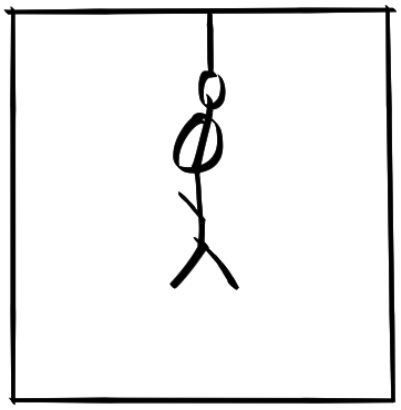
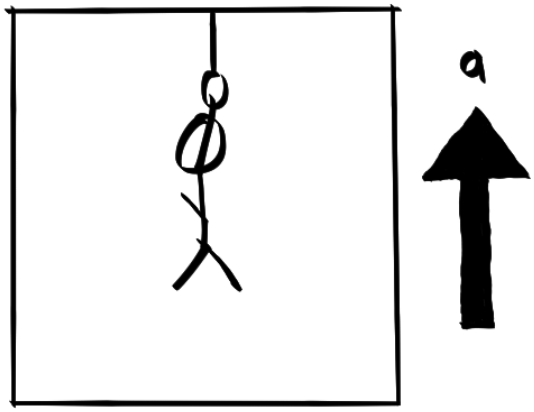
Elevator Problems

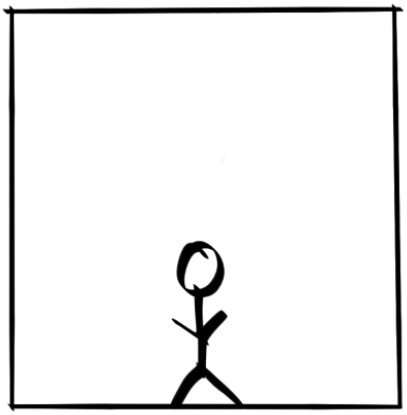


Suppose that a person hangs from a ring attached to a rope on the inside of an elevator (which is itself suspended). The elevator is not in motion and all the forces equal out.

1. Label the force vectors for gravity (mg) and the rope tension (T).



2. Suppose the elevator begins accelerating upwards. What is the value of the **string tension** T (in terms of mg and ma) now that the elevator (and the person) is accelerating upwards with acceleration a? Think about the direction of the force vectors.



3. (a) If the person stands on the floor instead, would the **normal force** N be different than what was calculated for T (assuming the elevator accelerates upward with the same value for a as before)?

   (b) What would be the **normal force** N acting on the person if the elevator accelerated at the same rate a but in the *downward* direction?