

SOME SUPPLEMENTS TO THE TABLES OF GRAPH SPECTRA

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Dedicated to the memory of Professor Dragoslav S. Mitrinović

We present some supplements to the tables of graph spectra which have been published in books “Spectra of Graphs” and “Recent Results in the Theory of Graph Spectra”. Results are obtained making use of the expert system “Graph”.

0. INTRODUCTION

Tables of graph spectra have been surveyed in monographs [5], [4]. Additional information can be found in [8], including new tables related to graph spectra. The aim of this paper is to present newly computed data thus providing further completion of existing tables. Introductory and some general remarks from [8] will not be repeated here.

New data have been computed by the system “Graph” [6] (for further information and references see [8]).

In Section 1 we describe the tables which will be completed in this paper while in Section 2 the completions are given.

1. TABLES TO BE COMPLETED

We describe briefly the four tables of graph spectra under the names Table A, B, C, D.

The table in [7] contains 112 connected graphs on six vertices together with several data for each graph. The graphs are ordered lexicographically by their

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spectral moments in non-increasing order. This table will be referred to as Table A.

In the appendix of [4] a table of all (853) connected graphs with seven vertices is given. The pictures, coefficients of the characteristic polynomials, spectrum and spectral moments are included. The graphs are ordered lexicographically by their spectral moments. This is Table B.

Table 2 in [5] contains all (200) trees with up to 10 vertices. The pictures, the eigenvalues and the coefficients of the characteristic polynomials are listed. This is Table C.

In [2] (see also [3]) all of the 621 connected cubic graphs with not more than 14 vertices are listed. The characteristic polynomial, spectrum, numbers of circuits of length 3, 4, . . . , 14, diameter, connectivity, order of the automorphism group and a statement indicating planarity are displayed. We refer to this table as Table D.

Table A has been completed in [8] by a list of algebraic connectivities of the graphs in question.

Table D had already a few completions.

Cubic graphs up to 12 vertices with a part of the data were reproduced in [5] in a different order.

The following data are given in [1] for each cubic graph up to 12 vertices: maximal clique order, maximal coclique order, chromatic class, and some other, repeating information from [2].

Given a graph G with vertex set $\{v_1, v_2, v_3, \dots, v_n\}$, let d_{ij} denote the number of vertices in G that are at distance j from vertex v_i . Then, the sequence $(d_{i0}, d_{i1}, d_{i2}, \dots, d_{ij}, \dots)$ is called the *distance degree sequence of v_i in G* . The n -tuple of distance degree sequences arranged in lexicographic order is the *distance degree sequence of G* . The *path degree sequence of v_i in G* is defined as the sequence $(p_{i0}, p_{i1}, p_{i2}, \dots, p_{ij}, \dots)$, where p_{ij} is the number of paths in G with initial vertex v_i and which have length j . The set of all such sequences arranged in lexicographic order is called the *path degree sequence of G* .

In [9] the results of [2] are extended by determining the following information for each connected cubic graph on ≤ 14 vertices: its distance degree sequence, its distance distribution, the mean distance at each vertex, the mean distance for the graph, its path degree sequence, the number of paths of specified length, and the total number of paths for the graph.

This is presented in a format compatible with [2]. Furthermore, for each graph a number of other parameters can be easily determined from tables, for example, the radius and diameter of the graph, and the eccentricity of a vertex.

The paper [10] contains pictures of all connected cubic graphs up to 14 vertices while in [2] pictures are given only for graphs up to 12 vertices. Orbits of the automorphism group are given for each graph in [10]. Graphs are ordered in [10] by their canonical adjacency matrices so that the ordering is different from that in [2]. However, for each graph in the table the author gives the graph identification number in tables of [2].

2. NEW TABLES

We present now Tables 1, 2, 3, 4 which complement the tables from the previous section.

Table 1 contains for each graph from Table A the following data:

- main angles.

Table 2 contains for each graph from Table B the following data:

- algebraic connectivity,
- planarity.

Table 3 contains for each tree from Table B the following data:

- radius,
- diameter.

Table 4 contains for each cubic graph on 14 vertices from Table D the following data:

- radius.

TABLE 1

Main angles of connected graphs on six vertices

1.	1	0					
2.	0.9973	0	0	0.0738			
3.	0.9919	0.0528	0	0.1156			
4.	0.9966	0	0	0.0823	0		
5.	0.9792	0.1372	0	0.1493			
6.	0.9871	0	0	0.1602			
7.	0.9895	0	0.0424	0	0	0.1382	
8.	0.9929	0.0718	0	0	0.0863	0.0381	
9.	1	0	0				
10.	0.9533	0.2487	0	0.1713			
11.	0.9787	0.0917	0	0	0.0221	0.1826	
12.	0.9790	0.0961	0.0911	0	0.1497	0.0402	
13.	0.9856	0	0	0.1691			
14.	0.9785	0.1969	0	0	0.0616		
15.	0.9887	0.0556	0	0	0.1394	0	
16.	0.9911	0	0.0978	0.0907			
17.	0.9905	0	0.1374	0	0		
18.	0.9949	0	0	0.0862	0	0.0515	
19.	0.9544	0.2217	0	0	0.0818	0.1824	
20.	0.9498	0.2180	0.2209	0	0.0404		

21.	0.9729	0.0760	0	0	0.2183	
22.	0.9727	0	0.1211	0	0	0.1977
23.	0.9719	0	0.2353	0	0	
24.	0.9765	0.1072	0.0657	0	0.1547	0.0820
25.	0.9819	0.0298	0	0.0577	0.1491	0.0972
26.	0.9750	0.1798	0.0649	0	0.1119	0.0200
27.	0.9837	0.0617	0	0.1565	0.0636	0
28.	0.9881	0	0.1540	0		
29.	0.9842	0.1427	0	0.0332	0.0996	
30.	0.9929	0	0.0927	0	0.0746	0
31.	0.9966	0	0	0	0.0823	
32.	0.9915	0.1202	0	0	0.0490	
33.	0.9510	0.1923	0.0732	0	0.0503	0.2253
34.	0.9468	0.1203	0.2357	0	0.1824	0.0137
35.	0.9391	0.2582	0.2261	0	0.0144	
36.	0.9614	0.1903	0	0.1988		
37.	0.9671	0	0	0.2546		
38.	0.9608	0.1728	0	0.2166	0	
39.	0.9566	0.1868	0	0.2072	0.0119	0.0832
40.	0.9712	0.0267	0	0.0736	0.1312	0.1826
41.	0.9560	0.2582	0	0	0.1395	0
42.	0.9732	0	0.2298	0		
43.	0.9756	0	0.0841	0	0.1467	0.1399
44.	0.9760	0	0	0.2116	0.0520	0
45.	0.9731	0.1115	0	0.1953	0	0.0501
46.	0.9779	0.0454	0.1240	0.0815	0.1198	0.0728
47.	0.9795	0.1702	0	0.1079	0	0
48.	0.9878	0.0809	0.0510	0	0.1147	0.0444
49.	0.9834	0.1247	0	0	0.1317	
50.	0.9858	0.1343	0	0.0819	0.0592	
51.	1	0	0	0		
52.	1	0	0			
53.	0.9301	0.2578	0	0	0.2617	
54.	0.9253	0	0.3123	0	0.2153	0
55.	0.9016	0.3900	0.1805	0	0.0484	
56.	0.9505	0.1623	0	0.0697	0.2555	
57.	0.9413	0.2011	0	0.2549	0	0.0923
58.	0.9551	0	0.1517	0.0265	0	0.2532
59.	0.9516	0.0958	0.1349	0.1949	0.1339	0.1052
60.	0.9454	0.1609	0.2357	0.1276	0.0835	0.0382
61.	0.9680	0.0789	0	0	0.0441	0.2341
62.	0.9714	0.0957	0.2089	0	0.0606	
63.	0.9578	0.0440	0.2357	0.1566	0.0262	
64.	0.9583	0.1701	0.0981	0.1718	0	0.1164
65.	0.9512	0.2582	0	0.1652	0	0.0357

66.	0.9662	0.1665	0	0.1967	0		
67.	0.9664	0.1697	0.0654	0.1662	0.0354	0.0644	
68.	0.9804	0	0.0887	0	0.1762	0	
69.	0.9655	0.2582	0	0	0	0.0337	
70.	0.9905	0	0	0.1374	0	0	
71.	0.9842	0.0649	0	0.1277	0.1038		
72.	0.9863	0.1204	0	0.0966	0	0.0589	
73.	0.9856	0	0.1691				
74.	0.9905	0	0	0.1374	0		
75.	0.9396	0.1811	0	0.0318	0.2887		
76.	0.9349	0	0.2582	0	0.2436		
77.	0.9310	0.1219	0.1845	0.2363	0.1498	0.0778	
78.	0.9344	0.1925	0	0.2670	0	0.1361	
79.	0.9567	0	0.0839	0	0.2787		
80.	0.9262	0	0.3653	0	0.0935		
81.	0.9167	0.3239	0	0.1924	0.0684	0.1141	
82.	0.9088	0.3426	0.2357	0	0.0332		
83.	0.9510	0.0671	0.2212	0	0.1990	0.0502	
84.	0.9856	0	0.1691	0	0		
85.	0.9597	0.0581	0.1347	0.1123	0.1879	0.0979	
86.	0.9556	0	0.2887	0.0598	0		
87.	0.9578	0.1891	0.0501	0.1875	0.0580	0.0767	
88.	0.9704	0.1288	0	0.1698	0	0.1138	
89.	0.9693	0.2210	0	0.0874	0	0.0629	
90.	0.9702	0.0927	0	0.1600	0.1565		
91.	0.9666	0.1341	0	0.2164	0.0300		
92.	0.9856	0	0	0.1691	0	0	
93.	0.9910	0.0904	0	0	0	0.0992	
94.	0.9365	0.1398	0	0	0.3217		
95.	0.9287	0.0200	0.2582	0.2117	0.1604		
96.	0.9239	0	0.3827	0			
97.	0.9219	0.2582	0.0191	0.2445	0	0.1524	
98.	0.9150	0.2234	0.2862	0.1204	0.1211	0.0418	
99.	0.9314	0.2485	0	0.2528	0	0.0825	
100.	0.9032	0.3725	0.1942	0	0.0878		
101.	0.9592	0.0389	0	0.2264	0.1646		
102.	0.9561	0	0.1051	0	0.2736	0	
103.	0.9560	0	0.2582	0	0.1395		
104.	0.9506	0.1907	0.2357	0.0533	0.0399		
105.	0.9795	0	0	0.1702	0	0.1079	
106.	1	0	0	0			
107.	0.9342	0	0.3568				
108.	0.9331	0.1228	0	0.2625	0.2132		
109.	0.9428	0	0	0.3333	0		
110.	0.9393	0	0.1612	0.2985	0	0.0512	
111.	0.9442	0.1243	0.2582	0.0633	0.1495		
112.	0.9561	0	0.2736	0	0.1051	0	

TABLE 2

a) *Algebraic connectivity of connected graphs on seven vertices*

1-10.	0.1981	0.2254	0.2603	0.3820	0.2679	0.3217	0.2955	0.3820	0.3983	0.4659
11-20.	1	0.7530	0.5858	0.3820	0.5188	0.6228	0.2765	0.6086	0.3588	0.3588
21-30.	0.3820	0.4330	0.5858	0.5140	0.5858	0.7269	0.2254	0.2679	0.3217	0.2679
31-40.	0.3004	0.3403	0.2955	0.3820	0.3820	0.3983	0.3983	0.3679	0.4116	0.6086
41-50.	0.4659	0.5505	0.5961	1	1	0.8851	0.7530	0.6571	0.6837	0.8214
51-60.	0.5858	0.6086	0.8458	0.3983	0.4424	0.5858	0.6766	0.6766	0.6972	0.8674
61-70.	0.7530	0.5858	0.6086	0.6490	0.5858	0.3588	0.7301	0.3889	0.3820	0.5140
71-80.	0.5858	0.5140	0.6699	0.5240	0.4374	0.6338	0.5926	0.6338	0.6086	0.6638
81-90.	0.7269	0.7382	0.8266	0.2679	0.3403	0.3983	0.3679	0.2765	0.4679	0.6086
91-100.	0.3588	0.5505	0.2955	0.3588	0.4659	0.3983	0.4330	0.3862	0.5961	0.4160
101-110.	0.5140	0.4221	0.5858	0.6150	0.4659	0.6837	0.7269	1	0.6470	0.7035
111-120.	1	1.3249	1.2679	1.3820	1	1.2087	0.9728	0.6766	0.8487	0.7269
121-130.	0.9486	1.5858	0.8851	1.0681	1.1864	1.0798	0.7530	0.9636	0.8299	0.6939
131-140.	0.8458	1	0.8244	0.8458	0.6766	0.7054	0.6665	0.8674	0.8226	0.8226
141-150.	0.9382	0.7857	1.0878	0.8851	0.6338	0.5858	0.6086	0.6571	0.8111	0.7396
151-160.	0.6972	0.8851	0.6656	0.8214	0.7639	0.5858	0.8266	0.7961	0.6239	0.6492
161-170.	0.6239	0.9217	0.7269	0.3983	0.8472	0.6638	0.7419	0.6837	0.4424	0.4384
171-180.	0.8890	0.6766	0.6766	0.6150	0.9099	0.6972	0.7399	0.7639	0.8674	0.8395
181-190.	0.3588	0.5505	0.3983	0.5140	0.5140	0.6150	0.7269	0.5961	0.3905	0.6470
191-200.	1	0.7035	0.5395	0.4376	0.6426	0.5972	0.6872	0.4659	0.3983	1
201-210.	0.6674	0.7149	0.5858	0.8302	0.7611	0.6766	0.4659	0.6885	1	0.8074
211-220.	1	0.2955	0.3983	0.4221	0.4659	0.7639	0.7035	1	1.5858	1.3820
221-230.	1.3187	0.8674	2	1.3820	1.5188	1.3274	1.4957	1.1153	1.4859	1.4424
231-240.	1.5858	1.2143	1.2679	1.1522	1.2679	1.5858	1.5858	1.3820	1.1301	1.1206
241-250.	1.3820	0.8458	1.3358	1.2087	0.9728	1.5858	1.3820	1.0463	1.0700	1
251-260.	1.1891	0.7107	1.3187	0.8542	0.8542	0.8254	0.9418	0.7269	0.8395	0.9486
261-270.	0.8851	1.1864	1.1338	0.8143	1.0878	0.8851	1.0133	1.0979	0.6766	1.1887
271-280.	0.6665	0.8642	0.6972	1	1.3010	0.8674	0.8395	0.8226	0.8226	0.9753
281-290.	0.8005	1.0878	0.8478	0.8247	0.9382	1.1105	0.9217	0.7066	0.6940	1.0148
291-300.	0.8307	0.8482	0.6766	0.6766	0.9393	0.9234	0.8487	1.2087	0.9157	0.5858
301-310.	0.6426	0.7269	0.8302	0.8851	0.6766	0.6338	0.7737	1	0.6751	1
311-320.	0.6972	0.7269	0.6638	0.8975	0.7971	0.8493	0.7639	0.9217	0.4424	1
321-330.	0.6824	0.7082	0.9099	1	0.4659	0.8251	0.6972	0.7466	0.9177	0.8674
331-340.	0.7727	1	1	0.7269	1	0.3983	0.5961	0.7035	0.3983	1
341-350.	0.4384	0.6766	0.6150	0.4659	0.6885	0.7639	0.8395	0.7639	0.8074	1
351-360.	1.7382	2.1392	1.5858	2	1.8013	1.6571	1.5119	1.6972	1.3187	1.4892
361-370.	1.7382	2	1.5858	1.5858	1.3820	1.4957	1.5858	1.5858	1.2223	1.4325
371-380.	1.5858	1.4229	1.5858	1.5858	1.5858	1.5858	1.3360	1.3446	1.4424	1.5580
381-390.	1.3820	1.4516	1.5858	1.3187	0.8674	0.8674	0.9430	1.2679	1.2171	1.5858
391-400.	1.5858	1.0463	1.1891	1.1551	1.4142	1.4550	1.2679	1.3187	1.4080	1.5858

401-410.	1.1153	1.5858	1.2087	1.2627	1.3489	1.2280	1.3530	1.0878	1.5858	1.5858
411-420.	1.3187	1.1442	0.8395	0.8573	1.1442	0.8482	0.9486	1.4877	0.9421	1.5007
421-430.	0.7269	0.8563	1.3187	0.9486	0.9275	0.8851	0.9139	1.0148	1.3010	1.2595
431-440.	1.1301	0.8674	1.2679	1.0761	0.8493	1.0148	0.6972	1	1	1.2266
441-450.	1.3249	0.8316	1.1227	1.3820	1.5858	1	0.7107	0.9395	1.2087	0.9217
451-460.	0.8542	0.7123	0.8254	0.8353	0.8545	0.9418	1.4384	0.9245	0.9399	1
461-470.	1.4859	2	0.7269	0.6766	1	0.8395	0.6824	1	0.8251	0.8057
471-480.	0.6766	0.9177	0.7091	1	0.9157	0.8493	0.9241	0.7269	1	0.8395
481-490.	1	0.4424	0.4659	0.6972	0.8674	0.7727	0.8074	1	3	2.2243
491-500.	2.1392	2.3249	1.7382	1.9035	2.0681	2.5858	1.7530	2.1392	1.7382	1.8358
501-510.	2	1.8111	2.1864	1.8013	1.5858	1.8633	1.5580	1.6864	1.6864	2
511-520.	1.5505	1.7382	2	1.5858	1.7857	1.5858	1.8224	1.5858	1.4333	1.6201
521-530.	1.5858	1.6239	1.6656	1.7639	1.3187	1.6571	1.5514	1.4424	1.5858	1.6629
531-540.	1.8013	1.5205	1.6239	1.6972	1.6452	1.7382	1.5007	1.7165	1.3187	1.4550
541-550.	1.2223	1.5858	2	1.2793	1.4229	1.2679	1.6360	1.5858	1.4550	1.6972
551-560.	1.3187	1.3575	1.5007	1.6830	1.5858	1.4384	1.6872	1.4516	1.3749	1.5972
561-570.	1.3187	0.8585	1.5858	1.6571	1.4892	0.9486	0.9422	0.8674	1.7639	0.9430
571-580.	0.8674	0.9486	1	1.0761	1.3249	1.5858	1.1442	1.2627	1.2087	1.4384
581-590.	1.4131	1.1442	1.4930	0.8574	1.4859	1.2087	0.8493	1.7639	1.6972	1.3187
591-600.	0.9421	1	0.7269	1.6314	0.9486	0.9275	2	1	0.8674	1
601-610.	0.8395	0.7123	0.8353	1	0.9399	0.9248	0.7269	1	0.8563	0.9275
611-620.	1	0.4659	0.8074	1	3	2.5858	3	2.4679	2.2243	2.4228
621-630.	2.3403	2.1206	2.5858	2.1392	2.3820	2.5858	2.0697	2.3325	1.8358	2.5858
631-640.	2	2.2243	1.8772	2.2243	1.9035	2	1.7382	2	1.9697	1.7382
641-650.	1.8358	2.1864	1.5858	1.8716	1.6710	2.1056	2.2679	1.5858	1.6864	1.8175
651-660.	2	1.8121	1.8358	1.6993	1.8674	1.8013	1.6864	1.7382	1.7639	1.9139
661-670.	2	1.5858	2	1.4550	1.6953	1.4424	1.6629	1.5580	1.8358	1.7639
671-680.	1.7216	1.7639	1.6972	1.6368	1.5580	1.8817	1.7165	1.6864	1.5505	0.9486
681-690.	1.4384	1.3187	1.3187	1.4384	1.6314	1.3983	1.4859	1.5858	1.7639	1.5007
691-700.	1.7639	1.6972	2	0.8674	0.9486	0.9430	1.7639	1	2	1.2087
701-710.	0.8585	0.9422	1	0.8674	1	1	0.7269	0.9275	1	3
711-720.	3	3.1981	2.7717	3	2.5858	2.4228	2.5858	2.3820	2.5395	2.3713
721-730.	2.5858	2.5188	2.5858	2.4384	2	3	2.1392	2.3489	2	2.2243
731-740.	2.2243	2.5858	2.5858	2.5858	1.8358	2.3403	2.4384	1.9035	2	2
741-750.	2.2679	1.9697	2.3820	1.6993	2.1088	1.8358	1.7639	1.8181	2.2679	1.7382
751-760.	1.8772	1.9139	1.8929	1.7382	1.7639	1.5858	1.7312	1.8358	2	1.6864
761-770.	1.8851	1.7639	2	2	1.4859	1.5505	1.7639	2	0.9486	1
771-780.	0.8674	0.9430	1	3.5858	4	3.3820	3.1981	3	2.8299	3
781-790.	3	2.5858	3	2.5188	2.6658	2.7717	2.7857	2.6972	3	2.4384
791-800.	2.6972	2.3713	2.6072	2.5858	2.4384	2	2.1864	2.2679	2.3820	2.6972
801-810.	1.8358	1.9139	1.9035	2.5188	2	3	2	1.7639	1.7382	1.8929
811-820.	2	0.9486	1	4	3.3820	3.5858	4	3	3.2679	2.8299
821-830.	3	3	3.3820	2.6972	2.7857	2.8299	2.5188	2.4384	2.6972	2
831-840.	3	1.9139	2	1	4	3.5858	4	4	3.3820	3
841-850.	3	2.8299	3	2	5	4	3.5858	4	3	5
851-853.	4	5	7							

b) *Planarity of connected graphs on seven vertices*

Connected graphs on 7 vertices with no more than 9 edges (graphs 1 – 218 in Table B) are, of course, planar. On the other hand, graphs from Table B with more than 15 edges (graphs 814 – 853) are non-planar. Among the 595 graphs with the number of edges between 10 and 15, including these numbers, (graphs 219 – 813) the following 167 graphs are non-planar:

219 ; 222 ; 351 ; 352 ; 353 ; 356 ; 371 ; 385 ; 386 ; 387 ; 489 ; 490 ;
 491 ; 492 ; 493 ; 494 ; 498 ; 503 ; 504 ; 505 ; 508 ; 509 ; 511 ; 512 ;
 526 ; 530 ; 534 ; 542 ; 568 ; 570 ; 571 ; 572 ; 573 ; 579 ; 593 ; 595 ;
 596 ; 612 ; 613 ; 614 ; 615 ; 616 ; 617 ; 618 ; 619 ; 620 ; 621 ; 624 ;
 628 ; 630 ; 632 ; 633 ; 634 ; 635 ; 637 ; 638 ; 642 ; 643 ; 647 ; 649 ;
 650 ; 654 ; 656 ; 657 ; 658 ; 659 ; 660 ; 661 ; 666 ; 667 ; 677 ; 678 ;
 679 ; 694 ; 695 ; 696 ; 698 ; 700 ; 704 ; 705 ; 706 ; 707 ; 708 ; 709 ;
 710 ; 711 ; 712 ; 713 ; 714 ; 716 ; 717 ; 719 ; 720 ; 721 ; 722 ; 723 ;
 724 ; 725 ; 726 ; 728 ; 729 ; 730 ; 731 ; 732 ; 734 ; 736 ; 737 ; 738 ;
 739 ; 741 ; 744 ; 746 ; 747 ; 748 ; 749 ; 750 ; 751 ; 752 ; 753 ; 754 ;
 760 ; 762 ; 764 ; 765 ; 766 ; 767 ; 768 ; 769 ; 770 ; 771 ; 772 ; 773 ;
 774 ; 775 ; 777 ; 778 ; 779 ; 780 ; 781 ; 783 ; 784 ; 785 ; 786 ; 787 ;
 788 ; 789 ; 790 ; 791 ; 792 ; 793 ; 794 ; 795 ; 796 ; 798 ; 801 ; 802 ;
 803 ; 804 ; 805 ; 806 ; 807 ; 808 ; 809 ; 810 ; 811 ; 812 ; 813

TABLE 3

a) *Diameter of trees up to ten vertices*

1-10.	1 2 2 3 2 3 4 2 3 3	101-110.	3 4 4 4 5 5 4 4 4 4
11-20.	4 4 5 2 3 3 4 4 4 4	111-120.	4 4 5 4 5 5 4 5 4 5
21-30.	5 5 4 6 2 3 3 3 4 4	121-130.	5 4 5 5 6 5 6 6 4 5
31-40.	4 4 4 5 4 5 4 5 5 5	131-140.	5 4 5 5 5 5 5 5 5 4
41-50.	4 5 6 6 6 5 7 2 3 3	141-150.	6 6 6 6 5 6 4 6 5 6
51-60.	4 4 3 4 4 4 4 5 4 5	151-160.	5 6 5 6 6 5 5 5 4 6
61-70.	4 4 4 5 5 5 5 4 5 5	161-170.	7 6 5 6 6 5 7 6 7 5
71-80.	4 6 5 4 6 5 6 5 4 6	171-180.	5 6 6 6 5 7 7 7 7 6
81-90.	6 6 6 5 6 5 6 5 7 7	181-190.	7 7 6 7 6 7 6 7 6 6
91-100.	7 6 6 8 2 3 3 4 4 3	191-200.	6 5 8 8 8 8 6 7 7 9

b) *Radius of trees up to ten vertices*

1-10.	1 1 1 2 1 2 2 1 2 2	101-110.	2 2 2 2 3 3 2 2 2 2
11-20.	2 2 3 1 2 2 2 2 2 2	111-120.	2 2 3 2 3 3 2 3 2 3
21-30.	3 3 2 3 1 2 2 2 2 2	121-130.	3 2 3 3 3 3 3 3 2 3
31-40.	2 2 2 3 2 3 2 3 3 3	131-140.	3 2 3 3 3 3 3 3 3 2
41-50.	2 3 3 3 3 3 4 1 2 2	141-150.	3 3 3 3 3 3 2 3 3 3
51-60.	2 2 2 2 2 2 2 3 2 3	151-160.	3 3 3 3 3 3 3 3 2 3
61-70.	2 2 2 3 3 3 3 2 3 3	161-170.	4 3 3 3 3 3 4 3 4 3
71-80.	2 3 3 2 3 3 3 3 2 3	171-180.	3 3 3 3 3 4 4 4 4 3
81-90.	3 3 3 3 3 3 3 3 4 4	181-190.	4 4 3 4 3 4 3 4 3 3
91-100.	4 3 3 4 1 2 2 2 2 2	191-200.	3 3 4 4 4 4 3 4 4 5

TABLE 4

Radius of connected cubic graphs on 14 vertices

1-10.	4 4 4 3 3 4 4 4 3 3	101-110.	3 4 4 4 4 3 3 3 3 3
11-20.	3 3 3 3 3 4 3 3 3 3	111-120.	3 3 3 3 3 3 3 3 3 3
21-30.	3 3 3 3 3 3 3 3 3 3	121-130.	3 3 3 3 3 3 3 4 3 4
31-40.	3 3 3 3 3 3 3 3 3 3	131-140.	4 4 3 3 3 3 4 4 4 4
41-50.	3 3 3 3 3 3 3 3 3 4	141-150.	4 3 3 3 4 3 3 3 3 3
51-60.	3 3 3 3 3 3 3 3 3 3	151-160.	3 4 3 3 3 3 3 4 4 4
61-70.	4 3 3 3 3 3 3 3 3 3	161-170.	4 4 4 4 4 4 4 4 3 3
71-80.	3 3 3 3 3 3 4 4 3 3	171-180.	3 3 3 3 3 4 3 3 3 3
81-90.	3 4 3 3 4 4 4 4 3 5	181-190.	4 3 3 3 4 4 4 3 3 3
91-100.	5 3 4 4 4 4 4 4 4 4	191-200.	3 3 3 3 3 3 3 3 3 3
201-210.	3 3 3 3 3 3 3 3 3 3	301-310.	3 3 3 3 3 3 3 3 3 3
211-220.	3 3 3 4 3 4 3 3 3 3	311-320.	3 3 3 3 3 3 3 3 3 3
221-230.	3 3 3 3 3 3 3 3 3 3	321-330.	3 3 3 3 4 3 3 3 3 3
231-240.	3 3 3 3 3 4 4 3 4 3	331-340.	3 3 3 3 3 3 3 3 3 3
241-250.	4 3 3 3 3 3 3 3 3 3	341-350.	3 3 3 3 3 3 3 3 3 3
251-260.	3 3 3 3 3 3 4 3 3 3	351-360.	3 3 3 4 4 4 4 3 3 4
261-270.	3 3 3 3 3 3 3 3 3 3	361-370.	3 4 3 3 3 3 4 3 3 3
271-280.	3 3 3 3 3 3 3 3 3 3	371-380.	3 3 3 3 3 3 3 4 3 3
281-290.	3 3 3 3 3 3 3 3 3 3	381-390.	3 3 3 3 3 3 3 3 3 3
291-300.	3 3 3 3 3 3 3 3 3 3	391-400.	3 3 3 3 3 3 3 3 3 3
401-410.	3 3 3 3 3 3 3 3 3 3	461-470.	3 4 3 3 3 3 3 3 3 3
411-420.	3 3 3 3 3 4 3 3 3 3	471-490.	3 3 3 3 3 3 3 3 3 3
421-430.	3 3 3 3 3 3 3 3 3 3	481-490.	3 3 3 3 3 3 3 3 3 3
431-440.	3 3 3 3 3 3 3 3 3 3	491-500.	3 3 3 3 3 3 3 3 3 3
441-450.	3 3 3 3 3 3 3 3 3 3	501-509.	3 3 3 3 3 3 3 3 3 3
451-460.	3 3 3 3 3 3 3 3 3 3		

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