Work-Kinetic Energy Theorem

Mr. Drouet

Objectives

- Apply the work-kinetic energy for an object.

Work-Kinetic Energy Theorem

- The net work done on an object is equal to the change in the kinetic energy of the object.

$$W_{net} = \Delta KE$$

$$fd\cos\theta = \left(\frac{1}{2}mv_f^{\,2}\right) - \left(\frac{1}{2}mv_i^{\,2}\right)$$

net work = change in kinetic energy

Notes

- Turn to page 176.

Sample Problem 1

A student wearing frictionless in-line skates on a horizontal surface is pushed by a friend with a constant force of 45 N. How far must the student be pushed, starting from rest, so that her final kinetic energy is 352 J?

Sample Problem 2

- A 2000 kg car accelerates from rest under the actions of two forces. One is a forward force of 1140 N provided by traction between the wheels and the road. The other is a 950 N resistive force due to various frictional forces. Use the work-kinetic energy theorem to determine how far the car must travel for it's speed to reach 2.0 m/s.