PhyzLab Springboard: Millikan Mystery

THE CHALLENGE
Given a scale and several uniform spheres, determine the mass of a single sphere. Seems simple enough. Unfortunately, you cannot take one sphere and weigh (or mass) it on a scale. Instead you will be given several mass readings which involve the mass of a collection of spheres and the container they're in. You will not be told the mass of the container or the number of spheres in each case. Nevertheless, you will have enough information to determine the mass of each sphere as well as the mass of the container.

PRACTICE (There is data for each group provided on the back)
Rewrite you data (all masses given in grams)

1. 2. 3.

4. 5. 6.

ANALYSIS
How can you use the data to determine the solutions (mass of each sphere and mass of container)?

PRACTICE SOLUTION
1. Mass of one sphere: 2. Mass of container:

REAL DATA

REAL SOLUTION
1. Mass of one sphere: 2. Mass of container:

GROUP A
39.9
25.8
63.4
54.0
16.4
77.5

GROUP E
19.6
15.7
30.0
13.1
22.2
9.2

GROUP B
37.0
26.2
55.0
65.8
19.0
44.2

GROUP F
47.3
100.1
20.9
126.5
82.5
161.7

GROUP C
51.1
35.2
93.5
24.6
61.7
8.7

GROUP G
26.9
18.2
41.4
35.6
12.4
50.1

GROUP D
74.9
47.3
120.9
148.5
28.9
93.3

GROUP H
36.7
73.9
16.1
92.5
61.5
117.3