

WORK AND ENERGY PRACTICE PROBLEMS

Answer these questions in your notebooks. Show all your math!!

1. How much work (energy) is needed to lift an object that weighs 200 N to a height of 4 m?
2. How much power is needed to lift the 200 N object to a height of 4 m in 4 seconds?
3. A tow truck pulls a car out of a ditch in 6.5 seconds. If 6000 watts of power is used, how much work is performed by the truck?
4. A comet with a mass of 7.85×10^{14} g strikes Earth at a speed, relative to Earth, of 25.0 km/s. Find the kinetic energy of the comet.
5. A teacher pushed a 10 kg desk across a floor for a distance of 5 meters. She exerted a horizontal force of 20 N. How much work was done?
6. A weight lifter lifts a 150 kg barbell above his head from the floor to a height of 2 m. He holds the barbell there for 5 sec. How much work does he do during that 5 sec interval?
7. A 50.0 kg shell is shot from a cannon at the Earth's surface to a height of 4.00×10^2 m.
 - a. What is the gravitational potential energy with respect to the earth's surface when the shell is at this height?
 - b. What is the change in gravitational potential energy when the shell falls to a height of 2.00×10^2 m.
8. A rifle can shoot a 4.20 gram bullet at a speed of 965.0 m/s.
 - a. Find the kinetic energy of the bullet.
 - b. Find the work done on the bullet if it starts from rest and travels 0.75 m in 1.6×10^{-3} sec.
 - c. In general, how would the kinetic energy of the bullet change if it was made from a more dense metal? Shot with a smaller velocity?
9. A woman lifts a 35 kg child a distance of 1.5 m and carries her forward for 6.5 m.
 - a. How much work does the woman do in lifting the child?
 - b. How much work does the child do?