Unit I – Worksheet # 1

Name _____

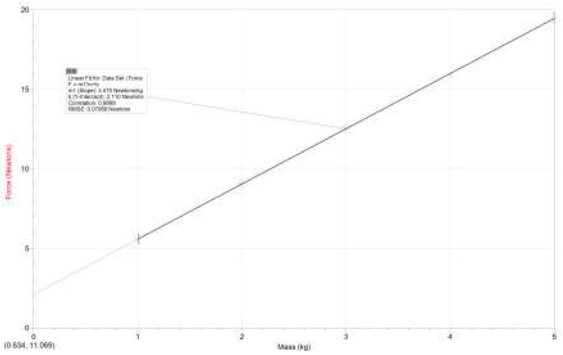
Enter each of the sets of data below into Logger Pro. The independent variable is the one listed in the column on the left. In the space beneath each data table, sketch the original graph. Your sketch should include proper labels, units and maximum values on both axes. Determine if any modification is needed to straighten the line. Include sketches of any modified graphs as well. If a straight line graph can be generated, then determine the mathematical model that fits the linear relationship and write it down in its final form. If no simple mathematical expression exists, explain why. Include an analysis of the Correlation Coefficient or the Mean Square Error.

First Attempt

Corrections/Solutions

1.

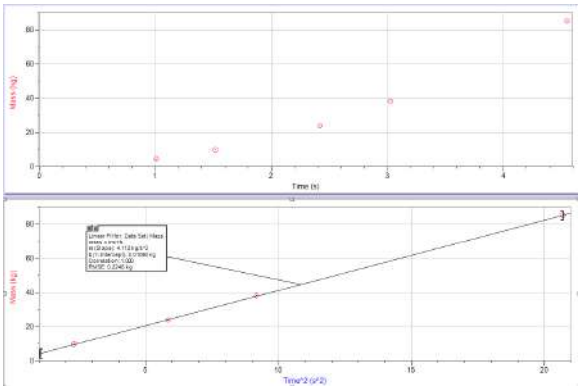
Mass (kg)	*Force (Newtons)*
1.0	5.6
2.0	9.0
3.0	12.6
4.0	15.9
5.0	19.5



Force = (3.47N/kg)*Mass + 2.11 N

2.

Time (seconds)	*Mass (kg)*
1.01	4.2
1.52	9.6
2.42	23.8
3.03	38.0
4.55	85.1



Mass = $(4.112 kg/s^2)*Time^2 + 0.0106 kg$

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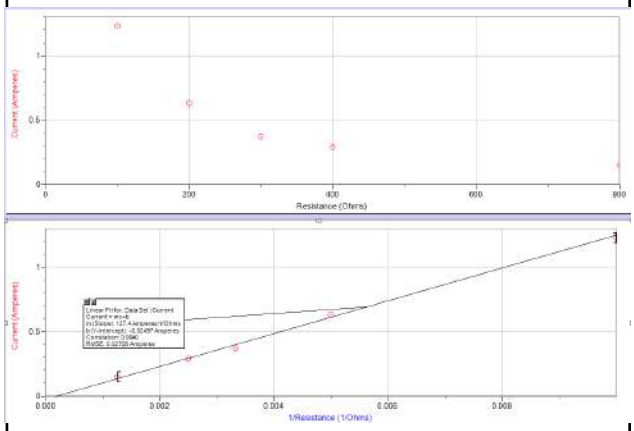
First Attempt | Corrections/Solutions

3.

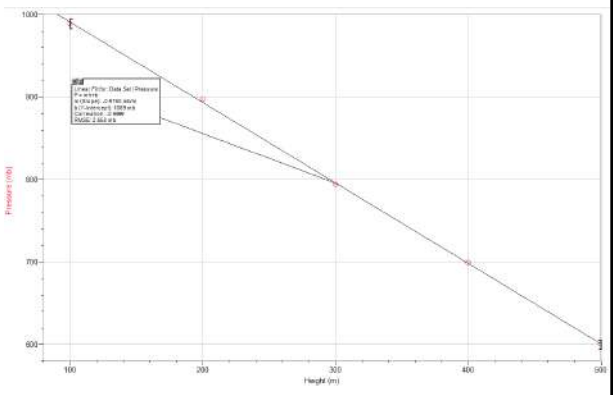
Resistance (Ohms)	*Current (Amperes)*
100	1.23
200	0.63
300	0.37
400	0.29
800	0.15



Current = (127.4 A*Ohms)(1/R) + (-0.025A)

4.

Height (meters)	*Pressure (mb)*
100	989
200	897
300	794
400	699
500	600



Pressure=(-0.976mb/m)Height+(1089mb)

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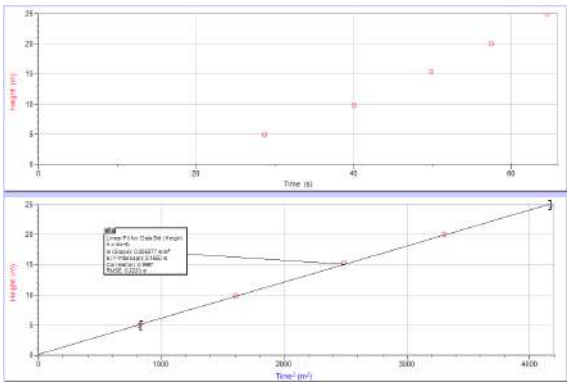
5.

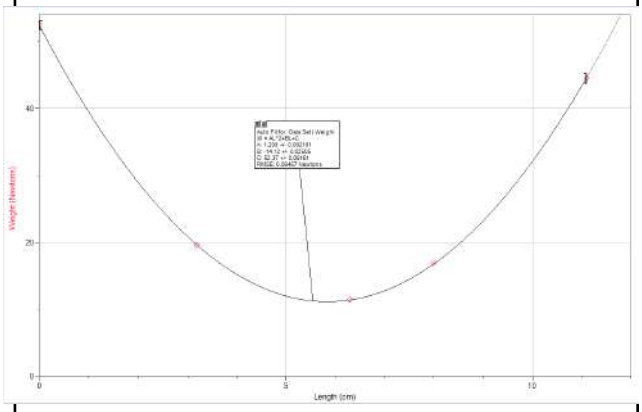
Time (seconds)	*Height (cm)*
28.7	4.9
40.1	9.8
49.9	15.3
57.5	20.0
64.4	24.9



$Height=(.005977 m/s^2)Time^2+(0.155m)$

6.

Length (cm)	*Weight (Newtons)*
0.0	52.4
3.2	19.5
6.3	11.4
8.0	16.8
11.1	44.5



$W=(1.208 N/cm^2)L^2+(-14.12 N/cm)L+(52.37 N)$

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7.

Separation (meters)	*Force (Newtons)*
25.0	0.022
20.0	0.034
15.0	0.060
10.0	0.126
5.0	0.510

$F = (12.69 Nm^2)(1/r^2)+(0.001756N)$