Problem of the Week
Problem C and Solution
Remix

Problem
A bin contains 10 kg of peanuts. 2 kg of peanuts are removed and 2 kg of raisins are added and thoroughly mixed in. Then 2 kg of this mixture are removed and 2 kg of raisins are added and thoroughly mixed in again. What is the ratio of the mass of peanuts to the mass of raisins in the final mixture?

Solution
When 2 kg of the 10 kg of peanuts are removed, there are 8 kg of peanuts remaining.
Since 2 kg of raisins are added, then there are 2 kg of raisins in the bin.
The peanuts and raisins are then thoroughly mixed and the total mass of the mixture is $8 + 2 = 10$ kg.
Since 2 kg of this mixture is removed and this is one-fifth of the total mass of 10 kg, then one-fifth of the mass of peanuts (or $\frac{1}{5} \times 8 = 1.6$ kg) is removed and one-fifth of the mass of raisins (or $\frac{1}{5} \times 2 = 0.4$ kg) is removed.
This leaves $8 - 1.6 = 6.4$ kg of peanuts and $2 - 0.4 = 1.6$ kg of raisins.
When 2 kg of raisins are then added, the mass of raisins becomes $1.6 + 2 = 3.6$ kg.
There are now 6.4 kg of peanuts and 3.6 kg of raisins.
Therefore, the ratio of the mass of peanuts to the mass of raisins is $6.4 : 3.6 = 64 : 36 = 16 : 9$. 