**Unit 5 – Worksheet 4**

**Elevator Practice**

1. An elevator is moving up at a *constant velocity* of 2.50 m/s, as illustrated in the diagram below: The man has a mass of 85.0 kg.



* 1. Construct a system schema for the man.
  2. Construct a force diagram for the man.
  3. How large is the force that the floor exerts on the man? How large is the force the man exerts on the floor?

1. The elevator now *accelerates* *upward* at 2.00 m/s2.
   1. Construct a new force diagram for the man.
   2. How much force does the floor of the elevator now exert on the man?
2. Upon reaching the top of the building, the elevator accelerates downward at 3.00 m/s2.
   1. Construct a force diagram for the man.
   2. How much force does the floor now exert on the man?
3. While descending in the elevator, the cable suddenly breaks. What is the force of the floor on the man?
4. Consider the situation where a person that has a mass of 68.0 kg is descending in an elevator at a constant velocity of 4.00 m/s. At some time "t", the elevator starts to slow to a stop at the rate of 2.00 m/s2.

a. Construct a qualitative motion map indicating the relative positions, velocities and accelerations of the elevator as it descends.

1. Construct **quantitative** force diagrams (include sizes) for the person in the elevator as it descends at (a) constant speed and (b) during the times it was accelerating.
2. If the person in the elevator were standing on a bathroom scale calibrated in ‘Newtons’, what would the scale read while the elevator was (a) descending at constant speed and (b) while slowing to a stop? Show your work and explain your answers.