Kevin Sheridan, Jr.

Problem of the Fortnight #12

How to get 1b of sand using:

1. With a 5lbs and a 6lbs weight:
   1. Balance the two pans with one pan having the 6lbs weight and the other having the 5lbs weight and sand in a container. Call the pan with the 6lbs, Pan A, and the other pan, Pan B.
   2. Remove the 5lbs weight and replace it with another container of sand to balance the scale.
   3. Remove the 5lbs of sand and return the 5lbs weight to the same pan.
   4. Remove the 6lbs weight and replace it with the 5lbs of sand plus another container of enough sand to balance the scale.
      1. That additional container contains 1lb of sand because 6lbs on Pan A balances 5lbs plus the extra on pan B. Since 5lbs of the 6lbs was sand in one container on Pan A, the additional container contains the necessary 1lb to balance the scale.
2. With a 5lbs and a 7lbs weight:
   1. Balance the two pans with one pan having the 7lbs weight and the other having the 5lbs weight and sand in a container. Call the pan with the 6lbs, Pan A, and the other pan, Pan B.
   2. Remove the 5lbs weight and replace it with another container of sand to balance the scale.
   3. Remove the 5lbs of sand and return the 5lbs weight to the same pan.
   4. Remove the 7lbs weight and replace it with the 5lbs of sand plus another container of enough sand to balance the scale. Now you have a container with 2lbs of sand.
   5. Repeat step 1-4 twice more to get a second and third 2lbs container.
   6. Repeat step 1
   7. Remove the 7lbs weight and replace it with the three containers of 2lbs of sand plus another container of enough sand to balance the scale.
      1. That additional container contains 1lb of sand because 7lbs on Pan A balances 5lbs plus the extra on pan B. Since three containers of 2lbs made a total of 6lbs of the 7lbs on Pan A, the additional container contains the necessary 1lb to balance the scale.