

1115 Midsummer Eve



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Instructions

Thank you for choosing Golden Kite products!
We hope you will have lots of fun with this cross-stitch pattern!

Fabric

Press the fabric with an iron if needed. A good thing to prevent the fabric from fraying is to machine zigzag the edges.

On large patterns, it is easiest to start from the upper left corner of the design. Make sure you have the proper margins before starting and that the fabric piece is of the correct size. The best way to verify this is to count all stitch positions on the fabric from the upper left corner downwards and to the right to make sure there is enough space for the design.

Some prefer to start in the center of the design instead. To locate the center of the fabric, fold the fabric in half both vertically and horizontally. The center is located where these two folds meet.

Stitches

Each length of DMC tread consists of six strands.
Use two of these strands for all stitches.

Note that some colors may be mixes (or blends) between two different pure colors. In that case take one strand of the two colors each and thread the two strands into the needle at the same time for stitching.

All stitches are full cross-stitches. No half-stitching and no back-stitching is necessary in this pattern.

All cross-stitches will be worked into the holes in the fabric from left to right. Always use the larger holes in the fabric for the stitches. Adjacent stitches should meet in the same hole. Make sure all stitches cross in the same direction.

Please be careful when washing the finished embroidery! The cotton thread may bleed when washed. Only hand wash it in lukewarm water. Remove excess water by roll it in a towel and lay it flat to air dry. Natural fabrics may shrink slightly when washed. We do not recommend washing the embroidery if not absolutely necessary and we take no responsibility for any damage that may occur.

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Midsummer Eve

Stitch Count	
Horizontal:	241
Vertical:	339

Recommended Fabric Color
Antique White

This table tells the size of the pattern (without any margins) and the size of the fabric required to stitch the pattern (including recommended margins). 3 inch margins have been added on each side in the 'Including Margins' row.

The sizes are given for 14, 16 and 18 stitches per inch fabrics.

Make sure to use the 'Including Margins' row when cutting the piece of fabric to be used. Also make sure that 3 inch margins are enough for your stitching technique and add more margin areas if necessary.

	14				16				18			
	Width		Height		Width		Height		Width		Height	
	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch
Pattern:	44	17.19	62	24.1	39	15.04	54	21.09	34	13.375	48	18.75
Including Margins:	60	24	78	31	55	22	70	28	50	20	64	25
	10				12				24			
	Width		Height		Width		Height		Width		Height	
	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch
Pattern:	61	24.06	86	33.74	51	20.05	72	28.11	25	10.02	36	14.05
Including Margins:	77	31	102	40	67	27	88	35	41	17	52	21
	25				26				27			
	Width		Height		Width		Height		Width		Height	
	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch
Pattern:	24	9.62	34	13.49	23	9.25	33	12.97	22	8.91	32	12.49
Including Margins:	40	16	50	20	39	16	49	19	38	15	48	19
	28				30				32			
	Width		Height		Width		Height		Width		Height	
	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch	cm	inch
Pattern:	22	8.59	31	12.05	20	8.02	28	11.24	19	7.52	27	10.54
Including Margins:	38	15	47	19	36	15	44	18	35	14	43	17

Solid Color Stitches. Use two strands of the specified color for these stitches.

Symbol	DMC	Name
★	223	Shell Pink-LT
⬢	224	Shell Pink-VY LT
⬢	225	Shell Pink-UL VY LT
■	310	Black
⬢	312	Baby Blue-VY DK
⬢	317	Pewter Gray
⬢	318	Steel Gray-LT
✕	334	Baby Blue-MD
●	336	Navy Blue
⋮	353	Peach
⬢	372	Mustard-LT
⬢	407	Desert Sand-DK
✕	413	Pewter Gray-DK
▲	414	Steel Gray-DK
◁	415	Pearl Gray
⋮	422	Hazelnut Brown-LT
⬢	437	Tan-LT
✕	451	Shell Gray-DK
▲	452	Shell Gray-MD
✱	503	Blue Green-MD
⊙	522	Fern Green
⬢	524	Fern Green-VY LT
♣	535	Ash Gray-VY LT
⊙	543	Beige Brown-UL VY LT
▽	564	Jade-VY LT
↖	597	Turquoise
⬢	598	Turquoise-LT
▀	611	Drab Brown
⬢	640	Beige Gray-VY DK
⬢	645	Beaver Gray-VY DK
⬢	646	Beaver Gray-DK
⬢	647	Beaver Gray-MD
⬢	648	Beaver Gray-LT
◊	712	Cream
⬢	738	Tan-VY LT
1	746	Off White
⬢	747	Sky Blue-VY LT
4	754	Peach-LT
✓	758	Terra Cotta-VY LT
√	762	Pearl Gray-VY LT
⬢	778	Antique Mauve-VY LT
➔	792	Cornflower Blue-DK
⊙	793	Cornflower Blue-MD

⬢	809	Delft Blue
●	838	Beige Brown-VY DK
⬢	844	Beaver Brown-UL DK
✕	913	Nile Green-MD
♥	924	Gray Green--VY DK
=	926	Gray Green-MD
⬢	927	Gray Green-LT
✕	930	Antique Blue-DK
⬢	931	Antique Blue-MD
⬢	932	Antique Blue-LT
□	948	Peach-VY LT
⬢	950	Desert Sand-LT
<	951	Tawny-LT
○	955	Nile Green-LT
▷	963	Dusty Rose-UL VY LT
⬢	993	Aquamarine-LT
⬢	3021	Brown Gray-VY DK
⬢	3024	Brown Gray-VY LT
●	3031	Mocha Brown-VY DK
◀	3032	Mocha Brown-MD
✕	3041	Antique Violet-MD
⬢	3053	Green Gray
⬢	3078	Golden Yellow-VY LT
⬢	3325	Baby Blue-LT
⬢	3713	Salmon-VY LT
⬢	3726	Antique Mauve-DK
⬢	3727	Antique Mauve-LT
⬢	3747	Blue Violet-VY LT
⬢	3750	Antique Blue-VY DK
⬢	3756	Baby Blue-UL VY LT
⬢	3761	Sky Blue-LT
⬢	3766	Peacock Blue-LT
⬢	3768	Gray Green-DK
∞	3770	Tawny-VY LT
✱	3772	Desert Sand-VY DK
⬢	3779	Terra Cotta-UL VY LT
⬢	3799	Pewter Gray-VY DK
⬢	3836	Grape-LT
⬢	3839	Lavender Blue-MD
⬢	3849	Teal Green-LT
⬢	3856	Mahogany-UL VY LT
⬢	3861	Cocoa-LT
⬢	3864	Mocha Beige-LT
u	3865	Winter White
>	3866	Mocha Brown-UL VY LT
o	Ecru	Ecru

Blend Stitches. Use one strand of each of DMC1 and DMC2 for these stitches.

Symbol	DMC1	Name1	DMC2	Name2
=	754	Peach-LT	951	Tawny-LT
●	535	Ash Gray-VY LT	645	Beaver Gray-VY DK
⊕	535	Ash Gray-VY LT	926	Gray Green-MD
×	738	Tan-VY LT	3864	Mocha Beige-LT
⊕	414	Steel Gray-DK	927	Gray Green-LT
×	3861	Cocoa-LT	3864	Mocha Beige-LT
⊕	223	Shell Pink-LT	407	Desert Sand-DK
♡	353	Peach	948	Peach-VY LT
▲	503	Blue Green-MD	926	Gray Green-MD
«	3770	Tawny-VY LT	3865	Winter White
♂	317	Pewter Gray	931	Antique Blue-MD
♣	312	Baby Blue-VY DK	317	Pewter Gray
▨	312	Baby Blue-VY DK	931	Antique Blue-MD
▩	318	Steel Gray-LT	415	Pearl Gray
↓	317	Pewter Gray	930	Antique Blue-DK
▼	930	Antique Blue-DK	931	Antique Blue-MD
◆	413	Pewter Gray-DK	924	Gray Green--VY DK
↘	931	Antique Blue-MD	932	Antique Blue-LT
↗	451	Shell Gray-DK	647	Beaver Gray-MD
↓	924	Gray Green--VY DK	3768	Gray Green-DK
✱	317	Pewter Gray	3809	Turquoise-VY DK
▶	517	Wedgewood-DK	931	Antique Blue-MD
⬇	334	Baby Blue-MD	931	Antique Blue-MD
↔	334	Baby Blue-MD	517	Wedgewood-DK
■	310	Black	3799	Pewter Gray-VY DK
←	930	Antique Blue-DK	3809	Turquoise-VY DK
↻	334	Baby Blue-MD	3849	Teal Green-LT
//	931	Antique Blue-MD	3849	Teal Green-LT
⊗	931	Antique Blue-MD	3809	Turquoise-VY DK
⌒	223	Shell Pink-LT	3032	Mocha Brown-MD
*	223	Shell Pink-LT	3726	Antique Mauve-DK
+	640	Beige Gray-VY DK	632	Desert Sand-UL VY DK
●	3726	Antique Mauve-DK	451	Shell Gray-DK
⋮	632	Desert Sand-UL VY DK	844	Beaver Brown-UL DK
⊙	334	Baby Blue-MD	3807	Cornflower Blue
⊠	597	Turquoise	334	Baby Blue-MD
⬇	407	Desert Sand-DK	640	Beige Gray-VY DK
▲	640	Beige Gray-VY DK	3772	Desert Sand-VY DK
◀	3726	Antique Mauve-DK	640	Beige Gray-VY DK
☾	3032	Mocha Brown-MD	3726	Antique Mauve-DK
⊠	317	Pewter Gray	3807	Cornflower Blue
○	931	Antique Blue-MD	3807	Cornflower Blue
↑	648	Beaver Gray-LT	224	Shell Pink-VY LT
7	3024	Brown Gray-VY LT	778	Antique Mauve-VY LT
⋈	3727	Antique Mauve-LT	415	Pearl Gray
⋈	640	Beige Gray-VY DK	3861	Cocoa-LT
▣	926	Gray Green-MD	317	Pewter Gray
(3770	Tawny-VY LT	963	Dusty Rose-UL VY LT
↔	3689	Mauve-LT	353	Peach
~	3865	Winter White	963	Dusty Rose-UL VY LT
⊙	316	Antique Mauve-MD	452	Shell Gray-MD
/	3024	Brown Gray-VY LT	3689	Mauve-LT
β	3024	Brown Gray-VY LT	353	Peach

::	3024	Brown Gray-VY LT	3727	Antique Mauve-LT
◇	3861	Cocoa-LT	451	Shell Gray-DK
**	962	Dusty Rose-MD	3716	Dusty Rose-VY LT
н	3716	Dusty Rose-VY LT	3727	Antique Mauve-LT
ρ	3689	Mauve-LT	3716	Dusty Rose-VY LT
—	3716	Dusty Rose-VY LT	778	Antique Mauve-VY LT
⓪	3864	Mocha Beige-LT	3733	Dusty Rose
□	3761	Sky Blue-LT	3325	Baby Blue-LT
✧	760	Salmon	3778	Terra Cotta-LT
	3689	Mauve-LT	3727	Antique Mauve-LT
⊞	3689	Mauve-LT	3866	Mocha Brown-UL VY LT
γ	224	Shell Pink-VY LT	3727	Antique Mauve-LT
▲	3740	Antique Violet-DK	3790	Beige Gray-UL DK
· ·	778	Antique Mauve-VY LT	950	Desert Sand-LT
Ⓢ	3733	Dusty Rose	778	Antique Mauve-VY LT
g	3713	Salmon-VY LT	3716	Dusty Rose-VY LT
⊞	747	Sky Blue-VY LT	3747	Blue Violet-VY LT
·	963	Dusty Rose-UL VY LT	747	Sky Blue-VY LT
△	3689	Mauve-LT	762	Pearl Gray-VY LT
ℳ	3733	Dusty Rose	738	Tan-VY LT
3	778	Antique Mauve-VY LT	739	Tan-UL VY LT
5	778	Antique Mauve-VY LT	353	Peach
m	758	Terra Cotta-VY LT	950	Desert Sand-LT
+	762	Pearl Gray-VY LT	3747	Blue Violet-VY LT
☆	415	Pearl Gray	3024	Brown Gray-VY LT
n	3770	Tawny-VY LT	746	Off White
‡	926	Gray Green-MD	930	Antique Blue-DK
☾	645	Beaver Gray-VY DK	646	Beaver Gray-DK
⊞	647	Beaver Gray-MD	414	Steel Gray-DK
)	3078	Golden Yellow-VY LT	353	Peach
⇒	3078	Golden Yellow-VY LT	3856	Mahogany-UL VY LT
↘	407	Desert Sand-DK	738	Tan-VY LT
⊞	407	Desert Sand-DK	372	Mustard-LT
▼	3341	Apricot	3856	Mahogany-UL VY LT
a	353	Peach	3856	Mahogany-UL VY LT
❖	3041	Antique Violet-MD	3861	Cocoa-LT
∴	927	Gray Green-LT	931	Antique Blue-MD
☾	413	Pewter Gray-DK	317	Pewter Gray
√	353	Peach	437	Tan-LT
⊞	3041	Antique Violet-MD	452	Shell Gray-MD
z	452	Shell Gray-MD	3861	Cocoa-LT
±	3856	Mahogany-UL VY LT	437	Tan-LT
›	931	Antique Blue-MD	993	Aquamarine-LT
♠	645	Beaver Gray-VY DK	926	Gray Green-MD
■	640	Beige Gray-VY DK	3790	Beige Gray-UL DK
⊞	3740	Antique Violet-DK	645	Beaver Gray-VY DK
φ	645	Beaver Gray-VY DK	3790	Beige Gray-UL DK
⦿	632	Desert Sand-UL VY DK	3790	Beige Gray-UL DK
⦿	312	Baby Blue-VY DK	336	Navy Blue
↑	317	Pewter Gray	336	Navy Blue
τ	927	Gray Green-LT	993	Aquamarine-LT
◇	955	Nile Green-LT	415	Pearl Gray
○	415	Pearl Gray	564	Jade-VY LT
⊞	564	Jade-VY LT	932	Antique Blue-LT
⊞	3740	Antique Violet-DK	646	Beaver Gray-DK
‡	316	Antique Mauve-MD	3861	Cocoa-LT
⊞	407	Desert Sand-DK	3726	Antique Mauve-DK
^	948	Peach-VY LT	3770	Tawny-VY LT

This table specifies how much thread of each color is required to stitch this pattern. It is good to know that one complete DMC skein contains 313 inches (795 cm) thread.

DMC	Name	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)
		14		16		18	
223	Shell Pink-LT	23	9	22	8	20	7
224	Shell Pink-VY LT	148	58	141	55	127	50
225	Shell Pink-UL VY LT	39	15	37	14	33	12
310	Black	1148	451	1093	430	984	387
312	Baby Blue-VY DK	362	142	345	135	310	122
316	Antique Mauve-MD	40	15	38	14	34	13
317	Pewter Gray	2451	964	2334	918	2101	827
318	Steel Gray-LT	220	86	210	82	189	74
334	Baby Blue-MD	252	99	240	94	216	85
336	Navy Blue	292	114	278	109	250	98
353	Peach	152	59	145	57	130	51
372	Mustard-LT	44	17	42	16	38	14
407	Desert Sand-DK	69	27	66	25	59	23
413	Pewter Gray-DK	1279	503	1218	479	1096	431
414	Steel Gray-DK	571	224	544	214	489	192
415	Pearl Gray	260	102	248	97	223	87
422	Hazelnut Brown-LT	5	1	4	1	4	1
437	Tan-LT	29	11	28	11	25	9
451	Shell Gray-DK	165	64	157	61	142	55
452	Shell Gray-MD	403	158	383	150	345	135
503	Blue Green-MD	214	84	204	80	183	72
517	Wedgewood-DK	80	31	76	29	68	26
522	Fern Green	35	13	33	12	30	11
524	Fern Green-VY LT	77	30	73	28	66	25
535	Ash Gray-VY LT	417	164	398	156	358	140
543	Beige Brown-UL VY LT	58	22	55	21	50	19
564	Jade-VY LT	88	34	84	33	76	29
597	Turquoise	67	26	63	24	57	22
598	Turquoise-LT	35	13	33	12	30	11
611	Drab Brown	6	2	6	2	5	1
632	Desert Sand-UL VY DK	25	9	24	9	22	8
640	Beige Gray-VY DK	149	58	142	55	128	50
645	Beaver Gray-VY DK	431	169	411	161	370	145
646	Beaver Gray-DK	289	113	276	108	248	97
647	Beaver Gray-MD	248	97	236	92	212	83
648	Beaver Gray-LT	184	72	176	69	158	62
712	Cream	40	15	38	14	34	13
738	Tan-VY LT	102	40	97	38	87	34
739	Tan-UL VY LT	31	12	30	11	27	10
746	Off White	54	21	51	20	46	18
747	Sky Blue-VY LT	93	36	89	35	80	31
754	Peach-LT	51	20	49	19	44	17
758	Terra Cotta-VY LT	55	21	52	20	47	18
760	Salmon	2	1	2	1	2	1
762	Pearl Gray-VY LT	86	33	82	32	74	29
778	Antique Mauve-VY LT	148	58	141	55	127	50
792	Cornflower Blue-DK	6	2	5	1	5	1
793	Cornflower Blue-MD	63	24	60	23	54	21
809	Delft Blue	59	23	56	22	50	19
838	Beige Brown-VY DK	9	3	8	3	7	2
844	Beaver Brown-UL DK	272	107	259	101	233	91
913	Nile Green-MD	6	2	6	2	5	1
924	Gray Green--VY DK	1150	452	1095	431	986	388
926	Gray Green-MD	835	328	795	312	716	281

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927	Gray Green-LT	607	238	578	227	520	204
930	Antique Blue-DK	840	330	800	314	720	283
931	Antique Blue-MD	1882	740	1792	705	1613	635
932	Antique Blue-LT	337	132	321	126	289	113
948	Peach-VY LT	82	32	78	30	70	27
950	Desert Sand-LT	128	50	122	48	109	42
951	Tawny-LT	48	18	45	17	41	16
955	Nile Green-LT	41	16	39	15	35	13
962	Dusty Rose-MD	1	1	1	1	1	1
963	Dusty Rose-UL VY LT	82	32	78	30	70	27
993	Aquamarine-LT	82	32	78	30	70	27
3021	Brown Gray-VY DK	92	36	87	34	79	31
3024	Brown Gray-VY LT	250	98	238	93	214	84
3031	Mocha Brown-VY DK	51	20	48	18	43	16
3032	Mocha Brown-MD	78	30	74	29	66	25
3041	Antique Violet-MD	233	91	222	87	200	78
3053	Green Gray	20	7	19	7	17	6
3078	Golden Yellow-VY LT	62	24	59	23	53	20
3325	Baby Blue-LT	36	14	35	13	31	12
3341	Apricot	4	1	4	1	4	1
3689	Mauve-LT	103	40	98	38	89	35
3713	Salmon-VY LT	25	9	23	9	21	8
3716	Dusty Rose-VY LT	14	5	13	5	12	4
3726	Antique Mauve-DK	51	20	49	19	44	17
3727	Antique Mauve-LT	114	44	109	42	98	38
3733	Dusty Rose	51	20	49	19	44	17
3740	Antique Violet-DK	160	62	153	60	137	53
3747	Blue Violet-VY LT	44	17	41	16	37	14
3750	Antique Blue-VY DK	22	8	21	8	19	7
3756	Baby Blue-UL VY LT	36	14	34	13	31	12
3761	Sky Blue-LT	26	10	25	9	22	8
3766	Peacock Blue-LT	25	9	24	9	21	8
3768	Gray Green-DK	538	211	512	201	461	181
3770	Tawny-VY LT	173	68	165	64	148	58
3772	Desert Sand-VY DK	26	10	25	9	22	8
3778	Terra Cotta-LT	2	1	2	1	2	1
3779	Terra Cotta-UL VY LT	40	15	38	14	35	13
3790	Beige Gray-UL DK	47	18	45	17	41	16
3799	Pewter Gray-VY DK	1680	661	1600	629	1440	566
3807	Cornflower Blue	347	136	330	129	297	116
3809	Turquoise-VY DK	190	74	181	71	163	64
3836	Grape-LT	10	3	9	3	8	3
3839	Lavender Blue-MD	20	7	19	7	17	6
3849	Teal Green-LT	109	42	104	40	93	36
3856	Mahogany-UL VY LT	59	23	56	22	51	20
3861	Cocoa-LT	306	120	292	114	262	103
3864	Mocha Beige-LT	194	76	184	72	166	65
3865	Winter White	129	50	123	48	110	43
3866	Mocha Brown-UL VY LT	77	30	74	29	66	25
Ecru	Ecru	10	3	9	3	8	3

Extended thread usage table.

DMC	Name	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)
		10		12		24	
223	Shell Pink-LT	36	13	30	11	15	5
224	Shell Pink-VY LT	229	90	191	75	95	38
225	Shell Pink-UL VY LT	59	22	50	18	25	9

310	Black	1771	697	1476	581	738	290
312	Baby Blue-VY DK	558	220	465	183	233	92
316	Antique Mauve-MD	61	23	51	20	26	10
317	Pewter Gray	3782	1489	3152	1241	1576	620
318	Steel Gray-LT	340	133	284	111	142	56
334	Baby Blue-MD	389	153	324	128	162	64
336	Navy Blue	450	176	375	147	188	74
353	Peach	234	92	195	77	98	38
372	Mustard-LT	68	25	57	21	29	11
407	Desert Sand-DK	106	41	89	35	44	17
413	Pewter Gray-DK	1973	776	1644	647	822	323
414	Steel Gray-DK	880	346	734	288	367	144
415	Pearl Gray	401	157	335	131	167	65
422	Hazelnut Brown-LT	7	2	6	2	3	1
437	Tan-LT	45	16	38	14	19	7
451	Shell Gray-DK	256	99	213	83	107	41
452	Shell Gray-MD	621	243	518	203	259	101
503	Blue Green-MD	329	130	275	108	137	54
517	Wedgewood-DK	122	47	102	39	51	20
522	Fern Green	54	20	45	17	23	8
524	Fern Green-VY LT	119	45	99	38	50	19
535	Ash Gray-VY LT	644	252	537	210	269	105
543	Beige Brown-UL VY LT	90	34	75	29	38	14
564	Jade-VY LT	137	52	114	44	57	22
597	Turquoise	103	40	86	33	43	17
598	Turquoise-LT	54	20	45	17	23	8
611	Drab Brown	9	2	8	2	4	1
632	Desert Sand-UL VY DK	40	14	33	12	17	6
640	Beige Gray-VY DK	230	90	192	75	96	38
645	Beaver Gray-VY DK	666	261	555	218	278	109
646	Beaver Gray-DK	446	175	372	146	186	73
647	Beaver Gray-MD	382	149	318	125	159	62
648	Beaver Gray-LT	284	112	237	93	119	47
712	Cream	61	23	51	20	26	10
738	Tan-VY LT	157	61	131	51	65	26
739	Tan-UL VY LT	49	18	41	15	20	8
746	Off White	83	32	69	27	35	14
747	Sky Blue-VY LT	144	56	120	47	60	23
754	Peach-LT	79	31	66	26	33	13
758	Terra Cotta-VY LT	85	32	71	27	35	14
760	Salmon	4	2	3	2	2	1
762	Pearl Gray-VY LT	133	52	111	44	56	22
778	Antique Mauve-VY LT	229	90	191	75	95	38
792	Cornflower Blue-DK	9	2	8	2	4	1
793	Cornflower Blue-MD	97	38	81	32	41	16
809	Delft Blue	90	34	75	29	38	14
838	Beige Brown-VY DK	13	4	11	3	5	2
844	Beaver Brown-UL DK	419	164	350	137	175	68
913	Nile Green-MD	9	2	8	2	4	1
924	Gray Green--VY DK	1775	698	1479	582	740	291
926	Gray Green-MD	1289	506	1074	422	537	211
927	Gray Green-LT	936	367	780	306	390	153
930	Antique Blue-DK	1296	509	1080	425	540	212
931	Antique Blue-MD	2903	1143	2420	953	1210	476
932	Antique Blue-LT	520	203	434	170	217	85
948	Peach-VY LT	126	49	105	41	53	20
950	Desert Sand-LT	196	76	164	63	82	32
951	Tawny-LT	74	29	62	24	31	12
955	Nile Green-LT	63	23	53	20	26	10

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962	Dusty Rose-MD	2	2	2	2	1	1
963	Dusty Rose-UL VY LT	126	49	105	41	53	20
993	Aquamarine-LT	126	49	105	41	53	20
3021	Brown Gray-VY DK	142	56	119	47	59	23
3024	Brown Gray-VY LT	385	151	321	126	161	63
3031	Mocha Brown-VY DK	77	29	65	24	32	12
3032	Mocha Brown-MD	119	45	99	38	50	19
3041	Antique Violet-MD	360	140	300	117	150	59
3053	Green Gray	31	11	26	9	13	5
3078	Golden Yellow-VY LT	95	36	80	30	40	15
3325	Baby Blue-LT	56	22	47	18	23	9
3341	Apricot	7	2	6	2	3	1
3689	Mauve-LT	160	63	134	53	67	26
3713	Salmon-VY LT	38	14	32	12	16	6
3716	Dusty Rose-VY LT	22	7	18	6	9	3
3726	Antique Mauve-DK	79	31	66	26	33	13
3727	Antique Mauve-LT	176	68	147	57	74	29
3733	Dusty Rose	79	31	66	26	33	13
3740	Antique Violet-DK	247	95	206	80	103	40
3747	Blue Violet-VY LT	67	25	56	21	28	11
3750	Antique Blue-VY DK	34	13	29	11	14	5
3756	Baby Blue-UL VY LT	56	22	47	18	23	9
3761	Sky Blue-LT	40	14	33	12	17	6
3766	Peacock Blue-LT	38	14	32	12	16	6
3768	Gray Green-DK	830	326	692	272	346	136
3770	Tawny-VY LT	266	104	222	87	111	44
3772	Desert Sand-VY DK	40	14	33	12	17	6
3778	Terra Cotta-LT	4	2	3	2	2	1
3779	Terra Cotta-UL VY LT	63	23	53	20	26	10
3790	Beige Gray-UL DK	74	29	62	24	31	12
3799	Pewter Gray-VY DK	2592	1019	2160	849	1080	425
3807	Cornflower Blue	535	209	446	174	223	87
3809	Turquoise-VY DK	293	115	245	96	122	48
3836	Grape-LT	14	5	12	5	6	2
3839	Lavender Blue-MD	31	11	26	9	13	5
3849	Teal Green-LT	167	65	140	54	70	27
3856	Mahogany-UL VY LT	92	36	77	30	38	15
3861	Cocoa-LT	472	185	393	155	197	77
3864	Mocha Beige-LT	299	117	249	98	125	49
3865	Winter White	198	77	165	65	83	32
3866	Mocha Brown-UL VY LT	119	45	99	38	50	19
Ecru	Ecru	14	5	12	5	6	2

Extended thread usage table.

DMC	Name	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)
		25		26		27	
223	Shell Pink-LT	14	5	14	5	13	5
224	Shell Pink-VY LT	91	36	88	35	85	33
225	Shell Pink-UL VY LT	24	9	23	8	22	8
310	Black	708	279	681	268	656	258
312	Baby Blue-VY DK	223	88	215	84	207	81
316	Antique Mauve-MD	24	9	24	9	23	9
317	Pewter Gray	1513	595	1455	573	1401	551
318	Steel Gray-LT	136	53	131	51	126	49
334	Baby Blue-MD	156	61	150	59	144	57
336	Navy Blue	180	71	173	68	167	65
353	Peach	94	37	90	35	87	34

372	Mustard-LT	27	10	26	10	25	9
407	Desert Sand-DK	42	17	41	16	39	15
413	Pewter Gray-DK	789	310	759	298	731	287
414	Steel Gray-DK	352	138	339	133	326	128
415	Pearl Gray	161	63	154	60	149	58
422	Hazelnut Brown-LT	3	1	3	1	3	1
437	Tan-LT	18	6	17	6	17	6
451	Shell Gray-DK	102	40	98	38	95	37
452	Shell Gray-MD	248	97	239	93	230	90
503	Blue Green-MD	132	52	127	50	122	48
517	Wedgewood-DK	49	19	47	18	45	17
522	Fern Green	22	8	21	8	20	7
524	Fern Green-VY LT	48	18	46	17	44	17
535	Ash Gray-VY LT	258	101	248	97	239	93
543	Beige Brown-UL VY LT	36	14	35	13	33	13
564	Jade-VY LT	55	21	53	20	51	19
597	Turquoise	41	16	39	15	38	15
598	Turquoise-LT	22	8	21	8	20	7
611	Drab Brown	4	1	3	1	3	1
632	Desert Sand-UL VY DK	16	6	15	6	15	5
640	Beige Gray-VY DK	92	36	89	35	85	33
645	Beaver Gray-VY DK	266	104	256	100	247	97
646	Beaver Gray-DK	179	70	172	67	165	65
647	Beaver Gray-MD	153	60	147	57	141	55
648	Beaver Gray-LT	114	45	109	43	105	41
712	Cream	24	9	24	9	23	9
738	Tan-VY LT	63	24	60	24	58	23
739	Tan-UL VY LT	19	7	19	7	18	7
746	Off White	33	13	32	12	31	12
747	Sky Blue-VY LT	58	22	55	21	53	21
754	Peach-LT	32	12	30	12	29	11
758	Terra Cotta-VY LT	34	13	33	12	31	12
760	Salmon	1	1	1	1	1	1
762	Pearl Gray-VY LT	53	21	51	20	49	19
778	Antique Mauve-VY LT	91	36	88	35	85	33
792	Cornflower Blue-DK	4	1	3	1	3	1
793	Cornflower Blue-MD	39	15	37	15	36	14
809	Delft Blue	36	14	35	13	33	13
838	Beige Brown-VY DK	5	1	5	1	5	1
844	Beaver Brown-UL DK	168	66	161	63	155	61
913	Nile Green-MD	4	1	3	1	3	1
924	Gray Green-- VY DK	710	279	683	269	657	259
926	Gray Green-MD	516	202	496	195	477	187
927	Gray Green-LT	374	147	360	141	347	136
930	Antique Blue-DK	518	204	498	196	480	189
931	Antique Blue-MD	1161	457	1117	440	1075	423
932	Antique Blue-LT	208	81	200	78	193	75
948	Peach-VY LT	50	19	48	19	47	18
950	Desert Sand-LT	78	30	75	29	73	28
951	Tawny-LT	30	12	28	11	27	11
955	Nile Green-LT	25	9	24	9	23	9
962	Dusty Rose-MD	1	1	1	1	1	1
963	Dusty Rose-UL VY LT	50	19	48	19	47	18
993	Aquamarine-LT	50	19	48	19	47	18
3021	Brown Gray-VY DK	57	22	55	21	53	21
3024	Brown Gray-VY LT	154	60	148	58	143	56
3031	Mocha Brown-VY DK	31	12	30	11	29	11
3032	Mocha Brown-MD	48	18	46	17	44	17
3041	Antique Violet-MD	144	56	138	54	133	52

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3053	Green Gray	12	4	12	4	11	4
3078	Golden Yellow-VY LT	38	14	37	14	35	13
3325	Baby Blue-LT	22	9	21	8	21	8
3341	Apricot	3	1	3	1	3	1
3689	Mauve-LT	64	25	62	24	59	23
3713	Salmon-VY LT	15	6	15	6	14	5
3716	Dusty Rose-VY LT	9	3	8	3	8	3
3726	Antique Mauve-DK	32	12	30	12	29	11
3727	Antique Mauve-LT	71	27	68	26	65	25
3733	Dusty Rose	32	12	30	12	29	11
3740	Antique Violet-DK	99	38	95	37	91	35
3747	Blue Violet-VY LT	27	10	26	10	25	9
3750	Antique Blue-VY DK	14	5	13	5	13	5
3756	Baby Blue-UL VY LT	22	9	21	8	21	8
3761	Sky Blue-LT	16	6	15	6	15	5
3766	Peacock Blue-LT	15	6	15	6	14	5
3768	Gray Green-DK	332	130	319	125	307	121
3770	Tawny-VY LT	107	42	102	40	99	39
3772	Desert Sand-VY DK	16	6	15	6	15	5
3778	Terra Cotta-LT	1	1	1	1	1	1
3779	Terra Cotta-UL VY LT	25	9	24	9	23	9
3790	Beige Gray-UL DK	30	12	28	11	27	11
3799	Pewter Gray-VY DK	1037	408	997	392	960	377
3807	Cornflower Blue	214	84	206	80	198	77
3809	Turquoise-VY DK	117	46	113	44	109	43
3836	Grape-LT	6	2	6	2	5	2
3839	Lavender Blue-MD	12	4	12	4	11	4
3849	Teal Green-LT	67	26	64	25	62	24
3856	Mahogany-UL VY LT	37	14	35	14	34	13
3861	Cocoa-LT	189	74	181	71	175	69
3864	Mocha Beige-LT	120	47	115	45	111	43
3865	Winter White	79	31	76	30	73	29
3866	Mocha Brown-UL VY LT	48	18	46	17	44	17
Ecru	Ecru	6	2	6	2	5	2

Extended thread usage table.

DMC	Name	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)	Usage (cm)	Usage (inch)
		28		30		32	
223	Shell Pink-LT	13	5	12	4	11	4
224	Shell Pink-VY LT	82	32	76	30	71	28
225	Shell Pink-UL VY LT	21	8	20	7	19	7
310	Black	633	249	590	232	554	218
312	Baby Blue-VY DK	199	78	186	73	174	69
316	Antique Mauve-MD	22	8	20	8	19	7
317	Pewter Gray	1351	532	1261	496	1182	465
318	Steel Gray-LT	122	48	113	44	106	42
334	Baby Blue-MD	139	55	130	51	122	48
336	Navy Blue	161	63	150	59	141	55
353	Peach	84	33	78	31	73	29
372	Mustard-LT	24	9	23	8	21	8
407	Desert Sand-DK	38	15	35	14	33	13
413	Pewter Gray-DK	705	277	658	259	617	242
414	Steel Gray-DK	314	123	293	115	275	108
415	Pearl Gray	143	56	134	52	125	49
422	Hazelnut Brown-LT	3	1	2	1	2	1
437	Tan-LT	16	6	15	5	14	5
451	Shell Gray-DK	91	35	85	33	80	31
452	Shell Gray-MD	222	87	207	81	194	76

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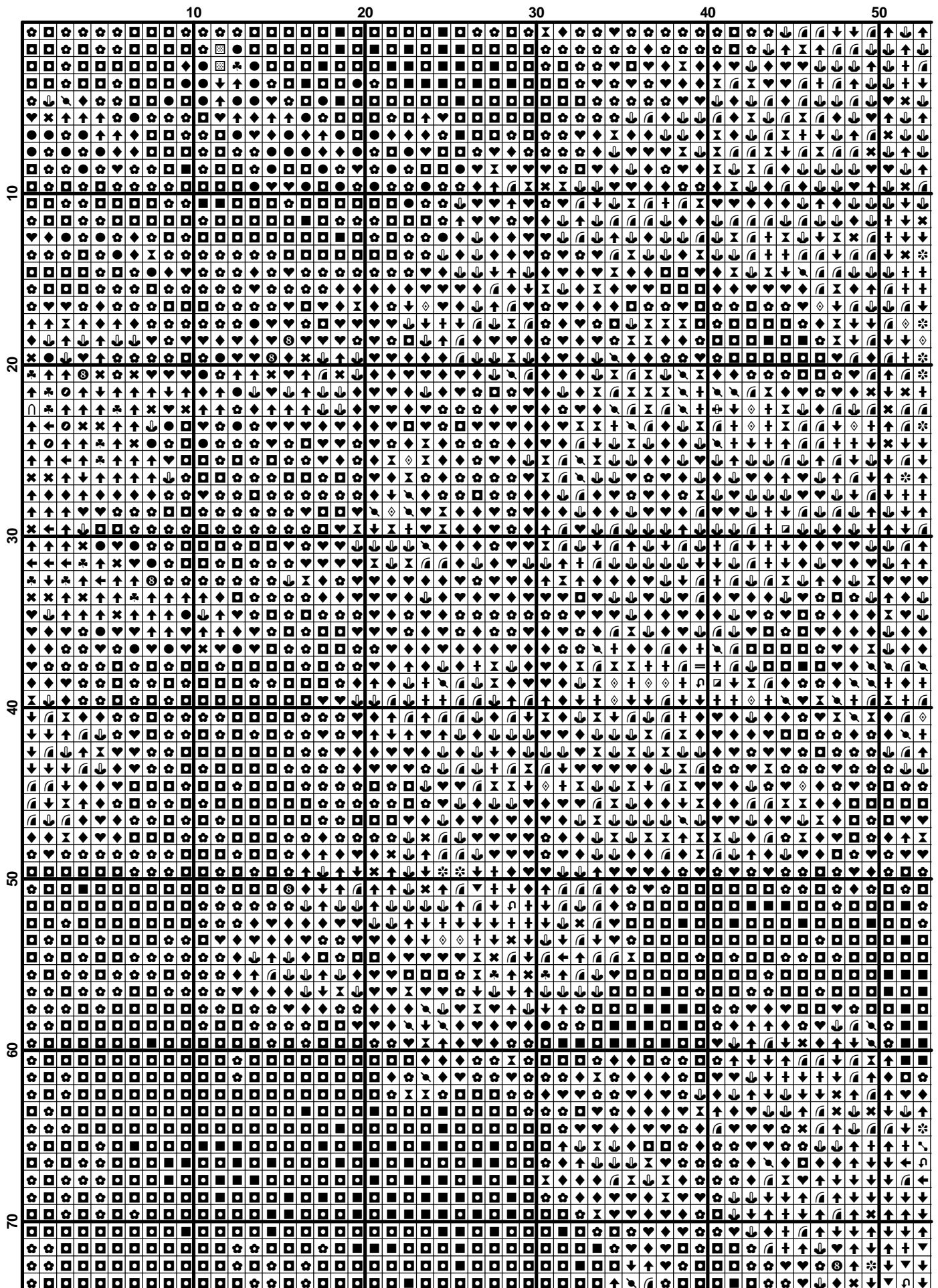
503	Blue Green-MD	118	46	110	43	103	41
517	Wedgewood-DK	44	17	41	16	38	15
522	Fern Green	19	7	18	7	17	6
524	Fern Green-VY LT	42	16	40	15	37	14
535	Ash Gray-VY LT	230	90	215	84	201	79
543	Beige Brown-UL VY LT	32	12	30	11	28	11
564	Jade-VY LT	49	19	46	17	43	16
597	Turquoise	37	14	34	13	32	12
598	Turquoise-LT	19	7	18	7	17	6
611	Drab Brown	3	1	3	1	3	1
632	Desert Sand-UL VY DK	14	5	13	5	12	5
640	Beige Gray-VY DK	82	32	77	30	72	28
645	Beaver Gray-VY DK	238	93	222	87	208	82
646	Beaver Gray-DK	159	62	149	58	140	55
647	Beaver Gray-MD	136	53	127	50	119	47
648	Beaver Gray-LT	102	40	95	37	89	35
712	Cream	22	8	20	8	19	7
738	Tan-VY LT	56	22	52	20	49	19
739	Tan-UL VY LT	17	6	16	6	15	6
746	Off White	30	12	28	11	26	10
747	Sky Blue-VY LT	51	20	48	19	45	17
754	Peach-LT	28	11	26	10	25	10
758	Terra Cotta-VY LT	30	12	28	11	26	10
760	Salmon	1	1	1	1	1	1
762	Pearl Gray-VY LT	48	19	44	17	42	16
778	Antique Mauve-VY LT	82	32	76	30	71	28
792	Cornflower Blue-DK	3	1	3	1	3	1
793	Cornflower Blue-MD	35	14	32	13	30	12
809	Delft Blue	32	12	30	11	28	11
838	Beige Brown-VY DK	5	1	4	1	4	1
844	Beaver Brown-UL DK	150	59	140	55	131	51
913	Nile Green-MD	3	1	3	1	3	1
924	Gray Green--VY DK	634	249	592	233	555	218
926	Gray Green-MD	460	181	430	169	403	158
927	Gray Green-LT	334	131	312	122	293	115
930	Antique Blue-DK	463	182	432	170	405	159
931	Antique Blue-MD	1037	408	968	381	907	357
932	Antique Blue-LT	186	73	173	68	163	64
948	Peach-VY LT	45	17	42	16	39	15
950	Desert Sand-LT	70	27	65	25	61	24
951	Tawny-LT	26	10	25	10	23	9
955	Nile Green-LT	23	8	21	8	20	7
962	Dusty Rose-MD	1	1	1	1	1	1
963	Dusty Rose-UL VY LT	45	17	42	16	39	15
993	Aquamarine-LT	45	17	42	16	39	15
3021	Brown Gray-VY DK	51	20	47	19	44	17
3024	Brown Gray-VY LT	138	54	128	50	120	47
3031	Mocha Brown-VY DK	28	10	26	10	24	9
3032	Mocha Brown-MD	42	16	40	15	37	14
3041	Antique Violet-MD	129	50	120	47	113	44
3053	Green Gray	11	4	10	4	10	3
3078	Golden Yellow-VY LT	34	13	32	12	30	11
3325	Baby Blue-LT	20	8	19	7	17	7
3341	Apricot	3	1	2	1	2	1
3689	Mauve-LT	57	23	53	21	50	20
3713	Salmon-VY LT	14	5	13	5	12	5
3716	Dusty Rose-VY LT	8	3	7	2	7	2
3726	Antique Mauve-DK	28	11	26	10	25	10
3727	Antique Mauve-LT	63	24	59	23	55	21

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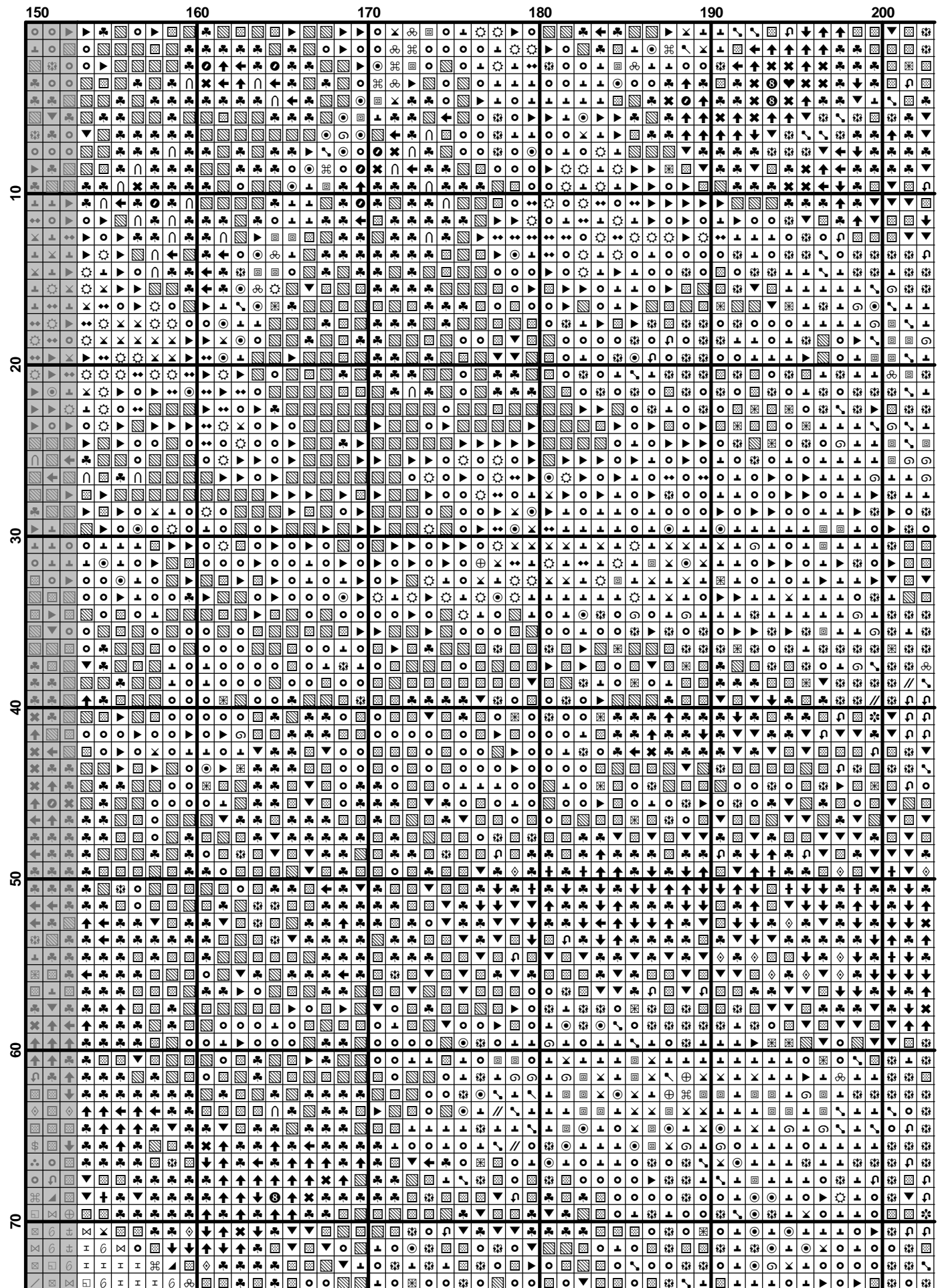
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3733	Dusty Rose	28	11	26	10	25	10
3740	Antique Violet-DK	88	34	82	32	77	30
3747	Blue Violet-VY LT	24	9	22	8	21	8
3750	Antique Blue-VY DK	12	5	11	4	11	4
3756	Baby Blue-UL VY LT	20	8	19	7	17	7
3761	Sky Blue-LT	14	5	13	5	12	5
3766	Peacock Blue-LT	14	5	13	5	12	5
3768	Gray Green-DK	296	116	277	109	259	102
3770	Tawny-VY LT	95	37	89	35	83	33
3772	Desert Sand-VY DK	14	5	13	5	12	5
3778	Terra Cotta-LT	1	1	1	1	1	1
3779	Terra Cotta-UL VY LT	23	8	21	8	20	7
3790	Beige Gray-UL DK	26	10	25	10	23	9
3799	Pewter Gray-VY DK	926	364	864	340	810	318
3807	Cornflower Blue	191	75	178	70	167	65
3809	Turquoise-VY DK	105	41	98	38	92	36
3836	Grape-LT	5	2	5	2	5	2
3839	Lavender Blue-MD	11	4	10	4	10	3
3849	Teal Green-LT	60	23	56	22	52	20
3856	Mahogany-UL VY LT	33	13	31	12	29	11
3861	Cocoa-LT	168	66	157	62	147	58
3864	Mocha Beige-LT	107	42	100	39	93	37
3865	Winter White	71	28	66	26	62	24
3866	Mocha Brown-UL VY LT	42	16	40	15	37	14
Ecru	Ecru	5	2	5	2	5	2

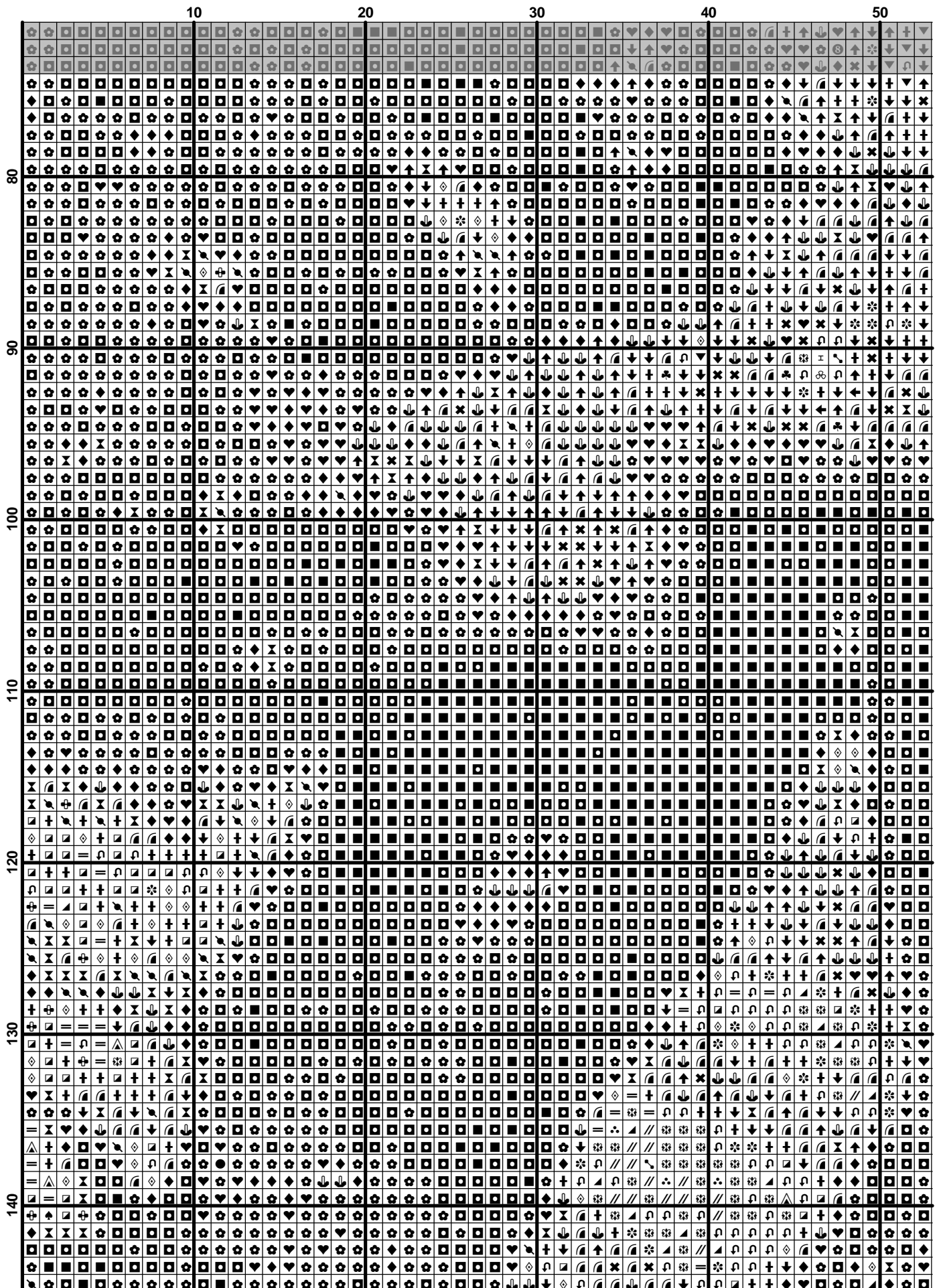


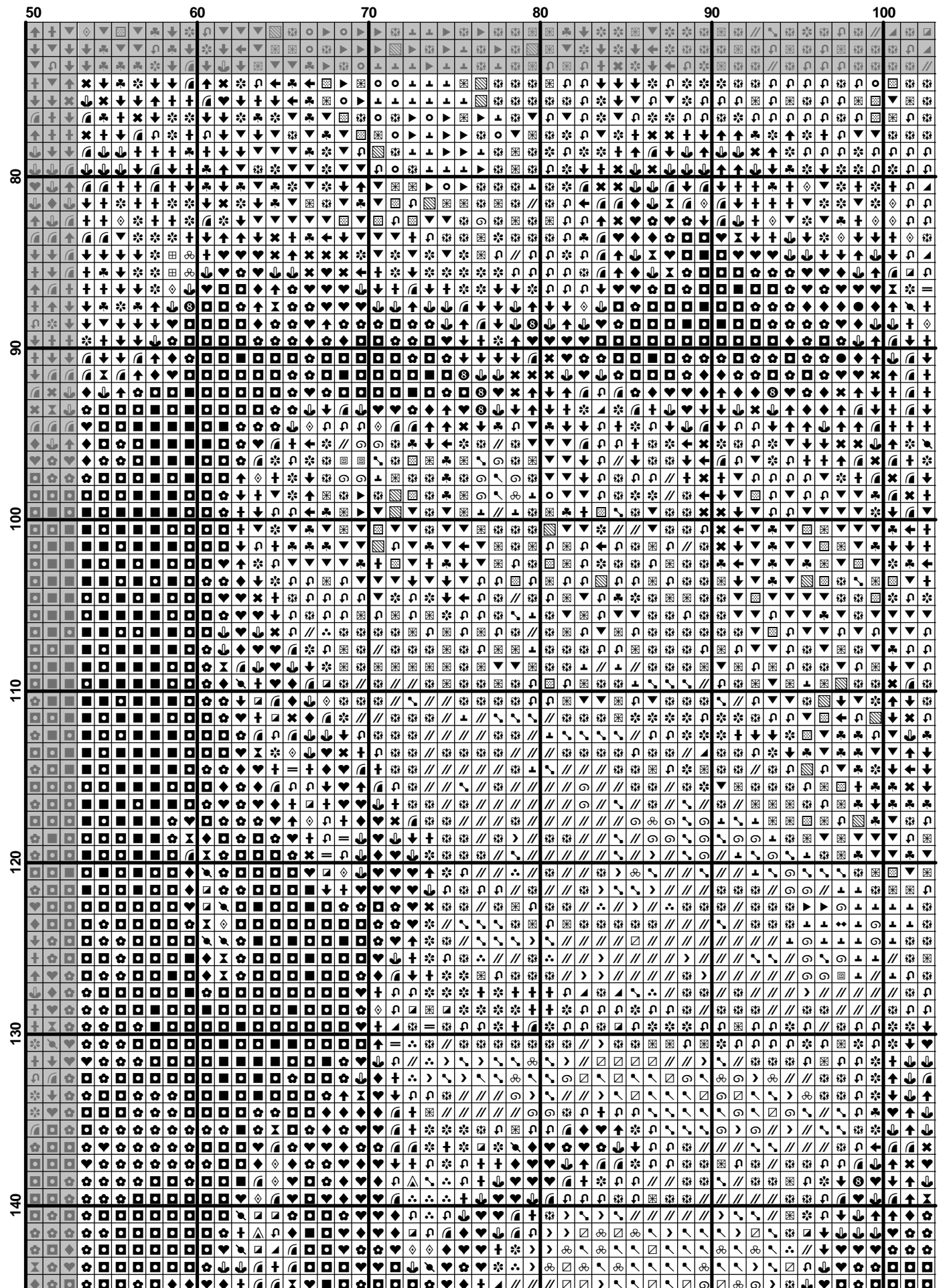
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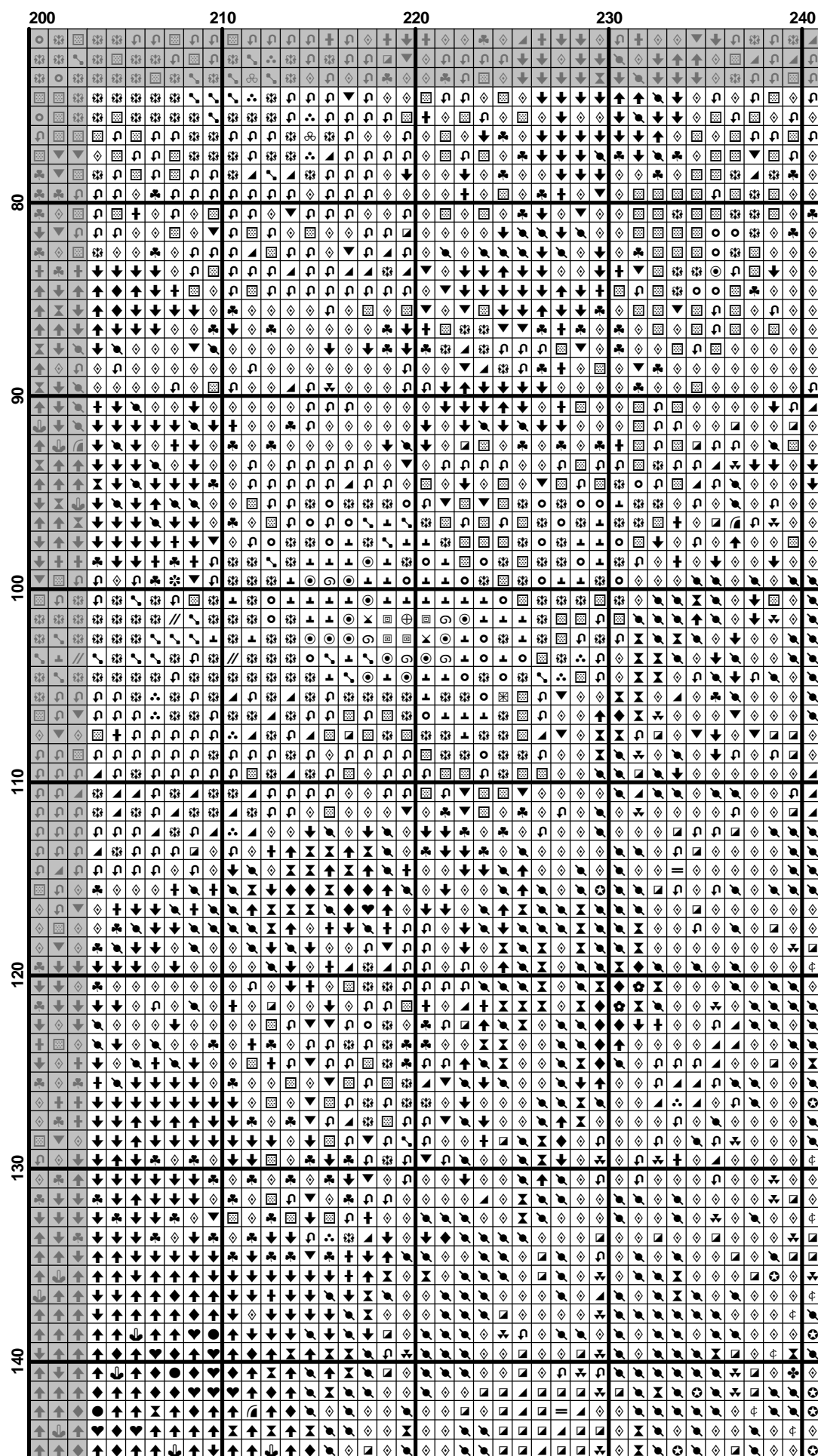
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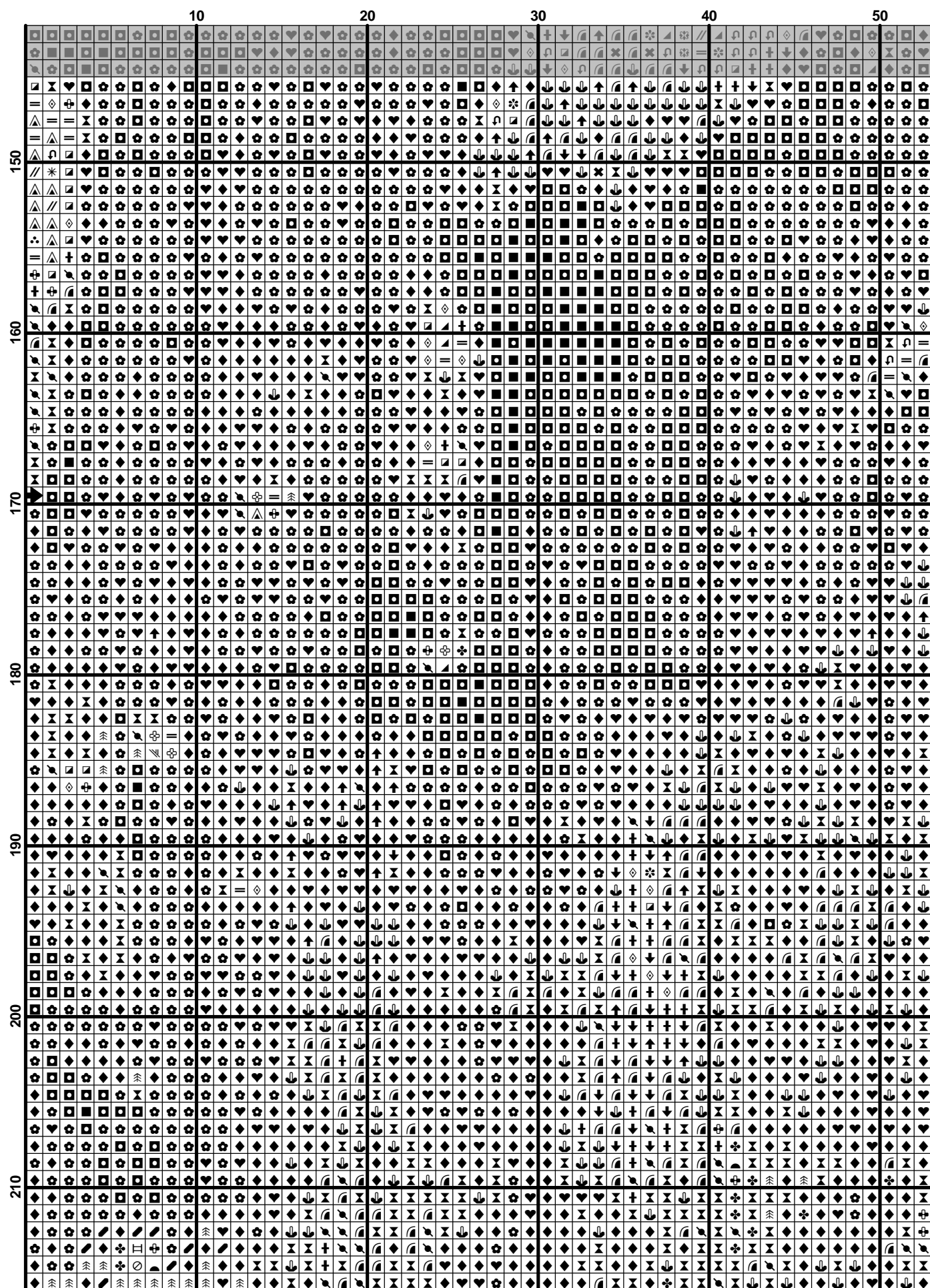


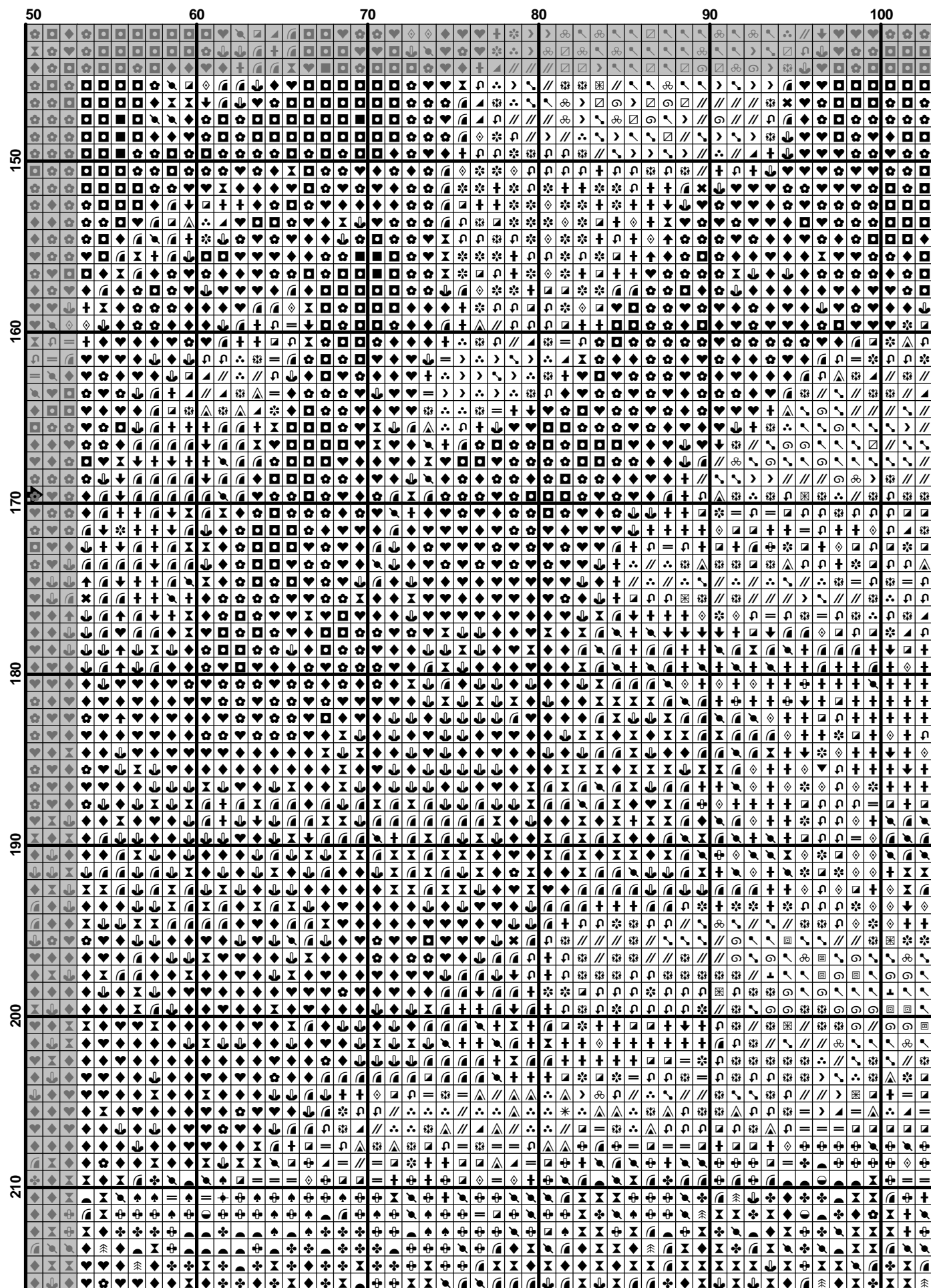


$$(13) \quad \mathcal{L}(\mathcal{A}) = \mathcal{L}(\mathcal{B}) \quad (14)$$

$$(14) \quad \frac{d}{dt} \left(\frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$$

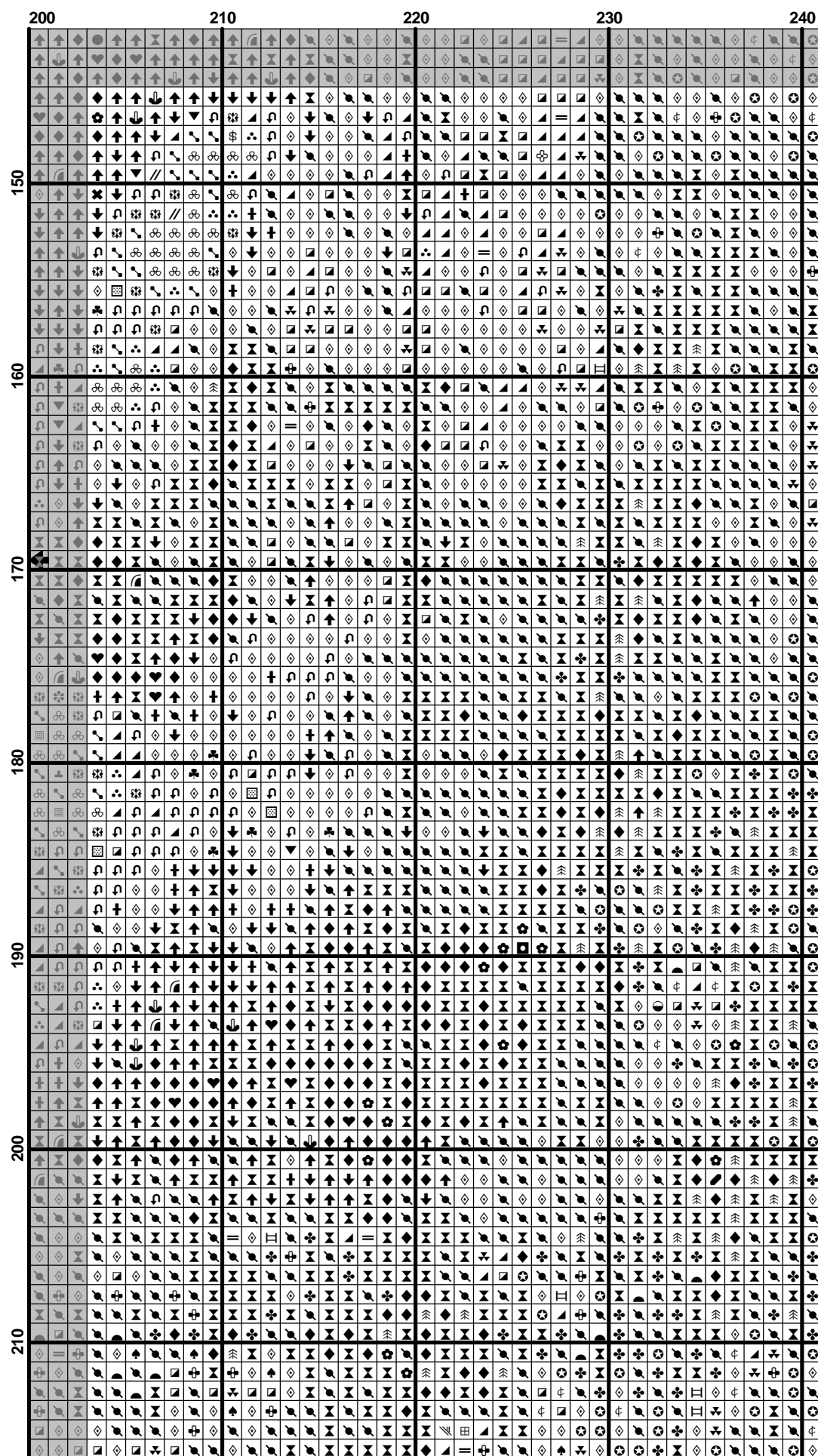


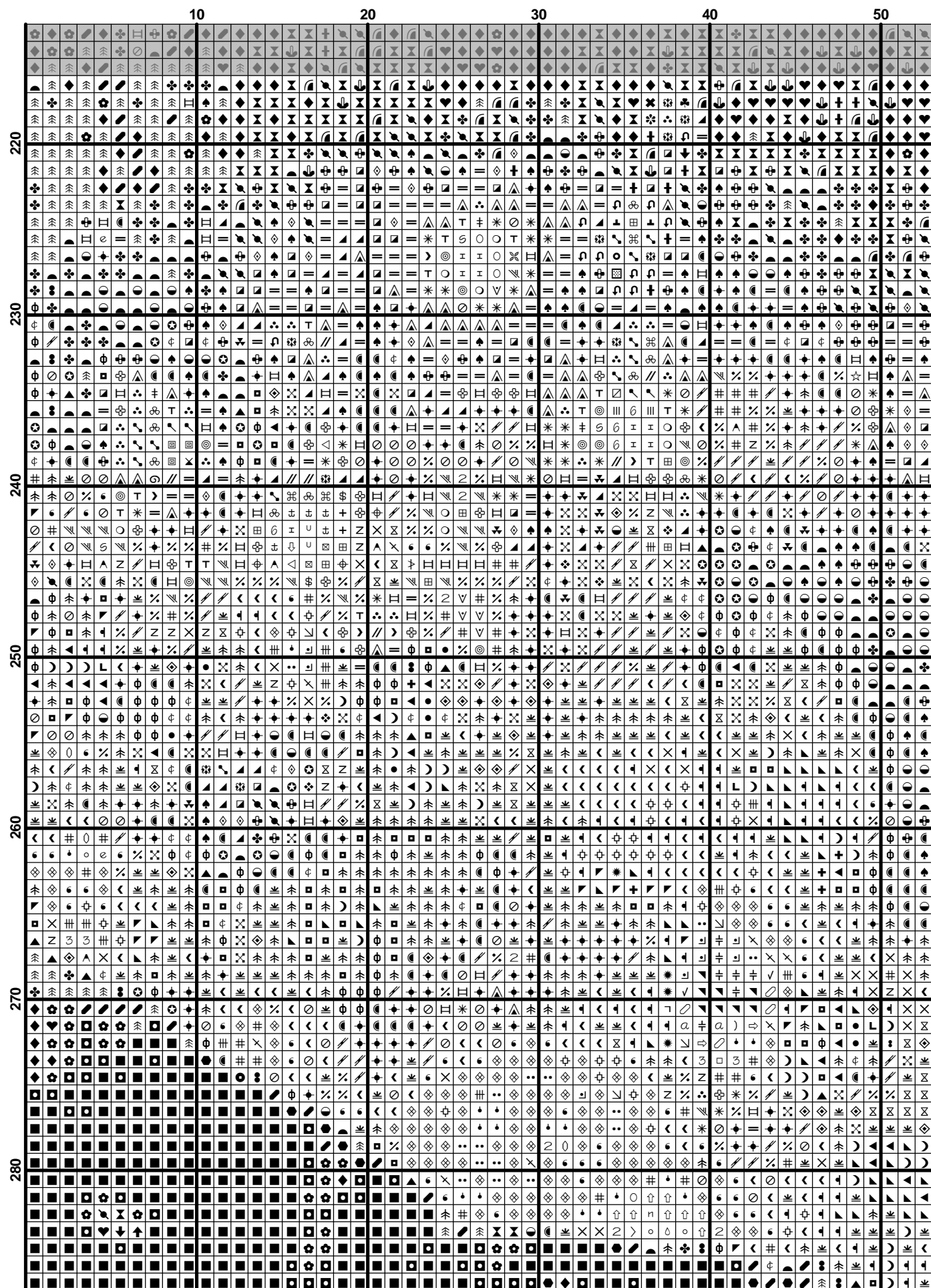




	100	110	120	130	140	150
	100	110	120	130	140	150
	160	170	180	190	200	210
150						
160						
170						
180						
190						
200						
210						

(20)





	50	60	70	80	90	100
220	♠	♠	♠	♠	♠	♠
221	♠	♠	♠	♠	♠	♠
222	♠	♠	♠	♠	♠	♠
223	♠	♠	♠	♠	♠	♠
224	♠	♠	♠	♠	♠	♠
225	♠	♠	♠	♠	♠	♠
226	♠	♠	♠	♠	♠	♠
227	♠	♠	♠	♠	♠	♠
228	♠	♠	♠	♠	♠	♠
229	♠	♠	♠	♠	♠	♠
230	♠	♠	♠	♠	♠	♠
231	♠	♠	♠	♠	♠	♠
232	♠	♠	♠	♠	♠	♠
233	♠	♠	♠	♠	♠	♠
234	♠	♠	♠	♠	♠	♠
235	♠	♠	♠	♠	♠	♠
236	♠	♠	♠	♠	♠	♠
237	♠	♠	♠	♠	♠	♠
238	♠	♠	♠	♠	♠	♠
239	♠	♠	♠	♠	♠	♠
240	♠	♠	♠	♠	♠	♠
241	♠	♠	♠	♠	♠	♠
242	♠	♠	♠	♠	♠	♠
243	♠	♠	♠	♠	♠	♠
244	♠	♠	♠	♠	♠	♠
245	♠	♠	♠	♠	♠	♠
246	♠	♠	♠	♠	♠	♠
247	♠	♠	♠	♠	♠	♠
248	♠	♠	♠	♠	♠	♠
249	♠	♠	♠	♠	♠	♠
250	♠	♠	♠	♠	♠	♠
251	♠	♠	♠	♠	♠	♠
252	♠	♠	♠	♠	♠	♠
253	♠	♠	♠	♠	♠	♠
254	♠	♠	♠	♠	♠	♠
255	♠	♠	♠	♠	♠	♠
256	♠	♠	♠	♠	♠	♠
257	♠	♠	♠	♠	♠	♠
258	♠	♠	♠	♠	♠	♠
259	♠	♠	♠	♠	♠	♠
260	♠	♠	♠	♠	♠	♠
261	♠	♠	♠	♠	♠	♠
262	♠	♠	♠	♠	♠	♠
263	♠	♠	♠	♠	♠	♠
264	♠	♠	♠	♠	♠	♠
265	♠	♠	♠	♠	♠	♠
266	♠	♠	♠	♠	♠	♠
267	♠	♠	♠	♠	♠	♠
268	♠	♠	♠	♠	♠	♠
269	♠	♠	♠	♠	♠	♠
270	♠	♠	♠	♠	♠	♠
271	♠	♠	♠	♠	♠	♠
272	♠	♠	♠	♠	♠	♠
273	♠	♠	♠	♠	♠	♠
274	♠	♠	♠	♠	♠	♠
275	♠	♠	♠	♠	♠	♠
276	♠	♠	♠	♠	♠	♠
277	♠	♠	♠	♠	♠	♠
278	♠	♠	♠	♠	♠	♠
279	♠	♠	♠	♠	♠	♠
280	♠	♠	♠	♠	♠	♠
281	♠	♠	♠	♠	♠	♠
282	♠	♠	♠	♠	♠	♠
283	♠	♠	♠	♠	♠	♠
284	♠	♠	♠	♠	♠	♠
285	♠	♠	♠	♠	♠	♠
286	♠	♠	♠	♠	♠	♠
287	♠	♠	♠	♠	♠	♠
288	♠	♠	♠	♠	♠	♠
289	♠	♠	♠	♠	♠	♠
290	♠	♠	♠	♠	♠	♠
291	♠	♠	♠	♠	♠	♠
292	♠	♠	♠	♠	♠	♠
293	♠	♠	♠	♠	♠	♠
294	♠	♠	♠	♠	♠	♠
295	♠	♠	♠	♠	♠	♠
296	♠	♠	♠	♠	♠	♠
297	♠	♠	♠	♠	♠	♠
298	♠	♠	♠	♠	♠	♠
299	♠	♠	♠	♠	♠	♠
300	♠	♠	♠	♠	♠	♠

	100	110	120	130	140	150
220
230
240
250
260
270
280

	150	160	170	180	190	200
220	150	160	170	180	190	200
230	230	230	230	230	230	230
240	240	240	240	240	240	240
250	250	250	250	250	250	250
260	260	260	260	260	260	260
270	270	270	270	270	270	270
280	280	280	280	280	280	280

(25)

