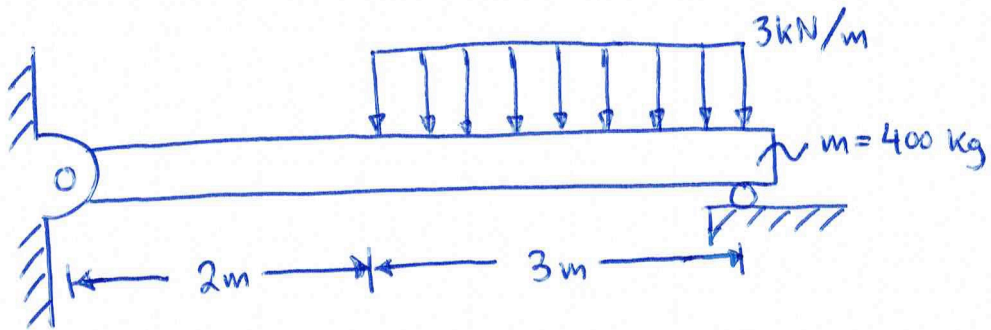
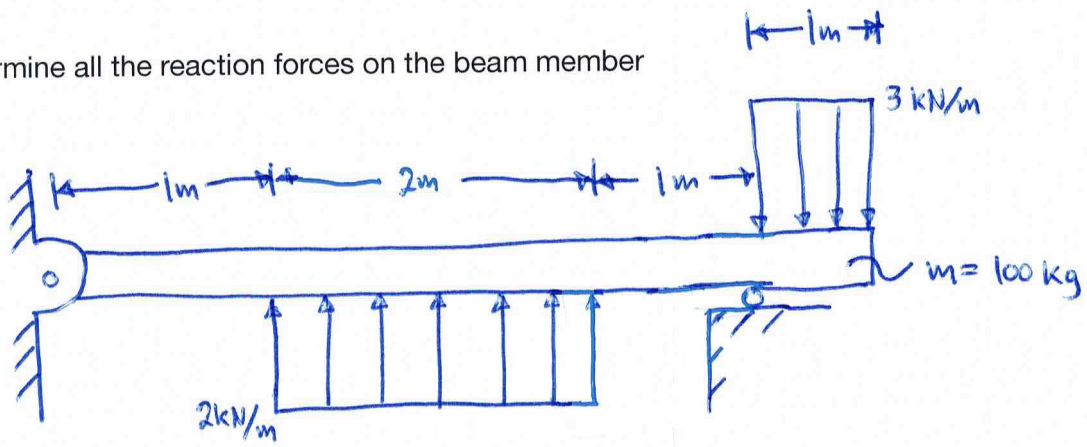


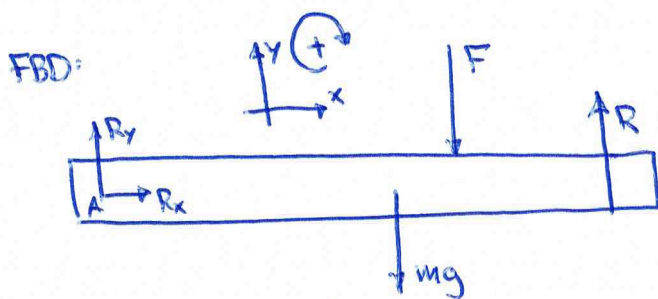
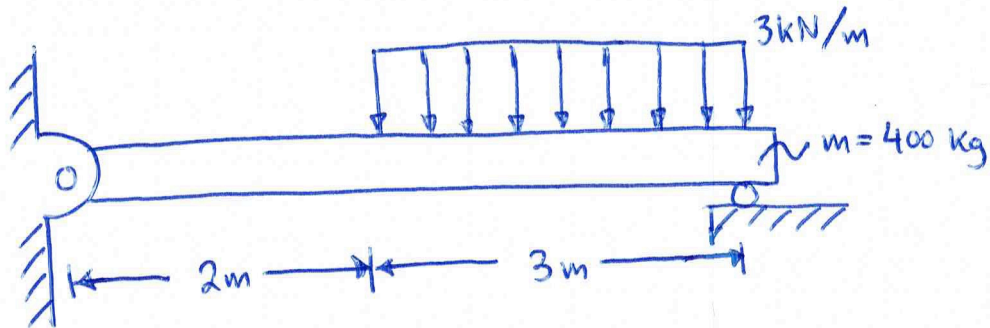
Determine all the reaction forces on the beam member



Determine all the reaction forces on the beam member



Determine all the reaction forces on the beam member



$$F = (3\text{m})(3\text{ kN/m}) = 3000\text{ N}$$

$$x = 2 + \frac{1}{2}(3) = 3.5\text{ m}$$

Newton's 2nd Law:

$$\sum F_x = \cancel{m\ddot{x}} = R_x \quad (1)$$

$$\sum F_y = \cancel{m\ddot{y}} = R_y - mg - F + R \quad (2)$$

$$\sum M = \cancel{I\ddot{\theta}} = 2.5mg + 3.5F - 5R \quad (3)$$

solve (1) for R_x :

$$\boxed{R_x = 0}$$

solve (3) for R :

$$R = \frac{1}{5}(2.5(400)(9.81) + 3.5(3000))$$

$$\boxed{R = 4062\text{ N}}$$

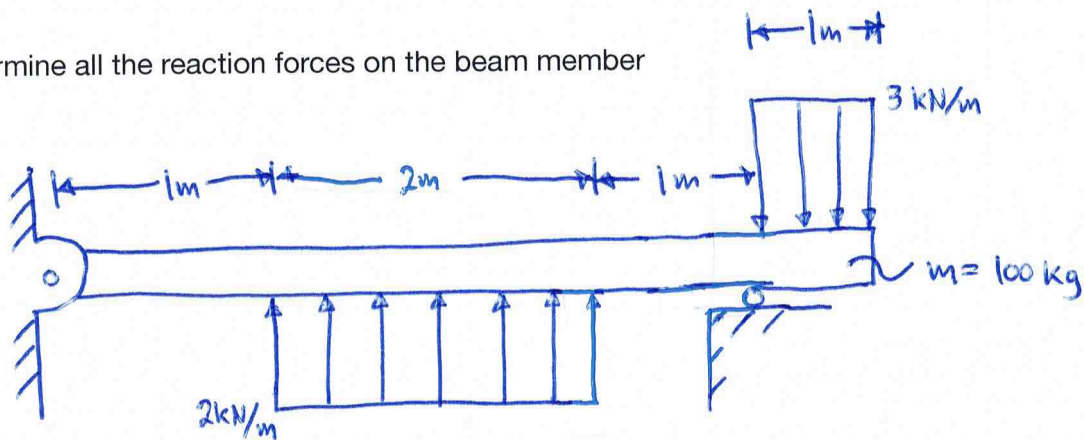
solve (2) for R_y :

$$R_y = mg + F - R$$

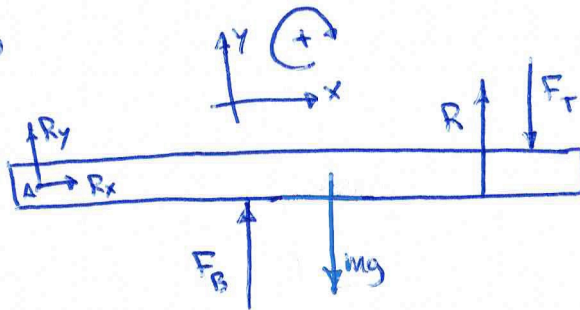
$$= (400)(9.81) + 3000 - [4062]$$

$$\boxed{R_y = 2862\text{ N}}$$

Determine all the reaction forces on the beam member



FBD



$$F_T = (1\text{m})(3\text{kN/m}) = 3000\text{ N}$$

$$x_T = 4 + \frac{1}{2}(1) = 4.5\text{ m}$$

$$F_B = (2\text{m})(2\text{kN/m}) = 4000\text{ N}$$

$$x_B = 1 + \frac{1}{2}(2) = 2\text{ m}$$

Newton's 2nd Law

$$\sum F_x = m \cancel{a_x} = R_x \quad (1)$$

$$\sum F_y = m \cancel{a_y} = R_y + F_B - mg + R - F_T \quad (2)$$

$$\sum M = I \cancel{\alpha} = -x_B F_B + 2.5mg - 4R + x_T F_T \quad (3)$$

Solve (1) for R_x :

$$\boxed{R_x = 0}$$

Solve (3) for R :

$$\begin{aligned} R &= \frac{1}{4}(-x_B F_B + 2.5mg + x_T F_T) \\ &= \frac{1}{4}(-(2)(4000) + 2.5(100)(9.81) + (4.5)(3000)) \end{aligned}$$

$$\boxed{R = 1988\text{ N}}$$

Solve (2) for R_y :

$$\begin{aligned} R_y &= F_T - F_B + mg - R \\ &= [3000] - [4000] + (100)(9.81) - [1988] \end{aligned}$$

$$\boxed{R_y = -2007}$$