

# 北斎の新形小紋帳 ギャラリー (J8 版)

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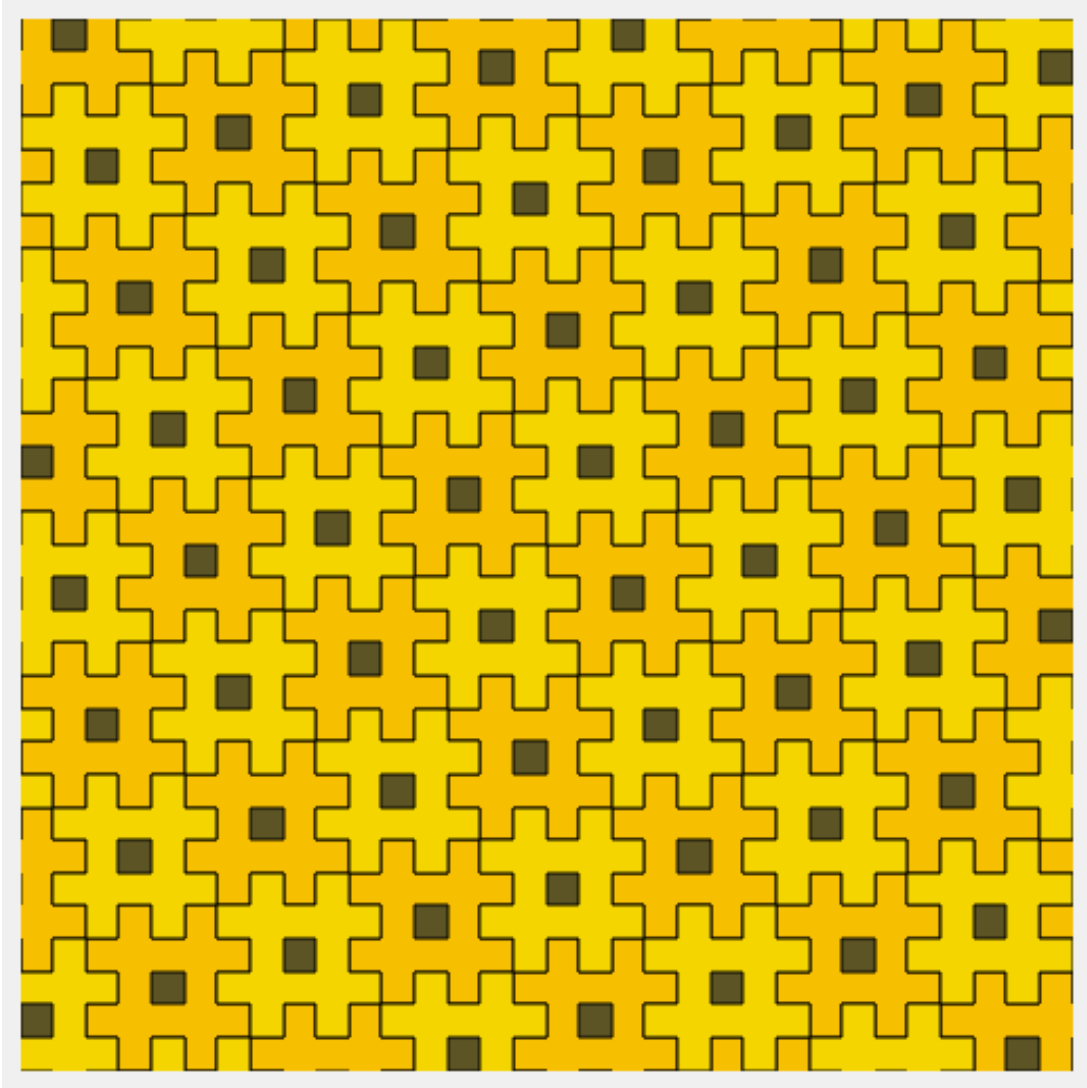
## 目次

1	ポリゴンで描く	3
1.1	井筒万字	3
1.2	六手万字	5
1.3	犀型	7
1.4	万字繋ぎ	9
1.5	万字菱	11
1.6	ひょうれつ麻の葉	13
1.7	麻の葉つくし	15
1.8	八つ手麻の葉	17
1.9	松川	19
2	直線を描く	23
2.1	行つ戻りつ	23
2.2	釣四ツ目	25
2.3	燭光の万字繋ぎ	27
2.4	菱の釣万字	29
2.5	破れ籠目	32
2.6	松皮	35
2.7	碁盤筋交い (No64)	38
2.8	畳 (No52)	40

2.9	唐様障子 (No71)	42
2.10	(No79)	44
2.11	早割碁盤割手 (No25)	46
2.12	三重格子 (No58)	48
2.13	ネジの蓋 (No42)	50
2.14	釣り稲妻 (No36)	52
2.15	菜籠麻の葉 No14	54
<b>3</b>	<b>正多角形と花卉で描く</b>	<b>57</b>
3.1	輪違い麻の葉 No8	57
3.2	桜割 No07	59
3.3	六角三ツ割 No12	62
3.4	六角七宝の碁盤割り No31	64
3.5	六角格子縞割り No67	67
3.6	金網亀甲 No53	69

# 1 ポリゴンで描く

## 1.1 井筒万字



(246 191 0;244 213 0 ;92 84 36) hokusai\_im 30 30

小紋の基準点と差分 (基準点 (x,y); 横の小紋との差分=距離 (x,y); 上の小紋との差分 (x,y))

IMPARAM

```
+---+---+---+
|0 4|4 1|_1 4|
+---+---+---+
```

IM

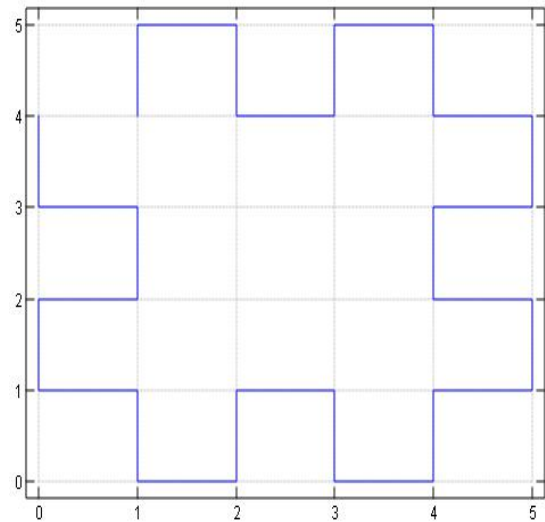
0 4	5 2
0 3	4 2
1 3	4 3
1 2	5 3
0 2	5 4
0 1	4 4
1 1	4 5
1 0	3 5
2 0	3 4
2 1	2 4
3 1	2 5
3 0	1 5
4 0	1 4
4 1	
5 1	

IM2 NB. 中心の黒点

```
2 3
2 2
3 2
3 3
```

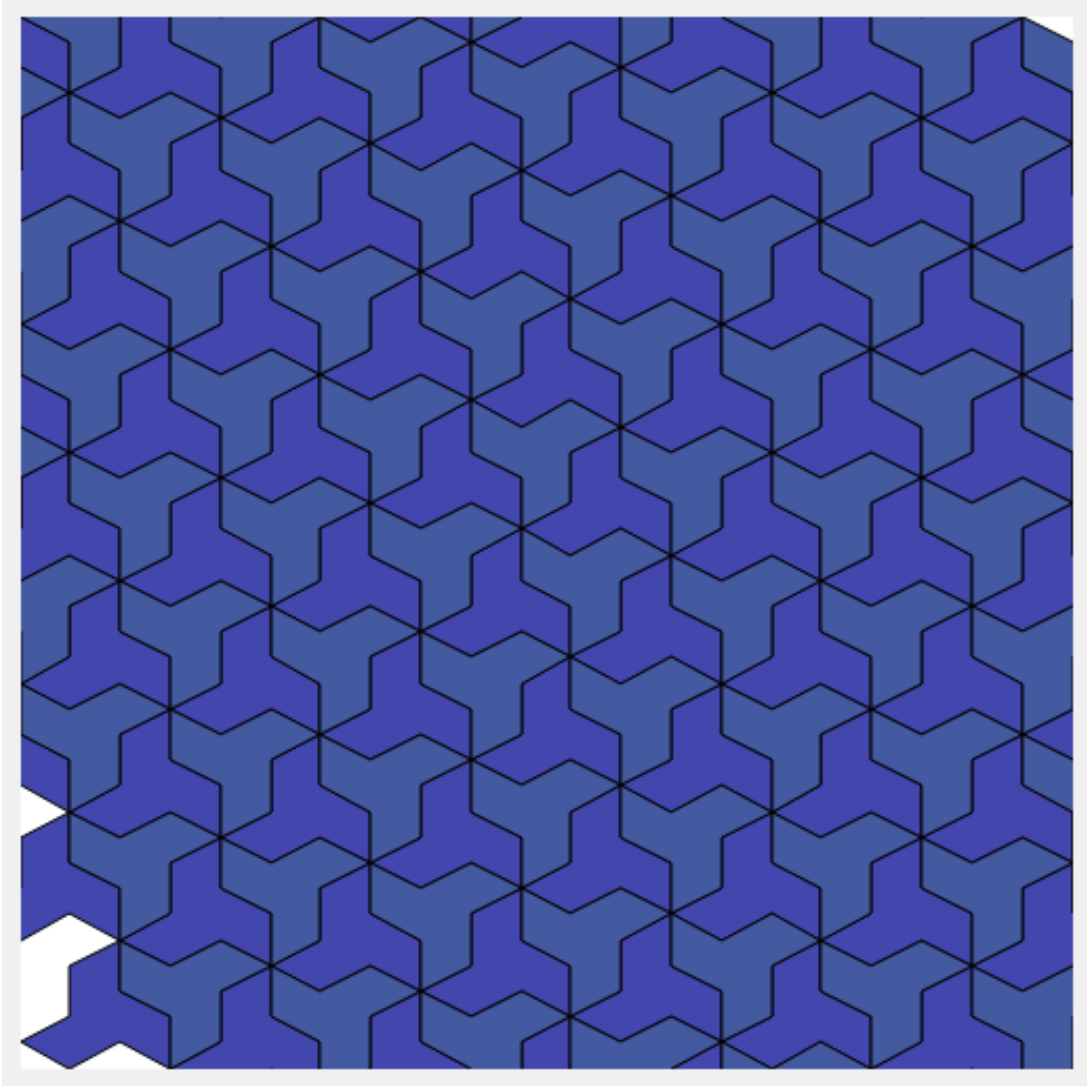
IM2PARAM

```
+---+---+---+
|2 3|4 1|_1 4|
+---+---+---+
```



ポリゴンでは最終点と始点の結節は記述しなくても自動で行われる

## 1.2 六手万字



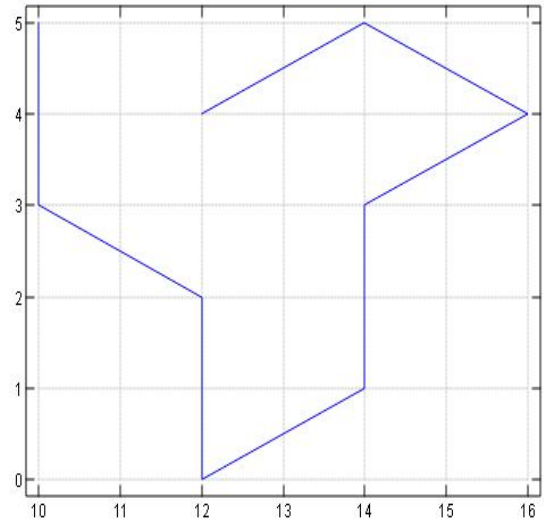
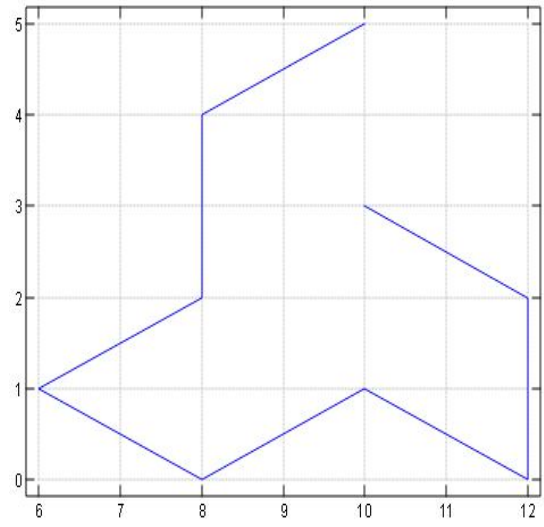
(67 71 173; 67 90 160) hokusai\_mm 15 15

MM0;MM1

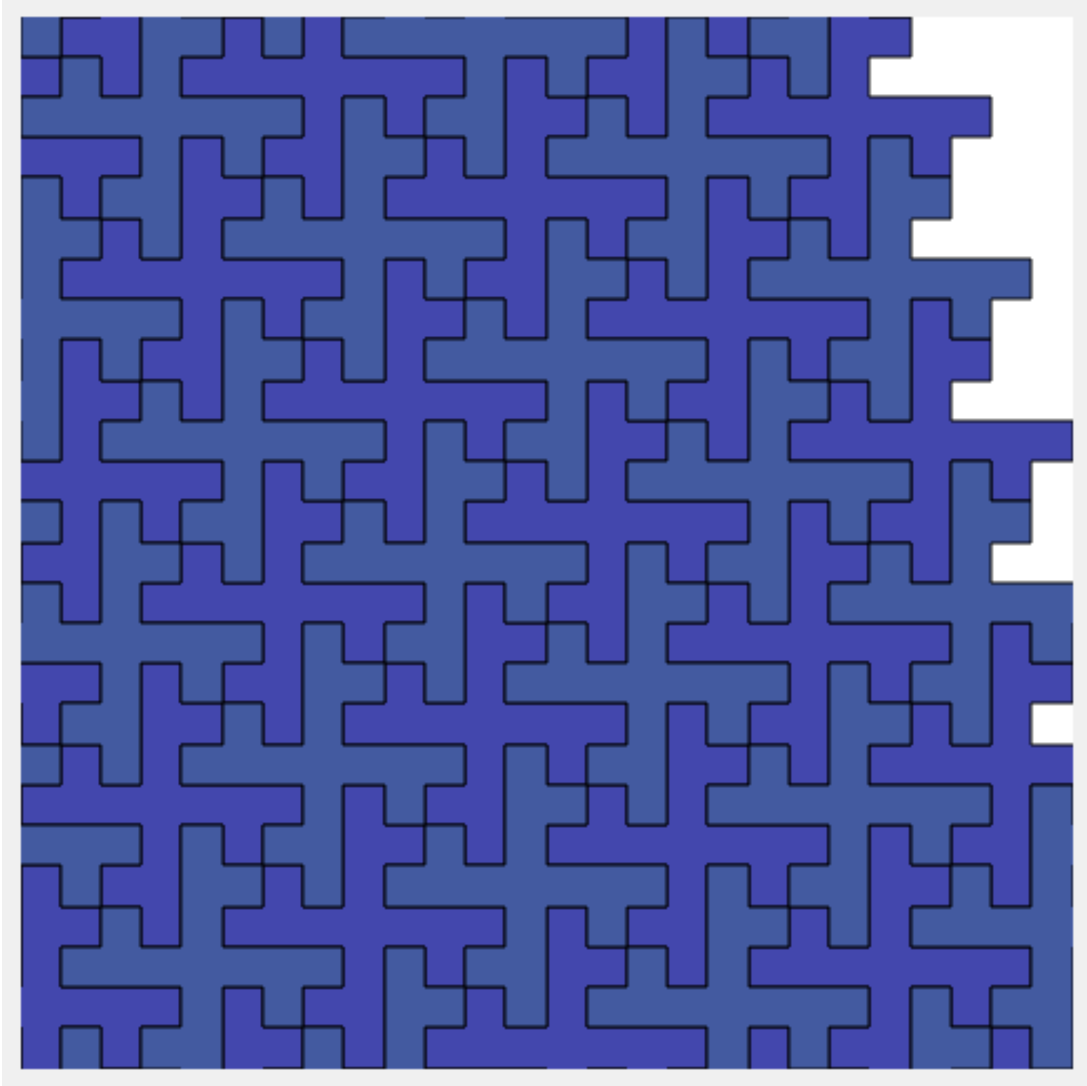
```
+-----+-----+
|10 5|10 5|
| 8 4|10 3|
| 8 2|12 2|
| 6 1|12 0|
| 8 0|14 1|
|10 1|14 3|
|12 0|16 4|
|12 2|14 5|
|10 3|12 4|
+-----+-----+
```

MM0PARAM, :MM1PARAM

```
+-----+-----+-----+
|10 5|6 _1|_2 5|
+-----+-----+-----+
|10 5|6 _1|_2 5|
+-----+-----+-----+
```



### 1.3 犀型



(67 71 173; 67 90 160) hokusai\_s 30 30

S  
 0 3  
 3 3  
 3 2  
 2 2  
 2 1  
 3 1  
 3 0  
 4 0  
 4 3  
 5 3  
 5 2  
 6 2  
 6 3  
 7 3  
 7 4

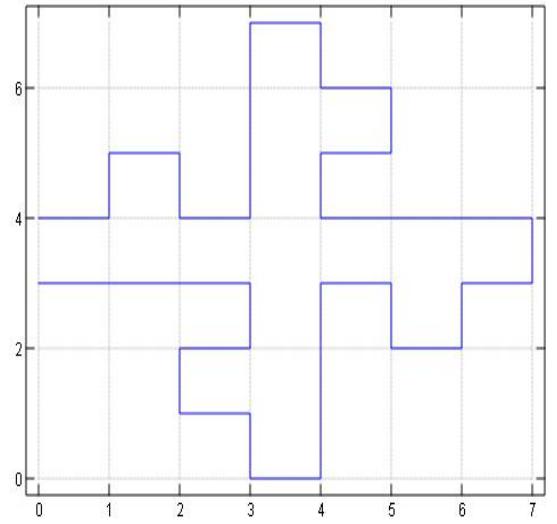
4 4  
 4 5  
 5 5  
 5 6  
 4 6  
 4 7  
 3 7  
 3 4  
 2 4  
 2 5  
 1 5  
 1 4  
 0 4

SPARAM

```

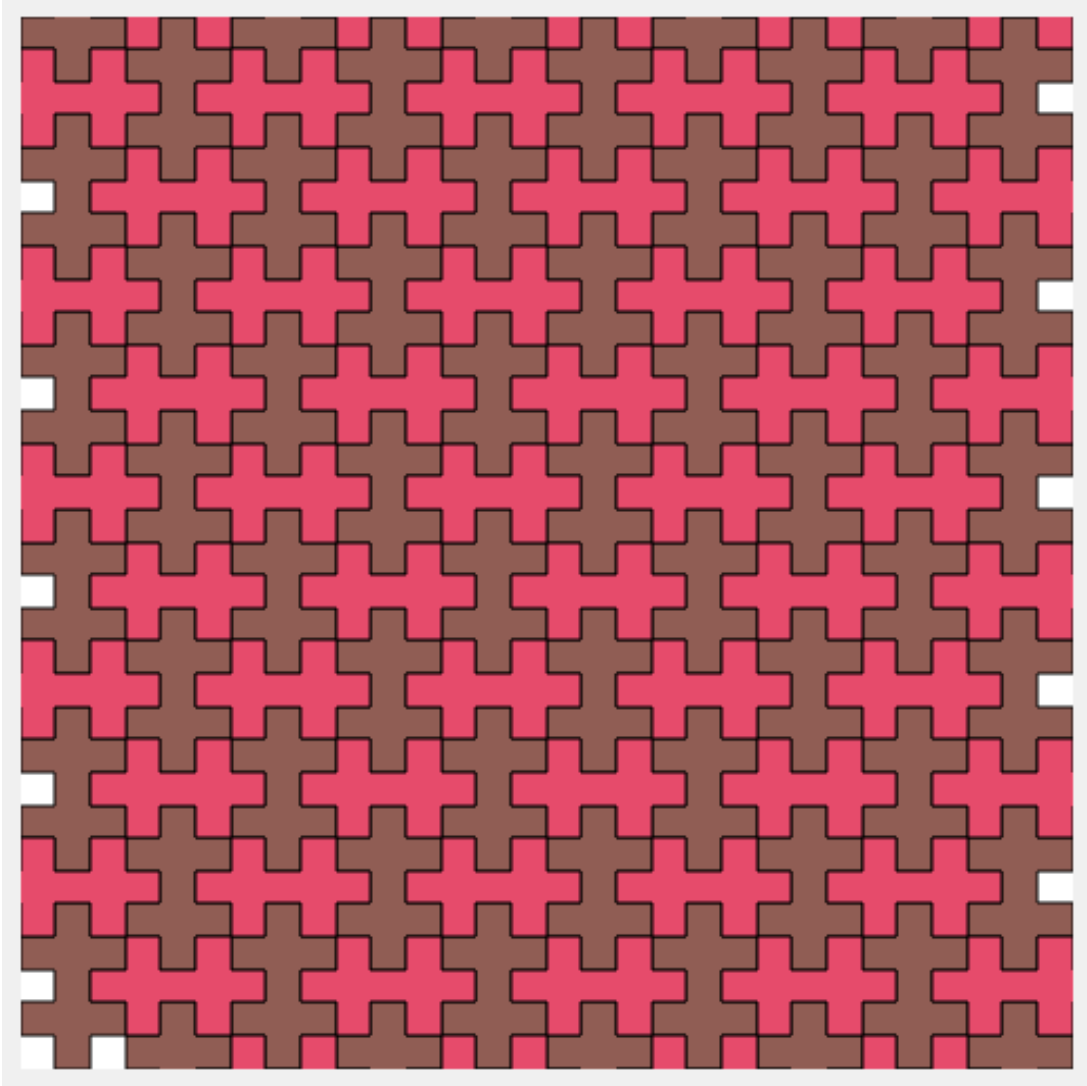
+---+-----+---+
|0 3|_1 4|4 1|
+---+-----+---+

```





#### 1.4 万字繋ぎ



(67 71 173; 67 90 160) hokusai\_mt 10 10

```

MT0;MT1
+---+---+
| 1 4|0 6|
| 1 3|0 5|
| 2 3|1 5|
| 2 2|1 4|
| 1 2|2 4|
| 1 1|2 5|
| 2 1|3 5|
| 2 0|3 4|
| 3 0|4 4|
| 3 1|4 5|
| 4 1|5 5|
| 4 2|5 6|
| 3 2|4 6|
| 3 3|4 7|
| 4 3|3 7|
| 4 4|3 6|
| 3 4|2 6|
| 3 5|2 7|
| 2 5|1 7|
| 2 4|1 6|
+---+---+

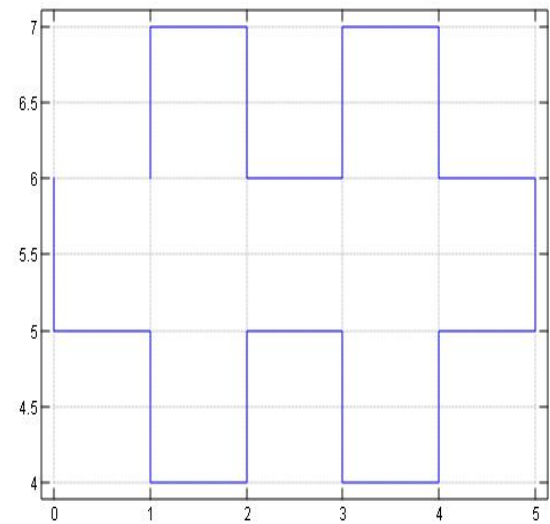
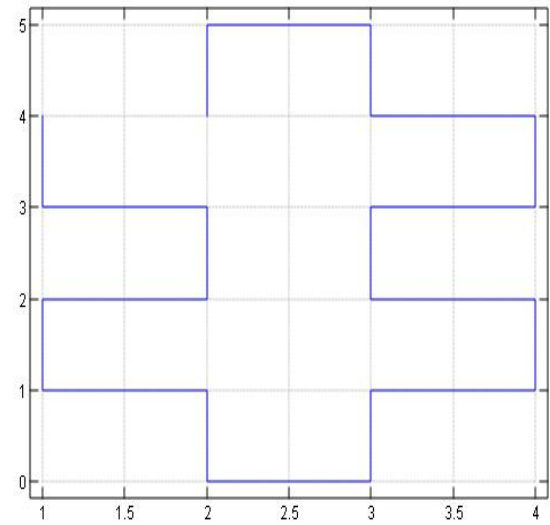
```

MT0PARAM, :MT1PARAM

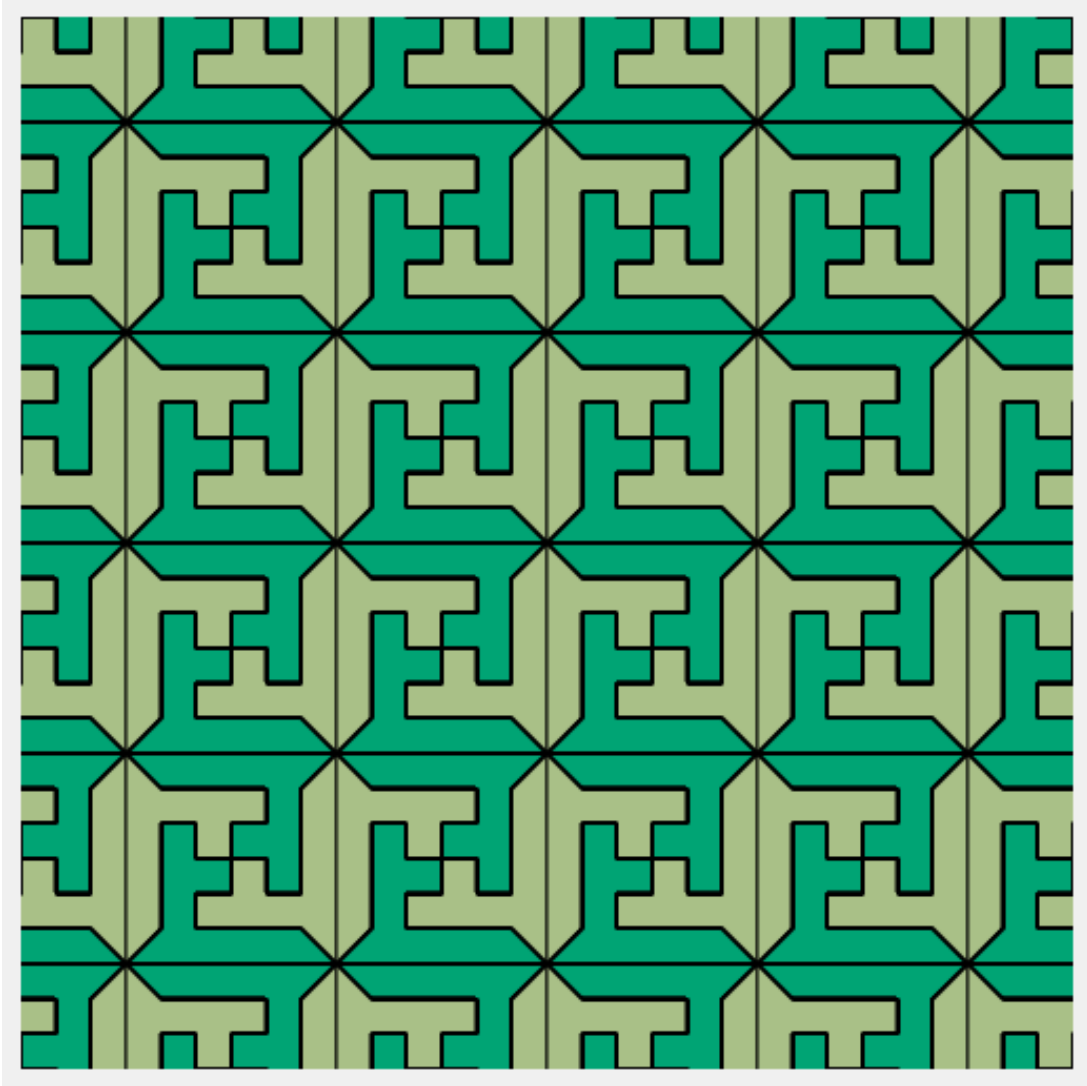
```

+---+---+---+
| 1 4|3 _3|0 6|
+---+---+---+
| 0 6|3 _3|0 6|
+---+---+---+

```



1.5 万字菱



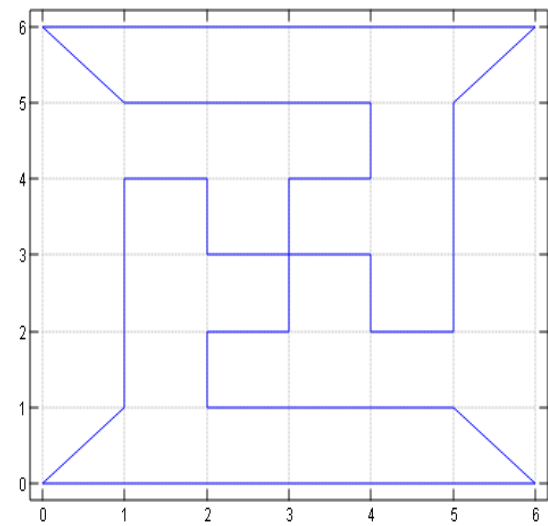
(67 71 173; 67 90 160) hokusai\_mc 15 15

MC0

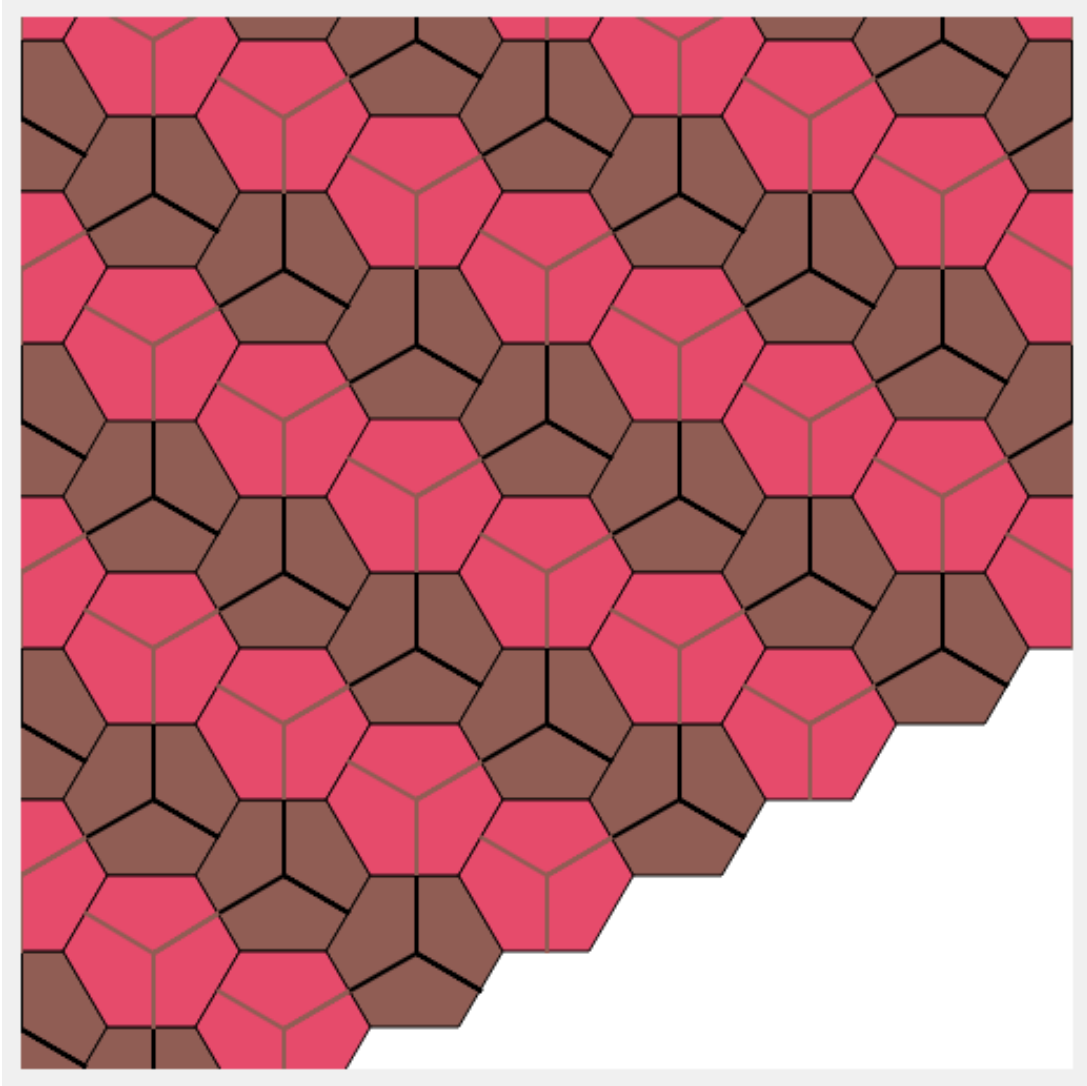
3 3  
4 3  
4 2  
5 2  
5 5  
6 6  
0 6  
1 5  
4 5  
4 4  
3 4  
3 3  
3 3  
3 2  
2 2  
2 1  
5 1  
6 0  
0 0  
1 1  
1 4  
2 4  
2 3  
3 3

MCOPARAM

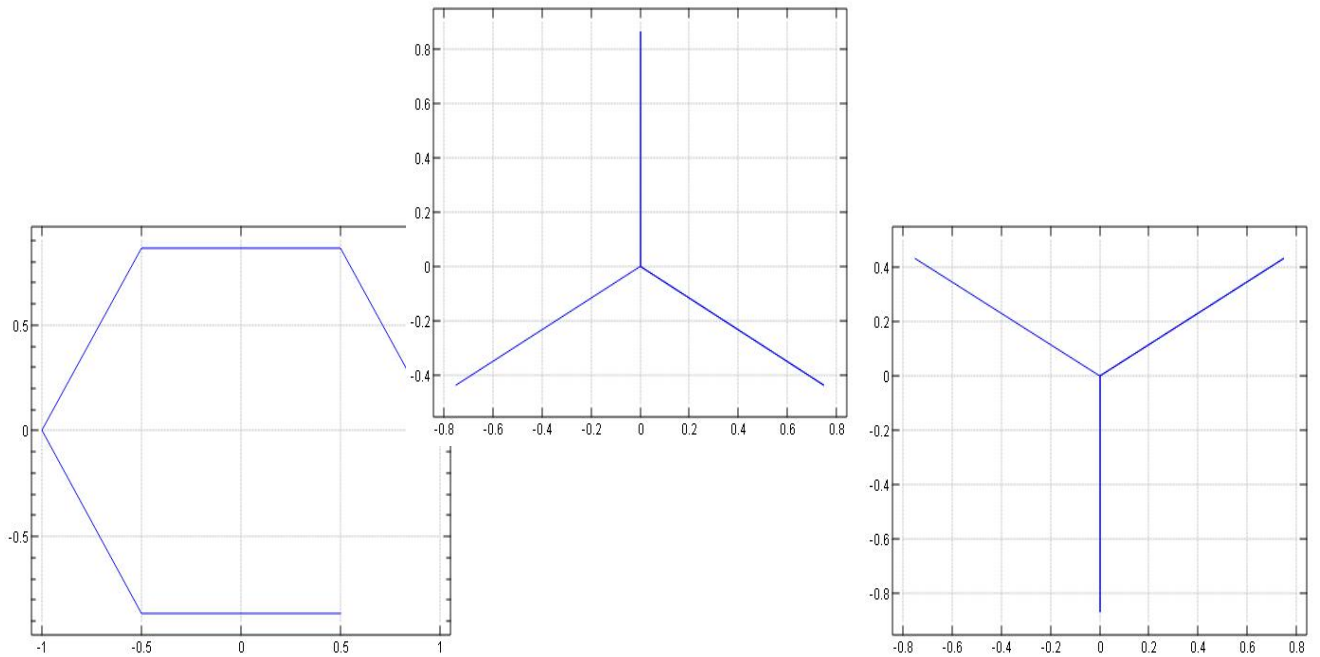
```
+---+---+---+  
|3 3|6 0|0 6|  
+---+---+---+
```



## 1.6 ひょうれつ麻の葉



(144 93 84;230 75 107;0 0 0;144 93 84) hokusai\_ha 15 20



(144 93 84;230 75 107;0 0 0;144 93 84) hokusai\_ha 15 15

HA0;HAL0;HAL1

```

+-----+-----+-----+
| 1           0| 0      0| 0      0|
| 0.5  0.866025| 0 0.866025| 0 _0.866025|
|_0.5  0.866025| 0      0| 0      0|
| _1  1.22465e_16| 0.75 _0.43317| 0.75  0.43317|
|_0.5  _0.866025| 0      0| 0      0|
| 0.5  _0.866025|_0.75 _0.43317|_0.75  0.43317|
+-----+-----+-----+

```

HA0PARAM

```

+---+-----+-----+
|1 0|1.5 0.866|0 1.732|
+---+-----+-----+

```

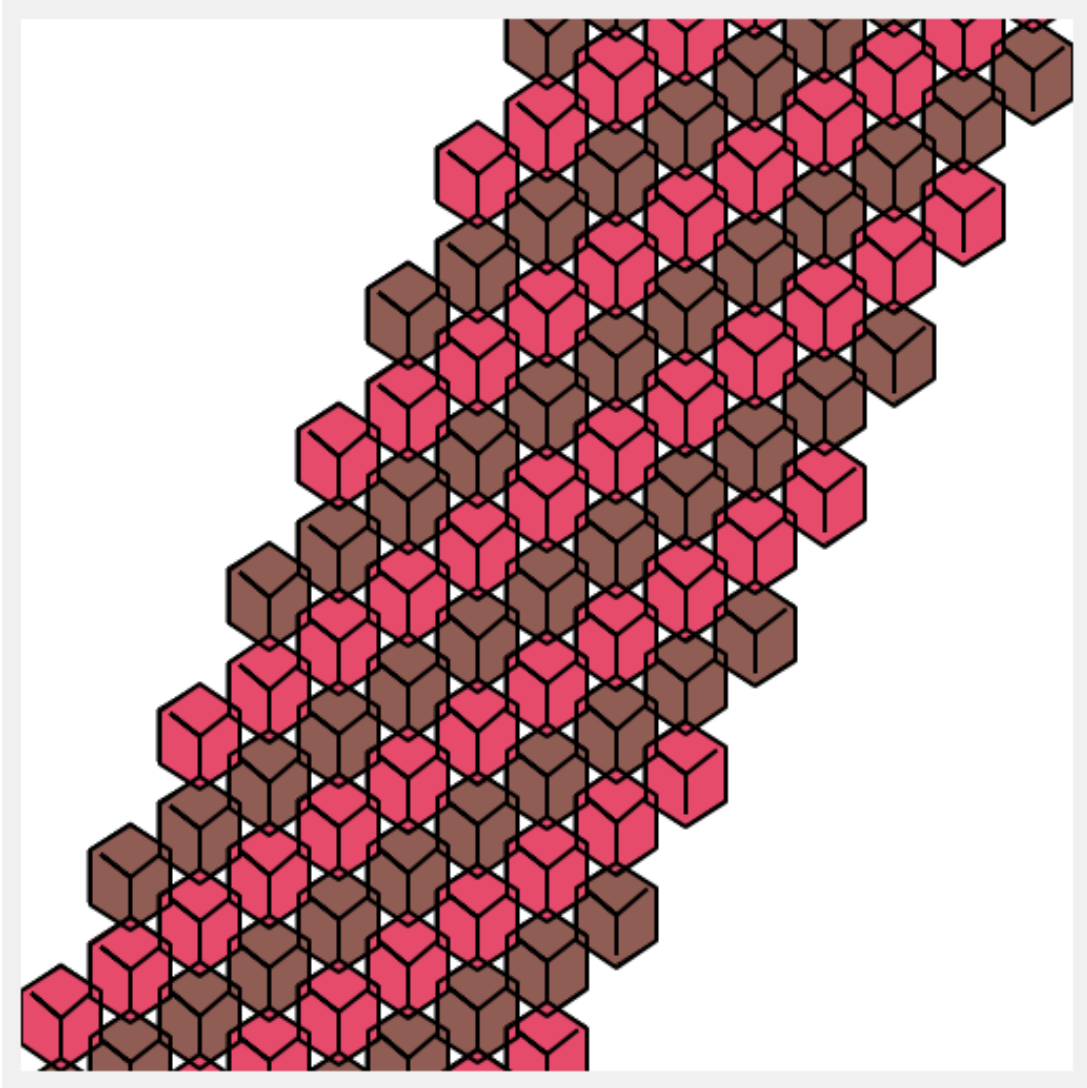
HAL0PARAM

```

+---+-----+-----+
|0 0|1.5 0.86625|0 1.7325|
+---+-----+-----+

```

## 1.7 麻の葉つくし



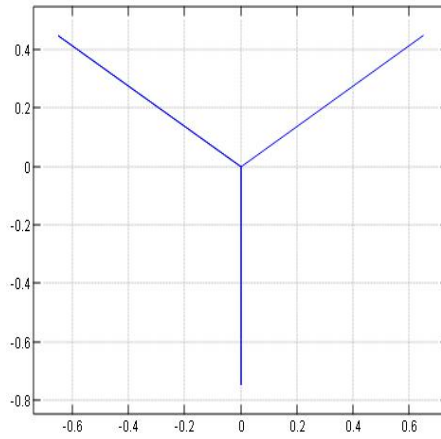
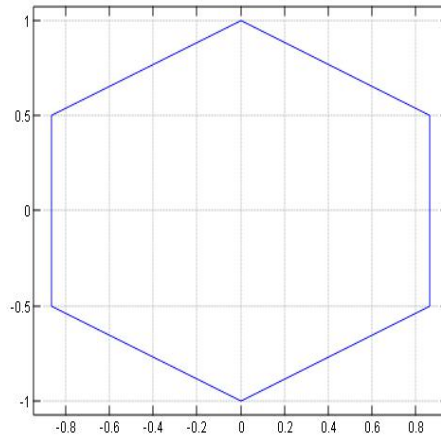
(144 93 84;230 75 107;0 0 0) hokusai\_at 15 10

AT;ATL

```
+-----+-----+
| 0.866025 0.5| 0 0|
|          0 1|_0.65 0.45|
| _0.866025 0.5| 0 0|
| _0.866025 _0.5| 0 _0.75|
|1.22465e_16 _1| 0 0|
| 0.866025 _0.5| 0.65 0.45|
| 0.866025 0.5|          |
+-----+-----+
```

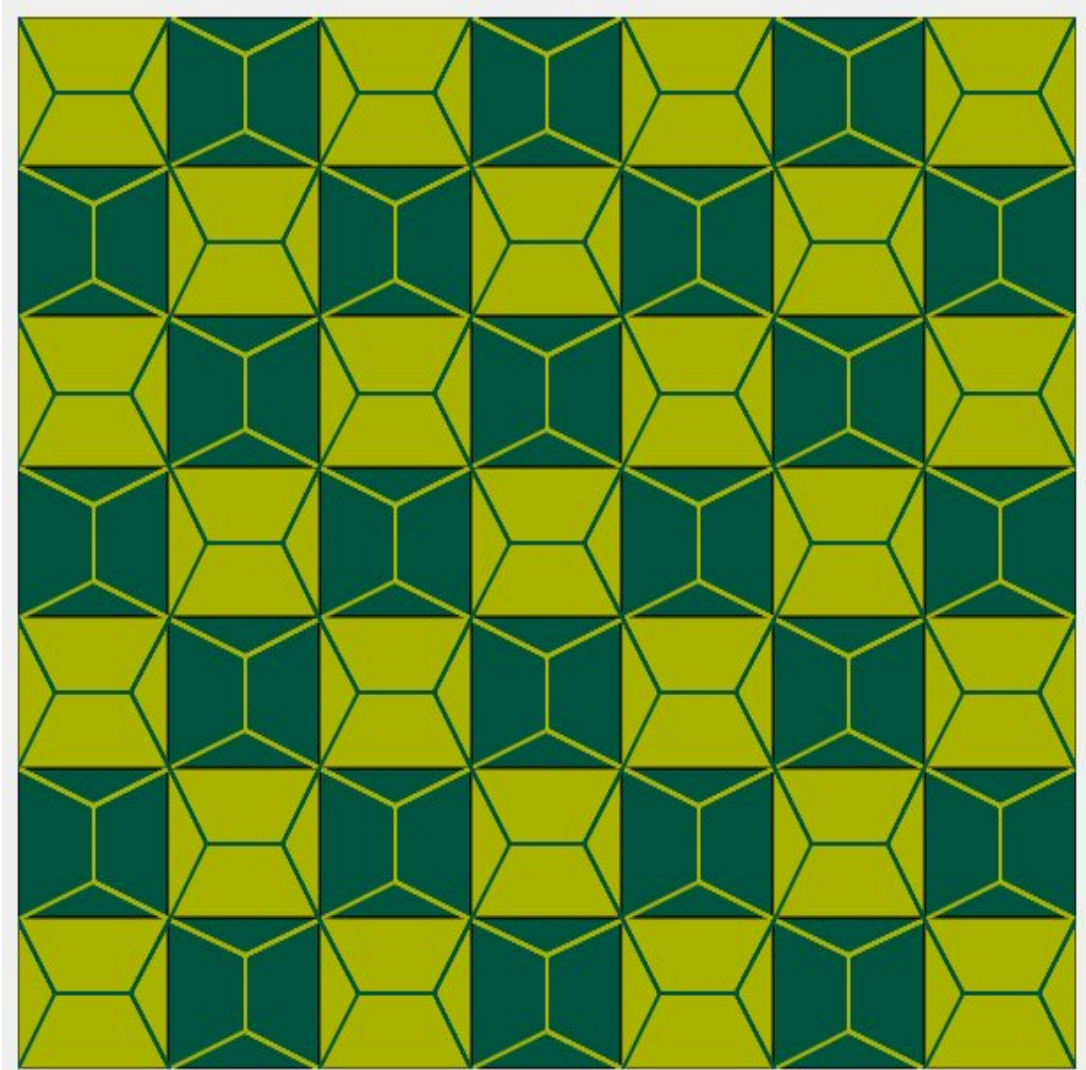
ATPARAM

```
+-----+-----+
|0.866 0.5|0 1.75|1.5 2.65|
+-----+-----+
```





## 1.8 八つ手麻の葉



(0 83 62;170 179 0;170 179 0) hokusai\_ym 10 15

YM0

1 1

\_1 1

\_1 \_1

1 \_1

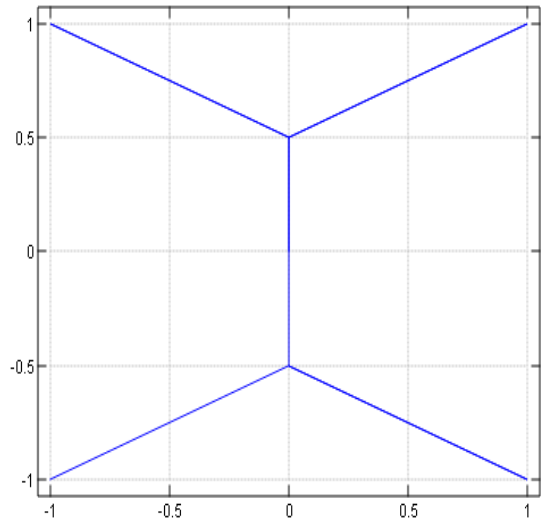
1 1

NB. square

```

YML1
0 0
0 0.5
1 1
0 0.5
-1 1
0 0.5
0 -0.5
1 -1
0 -0.5
-1 -1

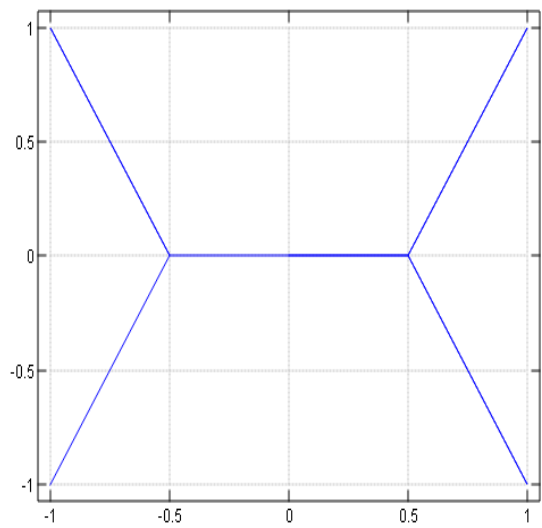
```



```

YML2
0 0
0.5 0
1 1
0.5 0
1 -1
0.5 0
-0.5 0
-1 1
-0.5 0
-1 -1

```

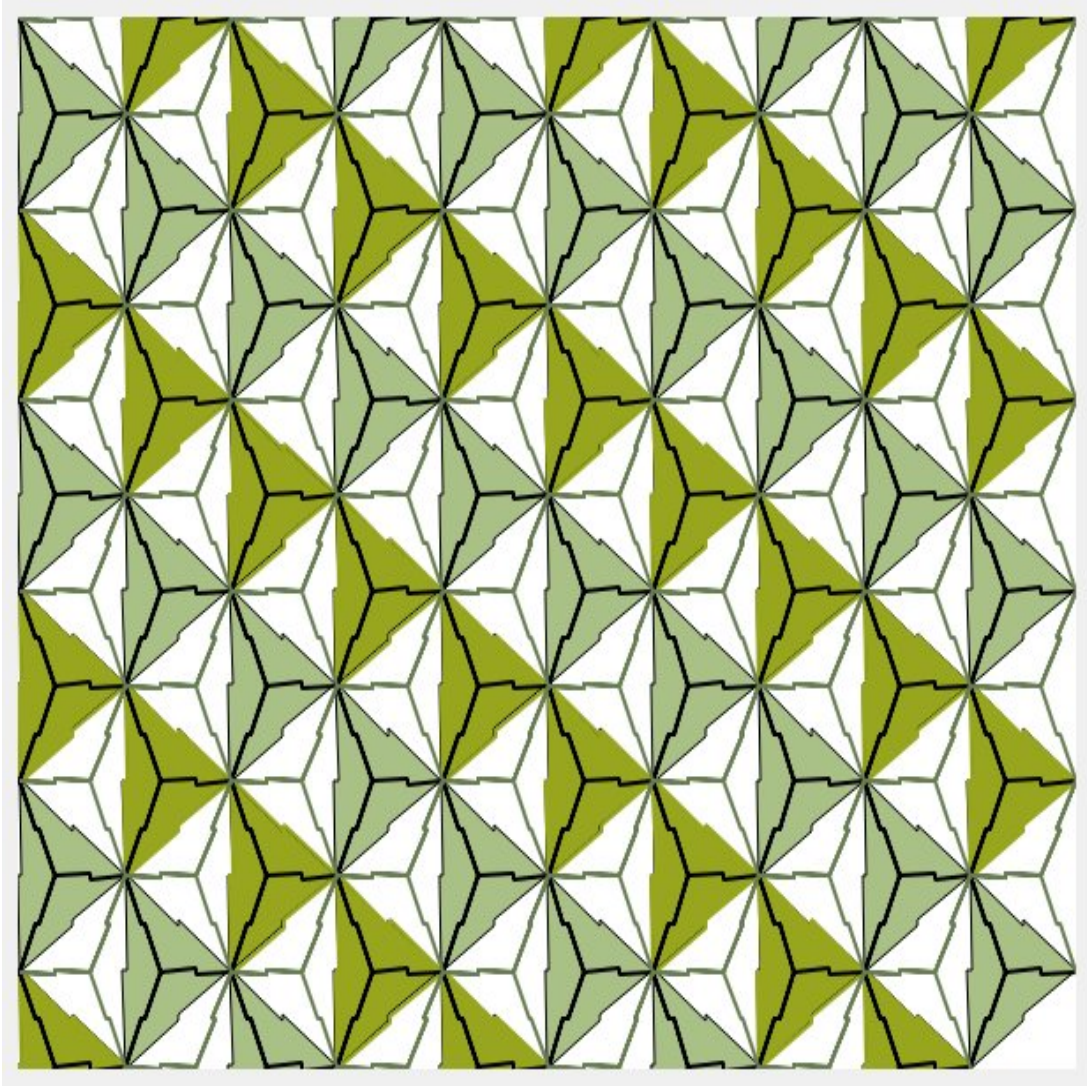


```

YMPARAM
+---+---+---+
|0 0|2 0|0 2|
+---+---+---+

```

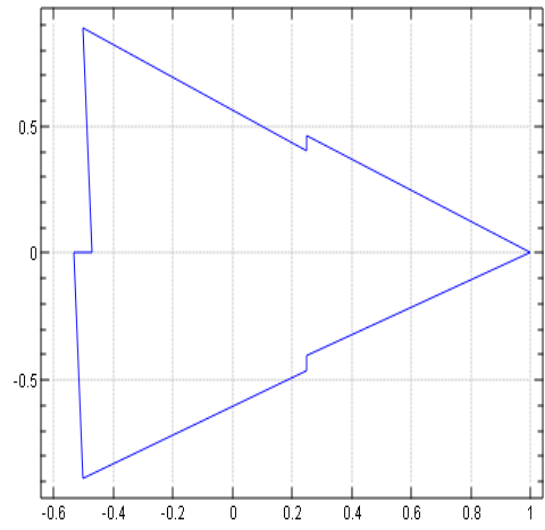
1.9 松川



(169 192 135;151 166 30;0 0 0 ; 104 126 82) hokusai\_ma 10 10

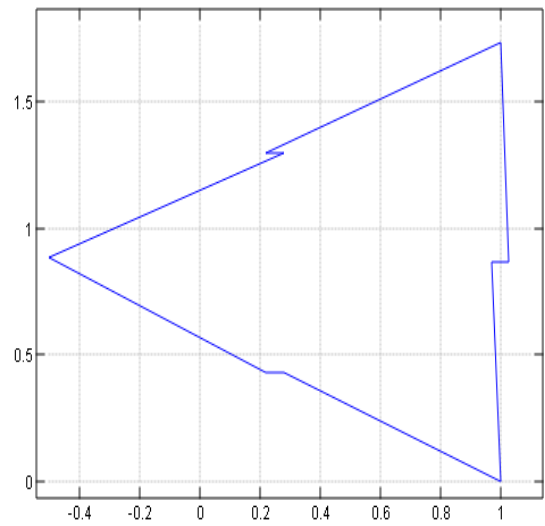
MA0

_0.5	0.886025
_0.47	0
_0.53	0
_0.5	_0.886025
0.25	_0.463
0.25	_0.403
1	0
0.25	0.463
0.25	0.403
_0.5	0.886025



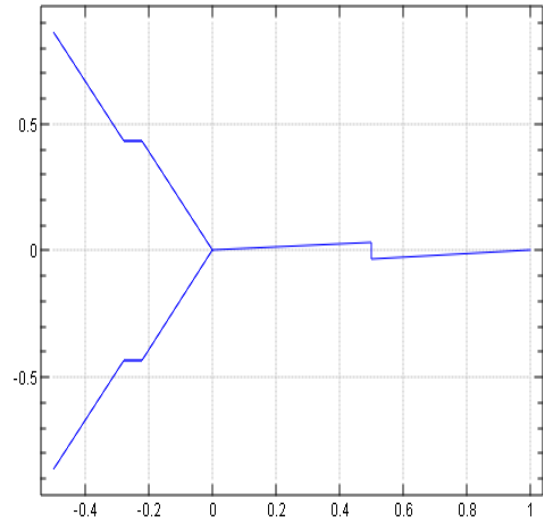
MA1

1	1.732
0.22	1.299
0.28	1.299
_0.5	0.886025
0.22	0.433
0.28	0.433
1	0
0.97	0.866
1.03	0.866
1	1.732



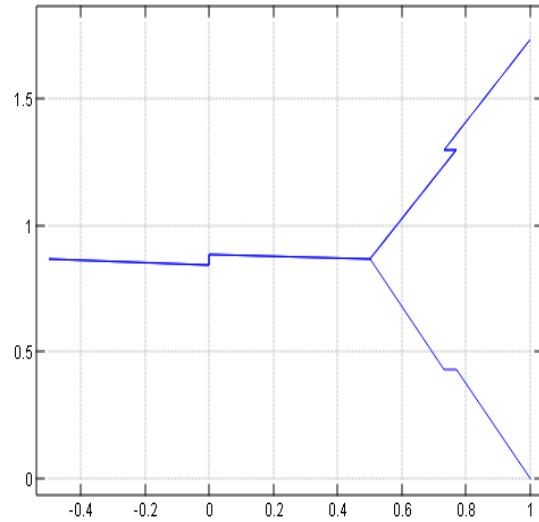
MAL0

0	0
0.22	0.433
0.28	0.433
0.5	0.866
0.28	0.433
0.22	0.433
0	0
0.22	-0.433
0.28	-0.433
0.5	-0.866
0.28	-0.433
0.22	-0.433
0	0
0.5	0.03
0.5	-0.03
1	0



MAL1

0.5 0.866  
0.77 1.299  
0.73 1.299  
1 1.732  
0.73 1.299  
0.77 1.299  
0.5 0.866  
0 0.886  
0 0.846  
\_0.5 0.866  
0 0.846  
0 0.886  
0.5 0.866  
0.73 0.433  
0.77 0.433  
1 0



MAOPARAM

+-----+-----+-----+  
|\_0.5 0.866025|1.5 0.866025|0 1.73205|  
+-----+-----+-----+

MA1PARAM

+-----+-----+-----+  
|1 1.73205|1.5 0.866025|0 1.73205|  
+-----+-----+-----+

MALOPARAM

+---+-----+-----+  
|0 0|1.5 0.866025|0 1.73205|  
+---+-----+-----+

MAL1PARAM

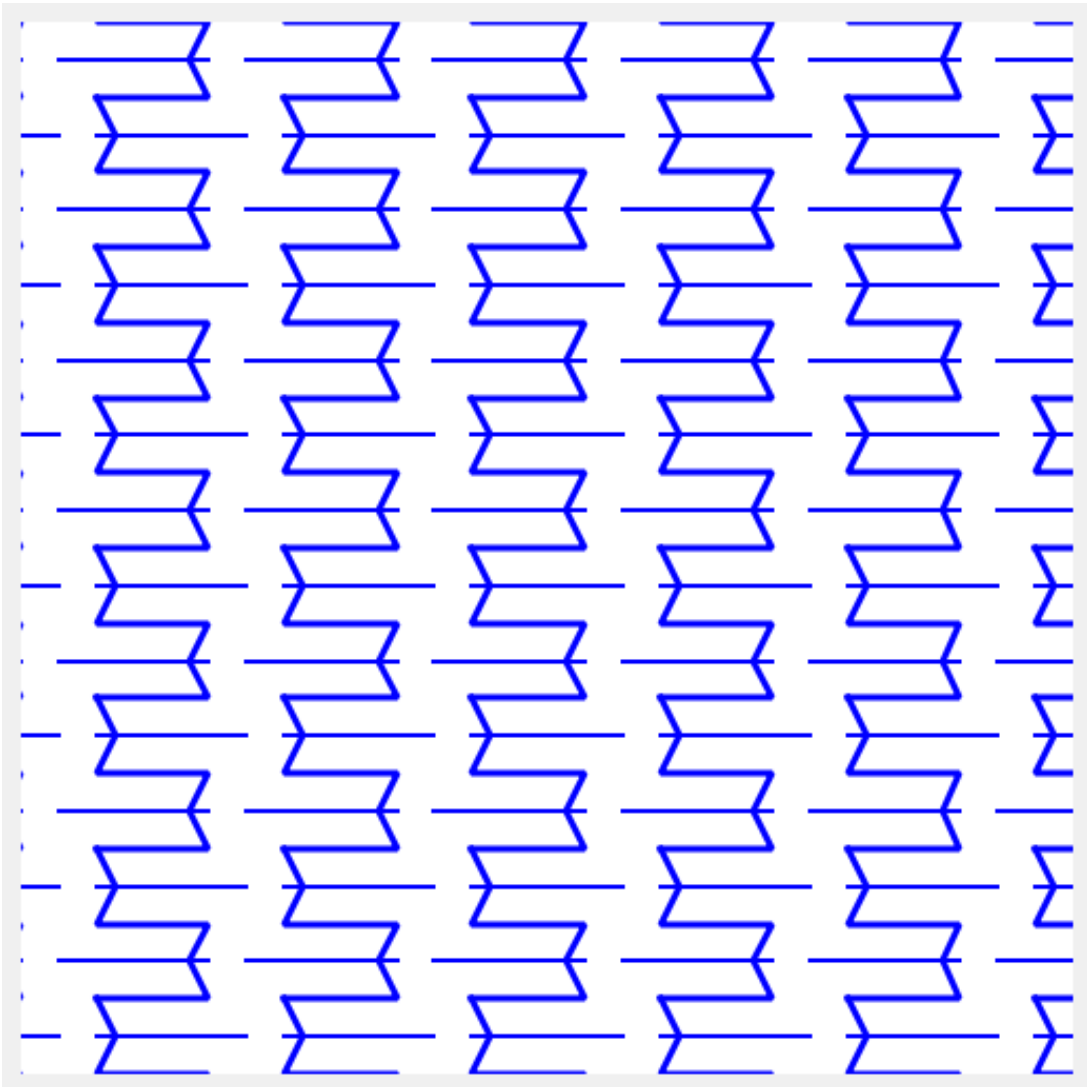
+-----+-----+-----+  
|1 1.73205|1.5 0.866025|0 1.73205|

+-----+-----+-----+

## 2 直線を描く

C.Reiter の *dline* をベースに太い線 *dline3* を作る。

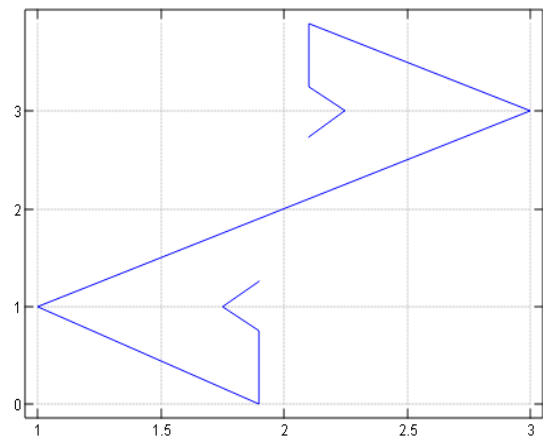
### 2.1 行つ戻りつ



IKI  
 2 0  
 5 0  
 4.5 1  
 5 2  
 2 2  
 2.5 3  
 2 4

IKI2  
 1 1  
 5 1

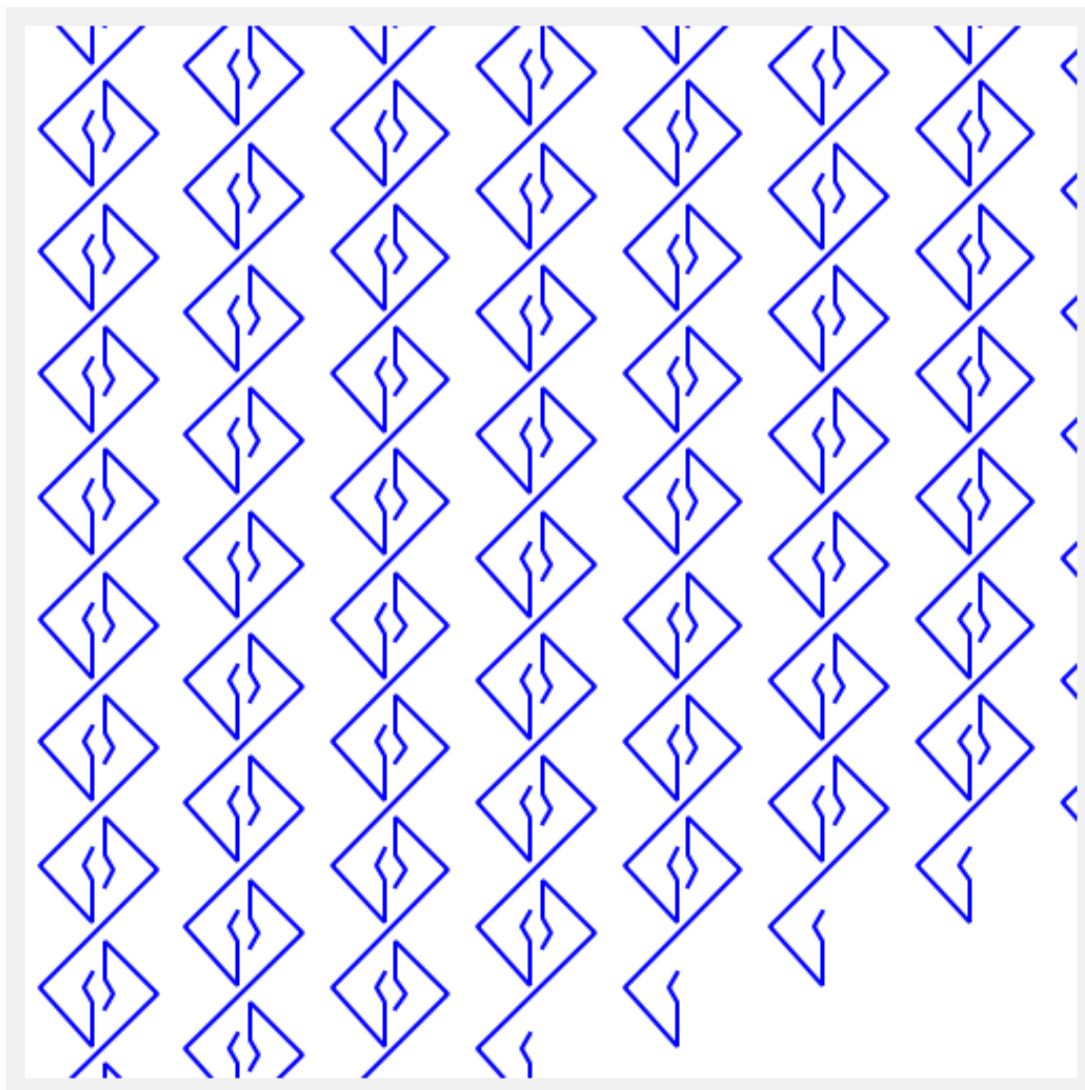
IKI3  
 2 3  
 6 3



IKIPARAM  
 +---+---+---+  
 |2 0|5 0|0 4|  
 +---+---+---+



## 2.2 釣四ツ目



0 0 255 hokusai\_ty 10 10

```

TY
2.1 2.74
2.25 3
2.1 3.25
2.1 3.9
3 3
1 1
1.9 0
1.9 0.75
1.75 1
1.9 1.26

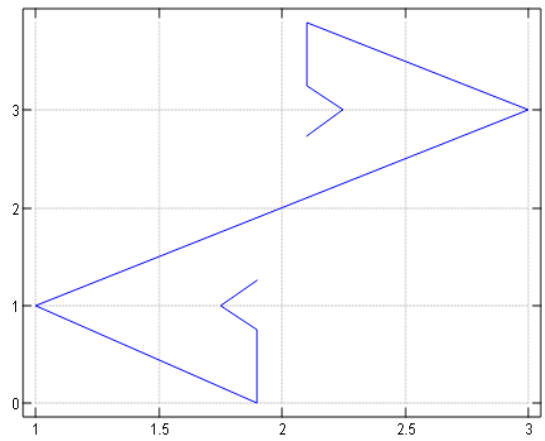
```

TYPARAM

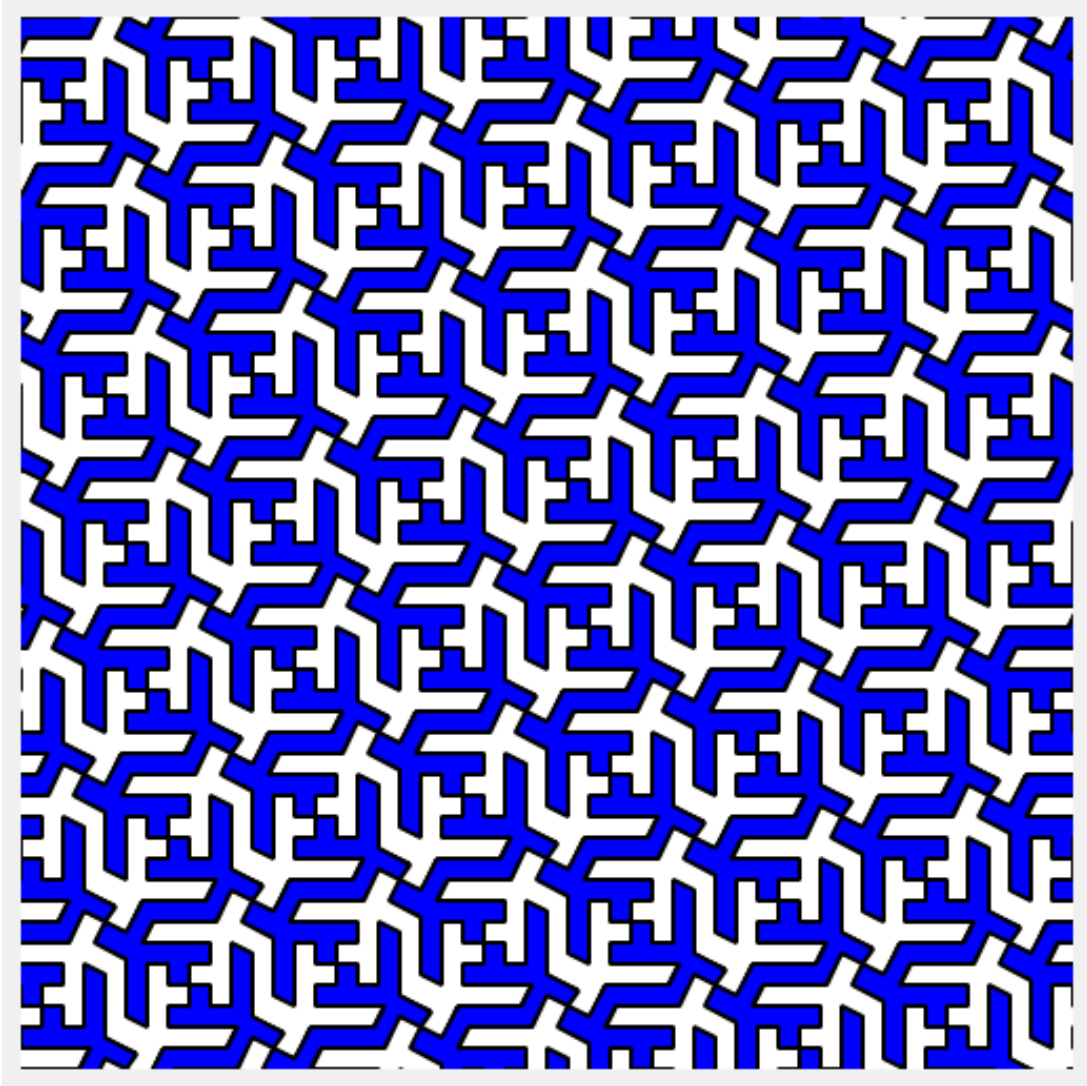
```

+-----+-----+-----+
|2.2 2.6|2.5 1.05|0 2.1|
+-----+-----+-----+

```



### 2.3 燭光の万字繋ぎ



```

SM0
4 0
4 3
5 3
5 2
6 2
6 3
7 3
7 4
3.75 4
4.25 5
7.25 5
8 6.5
9 6
9.5 6.75
8 7.5

```

```

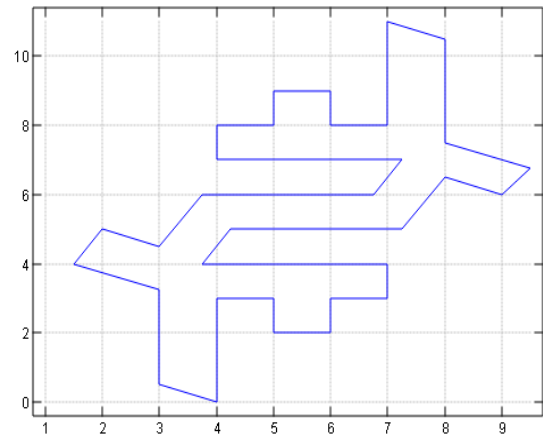
8 10.5
7 11
7 8
6 8
6 9
5 9
5 8
4 8
4 7
7.25 7
6.75 6
3.75 6
3 4.5
2 5
1.5 4
3 3.25
3 0.5
4 0

```

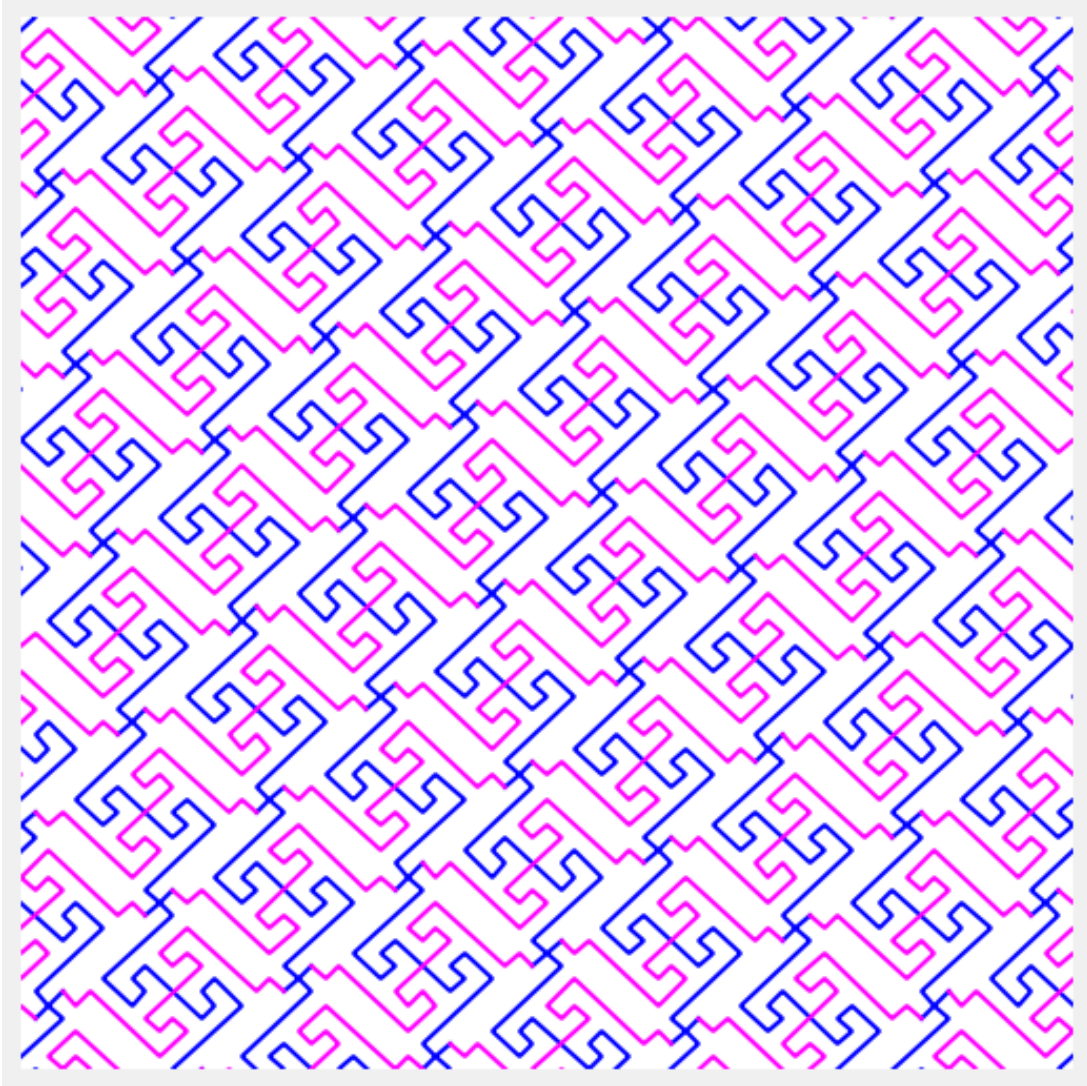
```

SM0PARAM
+---+---+---+
|4 0|7 1|_1 7|
+---+---+---+

```



## 2.4 菱の釣万字



HM0, .HM0R			HM1, .HM1R		
1 1	0	1.41421	9 1	5.65685	7.07107
2 1	0.707107	2.12132	9 2	4.94975	7.77817
2 2	0	2.82843	8 2	4.24264	7.07107
7 2	3.53553	6.36396	8 7	0.707107	10.6066
7 4	2.12132	7.77817	6 7	_0.707107	9.19239
6 4	1.41421	7.07107	6 6	0	8.48528
6 3	2.12132	6.36396	7 6	0.707107	9.19239
5 3	1.41421	5.65685	7 5	1.41421	8.48528
5 7	_1.41421	8.48528	3 5	_1.41421	5.65685
4 7	_2.12132	7.77817	3 4	_0.707107	4.94975
4 6	_1.41421	7.07107	4 4	0	5.65685
3 6	_2.12132	6.36396	4 3	0.707107	4.94975
3 8	_3.53553	7.77817	2 3	_0.707107	3.53553
8 8	0	11.3137	2 8	_4.24264	7.07107
8 9	_0.707107	12.0208	1 8	_4.94975	6.36396
9 9	0	12.7279	1 9	_5.65685	7.07107

HM0PARAM

```

+---+---+---+
|1 1|8 0|8 8|
+---+---+---+

```

HM1PARAM=: 1r4p1 find\_rotm\_diff HM0PARAM

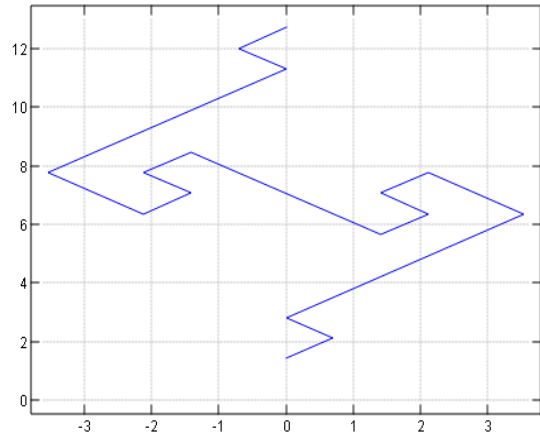
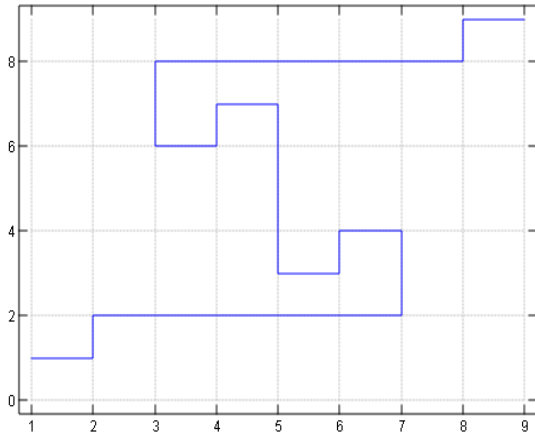
HM1PARAM

```

+-----+-----+-----+
|0 1.41421|5.65685 5.65685|_1.41421 9.89949|

```

+-----+-----+-----+-----+



回転が入ってくる。回転行列を用いて  $1r4p1 \rightarrow \frac{1}{4}\pi$  すなわち  $90^\circ$  回転させる。 *clean* は微細な数値計算のごみを取り除く *numeric* に入っている関数

```
rotm 1r4p1
0.707107 0.707107 0
-0.707107 0.707107 0
0 0 1
```

```
HM0R=: }:"1 clean (HM0 ,.1) mp rotm 1r4p1
HM1R=: }:"1 clean (HM1 ,.1) mp rotm 1r4p1
```

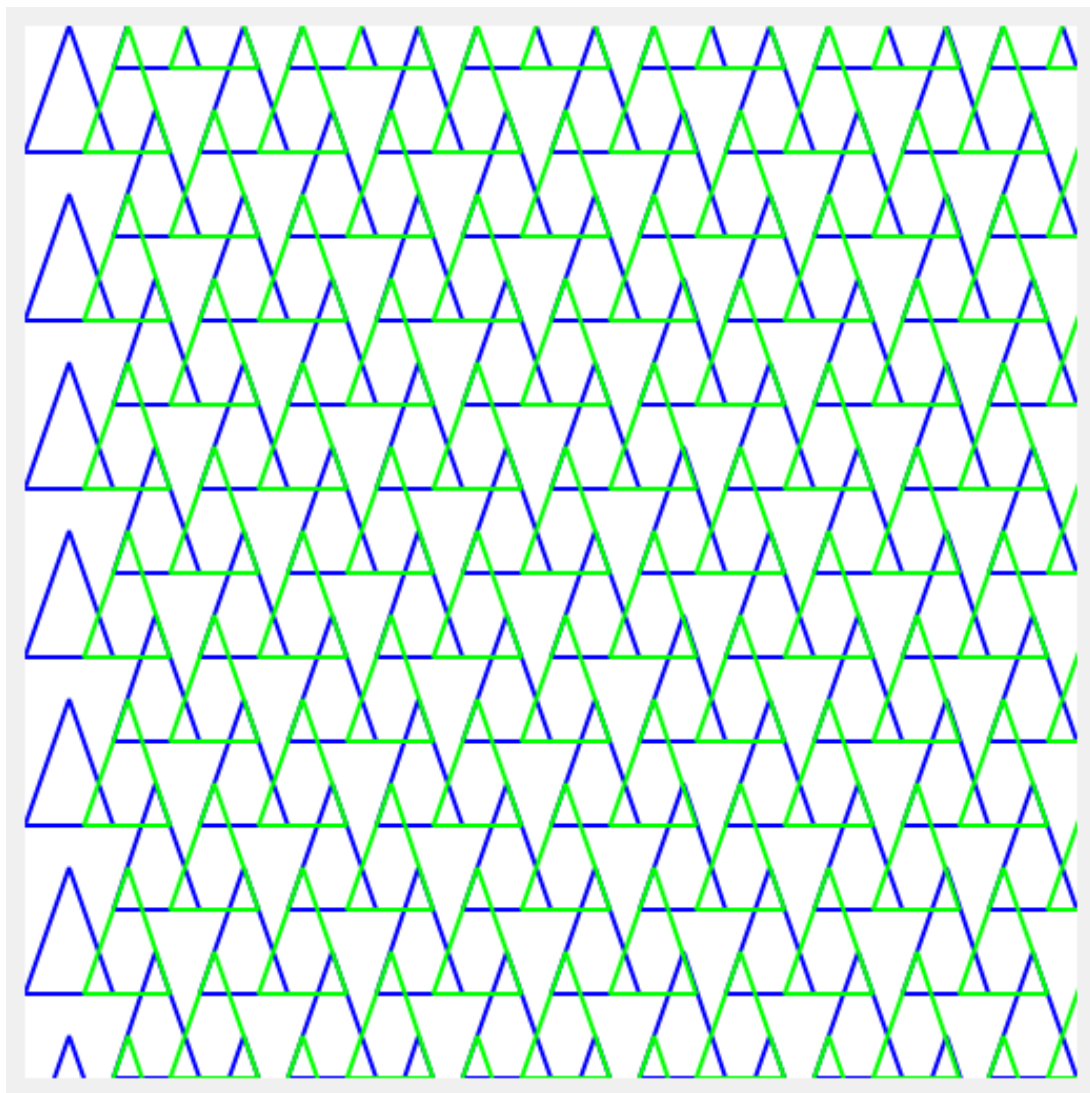
回転による差分パラメーターは自動検出する

```
HM1PARAM=: 1r4p1 find_rotm_diff HM0PARAM
```

HM1PARAM

+-----+-----+-----+-----+  
|0 1.41421|5.65685 5.65685|\_1.41421 9.89949|  
+-----+-----+-----+-----+

## 2.5 破れ籠目





1. 正 3 角形を描く

次の手順は正多角形の頂点座標を求める手法。ガウスの正 17 角形ならば 3 を 17 に変えればよい。

(a) 3 角形の素

```
}
(i.3)%3x
0 1r3 2r3
```

(b)  $2\pi = \text{円を掛ける}$

```
2p1* (i.3)%3x
0 2.0944 4.18879
```

(c) 極座標に変換する。y. は *angle*

```
r. 2p1* (i.3)%3x
1 _0.5j0.866025 _0.5j_0.866025
```

(d) 実部と虚部を分ける

```
+ . r. 2p1* (i.3)%3x
1 0
_0.5 0.866025
_0.5 _0.866025
```

(e) *polygon* で描かないので始点を後尾に追加

```
plot {@|: 1 0 ,~ + . r. 2p1* (i.3)%3x
1 0
_0.5 0.866025
_0.5 _0.866025
1 0
pd 'save png c:/temp/hokusai_yk0.png'
```

2. 回転 正 3 角形を  $\frac{1}{4}\pi$  回転し、正立させる。

```
((+. r. 2p1* (i.3)%3x),.1) mp rotm 1r4p1
0.707107 0.707107 1
_0.965926 0.258819 1
0.258819 _0.965926 1
```

### 3. 2つ目の3角形

YK1=: YK0+("1) (0.8666025\*4r3), 0

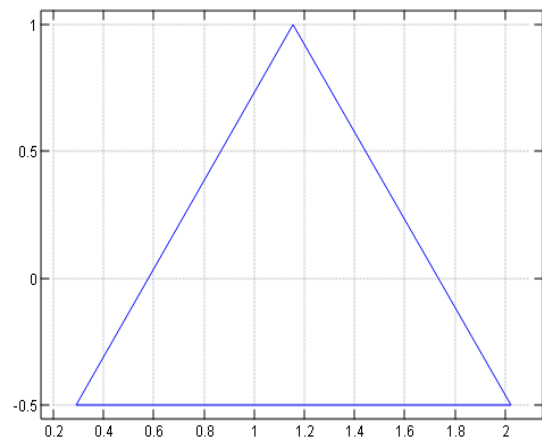
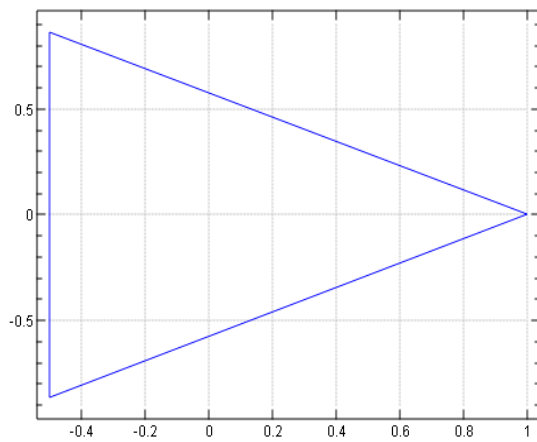
sin 1r3p1  
0.866025

4r3\* sin 1r3p1  
1.1547

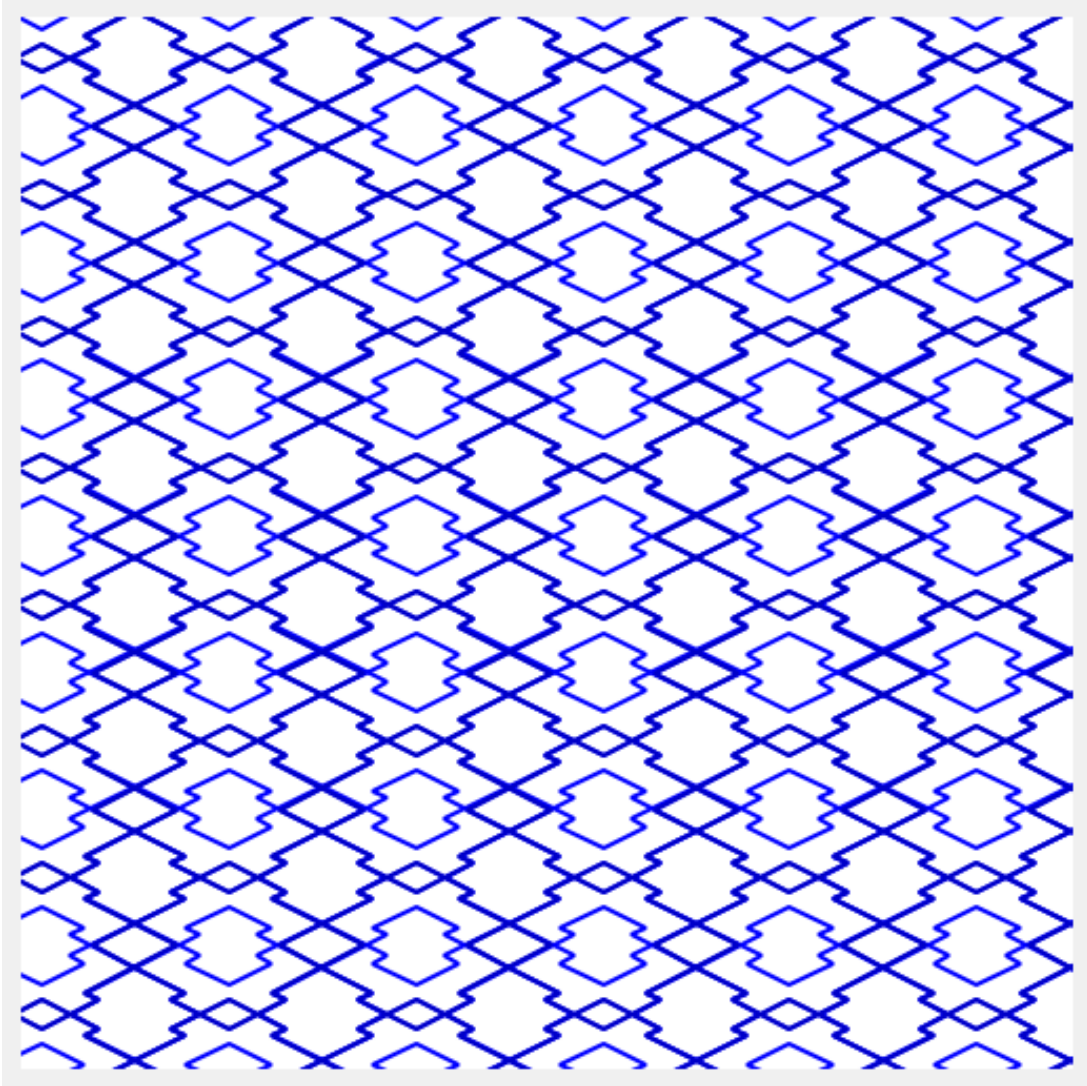
YK1  
1.15547 1  
0.289445 \_0.5  
2.0215 \_0.5  
1.15547 1

### 4. YKPARAM

YKPARAM  
+---+-----+---+  
|0 1|1.73333 1|0 2|  
+---+-----+---+



## 2.6 松皮



1. 最初の2つのピースの座標

	MK0;MK1_insert		
大	小		
+-----+-----+			
2	2	9.5	16
5	2	9.5	12.5
5	3	8.5	12.5
13	3	8.5	8.5
13	4	12.5	8.5
15	4	12.5	9.5
15	6	19	9.5
16	6	19	16
16	14	20	16
17	14	20	20
17	17	16	20
14	17	16	19
14	16	9.5	19
9.5	16	9.5	16
9.5	12.5		
8.5	12.5		
+-----+-----+			

2. 拡大

回転に加えて拡大行列を用いる。(右下の1は支柱の単機能のみ)

```

    elongm 1 0.5
1   0 0
0 0.5 0
0   0 1

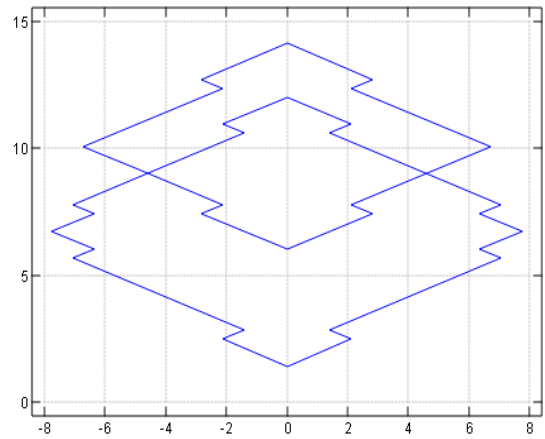
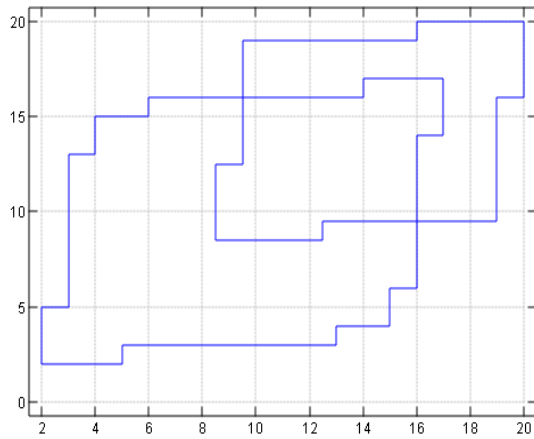
MK01=: clean }:"1 (MK0,.1) mp (rotm 1r4p1) mp elongm 1.0 0.5
MK11=: clean }:"1 (MK1_insert,.1) mp (rotm 1r4p1) mp elongm 1 0.5

```

3. 差分

MK01PARAM

```
+-----+-----+-----+  
|0 0|9.25 0|0 6.75|  
+-----+-----+-----+
```

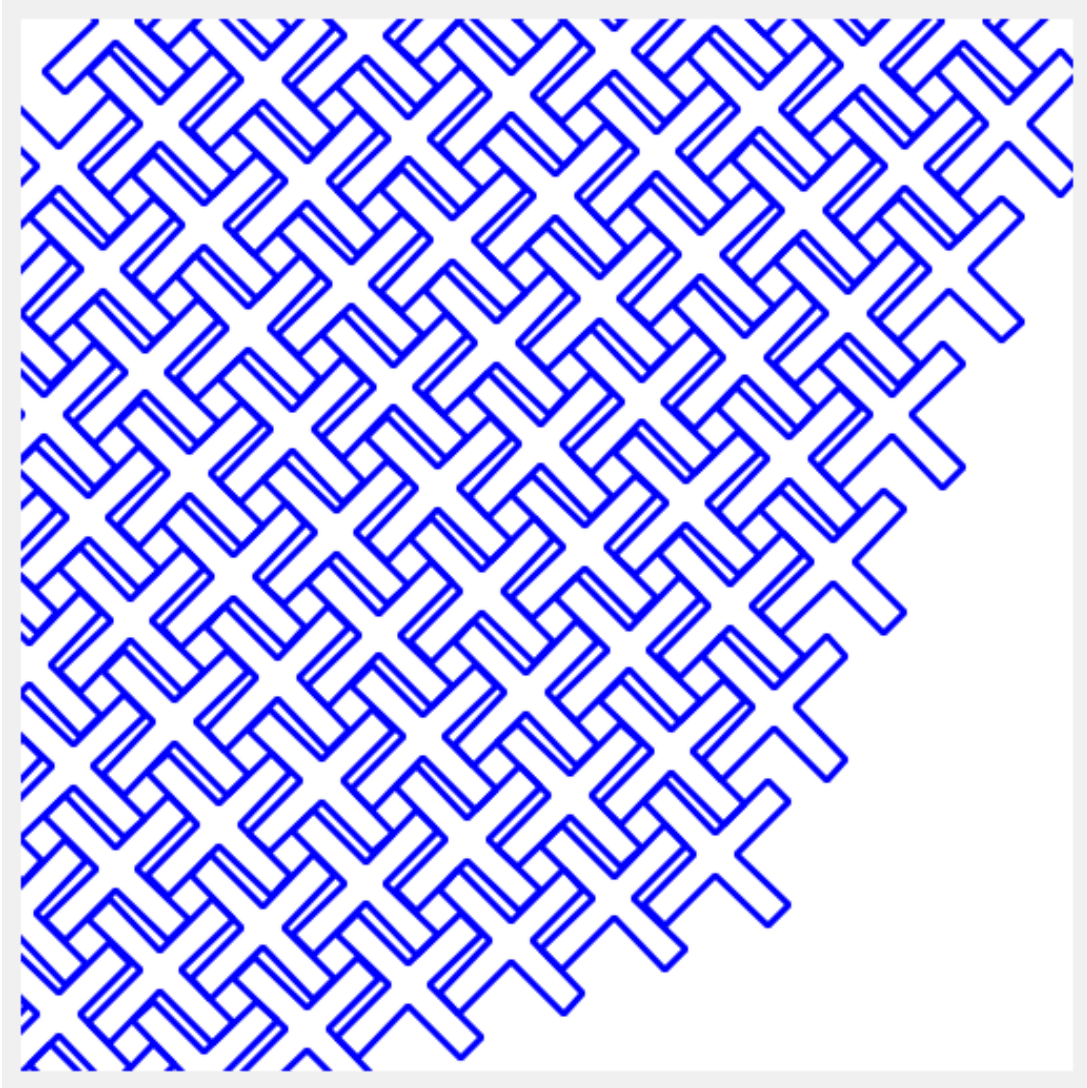


4. *line* でのグラデュエーション



(234 213 107;228 211 162) hokusai\_mk2 12 12

## 2.7 碁盤筋交い (No64)



0 0 255 hokusai\_skty 12 12

SKOR は  $\frac{1}{4}\pi$  回転させる

SKOR=: clean }:"1 (SK0,.1) mp rotm 1r4p1

SK0;SKOR

```

+-----+-----+
|3.5  1|  1.76777 3.18198|
|4.5  1|  2.47487 3.88909|
|4.5 3.5| 0.707107 5.65685|
|  7 3.5|  2.47487 7.42462|
|  7 4.5|  1.76777 8.13173|
|4.5 4.5|           0 6.36396|
|4.5  7| _1.76777 8.13173|
|3.5  7| _2.47487 7.42462|
|3.5 4.5|_0.707107 5.65685|
|  1 4.5| _2.47487 3.88909|
|  1 3.5| _1.76777 3.18198|
|3.5 3.5|           0 4.94975|
|3.5  1|  1.76777 3.18198|
+-----+-----+

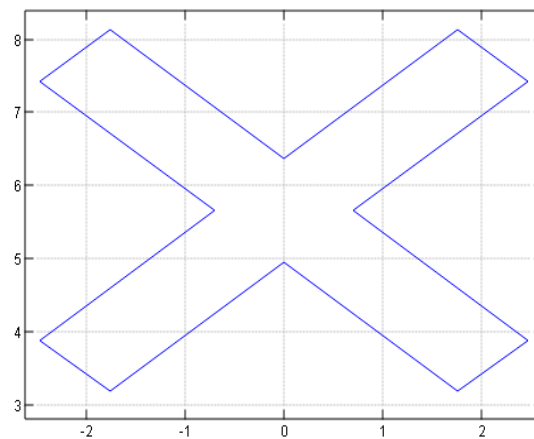
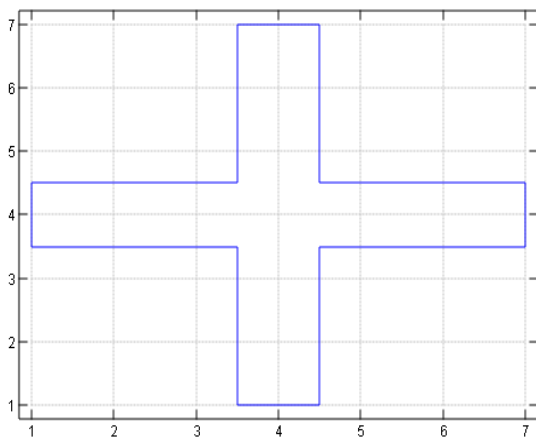
```

SKPARAM

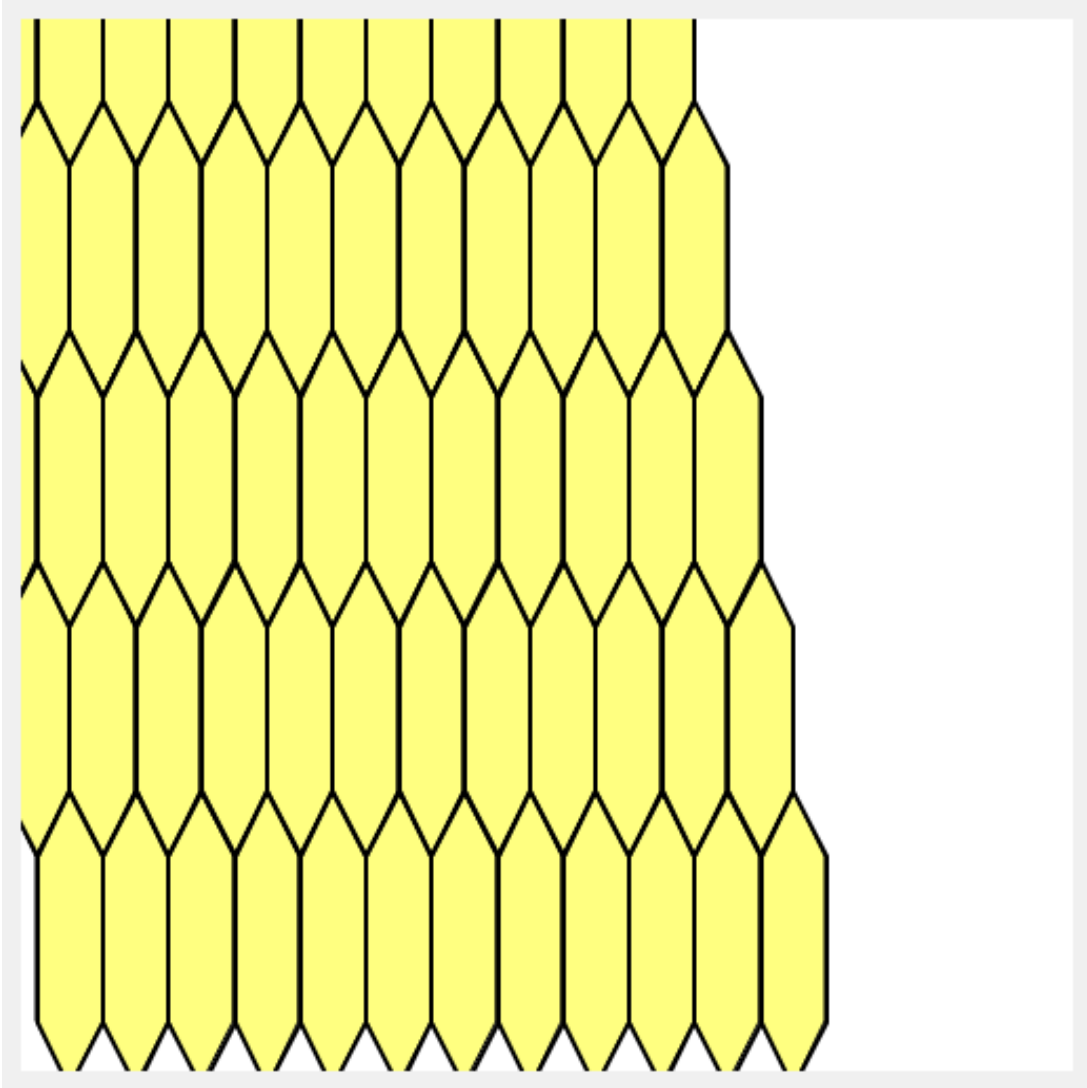
```

+-----+-----+
|3.5 1|3.5 1.5|2 5|
+-----+-----+

```



2.8 畳 (No52)



(0 0 0;255 255 128) hokusai\_tt 12 12

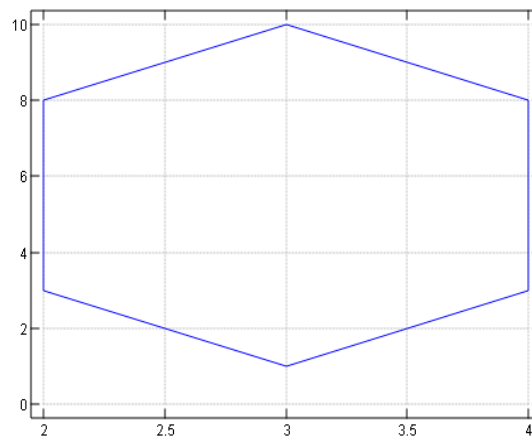


TT0

3 1  
4 3  
4 8  
3 10  
2 8  
2 3  
3 1

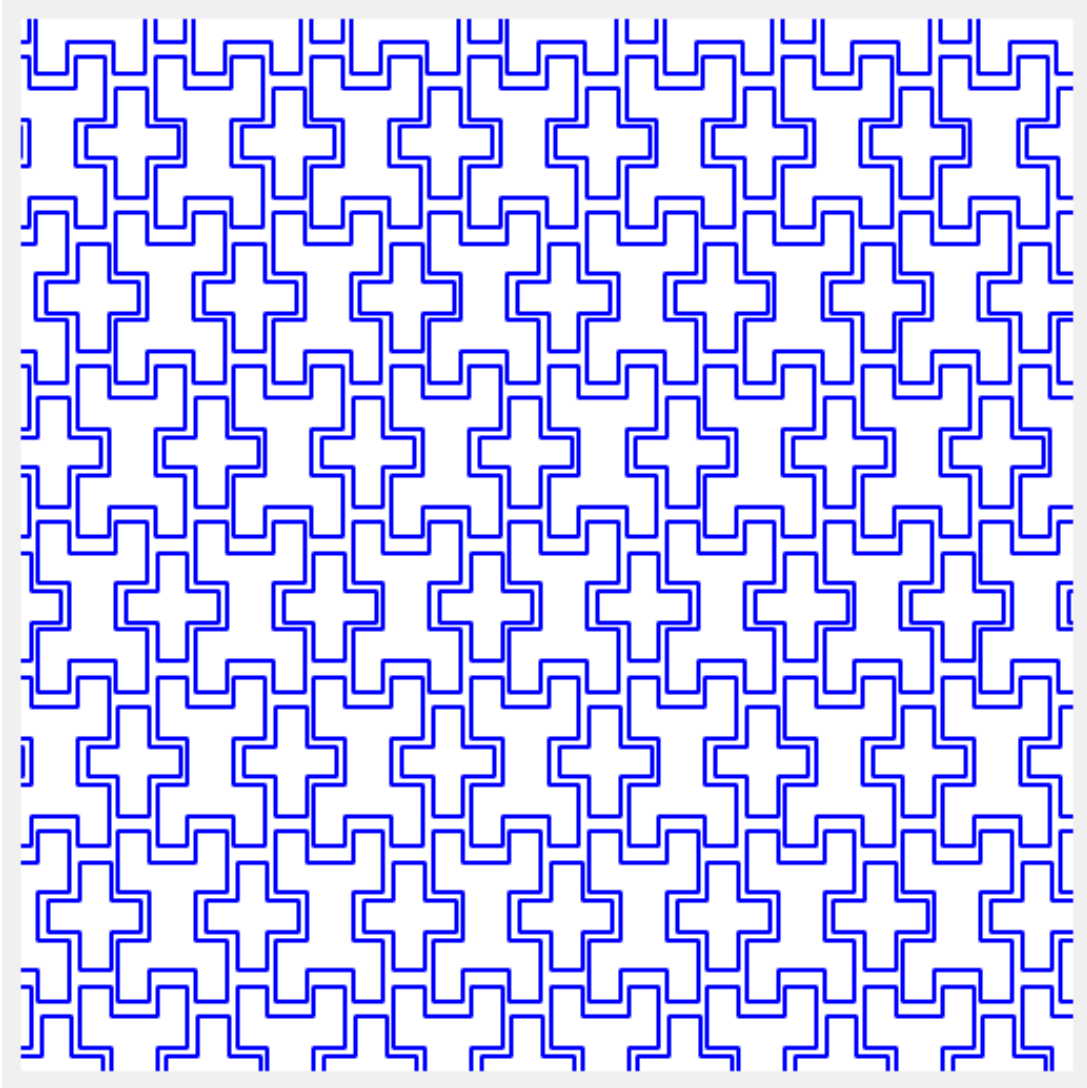
TT0PARAM

```
+---+---+---+  
|3 1|2 0|_1 7|  
+---+---+---+
```



*plot* の自動補正で縦が潰されている。

## 2.9 唐様障子 (No71)



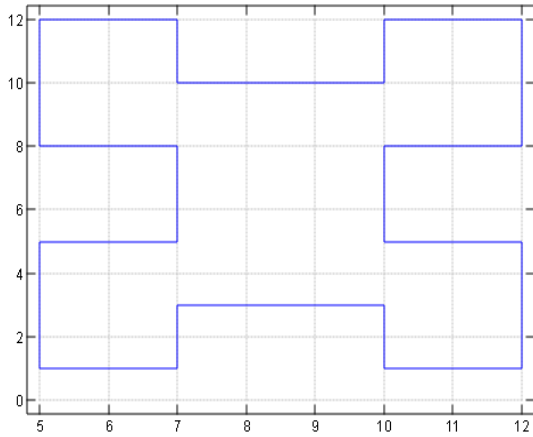
0 0 255 hokusai\_ksy 12 12

KSY0;KSY1

```

+-----+-----+
| 5  1|2.5  3|
| 7  1|4.5  3|
| 7  3|4.5  5.5|
|10  3|6.5  5.5|
|10  1|6.5  7.5|
|12  1|4.5  7.5|
|12  5|4.5  10|
|10  5|2.5  10|
|10  8|2.5  7.5|
|12  8|0.5  7.5|
|12 12|0.5  5.5|
|10 12|2.5  5.5|
|10 10|2.5  3|
| 7 10|      |

```



```

| 7 12|      |
| 5 12|      |
| 5  8|      |
| 7  8|      |
| 7  5|      |
| 5  5|      |
| 5  1|      |
+-----+-----+

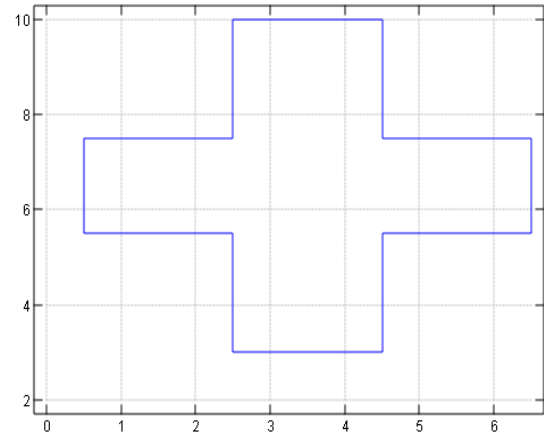
```

KSY0PARAM

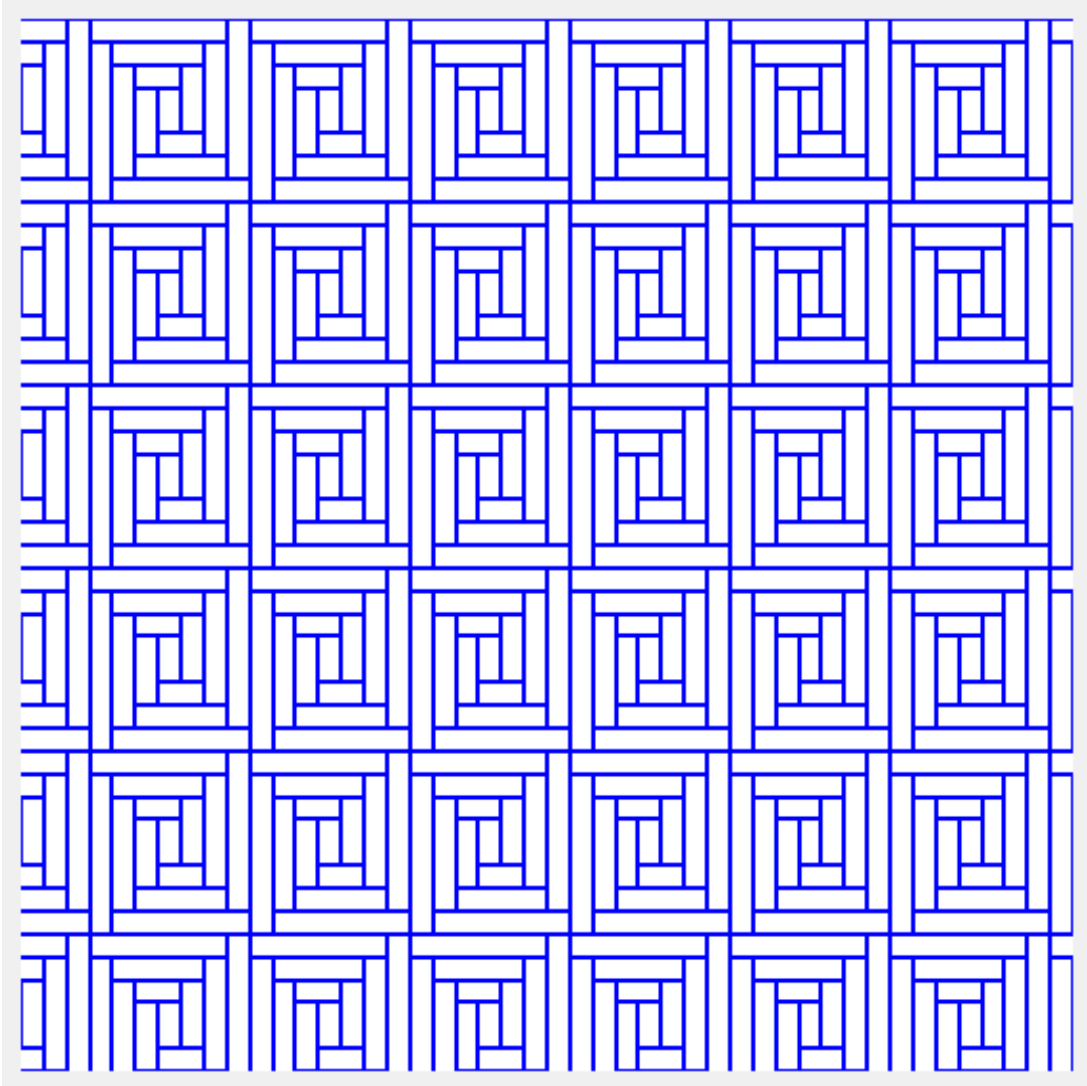
```

+---+-----+-----+
|5 1|10.15 0|2.5 10|
+---+-----+-----+

```



2.10 (No79)



0 0 255 hokusai\_nex 12 12

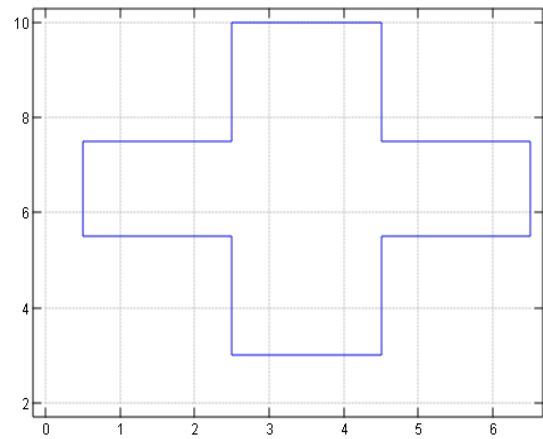
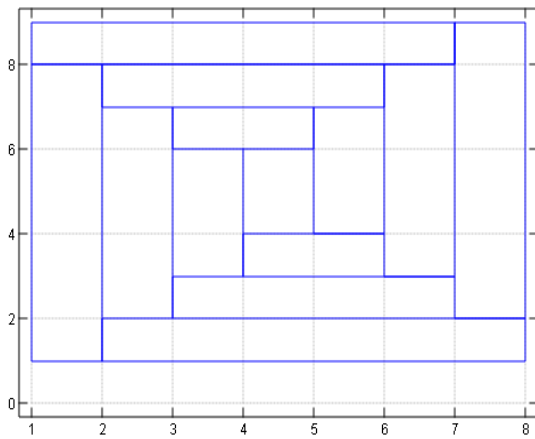
NEX0

7 9  
 1 9  
 1 8  
 7 8  
 7 9  
 8 9  
 8 1  
 1 1  
 1 8  
 7 8  
 7 9  
 7 2  
 8 2  
 2 2  
 2 1  
 2 8  
 2 7

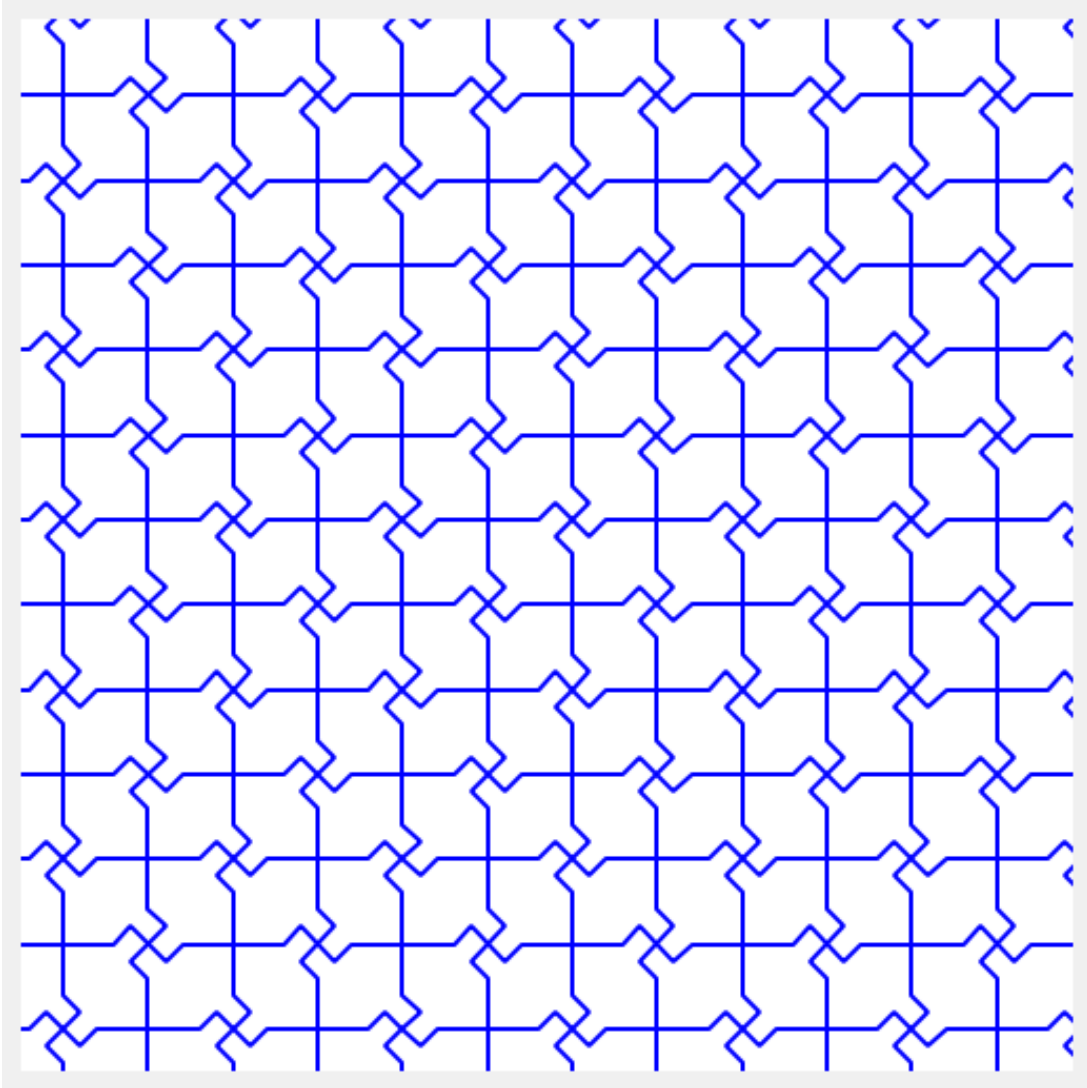
6 7  
 6 8  
 6 3  
 7 3  
 3 3  
 3 2  
 3 7  
 3 6  
 5 6  
 5 7  
 5 4  
 6 4  
 4 4  
 4 3  
 4 6

NEXOPARAM

```
+---+---+---+
|7 9|7 0|0 8|
+---+---+---+
```



## 2.11 早割碁盤割手 (No25)



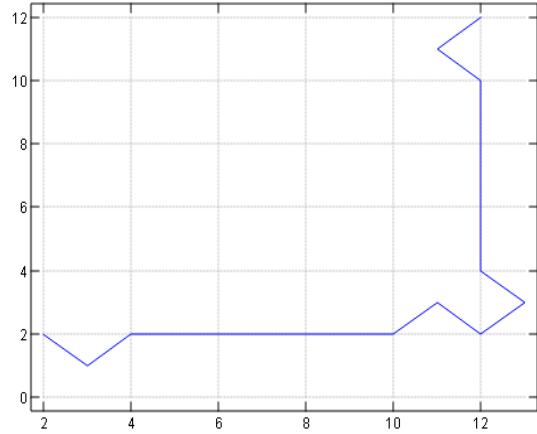
0 0 255 hokusai\_hg 12 12

HG0;HG1;HG2

```

+-----+-----+-----+
| 2  2| 2 7|7 12|
| 3  1| 5 7|7  9|
| 4  2| 6 8|8  8|
|10  2| 8 6|6  6|
|11  3| 9 7|7  5|
|12  2|12 7|7  2|
|13  3|    |    |
|12  4|    |    |
|12 10|    |    |
|11 11|    |    |
|12 12|    |    |
+-----+-----+-----+

```

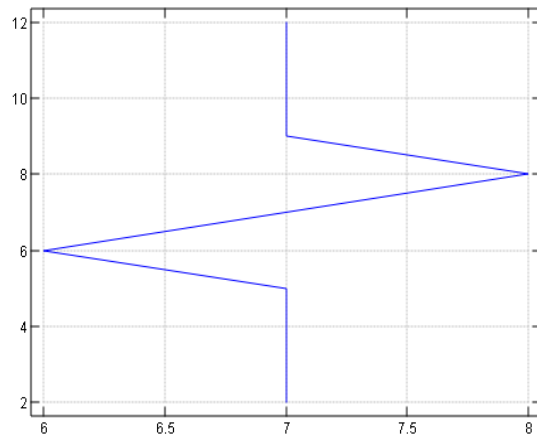
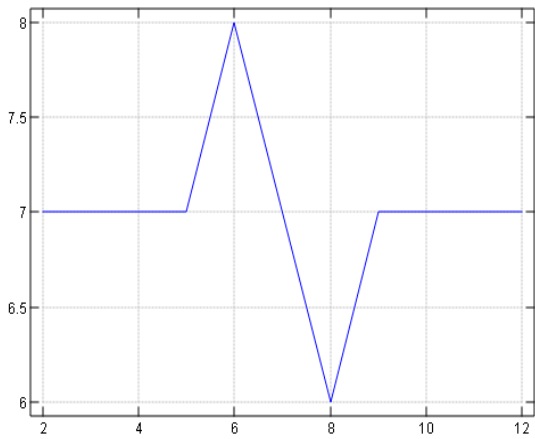


HG0PARAM

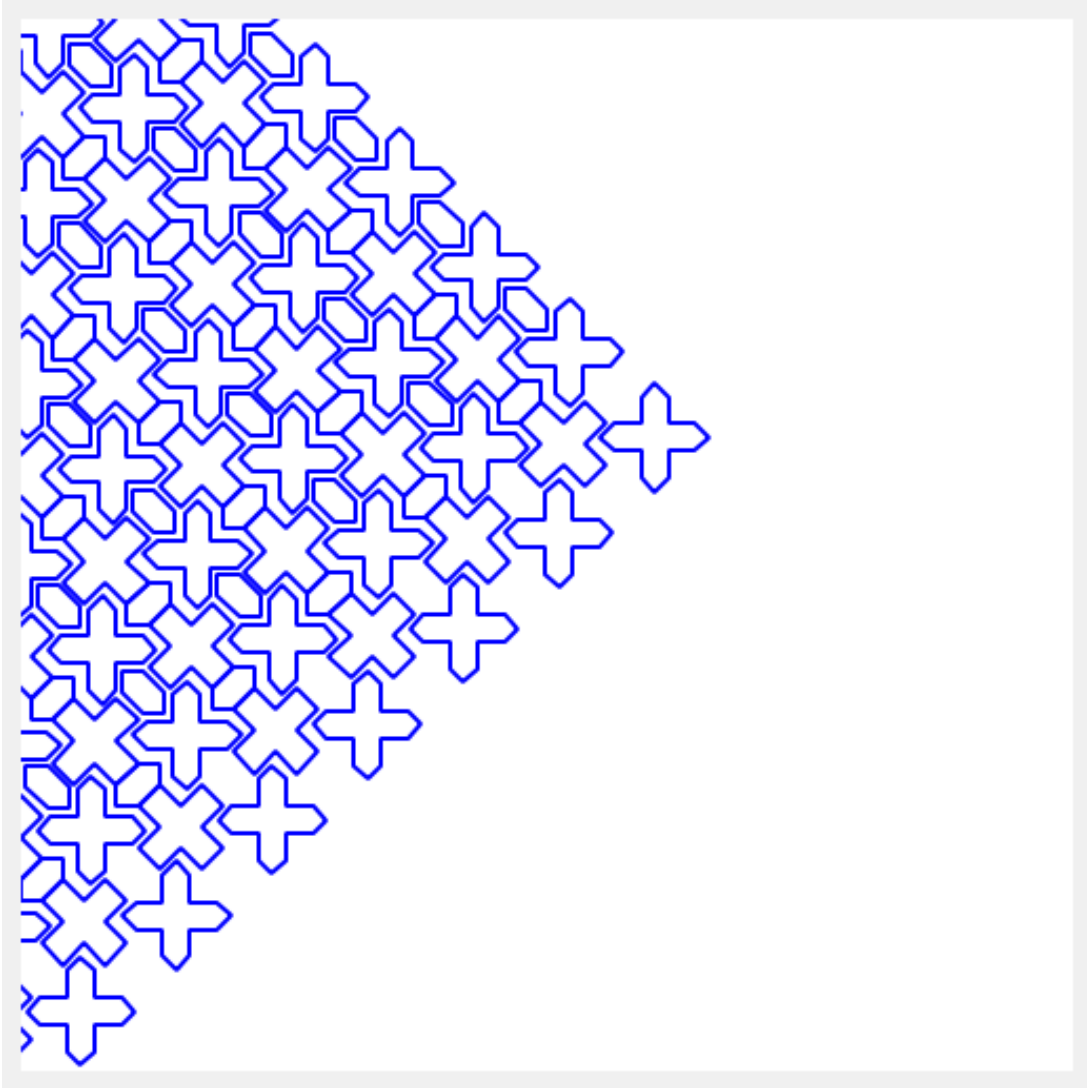
```

+---+-----+-----+
|2 2|10 0|0 10|
+---+-----+-----+

```



## 2.12 三重格子 (No58)



0 0 255 hokusai\_tk 12 12

TK0;TK1;TK2;TK3

```
+---+---+---+---+
|3 1|3 1|8 10|3 7|
|5 1|4 0|9 11|5 7|
|5 3|5 1|9 13|6 8|
|7 3|5 3|8 14|5 9|
```



```

|7 5|7 3|7 13|3 9|
|5 5|8 4|7 11|2 8|
|5 7|7 5|8 10|3 7|
|3 7|5 5|   |   |
|3 5|5 7|   |   |
|1 5|4 8|   |   |
|1 3|3 7|   |   |
|3 3|3 5|   |   |
|3 1|1 5|   |   |
|   |0 4|   |   |
|   |1 3|   |   |
|   |3 3|   |   |
|   |3 1|   |   |

```

```

+---+---+---+---+

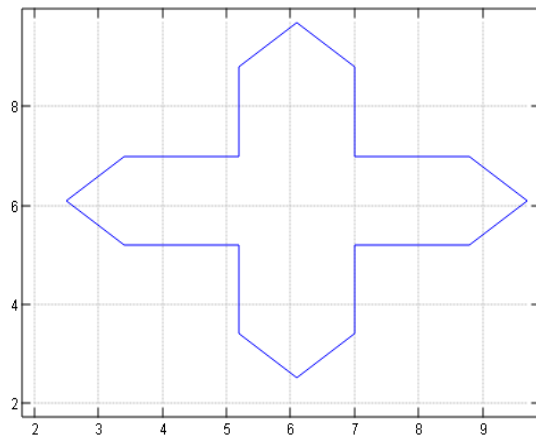
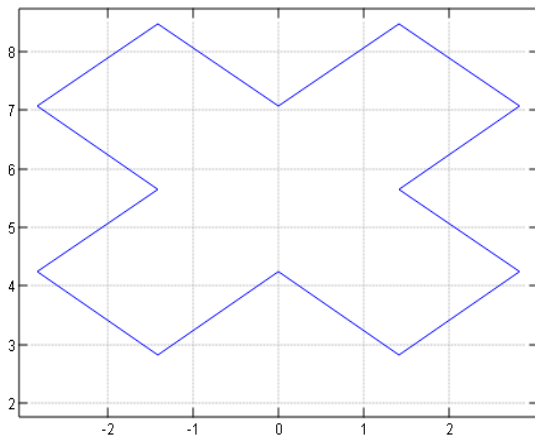
```

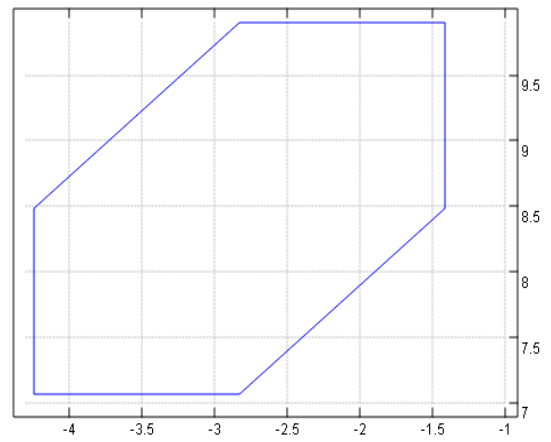
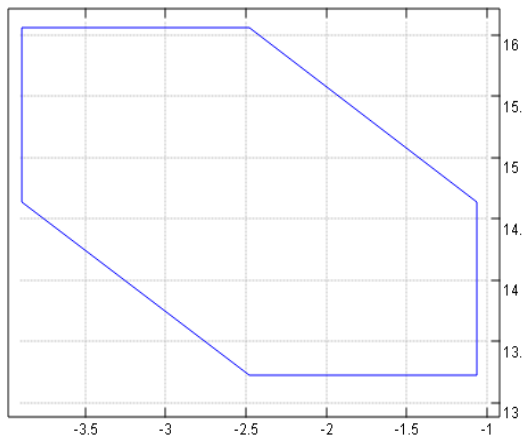
TKOPARAM, :TKORPARAM

```

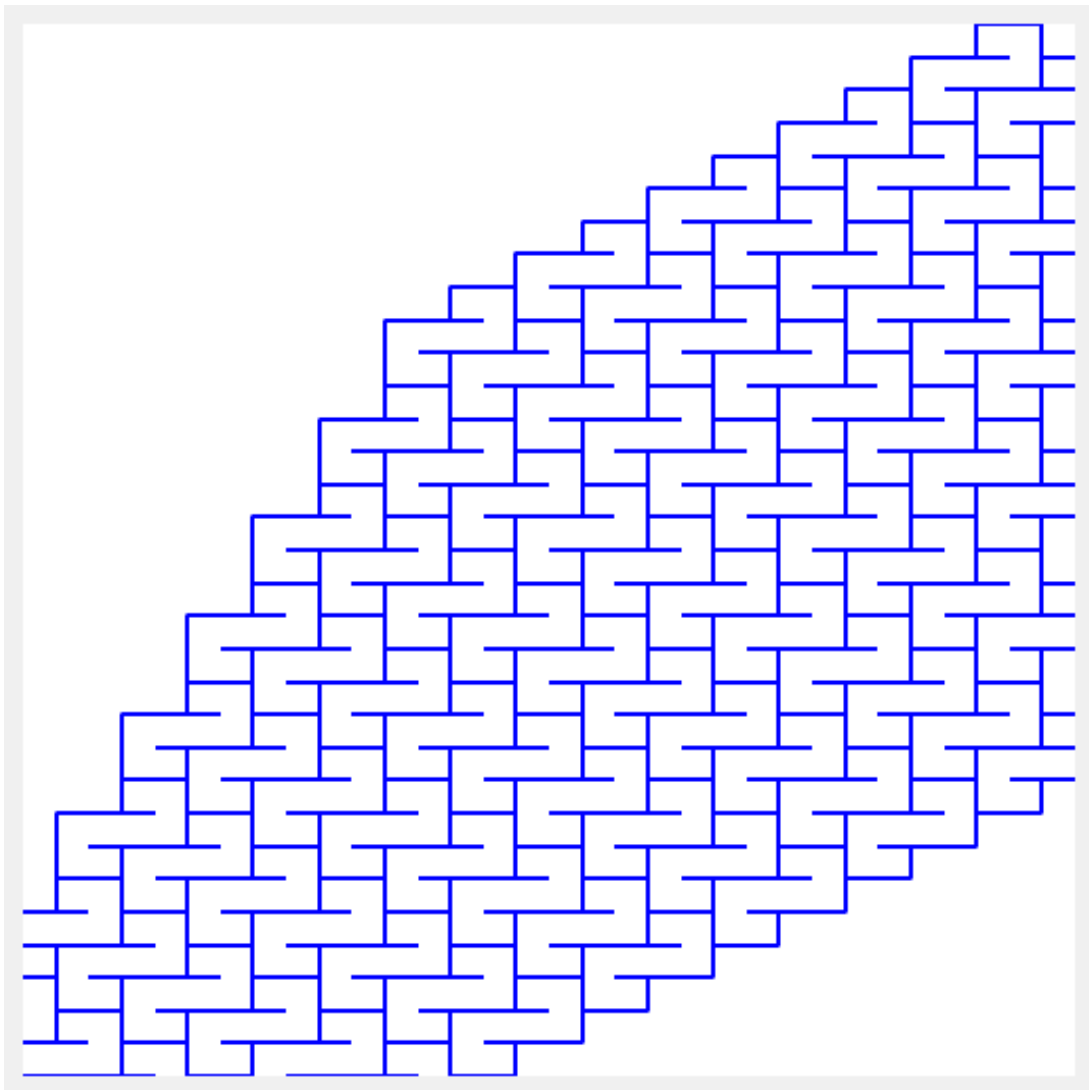
+---+---+---+---+
|5 5   |9 0   |0 8   |   |
+---+---+---+---+
|0 7.07107|6.36396 6.36396|_5.65685 5.65685|
+---+---+---+---+

```



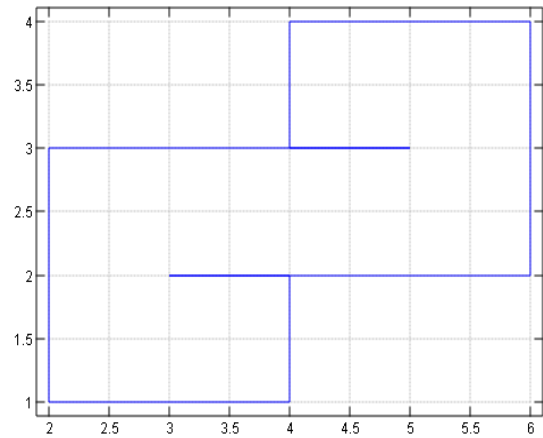


### 2.13 ネジの蓋 (No42)



0 0 255 hokusai\_nf 12 12  
NF0

2 1  
4 1  
4 2  
3 2  
6 2  
6 4  
4 4  
4 3  
5 3  
2 3  
2 1



NF0PARAM

```
+---+---+---+  
|2 1|4 2|2 3|  
+---+---+---+
```

## 2.14 釣り稲妻 (No36)



0 0 255 hokusai\_ti 12 12

TI0;TI1

+---+---+

|0 1|3 4|

|6 1|5 4|

|6 5|5 2|

|2 5|1 2|

|2 3|1 6|

|4 3|7 6|

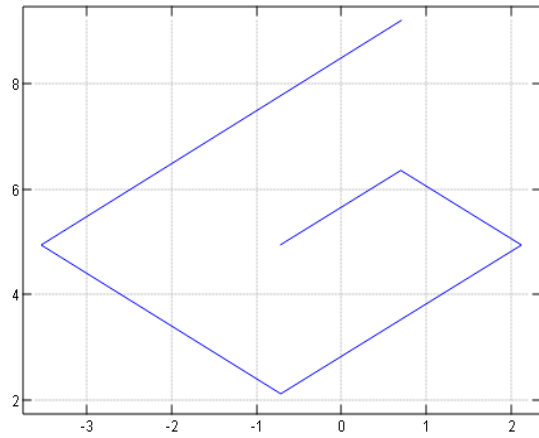
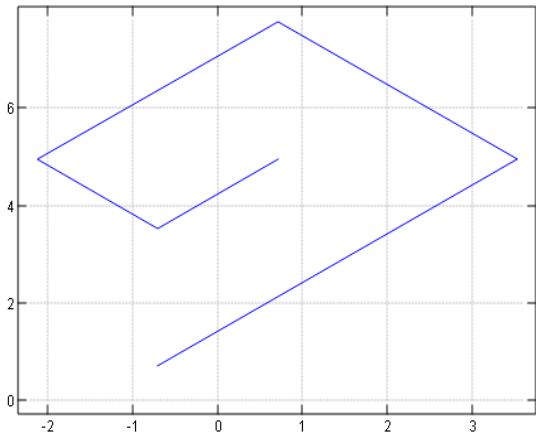
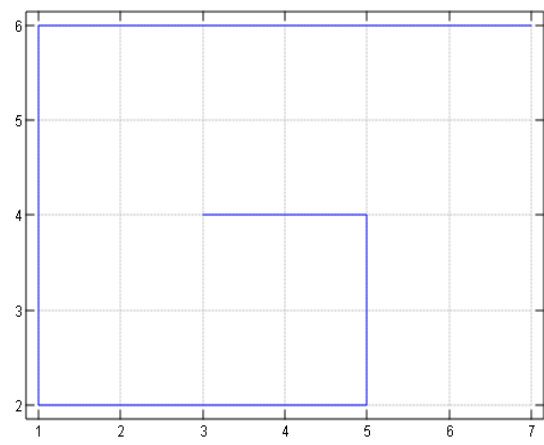
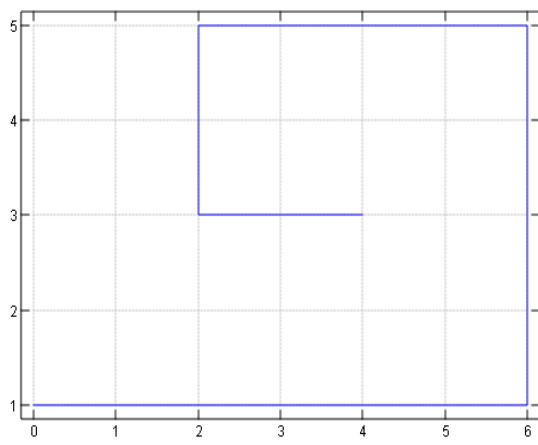
+---+---+

TIOPARAM

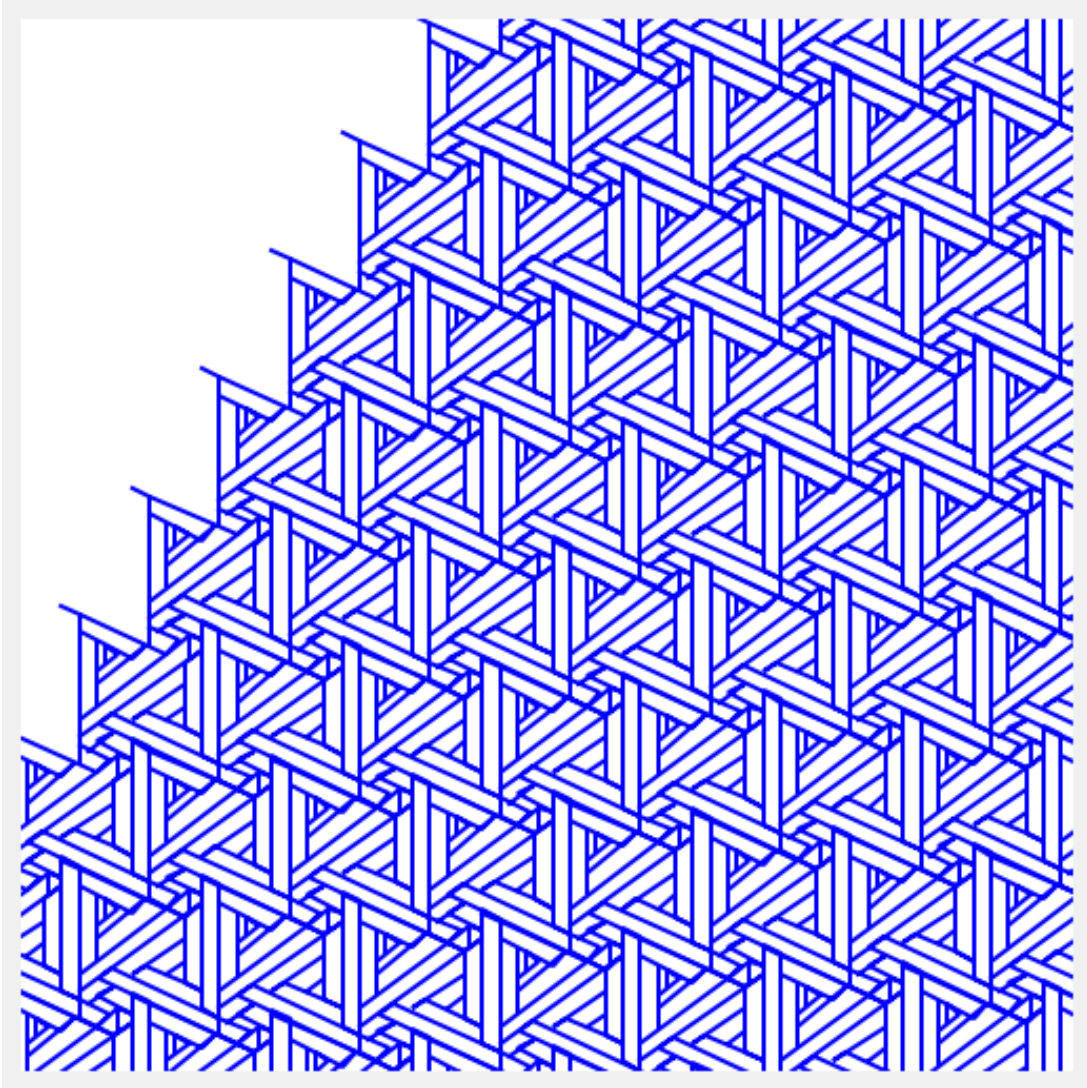
+---+---+---+

|0 1|7 \_1|\_1 6|

+---+---+---+



2.15 菜籠麻の葉 No14



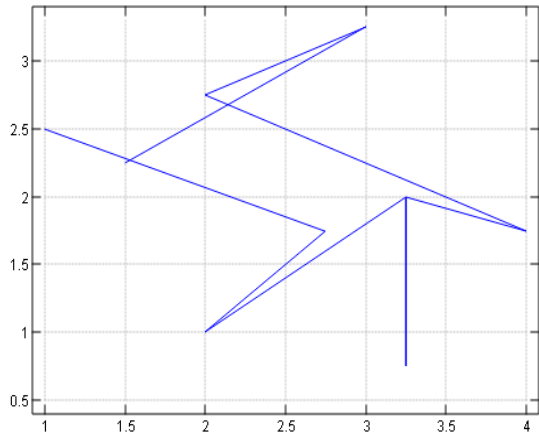
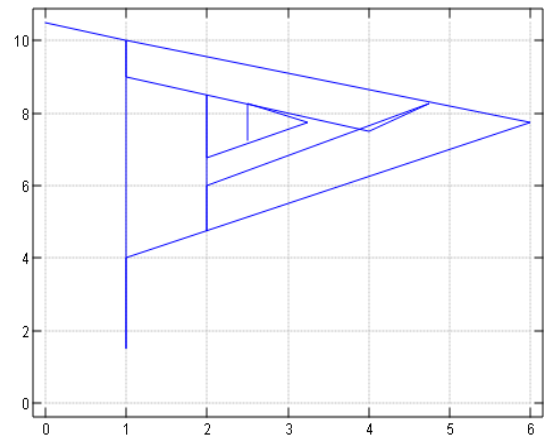
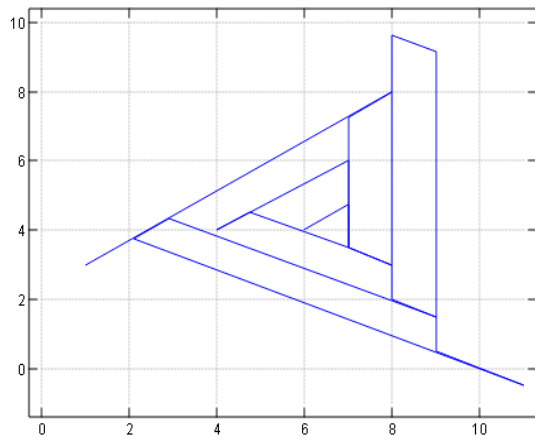
0 0 255 hokusai\_na 12 12

NA0;NA1;NA2

	1	3		0	10.5		1	2.5	
	8	8		1	10		2.75	1.75	
	8	9.65		1	1.5		2	1	
	9	9.15		1	4		3.25	2	
	9	0.5		6	7.75		3.25	0.75	
	11	-0.5		1	10		3.25	2	
	2.1	3.75		1	9		4	1.75	
	2.9	4.35		4	7.5		2	2.75	
	9	1.5		4.75	8.25		3	3.25	
	8	2		2	6		1.5	2.25	
	8	8		2	4.75				
	7	7.25		2	8.5				
	7	3.5		2	6.75				
	8	3		3.25	7.75				
	7	3.5		2.5	8.25				
	7	6		2.5	7.25				
	4	4							
	4.75	4.5							
	7	3.5							
	7	4.75							
	6	4							

NAOPARAM

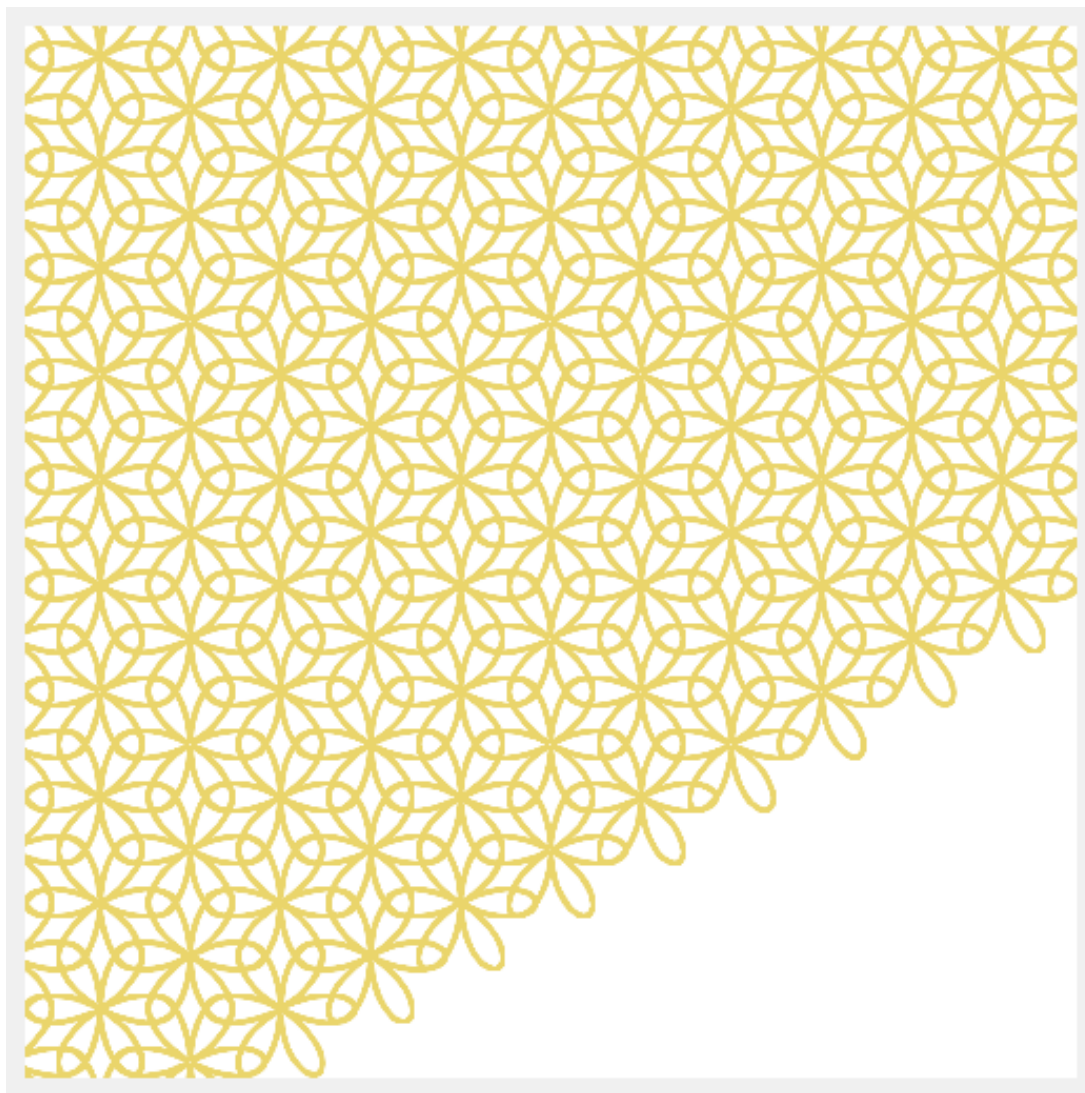
+-----+
1 3 8 _1 4 6.75
+-----+





### 3 正多角形と花卉で描く

#### 3.1 輪違い麻の葉 No8



234 213 107 hokusai\_wc 16 17

1. 花の花弁を描く。circ\_flower 3 1→6 弁でべき乗は1で太い花弁

```
circ_flower
```

```
3 : 0
```

```
NB. Usage: circ_flower 3 1
```

```

NB. petal is 2 * R0 --> 5 is 2.5 // 1 is 0.5
'R0 Beki'=. y
NB. 0.07 is Scale parameter
R=. Beki ^~| sin R0 * T=. 0.07 * i. 360
R polar_xy T
)

```

2.  $\frac{1}{6}\pi$  回転させる。同時に差分パラメーターを自動取得する

```

calc_hokusai_wachigai=: 3 : 0
NB. u ''
tmp=. circ_flower 3 1 NB. 6 petal flower
tmp=. }:"1 (tmp,.1) mp rotm 1r6p1 NB. rotate 1/3 pi
Min=. <./ Maxmin=. minmax_dwin tmp
WC=. tmp + - Min NB. adjust to all plus
'p1 p2'=. 2}. Maxmin NB. find WCPARAM
WCPARAM=: (0 0);((0.6*+:p1),0.8*p2);0,0.8*+:p2
(<WC),<WCPARAM
)

```

3. 差分パラメータ

```

WCPARAM
+---+-----+-----+
|0 0|1.19995 0.704047|0 1.40809|
+---+-----+

```

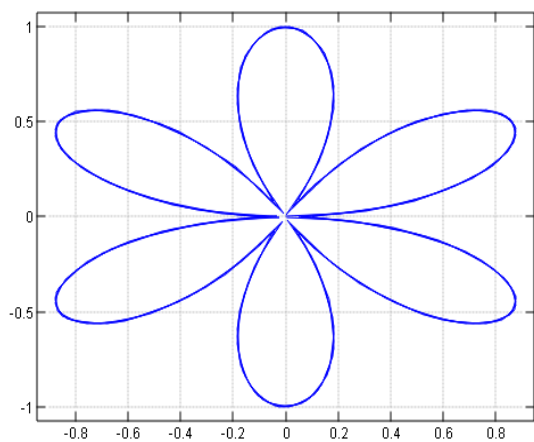
4. 回転前の花

```

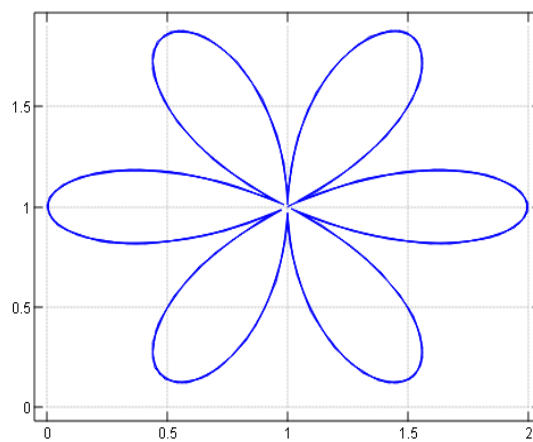
circ_flower 3 1
plot {@|: circ_flower 3 1
pd 'save png c:/temp/circ_flower0.png
-+-----+

```

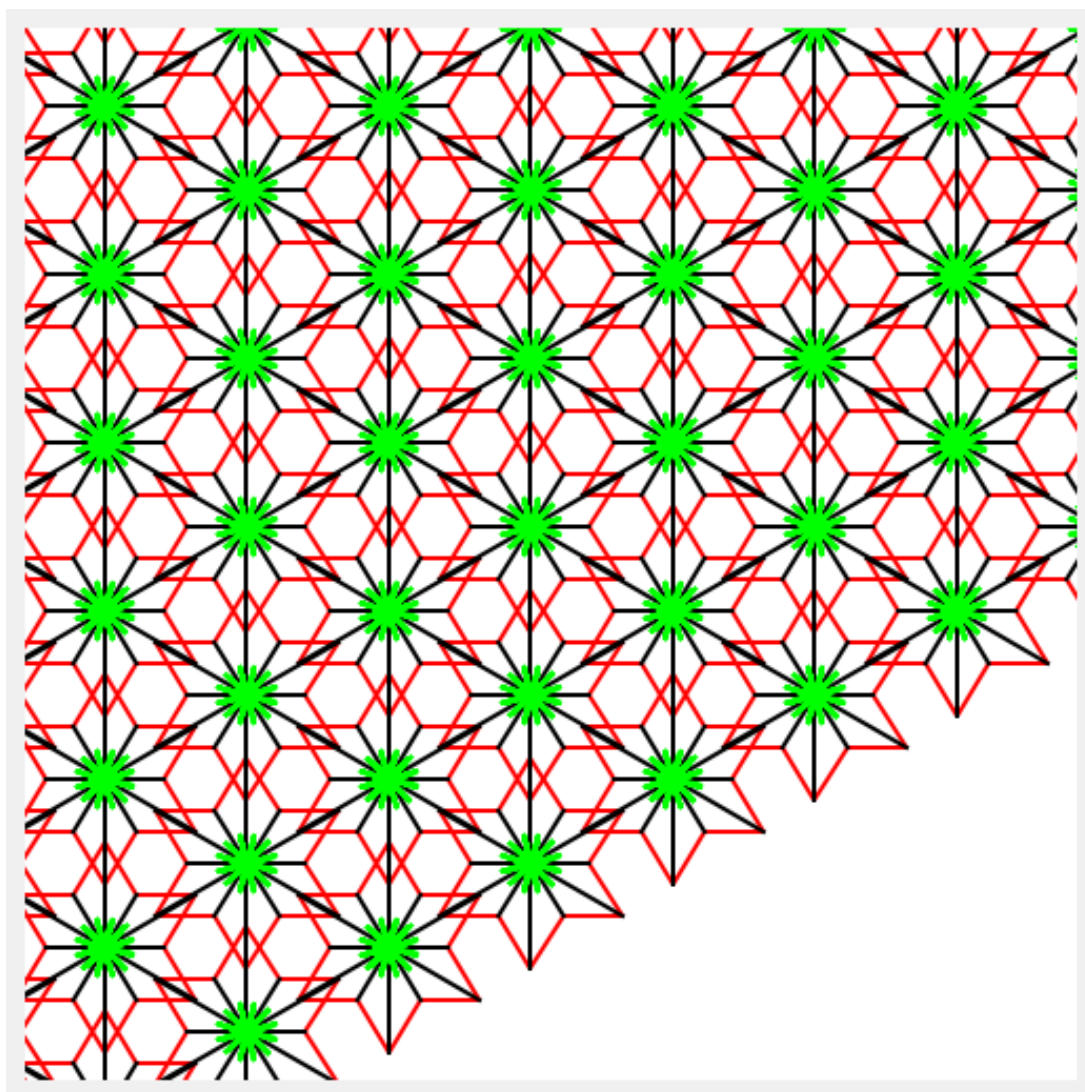
*circ\_flower*



*calc\_hokusai\_wachigai*



### 3.2 桜割 No07



```
(255 0 0; 0 255 0) hokusai_sw 12 12
```

### 1. 正6角形を描く

```
HA6=: +. r. 2p1*(i.6)%6 NB. hexagon
```

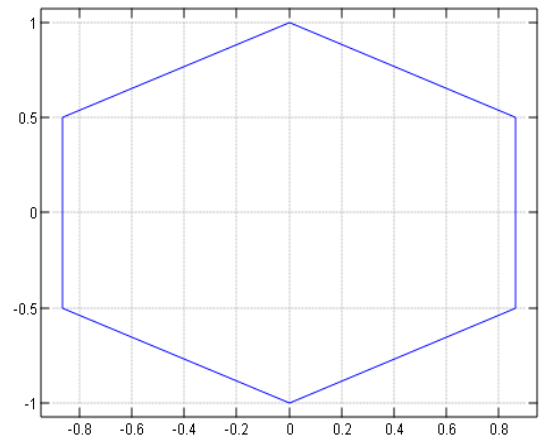
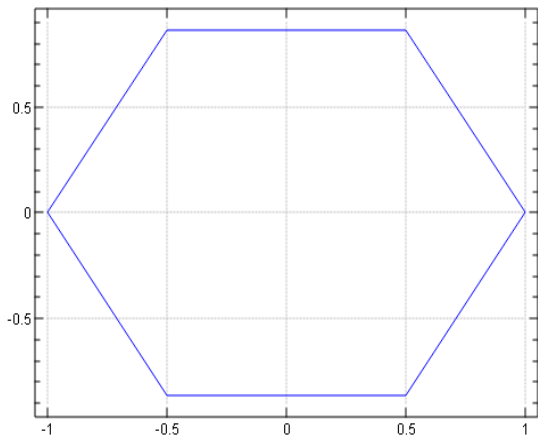
```
HA6
  1          0
0.5  0.866025
_0.5  0.866025
 _1 1.22465e_16
_0.5  _0.866025
 0.5  _0.866025
```

```
plot {@|: HA6, {.HA6
```

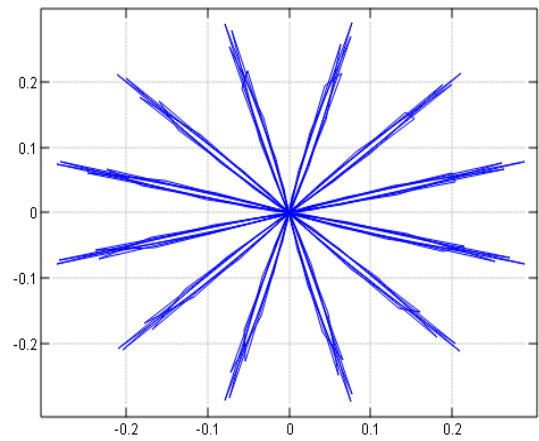
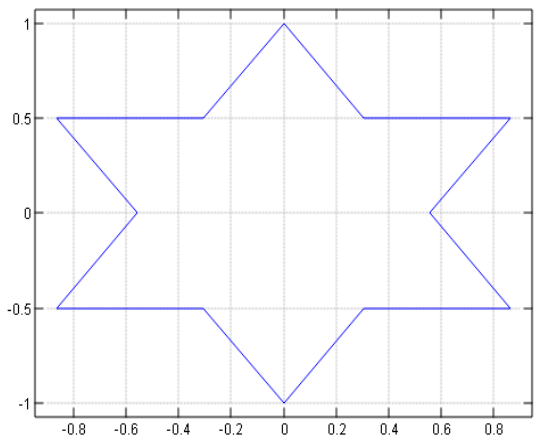
### 2. 差分パラメータ

```
SWPARAM
+---+-----+-----+
|0 1|1.35 0.8|0 1.6|
+---+-----+-----+
```

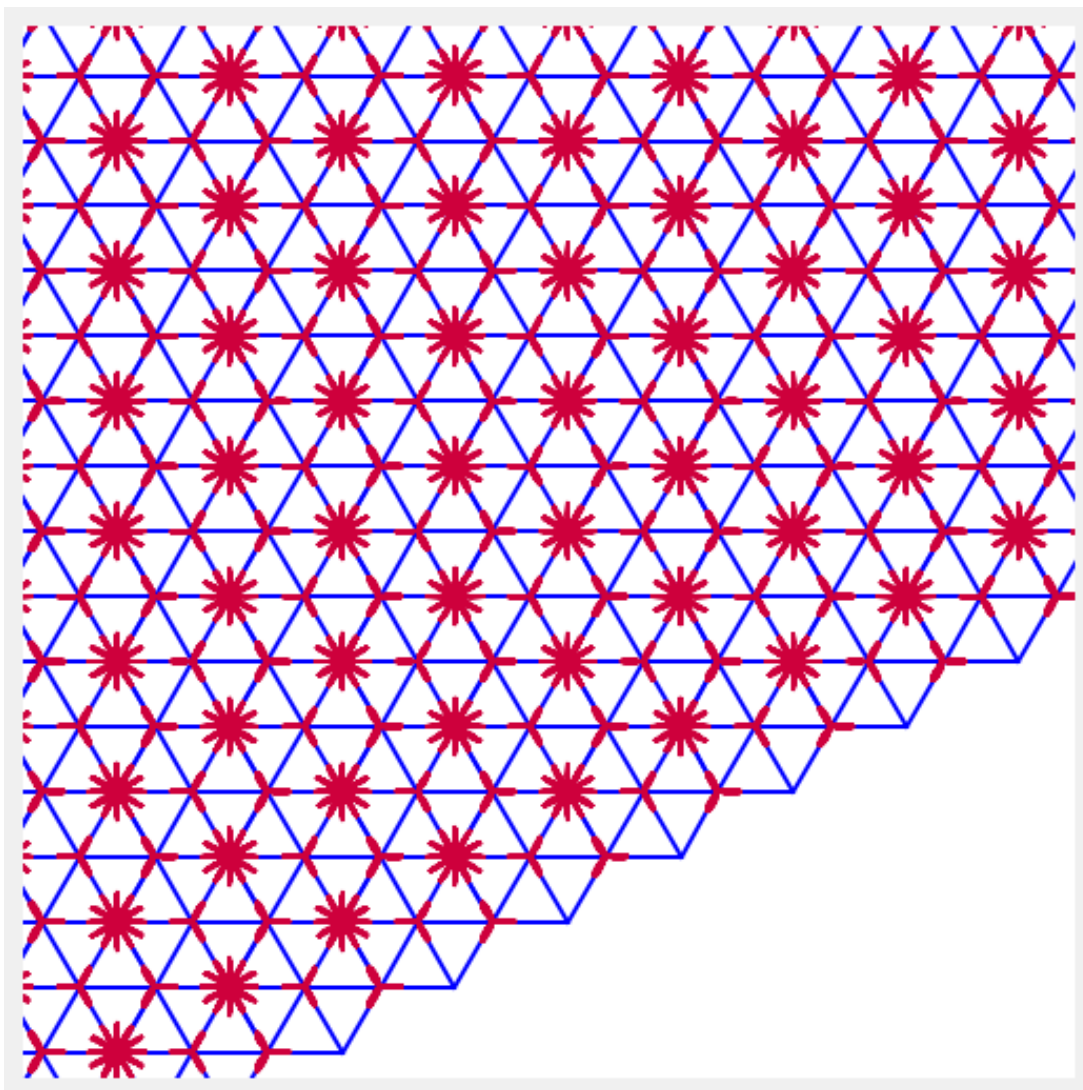
### 3. 回転前の花



*calc\_hokusai\_wachigai*



### 3.3 六角三ツ割 No12



(0 0 255; 206 0 60 ) hokusai\_h3 12 12

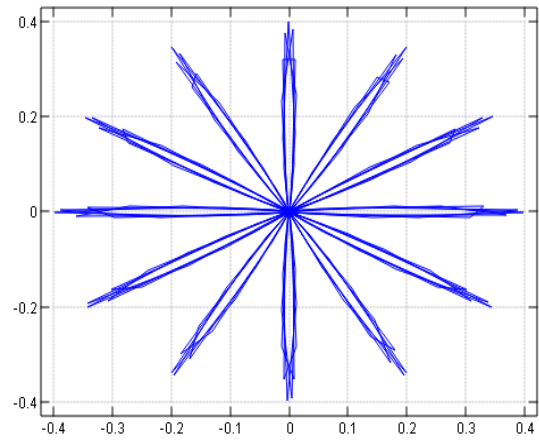
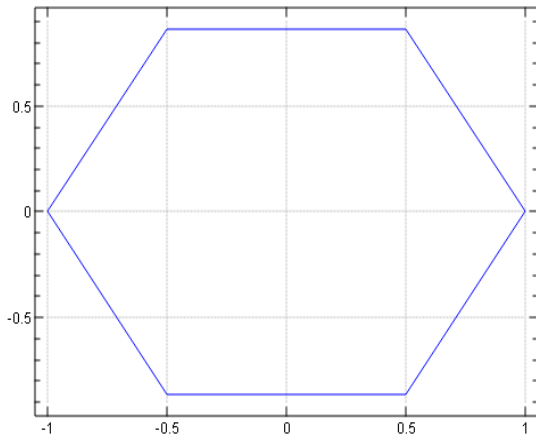
1.  $HAI$  は正 6 角形
2. 次の 3 は花卉の変形

H30=: 6 10 rotm\_elongm 1r4p1;0.4 0.4 NB. 8 petal  
H31=: 1.5 30 rotm\_elongm 1r3p1;0.3 0.3 NB. 3 petal for edge  
H32=: 1.5 60 rotm\_elongm 2p1;0.3 0.3 NB. 3 petal for center

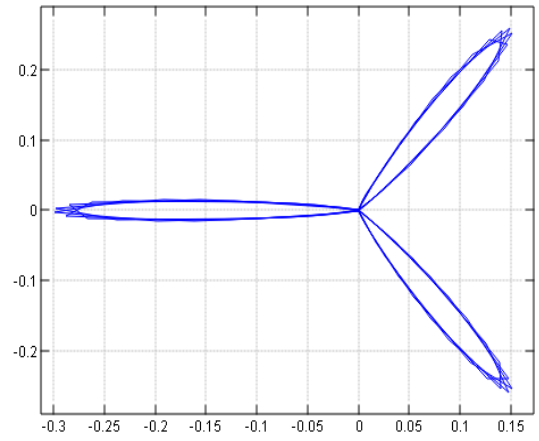
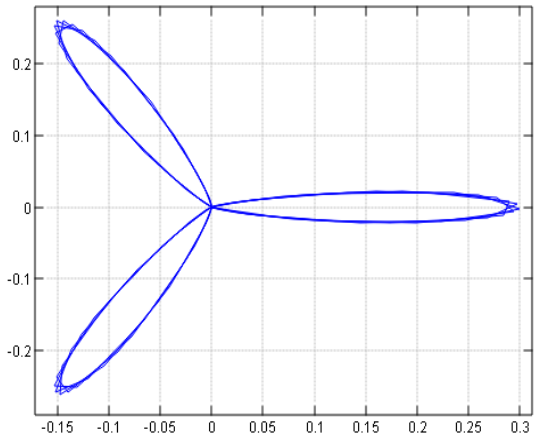
### 3. 差分パラメータ

H3PARAM

```
+-----+  
| 1 0 | 1.5 0.866025 | 0 1.73205 |  
+-----+
```

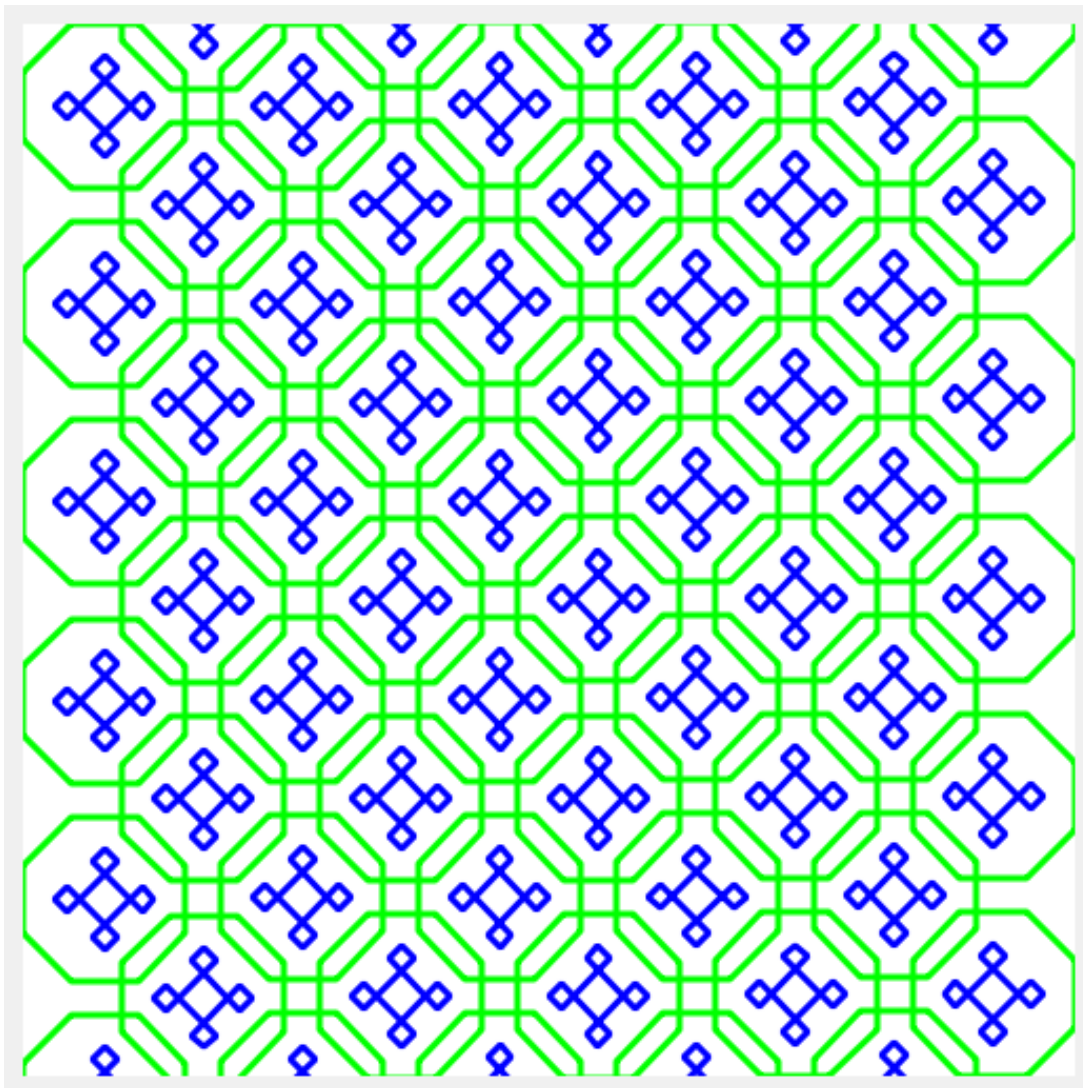


*calc\_hokusai\_wachigai*





### 3.4 六角七宝の碁盤割り No31



(0 0 255; 206 0 60 ) hokusai\_ks 12 12

1. *HAI* は正6角形

```
HA8=: clean (+. r. 2p1*(i.8)%8)          NB. hexagon
HA8=: }:"1 ((HA8,1 0),. 1) mp rotm 1r8p1 NB. rotate
```

2. インナー



KS10

```
1 0.5
1 1
0.5 1
0.5 -1
1 -1
1 -0.5
-1 -0.5
-1 -1
-0.5 -1
-0.5 1
-1 1
-1 0.5
1 0.5
```

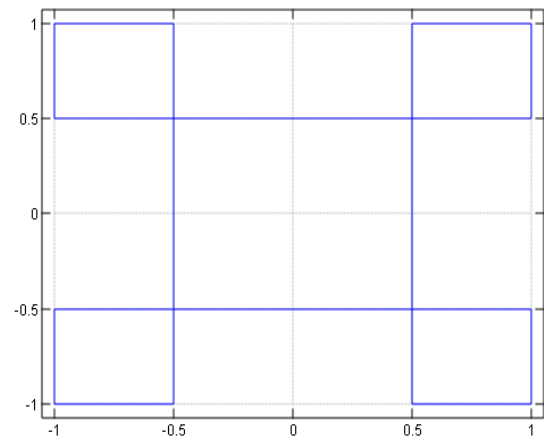
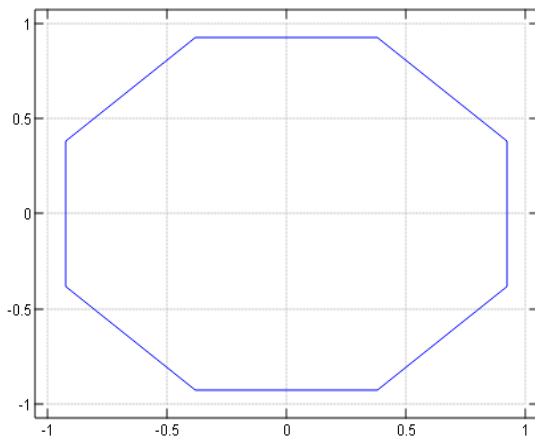
3. 回転 ( $\frac{1}{4}\pi$ ) と縮小 (0.4)

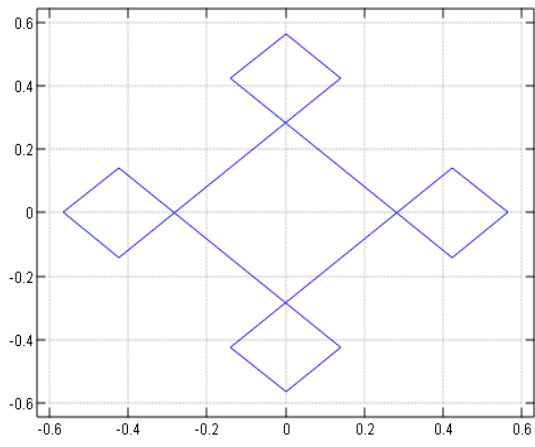
```
KS1=: }:"1 ((KS10,.1)mp elongm 0.4 0.4) mp rotm 1r4p1
```

4. 差分パラメータ

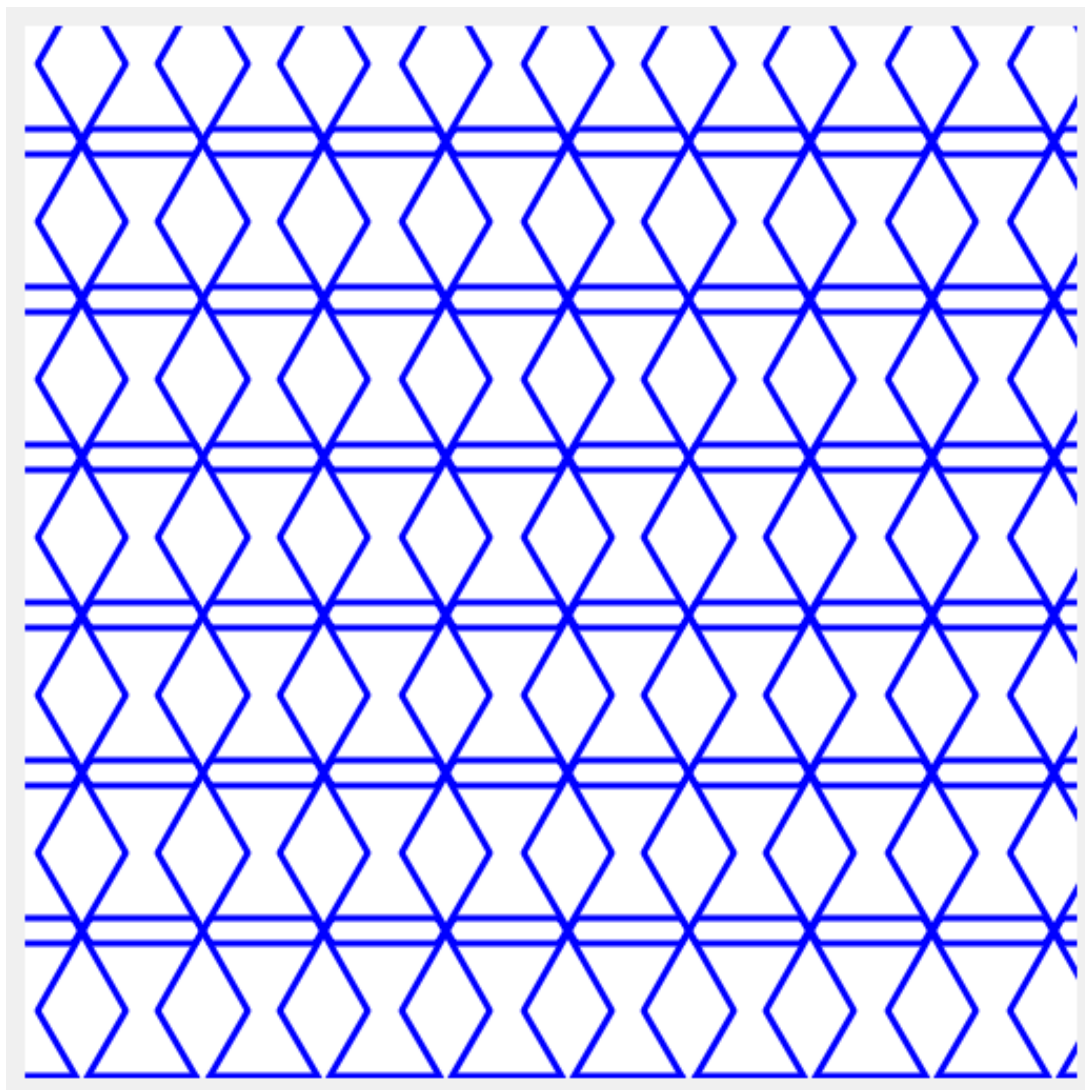
KSPARAM

```
+-----+-----+-----+
|0.92388 0.382683|1.12 1.12|0 2.23044|
+-----+-----+-----+
```





### 3.5 六角格子縞割り No67



0 0 255 hokusai\_hy 12 12

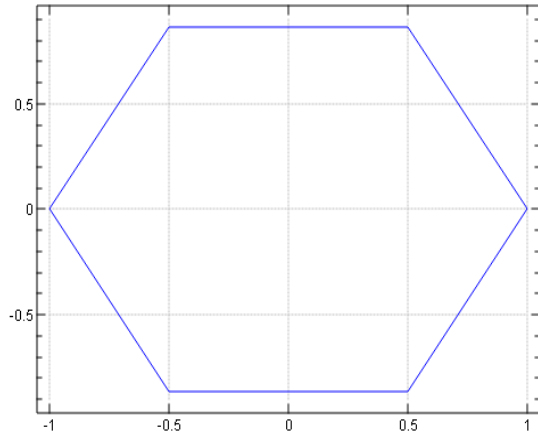
1.  $HHI$  は正6角形

HH=: 1 0 , ~ +. r. 2p1\*(i.6)%6 NB. hexagon

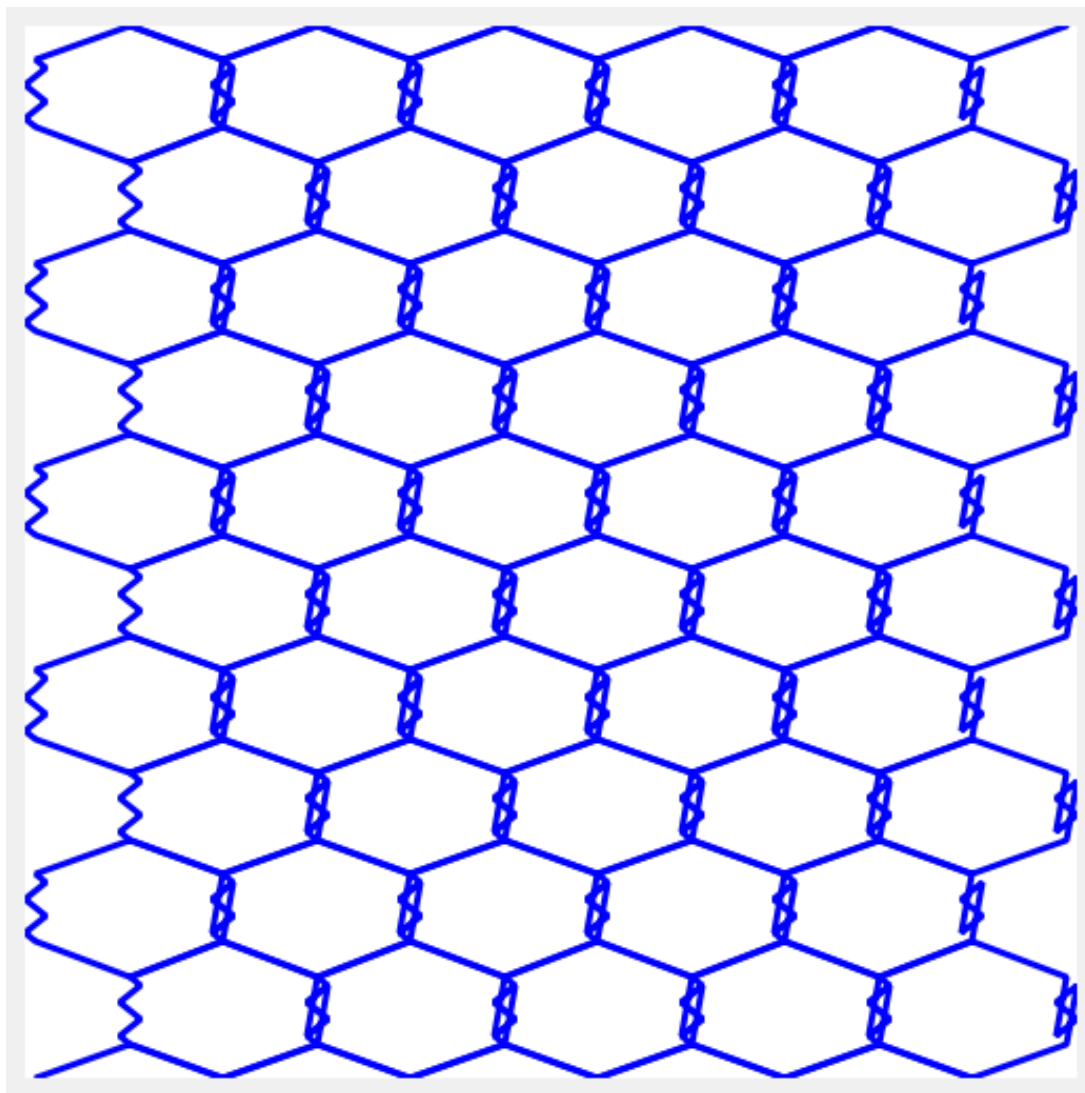
HH=: clean }:"1 (HH,.1) mp (rotm 1r2p1) mp elongm 2r3 1 ^

2. 差分パラメータ

HHPARAM=: 0 1;1.1547 0;0 3r2



### 3.6 金網亀甲 No53



0 0 255 hokusai\_kk1 12 12

1.  $KK$  は正六角形
2.  $KK2$  は正六角形に金網を付加したもの

$KY0 =: 0.375 \ 0.25 \ 0.125 \ 0 \ _0.125 \ _0.25 \ _0.375$

$KX0 =: \_0.766 \ _0.866 \ _0.966 \ _0.866 \ _0.766 \ _0.866 \ _0.966$

$KXY0 =: KX0, .KY0$

KXY1=: (|.-KX0),.KY0

KK2=: (2{.KK),KXY0,(2 3 4{KK),(KXY1),\_2{.KK

### 3. 差分パラメータ

KKPARAM=: 0 1;0.866025 1.5;0 3

