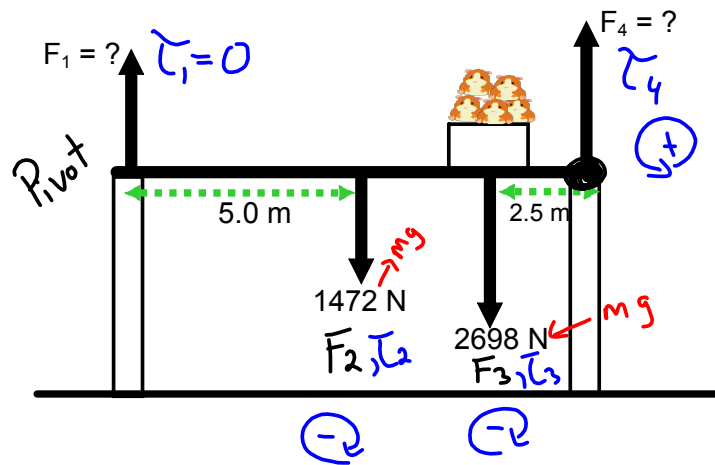


Example: A uniform 150 kg beam, 10.0 m long, supports a 275 kg box of hamsters 2.5 m from the right support column. Calculate the magnitude of the forces on the beam exerted by each of the vertical support columns.



$$\tau_{\text{net}} = \tau_1 + \tau_2 + \tau_3 + \tau_4$$

$$0 = 0 - r_2 F_2 - r_3 F_3 + r_4 F_4$$

$$0 = -(5)(1472) - (7.5)(2698) + (10)F_4$$

$$0 = -7360 - 20235 + 10F_4$$

$$27595 = 10F_4$$

$$\underline{2760 \text{ N} = F_4}$$

Move Pivot to F_4 and solve for F_1

$$\tau_{\text{net}} = \tau_1 + \tau_2 + \tau_3 + \tau_4$$

$$0 = -10F_1 + (5)(1472) + (2.5)(2698) + 0$$

$$0 = -10F_1 + 7360 + 6745$$

$$-14105 = -10F_1$$

$$\boxed{1411 \text{ N} = F_1}$$