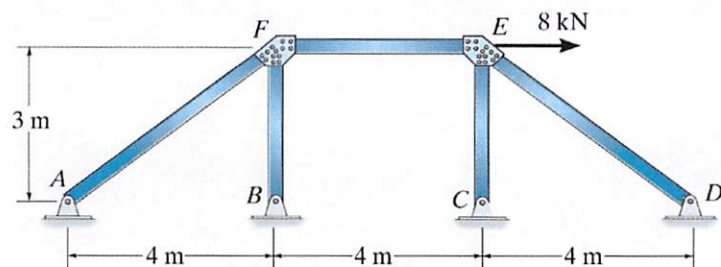


Problem 9-32 – Determine the force in each member. Assume AE is constant.



REAL FORCES

ZERO-FORCE MEMBERS

$$\underline{F_{AF} = F_{BF} = 0}$$

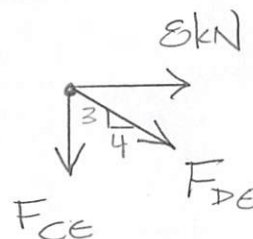
JOINT E

$$+\rightarrow \sum F_x = 0$$

$$= \frac{4}{5} F_{DE} + 8 \text{ kN} \quad \underline{F_{DE} = -10 \text{ kN}}$$

$$+\uparrow \sum F_y = 0$$

$$= -F_{CE} - \frac{3}{5} F_{DE} \quad \underline{F_{CE} = 6 \text{ kN}}$$



VIRTUAL FORCES

JOINT E

$$+\rightarrow \sum F_x = 0$$

$$= \frac{4}{5} f_{DE} - 1 \quad \underline{f_{DE} = 1.25}$$

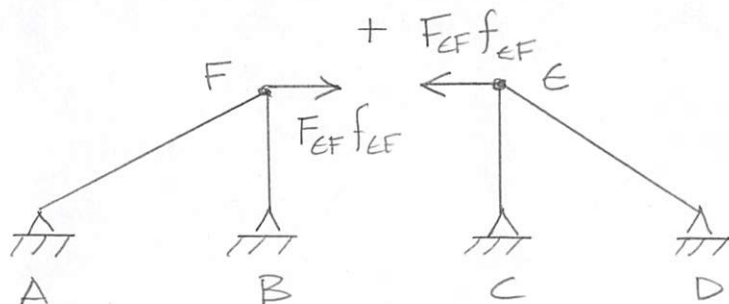
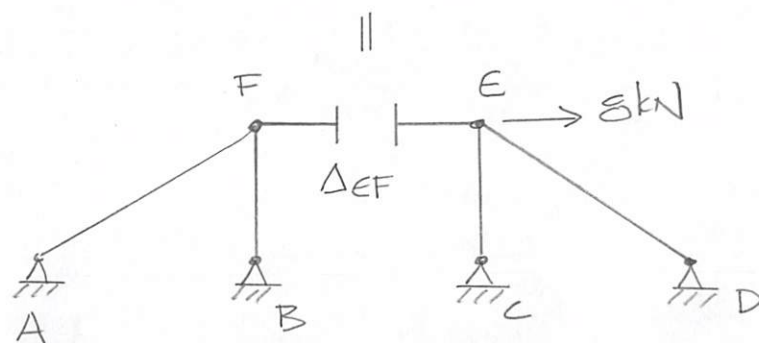
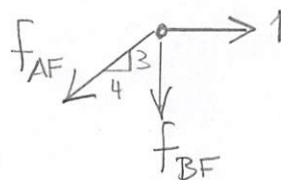
$$+\uparrow \sum F_y = 0$$

$$= -f_{CE} - \frac{3}{5} f_{DE} \quad \underline{f_{CE} = -0.75}$$

JOINT F

$$+\rightarrow \sum F_x = 0 = 1 - \frac{4}{5} F_{AF} \quad \underline{F_{AF} = 1.25}$$

$$+\uparrow \sum F_y = 0 = -f_{BF} - \frac{3}{5} F_{AF} \quad \underline{f_{BF} = -0.75}$$



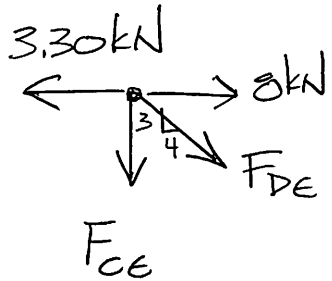
$$\underline{\Delta_{EF} + F_{EF} f_{EF} = 0}$$

Problem 9-32 – Determine the force in each member. Assume AE is constant.

MEMBER	$F(kN)$	f	$L(m)$	$\pm fL(kNm)$	$f\bar{f}L(m)$
AF	0	1.25	5	0	7.8125
BF	0	-0.75	3	0	1.6875
EF	0	1	4	0	4
DE	-10	1.25	5	-62.5	7.8125
CE	6	-0.75	3	-13.5	1.6875
				-76	23

$$F_{EF} = - \frac{\Delta_{EF}}{f_{EF}} = - \frac{(-76 kNm)}{23m} = \underline{\underline{3.30 kN}}$$

JOINT E



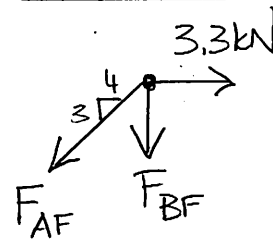
$$+\rightarrow \sum F_x = 0 = \frac{4}{5} F_{DE} - 3.3 kN + 8 kN$$

$$\underline{\underline{F_{DE} = -5.875 kN}}$$

$$+\uparrow \sum F_y = 0 = -F_{CE} - \frac{3}{5} F_{DE}$$

$$\underline{\underline{F_{CE} = 3.525 kN}}$$

JOINT F



$$+\rightarrow \sum F_x = 0 = 3.3 kN - \frac{4}{5} F_{AF}$$

$$\underline{\underline{F_{AF} = 4.125 kN}}$$

$$+\uparrow \sum F_y = 0 = -F_{BF} - \frac{3}{5} F_{AF}$$

$$\underline{\underline{F_{BF} = -2.475 kN}}$$