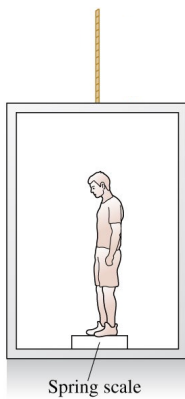
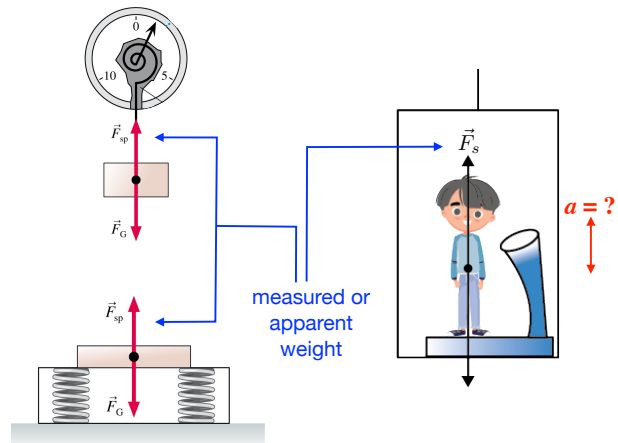


Weight, Apparent Weight, Weightlessness

The weight of an object is the magnitude of the gravitational force acting on it, i.e. F_G . The *measured* or *apparent weight* refers to the reading on a scale, i.e. F_s .

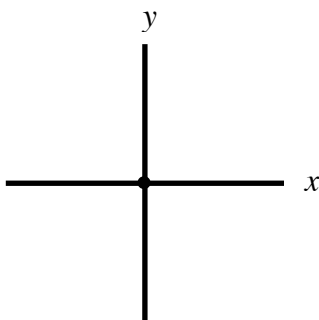
For an object in equilibrium, the scale reads the actual or true weight ($F_s = F_G$).

Does the reading on a scale change when the system is no longer in equilibrium?



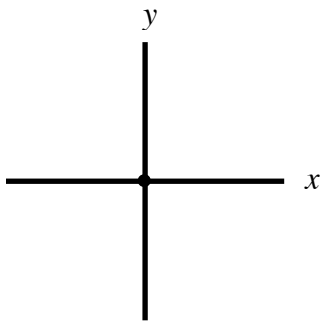
Example:

A person of mass m stands on a bathroom scale while riding the elevator (see Figure). What is the reading on a scale if the elevator is accelerating?

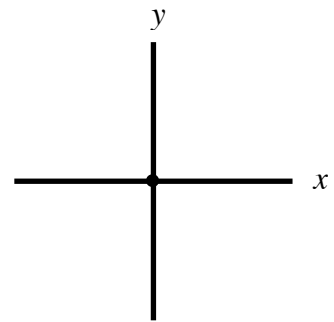


Different scenarios:

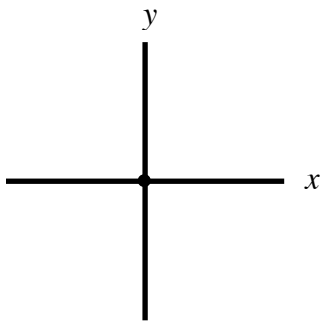
case 1: no acceleration



case 2: upward acceleration



case 3: downward acceleration



case 4: free-fall

