## RESEARCH PROBLEM

## 39. Mok-Kong Shen and Tsen-Pao Shen: Number theory.

The first $2 n$ natural numbers will be grouped into $n$ pairs ( $a_{1}, b_{1}$ ), $\left(a_{2}, b_{2}\right), \cdots\left(a_{n}, b_{n}\right)$ with $b_{i}>a_{i}$ and the sum and difference of the elements of each pair formed: $c_{i}=a_{i}+b_{i}, d_{i}=b_{i}-a_{i}$. Can we prove that for $n \geqq 3$ it is always possible to form the above mentioned pairs such that the $2 n$ numbers $c_{i}$ and $d_{i}$ are all different? Examples:

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n=3:(1, 5), (2, 3), (4, 6).
n=6:(1, 10), (2, 6), (3, 9), (4, 11), (5, 8), (7, 12).
n=8:(1, 10), (2, 14), (3, 16), (4, 11), (5, 9), (6, 12), (7, 15), (8, 13).
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