

Pocket Money

Submission deadline: November 29th 2022

Ahmed has 10 pockets and 54 coins each worth a Dirham. He would like to distribute the coins so that each pocket has a different number of coins and no pocket is empty.

1. Can he do so?
2. Generalize above to p pockets and n coins.

The problem was solved by

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Discussion.

It is clear that the required number of coins cannot be smaller than

$$1 + 2 + 3 + \cdots + 10.$$

Thus, at least 55 coins are required.

Similarly, if there are p pockets, it can be seen that

$$n \geq 1 + 2 + 3 + \cdots + p$$

Hence n cannot be less than $p(p+1)/2$.