

# Contents

<b>Abstract</b>	<b>i</b>
中文摘要	ii
<b>1 Introduction</b>	<b>1</b>
1.1 Introduction . . . . .	1
1.2 Description of Three Original Questions . . . . .	2
<b>2 Solved By Recurrence Relation</b>	<b>3</b>
2.1 Solution by Recurrence Relation for Question 1 . . . . .	3
2.2 Solution by Recurrence Relation for Question 2 . . . . .	4
2.3 Solution by Recurrence Relation for Question 3 . . . . .	6
<b>3 General Question of Higher Dimensional Spaces</b>	<b>8</b>
3.1 Generalizing These Three Classical Questions . . . . .	8
3.2 The Properties of Point, Line, and 3-D Space . . . . .	9
3.3 The Properties of General Question and Standard Partition System of $n$ -Dimensional Space . . . . .	10
3.4 Proof of the Properties . . . . .	11
3.5 Solution by Recurrence Relation for General Question . . . . .	15
<b>4 Solved By Combinatorial Argument</b>	<b>17</b>
4.1 Non-isomorphic of $k$ -Max-Line-Drawing and $k$ -Max-Plane-Drawing . . . . .	17

4.2	Combinatorial Argument with Algorithm . . . . .	19
4.3	Combinatorial Argument for Higher Dimensional Space with Algorithm	21
4.4	Presentation of Partitions in the Lower Dimensional Space . . . . .	22
4.5	A List of All Numbers . . . . .	25
<b>5</b>	<b>Number of Bounded Regions</b>	<b>26</b>
5.1	Number of Bounded Regions in Sense of $k$ -max-point-drawing . . . . .	26
5.2	Number of Bounded Regions in Sense of $k$ -max-line-drawing . . . . .	27
5.3	Number of Bounded Regions in Sense of $k$ -max-plane-drawing . . . . .	28
5.4	Number of Bounded Regions of Higher Dimensional Space . . . . .	28
<b>6</b>	<b>Number of Unbounded Regions</b>	<b>30</b>
6.1	Number of Unbounded Regions in Sense of $k$ -max-point-drawing . . . . .	30
6.2	Number of Unbounded Regions in Sense of $k$ -max-line-drawing . . . . .	31
6.3	Number of Unbounded Regions in Sense of $k$ -max-plane-drawing . . . . .	31
6.4	Number of Unbounded Regions of Higher Dimensional Space . . . . .	32
	<b>References</b>	<b>34</b>