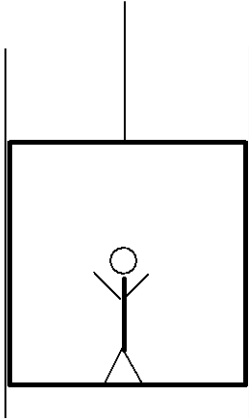


UNIT III: Worksheet 1

1. An elevator is moving up at a constant velocity of 2.5 m/s, as illustrated in the diagram below:
The man has a mass of 85 kg.



- a. Sketch a force diagram for the man.
- b. Calculate the force the floor exerts on the man.
2. The elevator now accelerates upward at 2.0 m/s^2 .
- a. Sketch a force diagram for the man.
- b. Calculate the force the floor now exerts on the man.
3. Upon reaching the top of the building, the elevator accelerates downward at 3.0 m/s^2 .
- a. Sketch a force diagram for the man.
- b. Calculate the force the floor now exerts on the man.
4. While descending in the elevator, the cable suddenly breaks. What is the force of the floor on the man? Explain your answer.

5. Consider the situation where a person that has a mass of 68 kg is descending in an elevator at a constant velocity of 4.0 m/s. At some time "t", the elevator starts to slow to a stop at the rate of 2.0 m/s^2 .
- Sketch three qualitative motion maps indicating the position, velocity and acceleration of the elevator as it descends.
 - Sketch two force diagrams for the person in the elevator as it descends at (a) constant speed and (b) during its period of acceleration.
 - If the person in the elevator were standing on a bathroom scale calibrated in Newtons, calculate what the scale would read while the elevator was (a) descending at constant speed and (b) while slowing to a stop.