

## ENERGY Review



1. You are dragging a box of books down the hall using a rope that is attached to the box at an angle of  $40.0^\circ$  above the horizontal. You are pulling on the rope with a force of  $250\text{ N}$  and pull the box  $45.0\text{ m}$ . How much work do you do?

2. How much work is required to carry a  $10\text{-N}$  rock up one flight of stairs ( $4.0\text{ m}$ ) in 10 seconds?

How much work is required to carry the same load one flight in 5 sec?

How much power is required for each?

3. A man can lift a  $40\text{-N}$  rock with help of a lever. When he pushes down with a  $10\text{-N}$  force, he lifts the rock  $0.20$  meters. How far does he have to move his end of the lever to do this?

4. What is the **IMA** of a 5-meter long incline plane that has one end elevated 1 m?

What is the **MA** if  $100\text{ N}$  of effort is needed to push a block of ice that weighs  $400\text{ N}$  up the plane?

What is the efficiency of the incline plane?

5. A shot putter heaves a 7.26-kg shot with a final velocity of 7.50 m/s
- What is the kinetic energy of the shot?
- The shot was initially at rest...how much work was done on it to give it this kinetic energy?
6.  $KE = \frac{1}{2} mv^2$ ; therefore, if velocity is doubled, KE is increased \_\_\_\_\_ times.
7. A 1600-kg vehicle moves with a velocity of 19.5 m/s. Calculate the power required to reduce the velocity to 3.20 m/s in 11.0 s.

8. A piece of ice ( $m = 15.0$  kg) hits the ground with a kinetic energy of 1200 J.

- From what height did it fall?
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- What was its velocity when it struck the ground?

9. You are traveling at constant velocity on your bike on a level road when you encounter a gentle hill with an overall vertical rise of 5 meters. Without peddling, you allow your speed to decrease as you coast up and onto the top of this hill. Your new speed is 2 m/s. What was your initial speed? (assume no frictional losses)

