

Work

1. A weight lifter lifts a set of weights a vertical distance of 2 m. If a constant net force of 350 N is exerted on the weights, what is the net work done on the weights?
2. A shopper in a supermarket pushes a cart with a force of 35 N directed at an angle of 25 degrees downward from the horizontal. Find the work done by the shopper on the cart as the shopper moves along a 50 m length of aisle.
3. If 2 J of work is done in raising a 180 g apple, how far is it lifted?
4. For each of the following cases, indicate whether the work done on the second object in each example will have a positive or a negative value.
 - a. The road exerts a friction force on a speeding car skidding to a stop.
 - b. A rope exerts a force on a bucket as the bucket is raised up a well.
 - c. Air exerts a force on a parachute as the parachutist falls to Earth.
5. If a neighbor pushes a lawnmower four times as far as you do but exerts only half the force, which one of you does more work and by how much?

6. A worker pushes a 1500 N crate with a horizontal force of 345 N a distance of 24 m. Assume the coefficient of kinetic friction between the crate and the floor is .22.

a. How much work is done by the worker on the crate?

b. How much work is done by the floor on the crate?

c. What is the net work done on the crate?

7. A .075 kg ball in a kinetic sculpture moves at a constant speed along a motorized vertical conveyor belt. The ball rises 1.32 m above the ground. A constant frictional force of .35 N acts in the direction opposite the conveyor belt's motion. What is the net work done on the ball?

8. For each of the following statements, identify whether the everyday or the scientific meaning of work is intended.

a. Jack had to work against time as the deadline neared.

b. Jill had to work on her homework before she went to bed.

c. Jack did work carrying the pail of water up the hill.

9. Determine whether work is being done in each of the following examples:

a. a train engine pulling a loaded boxcar initially at rest

b. a tug of war that is evenly matched

c. a crane lifting a car