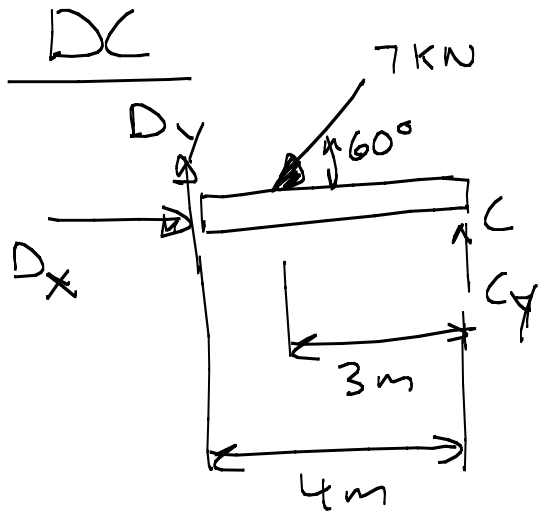
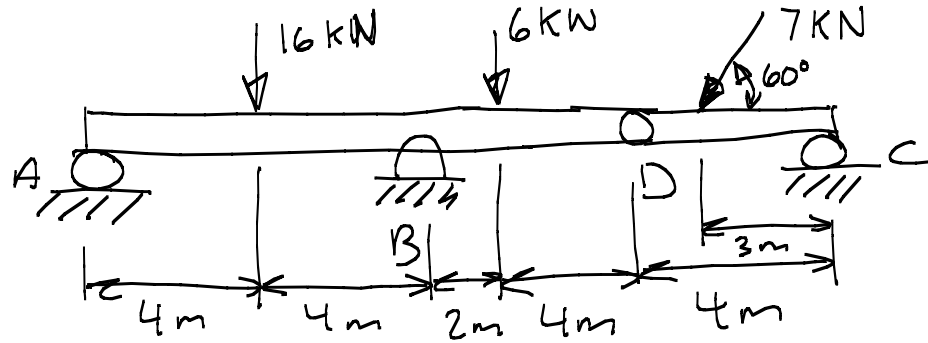


Problem 4

Given: Hinge (pin) at D

Determine: The support reactions



$$\rightarrow \sum F_x = 0 \Rightarrow D_x - (7 \text{ kN})(\cos 60^\circ) = 0$$

$$D_x = 3.5 \text{ kN}$$

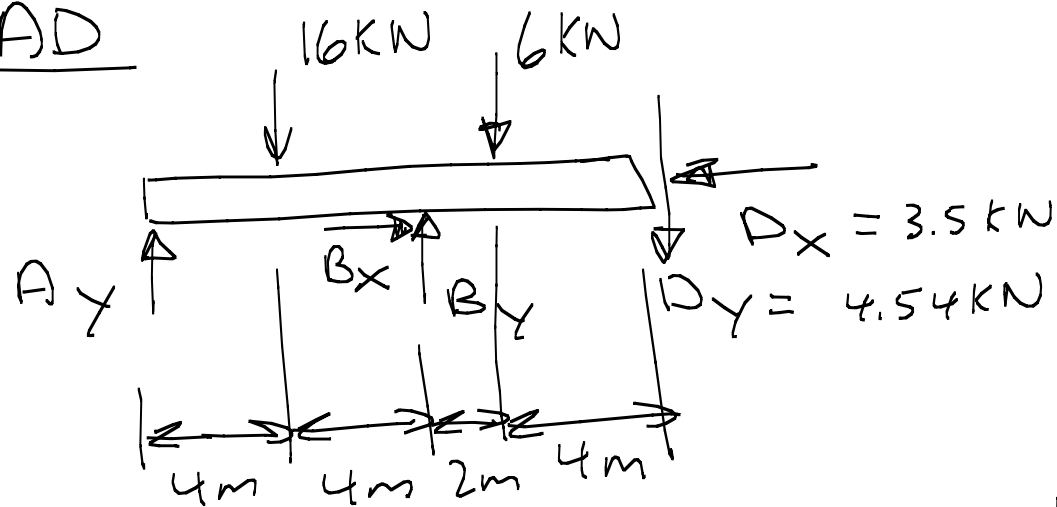
$$\uparrow \sum F_y = 0 \Rightarrow C_y + D_y - (7 \text{ kN})(\sin 60^\circ) = 0$$

$$\uparrow \sum M_D = 0 \Rightarrow -(7 \text{ kN})(\sin 60^\circ)(1 \text{ m}) + (C_y)(4 \text{ m}) = 0$$

$$C_y = 1.52 \text{ kN}$$

$$D_y = 4.54 \text{ kN}$$

AD



$$\rightarrow \sum F_x = 0 \Rightarrow B_x - 3.5 \text{ kN} = 0 \quad \boxed{B_x = 3.5 \text{ kN}}$$

$$\uparrow \sum M_A = 0 \Rightarrow -(16 \text{ kN})(4 \text{ m}) + (B_y)(8 \text{ m}) - (6 \text{ kN})(10 \text{ m}) - (4.54 \text{ kN})(14 \text{ m})$$
$$\boxed{B_y = 23.4 \text{ kN}}$$

$$\uparrow \sum F_y = 0 \Rightarrow A_y - 16 \text{ kN} + B_y - 6 \text{ kN} - 4.54 \text{ kN} = 0$$
$$\boxed{A_y = 3.1 \text{ kN}}$$