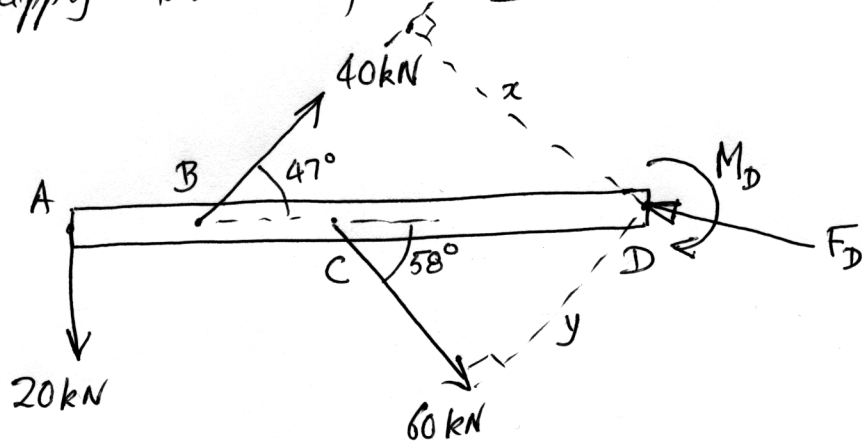


Qu. 6

Because D is built in (as opposed to pin-jointed) the wall can apply both a force and a moment at D.

Draw FBD



Since we don't know F_D in either magnitude or direction take moments about D.

Distances x & y can be found from a scale diagram or from trigonometry. It is found

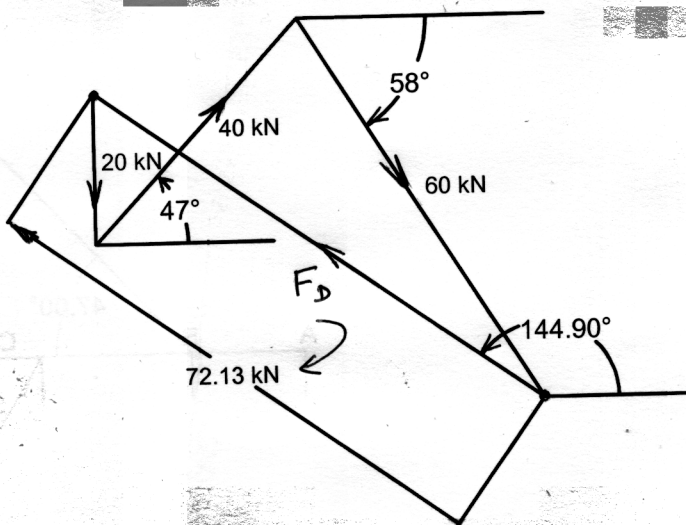
$$x = 1.170 \text{ m} \quad y = 1.018 \text{ m}$$

$$\sum M_D = -20 \times AD + 40 \times x - 60 \times y + M_D = 0$$

$$\therefore -20 \times 1.9 + 40 \times 1.170 - 60 \times 1.018 + M_D = 0$$

$$\therefore M_D = 20 \times 1.9 + 60 \times 1.018 - 40 \times 1.170 = \underline{52.28 \text{ kNm}}$$

F_D can be found by completing the vector diagram $\sum \vec{F} = 0$



$$F_D = 72.13 \text{ kN}$$

$$\text{at } \underline{144.9^\circ}$$