Physics 20 Lesson 21H

"Curve Straightening" Assignment

A student performed an experiment that verified **Newton's Universal Law of Gravitation** by measuring the attraction between two spherical masses, A and B, as a function of their separation. The measurements are shown in the table of values below:

Gravitational Force as a Function of Separation

Separation (m)	Force ($x10^{-8}$ N)
0.10	14.0
0.15	6.23
0.20	3.50
0.40	0.875
0.60	0.389

⇒ Graph these measurements on Graph 1.

⇒ Show that these results verify **Newton's Universal Law of Gravitation** by manipulating the data and providing a new table of values that, when plotted, will produce a straight line graph.

⇒ Plot the new data on Graph 2.

⇒ Calculate the slope of Graph 2.

⇒ Using the slope value, determine the mass of sphere B, if the mass of sphere A is 3.50 kg.

⇒ Determine the magnitude of the force between spheres A and B when they are a distance of 2.00 m apart. Use the hypothetical value of 5.00 kg for the mass of sphere B if you were unable to determine the actual value.