Name: ABSENT STUDENT DATA

Formulas needed:

Work = F * d

Power = W ÷ t

Horsepower = Power ÷ 746

Pounds to Newtons: Your mass in pounds X 4.45

Data Sheet

	Your Data	
Height of one step	0.17	Meters (m)
Number of stairs	20	Stairs
Total height climbed		Meters (m)
Your mass (in pounds)	130	Pounds (lbs)
Your weight (in Newtons)		Newtons (N)
Work WALKING up stairs		Joules (J)
Work RUNNING up stairs		Joules (J)
Time WALKING up stairs	6.8	Seconds (s)
Power generated walking up stairs		Watts (W)
Horsepower generated walking up stairs		Horsepower (Hp)
Time RUNNING up stairs	3.4	Seconds (s)
Power generated running up stairs		Watts (W)
Horsepower generated running up stairs		Horsepower (Hp)

Calculations: SHOW ALL WORK!

End of Lab Questions. Answer the following IN COMPLETE SENTENCES.

1. When James Watt was trying to sell his steam engine, he was repeatedly asked how the power of his engine compared to the power of a horse. To answer this question, Watt measured how fast horses worked. He determined how much work an average horse could do in one second and defined this as one horsepower. In this lab, you determined your work output as horsepower. Horses can maintain their work output for over half an hour. Do you think that you could maintain this power output for half an hour or more? ***Explain***.

2. How are force, work and power related? Describe how the formulas we have been using in class relate to one another.

3. Did you do more work when you were walking or running up the stairs? ***Explain.***

4. Did you use more power, and more horsepower, when you were walking or running up the stairs? ***Explain***.

5. How did your power output compare to that of a 100 W light bulb? (*You should have an answer for walking, and for running)*

6. How did your maximum running power output compare to that of an average horse (746 Joules/second)?