

EJERCICIO (44:07)

Calcular los términos de Orden 3 y sus factores de simetría.

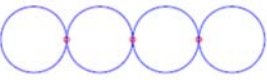
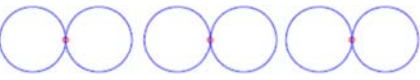
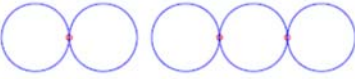
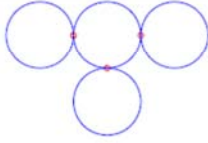
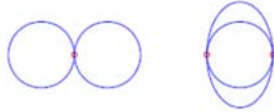
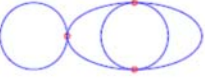
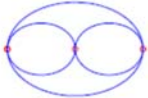
En la siguiente tabla se muestran los vértices y contracciones calculadas por Javier.

#	Cantidad	Vértices											
		1	2	3	4	5	6	7	8	9	10	11	12
1	24	3	5	3	5	3	3	4	5	4	5	4	4
2	27	3	3	3	3	4	4	4	4	5	5	5	5
3	36	3	3	3	3	4	5	4	5	4	4	5	5
4	36	3	4	3	4	3	3	4	4	5	5	5	5
5	36	3	5	3	5	3	3	4	4	4	4	5	5
6	48	3	4	3	5	3	3	4	5	4	4	5	5
7	48	3	5	3	3	3	5	4	5	4	5	4	4
8	48	3	5	3	4	3	3	4	5	4	4	5	5
9	48	3	5	3	5	3	3	4	5	4	4	4	5
10	72	3	3	3	3	4	5	4	4	4	5	5	5
11	72	3	3	3	3	4	5	4	5	4	5	4	5
12	72	3	3	3	5	3	5	4	5	4	5	4	4
13	72	3	4	3	3	3	4	4	4	5	5	5	5
14	72	3	4	3	4	3	4	3	4	5	5	5	5
15	72	3	5	3	3	3	5	4	4	4	4	5	5
16	72	3	5	3	5	3	3	4	4	4	5	4	5
17	72	3	5	3	5	3	5	3	5	4	4	4	4
18	96	3	4	3	3	3	5	4	5	4	4	5	5
19	96	3	4	3	5	3	3	4	4	4	5	5	5
20	96	3	4	3	5	3	3	4	5	4	5	4	5
21	96	3	4	3	5	3	5	3	5	4	5	4	4
22	96	3	5	3	3	3	4	4	5	4	4	5	5
23	96	3	5	3	3	3	5	4	5	4	4	4	5
24	96	3	5	3	4	3	3	4	4	4	5	5	5
25	96	3	5	3	4	3	3	4	5	4	5	4	5
26	96	3	5	3	4	3	5	3	5	4	5	4	4
27	96	3	5	3	5	3	4	3	5	4	5	4	4
28	96	3	5	3	5	3	5	3	4	4	5	4	4
29	108	3	3	3	3	4	4	4	5	4	5	5	5
30	108	3	3	3	4	3	4	4	4	5	5	5	5
31	108	3	3	3	5	3	5	4	4	4	4	5	5
32	144	3	3	3	4	3	5	4	5	4	4	5	5
33	144	3	3	3	5	3	4	4	5	4	4	5	5
34	144	3	3	3	5	3	5	4	5	4	4	4	5
35	144	3	4	3	4	3	3	4	5	4	5	5	5
36	144	3	4	3	4	3	5	3	5	4	4	5	5
37	144	3	4	3	5	3	4	3	5	4	4	5	5
38	144	3	4	3	5	3	5	3	4	4	4	5	5

#	Cantidad	Vértices											
		1	2	3	4	5	6	7	8	9	10	11	12
39	144	3	5	3	3	3	5	4	4	4	5	4	5
40	144	3	5	3	4	3	4	3	5	4	4	5	5
41	144	3	5	3	4	3	5	3	4	4	4	5	5
42	144	3	5	3	5	3	4	3	4	4	4	5	5
43	192	3	4	3	3	3	5	4	4	4	5	5	5
44	192	3	4	3	3	3	5	4	5	4	5	4	5
45	192	3	4	3	5	3	5	3	5	4	4	4	5
46	192	3	5	3	3	3	4	4	4	4	5	5	5
47	192	3	5	3	3	3	4	4	5	4	5	4	5
48	192	3	5	3	4	3	5	3	5	4	4	4	5
49	192	3	5	3	5	3	4	3	5	4	4	4	5
50	192	3	5	3	5	3	5	3	4	4	4	4	5
51	216	3	3	3	5	3	5	4	4	4	5	4	5
52	288	3	3	3	4	3	5	4	4	4	5	5	5
53	288	3	3	3	4	3	5	4	5	4	5	4	5
54	288	3	3	3	5	3	4	4	4	4	5	5	5
55	288	3	3	3	5	3	4	4	5	4	5	4	5
56	288	3	4	3	3	3	4	4	5	4	5	5	5
57	288	3	4	3	4	3	4	3	5	4	5	5	5
58	288	3	4	3	4	3	5	3	4	4	5	5	5
59	288	3	4	3	4	3	5	3	5	4	5	4	5
60	288	3	4	3	5	3	4	3	4	4	5	5	5
61	288	3	4	3	5	3	4	3	5	4	5	4	5
62	288	3	4	3	5	3	5	3	4	4	5	4	5
63	288	3	5	3	4	3	4	3	4	4	5	5	5
64	288	3	5	3	4	3	4	3	5	4	5	4	5
65	288	3	5	3	4	3	5	3	4	4	5	4	5
66	288	3	5	3	5	3	4	3	4	4	5	4	5
67	432	3	3	3	4	3	4	4	5	4	5	5	5

En el Anexo se grafican los diagramas correspondientes a cada caso.

Se han identificado los siguientes Diagramas Tipo, incluidos en la siguiente tabla junto con sus factores de simetría (# es el número de caso, de la tabla calculada por Javier).

Diagrama	#	Gráfico	Factor de Simetría
1	1, 7, 9, 12, 16, 23, 34, 35, 36, 37, 38 39, 40, 41, 42, 51, 56, 67		32
2	2		3072
3	3, 4, 5, 10, 13, 15, 29, 30, 31		128
4	6, 8, 18, 19, 22, 24, 32, 33, 43, 46, 52, 54		48
5	11, 14, 17		384
6	20, 21, 25, 26, 27, 28, 44, 45, 47, 48, 49, 50, 53, 55, 57, 58, 60, 63		24
7	59, 61, 62, 64, 65, 66		48

En la siguiente tabla se indican: (a) el diagrama tipo para cada caso; (b) la cantidad correspondiente; (c) la suma para cada diagrama tipo; y (c) el Factor de Simetría, considerando que el $3! \times (4!)^3 = 82944$

#	Cantidad	Diagrama Tipo	Cantidad / Diagrama						
			1	2	3	4	5	6	7
1	24	1	24	0	0	0	0	0	0
2	27	2	0	27	0	0	0	0	0
3	36	3	0	0	36	0	0	0	0
4	36	3	0	0	36	0	0	0	0
5	36	3	0	0	36	0	0	0	0
6	48	4	0	0	0	48	0	0	0
7	48	1	48	0	0	0	0	0	0
8	48	4	0	0	0	48	0	0	0
9	48	1	48	0	0	0	0	0	0

#	Cantidad
10	72
11	72
12	72
13	72
14	72
15	72
16	72
17	72
18	96
19	96
20	96
21	96
22	96
23	96
24	96
25	96
26	96
27	96
28	96
29	108
30	108
31	108
32	144
33	144
34	144
35	144
36	144
37	144
38	144
39	144
40	144
41	144
42	144
43	192
44	192
45	192
46	192
47	192
48	192
49	192
50	192
51	216

Diagrama Tipo
3
5
1
3
5
3
1
5
4
4
6
6
4
1
4
6
6
6
6
6
3
3
3
4
4
1
1
1
1
1
1
1
1
1
1
1
4
6
6
4
6
6
6
6
6
1

Cantidad / Diagrama						
1	2	3	4	5	6	7
0	0	72	0	0	0	0
0	0	0	0	72	0	0
72	0	0	0	0	0	0
0	0	72	0	0	0	0
0	0	0	0	72	0	0
0	0	72	0	0	0	0
72	0	0	0	0	0	0
0	0	0	0	72	0	0
0	0	0	96	0	0	0
0	0	0	96	0	0	0
0	0	0	0	0	96	0
0	0	0	0	0	96	0
0	0	0	96	0	0	0
96	0	0	0	0	0	0
0	0	0	96	0	0	0
0	0	0	0	0	96	0
0	0	0	0	0	96	0
0	0	0	0	0	96	0
0	0	0	0	0	96	0
0	0	108	0	0	0	0
0	0	108	0	0	0	0
0	0	108	0	0	0	0
0	0	0	144	0	0	0
0	0	0	144	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
144	0	0	0	0	0	0
0	0	0	192	0	0	0
0	0	0	0	0	192	0
0	0	0	0	0	192	0
0	0	0	192	0	0	0
0	0	0	0	0	192	0
0	0	0	0	0	192	0
0	0	0	0	0	192	0
0	0	0	0	0	192	0
216	0	0	0	0	0	0

#	Cantidad
52	288
53	288
54	288
55	288
56	288
57	288
58	288
59	288
60	288
61	288
62	288
63	288
64	288
65	288
66	288
67	432

Diagrama Tipo
4
6
4
6
1
6
6
7
6
7
7
6
7
7
7
7
1

Cantidad / Diagrama							
1	2	3	4	5	6	7	
0	0	0	288	0	0	0	
0	0	0	0	0	288	0	
0	0	0	288	0	0	0	
0	0	0	0	0	288	0	
288	0	0	0	0	0	0	
0	0	0	0	0	288	0	
0	0	0	0	0	0	288	
0	0	0	0	0	0	0	288
0	0	0	0	0	288	0	
0	0	0	0	0	0	0	288
0	0	0	0	0	0	0	288
0	0	0	0	0	0	0	288
0	0	0	0	0	0	0	288
0	0	0	0	0	0	0	288
432	0	0	0	0	0	0	
Σ	2592	27	648	1728	216	3456	1728
Factor de Simetría							
32	3072	128	48	384	24	48	

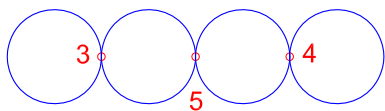
**RODOLFO
GUIDOBONO**

**CURSO TEORÍA CUÁNTICA DE CAMPOS
EJERCICIO CAPÍTULO 78**

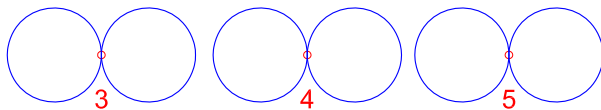
JAVIER GARCÍA

ANEXO EJERCICIO N° 1 – GRÁFICOS

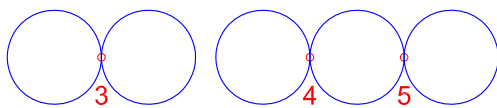
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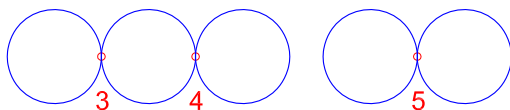
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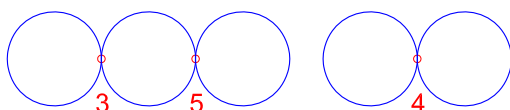
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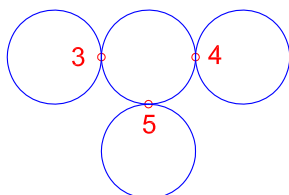
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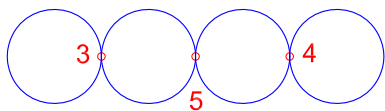
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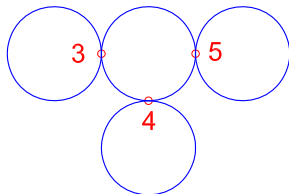
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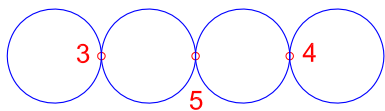
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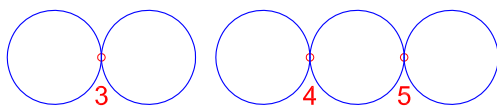
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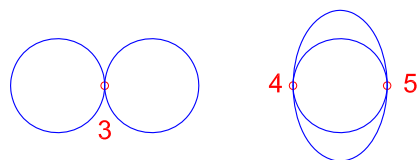
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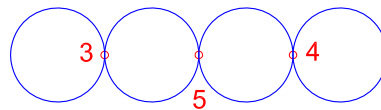
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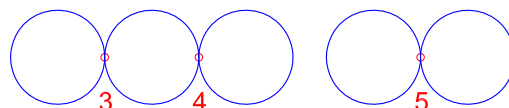
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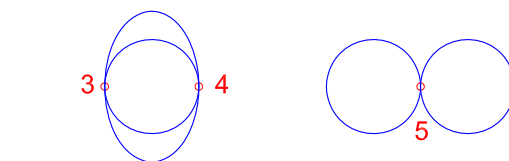
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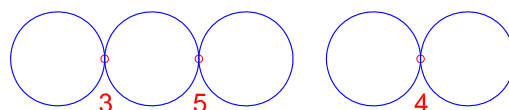
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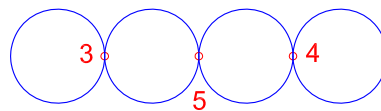
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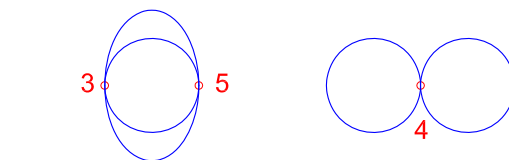
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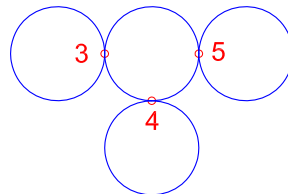
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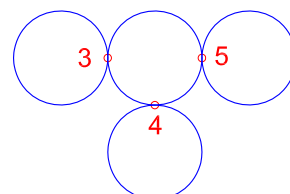
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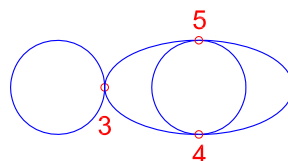
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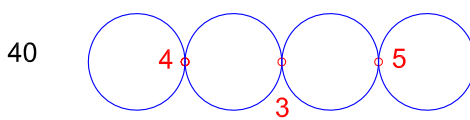
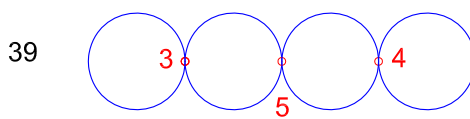
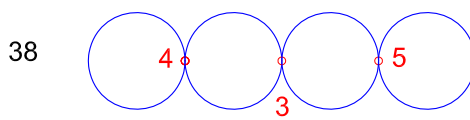
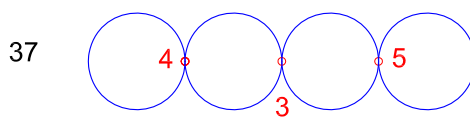
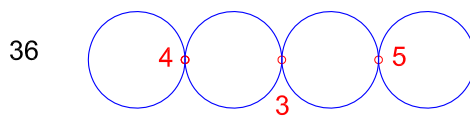
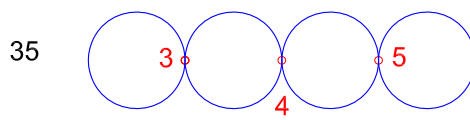
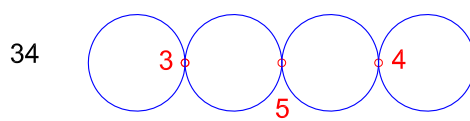
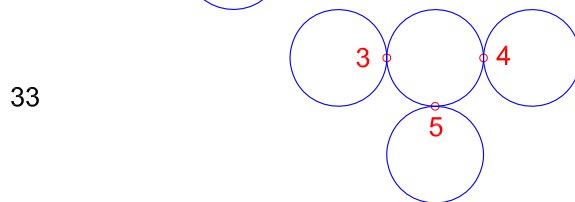
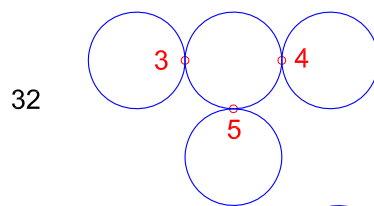
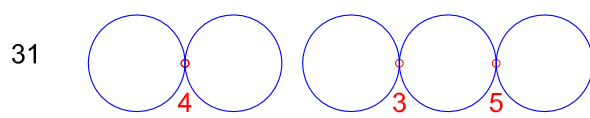
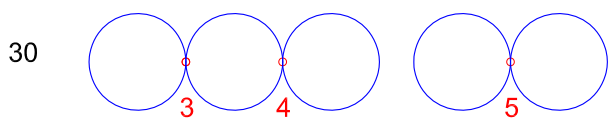
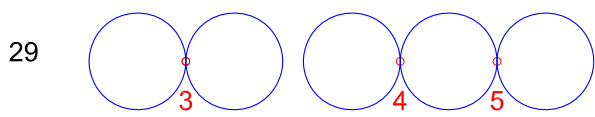
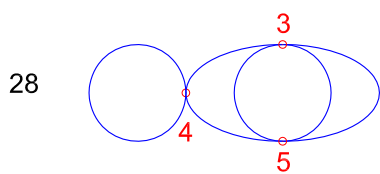
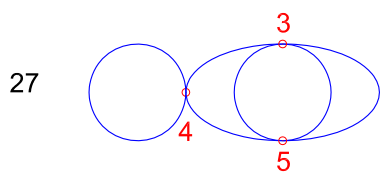
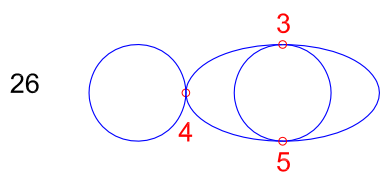
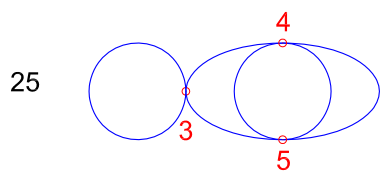
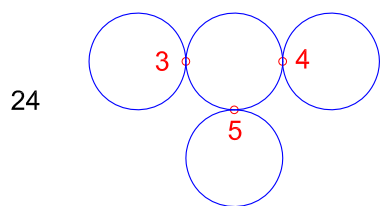
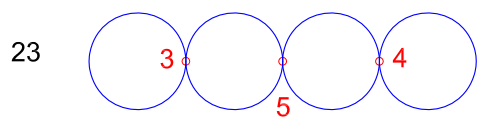
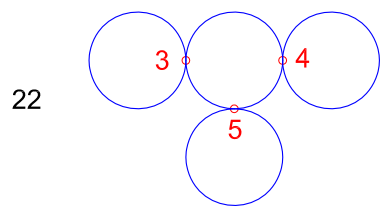
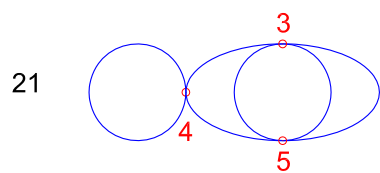


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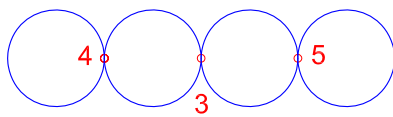


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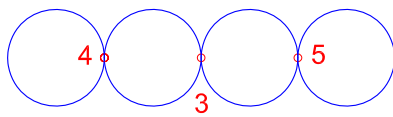




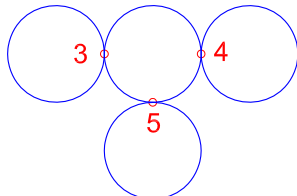
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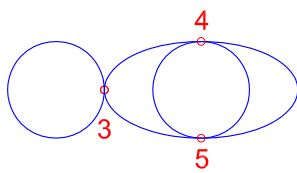
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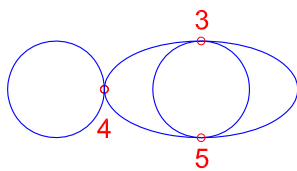
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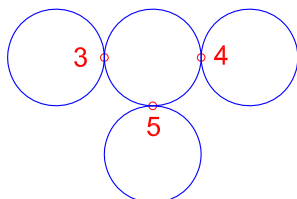
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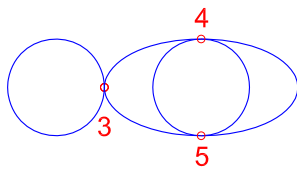
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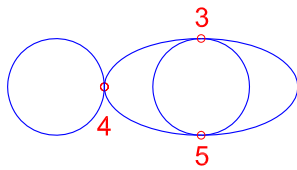
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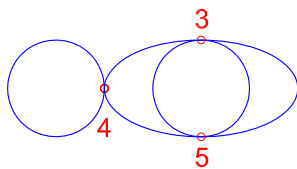
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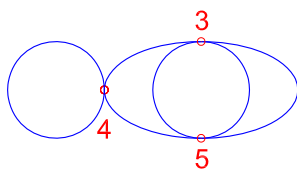
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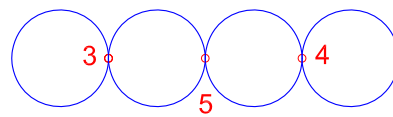
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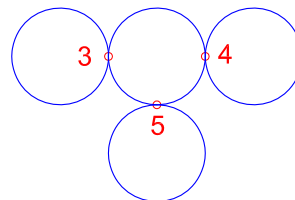
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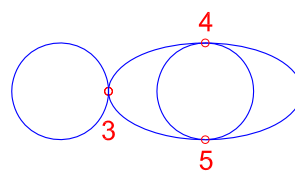
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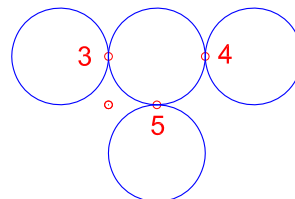
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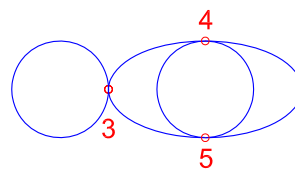
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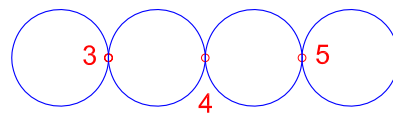
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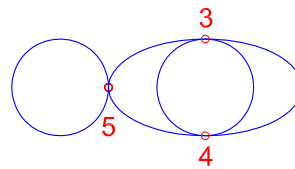
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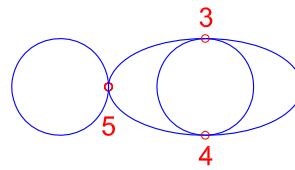
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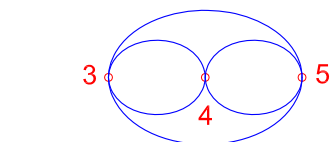
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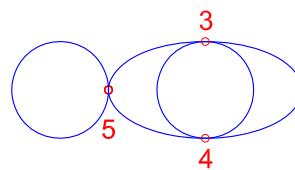
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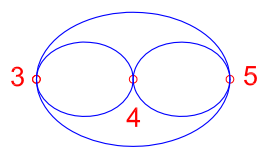
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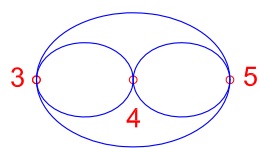
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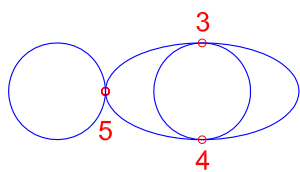
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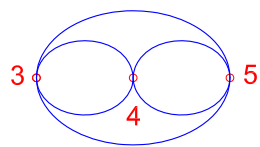
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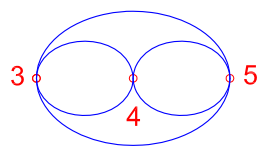
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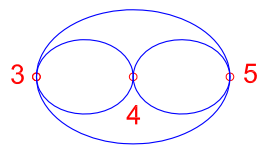
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67

