Work and Kinetic Energy Worksheet

Name:_____

Do the following on a separate sheet of paper:

1. A force of 3.00 N acts over a distance of 12.0 m in the direction of the force. Find the work done by the force.
2. Katie, a 30.0 kg child, climbs a tree to rescue her cat that is afraid to jump 8.0 m to the ground. How much work does Katie do in order to reach the cat?
3. How much work must be done to raise a 1100 kg car 2.0 m above the ground?
4. A 4.00 kg object is lifted 1.50 m.
    a. How much work is done against gravity?
    b. Repeat the problem if the car is lowered instead of raised.
5. The driver of a 1500 kg car slams on the brakes, locking the wheels. A total retarding force of 1800 N acts to stop the car in a distance of 70.0 m. How much work is done in bringing the car to a halt, and is this work done on or by the car?
6. A pump lifts water from a lake to a large tank 20.0 m above the lake. How much work against gravity must the pump do to transfer 5.00 m^3 of water to the tank? The density of water is 1000 kg/m^3.
7. A 20$\underline{00}$ kg elevator rises from rest in the basement to the fourth floor, a distance of 25.0 m. As it passes the fourth floor, its speed is 3.00 m/s. There is a constant frictional force 50$\underline{0}$ N. Calculate the work done by the lifting mechanism.
8. The earth exerts a gravitational force of 2.0 x 10^{20} N on the moon, and the moon travels 2.4 x 10^9 m each time it orbits the earth. How much work does the earth do on the moon?
9. Marissa does 3.2 J of work to lower the window shade in her bedroom a distance of 0.80 m. How much force does Marissa exert on the shade?
10. A 200 kg cart is pushed up a ramp inclined at 15° to the horizontal. How much work is done to move the cart 5.8 m up the ramp if friction is negligible?
11. Is more work done in accelerating a car from 10 m/s to 20 m/s or from 20 m/s to 30 m/s? Explain your answer.

Answers to Selected Questions

1.	36.0 J		8.	J
2.	2400 J		9.	4.0 N
3.	22,000 J		10.	2900 J
4.	a. 58.9 J		11.	J
	b. -58.9 J			
5.	-1.3 x 10^5 J			
6.	9.80 x 10^5 J			
7.	5.1 x 10^5 J			