Name:_____ Date:_____

Mr. Croom's Physics Chapter 5: Work and Energy

Kinetic Energy and Work 2

Solve the following problems.

1. (Giancoli, p. 162, # 15) At room temperature, an oxygen molecule, with mass of 5.31×10^{-26} kg, typically has a KE of about 6.21×10^{-21} J. How fast is the molecule moving?

2. (Giancoli, p. 162, # 16) If the KE of an arrow is doubled, by what factor has its speed increased? If its speed is doubled, by what factor does its KE increase?

3. (Giancoli, p. 162, # 17) How much work is required to stop an electron (m-9.11×10^{-31}) kg) which is moving with a speed of 1.9×10^{-6} m/s?

4. (Giancoli, p. 162, # 21) If the speed of a car is increased by 50%, by what factor will its minimum braking distance be increased, assuming all else is the same? Ignore the driver's reaction time.

5. (Giancoli, p. 162, # 22) At an accident scene on a level road, investigators measure a car's skid mark to be 88m long. The accident occurred on a rainy day, and the coefficient of kinetic friction was estimated to be 0.42. Use these data to determine the speed if the car when the driver slammed on (and locked) the brakes. (Why does the car's mass not matter?)

6. (Giancoli, p. 162, # 23) A softball having a mass of 0.25 kg is pitched at 95 km/h. By the time it reaches the plate, it may have slowed by 10%. Neglecting gravity, estimate the average force of air resistance during a pitch. If the distance between the late and the pitcher is about 15m.

7. (Giancoli, p. 162, # 24) How high will a 1.85 kg rock go if thrown straight up by someone who does 80J of work on it? Neglect air resistance.

8. (Giancoli, p. 162, # 25) A 285 kg load is lifted 22.0m vertically with an acceleration a = 0.160 g by a single cable. Determine the tension in the cable, the net work done on the load, the work done by the cable on the load, the work done by gravity on the load, and the final speed of the load assuming it started from rest.