

Name: _____

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Chapter 7.1 Homework
Conceptual Physics

Parent Signature: _____

Reviewing Concepts

1. Why are work and energy both measured in joules? (0.5)

2. If you lift a box of books 1 m off the ground, you are doing work. How much more work would you do if you lifted the box 2 m off the ground? (0.5)

3. Decide whether work is being done (using the physics definition of work) in the following situations: (3)
 - a. picking up a bowling ball off the floor
 - b. two people pulling with the same amount of force on each end of a rope
 - c. hitting a tennis ball with a tennis racket
 - d. pushing hard against a wall for an hour
 - e. pushing against a book as it slides across the floor
 - f. standing very still with a book balanced on your head

4. In which direction should you apply a force if you want to do the greatest amount of work? (1)

5. What is the difference between work and power? (0.5)

6. What is the meaning of the unit of power called a watt? (0.5)

Solving Problems

1. Calculate the amount of work you do in each situation. (2.5)
 - a. You push a refrigerator with a force of 50 N and it moves 3 m across the floor.

 - b. You lift a box weighing 25 N to a height of 2 m.

 - c. You apply a 500 N force downward on a chair as you sit while eating dinner.

 - d. You lift a baby with a mass of 4 kg up 1 m out of her crib.

 - e. You climb a mountain that is 1,000 m tall. Your mass is 60 kg.

2. Sal has a weight of 500 N. How many joules of work has Sal done against gravity when he reaches 4 m high on a rock-climbing wall? (0.5)

3. You do 200 J of work against gravity when lifting your backpack up a flight of stairs that is 4 m tall. What is the weight of your backpack in newtons? (1)

4. A moving object has a mass of 2,000 kg and a speed of 10 m/s. A stopping force of 5,000 N is applied. (1)
 - a. What is the object's kinetic energy?

 - b. What is the distance it takes to stop?

5. You lift a 200-N package to a height of 2 m in 10 s. (1)
- How much work did you do?
 - What was your power?
6. One machine can perform 500 J of work in 20 s. Another machine can produce 200 J of work in 5 s. Which machine is more powerful? (1)
7. Two cranes use rope and pulley systems to lift a load from a truck to the top of a building. Crane A has twice as much power as Crane B. (2)
- If it takes Crane A 10 s to lift a certain load, how much time does Crane B take to lift the same load?
 - If Crane B can do 10,000 J of work in one minute, how many joules of work can Crane A do in a minute?
8. An elevator lifts a 500-kg load a distance of 10 m in 8 s. (1)
- Calculate the work done by the elevator.
 - Calculate the elevator's power.