

WORK, POTENTIAL AND KINETIC ENERGY

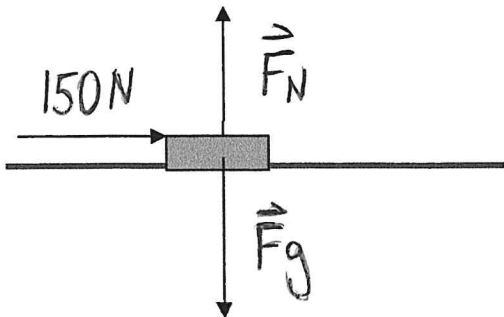


1. Consider an object with initial kinetic energy of 3000 J.

a) How much work by net external force was done on the object if its final kinetic energy is 5600 J?

b) Assume that only two forces acted on the object, both of which were horizontal and of equal magnitude. Find the magnitude and direction of the forces if the object moved strictly horizontally to the left by 3.0m.

2. Find the amount of work done provided that only the three indicated forces act on the object moving it by 0.35 m right.



3. What is the kinetic energy of a 13.0-kg object moving at the speed of 15km/h?

4. Find the mass an object that is moving at the speed of 45m/s and has a kinetic energy of 1.0×10^4 J .

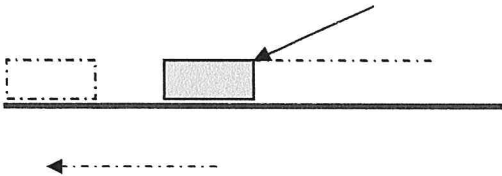
5. How fast is a 15.0-kg object moving if its kinetic energy is 4.5×10^5 J?

6. What is the mass of an object resting 1500 m above the ground level and having potential energy of 8.8×10^4 J?

7. Find the total mechanical energy of a 120-kg rollercoaster car coasting on a track 50.0m above ground at the speed of 5m/s. Assume that friction and air resistance are negligible.

8. Consider a person pulling a vacuum cleaner with a force of 50.0N at an angle of 30° as shown below. The vacuum cleaner moves 3.0 m along the carpet.

a) Determine the work done by the 50.0N force assuming that the carpet is laid strictly horizontally.



b) If the mass of the vacuum cleaner is 15kg and it starts from the rest, what is its speed when being pushed by the person with the force from a) over the distance of 3.0m?

9. A 1000-kg rollercoaster car is at rest on the top of 40.0 m tall hill. Ignoring the effects of frictional forces, find

a) Car's speed at the bottom of the hill.

b) The height at which the car will have $\frac{1}{2}$ of the speed found in a)