EXPERIMENT #2 - PHYSICS 230

Vectors (Suspension Systems)

OBJECT: To study the vector treatment of static forces by constructing various suspension systems.

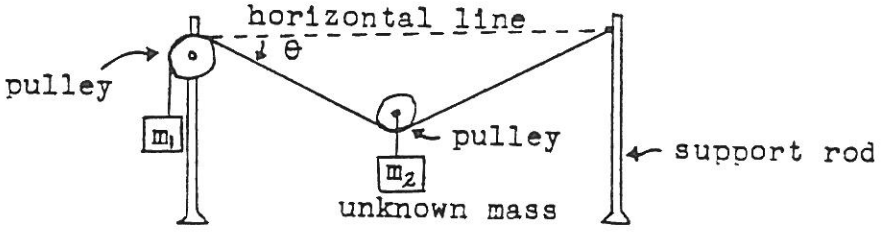
EQUIPMENT: pulleys, string, support rods, standard masses, spring scales, clamps

THEORY: Refer to experiment #1

GENERAL DIRECTIONS:

A. One suspended mass:

1. Using a string, 2 pulleys, and support rods set up the following device:

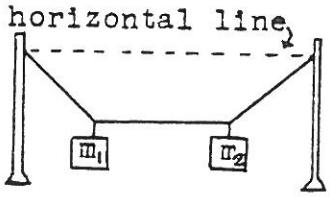


Adjust the known mass m_1 until a convenient equilibrium value of θ is found. Using the known values of the angles and m_1 find the value of m_2.

2. Weigh the unknown mass on a scale and find the percent error. Explain why there may be an experimental error.

B. Two suspended masses:

1. Using string and support rods set up the following device:



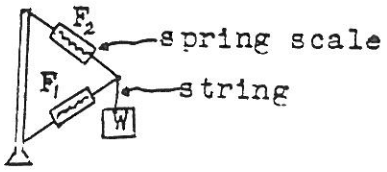
The string joining m_1 and m_2 is horizontal.

Let m_1 be a known mass and m_2 an unknown mass. By properly considering the string angles and the value of m_1 find the value of m_2.

2. Weigh m_2 on a scale and find the percent error. Explain why there may be an experimental error.

C. Suspended weight from a rigid support:

1. Using spring scales, string, supports, and a weight construct the following system:



2. Record the supporting forces F_1 and F_2, the weight W, and any needed angles.

3. Verify the value of the forces F_1 and F_2 by the proper calculations by using the value of W and the proper angles. Find the per cent error for F_1 and F_2 and explain why these errors may exist.