

Work-Kinetic NRG Theorem

On a frozen pond, a person pushes a 10 kg sled, giving it an initial speed of 2.2 m/s. How far does the sled move if the coefficient of kinetic friction between the sled and the ice is 0.1?

$$W = F_{net}d \quad W_{net} = \Delta KE \quad \Delta KE = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$

$$F_{net} = F_k \text{ (friction is only acting force)}$$

A 2100 kg car accelerates from rest at the top of a driveway that is sloped at an angle of 20° . An average fictional force of 4000 N impedes the car so the car has speed of 3.8 m/s at the bottom of the driveway. What is the length of the driveway?