

Monday Reading Assessment: Unit 4, Forces

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1 Memory Bank

- Newton's First Law: If $\vec{F}_{net} = 0$, then $\Delta\vec{v} = 0$. (An object at rest stays at rest, or an object in motion stays in motion, unless the object has a net external force acting upon it).
- Newton's Second Law: $\vec{F}_{net} = m\vec{a}$. (The net external force on an object is equal to the mass of the object times the acceleration of the object).
- Newton's Third Law: $\vec{F}_{AB} = -\vec{F}_{BA}$. (For every action there is an equal and opposite reaction).

2 Chapter 4 - Forces, Continued

1. In Fig. 1, a man with mass m stands on a bathroom scale in an elevator. Which of the following is true, if the elevator is accelerating upwards?
 - A: The scale reading gives a weight that is larger than mg .
 - B: The scale reading gives a weight that is smaller than mg .
 - C: The scale reading gives a weight equal to mg .
 - D: The scale reading gives a weight of zero.

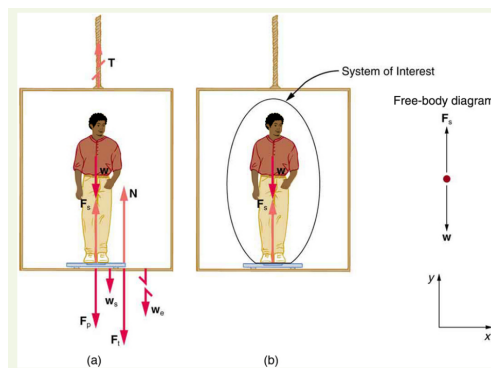


Figure 1: A person of weight \vec{w} stands on a scale in an elevator.

2. In Fig. 1, a 75.0-kg man stands on a bathroom scale in an elevator. Calculate what weight does the scale read if:
(a) the acceleration of the elevator is $+1.0 \text{ m/s}^2$, (b) the acceleration of the elevator is -1.0 m/s^2 , (c) the elevator moves upward at 3.0 m/s , and (d) if the elevator is stationary.