Abstract

In this article, we will discuss a class of classical questions had been solved by Recurrence Relation, Difference Equation, and Euler's Formula, etc.. And then, we construct a system of equations -Standard Partition System of n-Dimensional Space- to generalize the properties of maximizing the number of regions made up by k partitioner in an n-dimensional space and look into the construction of each dimension. Also, we provide a more directly Combinatorial Argument by Algorithm for this kind of question. At last, we focus on the number of bounded regions and unbounded regions in sense of maximizing the number of regions.

Keywords: Recurrence Relation, Difference Equation, Euler's Formula, Standard Partition System of n-Dimensional Space, Partitioner, n-dimensional space, Combinatorial Argument, Algorithm, Bounded Region, Unbounded Region.

中文摘要

在這篇論文裡，我們將要討論一類古典的問題，這類問題已經經由許多方法解決，例如：遞迴關係式、差分方程式、尤拉公式等等。接著我們歸納低維度的特性，並藉由定義出一組方程式-標準 n 維空間分割系統-來推廣這些特性到一般的 n 維度空間中。然後我們利用演算法來提供一個更直接的組合論證法。最後，我們會把問題再細分成有界區域與無界區域的個數。

關鍵字：遞迴關係式，差分方程式，尤拉公式，標準 n 維空間分割系統，n 維度空間，演算法，組合論證法，有界區域，無界區域。