Practice 5.0 - Work and Energy

Work: W = Fd
1. How much work does Fred do exerting 45.0 N to lift a box 3.20 m? (144 J)
2. How much work does Adair lifting a 12.0 N box up 5.00 m? (60.0 J)
3. An alkaline AA battery contains 9360 J of energy. If it takes 68.0 N of force to drag a heavy box across the floor, how far could the energy in a AA battery drag the box? (138 m)
4. What vertical distance will 64.0 J of work lift a box that weighs 41.0 N? (1.56 m)
5. Katherine moves a box 7.20 m doing 5.00 J of work. What is the frictional force? (0.694 N)
6. What force exerted for 4.10 m does 117 J of work? (28.5 N)

Potential Energy: PE = mgh
7. What is the potential energy of a 5.40 Kg shot put that is 12.0 m in the air? (635 J)
8. What is the potential energy of a 3.20 kg clock weight that has been wound up to a height of 0.680 m? (21.3 J)
9. What is the mass of a pile driver if it has 13,200 J of PE when it is 8.30 m in the air? (162 Kg)
10. What mass has a PE of 140. J when it is at an elevation of 0.210 m? (68.0 kg)
11. An alkaline AA battery contains 9360 J of energy. If I connected it to a 100% efficient winch, how high could it lift a 72.0 kg person? (13.3 m, 43.5 feet)
12. To what height must a 0.145 Kg baseball rise to get a potential energy of 27.0 J? (19.0 m)

Kinetic energy: KE = 1/2mv^2
13. What is the kinetic energy of a 0.145 Kg baseball going 40.0 m/s? (about 90 mph) (116 J)
14. What is the kinetic energy of a 4.20 g (0.0042 kg) bullet going 1120 m/s? (2634 J)
15. An alkaline AA battery contains 9360 J of energy. If I connected it to a 100% efficient pitching machine, how fast could it pitch a 0.145 kg baseball? (359 m/s or mach 1.05)
16. What speed must a 0.450 Kg hammer have to have a kinetic energy of 57.0. J? (15.9 m/s)
17. A pile driver must develop 14,500 J of kinetic energy when it is going 13.0 m/s. What does its mass have to be? (172 kg)
18. A bullet with a speed of 892 m/s has a kinetic energy of 2740 J. What is its mass? (0.00689 Kg or 6.89 g)