

Name: _____

Period: _____ Date: _____

Work

Directions: Read each of the following statements/questions. Answer them correctly and box your final answer.

1. Using a force of 150 newtons, you push a sofa to the other side of a room, a distance of 3.1 meters. Then you decide you do not like it there, so you push it back. How much work have you done?
2. Using appropriate machinery, you lift a load by pulling 22 meters of rope with a force of 150 newtons. How much work has been done?
3. A 20-kilogram boulder falls off a cliff and strikes the ground after falling 30 meters. How much work was done on the boulder?
4. A student lifts a box of books that weighs 185 N. The box is lifted 0.800 m. How much work does the student do?
5. A force of 825 newtons is needed to push a car across a lot. Two students push the car 35 meters.
 - a. How much work is done?
 - b. After a rainstorm, the force needed to move the car doubled because the ground became soft. Now how much work would be needed to move the car?
6. A delivery clerk carries a 34 newton package from the ground to the fifth floor of an office building, a total height of 15 meters. How much work is done by the clerk?
7. What work is done by a forklift raising a 583 kilogram box 1.2 meters?
8. You and a friend each carry identical boxes to a room one floor above you and down the hall. You choose to carry it first up the stairs, then down the hall. Your friend carries it down the hall, then up another stairwell. Who does more work?
9. A sailor pulls a boat along a dock using a rope at an angle of 60.0° with the horizontal. How much work is done by the sailor if he exerts a force of 225 newtons on the rope and pulls the boat 30.0m?
10. How much work does the force of gravity do when a 25 newton object falls a distance of 3.5 meters?

Power

Directions: Read each of the following statements/questions. Answer them correctly and box your final answers.

1. An electric motor lifts an elevator that weighs 1.20×10^4 N a distance of 9.00 m in 15.0s. What is the power of the motor in watts and kilowatts?

2. A box that weighs 575 N is lifted a distance of 20.0 m straight up by a rope. The job is done in 10.0 s. What power is developed in watts and kilowatts?

3. A rock climber wears a 7.50-kg knapsack while scaling a cliff. After 30.0 min, the climber is 8.2 m above the starting point.
 - a. How much work does the climber do on the knapsack?

 - b. If the climber weighs 645 N, how much work does she do lifting herself and the knapsack?

 - c. What is the average power developed by the climber?

4. An electric motor develops 65kW of power as it lifts a loaded elevator 17.5 m in 35.0 s. How much force does the motor exert?

5. A force of 300 N is used to push 1 145-kg mass 30.0 m horizontally in 3.00s
 - a. Calculate the work done on the mass.

 - b. Calculate the power.

6. Robin pushes a wheelbarrow by exerting a 145-N force horizontally. Robin moves it 60.0 m at a constant velocity in 25.0s.
 - a. What power does Robin develop?

 - b. If Robin moves the wheelbarrow twice as fast, how much power is developed?