1. A 2-meter long, 200 kg steel beam is attached to a wall and supported by a cable, as shown in the diagram:

(a) Determine the torque applied to the steel bar, due to its weight alone.

(b) What torque is applied by the cable?

(c) Determine the tension in the cable. What would the tension be if the rope were hanging straight down (i.e. connected at an angle of 90°)?

(d) If the cable is cut, determine the angular acceleration of the beam. The rotational inertia of a beam rotating about one of its ends is $I = \frac{1}{3} ML^2$.

(e) The cable is re-attached, and a person of mass 75 kg stands 50 cm from the wall. Determine the new tension in the cable.