

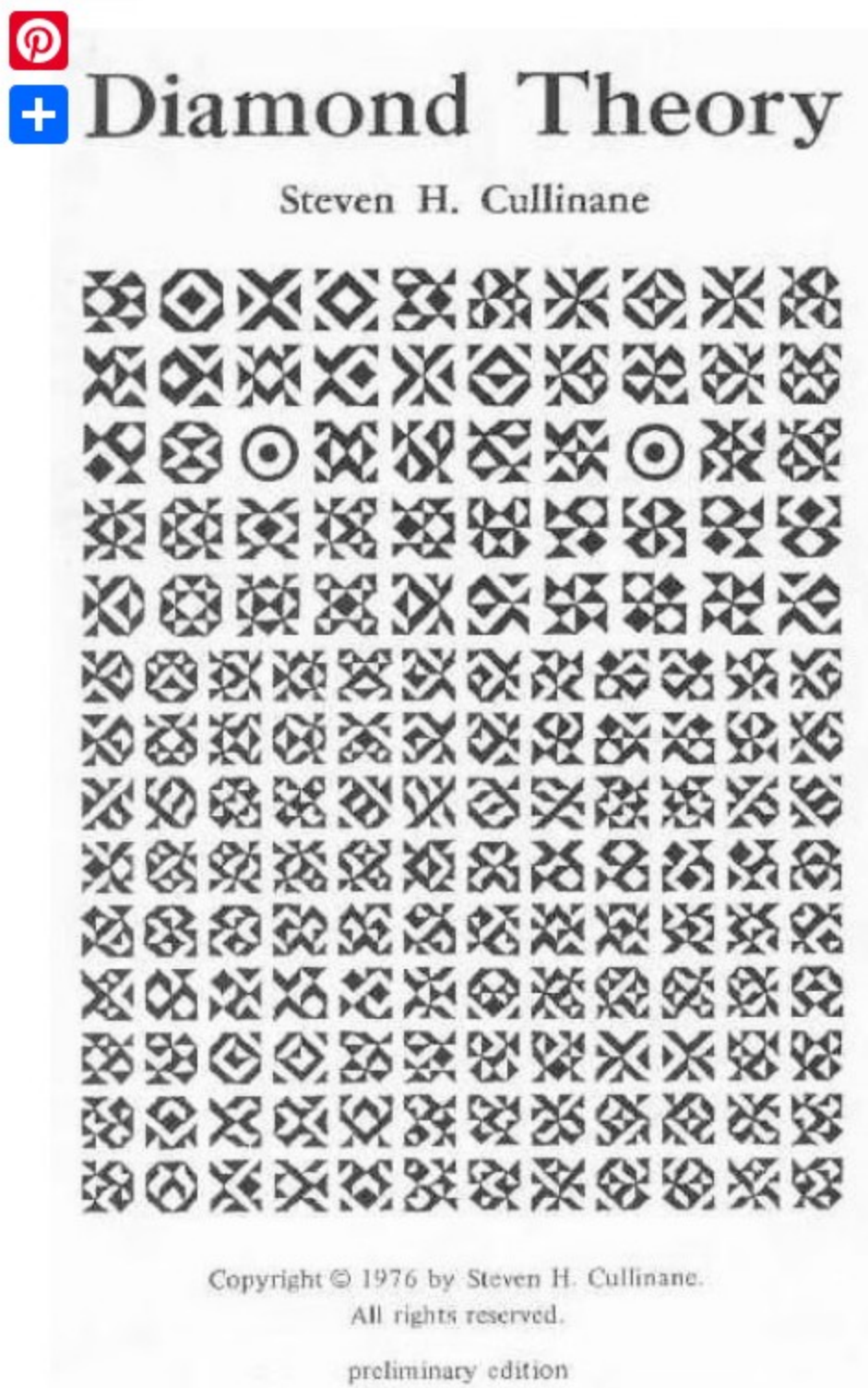
Log 24

Thursday, September 18, 2025

Contrapuntal Structure in Latin Squares

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Images from <https://shc7596.wixsite.com/website> —

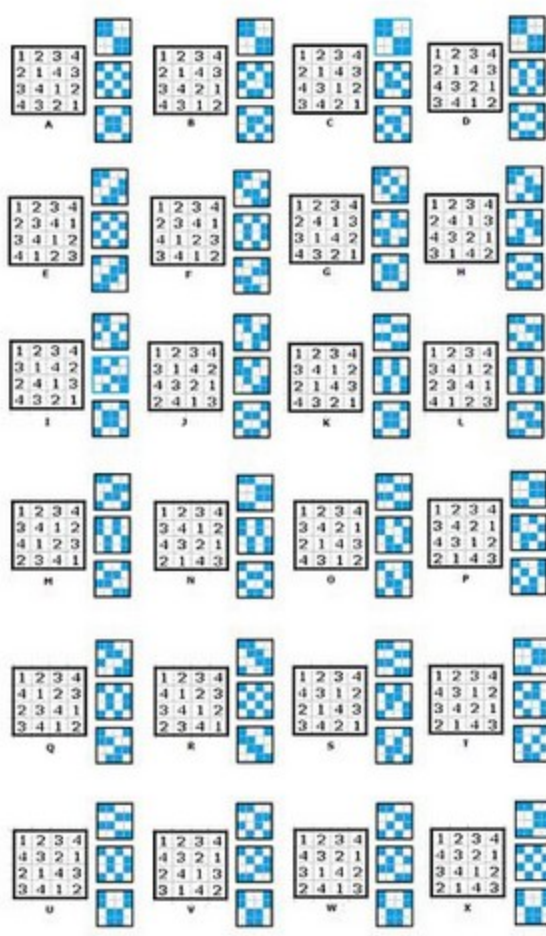


Diagrams at right show the underlying structure of the 24 Latin squares below. Each two-color diagram has 3 parts:
 show the locations of the 6 element subsets of $\{1, 2, 3, 4\}$.

4 × 4 Latin Squares															
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3
3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
A				B				C				D			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1
3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
E				F				G				H			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3
4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
I				J				K				L			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3
4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
M				N				O				P			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3
Q				R				S				T			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3
3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
U				V				W				X			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3
4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1

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Such diagrams were devised to prove the diamond theorem of Steven H. Cullinane. See diamondtheorem.com and finitegeometry.org/sc for details.

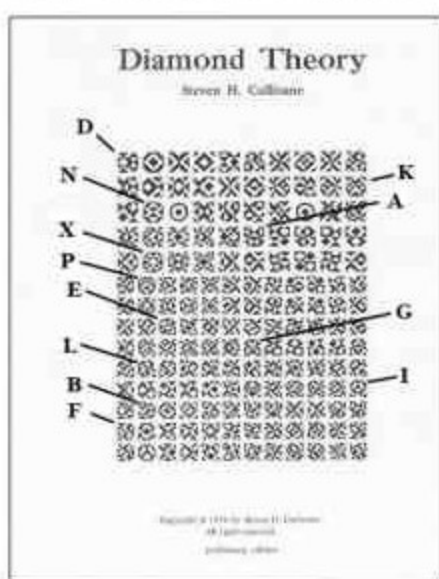


Pin Squares of Triangles

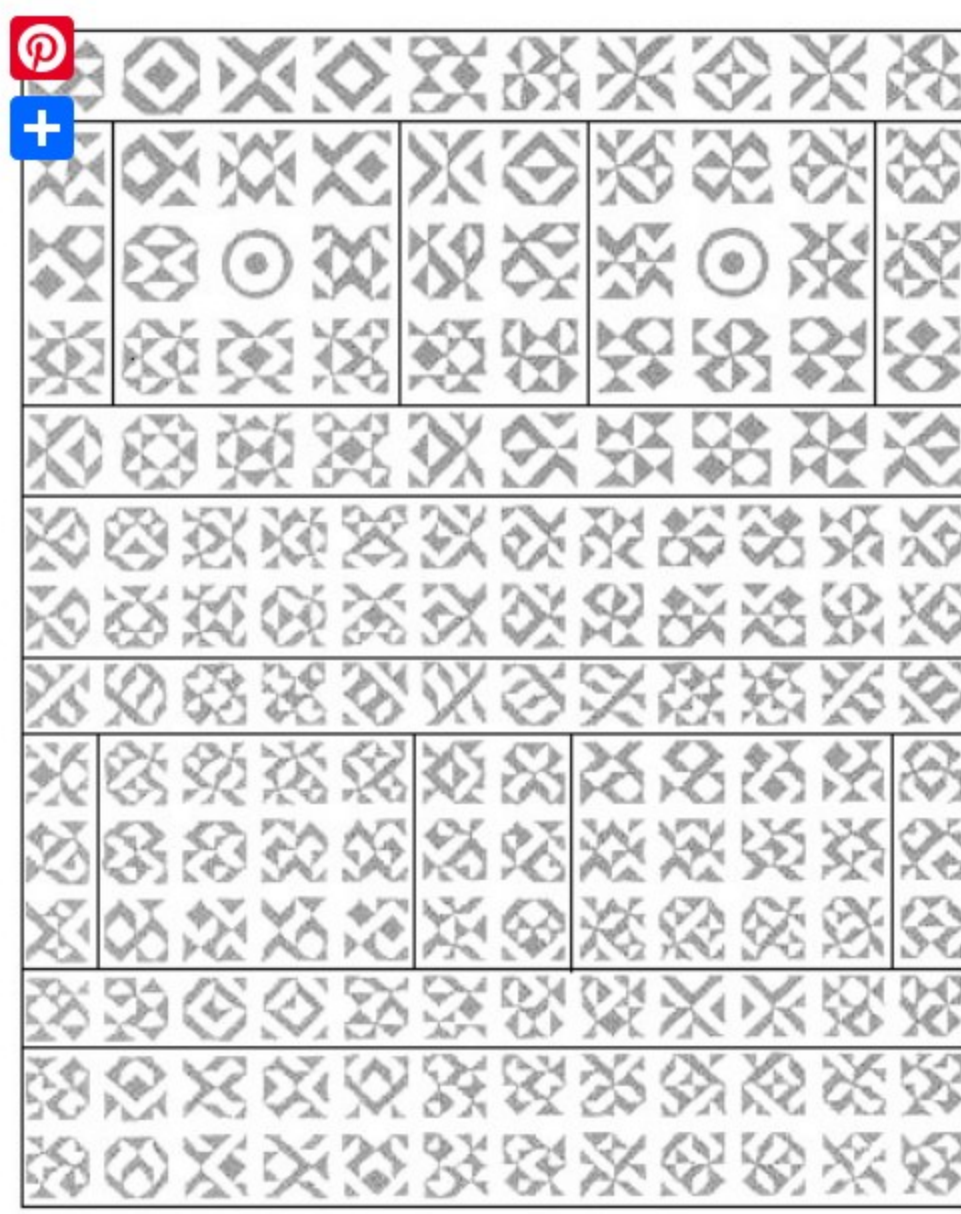
1234		1234	
2143		2143	
4321		3421	
4321		4312	
A		B	
1234		1234	
2143		2341	
4321		3412	
3412		4123	
D		E	
1234		1234	
3412		2341	
2143		4123	
4321		3412	
K		F	
1234		1234	
3412		2413	
4321		3142	
2143	N	4321	
		G	
1234		1234	
4321		3142	
3412		2413	
2143		4321	
X		I	
		1234	
		3412	
		2341	
		4123	
		L	
		1234	
		3421	
		4312	
		2143	
		P	

At left are the 12 Latin squares, with first row in standard 1234 order, that are structurally distinct modulo the group of 8 symmetries of the square.

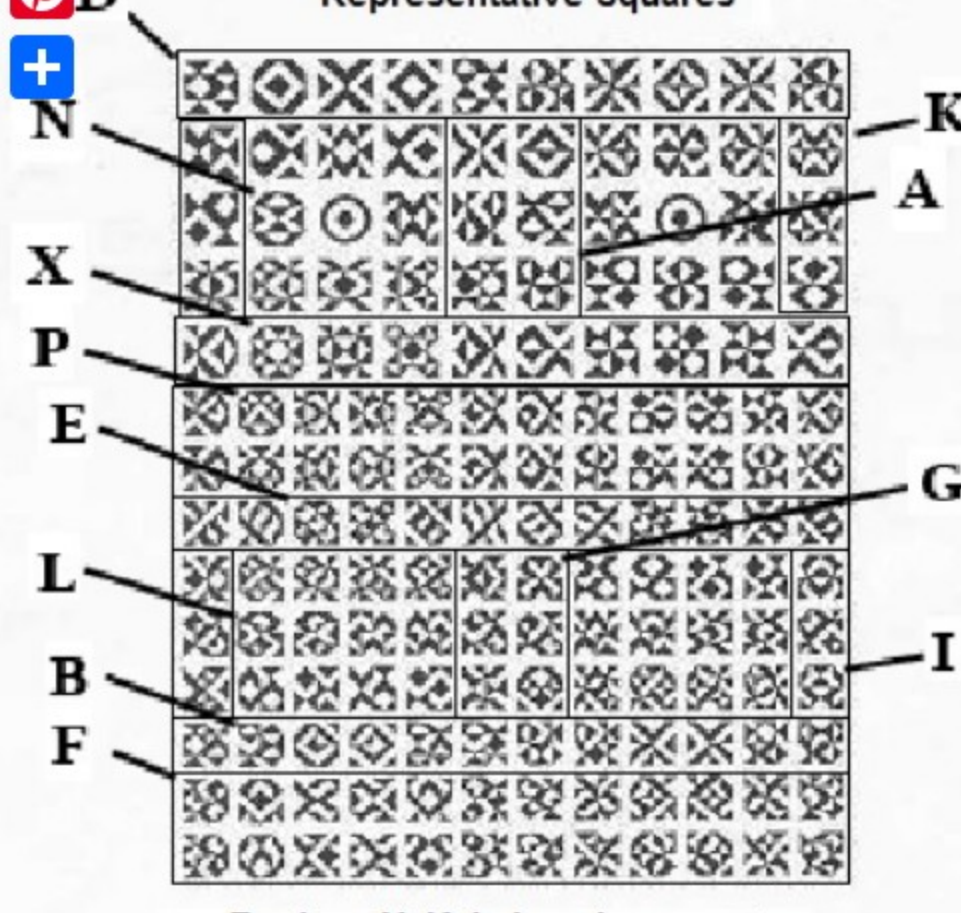
Each Latin square can be converted to a graphic figure by mapping the digits 1234 to the four triangular half-squares in some order. (This can be done in 24 ways; one of the ways is shown at left.)



The image above shows all such graphic figures that are structurally distinct modulo the group of four rotations of the square in the square's own plane.



Representative Squares



Regions N, K, L, I are in separate, symmetrically located rectangles.