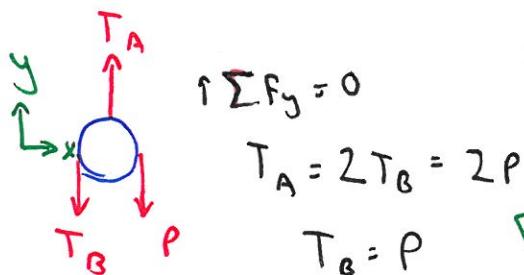


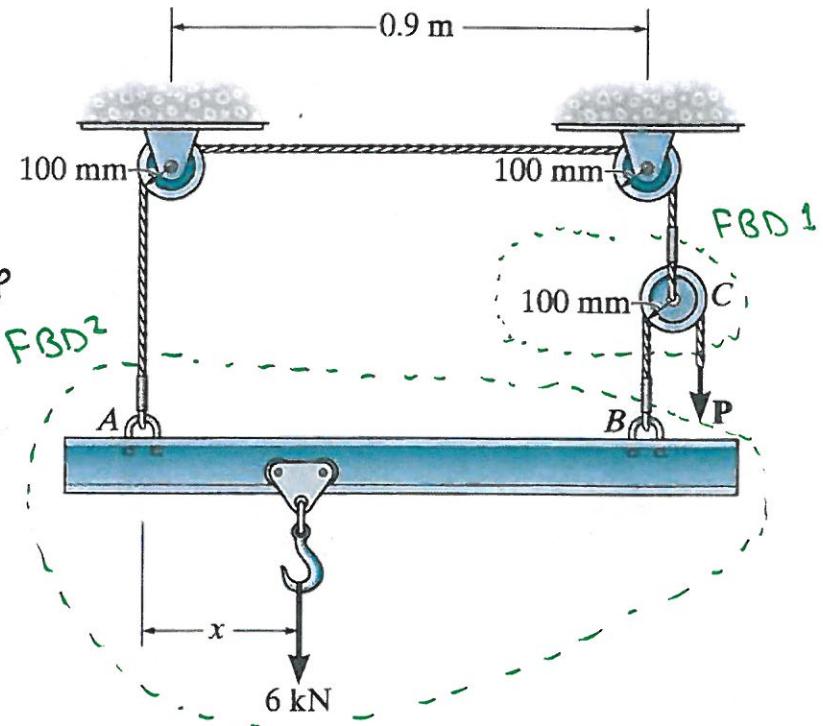
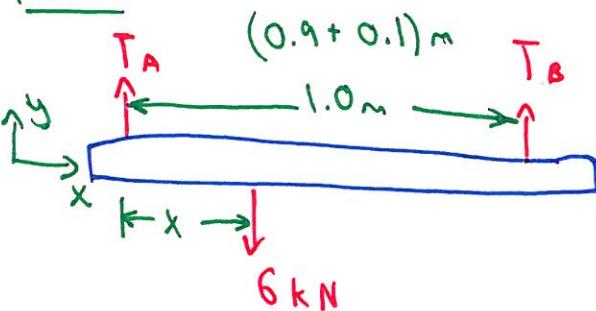
## Pulleys 2

Determine the force P needed to lift the load. Also, determine the proper placement x of the hook for equilibrium. Neglect the weight of the beam.

FBD 1



FBD 2



$$\uparrow \sum F_y = 0$$

$$0 = T_A + T_B - 6 \text{ kN}$$

From FBD 1

$$(T_A = 2T_B) \quad 3T_B = 6 \text{ kN}$$

$$\therefore T_B = P = 2 \text{ kN}$$

$$\therefore T_A = 4 \text{ kN}$$

$$\uparrow \sum M_A = 0$$

$$x(6 \text{ kN}) - 1.0(2 \text{ kN}) = 0$$

$$x = \frac{2.0 \text{ kN} \cdot \text{m}}{6 \text{ kN}} = \frac{1}{3} \text{ m}$$

$$P = 2 \text{ kN} \downarrow$$

$$x = 0.333 \text{ m}$$