

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	blue overlays
A	B	red
1	9	Start 1

## Ribbons everywhere: $n = (k+1)^2$ when $k$ is even (nine ribbons and nine paired vertices with $k = 18$ )

361 n polygon vertices

18 k, Multiplier

18	162	End 1, S2
324	28	E2 (S3)
56	143	E3 (S4)
286	47	E4 (S5)
94	124	E5 (S6)
248	66	E6 (S7)
132	105	E7 (S8)
210	85	E8 (S9)
170	86	E9 (S10)
172	104	E10 (S11)
208	67	E11 (S12)
134	123	E12 (S13)
246	48	E13 (S14)
96	142	E14 (S15)
284	29	E15 (S16)
58	161	E16 (S17)
322	10	E17 (S18)
20	180	E18 (S19)
360	352	E19 (S20)
343	199	E20 (S21)
37	333	E21 (S22)
305	218	E22 (S23)
75	314	E23 (S24)
267	237	E24 (S25)
113	295	E25 (S26)
229	256	E26 (S27)
151	276	E27 (S28)
191	275	E28 (S29)
189	257	E29 (S30)
153	294	E30 (S31)
227	238	E31 (S32)
115	313	E32 (S33)
265	219	E33 (S34)
77	332	E34 (S35)
303	200	E35 (S36)
39	351	E36 (S37)
341	181	E37 (S38)
1	9	E38 (S39)

This is an example of the  $n = (k+1)^2$  when  $k$  is even image. This image has  $k/2$  paired vertices and  $k/2$   $2k$ -vertex loops each of which is an open-end ribbon.

The  $k/2$  paired vertices are horizontal lines at  $a \cdot (k+1)$ ,  $1 \leq a \leq k/2$ .

The loops have smallest vertex  $v$  from  $1 \leq v \leq k/2$ .

The  $k/2$  version is 1-vertex wide (blue) and vertex 1 in red is 2-vertices wide.

Notice that the blue 1-wide loop has no internal blue overlaps, but the red 2-wide loop has 1 internal red overlap (on the vertical centerline).

This pattern continues: place 2 in N5 and 8 in O5 and see 3-wide with 2 internal overlaps from 8 and 4-wide with 3 internal overlaps from 2.

Ribbon ends are noted with circles to the left.

