

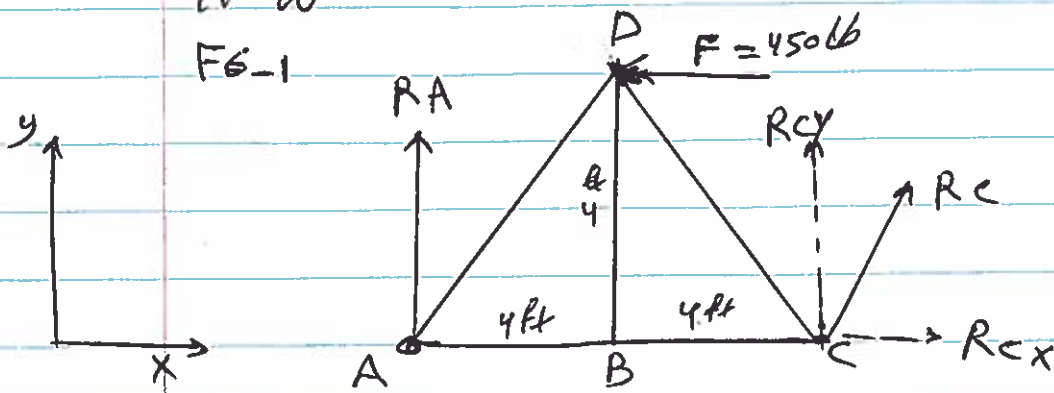
①

METC III

Juddo Abaker

H-W

FG-1



External points -

$$\sum F_x = -450 \text{ lb} + R_{Cx} = 0$$

$$\sum F_y = R_A + R_{Cy} = 0$$

$$R_{Cx} = 450 \text{ lb}$$

$$R_A = -R_{Cy}$$

$$\sum M_A = (4 \text{ ft})(450 \text{ lb}) + (8 \text{ ft})R_{Cy} = 0$$

$$\frac{8 \text{ ft} R_{Cy}}{8 \text{ ft}} = \frac{-(4 \text{ ft})(450 \text{ lb})}{8 \text{ ft}}$$

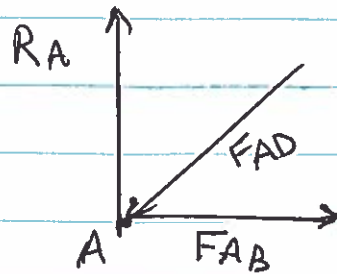
$$R_{Cy} = -\frac{450 \text{ lb}}{2}$$

$$R_{Cy} = -225 \text{ lb} \rightarrow R_A = 225 \text{ lb}$$

internal points.

(2)

A

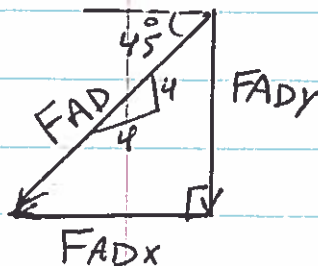


$$\sum F_x = F_{AB} + F_{ADx} = 0$$

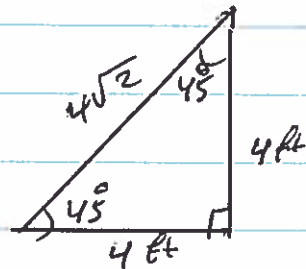
$$\sum F_y = R_A + F_{ADy} = 0$$

$$F_{ADy} = -R_A$$

$$F_{ADy} = -225 \text{ lb}$$



or



$$F_{ADy} = -\frac{F_{AD}}{\sqrt{2}}$$

$$\leftarrow F_{ADy} = -F_{AD} \sin 45^\circ$$

$$F_{ADx} = -\frac{F_{AD}}{\sqrt{2}}$$

$$\leftarrow F_{ADx} = -F_{AD} \cos 45^\circ$$

$$-225 \text{ lb} = -\frac{F_{AD}}{\sqrt{2}}$$

$$F_{ADy} = -F_{AD} \frac{1}{\sqrt{2}}$$

$$F_{AD} = 225\sqrt{2}$$

$$F_{ADx} = -225 \text{ lb}$$

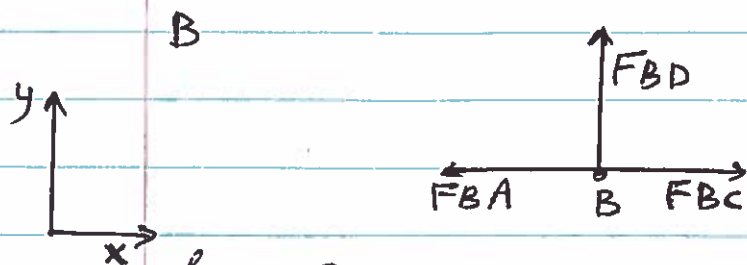
$$F_{ADx} = -F_{AD} \frac{1}{\sqrt{2}}$$

$$F_{AB} = 225 \text{ lb}$$

$$A \rightarrow \quad F_{AD} = 225\sqrt{2} \text{ lb} = 318 \text{ lb (c)}$$

$$F_{AB} = 225 \text{ lb (T)}$$

③



from ① $\rightarrow F_{BA} = -F_{AB} = -225 \text{ lb}$

$$\sum F_x = 0 \quad F_{BA} + F_{BC} = 0$$

$$F_{BC} = -F_{BA} = -(-225 \text{ lb})$$

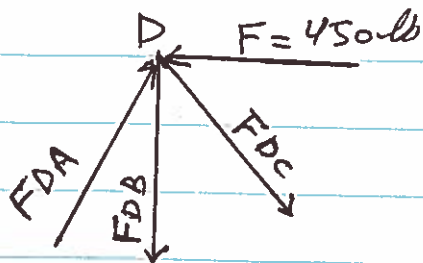
$$F_{BC} = 225 \text{ lb (T)}$$

$$\sum F_y = F_{BD} = 0$$

$$F_{BD} = 0$$

④

D



$$F_{DB} = 0$$

$$\sum F_x = -450 \text{ lb} + F_{DAx} + F_{DCx} = 0$$

$$\sum F_y = F_{DAy} + F_{DCy} = 0$$

$$\hookrightarrow F_{DCy} = -F_{DAy}$$

$$F_{DAy} = 225 \text{ lb} - F_{DCy} = -225 \text{ lb}$$

$$F_{DAx} = 225 \text{ lb}$$

$$-450 \text{ lb} + 225 \text{ lb} + F_{DCx} = 0$$

$$F_{DCx} = 225 \text{ lb}$$

$$F_{DC} = 225 \text{ lb} \times \sqrt{2} = 318 \text{ lb (T)}$$

