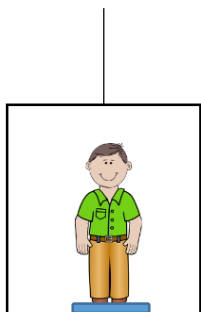


Weightless in a lift?

A man has a mass of just over 76 kg, which means his weight is so close to 750 N that we don't need to worry about the difference.

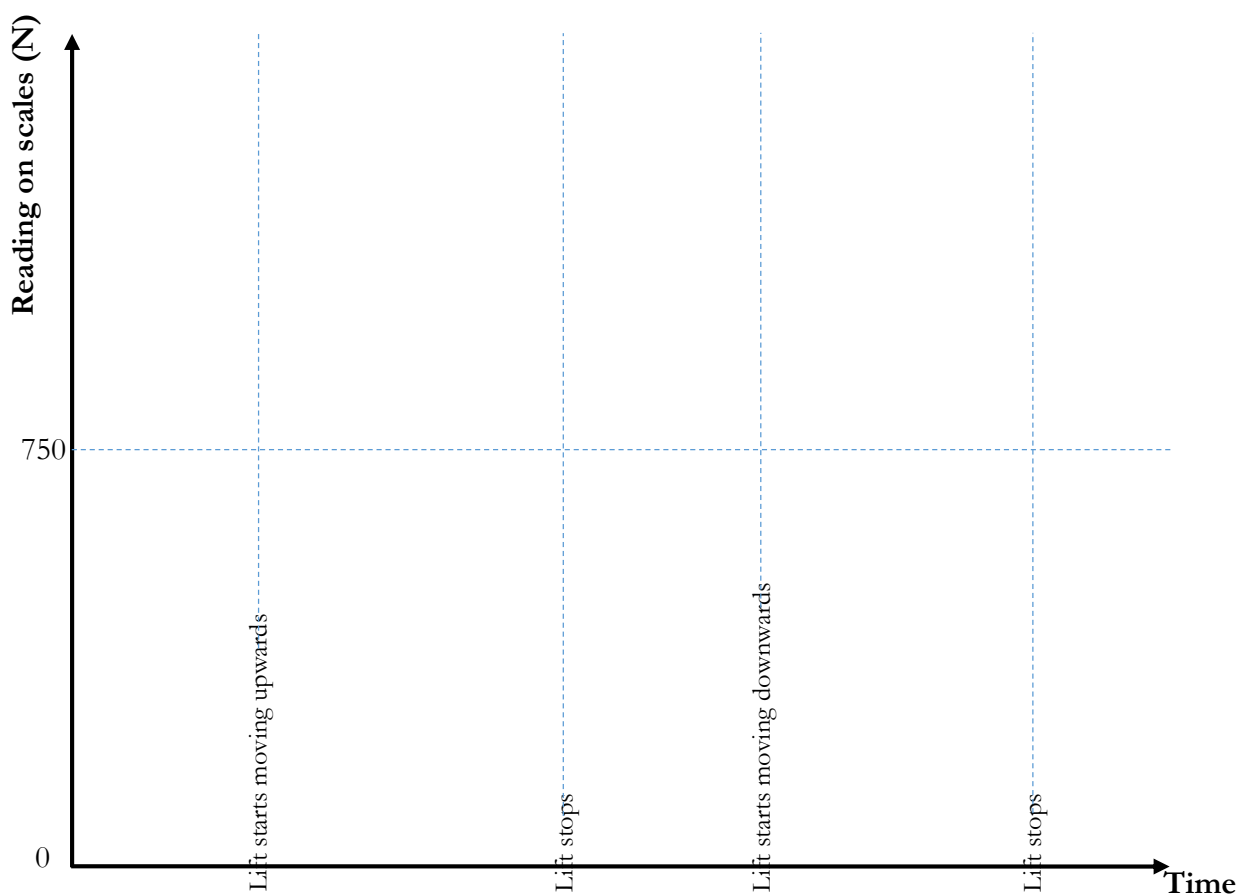
For reasons we won't go into just now, he stands on a set of scales in a stationary lift:



The scales are well calibrated, so read 750 N when the lift is stationary.

The lift then ascends to the top floor of the building (by accelerating for a short time, travelling at a constant velocity, then decelerating) and stops. It waits at the top floor for a while, then descends back to the ground floor in a similar way.

On the axes below, sketch how you would expect the reading on the scales to vary as the lift goes up and down:



Further questions:

- 1) What would the reading on the scales be if the lift moved upwards at a constant speed of 50 kmh^{-1} (no, this is not a realistic speed for a normal lift, but nevertheless)?
- 2) Would it be possible for the lift to move downwards in such a way that the reading on the scales would be zero?
- 3) In what way would the lift need to move so that the reading on the scales would be double the man's actual weight ($= 1500 \text{ N}$)?