Sample Calculations for lab 06

A meterstick has a mass m_s=0.5 kg and has a pivot at x=0.4 m. How large of a mass should be placed at x=0.2 to balance the system?

(a) Draw a sketch of the system, showing all forces with correct labels. Call the force from the pivot F_p.

(b) In static equilibrium, $\sum \vec{F}=0$. Use this to find F_p in terms of m_s and m.

(c) Choose x=0 to be the axis. Use $\sum \vec{\Gamma}=\vec{0}$ to write this equation for each of the torques, providing the correct signs, in terms of F_p ,m_s and m. Note that the mass of the meterstick operates at x=0.5 m.

(d) Substitute your F_p from (b) and then solve the result in (c) for m, providing correct SI units.