Name_____

Date _____ Pd____

Unit VII: Worksheet 5

1. A 60 kg box is lifted by a rope a distance of 10 meters straight up at constant speed. How much power is required to complete this task in 5 seconds?

2. Hulky and Bulky are two workers being considered for a job at the UPS loading dock. Hulky boasts that he can lift a 100 kg box 2.0 meters vertically, in 3.0 seconds. Bulky counters with his claim of lifting a 200 kg box 5.0 meters vertically, in 20 seconds.
   Which worker has a greater power rating?

3. A 1994 Ford Mustang is driving down a road with a constant speed of 30 m/s. The engine must exert a 5000 N force to maintain this speed.

   a. What is the power rating of the engine?

   b. How does the Mustang's power rating compare to the 220 hp Dodge Stealth engine (1 hp = 746 W)?

4. An 82 kg hiker climbs Mt. Humphrey near Flagstaff. During a two hour period, the hiker's vertical elevation increases by 540 meters.

   a. Calculate the climber's ΔE_g.

   b. Find the power generated to increase the hiker's E_g.

5. How long would it take a 7.5 KW motor to raise a 500 kg piano to an apartment window 10 meters above the ground?

6. The trains on the Viper are raised from 10 m above ground at the loading platform to a height of 60 m at the top of the first hill in 45 s. Assume that the train (including passengers) has a mass of 2500 kg. Ignoring frictional losses, what power motor would be required to accomplish this task?

7. Your electric utility company sends you a monthly bill informing you of the number of kilowatt-hours you have used that month.
   a. Is the utility charging you for energy or power? Explain.

   b. How many joules does your 1600W blow drier transfer if you dry your hair in 5.0 min?