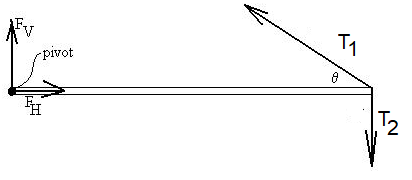
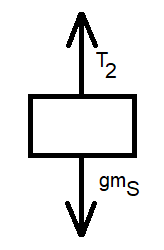
HW 10-1 Soln)

To be in equilibrium, we require that the sums of the torques, x-component forces, and y-component forces be zero. Let x be horizontal and y be vertical.

  
The beam seems to be the central object on which most of the forces of interest act, so to keep track of the forces, draw a free-body diagram.

We’ll need to do an analysis for the forces acting on the sign as well:

The force from the hinge at the left is decomposed into its vertical and horizontal components.  Let L be the length of the beam.  Define the torques to be positive out of the page (CCW). Since the beam is in static equilibrium, we can *choose* our pivot about which to calculate the torques; we should get zero regardless of our choice.  I choose the hinge.   
So,