

Round Table

Submission deadline: June 28th 2024

Ten students are sitting around a circular table. The teacher wants to distribute 10 Dirhams among the ten students such that each student receives the average of the amounts the 2 neighbours receive. Find out all possible ways the 10 Dirhams can be distributed.

The problem was solved by

- Ekansh Nitalie Garg, *Dubai College, UAE.*
- Arda Karahan, *Trabzon Science High School, Turkey.*
- Ionut-Zaharia Chirila, *alumnus, Lower Danube University, Galati, Romania.*
- K.Sengupta, *Calcutta, India.*

Discussion:

Clearly, one way to distribute the money is to give each student 1 Dirham.

Assume that there is another way to distribute the money. Since the total amount is 10, at least one student must receive more than 1 Dirham. Now take a student who receives the largest amount p . Name this student S_0 .

Since p is the average of the amounts received by students on either side of S_0 and these amounts cannot exceed p , it follows that students on each side must receive p as well.

By using the same argument repeatedly, it is easy to see that each of the ten must receive p . This results in a total more than 10.

Thus, giving 1 Dirham to each is the only way to distribute the money.