WORKSHEET 7B: JOULES & WORK

NAME: _____ DATE: _____

SHOW ALL CALCULATIONS! Solve the following problems, being sure to resolve units to the simplest unit equivalent:

$$\mathbf{KE= \frac{1}{2} mv^2}$$

PE = weight times height = mgh

Weight = mass × gravitational acceleration = (kg)(9.8m/s^2)

Force = Newtons = N = (kg)(m/s^2)

Energy = Joules = Nm

Work = Force × Distance = Nm = Joules

Velocity= m/s

Gravitational acceleration = g = 9.8 m/s^2

1. A bowling ball weighing 7 kg is held 1 m above the floor. How high above the floor would you have to hold a 0.5 kg billiard ball to achieve the same potential energy represented by the bowling ball?

2. Amy uses 20N of force to push a lawn mower 10 meters. How much work does she do?

3. How much work does an elephant do while moving a circus wagon 20 meters with a pulling force of 200N?

4. If a 10 kg rock has 4,000 J of potential energy sitting on a hill, how high is the hill?

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5. A baseball player does 1234 Joules of work when hitting a baseball into left field. Assuming the baseball landed 100 meters away from home plate, how much force did the player use to hit the ball?

6. Angela uses a force of 25 Newtons to lift her grocery bag while doing 50 Joules of work. How far did she lift the grocery bags?

7. Determine the kinetic energy of a 625-kg roller coaster car that is moving with a speed of 18.3 m/s.

8. A swimmer at the neighborhood pool jumps off the diving board and has a kinetic energy of 12 000 J just prior to hitting the water. If her mass is 40 kg, then what is her speed right before she hits the water?

9. A 900-kg compact car moving at 60 mi/hr has approximately 320,000 Joules of kinetic energy. Use algebra to estimate its new kinetic energy if it is moving at 30 mi/hr.

10. A 900-kg compact car moving at 60 mi/hr has approximately 320,000 Joules of kinetic energy. Use the factor-label method to estimate its new kinetic energy if it is moving at 30 mi/hr by converting miles per hour to meters per second.