

Bordered and Pandiagonal Magic Squares Multiples of 16

The work is also available at author's site:
<https://numbers-magic.com/?p=9634>

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Abstract

*During past years author worked with **block-wise**, **bordered** and **block-bordered** magic squares. This work make connection between **block-wise** and **bordered** magic squares. We first constructed **bordered** magic squares of orders 140 and 126 multiples of magic square of order 14. Based on these two big magic squares lower order magic squares are obtained. By lower orders we understand that magic squares of orders 112, 98, 84, etc. The construction of the **bordered** magic squares multiples of 14 is based on equal sum blocks of magic squares of order 14. We considered 46 different types of magic square of order 14. The advantage in studying **bordered** magic squares is that when we remove external border, still we left with magic squares with sequential entries. For multiples of order 4, 6, 8, 10 and 12 see author's work [24, 25, 26, 27, 28]. The further multiples, such as multiples, 16, 18, etc. shall be done in another works. This work brings examples only up to order 42. Higher orders examples can be seen in **Excel files** attached with the work. The total work is up to order 140.*

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1 Introduction

During past years author [3, 4, 5, 6, 7, 8, 9] worked with **block-wise** magic squares from orders 12 to 47. Author [10, 11, 12, 13, 14, 15] also worked with **bordered** magic squares. The study on **bordered** magic squares is extended to **block-bordered** magic squares [16, 17, 18]. This is specially done for the magic squares of orders p and p , where p is a prime number. This study is still extended to **block-wise bordered** magic squares [19, 20, 21, 22]. Some conection with Pythagorean triples and area-representations are also made [24, 25, 26, 27, 28]. The main property of **bordered** magic squares is that if we remove external borders, still we get **sub-bordered** magic squares, i.e., each layer in itself lead us to magic squares. In many cases, the properties of **bordered** magic square are seperated by **even** and **odd** orders magic squares. In many cases, we get good properties for the **even** order **bordered** magic squares. In many cases, we have to use fractional numbers entries, specially to reach minimum perfect square sum of entries. For more study on **bordered** magic squares refer H. White's [1] and H. Danielsson's [2] web-sites.

1.1 Summary of Bordered Magic Squares

1.1.1 Odd Numbers Multiples

- **Single Digit:** Bordered magic squares based on single digit [10, 11, 1].
- **Three Digits:** Bordered magic squares based on magic squares of order 3 [31].
- **Five Digits:** Bordered magic squares multiples of magic squares of order 5 [32].
- **Seven Digits:** Bordered magic squares multiples of magic squares of order 7 [33].
- **Nine Digits:** Bordered magic squares multiples of magic squares of order 9 [34]
- **Eleven Digits:** Bordered magic squares multiples of magic squares of order 11 [35]
- **Thirteen Digits:** Bordered magic squares multiples of magic squares of order 13 [36]
- **Fifteen Digits:** Bordered magic squares multiples of magic squares of order 15 [37]
- **Seventeen Digits:** Bordered magic squares multiples of magic squares of order 17 [38]
- **Nineteen Digits:** Bordered magic squares multiples of magic squares of order 19 [39]

1.1.2 Even Numbers Multiples

- **Two Digits:** Bordered magic squares based on magic rectangles multiples of 2 [79, 80, 68, 69, 69, 70].
- **Four Digits:** Bordered magic squares multiples of magic squares of order 4 [24].
- **Six Digits:** Bordered magic squares multiples of magic squares of order 6 [25]
- **Eight Digits:** Bordered magic squares multiples of magic squares of order 8 [26]
- **Ten Digits:** Bordered magic squares multiples of magic squares of order 10 [27]
- **Ten Digits:** Bordered magic squares multiples of magic squares of order 12 [28]
- **Fourteen Digits:** Bordered magic squares multiples of magic squares of order 14 [29]
- **Sixteen Digits:** Bordered magic squares multiples of magic squares of order 16 [30] (This work)

The work on even number multiples is with equal sums blocks of magic squares. The work on odd number multiples is with different sum magic squares.

This work brings bordered and pandiagonal magic squares multiples of 16. Previous version still remains online at the same place. Here we have considered 25 different types of magic squares of order 16 including one pandiagonal. The examples are written only for orders 16, 32 and 48. Higher order examples can be seen in an **excel files** attached with the work.

2 Bordered Magic Squares Multiples of 16

Let's consider following 24 magic squares of order 16.

1	mgc	2122	2403	1562	2150	2014	2211	2220	1916	1839	2229	2127	1738	2605	1817	1887	2056	2	mgc	1905	2061	2200	2053	2057	2055	2065	2056	2100	2057	2026	2057	2154	2053	1941	2056
254	255	1	4	5	251	250	8	9	247	246	12	242	243	13	16	2056	7	252	1	254	15	244	9	246	23	236	17	238	31	228	25	230	2056		
3	2	256	253	252	6	7	249	248	10	11	245	15	14	244	241	2056	2	253	8	251	10	245	16	243	18	237	24	235	26	229	32	227	2056		
53	204	60	57	199	198	61	195	194	64	65	68	190	191	17	240	2056	256	3	250	5	248	11	242	13	240	19	234	21	232	27	226	29	2056		
203	54	197	200	58	59	196	62	63	193	192	189	67	66	239	18	2056	249	6	255	4	241	14	247	12	233	22	239	20	225	30	231	28	2056		
202	55	93	164	99	97	159	157	156	154	104	102	69	188	238	19	2056	95	164	89	166	99	97	159	157	156	154	104	102	39	220	33	222	2056		
56	201	163	94	158	160	98	100	101	103	153	155	187	70	20	237	2056	90	165	96	163	158	160	98	100	101	103	153	155	34	221	40	219	2056		
49	208	162	95	113	144	127	132	121	134	117	140	186	71	21	236	2056	168	91	162	93	113	144	127	132	121	134	117	140	224	35	218	37	2056		
207	50	96	161	116	141	122	133	128	131	120	137	72	185	235	22	2056	161	94	167	92	116	141	122	133	128	131	120	137	217	38	223	36	2056		
206	51	89	168	143	114	136	123	130	125	139	118	73	184	234	23	2056	87	172	81	174	143	114	136	123	130	125	139	118	47	212	41	214	2056		
52	205	167	90	142	115	129	126	135	124	138	119	183	74	24	233	2056	82	173	88	171	142	115	129	126	135	124	138	119	42	213	48	211	2056		
45	212	166	91	149	151	105	107	112	110	146	148	182	75	25	232	2056	176	83	170	85	149	151	105	107	112	110	146	148	216	43	210	45	2056		
211	46	92	165	108	106	152	150	145	147	111	109	76	181	231	26	2056	169	86	175	84	108	106	152	150	145	147	111	109	209	46	215	44	2056		
210	47	171	170	88	85	81	175	174	84	178	179	77	80	230	27	2056	79	180	73	182	71	188	65	190	63	196	57	198	55	204	49	206	2056		
48	209	86	87	169	172	176	82	83	173	79	78	180	177	28	229	2056	74	181	80	179	66	189	72	187	58	197	64	195	50	205	56	203	2056		
44	41	214	215	37	219	218	40	33	223	222	36	29	32	227	226	2056	184	75	178	77	192	67	186	69	200	59	194	61	208	51	202	53	2056		
213	216	43	42	220	38	39	217	224	34	35	221	228	225	30	31	2056	177	78	183	76	185	70	191	68	193	62	199	60	201	54	207	52	2056		
2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056		

19	mgc	2177	2276	1761	2391	1961	1739	2495	2195	1446	2128	2246	1998	2173	1923	1931	2056
75	78	183	178	6	252	250	256	3	4	21	22	238	232	24	234	2056	
180	83	174	77	5	251	7	1	254	253	236	235	19	25	23	233	2056	
76	176	81	181	9	248	17	242	11	244	35	224	29	226	27	230	2056	
184	173	84	73	249	8	12	243	18	241	30	225	36	223	229	28	2056	
177	82	175	80	247	10	246	13	240	15	228	31	222	33	237	20	2056	
79	179	74	182	255	2	239	16	245	14	221	34	227	32	231	26	2056	
115	148	112	144	141	111	127	132	121	134	87	172	88	165	168	91	2056	
143	118	140	137	119	114	122	133	128	131	90	94	164	161	95	167	2056	
110	139	117	120	138	147	136	123	130	125	171	163	93	96	162	86	2056	
146	109	145	113	116	142	129	126	135	124	166	85	169	92	89	170	2056	
195	62	71	188	65	190	53	206	47	208	213	44	103	155	98	158	2056	
201	56	66	189	72	187	48	207	54	205	45	212	160	149	108	97	2056	
193	64	192	67	186	69	210	49	204	51	219	38	100	106	151	157	2056	
63	194	185	70	191	68	203	52	209	50	211	46	153	152	105	104	2056	
60	198	196	202	58	57	40	39	220	214	42	216	156	107	150	101	2056	
59	197	61	55	199	200	217	218	37	43	41	215	99	102	159	154	2056	
2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	

20	mgc	2154	2283	1832	2533	1575	1943	2243	1926	2259	2291	2009	1773	2084	1771	2164	2056
6	252	250	256	3	4	75	78	183	178	21	22	238	232	24	234	2056	
5	251	7	1	254	253	184	83	174	73	236	235	19	25	23	233	2056	
9	248	17	242	11	244	76	173	84	181	35	224	29	226	27	230	2056	
255	2	12	243	18	241	177	176	81	80	30	225	36	223	229	28	2056	
247	10	246	13	240	15	180	82	175	77	228	31	222	33	237	20	2056	
249	8	239	16	245	14	79	179	74	182	221	34	227	32	231	26	2056	
111	148	112	141	144	115	127	132	121	134	87	172	88	165	168	91	2056	
114	119	137	140	118	143	122	133	128	131	90	95	161	164	94	167	2056	
147	138	120	117	139	110	136	123	130	125	171	162	96	93	163	86	2056	
142	109	145	116	113	146	129	126	135	124	166	85	169	92	89	170	2056	
195	62	71	188	65	190	53	206	47	208	213	44	99	102	159	154	2056	
201	56	66	189	72	187	48	207	54	205	45	212	160	107	150	97	2056	
193	64	192	67	186	69	210	49	204	51	219	38	100	149	108	157	2056	
63	194	185	70	191	68	203	52	209	50	211	46	153	152	105	104	2056	
60	198	196	202	58	57	40	39	220	214	42	216	156	106	151	101	2056	
59	197	61	55	199	200	217	218	37	43	41	215	103	155	98	158	2056	
2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	

21	mgc	2237	2208	1750	2281	2116	1946	2281	1854	1687	2288	2290	1953	2176	1702	2071	2056
17	242	11	244	249	8	75	78	183	178	231	26	35	224	29	226	2056	
12	243	18	241	247	10	184	83	174	73	237	20	30	225	36	223	2056	
246	13	240	15	255	2	76	173	84	181	229	28	228	31	222	33	2056	
239	16	245	14	9	248	177	176	81	80	27	230	221	34	227	32	2056	
4	3	256	250	6	252	180	82	175	77	24	234	232	238	22	21	2056	
253	254	1	7	5	251	79	179	74	182	23	233	25	19	235	236	2056	
111	148	112	141	144	115	127	132	121	134	87	172	88	165	168	91	2056	
114	119	137	140	118	143	122	133	128	131	90	95	161	164	94	167	2056	
147	138	120	117	139	110	136	123	130	125	171	162	96	93	163	86	2056	
142	109	145	116	113	146	129	126	135	124	166	85	169	92	89	170	2056	
57	58	202	196	60	198	99	102	159	154	42	216	214	220	39	40	2056	
200	199	55	61	59	197	160	107	150	97	41	215	43	37	218	217	2056	
71	188	65	190	63	194	100	149	108	157	45	212	53	206	47	208	2056	
66	189	72	187	193	64	153	152	105	104	219	38	48	207	54	205	2056	
192	67	186	69	201	56	156	106	151	101	211	46	210	49	204	51	2056	
185	70	191	68	195	62	103	155	98	158	213	44	203	52	209	50	2056	
2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	

22	mgc	1558	2717	1784	2056	2395	2276	1673	2042	2106	2183	2252	2083	1587	1941	2187	2056
85	174	79	176	166	92	167	94	88	164	198	199	62	60	56	196	2056	
80	175	86	173	168	98	161	95	160	89	200	63	193	66	192	57	2056	
178	81	172	83	87	159	96	162	97	170	55	194	64	191	65	202	2056	
171	84	177	82	93	165	90	163	169	91	61	58	195	197	201	59	2056	
154	156	99	105	116	140	146	113	114	142	238	21	22	232	24	234	2056	
104	110	147	153	137	127	132	121	134	120	19	236	235	25	23	233	2056	
106	107	150	151	145	122	133	128	131	112	35	224	29	226	27	230	2056	
155	149	108	102	139	136	123	130	125	118	30	225	36	223	229	28	2056	
100	148	109	157	119	129	126	135	124	138	228	31	222	33	237	20	2056	
152	101	158	103	115	117	111	144	143	141	221	34	227	32	231	26	2056	
186	188	67	73	219	38	53	206	47	208	17	242	11	244	249	8	2056	
74	75	182	183	211	46	48	207	54	205	12	243	18	241	247	10	2056	
187	78	179	70	45	212	210	49	204	51	246	13	240	15	255	2	2056	
72	181	76	185	213	44	203	52	209	50	239	16	245	14	9	248	2056	
68	180	77	189	42	216	214	220	40	39	4	3	256	250	6	252	2056	
184	69	190	71	41	215	43	37	217	218	253	254	1	7	5	251	2056	
2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	

23 mgc	1986	1993	2261	2551	1550	2123	2229	1868	1767	2295	2062	2136	2355	2272	1392	2056	24 mgc	2271	2418	1468	2304	2076	1941	1913	2181	2026	2293	2186	2113	1529	1930	2191	2056
1	255	254	253	2	6	75	78	183	178	19	237	236	235	20	24	2056	252	250	3	256	4	6	75	78	183	178	234	232	21	238	22	24	2056
250	8	248	9	11	245	184	83	174	73	232	26	230	27	29	227	2056	2	17	242	11	244	255	184	83	174	73	20	35	224	29	226	237	2056
244	243	15	16	240	13	76	173	84	181	226	225	33	34	222	31	2056	8	12	243	18	241	249	76	173	84	181	26	30	225	36	223	231	2056
18	14	241	242	17	239	177	176	81	80	36	32	223	224	35	221	2056	10	246	13	240	15	247	177	176	81	80	28	228	31	222	33	229	2056
7	246	10	247	249	12	180	82	175	77	25	228	28	229	231	30	2056	248	239	16	245	14	9	180	82	175	77	230	221	34	227	32	27	2056
251	5	3	4	252	256	79	179	74	182	233	23	21	22	234	238	2056	251	7	254	1	253	5	79	179	74	182	233	25	236	19	235	23	2056
111	148	112	141	144	115	127	132	121	134	87	172	88	165	168	91	2056	111	148	112	141	144	115	127	132	121	134	87	172	88	165	168	91	2056
114	119	137	140	118	143	122	133	128	131	90	94	161	164	95	167	2056	114	119	137	140	118	143	122	133	128	131	90	95	161	164	94	167	2056
147	138	120	117	139	110	136	123	130	125	171	163	96	93	162	86	2056	147	138	120	117	139	110	136	123	130	125	171	162	96	93	163	86	2056
142	109	145	116	113	146	129	126	135	124	166	85	169	92	89	170	2056	142	109	145	116	113	146	129	126	135	124	166	85	169	92	89	170	2056
55	201	200	199	56	60	99	102	159	154	37	219	218	217	38	42	2056	198	196	57	202	58	60	99	102	159	154	216	214	39	220	40	42	2056
196	62	194	63	65	191	160	107	150	97	214	44	212	45	47	209	2056	56	71	188	65	190	201	160	107	150	97	38	53	206	47	208	219	2056
190	189	69	70	186	67	100	149	108	157	208	207	51	52	204	49	2056	62	66	189	72	187	195	100	149	108	157	44	48	207	54	205	213	2056
72	68	187	188	71	185	153	152	105	104	54	50	205	206	53	203	2056	64	192	67	186	69	193	153	152	105	104	46	210	49	204	51	211	2056
61	192	64	193	195	66	156	106	151	101	43	210	46	211	213	48	2056	194	185	70	191	68	63	156	106	151	101	212	203	52	209	50	45	2056
197	59	57	58	198	202	103	155	98	158	215	41	39	40	216	220	2056	197	61	200	55	199	59	103	155	98	158	215	43	218	37	217	41	2056
2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056

2.1 Bordered Magic Squares of Orders 144 and 128

Let's consider following distributions of numbers 64 and 81:

1	2	3	4	5	6	7	8
28	29	30	31	32	33	34	9
27	48	49	50	51	52	35	10
26	47	60	61	62	53	36	11
25	46	59	64	63	54	37	12
24	45	58	57	56	55	38	13
23	44	43	42	41	40	39	14
22	21	20	19	18	17	16	15

Table: 9 × 9 - 64 numbers

1	2	3	4	5	6	7	8	9
32	33	34	35	36	37	38	39	10
31	56	57	58	59	60	61	40	11
30	55	72	73	74	75	62	41	12
29	54	71	80	81	76	63	42	13
28	53	70	79	78	77	64	43	14
27	52	69	68	67	66	65	44	15
26	51	50	49	48	47	46	45	16
25	24	23	22	21	20	19	18	17

Table: 10 × 10 - 81 numbers

2.2 Equal Sums Distribution for 8×8

It has total 64 numbers. Let's consider following distribution of equal sums:

$$\begin{array}{ll}
 D_1 := \{1, 2, \dots, 128, 16257, 16258, \dots, 16384\}; & \text{Total Sum } D_1 := 2097280 \\
 D_2 := \{129, 130, \dots, 256, 16129, 16130, \dots, 16256\}; & \text{Total Sum } D_2 := 2097280 \\
 \dots & \dots \\
 \dots & \dots \\
 D_{63} := \{7937, 7938, \dots, 8064, 8321, 8322, \dots, 8448\}; & \text{Total Sum } D_{63} := 2097280 \\
 D_{64} := \{8065, 8066, \dots, 8192, 8193, 8194, \dots, 8320\}; & \text{Total Sum } D_{64} := 2097280
 \end{array}$$

In a Table of order 8×8 , total we have 64 numbers. Replacing numbers by magic squares of order 16 made from their respective distributions as given above. This given us 64 magic squares of order 16 of equal magic sums. Replacing them according to above Table of order 9×9 , we get magic square of order 128 multiples of magic squares of order 16. Since there are 24 magic squares of order 16, thus, we get 24 magic squares of order 128. See the attached **excel files** for details.

2.3 Equal Sums Distribution for 9×9

It has total 81 numbers. Let's consider following distribution of equal sums:

$$\begin{array}{ll}
 D_1 := \{1, 2, \dots, 128, 20609, 20610, \dots, 20736\}; & \text{Total Sum } D_1 := 2654336 \\
 D_2 := \{129, 130, \dots, 256, 19405, 19406, \dots, 20608\}; & \text{Total Sum } D_2 := 2654336 \\
 \dots & \dots \\
 \dots & \dots \\
 D_{80} := \{10113, 10114, \dots, 10240, 10497, 10498, \dots, 10624\}; & \text{Total Sum } D_{80} := 2654336 \\
 D_{81} := \{10241, 10242, \dots, 10368, 10369, 10370, \dots, 10496\}; & \text{Total Sum } D_{81} := 2654336
 \end{array}$$

In a Table of order 9×9 , total we have 81 numbers. Replacing numbers by magic squares of order 16 made from their respective distributions as given above. This given us 81 magic squares of order 16 of equal magic sums. Replacing them according to above Table of order 9×9 , we get magic square of order 144 multiples of magic squares of order 16. Since there are 24 magic squares of order 16, thus, we get 24 magic squares of order 144. See the attached **excel files** for details.

In the magic squares orders 144 and 128, the distribution is considered in such a way that removing the external borders of order 16, still we are left with magic squares of lower orders. Based on this idea, we shall give below some examples of magic squares up to order 48 derived from the above two big magic squares. For complete work see the attached **excel files**.

2.4 Magic Squares of Order 48

Below are three examples of magic squares of order 48 obtained from the magic squares of order 144. It is obtained by the application of the formula $\frac{a^2 - b^2}{2}$, $a > b$, i.e., subtract $\frac{144^2 - 48^2}{2} := 9216$ from each entry, we get the following three magic squares of order 48:

6	mgc	54470	62616	44586	59743	54089	55710	58923	56948	51690	55935	54320	52279	61838	42315	64338	55320	50886	68760	43050	58719	55625	55710	59435	53876	51178	55935	55856	50231	64398	45387	60754	55320	51910	65688	46122	57695	55625	55710	58411	53876	52202	55935	55856	51255	62350	48459	58706	55320
2302	2303	1	4	5	2299	2298	8	9	2295	2294	12	2290	2291	13	16	2174	2175	129	132	133	2171	2170	136	137	2167	2166	140	2162	2163	141	144	2046	2047	257	260	261	2043	2042	264	265	2039	2038	268	2034	2035	269	272	55320	
3	2	2304	2301	2300	6	7	2297	2296	10	11	2293	15	14	2292	2289	131	130	2176	2173	2172	134	135	2169	2168	138	139	2165	143	142	2164	2161	259	258	2048	2045	2044	262	263	2041	2040	266	267	2037	271	270	2036	2033	55320	
53	2252	60	57	2247	2246	61	2243	2242	64	65	68	2238	2239	17	2288	181	2124	188	185	2119	2118	189	2115	2114	192	193	196	2110	2111	145	2160	309	1996	316	313	1991	1990	317	1987	1986	320	321	324	1982	1983	273	2032	55320	
2251	54	2245	2248	58	59	2244	62	63	2241	2240	2237	67	66	2287	18	2123	182	2117	2120	186	187	2116	190	191	2113	2112	2109	195	194	2159	146	1995	310	1989	1992	314	315	1988	318	319	1985	1984	1981	323	322	2031	274	55320	
2250	55	93	2212	2178	2128	123	2181	2180	126	121	2183	69	2236	2286	19	2122	183	221	2084	2050	256	251	2053	2052	254	249	2055	197	2108	2158	147	1994	311	349	1956	1922	384	379	1925	1924	382	377	1927	325	1980	2030	275	55320	
56	2249	2211	94	2207	2197	2198	103	106	2204	105	100	2235	70	20	2285	184	2121	2083	222	2079	2069	2070	231	234	2076	233	228	2107	198	148	2157	312	1993	1955	350	1951	1941	1942	359	362	1948	361	356	1979	326	276	2029	55320	
49	2256	2210	95	97	115	109	113	2191	2193	2194	2208	2234	71	21	2284	177	2128	2082	223	225	243	237	241	2063	2065	2066	2080	2106	199	149	2156	305	2000	1954	351	353	371	365	369	1935	1937	1938	1952	1978	327	277	2028	55320	
2255	50	96	2209	104	2189	118	2185	2188	119	116	2201	72	2233	2283	22	2127	178	224	2081	232	2061	246	2057	2060	247	244	2073	200	2105	2155	150	1999	306	352	1953	360	1933	374	1929	1932	375	372	1945	328	1977	2027	278	55320	
2254	51	89	2216	99	2195	2187	120	117	2186	110	2206	73	2232	2282	23	2126	179	217	2088	227	2067	2059	248	245	2058	238	2078	201	2104	2154	151	1998	307	345	1960	355	1939	1931	376	373	1930	366	1950	329	1976	2026	279	55320	
52	2253	2215	90	2203	111	2196	2192	114	112	2190	102	2231	74	24	2281	180	2125	2087	218	2075	239	2068	2064	242	240	2062	230	2103	202	152	2153	308	1997	1959	346	1947	367	1940	1936	370	368	1934	358	1975	330	280	2025	55320	
45	2260	2210	91	2205	108	107	2202	2199	101	2200	98	2230	75	25	2280	177	2128	2086	219	2077	236	235	2074	2071	229	2072	226	2102	203	153	2152	301	2004	1958	347	1949	364	363	1946	1943	357	1944	354	1974	331	281	2024	55320	
2259	46	92	2213	127	2177	2182	124	125	2179	2184	122	76	2229	2279	26	2131	174	220	2085	255	2049	2054	252	253	2051	2056	250	204	2101	2151	154	2003	302	348	1957	383	1921	1926	380	381	1923	1928	378	332	1973	2023	282	55320	
2258	47	2219	2218	88	85	81	2223	2222	84	2226	2227	77	80	2278	27	2130	175	2091	2090	216	213	209	2095	2094	212	2098	2099	205	208	2150	155	2002	303	1963	1962	344	341	337	1967	1966	340	1970	1971	333	336	2022	283	55320	
48	2257	86	87	2217	2220	2224	82	83	2221	79	78	2228	2225	28	2277	176	2129	214	215	2089	2092	2096	210	211	2093	207	206	2100	2097	156	2149	304	2001	342	343	1961	1964	1968	338	339	1965	335	334	1972	1969	284	2021	55320	
44	41	2262	2263	37	2267	2266	40	33	2271	2270	36	29	32	2275	2274	172	169	2134	2135	165	2139	2138	168	161	2143	2142	164	157	160	2147	2146	300	297	2006	2007	293	2011	2010	296	289	2015	2014	292	285	288	2019	2018	55320	
2261	2264	43	42	2268	38	39	2265	2272	34	35	2269	2276	2273	30	31	2133	2136	171	170	2140	166	167	2137	2144	162	163	2141	2148	2145	158	159	2005	2008	299	298	2012	294	295	2009	2016	290	291	2013	2020	2017	286	287	55320	
1406	1407	897	900	901	1403	1402	904	905	1399	1398	908	1394	1395	909	912	1278	1279	1025	1028	1029	1275	1274	1032	1033	1271	1270	1036	1266	1267	1037	1040	1918	1919	385	388	389	1915	1914	392	393	1911	1910	396	1906	1907	397	400	55320	
899	898	1408	1405	1404	902	903	1401	1400	906	907	1397	911	910	1396	1393	1027	1026	1280	1277	1276	1030	1031	1273	1272	1034	1035	1269	1039	1038	1268	1265	387	386	1920	1917	1916	390	391	1913	1912	394	395	1909	399	398	1908	1905	55320	
949	1356	956	953	1351	1350	957	1347	1346	960	961	964	1342	1343	913	1392	1077	1228	1084	1081	1223	1222	1085	1219	1218	1088	1089	1092	1214	1215	1041	1264	437	1868	444	441	1863	1862	445	1859	1858	448	449	452	1854	1855	401	1904	55320	
1355	950	1349	1352	954	955	1348	958	959	1345	1344	1341	963	962	1391	914	1227	1078	1221	1224	1082	1083	1220	1086	1087	1217	1216	1213	1091	1090	1263	1042	1867	438	1861	1864	442	443	1860	446	447	1857	1856	1853	451	450	1903	402	55320	
1354	951	989	1316	1282	1024	1019	1285	1284	1022	1017	1287	965	1340	1390	915	1226	1079	1117	1188	1154	1152	1147	1157	1156	1150	1145	1159	1093	1212	1262	1043	1866	439	477	1828	1794	512	507	1797	1796	510	505	1799	453	1852	1902	403	55320	
952	1353	1315	990	1311	1301	1302	999	1002	1308	1001	996	1339	966	916	1389	1080	1225	1187	1118	1183	1173	1174	1127	1130	1180	1129	1124	1211	1094	1044	1261	440	1865	1827	478	1823	1813	1814	487	490	1820	489	484	1851	454	404	1901	55320	
945	1360	1314	991	993	1011	1005	1009	1295	1297	1298	1312	1338	967	917	1388	1073	1232	1186	1119	1121	1139	1133	1137	1167	1169	1170	1184	1210	1095	1045	1260	433	1872	1826	479	481	499	493	497	1807	1809	1810	1824	1850	455	405	1900	55320	
1359	946	992	1313	1000	1293	1014	1289	1292	1015	1012	1305	968	1337	1387	918	1231	1074	1120	1185	1128	1165	1142	1161	1164	1143	1140	1177	1096	1209	1259	1046	1871	434	480	1825	488	1805	502	1801	1804	503	500	1817	456	1849	1899	406	55320	
1358	947	985	1320	995	1299	1291	1016	1013	1290	1006	1310	969	1336	1386	919	1230	1075	1113	1192	1123	1171	1163	1144	1141	1162	1134	1182	1097	1208	1258	1047	1870	435	473	1832	483	1811	1803	504	501	1802	494	1822	457	1848	1898	407	55320	
948	1357	1319	986	1307	1007	1300	1296	1010	1008	1294	998	1335	970	920	1385	1076	1229	1191	1114	1179	1135	1172	1168	1138	1136	1166	1126	1207	1098	1048	1257	436	1869	1831	474	1819	495	1812	1808	498	496	1806	486	1847	458	408	1897	55320	
941	1364	1318	987	1309	1004	1003	1306	1303	997	1304	994	1334	971	921	1384	1069	1236	1190	1115	1181	1132	1131	1178	1175	1125	1176	1122	1206	1099	1049	1256	429	1876	1830	475	1821	492	491	1818	1815	485	1816	482	1846	459	409	1896	55320	
1363	942	988	1317	1023	1281	1286	1020	1021	1283	1288	1018	972	1333																																				

11	mgc	65697	60178	46706	59800	58884	55698	56326	50753	56320	51206	56137	48249	61964	50714	42976	55320	72353	64274	47218	58776	59396	55698	54790	51777	54784	52230	54601	47225	64524	51738	44512	55320	68257	62226	49266	57752	58372	55698	54790	52801	54784	53254	54601	49273	62476	52762	47584	55320
2302	2303	1	4	5	2299	2298	8	9	2295	2294	12	2290	2291	13	16	2174	2175	129	132	133	2171	2170	136	137	2167	2166	140	2162	2163	141	144	2046	2047	257	260	261	2043	2042	264	265	2039	2038	268	2034	2035	269	272	55320	
3	2	2304	2301	2300	6	7	2297	2296	10	11	2293	15	14	2292	2289	131	130	2176	2173	2172	134	135	2169	2168	138	139	2165	143	142	2164	2161	259	258	2048	2045	2044	262	263	2041	2040	266	267	2037	271	270	2036	2033	55320	
53	2252	2237	2228	2230	2245	2247	78	76	74	61	59	57	2238	17	2288	181	2124	2109	2100	2102	2117	2119	206	204	202	189	187	185	2110	145	2160	309	1996	1981	1972	1974	1989	1991	334	332	330	317	315	313	1982	273	2032	55320	
2251	54	73	2217	96	2212	2224	2210	94	92	82	80	2218	2232	2287	18	2123	182	201	2089	224	2084	2096	2082	222	220	210	208	2090	2104	2159	146	1995	310	329	1961	352	1956	1968	1954	350	348	338	336	1962	1976	2031	274	55320	
2250	55	70	91	2201	2196	2207	110	108	99	97	2202	2214	2235	2286	19	2122	183	198	219	2073	2068	2079	238	236	227	225	2074	2086	2107	2158	147	1994	311	326	347	1945	1940	1951	366	364	355	353	1946	1958	1979	2030	275	55320	
56	2249	69	89	106	2189	2186	120	118	112	2190	2199	2216	2236	20	2285	184	2121	197	217	234	2061	2058	248	246	240	2062	2071	2088	2108	148	2157	312	1993	325	345	362	1933	1930	376	374	368	1934	1943	1960	1980	276	2029	55320	
49	2256	64	85	105	117	2184	2181	124	121	2188	2200	2220	2241	21	2284	177	2132	192	213	233	245	2056	2053	252	249	2060	2072	2092	2113	149	2156	305	2000	320	341	361	373	1928	1925	380	377	1932	1944	1964	1985	277	2028	55320	
2255	50	62	79	100	111	122	123	2182	2183	2194	2205	2226	2243	2283	22	2127	178	190	207	228	239	250	251	2054	2055	2066	2077	2098	2115	2155	150	1999	306	318	335	356	367	378	379	1926	1927	1938	1949	1970	1987	2027	278	55320	
2254	51	2233	2215	2198	2192	125	128	2177	2180	113	107	90	72	2282	23	2126	179	2105	2087	2070	2064	253	256	2049	2052	241	235	218	200	2154	151	1998	307	1977	1959	1942	1936	381	384	1921	1924	369	363	346	328	2026	279	55320	
52	2253	2234	2219	2203	2191	2179	2178	127	126	114	102	86	71	24	2281	180	2125	2106	2091	2075	2063	2051	2050	255	254	242	230	214	199	152	2153	308	1997	1978	1963	1947	1935	1923	1922	383	382	370	358	342	327	280	2025	55320	
45	2260	2239	2221	2204	115	119	2185	2187	2193	116	101	84	66	25	2280	173	2132	2111	2093	2076	243	247	2057	2059	2065	244	229	212	194	153	2152	301	2004	1983	1965	1948	371	375	1929	1931	1937	372	357	340	322	281	2024	55320	
2259	46	2240	2222	103	109	98	2195	2197	2206	2208	104	83	65	2279	26	2131	174	2112	2094	231	237	226	2067	2069	2078	2080	232	211	193	2151	154	2003	302	1984	1966	359	365	354	1939	1941	1950	1952	360	339	321	2023	282	55320	
2258	47	2242	87	2209	93	81	95	2211	2213	2223	2225	88	63	2278	27	2130	175	2114	215	2081	221	209	223	2083	2085	2095	2097	216	191	2150	155	2002	303	1986	343	1953	349	337	351	1955	1957	1967	1969	344	319	2022	283	55320	
48	2257	67	77	75	60	58	2227	2229	2231	2244	2246	2248	68	28	2277	176	2129	195	205	203	188	186	2099	2101	2103	2116	2118	2120	196	156	2149	304	2001	323	333	331	316	314	1971	1973	1975	1988	1990	1992	324	284	2021	55320	
44	41	2262	2263	37	2267	2266	40	33	2271	2270	36	29	32	2275	2274	172	169	2134	2135	165	2138	168	167	2137	2144	162	163	2141	2148	158	2005	2008	299	298	2012	294	295	2009	2016	290	291	2013	2020	2017	286	287	55320		
2261	2264	43	42	2268	38	39	2265	2272	34	35	2269	2276	2273	30	31	2133	2136	171	170	2140	166	167	2137	2144	162	163	2141	2148	158	2005	2008	299	298	2012	294	295	2009	2016	290	291	2013	2020	2017	286	287	55320			
1406	1407	897	900	901	1403	1402	904	905	1399	1398	908	1394	1395	909	912	1278	1279	1025	1028	1029	1275	1274	1032	1033	1271	1270	1036	1266	1267	1037	1040	1918	1919	385	388	389	1915	1914	392	393	1911	1910	396	1906	1907	397	400	55320	
899	898	1408	1405	1404	902	903	1401	1400	906	907	1397	911	910	1396	1393	1027	1026	1280	1277	1276	1030	1031	1273	1272	1034	1035	1269	1039	1038	1268	1265	387	386	1920	1917	1916	390	391	1913	1912	394	395	1909	399	398	1908	1905	55320	
949	1356	1341	1332	1334	1349	1351	974	972	970	957	955	953	1342	913	1392	1077	1228	1213	1204	1206	1221	1223	1102	1100	1098	1085	1083	1081	1214	1041	1264	437	1868	1853	1844	1846	1861	1863	462	460	458	445	443	441	1854	401	1904	55320	
1355	950	969	1321	992	1316	1328	1314	990	988	978	976	1322	1336	1391	914	1227	1228	1097	1193	1120	1188	1200	1186	1118	1116	1106	1104	1194	1208	1263	1042	1867	438	457	1833	480	1828	1840	1826	478	476	466	464	1834	1848	1903	402	55320	
1354	951	966	987	1305	1300	1311	1006	1004	995	993	1306	1318	1339	1390	915	1226	1079	1094	1115	1177	1172	1183	1134	1132	1123	1121	1178	1190	1211	1262	1043	1866	439	454	475	1817	1812	1823	494	492	483	481	1818	1830	1851	1902	403	55320	
952	1353	965	985	1002	1293	1290	1016	1014	1008	1294	1303	1320	1340	916	1389	1080	1225	1093	1113	1130	1165	1162	1144	1142	1136	1166	1175	1192	1212	1044	1261	440	1865	453	473	490	1805	1802	504	502	496	1806	1815	1832	1852	404	1901	55320	
945	1360	960	981	1001	1013	1288	1285	1020	1017	1292	1304	1324	1345	917	1388	1083	1232	1088	1109	1129	1141	1160	1157	1148	1145	1164	1176	1196	1217	1045	1260	433	1872	448	469	489	501	1800	1797	508	505	1804	1816	1836	1856	405	1900	55320	
1359	946	958	975	996	1007	1018	1019	1286	1287	1298	1309	1330	1347	918	1387	1086	1103	1124	1135	1146	1147	1158	1159	1170	1181	1202	1219	1259	1046	1871	434	446	463	484	495	506	507	1798	1799	1810	1821	1842	1859	1899	406	55320			
1358	947	1337	1319	1302	1296	1021	1024	1281	1284	1009	1003	986	968	1386	919	1230	1075	1209	1191	1174	1168	1149	1152	1153	1156	1137	1131	1114	1096	1258	1047	1870	435	1849	1831	1814	1808	509	512	1793	1796	497	491	474	456	1898	407	55320	
948	1357	1338	1323	1307	1295	1283	1282	1023	1022	1010	998	982	967	920	1385	1076	1229	1210	1195	1179	1167	1155	1154	1151	1150	1138	1126	1110	1095	1048	1257	436	1869	1850	1835	1819	1807	1795	1794	511	510	498	486	470	455	408	1897	55320	
941	1364	1343	1325	1308	1011	1015	1289	1291	1297	1012	997	980	962	921	1384	1069	1236	1215	1197	1180	1139	1143	1161	1163	1169	1140	1125	1108	1090	1049	1256	429	1876	1855	1837	1820	499	503	1801	1803	1809	500	485	468	450	409	1896	55320	
1363	942	1344	1326	999	1005	994	1299	1301	1310	1312	1000	979	961	1383	922	1235	1070	1216																															

19	mgc	56707	58028	47267	68613	54011	46177	61757	59833	40178	63728	61010	49002	52599	50825	58017	55320	60291	60076	42659	70661	55547	43105	64317	58809	39666	61680	63570	47978	52087	51849	58529	55320	59267	59052	45731	66565	55547	46177	62269	57785	43762	59632	61522	50026	53111	52873	57805	55320
75	78	2231	2226	6	2300	2298	2304	3	4	21	22	2286	2280	24	2282	203	206	2103	2098	134	2172	2170	2176	131	132	149	150	2158	2152	152	2154	331	334	1975	1970	262	2044	2042	2048	259	260	277	278	2030	2024	280	2026	55320	
2228	83	2222	77	5	2299	7	1	2302	2301	2284	2283	19	25	23	2281	2100	211	2094	205	133	2171	135	129	2174	2173	2156	2155	147	153	151	2153	1972	339	1966	333	261	2043	263	257	2046	2045	2028	2027	275	281	279	2025	55320	
76	2224	81	2229	9	2296	17	2290	11	2292	35	2272	29	2274	27	2278	204	2096	209	2101	137	2168	145	2162	139	2164	163	2144	157	2146	155	2150	332	1968	337	1973	265	2040	273	2034	267	2036	291	2016	285	2018	283	2022	55320	
2232	2221	84	73	2297	8	12	2291	18	2289	30	2273	36	2271	2277	28	2104	2093	212	201	2169	136	140	2163	146	2161	158	2145	164	2143	2149	156	1976	1965	340	329	2041	264	268	2035	274	2033	286	2017	292	2015	2021	284	55320	
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638	639	385	388	389	635	634	392	393	631	630	396	626	627	397	400	766	767	257	260	261	763	762	264	265	759	758	268	754	755	269	272	16400		
387	386	640	637	636	390	391	633	632	394	395	629	399	398	628	625	259	258	768	765	764	262	263	761	760	266	267	757	271	270	756	753	16400		
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587	438	581	584	442	443	580	446	447	577	576	573	451	450	623	402	715	310	709	712	314	315	708	318	319	705	704	701	323	322	751	274	16400		
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433	592	546	479	544	483	538	485	536	491	530	493	570	455	405	620	305	720	674	351	672	355	666	357	664	363	658	365	698	327	277	748	16400		
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16	mgc	18124	14602	17644	16744	14310	18330	15490	16198	17244	14298	15790	16474	16910	18706	15136	16400	19660	13578	17644	15720	13798	19354	14466	17222	18268	14298	14766	16474	17934	17682	15136	16400	
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594	426	588	606	415	430	598	607	587	440	433	602	428	421	407	618	722	298	716	734	287	302	726	735	715	312	305	730	300	293	279	746	16400		
386	638	616	399	623	406	388	630	404	410	629	636	390	412	622	611	258	766	744	271	751	278	260	758	276	282	757	764	262	284	750	739	16400		
639	387	409	626	402	619	637	395	621	615	396	389	635	613	414	403	767	259	281	754	274	747	765	267	749	743	268	261	763	741	286	275	16400		
16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400

22 mgc	13100	20282	15600	16400	19382	17352	12306	16372	16244	19726	16536	19014	11622	15146	16406	16400	11564	22842	14576	16400	19382	17864	12818	16372	16756	18190	17048	16966	13158	15658	16918	16400	
85	942	79	944	934	92	935	94	88	932	966	967	62	60	56	964	213	814	207	816	806	220	807	222	216	804	838	839	190	188	184	836	16400	
80	943	86	941	936	98	929	95	928	89	968	63	961	66	960	57	208	815	214	813	808	226	801	223	800	217	840	191	833	194	832	185	16400	
946	81	940	83	87	927	96	930	97	938	55	962	64	959	65	970	818	209	812	211	215	799	224	802	225	810	183	834	192	831	193	842	16400	
939	84	945	82	93	933	90	931	937	91	61	58	963	965	969	59	811	212	817	210	221	805	218	803	809	219	189	186	835	837	841	187	16400	
922	924	99	105	116	908	914	113	114	910	1006	21	22	1000	24	1002	794	796	227	233	244	780	786	241	242	782	878	149	150	872	152	874	16400	
104	110	915	921	905	127	900	121	902	120	19	1004	1003	25	23	1001	232	238	787	793	777	255	772	249	774	248	147	876	875	153	151	873	16400	
106	107	918	919	913	122	901	128	899	112	35	992	29	994	27	998	234	235	790	791	785	250	773	256	771	240	163	864	157	866	155	870	16400	
923	917	108	102	907	904	123	898	125	118	30	993	36	991	997	28	795	789	236	230	779	776	251	770	253	246	158	865	164	863	869	156	16400	
100	916	109	925	119	897	126	903	124	906	996	31	990	33	1005	20	228	788	237	797	247	769	254	775	252	778	868	159	862	161	877	148	16400	
920	101	926	103	115	117	111	912	911	909	989	34	995	32	999	26	792	229	798	231	243	245	239	784	783	781	861	162	867	160	871	154	16400	
954	956	67	73	987	38	53	974	47	976	17	1010	11	1012	1017	8	826	828	195	201	859	166	181	846	175	848	145	882	139	884	889	136	16400	
74	75	950	951	979	46	48	975	54	973	12	1011	18	1009	1015	10	202	203	822	823	851	174	176	847	182	845	140	883	146	881	887	138	16400	
955	78	947	70	45	980	978	49	972	51	1014	13	1008	15	1023	2	827	206	819	198	173	852	850	177	844	179	886	141	880	143	895	130	16400	
72	949	76	953	981	44	971	52	977	50	1007	16	1013	14	9	1016	200	821	204	825	853	172	843	180	849	178	879	144	885	142	137	888	16400	
68	948	77	957	42	984	982	988	40	39	4	3	1024	1018	6	1020	196	820	205	829	170	856	854	860	168	167	132	131	896	890	134	892	16400	
952	69	958	71	41	983	43	37	985	986	1021	1022	1	7	5	1019	824	197	830	199	169	855	171	165	857	858	893	894	129	135	133	891	16400	
469	558	463	560	550	476	551	478	472	548	582	583	446	444	440	580	341	686	335	688	678	348	679	350	344	676	710	711	318	316	312	708	16400	
464	559	470	557	552	482	545	479	544	473	584	447	577	450	576	441	336	687	342	685	680	354	673	351	672	345	712	319	705	322	704	313	16400	
562	465	556	467	471	543	480	546	481	554	439	578	448	575	449	586	690	337	684	339	343	671	352	674	353	682	311	706	320	703	321	714	16400	
555	468	561	466	477	549	474	547	553	475	445	442	579	581	585	443	683	340	689	338	349	677	346	675	681	347	317	314	707	709	713	315	16400	
538	540	483	489	500	524	530	497	498	526	622	405	406	616	408	618	666	668	355	361	372	652	658	369	370	654	750	277	278	744	280	746	16400	
488	494	531	537	521	511	516	505	518	504	403	620	619	409	407	617	360	366	659	665	649	383	644	377	646	376	275	748	747	281	279	745	16400	
490	491	534	535	529	506	517	512	515	496	419	608	413	610	411	614	362	363	662	663	657	378	645	384	643	368	291	736	285	738	283	742	16400	
539	533	492	486	523	520	507	514	509	502	414	609	420	607	613	412	667	661	364	358	651	648	379	642	381	374	286	737	292	735	741	284	16400	
484	532	493	541	503	513	510	519	508	522	612	415	606	417	621	404	356	660	365	669	375	641	382	647	380	650	740	287	734	289	749	276	16400	
536	485	542	487	499	501	495	528	527	525	605	418	611	416	615	410	664	357	670	359	371	373	367	656	655	653	733	290	739	288	743	282	16400	
570	572	451	457	603	422	437	590	431	592	401	626	395	628	633	392	698	700	323	329	731	294	309	718	303	720	273	754	267	756	761	264	16400	
458	459	566	567	595	430	432	591	438	589	396	627	402	625	631	394	330	331	694	695	723	302	304	719	310	717	268	755	274	753	759	266	16400	
571	462	563	454	429	596	594	433	588	435	630	397	624	399	639	386	699	334	691	326	301	724	722	305	716	307	758	269	752	271	767	258	16400	
456	565	460	569	597	428	587	436	593	434	623	400	629	398	393	632	328	693	332	697	725	300	715	308	721	306	751	272	757	270	265	760	16400	
452	564	461	573	426	600	598	604	424	423	388	387	640	634	390	636	324	692	333	701	298	728	726	732	296	295	260	259	768	762	262	764	16400	
568	453	574	455	425	599	427	421	601	602	637	638	385	391	389	635	696	325	702	327	297	727	299	293	729	730	765	766	257	263	261	763	16400	
16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400

There are total 24 magic squares of order 32. The other can be seen in **excel files** attached with the work.

3 Pandiagonal Magic Squares Multiples of 16

The procedure to calculate **pandiagonal** magic squares is totally different from the one given above for bordered magic squares multiples of 16. In this case we have to make separate distribution for each order of magic square. Reader can see this procedure in author's previous

works on orders multiples of 4, 8 and 12 [24, 26, 28].

In the beginning of previous Section 2, we have given 24 magic squares of order 16. But there is one **pandiagonal** magic square of order 16 not written there. Below is this magic square.

3.1 Pandiagonal Magic Square of Order 16

	pan	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056
2056	7	252	1	254	15	244	9	246	23	236	17	238	31	228	25	230	2056
2056	2	253	8	251	10	245	16	243	18	237	24	235	26	229	32	227	2056
2056	256	3	250	5	248	11	242	13	240	19	234	21	232	27	226	29	2056
2056	249	6	255	4	241	14	247	12	233	22	239	20	225	30	231	28	2056
2056	39	220	33	222	47	212	41	214	55	204	49	206	63	196	57	198	2056
2056	34	221	40	219	42	213	48	211	50	205	56	203	58	197	64	195	2056
2056	224	35	218	37	216	43	210	45	208	51	202	53	200	59	194	61	2056
2056	217	38	223	36	209	46	215	44	201	54	207	52	193	62	199	60	2056
2056	71	188	65	190	79	180	73	182	87	172	81	174	95	164	89	166	2056
2056	66	189	72	187	74	181	80	179	82	173	88	171	90	165	96	163	2056
2056	192	67	186	69	184	75	178	77	176	83	170	85	168	91	162	93	2056
2056	185	70	191	68	177	78	183	76	169	86	175	84	161	94	167	92	2056
2056	103	156	97	158	111	148	105	150	119	140	113	142	127	132	121	134	2056
2056	98	157	104	155	106	149	112	147	114	141	120	139	122	133	128	131	2056
2056	160	99	154	101	152	107	146	109	144	115	138	117	136	123	130	125	2056
	153	102	159	100	145	110	151	108	137	118	143	116	129	126	135	124	2056
	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056	2056

3.3 Pandiagonal Magic Square of Order 48

pan	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320	55320
55320	7	2300	1	2302	15	2292	9	2294	23	2284	17	2286	31	2276	25	2278	135	2172	129	2174	143	2164	137	2166	151	2156	145	2158	159	2148	153	2150	263	2044	257	2046	271	2036	265	2038	279	2028	273	2030	287	2020	281	2022	55320
55320	2	2301	8	2299	10	2293	16	2291	18	2285	24	2283	26	2277	32	2275	130	2173	136	2171	138	2165	144	2163	146	2157	152	2155	154	2149	160	2147	258	2045	264	2043	266	2037	272	2035	274	2029	280	2027	282	2021	288	2019	55320
55320	2304	3	2298	5	2296	11	2290	13	2288	19	2282	21	2280	27	2274	29	2176	131	2170	133	2168	139	2162	141	2160	147	2154	149	2152	155	2146	157	2048	259	2042	261	2040	267	2034	269	2032	275	2026	277	2024	283	2018	285	55320
55320	2297	6	2303	4	2289	6	2295	12	2281	22	2287	20	2273	30	2279	28	2169	134	2175	132	2161	142	2167	140	2153	150	2159	148	2145	158	2151	156	2041	262	2047	260	2033	270	2039	268	2025	278	2031	276	2017	286	2023	284	55320
55320	39	2268	33	2270	47	2260	41	2262	55	2252	49	2254	63	2244	57	2246	167	2140	161	2142	175	2132	169	2134	183	2124	177	2126	191	2116	185	2118	295	2012	289	2014	303	2004	297	2006	311	1996	305	1998	319	1988	313	1990	55320
55320	34	2269	40	2267	42	2261	48	2259	50	2253	56	2251	58	2245	64	2243	162	2141	168	2139	170	2133	176	2131	178	2125	184	2123	186	2117	192	2115	290	2013	296	2011	298	2005	304	2003	306	1997	312	1995	314	1989	320	1987	55320
55320	2272	35	2266	37	2264	43	2258	45	2256	51	2250	53	2248	59	2242	61	2144	163	2138	165	2136	171	2130	173	2128	179	2122	181	2120	187	2114	189	2016	291	2010	293	2008	299	2002	301	2000	307	1994	309	1992	315	1986	317	55320
55320	2265	38	2271	36	2257	46	2263	44	2249	54	2255	52	2241	62	2247	60	2137	166	2143	164	2129	174	2135	172	2121	182	2127	180	2113	190	2119	188	2009	294	2015	292	2001	302	2007	300	1993	310	1999	308	1985	318	1991	316	55320
55320	71	2236	65	2238	79	2228	73	2230	87	2220	81	2222	95	2212	89	2214	199	2108	193	2110	207	2100	201	2102	215	2092	209	2094	223	2084	217	2086	327	1980	321	1982	335	1972	329	1974	343	1964	337	1966	351	1956	345	1958	55320
55320	66	2237	72	2235	74	2229	80	2227	82	2221	88	2219	90	2213	96	2211	194	2109	200	2107	202	2101	208	2099	210	2093	216	2091	218	2085	224	2083	322	1981	328	1979	330	1973	336	1971	338	1965	344	1963	346	1957	352	1955	55320
55320	2240	67	2234	69	2232	75	2226	77	2224	83	2218	85	2216	91	2210	93	2112	195	2106	197	2104	203	2098	205	2096	211	2090	213	2088	219	2082	221	1984	323	1978	325	1976	331	1970	333	1968	339	1962	341	1960	347	1954	349	55320
55320	2233	70	2239	68	2225	78	2231	76	2217	86	2223	84	2209	94	2215	92	2105	198	2111	196	2097	206	2103	204	2089	214	2095	212	2081	222	2087	220	1977	326	1983	324	1969	334	1975	332	1961	342	1967	340	1953	350	1959	348	55320
55320	103	2204	97	2206	111	2196	105	2198	119	2188	113	2190	127	2180	121	2182	239	2068	233	2070	247	2060	241	2062	255	2052	249	2054	359	1948	353	1950	367	1940	361	1942	375	1932	369	1934	383	1924	377	1926	391	1916	385	1918	55320
55320	98	2205	104	2203	106	2197	112	2195	114	2189	120	2187	122	2181	128	2179	226	2077	232	2075	234	2069	240	2067	242	2061	248	2059	250	2053	256	2051	354	1949	360	1947	362	1941	368	1939	370	1933	376	1931	378	1925	384	1923	55320
55320	2208	99	2202	101	2200	107	2194	109	2192	115	2186	117	2184	123	2178	125	2080	227	2074	229	2072	235	2066	237	2064	243	2058	245	2056	251	2050	253	1952	355	1946	357	1944	363	1938	365	1936	371	1930	373	1928	379	1922	381	55320
55320	2201	102	2207	100	2193	110	2199	108	2185	118	2191	116	2177	126	2183	124	2073	230	2079	228	2065	238	2071	236	2057	246	2063	244	2049	254	2055	252	1945	358	1951	356	1937	366	1943	364	1929	374	1935	372	1921	382	1927	380	55320
55320	391	1916	385	1918	399	1908	393	1910	407	1900	401	1902	415	1892	409	1894	519	1788	513	1790	527	1780	521	1782	535	1772	529	1774	543	1764	537	1766	647	1660	641	1662	655	1652	649	1654	663	1644	657	1646	671	1636	665	1638	55320
55320	386	1917	392	1915	394	1909	400	1907	402	1901	408	1899	410	1893	416	1891	514	1789	520	1787	522	1781	528	1779	530	1773	536	1771	538	1765	544	1763	642	1661	648	1659	650	1653	656	1651	658	1645	664	1643	666	1637	672	1635	55320
55320	1920	387	1914	389	1912	395	1906	397	1904	403	1898	405	1896	411	1890	413	1792	515	1786	517	1784	523	1778	525	1776	531	1770	533	1768	539	1762	541	1664	643	1658	645	1656	651	1650	653	1648	659	1642	661	1640	667	1634	669	55320
55320	1913	390	1919	388	1905	398	1911	396	1897	406	1903	404	1889	414	1895	412	1785	518	1791	516	1777	526	1783	524	1769	534	1775	532	1761	542	1767	540	1657	646	1663	644	1649	654	1655	652	1641	662	1647	660	1633	670	1639	668	55320
55320	423	1884	417	1886	431	1876	425	1878	439	1868	433	1870	447	1860	441	1862	551	1756	545	1758	559	1748	553	1750	567	1740	561	1742	575	1732	569	1734	679	1628	673	1630	687	1620	681	1622	695	1612	689	1614	703	1604	697	1606	55320
55320	418	1885	424	1883	426	1877	432	1875	434	1869	440	1867	442	1861	448	1859	546	1757	552	1755	554	1749	560	1747	562	1741	568	1739	570	1733	576	1731	674	1629	680	1627	682	1621	688	1619	690	1613	696	1611	698	1605	704	1603	55320
55320	1888	419	1882	421	1880	427	1874	429	1872	435	1866	437	1864	443	1858	445	1760	547	1754	549	1752	555	1746	557	1744	563	1738	565	1736	571	1730	573	1632	675	1626	677	1624	683	1618	685	1616	691	1610	693	1608	699	1602	701	55320
55320	1881	422	1887	420	1873	430	1879	428	1865	438	1871	436	1857	446	1863	444	1753	550	1759	548	1745	558	1751	556	1737	566	1743	564	1729	574	1735	572	1625	678	1631	676	1617	686	1623	684	1609	694	1615	692	1601	702	1607	700	55320
55320	455	1852	449	1854	463	1844	457	1846	471	1836	465	1838	479	1828	473	1830	583	1724	577	1726	591	1716	585	1718	599	1708	593	1710	607	1700	601	1702	711	1596	705	1598	719	1588	713	1590	727	1580	721	1582	735	1572	729	1574	55320
55320	450	1853	456	1851	458	1845	464	1843	466	1837	472	1835	474	1829	480	1827	578	1725	584	1723	586	1717	592	1715	594	1709	600	1707	602	1701	608	1699	706	1597	712	1595	714	1589	720	1587	722	1581	728	1579	730	1573	736	1571	55320
55320	1856	451	1850	453	1848	459	1842	461	1840	467	1834	469	1832	475	1826	477	1728	579	1722	581	1720	587	1714	589	1712	595	1706	597	1704	603	1698	605	1600	707	1594	709	1592	715	1586	717	1584	72							

4 Author's Contribution to Magic Squares and Recreation Numbers

For author's contribution to **magic squares** and **recreation numbers** please see the links below:

- **Inder J. Taneja**, Magic Squares, <https://inderjtaneja.com/2019/06/27/publications-magic-squares/>
- **Inder J. Taneja**, Recreation of Numbers, <https://inderjtaneja.com/2019/06/27/publications-recreation-of-numbers/>

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- [2] **H. Danielsson**, Bordered Magic Squares - <https://www.magic-squares.info/methods/bordered.html>
- **Block-Wise Magic Squares**
- [3] **Inder J. Taneja**, Block-Wise Constructions of Magic and Bimagic Squares of Orders 8 to 108, May 15, 2019, pp. 1-43, **Zenodo**, <http://doi.org/10.5281/zenodo.2843326>.
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- [5] **Inder J. Taneja**, Magic Rectangles in Construction of Block-Wise Pandiagonal Magic Squares, **Zenodo**, January 31, 2019, pp. 1-49, <http://doi.org/10.5281/zenodo.2554520>.
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- [7] **Inder J. Taneja**, Block-Wise Unequal Sums Magic Squares, **Zenodo**, February 1, 2019, pp. 1-52, <http://doi.org/10.5281/zenodo.2555260>.
- [8] **Inder J. Taneja**, Block-Wise Magic and Bimagic Squares of Orders 12 to 36, **Zenodo**, February 1, 2019, pp. 1-53, <http://doi.org/10.5281/zenodo.2555343>.

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• Bordered Magic Squares

- [10] **Inder J. Taneja**, Nested Magic Squares With Perfect Square Sums, Pythagorean Triples, and Borders Differences, **Zenodo**, June 14, 2019, pp. 1-59, <http://doi.org/10.5281/zenodo.3246586>.

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