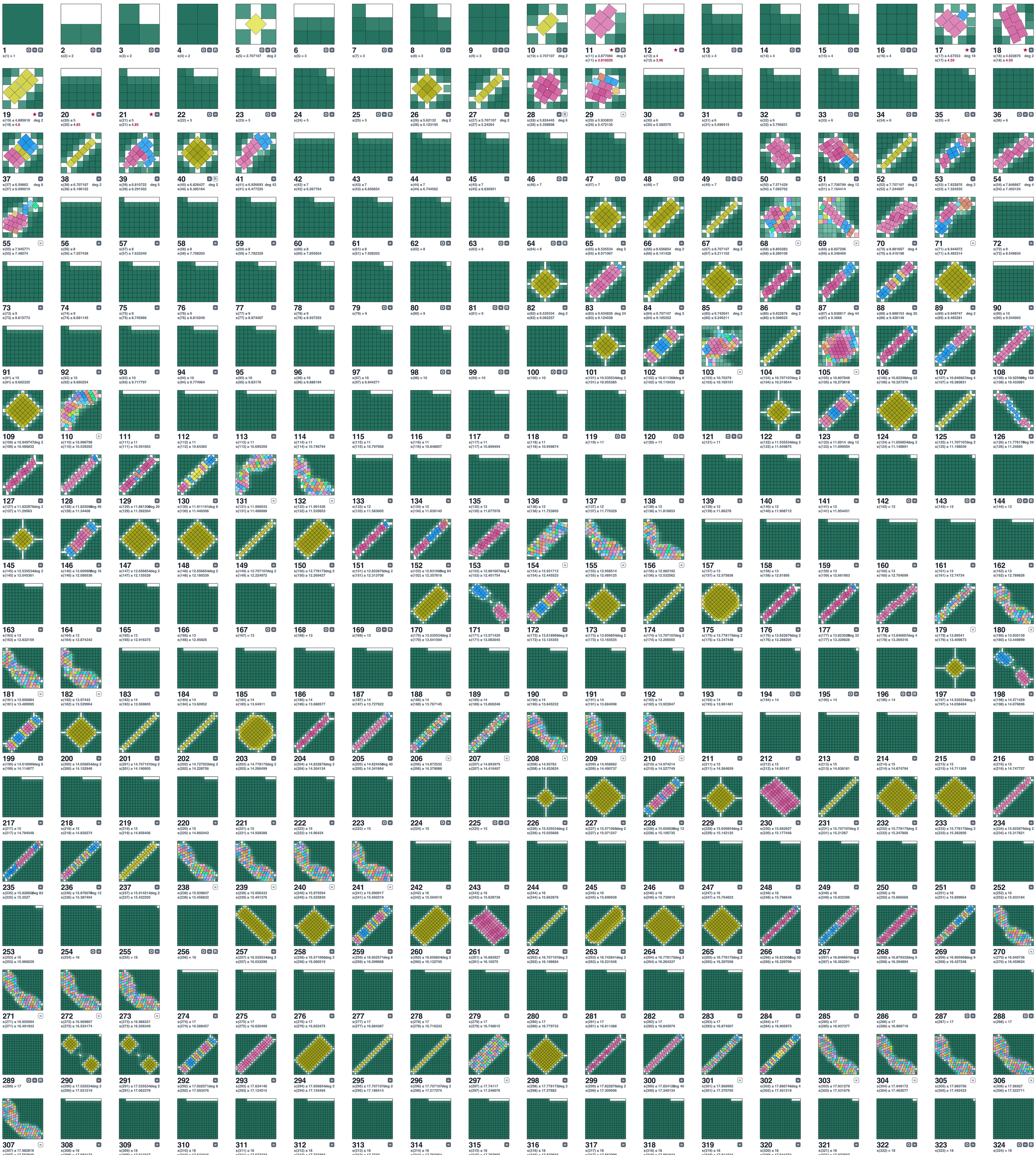
324 BEST KNOWN SQUARE PACKINGS

★ Including new results (September 8, 2026)

github.com/jlevy/squares



n	status	s(n)	deg
1	O = R	= 1	
2	O =	= 2	
3	O =	= 3	
4	O = R	= 2	
5	O = R	= 2.707107	2
6	O =	= 3	
7	O =	= 3	
8	O =	= 3	
9	O = R	= 3	
10	O =	= 3.707107	2
11	★ = R	≤ 3.877084	6
		≥ 3.810025	
12	★ =	≤ 4	
		≥ 3.96	
13	O =	= 4	
14	O =	= 4	
15	O =	= 4	
16	O = R	= 4	
17	★ =	≤ 4.67553	18
		≥ 4.59	
18	★ =	≤ 4.822876	2
		≥ 4.59	
19	★ =	≤ 4.885618	2
		≥ 4.8	
20	★ =	≤ 5	
		≥ 4.85	
21	★ =	≤ 5	
		≥ 4.85	
22	O =	= 5	
23	O =	= 5	
24	O =	= 5	
25	O = R	= 5	
26	=	≤ 5.62132	2
		≥ 5.123105	
27	=	≤ 5.707107	2
		≥ 5.24264	
28	= R	≤ 5.824445	6
		≥ 5.358898	
29	≈	≤ 5.933833	
		≥ 5.472135	
30	=	≤ 6	
		≥ 5.582575	
31	=	≤ 6	
		≥ 5.690415	
32	=	≤ 6	
		≥ 5.795831	
33	O =	= 6	
34	O =	= 6	
35	O =	= 6	
36	O = R	= 6	
37	=	≤ 6.59862	8
		≥ 6.099019	
38	=	≤ 6.707107	2
		≥ 6.196152	
39	=	≤ 6.810722	5
		≥ 6.291502	
40	= R	≤ 6.828427	2
		≥ 6.385164	
41	=	≤ 6.926693	42
		≥ 6.477225	
42	=	≤ 7	
		≥ 6.567764	
43	=	≤ 7	
		≥ 6.656854	
44	=	≤ 7	
		≥ 6.744562	
45	=	≤ 7	
		≥ 6.830951	
46	O =	= 7	
47	O =	= 7	
48	O =	= 7	
49	O = R	= 7	
50	=	≤ 7.571429	
		≥ 7.082762	
51	=	≤ 7.700799	12
		≥ 7.164414	
52	=	≤ 7.707107	2
		≥ 7.244997	
53	=	≤ 7.822876	2
		≥ 7.324555	
54	=	≤ 7.846667	4
		≥ 7.403124	
55	≈	≤ 7.945771	
		≥ 7.48074	
56	=	≤ 8	
		≥ 7.557438	
57	=	≤ 8	
		≥ 7.633249	
58	=	≤ 8	
		≥ 7.708203	
59	=	≤ 8	
		≥ 7.782329	
60	=	≤ 8	
		≥ 7.855654	
61	=	≤ 8	
		≥ 7.928203	
62	O =	= 8	
63	O =	= 8	
64	O = R	= 8	
65	=	≤ 8.535534	2
		≥ 8.071067	
66	=	≤ 8.656854	2
		≥ 8.141428	
67	=	≤ 8.707107	2
		≥ 8.211102	
68	≈	≤ 8.803383	
		≥ 8.280109	
69	≈	≤ 8.827206	
		≥ 8.348469	
70	=	≤ 8.881667	4
		≥ 8.416198	
71	≈	≤ 8.944072	
		≥ 8.483314	
72	=	≤ 9	
		≥ 8.549834	
73	=	≤ 9	
		≥ 8.615773	
74	=	≤ 9	
		≥ 8.681145	
75	=	≤ 9	
		≥ 8.745966	
76	=	≤ 9	
		≥ 8.810249	
77	=	≤ 9	
		≥ 8.874007	
78	=	≤ 9	
		≥ 8.937253	
79	O =	= 9	
80	O =	= 9	
81	O = R	= 9	
82	=	≤ 9.535534	2
		≥ 9.062257	
83	=	≤ 9.634826	24
		≥ 9.124038	
84	=	≤ 9.707107	2
		≥ 9.185352	
85	=	≤ 9.742641	2
		≥ 9.246211	
86	=	≤ 9.822876	2
		≥ 9.306623	
87	=	≤ 9.838817	44
		≥ 9.3666	
88	=	≤ 9.888153	20
		≥ 9.426149	
89	=	≤ 9.949747	2
		≥ 9.485281	
90	=	≤ 10	
		≥ 9.544003	
91	=	≤ 10	
		≥ 9.602325	
92	=	≤ 10	
		≥ 9.660254	
93	=	≤ 10	
		≥ 9.717797	
94	=	≤ 10	
		≥ 9.774964	
95	=	≤ 10	
		≥ 9.83176	
96	=	≤ 10	
		≥ 9.888194	
97	=	≤ 10	
		≥ 9.944271	
98	O =	= 10	
99	O =	= 10	
100	O = R	= 10	
101	=	≤ 10.535534	2
		≥ 10.055385	
102	=	≤ 10.611388	8
		≥ 10.110433	
103	≈	≤ 10.70379	
		≥ 10.165151	
104	=	≤ 10.707107	2
		≥ 10.219544	
105	≈	≤ 10.807848	
		≥ 10.273618	
106	=	≤ 10.82298	32
		≥ 10.327379	
107	=	≤ 10.846667	4
		≥ 10.380831	
108	=	≤ 10.925969	144
		≥ 10.433981	
109	=	≤ 10.949747	2
		≥ 10.486832	
110	≈	≤ 10.996798	
		≥ 10.539392	
111	=	≤ 11	
		≥ 10.591663	
112	=	≤ 11	
		≥ 10.64365	
113	=	≤ 11	
		≥ 10.695359	
114	=	≤ 11	
		≥ 10.746794	
115	=	≤ 11	
		≥ 10.797958	
116	=	≤ 11	
		≥ 10.848857	
117	=	≤ 11	
		≥ 10.899494	
118	=	≤ 11	
		≥ 10.949874	
119	O =	= 11	
120	O =	= 11	
121	O = R	= 11	
122	=	≤ 11.535534	2
		≥ 11.049875	
123	=	≤ 11.6014	12
		≥ 11.099504	
124	=	≤ 11.656854	2
		≥ 11.148891	
125	=	≤ 11.707107	2
		≥ 11.198039	
126	=	≤ 11.776170	59
		≥ 11.24695	
127	=	≤ 11.822876	2
		≥ 11.29563	
128	=	≤ 11.825098	40
		≥ 11.34408	
129	=	≤ 11.881306	20
		≥ 11.392304	
130	=	≤ 11.911191	8
		≥ 11.440306	
131	≈	≤ 11.956543	
		≥ 11.488088	
132	≈	≤ 11.991436	
		≥ 11.535653	
133	=	≤ 12	
		≥ 11.583005	
134	=	≤ 12	
		≥ 11.630145	
135	=	≤ 12	
		≥ 11.677078	
136	=	≤ 12	
		≥ 11.723805	
137	=	≤ 12	
		≥ 11.770329	
138	=	≤ 12	
		≥ 11.816653	
139	=	≤ 12	
		≥ 11.86278	
140	=	≤ 12	
		≥ 11.908712	
141	=	≤ 12	
		≥ 11.954451	
142	O =	= 12	
143	O =	= 12	
144	O = R	= 12	
145	=	≤ 12.535534	2
		≥ 12.045361	
146	=	≤ 12.600906	16
		≥ 12.090536	
147	=	≤ 12.656854	2
		≥ 12.135528	
148	=	≤ 12.656854	2
		≥ 12.180339	
149	=	≤ 12.707107	2
		≥ 12.224972	
150	=	≤ 12.778175	2
		≥ 12.269427	
151	=	≤ 12.822876	2
		≥ 12.313708	
152	=	≤ 12.831006	84
		≥ 12.357816	
153	=	≤ 12.881667	4
		≥ 12.401754	
154	≈	≤ 12.931712	
		≥ 12.445523	
155	≈	≤ 12.958514	
		≥ 12.489125	
156	≈	≤ 12.982192	
		≥ 12.532562	
157	=	≤ 13	
		≥ 12.575836	
158	=	≤ 13	
		≥ 12.61895	
159	=	≤ 13	
		≥ 12.661903	
160	=	≤ 13	
		≥ 12.704699	
161	=	≤ 13	
		≥ 12.74734	
162	=	≤ 13	
		≥ 12.789826	
163	=	≤ 13	
		≥ 12.832159	
164	=	≤ 13	
		≥ 12.874342	
165	=	≤ 13	
		≥ 12.916375	
166	=	≤ 13	
		≥ 12.95826	
167	O =	= 13	
168	O =	= 13	
169	O = R	= 13	
170	=	≤ 13.535534	2
		≥ 13.041594	
171	=	≤ 13.571429	
		≥ 13.083045	
172	=	≤ 13.618989	8
		≥ 13.124355	
173	=	≤ 13.656854	2
		≥ 13.165525	
174	=	≤ 13.707107	2
		≥ 13.206555	
175	=	≤ 13.778175	2
		≥ 13.247448	
176	=	≤ 13.822876	2
		≥ 13.288205	
177	=	≤ 13.823028	32
		≥ 13.328828	
178	=	≤ 13.846667	4
		≥ 13.369316	
179	≈	≤ 13.89541	
		≥ 13.409673	
180	≈	≤ 13.935139	
		≥ 13.449899	
181	≈	≤ 13.956984	
		≥ 13.489995	
182	≈	≤ 13.97443	
		≥ 13.529964	
183	=	≤ 14	
		≥ 13.569805	
184	=	≤ 14	
		≥ 13.60952	
185	=	≤ 14	
		≥ 13.64911	
186	=	≤ 14	
		≥ 13.688577	
187	=	≤ 14	
		≥ 13.727922	
188	=	≤ 14	
		≥ 13.767145	
189	=	≤ 14	
		≥ 13.806248	
190	=	≤ 14	
		≥ 13.845232	
191	=	≤ 14	
		≥ 13.884098	
192	=	≤ 14	
		≥ 13.922847	
193	=	≤ 14	
		≥ 13.961481	
194	O =	= 14	
195	O =	= 14	
196	O = R	= 14	
197	=	≤ 14.535534	2
		≥ 14.038404	
198	=	≤ 14.571429	
		≥ 14.076696	
199	=	≤ 14.618989	8
		≥ 14.114877	
200	=	≤ 14.656854	2
		≥ 14.152946	
201	=	≤ 14.707107	2
		≥ 14.190905	
202	=	≤ 14.727922	2
		≥ 14.228756	
203	=	≤ 14.778175	2
		≥ 14.266499	
204	=	≤ 14.822876	2
		≥ 14.304134	
205	=	≤ 14.824455	40
		≥ 14.341664	
206	≈	≤ 14.872532	
		≥ 14.379088	
207	≈	≤ 14.893979	
		≥ 14.416407	
208	≈	≤ 14.93783	
		≥ 14.453624	
209	≈	≤ 14.958682	
		≥ 14.490737	
210	≈	≤ 14.974214	
		≥ 14.527749	
211	=	≤ 15	
		≥ 14.564659	
212	=	≤ 15	
		≥ 14.60147	
213	=	≤ 15	
		≥ 14.638181	
214	=	≤ 15	
		≥ 14.674794	
215	=	≤ 15	
		≥ 14.711309	
216	=	≤ 15	
		≥ 14.747727	
217	=	≤ 15	
		≥ 14.784048	
218	=	≤ 15	
		≥ 14.820274	
219	=	≤ 15	
		≥ 14.856406	
220	=	≤ 15	
		≥ 14.892443	
221	=	≤ 15	
		≥ 14.928388	
222	=	≤ 15	
		≥ 14.96424	
223	O =	= 15	
224	O =	= 15	
225	O = R	= 15	
226	=	≤ 15.535534	2
		≥ 15.035668	
227	=	≤ 15.571068	2
		≥ 15.071247	
228	=	≤ 15.609028	12
		≥ 15.106735	
229	=	≤ 15.656854	2
		≥ 15.142135	
230	=	≤ 15.682927	
		≥ 15.177446	
231	=	≤ 15.707107	2
		≥ 15.21267	
232	=	≤ 15.778175	2
		≥ 15.247806	
233	=	≤ 15.778175	2
		≥ 15.282856	
234	=	≤ 15.822876	2
		≥ 15.317821	
235	=	≤ 15.826606	83
		≥ 15.3527	
236	=	≤ 15.876078	12
		≥ 15.387494	
237	=	≤ 15.914214	2
		≥ 15.422205	
238	≈	≤ 15.939847	
		≥ 15.456832	
239	≈	≤ 15.956433	
		≥ 15.491376	
240	≈	≤ 15.975594	
		≥ 15.525839	
241	≈	≤ 15.990917	
		≥ 15.560219	
242	=	≤ 16	
		≥ 15.594519	
243	=	≤ 16	
		≥ 15.628738	
244	=	≤ 16	
		≥ 15.662878	
245	=	≤ 16	
		≥ 15.696938	
246	=	≤ 16	
		≥ 15.730919	
247	=	≤ 16	
		≥ 15.764823	
248	=	≤ 16	
		≥ 15.798648	
249	=	≤ 16	
		≥ 15.832396	
250	=	≤ 16	
		≥ 15.866068	
251	=	≤ 16	
		≥ 15.899664	
252	=	≤ 16	
		≥ 15.933184	
253	=	≤ 16	
		≥ 15.966629	
254	O =	= 16	
255	O =	= 16	
256	O = R	= 16	
257	=	≤ 16.535534	2
		≥ 16.033296	
258	=	≤ 16.571068	2
		≥ 16.066519	
259	=	≤ 16.602571	8
		≥ 16.099668	
260	=	≤ 16.656854	2
		≥ 16.132745	
261	=	≤ 16.682927	
		≥ 16.16575	
262	=	≤ 16.707107	2
		≥ 16.198684	
263	=	≤ 16.742641	2
		≥ 16.231546	
264	=	≤ 16.778175	2
		≥ 16.264337	
265	=	≤ 16.778175	2
		≥ 16.297058	
266	=	≤ 16.823060	32
		≥ 16.329709	
267	=	≤ 16.846667	4
		≥ 16.362291	
268	=	≤ 16.879332	6
		≥ 16.394804	
269	=	≤ 16.905968	8
		≥ 16.427248	
270	≈	≤ 16.940736	
		≥ 16.459624	
271	≈	≤ 16.955094	
		≥ 16.491933	
272	≈	≤ 16.969807	
		≥ 16.524174	
273	≈	≤ 16.988321	
		≥ 16.556349	
274	=	≤ 17	
		≥ 16.588457	
275	=	≤ 17	
		≥ 16.620499	
276	=	≤ 17	
		≥ 16.652475	
277	=	≤ 17	
		≥ 16.684387	
278	=	≤ 17	
		≥ 16.716233	
279	=	≤ 17	
		≥ 16.748015	
280	=	≤ 17	
		≥ 16.779733	
281	=	≤ 17	
		≥ 16.811388	
282	=	≤ 17	
		≥ 16.842979	
283	=	≤ 17	
		≥ 16.874507	
284	=	≤ 17	
		≥ 16.905973	
285	=	≤ 17	
		≥ 16.937377	
286	=	≤ 17	
		≥ 16.968719	
287	O =	= 17	
288	O =	= 17	
289	O = R	= 17	
290	=	≤ 17.535534	2
		≥ 17.031219	
291	=	≤ 17.535534	2
		≥ 17.062378	
292	=	≤ 17.602571	8
		≥ 17.093476	
293	=	≤ 17.634146	
		≥ 17.124515	
294	=	≤ 17.656854	2
		≥ 17.155494	
295	=	≤ 17.707107	2
		≥ 17.186414	
296	=	≤ 17.707107	2
		≥ 17.217274	
297	≈	≤ 17.74117	
		≥ 17.248076	
298	=	≤ 17.778175	2
		≥ 17.27882	
299	=	≤ 17.822876	2
		≥ 17.309506	
300	=	≤ 17.824128	40
		≥ 17.340134	
301	≈	≤ 17.868992	
		≥ 17.370705	
302	=	≤ 17.886746	4
		≥ 17.401219	
303	≈	≤ 17.931279	
		≥ 17.431676	
304	≈	≤ 17.949172	
		≥ 17.462077	
305	≈	≤ 17.960756	
		≥ 17.492422	
306	≈	≤ 17.96927	
		≥ 17.522711	
307	≈	≤ 17.982816	
		≥ 17.552945	
308	=	≤ 18	
		≥ 17.583123	
309	=	≤ 18	
		≥ 17.613247	
310	=	≤ 18	
		≥ 17.643316	
311	=	≤ 18	
		≥ 17.673332	
312	=	≤ 18	
		≥ 17.703293	
313	=	≤ 18	
		≥ 17.7332	
314	=	≤ 18	
		≥ 17.763054	
315	=	≤ 18	
		≥ 17.792855	
316	=	≤ 18	
		≥ 17.822603	
317	=	≤ 18	
		≥ 17.852299	
318	=	≤ 18	
		≥ 17.881943	
319	=	≤ 18	
		≥ 17.911534	
320	=	≤ 18	
		≥ 17.941074	
321	=	≤ 18	
		≥ 17.970562	
322	O =	= 18	
323	O =	= 18	
324	O = R	= 18	

O proved optimal (59) = exact value known (287) ≈ only known numerically (37) R rigid (established here) (20) (R) annotated rigid by the catalogue (2) ★ lower bound first proved here (7)

colors indicate distinct tilt angles 4 3 2 1 0 shade indicates number of full-side contacts

s(n) is the side of the smallest square holding n unit squares; deg is the algebraic degree of that side length

Diagram by Joshua Levy with assistance from Claude and Codex

DRAFT v0.3.0-33cd4760