Work and Power

Solve the following problems. Show all your work. Remember to include the correct units.

1. A force of 10,000 N is applied to a stationary wall. How much work is performed?

2. A 950-N skydiver jumps from an altitude of 3000 m. What is the total work performed on the skydiver?

3. A bulldozer performs 80,000 N-m of work pushing dirt a distance of 16 m. What is the force of the dirt?

4. An ant does 1 N-m of work in dragging a 0.0020-N grain of sugar. How far does the ant drag the sugar?

5. You are walking from your math class to your science class. You are carrying books that weigh 20 N. You walk 45 m down the hall, climb 15 m up the stairs, and then walk another 30 m to your science class. What is the total work performed on your books? * hint: recall that for work to occur, a distance must be covered in the same direction as the force applied.

6. A horse performs 15,000 J of work pulling a wagon for 20 sec. What is the horse's power?

7. A 750-N pole vaulter lifts himself 5.0 m high in 2.5 sec. What is his power?

8. A pump drains a small pond by performing 120,000 J of work. The power rating of the pump is 1000 w. How long does it take to drain the pond?

9. A tow truck pulls a car out of a ditch in 6.5 seconds. If 6000 w of power is used, how much work is performed by the truck?

10. An elevator lifts five passengers 30 m in 24 sec. The power is 15,000 w. What is the total weight of the elevator and passengers? Hint: calculate the work, then you can figure out the weight (force)