PHYSICS 230 LAB #1- FORCE TABLE

In this lab, you will be showing static equilibrium of four setups using four different ways. Therefore, do not repeat the same setup/data and same mathematical method.

The manual suggests to measure masses of hangers individually, but is there any easier way? How can you ensure that the system is in equilibrium (what can you do to minimize frictions?)?

SETUP #1

Set the hangers at 0^0, 120^0, and 240^0. Using regular force vector analysis, calculate the third mass at 240^0 using both x and y components.

SETUP #2

Set first two hangers at 0^0, 120^0, and other two at appropriate locations so that the system is in equilibrium. Using all the data you obtain in this section, show that $\sum \overrightarrow{F_{xi}} = 0$ and $\sum \overrightarrow{F_{yi}} = 0$.

SETUP #3

Do not set any hanger at a nice angle such as 0^0, 90^0, 180^0 and so forth. Try to solve the third mass using the first two masses and the angle between. (Actually, try to show it is impossible to solve with the data obtained.) Here comes the importance of "rotating axis". The point you want to make or learn is that even though the problem seems to be impossible to solve using one coordinate system, but just by using another coordinate system, the problem is very easy to solve. (Lesson; Do not stick with one coordinate system.)

SETUP #4

Do not repeat the setup #1. Here, you want to solve for two unknown masses using two equations.