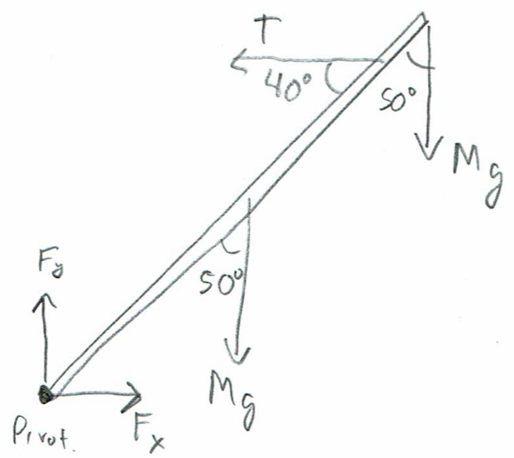
1. Here is an FBD.



From looking at the torques around the pivot: $\tau_{net} = 0$ implies:

$$8m \cdot T \cdot \sin 40° - 10m \cdot Mg \cdot \sin 50° - 5m \cdot Mg \cdot \sin 50° = 0$$

$$\Rightarrow T = \frac{(10m + 5m)\, Mg \sin 50°}{8m \cdot \sin 40°}$$

$$= \frac{15}{8} Mg \cdot \frac{\sin 40°}{\sin 50°} = 4380\ N$$

$F_{net,y} = 0 \quad \Rightarrow \quad F_y - Mg - Mg = 0$

$\Rightarrow F_y = 2Mg = 3920\ N$

$F_{net,x} = 0 \quad \Rightarrow \quad F_x - T = 0 \quad \Rightarrow \quad F_x = T = 4380\ N$

2. Angular momentum will be conserved, so

$I_i w_i = I_f w_f$

$\Rightarrow w_f = \frac{I_i}{I_f} w_i$

$I_i = I_{body} + I_{weights}$ (two weights)

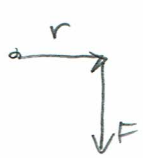
$= \frac{1}{2}(50kg)(0.2m)^2 + 2(1kg)(1m)^2$

$= 3\ kg\ m^2$

$I_f = I_{body} = 1\ kg\ m^2$

so $w_f = \frac{3\ kg m^2}{1\ kg m^2}(0.5\ rad/s) = 1.5\ rad/s$

3. a)



RHR gives $\vec{\tau}$ is into the page

b)

RHR gives $\vec{\omega}$ and $\vec{L}$ into the page