

# Warm Up: Unit 4, Forces

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## 1 Memory Bank

- $\vec{v} = \Delta\vec{x}/\Delta t$ , the definition of velocity.
- 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).

## 2 Review of Kinematics

1. Suppose a student cuts diagonally across the quad to save time getting to class. If the quad is 40 meters by 80 meters, and his walking speed is 3 m/s, how much time does he save? That is, compare the time it takes to go from one corner to the other by cutting across diagonally versus walking the perimeter.

## 3 Applied 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.
2. Suppose a person's mass is 60 kg. The person is standing on a scale in an elevator that is *accelerating upwards* at  $0.2 \text{ m/s}^2$ . What is the person's weight, according to the scale?

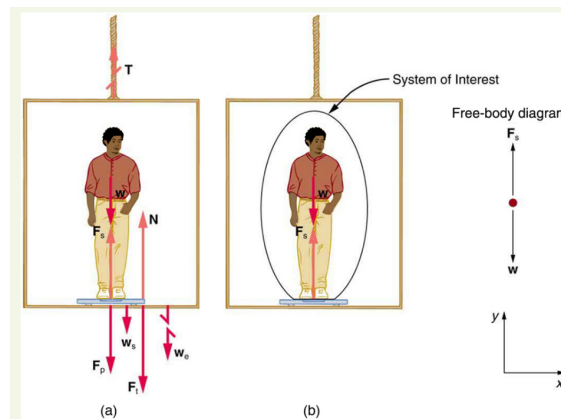


Figure 1: A person of weight  $\vec{w}$  stands on a scale in an elevator.