{BC} = K_2 = \frac{4EI_2}{L_2} = \frac{4EI}{L} \rightarrow 4$$

$$K_{CD} = K_3 = \frac{4EI_3}{L_3} = \frac{4EI}{4L} = \frac{3EI}{L} \rightarrow 3$$

$$K_{CE} = K_4 = \frac{4EI_4}{L_4} = \frac{4E(2I)}{2L} = \frac{4EI}{L} \rightarrow 4$$

D. Factors: $D.F._{BA} = \frac{3}{3+4} = 3/7$

$D.F._{BC} = 1/7$

$D.F._{CB} = \frac{4}{4+3+4} = 4/11$

$D.F._{CD} = 3/11$

$D.F._{CE} = 4/11$

Joint	B		C			D	E
Member	BA	BC	CB	CE	CD	DC	EC
D. Factor	3/7	4/7	4/11	4/11	3/11	0	0
FEM	-45	0	0	30	0	0	-30
Bal. Mom	19.29	25.71	-10.91	-10.91	-8.18	0	0
Carry over	0	-5.46	12.86	0	0	-4.09	-5.46
Bal. Mom	2.34	3.12	-4.68	-4.68	-3.51	0	0
Carry over	0	-2.34	1.56	0	0	-1.76	-2.34
Bal. Mom	1.00	1.34	-0.57	-0.57	-0.42	0	0
Carry over	0	-0.28	0.67	0	0	-0.21	-0.29
Bal. Mom	0.12	0.17	-0.24	-0.24	-0.18	0	0
Carry over	0	-0.12	0.09	0	0	-0.09	-0.12
Bal. Mom	0.05	0.07	-0.03	-0.03	-0.03	0	0
	-22.2	22.2	-1.25	13.57	-12.32	-6.15	-38.21

Δ_{MN}	22.8	22.2	-1.25	-16.43	-12.32	-6.15	-8.21
$-\frac{1}{2} \Delta M$	0	+0.63	-11.1	+4.11	+3.08	+6.16	+8.21
K _{rel.}	4	4	4	4	3	3	4
Orcl.	5.7	5.7	-3.1	-3.1	-3.1	0	0

