

## Chapter 4 Newton's Laws of Motion

### Example 1:

(a) If a 10 kg mass is located on the surface of the Earth, what is its weight? (b) If the same mass is located on the surface of the Moon, what is its weight? (c) If a person weighs 120 lb on Earth, what is the person's mass?

### Example 2:

A person is pulling a 125 lb box across a smooth horizontal surface. What is the acceleration of the box if they are pulling upward at an angle of  $15^\circ$  with a force of 75 lbs?

### Example 3:

A 15 kg block slides down a smooth  $40^\circ$  incline. If it starts from rest what is its speed after sliding 2 meters?

### Example 4:

Find the tension in the rope of an Atwood machine that has a 40 kg mass hanging on one side and a 60 kg mass on the other.

### Example 5:

An elevator is accelerating downward at  $5.3 \text{ m/s}^2$ . What is the tension in the chain supporting the elevator's 3 kg ceiling lamp?

### Example 6:

A rope connects a 40 kg block to a 30 kg block. The rope passes over a pulley at the top of a  $37^\circ$  incline. The 40 kg block rests on the incline and the 30 kg block hangs from the pulley. Calculate the acceleration of either block.

### Example 7:

Two blocks (30 kg and 50 kg) are in contact on a horizontal frictionless surface with the 30 kg block to the left of the 50 kg block. There is a 360 N horizontal force pushing the 30 kg block to the right. What is the magnitude of the force pushing on the 50 kg block?