

Name_____

Class_____Date_____

Weighing Indirectly

Aim

To determine the weight of two unknown objects, from their resultant vector.

Equipment

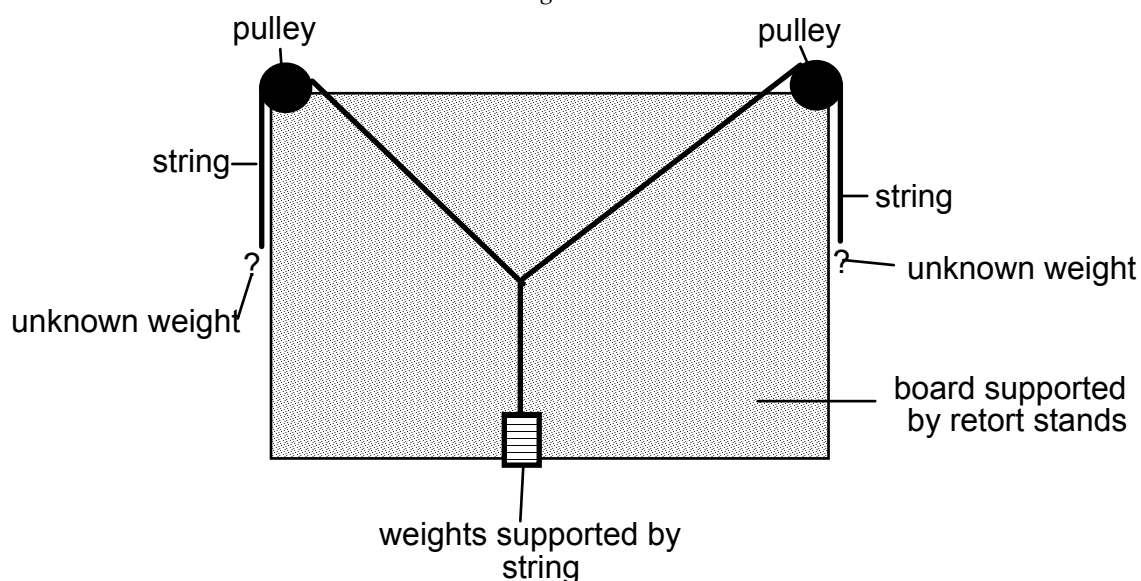
A vertical board with two pulleys attached

Various masses and mass carriers up to 2kg, but including 5g masses to allow a continuous range of masses to be suspended.

Method

1. Join three strings. To two strings attach the unknown weights. Attach the mass carriers to the other string. Suspend the two strings with the weights over the pulleys, so that they are free to move, and add masses to the third (hanging) string, so that the weights do not move. Try to ensure that the pulleys are not being hampered by friction. Figure 1 illustrates the final arrangement.

Figure 1



2. Record the weight of the masses that balance the unknown weights.
3. Place a piece of paper on the board, under the strings, and record the positions of the three strings. Remove the sheet and measure the angles.
4. Develop a vector diagram of the situation, and from the weight of the known masses, and the angles of the three forces relative to each other, calculate the other two weight forces.
5. If you wish, use the electronic scales to weigh the unknowns.

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Interpretation

No formal interpretation is necessary. Record your results and calculations, and give a judgement on the accuracy of the results. The errors will need to be calculated carefully.

S. Simon