**G Energy Mock Test**

**1. A winch with an output of 347 W lifts a 790. kg load.**

A. What is the **force** needed to lift the load? (7740 N)

B. What **time** will it take to lift the load 3.40 m? (75.9 s)

C. If the winch is 82% efficient, what must be the **power input** in Watts? (e = output/input) (423 Watts)

**2. A rollercoaster starts 512 kg cars at an elevation of 11.0 m and a speed of 7.50 m/s.**

A. What is the **total energy** of the car? (69,600 J)

B. What is the car’s **speed** when it is at an elevation of 7.80 m? (10.9 m/s)

C. The cars are stopped at an elevation of 4.50 m with a force of 5600 N in what **distanc**e? (8.40 m)

**3. Random Energy Questions:**

A. What **time** will it take a 34.0 W heater to evolve 1250 J of Heat? How much **heat** would it put out in 1.8 minutes? (36.8 s, 3670 J)

B. A 1260 kg car going 6.7 m/s on the top of an 8.0 m tall hill is brought to rest at the bottom by a force of 34,500 N in what **distance**? (3.68 m)

C. A 62.0 kg cart is going 6.17 m/s at the bottom of a hill. A force of 272 N acts for a distance of 5.80 m to speed it up. What is the **height** of the hill if the cars are going 3.78 m/s after this at the top of the hill? (3.81 m)

**4. Red Elk drives a tractor that has a 47 HP engine. (1 HP= 745.7 W) It is dragging an 8700 kg sled along the ground where the coefficient of friction is .72.**

A. What **force** must the tractor exert to slide the sled at a constant speed? (61,400 N)

B. How **far** can it drag in the sled in 3.00 minutes? (103 m)

C. A baseball pop fly (mass .145 kg) goes straight up, and is observed at a height of 9.0 m above the bat to be going 16 m/s up by a radar gun. (By someone in a helicopter) What was the **velocity** of the ball when it left the bat? (h=0) (20.8 m/s)