Physics 200 Name: ____________________________

Energy Problems based on the Energy Video Activity

- Match these to the numbered scenarios from the energy video activity -- hopefully they match up! :-)
- Solve

1. A 0.1kg ball is thrown upward. At a height of 1m, the ball has a velocity of 8m/s. The ball is caught and brought to rest at a height of 2m. What non-conservative work is done on the ball after it passes the 1m mark?

2. A physics student creates a string of rubber bands with k=5N/m. She then ties one end of the string to a 500g mass and the other end to the floor. She raises the mass until it is just about to stretch the spring (at a height of 1.2m) and holds it momentarily motionless. Then she throws the mass directly upward. At the moment before the mass hits the 2.7m tall ceiling, its velocity is 4m/s. If, during the throw, her hand pushed the mass over a distance of 0.3m, what average force did she apply?

3. A physics teacher pushes a 1N banana up a ramp. The banana starts at rest and ends at rest. The ramp is 0.1m tall, but it is 0.5m long. Assuming zero friction, how much average force does the teacher exert on the banana?

4. The same launcher is used to shoot a 0.03kg cube up an inclined ramp, and this time the spring is compressed a distance of 0.4m. The cube slides up the ramp and comes to a stop, due to friction. At some point in its slide, the cube has traveled a linear distance of 5m and a vertical distance of 0.3m, and its speed has dropped to 1m/s. What average force of friction has the spring experienced up to this point?

5. A 0.03kg sphere is launched horizontally from a spring-loaded projectile launcher. To load the launcher, a student compresses the spring a distance of 0.25m. When the sphere is launched, it reaches a maximum speed of 10m/s. What is the k of the launcher spring?