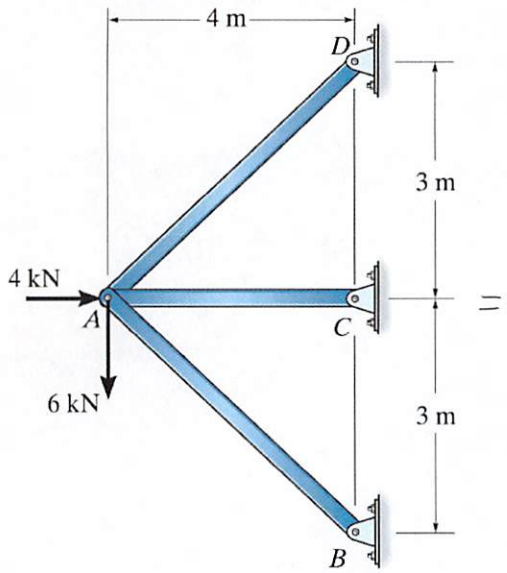
Problem 9-25 – Determine the force in each member. Assume *AE* is constant.



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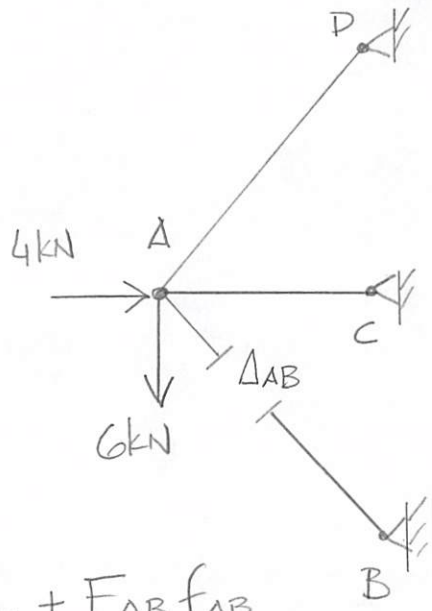

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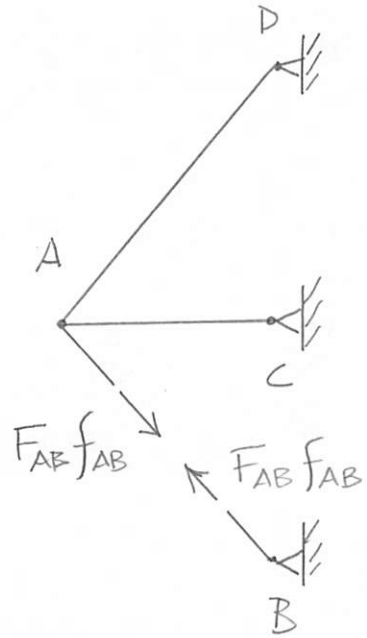
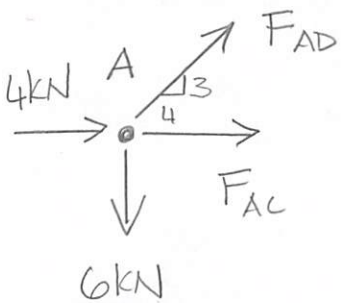


$$0 = \Delta_{AB} + F_{AB} f_{AB}$$

REAL FORCES



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

$$= \frac{3}{5} F_{AD} - 6\text{kN}$$

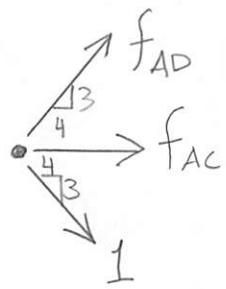
$$F_{AD} = 10\text{kN}$$

$$\pm\rightarrow \sum F_x = 0$$

$$= \frac{4}{5} F_{AD} + F_{AC} + 4\text{kN}$$

$$F_{AC} = -12\text{kN}$$

VIRTUAL FORCES



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

$$= \frac{3}{5} f_{AD} - \frac{3}{5} 1$$

$$f_{AD} = 1$$

$$\pm\rightarrow \sum F_x = 0$$

$$= f_{AD} + f_{AC} + \frac{4}{5}(1)$$

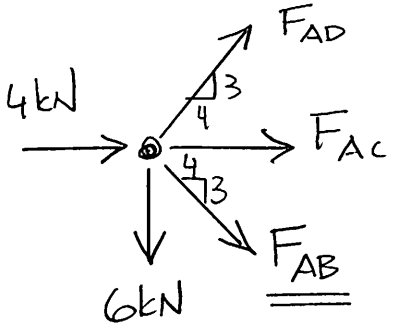
$$f_{AC} = -1.6$$

Problem 9-25 – Determine the force in each member. Assume *AE* is constant.

MEMBER	F(kN)	f	L(m)	FfL(kNm)	ffL(m)
AB	0	1	5	0	5
AC	-12	-1.6	4	76.8	10.24
AD	10	1	5	50	5
			$\sum$	126.8	20.24

$$\Delta_{AB} + F_{AB} f_{AB} = 0 \implies F_{AB} = \frac{-\Delta_{AB}}{f_{AB}} = \underline{-6.26\ kN}$$

JOINT A



$$+\uparrow \sum F_y = 0 = \frac{3}{5}F_{AD} - \frac{3}{5}F_{AB} - 6\ kN \qquad \underline{F_{AD} = 3.74\ kN}$$

$$\pm\rightarrow \sum F_x = 0 = \frac{4}{5}F_{AD} + F_{AC} + \frac{4}{5}F_{AB} + 4kN$$

$$\underline{F_{AC} = -1.98\ kN}$$