Name: _____ Date:_____

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

Kinetic Energy and Work

Solve the following problems.

1. (Walker, p. 194, # 16) When Skylab reentered the Earth's atmosphere on July 11, 1979, it broke into a myriad of pieces. One of the largest fragments was a 1770-kg lead-lined film vault, and it landed with an estimated speed of 120 m/s. What was the kinetic energy of the film vault when it landed?

2. Complete the following table:

Kinetic Energy	Mass	Velocity	Ratio: Current E_k / $E_{k@1m/s}$
	30 kg	1 m/s	
	30 kg	2 m/s	
	30 kg	3 m/s	
	30 kg	4 m/s	
	30 kg	5 m/s	
	30 kg	6 m/s	
	30 kg	7 m/s	
	30 kg	8 m/s	
	30 kg	9 m/s	
	30 kg	10 m/s	

3. An 80 kg boy has 200J of kinetic energy. How fast is the boy running?

4. A ball is rolling at 7m/s with a kinetic energy of 200J. What is the mass of the ball?

5. A 0.145kg baseball is traveling at 40m/s when it is caught by catcher who brings it to rest in 0.12m. How much force must the catcher exert on the ball to bring it to rest?

6. A car 1400 kg car moving at 25 m/s skids 15 m when it locks its brakes to stop. What is the force of the brakes? How far will the car skid when it tries to stop at 50 m/s with the same brakes?

7. (Walker, p. 194, # 21) After hitting a long fly ball that goes over the right fielder's head and lands in the outfield, the batter decides to keep going past second base and try for third base. The 62.0-kg player begins sliding 3.40 m from the base with a speed of 4.35 m/s. If the player comes to rest at third base, **(a)** how much work was done on the player by friction? **(b)** What was the coefficient of kinetic friction between the player and the ground?

8. (Walker, p. 194, # 18) A 0.21-kg pine cone falls 14 m to the ground, where it lands with a speed of 13 m/s. **(a)** With what speed would the pine cone have landed if there had been no air resistance? **(b)** Did air resistance do positive work, negative work, or zero work on the pine cone? Explain.