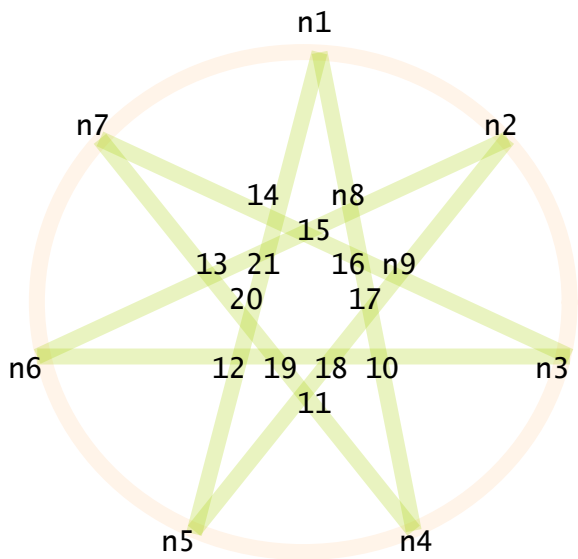


# Part 2: Basic Studies of Magic Stars III: Kanji Setsuda

## Chapter 7: Special Type of Triple-Ringed Magic Stars of Order 7



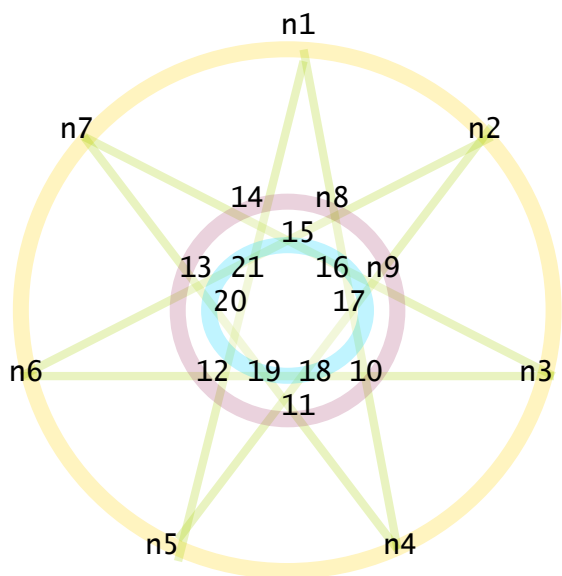
### \* Basic Conditions \*

$$\begin{aligned}
 n1+n8+n16+n17+n10+n4 &= C & \dots & sm1 \\
 n2+n9+n17+n18+n11+n5 &= C & \dots & sm2 \\
 n3+n10+n18+n19+n12+n6 &= C & \dots & sm3 \\
 n4+n11+n19+n20+n13+n7 &= C & \dots & sm4 \\
 n5+n12+n20+n21+n14+n1 &= C & \dots & sm5 \\
 n6+n13+n21+n15+n8+n2 &= C & \dots & sm6 \\
 n7+n14+n15+n16+n9+n3 &= C & \dots & sm7
 \end{aligned}$$

$$sm1+sm2+sm3+sm4+sm5+sm6+sm7$$

$$\begin{aligned}
 2*(n1+n2+n3+\dots+n20+n21) &= 7*C \\
 2*(1+2+3+4+\dots+19+20+21) &= 7*C \\
 2*(22*21/2) &= 7*C \\
 462 &= 7*C
 \end{aligned}$$

Therefore  $C=66$



What characteristic properties do they have?

- (1) Triple Rings and Net Structure
- (2) 7 equations must add up to 66. Each is made of 6 variables

Let's take the next conditions as follows adding to the Basic Conditions above.

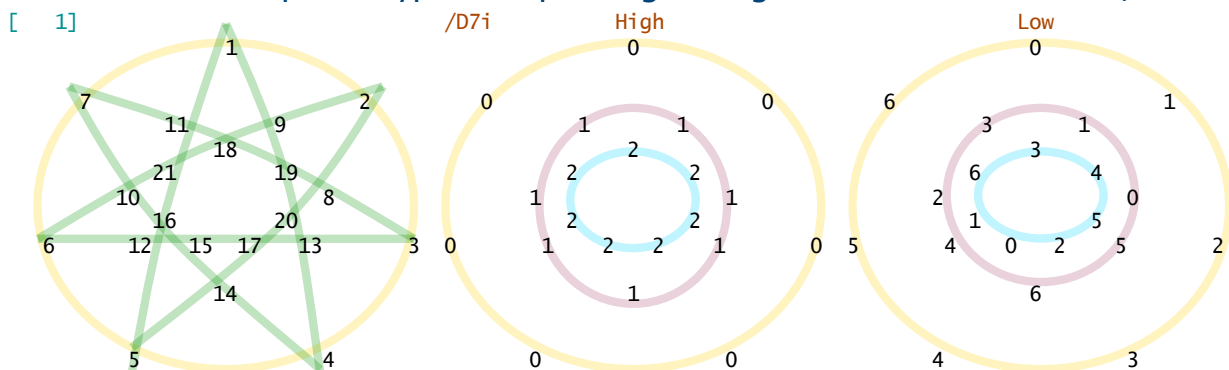
$$\begin{aligned}
 \{n1, n2, n3, n4, n5, n6, n7\} &= \{1, 2, 3, 4, 5, 6, 7\} & \dots & rg1 \\
 \{n8, n9, n10, n11, n12, n13, n14\} &= \{8, 9, 10, 11, 12, 13, 14\} & \dots & rg2 \\
 \{n15, n16, n17, n18, n19, n20, n21\} &= \{15, 16, 17, 18, 19, 20, 21\} & \dots & rg3
 \end{aligned}$$

Otherwise, we should have too many solutions only under the Basic Conditions.

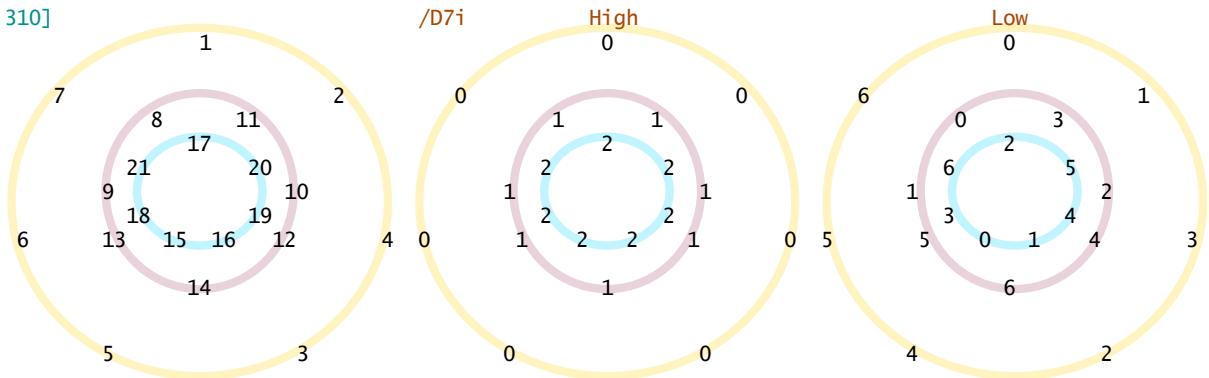
Let me skip my explanation and jump to my conclusion.

I put each solution with its decomposed diagrams by the 7-th increment number system.

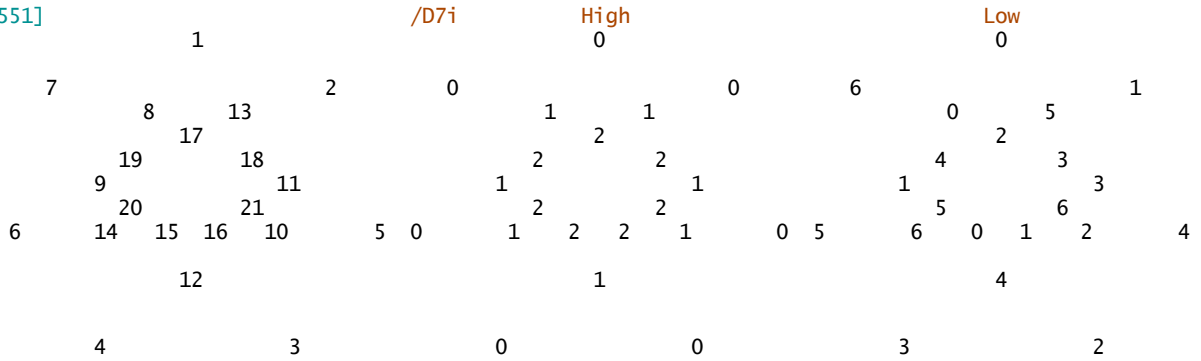
### \* Solution List: Special Type of Triple-Ringed Magic Stars of Order 7 with /D7i \*



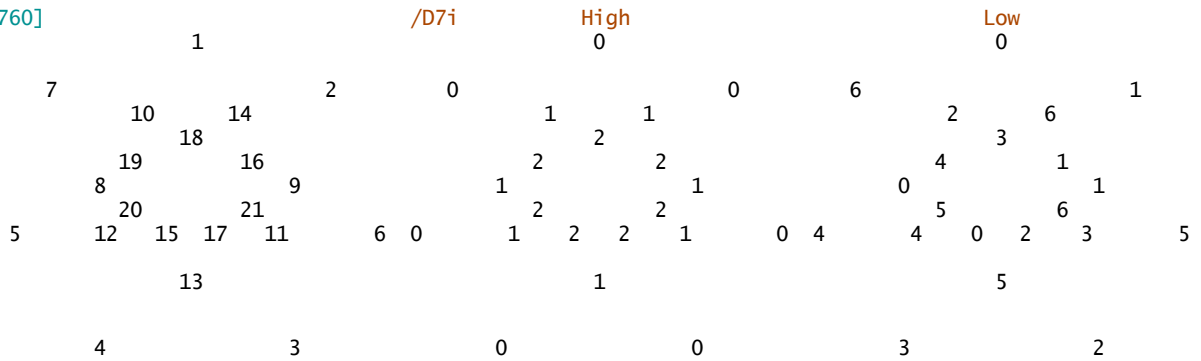
[ 310]



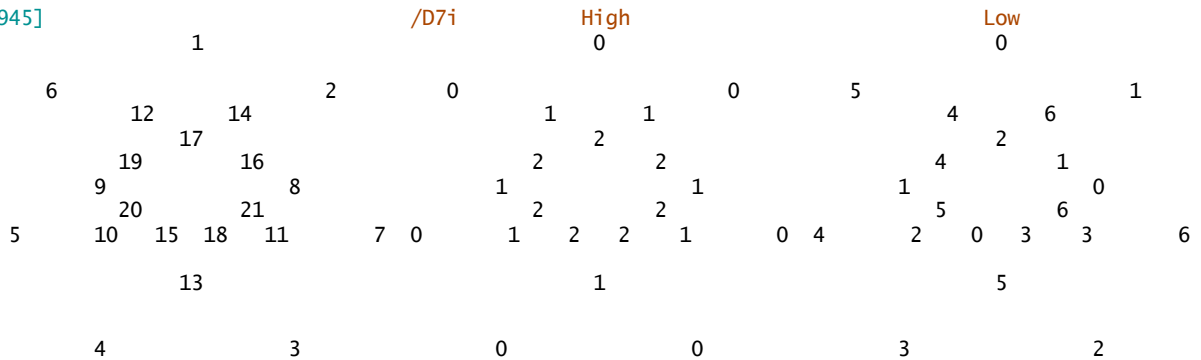
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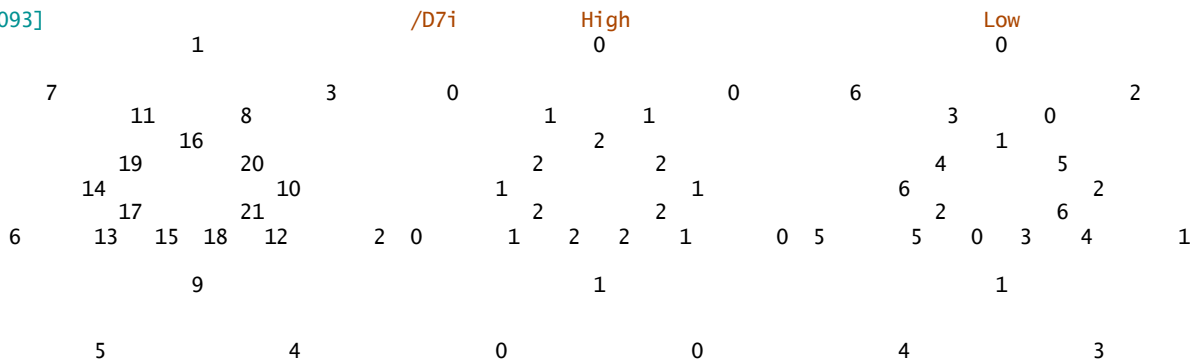
[ 760]



[ 945]

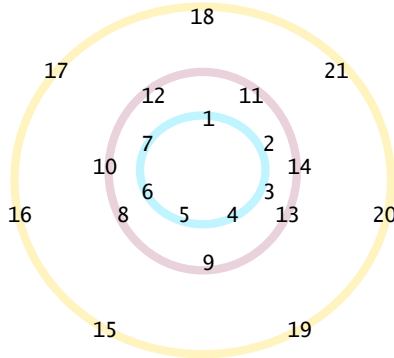


[1093]



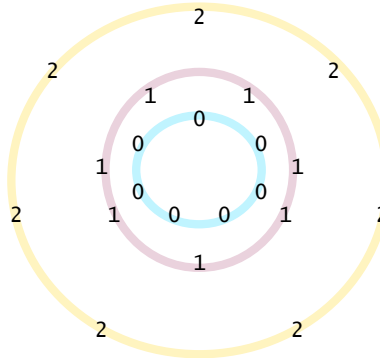


[ 1 ]

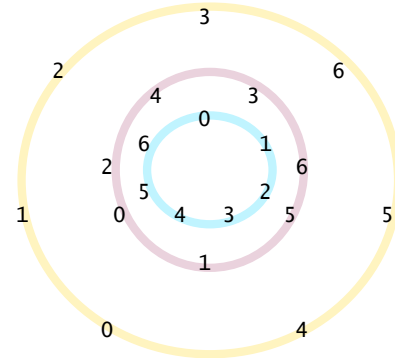


/D7i

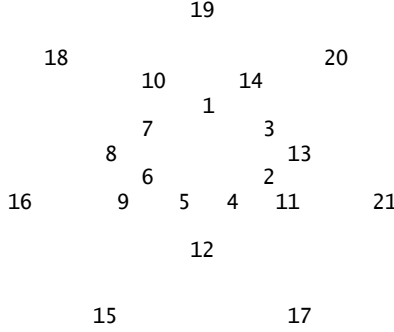
High



Low

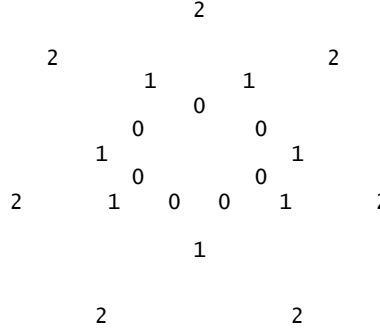


[ 331 ]

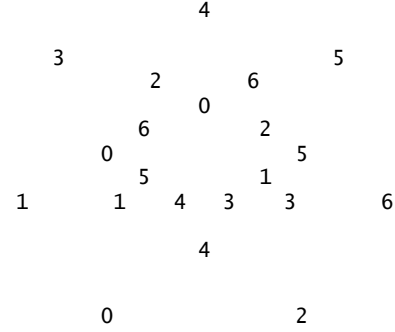


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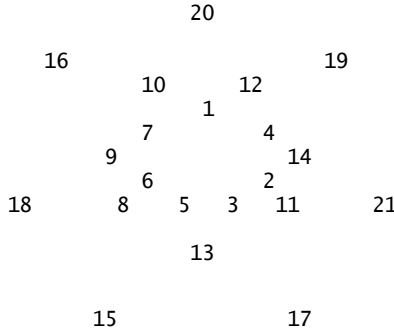
High



Low

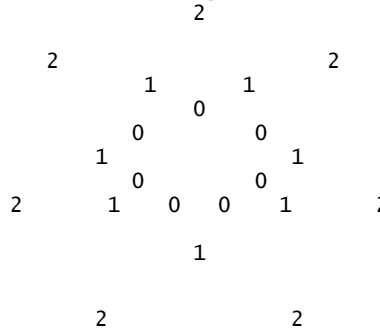


[ 869 ]

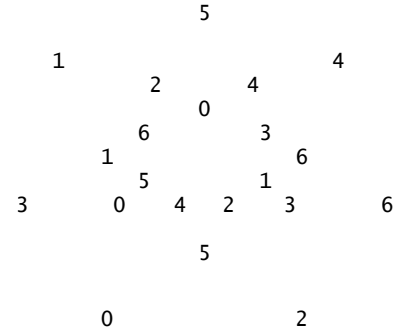


/D7i

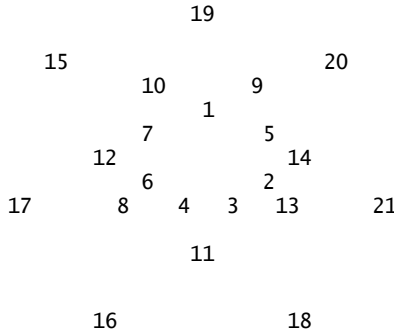
High



Low

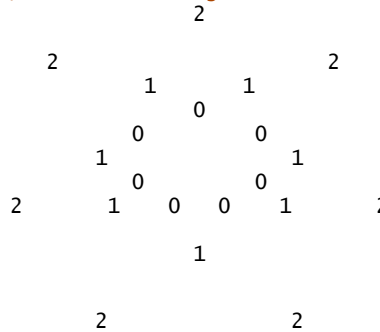


[1501]

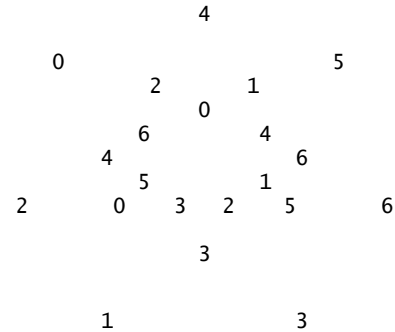


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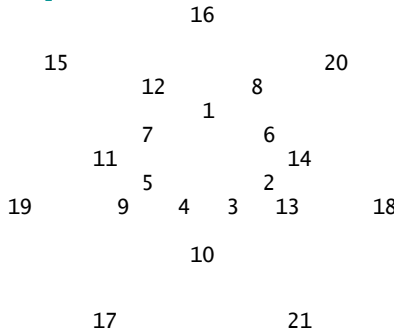
High



Low

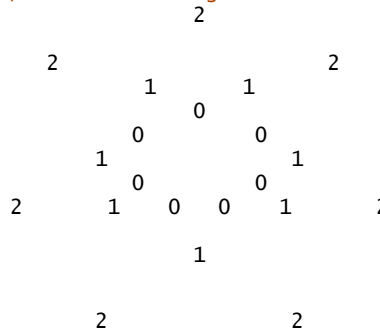


[2401]

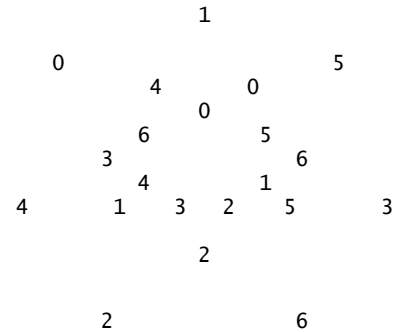


/D7i

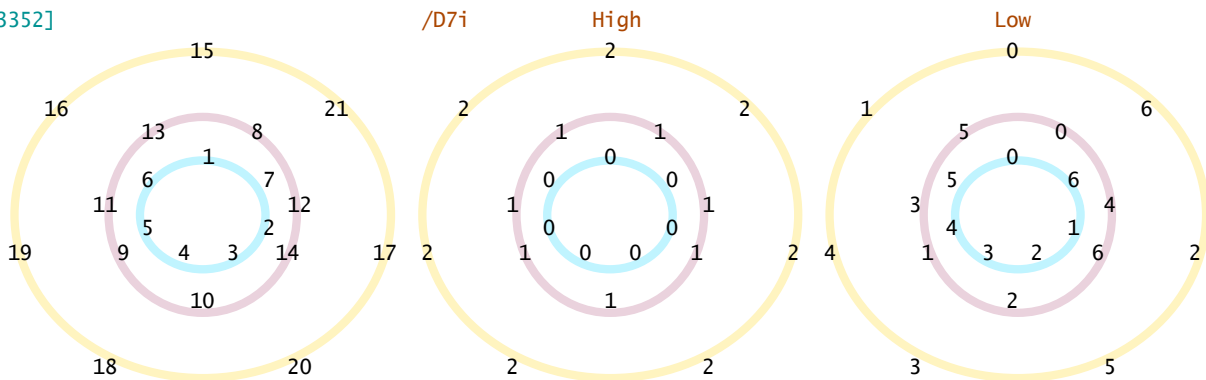
High



Low



[3352]



[Count=4419] OK!

Only in the higher layer of /D7i diagrams in the center, each ring consists of a single value of {0, 1 and 2}, and the same pattern appears in the list without any exception.

In the low layer of /D7i diagrams right, each value of {0,1,2,3,4,5 and 6} appears strictly once on each ring, and no one appears twice or more often, no one disappears, either.

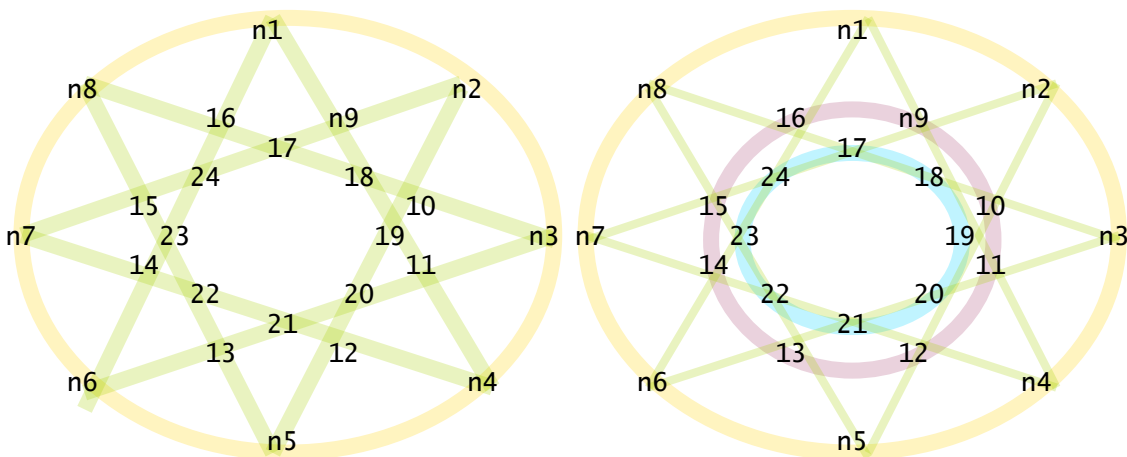
Yes. This is the same property with the so-called "Latin Type" of any magic things.

Are they really beautiful, aren't they?

## Chapter 8: Special Type of Triple-Ringed Magic Stars of Order 8

### \* Basic Conditions \*

$n1+n9+n18+n19+n11+n4=C$	... sm1		$sm1+sm2+sm3+sm4+sm5+sm6+sm7+sm8$
$n2+n10+n19+n20+n12+n5=C$	... sm2		$2*(n1+n2+n3+ \dots +n23+n24)=8*C$
$n3+n11+n20+n21+n13+n6=C$	... sm3		$2*(1+2+3+4+ \dots +22+23+24)=8*C$
$n4+n12+n21+n22+n14+n7=C$	... sm4		$2*(25*24/2)=8*C$
$n5+n13+n22+n23+n15+n8=C$	... sm5		$600=8*C$
$n6+n14+n23+n24+n16+n1=C$	... sm6		Therefore C=75
$n7+n15+n24+n17+n9+n2=C$	... sm7		
$n8+n16+n17+n18+n10+n3=C$	... sm8		



What properties do they have?

(1) Triple Rings and Net Structure

(2) 8 simultaneous equations must add up to the magic Constant 75.

Each is made of 6 variables.

Since we have only 8 equations for the 24 variables, we can make quite a lot of solutions for this type. They seem too many.

Let's take the next conditions as follows adding to the Basic Conditions.

$\{n1, n2, n3, n4, n5, n6, n7, n8\}=\{1, 2, 3, 4, 5, 6, 7, 8\}$  ...rg1

$\{n9, n10, n11, n12, n13, n14, n15, n16\}=\{9, 10, 11, 12, 13, 14, 15, 16\}$  ...rg2

$\{n17, n18, n19, n20, n21, n22, n23, n24\}=\{17, 18, 19, 20, 21, 22, 23, 24\}$  ...rg3

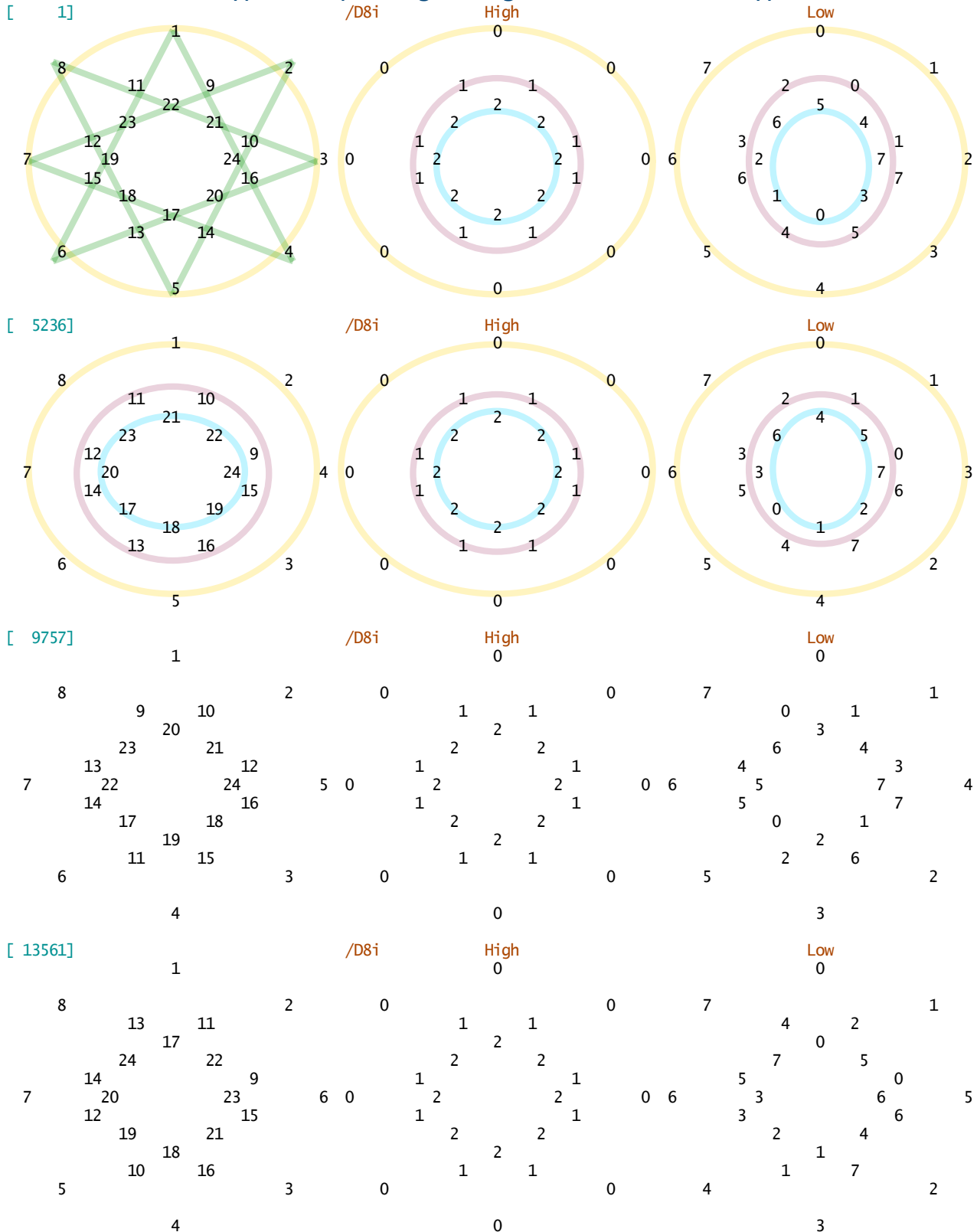
Why do they have to be restricted to such a strict value range on rings?

We really have another reason for that. Watch the next list of several solutions with the decomposed patterns by /D8i, especially on rings, please.

Only in the low layer of /D8i diagrams, each value of {0,1,2,3,4,5,6 and 7} appears strictly once on each ring, and no one appears twice or more often, no one disappears, either.

Yes. This is the same property as the "Latin Type" of any magic things.

**\*\* List of "Latin" Type of Triple-Ringed Magic Stars of Order 8: Type 1 \*\***



[ 16369]

				/D8i		High				Low		
						0				0		
	1											
8		9	13	2	0	1	1	0	7	0	4	1
		22	21			2	2			4	3	
6	11		20			1	2	1		5	1	6
	23		24	10	7 0	2	2	2	1	6	7	
	15	17	19	14		1	2	2	1	0	5	
		18	16			2	2	1		6	7	5
5	12			3	0	1	1	0	4	0	2	2
										3	1	
	4									3	7	

[ 18819]

				/D8i		High				Low		
						0				0		
	1											
7		11	12	2	0	1	1	0	6	2	3	1
		22	21			2	2			5	1	
6	15		10			1	2	1		6	4	7
	23		24	10	8 0	2	2	2	1	0	5	
	13	17	19	14		1	2	2	1	6	7	5
		20	16			2	2	1		4	0	2
5	9			3	0	1	1	0	4	0	3	7
										0	7	
	4									3	7	

[ 20980]

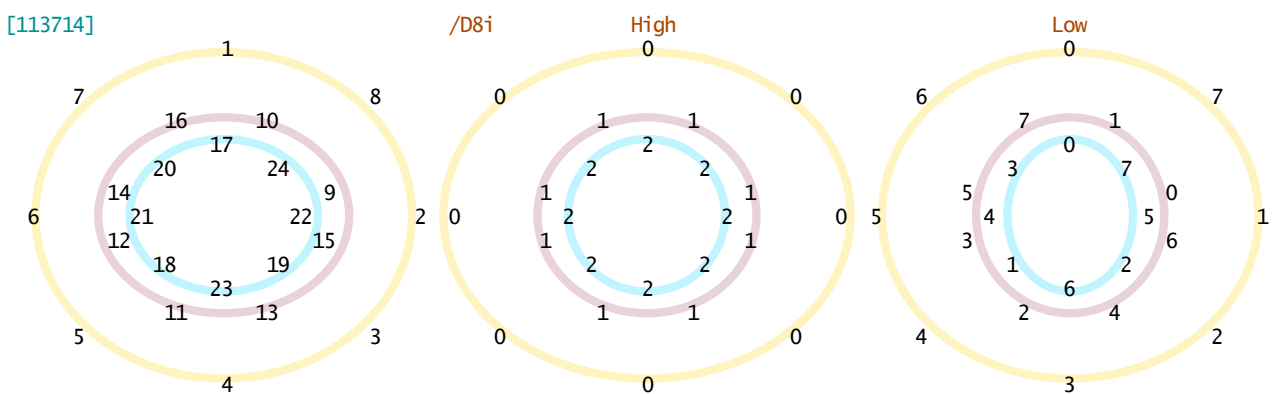
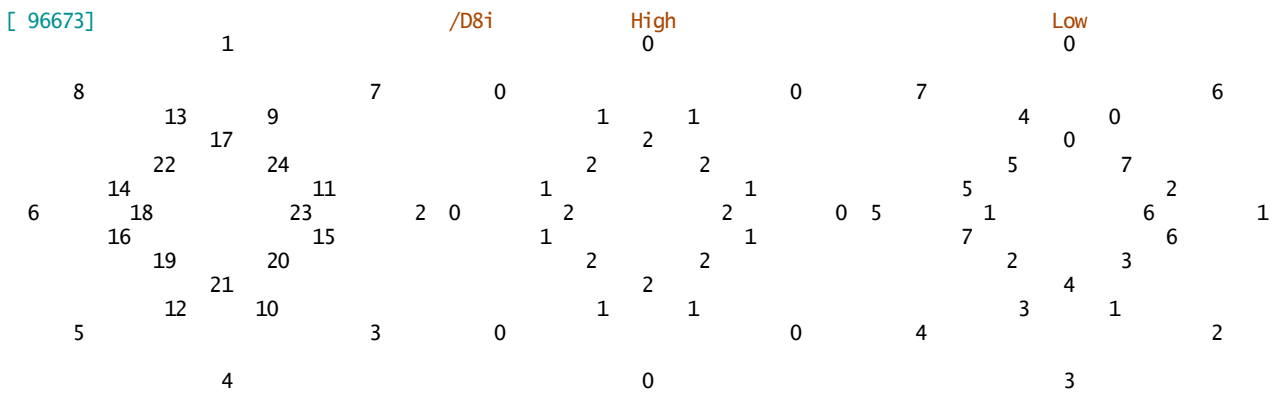
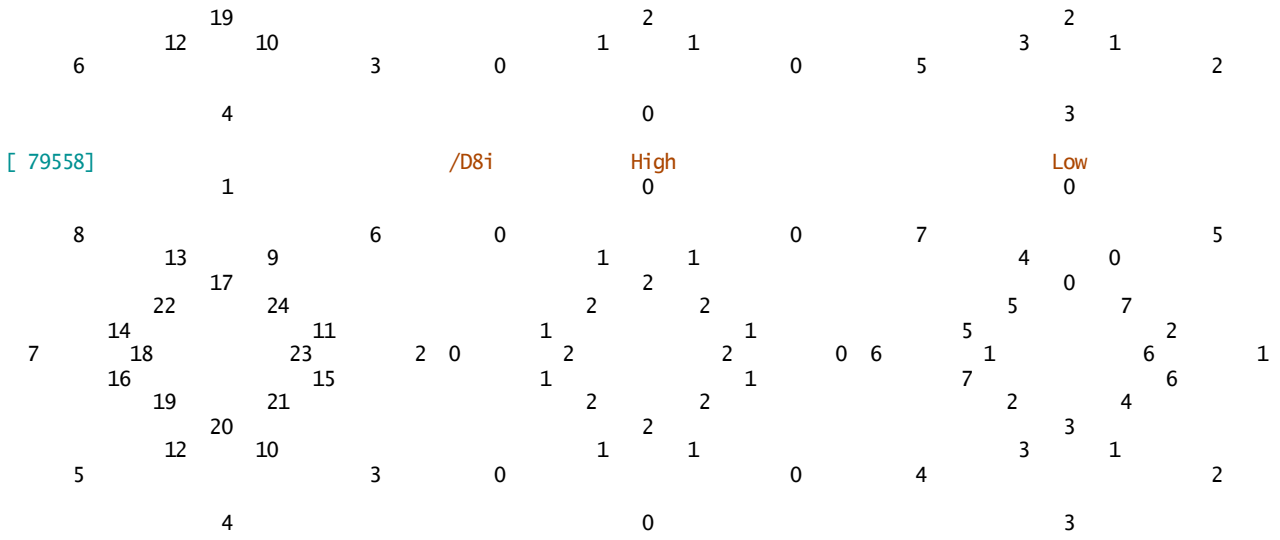
				/D8i		High				Low		
						0				0		
	1											
8		12	9	3	0	1	1	0	7	3	0	2
		22	21			2	2			5	4	
7	11		10			1	2	1		6	4	1
	23		24	10	2 0	2	2	2	1	2	1	
	18		16			1	2	2	1	0	6	7
	15	19	20	16		2	2	2	1	6	7	5
		17	13			1	2	2		2	0	3
6	14			4	0	1	1	0	5	5	4	3
										0	4	
	5									4	4	

[ 42369]

				/D8i		High				Low		
						0				0		
	1											
8		13	9	4	0	1	1	0	7	4	0	3
		23	24			2	2			6	1	
7	14		10			1	2	1		5	7	1
	20		22	10	2 0	2	2	2	1	0	6	
	12	17	19	16		1	2	2	1	3	3	5
		21	15			2	2	2	1	0	6	7
6	11			3	0	1	1	0	5	2	4	2
										0	6	
	5									4	6	

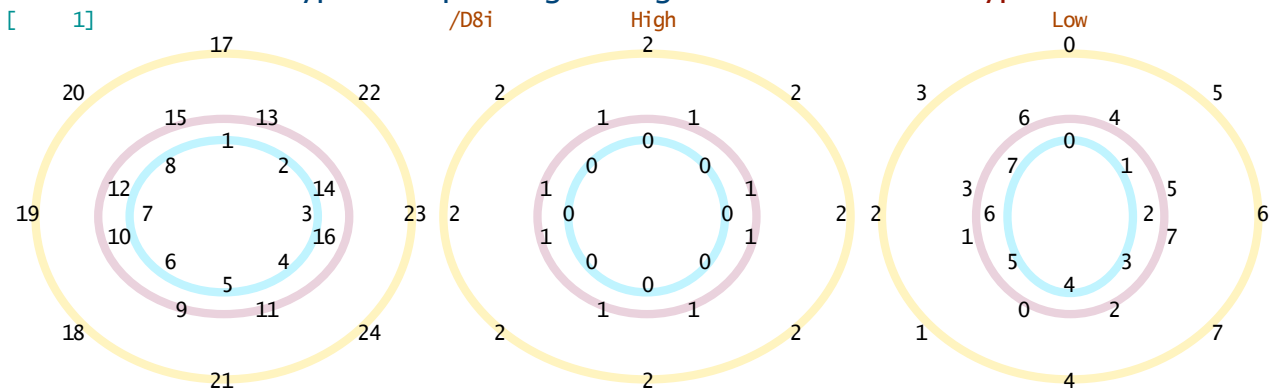
[ 60652]

				/D8i		High				Low		
						0				0		
	1											
8		13	9	5	0	1	1	0	7	4	0	4
		22	23			2	2			5	1	
7	14		11			1	2	1		5	6	2
	17		24	11	2 0	2	2	2	1	0	6	
	16		15			1	2	2	1	7	0	7
		20	21			2	2	2	1	0	6	5
										7	3	4



[Count=128700] OK!

**\*\* List of "Latin" Type of Triple-Ringed Magic Stars of Order 8: Type 2 \*\***





[ 11631]

						/D8i	High		Low				
							2		3				
	20			23		2	1	1	2	4	3	2	6
	21	12	11				0	0			0	2	
		8	1	3			0	0			7	2	
18	14	7		2	16	22	1	0	1	2	5	6	7
	9			15		2	1	0	0	1	0	1	5
		6	4				1	0	0		5	3	6
		10	5	13			1	0	1		1	4	7
19				24		2			2	2			
								2				0	

[ 24689]

						/D8i	High		Low				
							2		2				
	19			24		2	1	1	2	5	3	2	7
	22	12	11				0	0			0	2	
		8	1	4			0	0			7	3	
18	13	7		2	15	21	1	0	1	2	4	6	4
	9			16		2	1	0	0	1	0	1	7
		6	3				1	0	0		5	2	
		10	5	14			1	0	1		1	4	6
20				23		2			2	3		5	
								2				0	

[ 40916]

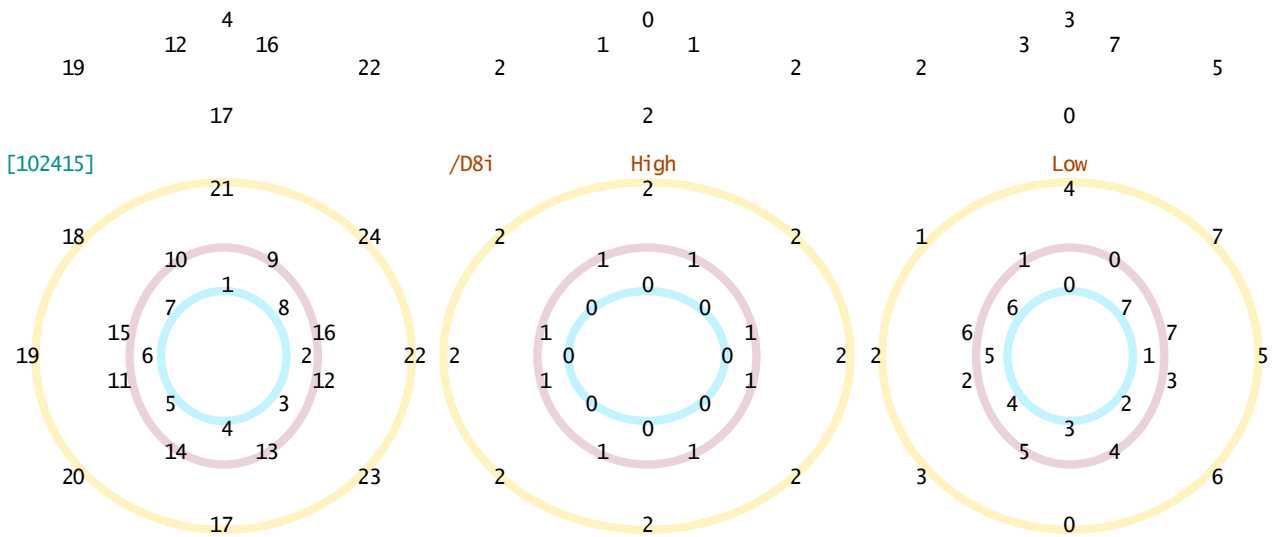
						/D8i	High		Low				
							2		4				
	21			23		2	1	1	2	1	3	0	6
	18	12	9				0	0			7	0	
		8	1	5			0	0			5	4	
20	14	7		2	15	24	1	0	1	2	3	6	7
	10			16		2	1	0	0	1	2	1	7
		6	3				1	0	0		1	5	
		11	4	13			1	0	1		2	3	2
17				22		2		1	1	2	0	2	4
								1	1			3	5
								2				2	

[ 59186]

						/D8i	High		Low				
							2		4				
	21			22		2	1	1	2	0	2	0	5
	17	11	9				0	0			2	0	
		8	1	6			0	0			7	0	
20	15	7		2	16	24	1	0	1	2	3	6	7
	10			14		2	1	0	0	1	2	1	5
		5	3				1	0	0		1	4	
		12	4	13			1	0	1			3	2
18				23		2		1	1	2	1	3	4
								1	1			3	6
								2				2	

[ 79604]

						/D8i	High		Low				
							2		4				
	21			24		2	1	1	2	3	2	0	7
	20	11	9				0	0			2	0	
		8	1	7			0	0			7	0	
18	15	6		2	13	23	1	0	1	2	1	6	4
	10			14		2	1	0	0	1	2	1	5
		5	3				1	0	1		1	5	6
							0	0			1	4	
								0				2	



[Count=128700] OK!

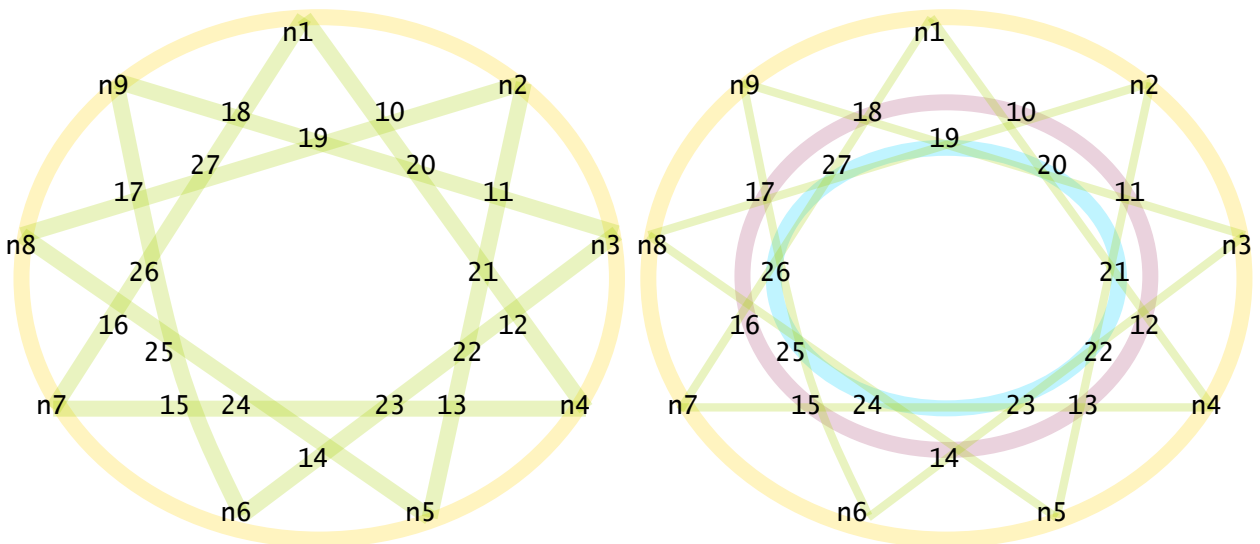
## Chapter 9: Special Type of Triple-Ringed Magic Stars of Order 9

### \*\* Basic Diagrams and Basic Conditions \*\*

$n1+n10+n20+n21+n12+n4=C$	... sm1		$sm1+sm2+sm3+sm4+sm5+sm6+sm7+sm8$
$n2+n11+n21+n22+n13+n5=C$	... sm2		$2*(n1+n2+n3+ \dots +n26+n27)=9*C$
$n3+n12+n22+n23+n14+n6=C$	... sm3		$2*(1+2+3+4+ \dots +25+26+27)=9*C$
$n4+n13+n23+n24+n15+n7=C$	... sm4		$2*(28*27/2)=9*C$
$n5+n14+n24+n25+n16+n8=C$	... sm5		$756=9*C$
$n6+n15+n25+n26+n17+n9=C$	... sm6		Therefore C=84
$n7+n16+n26+n27+n18+n1=C$	... sm7		
$n8+n17+n27+n19+n10+n2=C$	... sm8		
$n9+n18+n19+n20+n11+n3=C$	... sm9		

What properties do they have?

- (1) Triple Rings and Net Structure
- (2) 9 simultaneous equations must add up to the magic Constant 84.  
Each is made of 6 variables.



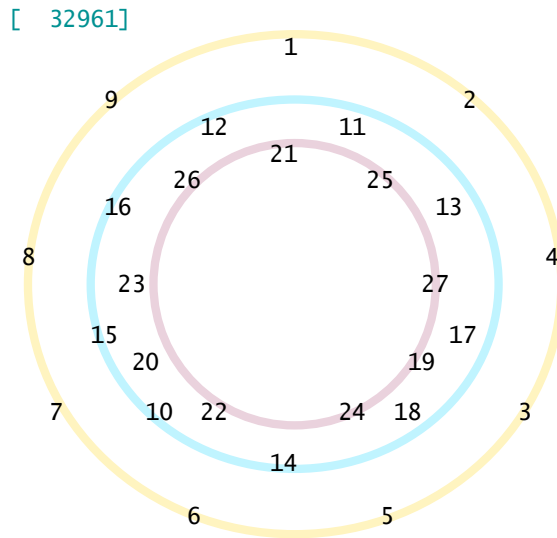
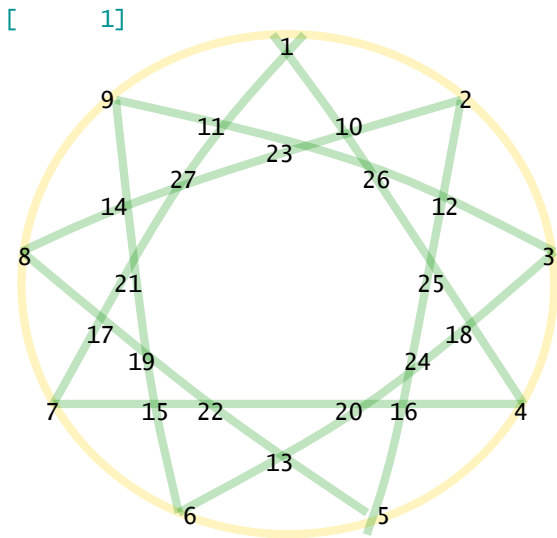
Since we have only 9 equations for the 27 variables, we can make quite a lot of solutions for this type. They seem too many.

Let's take the next conditions as follows adding to the Basic Conditions above.

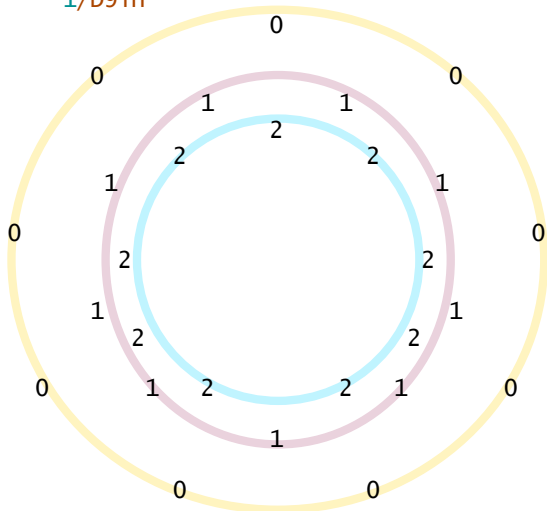
$\{n1, n2, n3, n4, n5, n6, n7, n8, n9\} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$  ...rg1

{n10,n11,n12,n13,n14,n15,n16,n17,n18}={10,11,12,13,14,15,16,17,18} ...rg2  
 {n19,n20,n21,n22,n23,n24,n25,n26,n27}={19,20,21,22,23,24,25,26,27} ...rg3

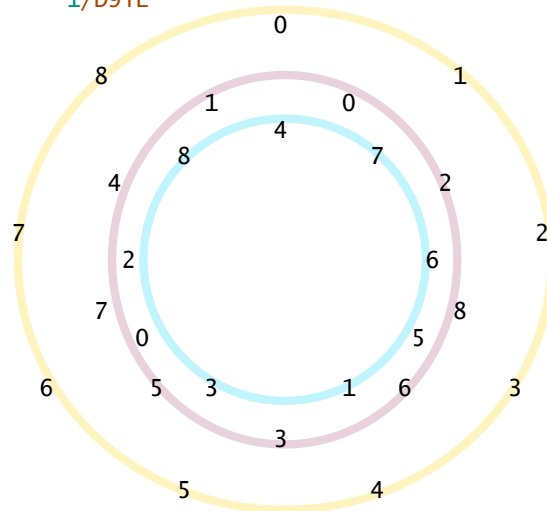
**\*\* List: "Latin" Type of Triple-Ringed Magic Stars of Order 9: Type 1 \*\***



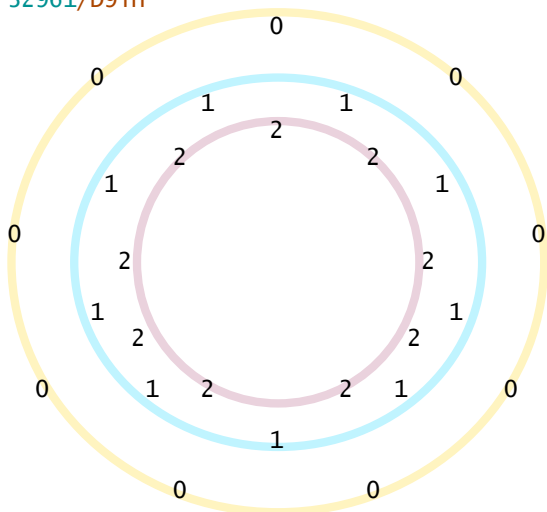
1/D9iH



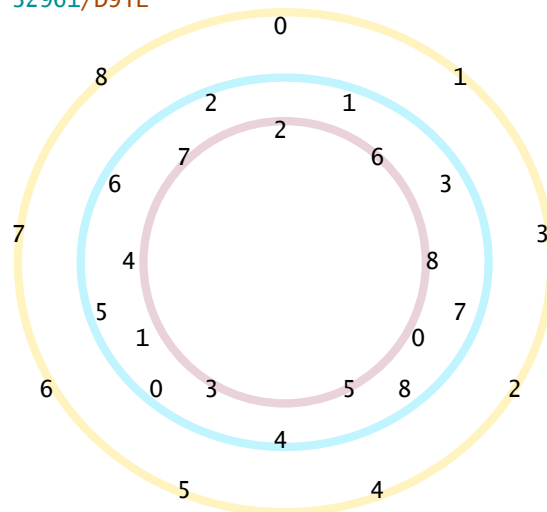
1/D9iL



32961/D9iH



32961/D9iL



[ 57925 ]

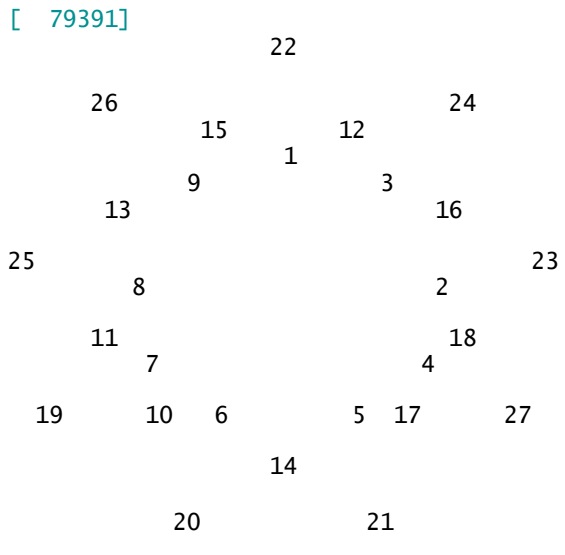
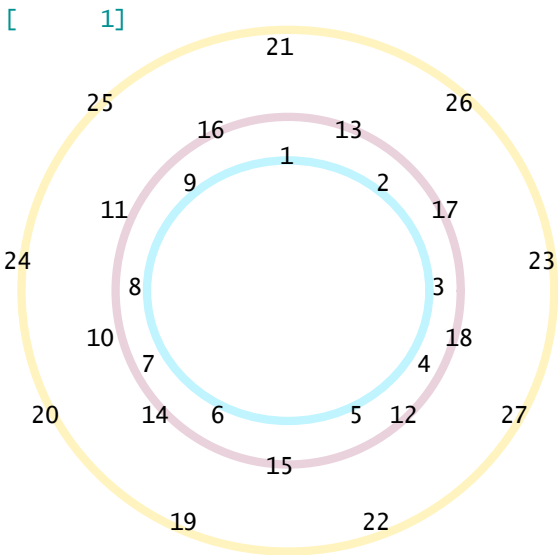
1  
9 2

[ 79471 ]

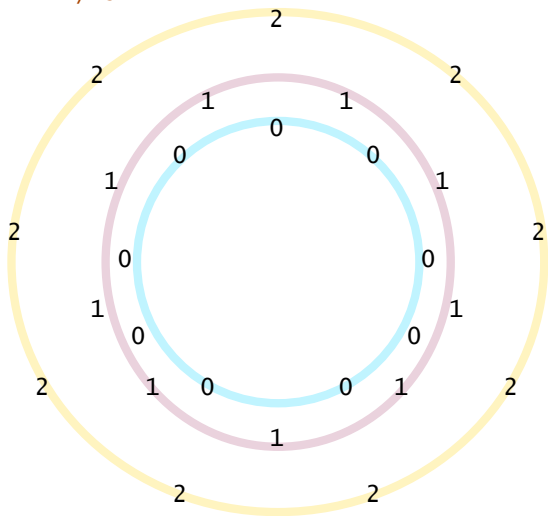
1  
9 2

		11		12				10		11			
		27	19		26			27	21		25		
	16				14			15			13		
8						5	8					6	
	23				25			22			26		
	15				17			17			18		
	20				21			19			23		
7	10	24		22	18	3	7	14	24		20	16	3
			13								12		
		6			4				5		4		
[ 96335]													
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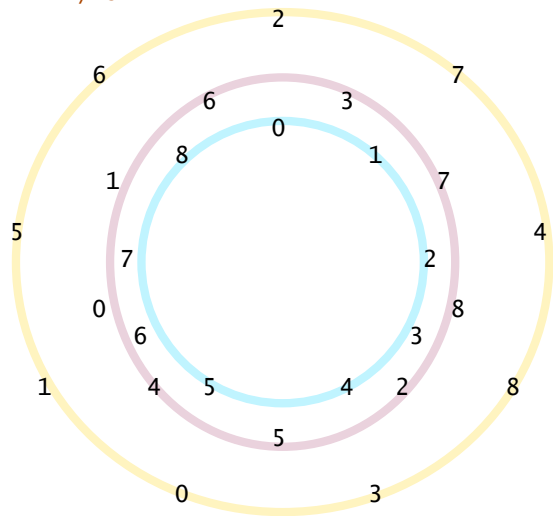




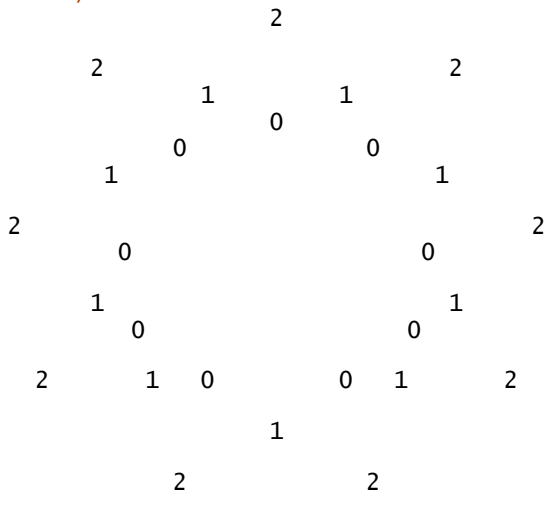
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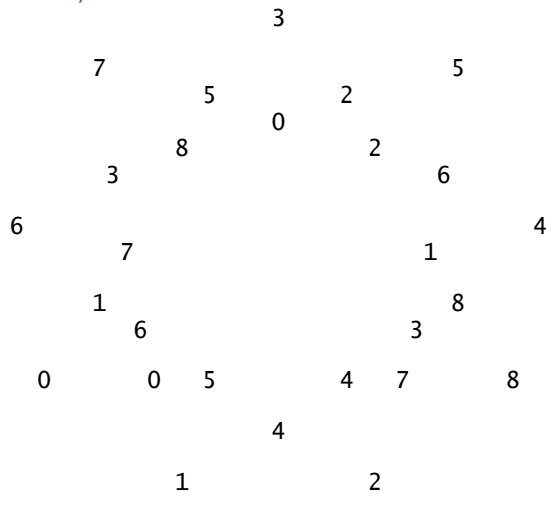
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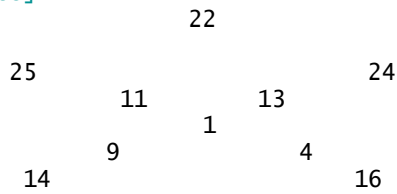
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