

Prob-Chap07-PHYS-109

7.3. A standard man climbs the stairs in a building. Assume that he reaches the fourth floor (16 m above the ground floor) in 15 seconds. How much work has the standard man done, and what was the power used for the climb?

7.9. A shopper in a grocery store pushes a shopping cart with a force of 40 N directed at an angle of 30° below the horizontal. What is the work the shopper does on the cart for a horizontal distance of 10 m?

7.17. A child and sled with a combined mass of 50 kg slide down a frictionless hill. If the sled starts from rest and has a speed of 3.0 m/s at the bottom, what is the height of the hill?

7.19. An object of mass 0.5 kg has a speed of 2.5 m/s at position 1 and a kinetic energy of 10.0 J at position 2. Calculate (a) its kinetic energy at position 1, (b) its speed at position 2, and (c) the total work done on the object as it moves from position 1 to position 2.

7.30. An object of mass $m_1 = 7.5$ g moves to the right at 25 cm/s. It makes an elastic head-on collision with a second object of mass $m_2 = 12.5$ g. The second object is at rest before the collision. Calculate (a) the speed of each object after the collision and (b) the fraction of the initial kinetic energy that is transferred to the second object.