

# Elevator Problems

What is the normal force acting on a person?

What is a person's apparent weight?

What does the scale read?

All the same question!

Elevator:      Acc. Up

Constant Speed

Acc. Down



An elevator **accelerates up** when it:

moves up getting faster or moves down getting slower

An elevator **accelerates down** when it:

moves down getting faster or moves up getting slower

**Ex:** An elevator starts from rest and ascends, increasing its speed to 6 m/s in 3 seconds. It then maintains that speed for 5 seconds. Finally, it slows down, coming to rest over a distance of 6 m. The elevator has a mass of 500 kg and its lone occupant has a mass of 65 kg.

- a. **What is the tension in the cable supporting the elevator when  $t = 2$  s?**
- b. **What is the occupant's apparent weight when  $t = 2$  s?**
- c. **What is the normal force acting on the occupant when  $t = 5$  s?**
- d. **If the occupant stood on the scale in the elevator at  $t = 9$  s, what would it read?**