

DAY 4

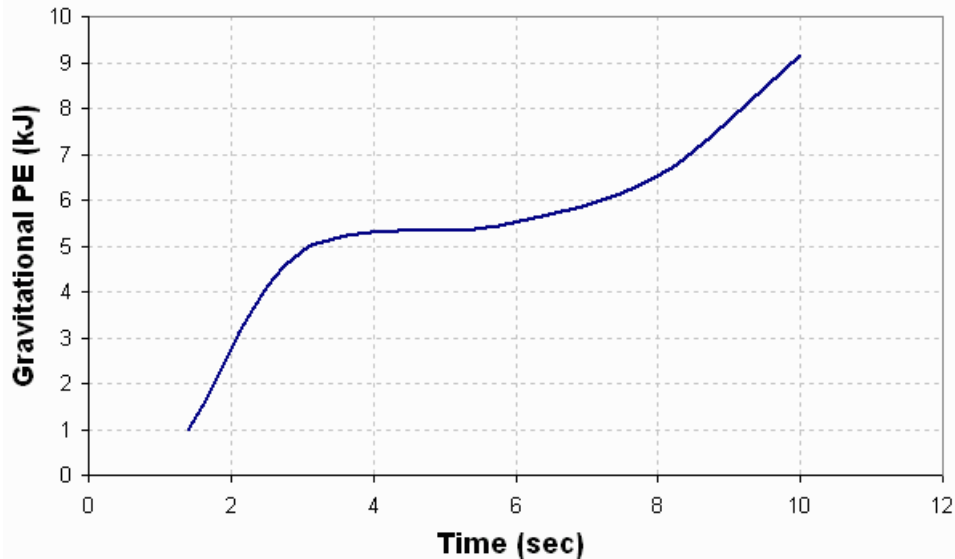
Homework Assignment

1. Calculate the power required to accelerate a 100 kg mass to 50 m/s in 40 s. Calculate the power required to accelerate it from 50 m/s to 100 m/s in 40 s.
2. What is the kinetic energy of a 10 gram bullet that is moving at 500 m/s?
3. A river measures 150 feet wide and is 20 feet deep on average. The current in the river is 2 mph. The river goes over a dam that is 20 feet high. How much hydroelectric power could be produced by the water going over the dam?
4. It takes 35 lbs of force to draw a bow back 28 inches. How much energy is stored in the bow? If the bow is released, what will the speed of the arrow be if the arrow has mass of 200 grams? Assume the bow behaves like a typical elastic object.
5. A large rock is dropped down a well that is 20 m deep. Use energy to determine how fast the rock will be moving when it hits the bottom. How long will it take to get there?

6. PHY 231 ONLY

The graph below is produced in a test of a team's ability to operate a human-powered crane intended for use on farms in developing nations.

Human Power Output Test



By measuring directly off this graph, determine the team's power output (in Watts) at $t=2$ and $t=8$ seconds. When was the team's power output zero?