**Physics 11 Energy and Power Assignment Name 1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Assignment (due on Test Day):**

**Mark:\_\_\_\_\_/15**

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|  | Define the following term  Heat:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Temperature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Thermal Energy:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | In a movie, the hero lifts the 91kg villain straight upward through a distance of 1.2 m in 0.51 s at a constant speed. What power does the hero produce while doing this?  Power \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | a) A student pushes against a wall with a force of 50 N for 30s. How much work is done?  Work \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  b) A nurse pushed someone in a wheelchair 100m doing 100J of work in the process, what average force did the nurse exert in the direction of motion?  Force \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | A 0.0755 kg arrow is fired horizontally. The bowstring exerts an average force of 65 N on the arrow over a distance of 0.9m. With what speed does the arrow leave the bow?  Speed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | What is elastic potential energy stored in a spring whose force constant is 160 N/m when it is compressed by 8.0 cm?  Energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | The height of the upper fall at Yellowstone Falls is 33.2m. When the water reaches the bottom of the falls, its speed is 25.8 m/s. Neglecting air resistance, what is the speed of the water at the top of the fall?  Speed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | A 3.0kg ball is dropped from a height of 0.8 m onto a vertical spring (k= 1200N/m). What is the maximum compression of the spring?  Compression \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | A ball of mass 0.750 kg is shot straight up with an initial speed of 18.0 m/s  a) how high would it go if there were no air friction?  b) if the ball rises to a max height of only 11.8m, determine Energy loss due to air resistance  c) Find the average force due to air resistance  Height \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Force \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | A hot water tank contains 75L of hot water at 45°C, 25L of water at 15°C are added. What is the final temperature of the water? (fun fact: for water 1L = 1kg)  Temperature) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Calculate the energy required to raise the temperature of 2 kg of liquid water from 20°C to steam at 150°C  Energy) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |