

Complete the following on a separate sheet of paper. **BE SURE TO SHOW ALL WORK AND USE THE METHOD FOR SOLVING WORD PROBLEMS.**

1. A 60 kg box is lifted a distance of 9.42 meters straight up at a constant speed using a rope. How much average power is required to complete this task in 5.10 seconds?
2. Harry and Bob are two workers being considered for a job at the UPS loading dock. Harry boasts that he can lift a 100.0 kg box 2.50 meters vertically, in 3.13 seconds. Bob counters with his claim of lifting a 222 kg box, 5.00 meters vertically, in 21.3 seconds. Which worker has the greater average power rating?
3. A 1000kg Mustang is accelerates down a road, reaching a speed of 30.00 m/s. The engine must exert a 5015 N force (on average) to maintain that speed.
  - a. How much work does the engine do to reach that velocity?
  - b. How far is the car displaced during this time?

4. An 82 kg hiker climbs Mt. Humphrey. During a two hour period, the hiker's vertical elevation increases by 540 meters.
  - a. Calculate the climber's change in gravitational potential energy.
  
  
  
  
  
  
  
  
  
  
  - b. Find the average power generated during this increase in gravitational potential energy.
  
  
  
  
  
  
  
  
  
  
5. How long would it take a 7.5 kW motor to raise a 500.0 kg piano to an apartment window 11 meters above the ground?
  
  
  
  
  
  
  
  
  
  
6. A fire truck requires a pump that can move 9.75 kg of water vertically 10.0 meters each second. Does a 1.25 hp pump have enough power to do the job? Why or why not? If not, what would be necessary?