Rational approximations to $\sqrt{3}$:

fraction	abs. err.	pct. err.
2/1	0.26795	15.470%
3/2	0.23205	13.397%
5/3	0.06538	3.775%
7/4	0.01795	1.036%
9/5	0.06795	3.923%
10/6 = 5/3	0.06538	3.775%
12/7	0.01777	1.026%
14/8 = 7/4	0.01795	1.036%
16/9	0.04573	2.640%
17/10	0.03205	1.850%
19/11	0.00478	0.276%
21/12 = 7/4	0.01795	1.036%
23/13	0.03718	2.147%
24/14 = 12/7	0.01777	1.026%
26/15	0.00128	0.074%
28/16 = 7/4	0.01795	1.036%
29/17	0.02617	1.511%
31/18	0.00983	0.567%
33/19	0.00479	0.277%
35/20 = 7/4	0.01795	1.036%
36/21 = 12/7	0.01777	1.026%
38/22 = 19/11	0.00478	0.276%
40/23	0.00708	0.409%
42/24 = 7/4	0.01795	1.036%
43/25	0.01205	0.696%
45/26	0.00128	0.074%
47/27	0.00869	0.502%
48/28 = 12/7	0.01777	1.026%
50/29	0.00791	0.457%
52/30 = 26/15	0.00128	0.074%
54/31	0.00988	0.571%
55/32	0.01330	0.768%
57/33 = 19/11	0.00478	0.276%
59/34	0.00324	0.187%
61/35	0.01081	0.624%
62/36 = 31/18	0.00983	0.567%
64/37	0.00232	0.134%
66/38 = 33/19	0.00479	0.277%
68/39	0.01154	0.666%
69/40	0.00705	0.407%
71/41	0.00034	0.020%
73/42	0.00604	0.349%
74/43	0.01112	0.642%
76/44 = 19/11	0.00478	0.276%
78/45 = 26/15	0.00128	0.074%
80/46 = 40/23	0.00708	0.409%
81/47	0.00865	0.499%
83/48	0.00288	0.167%
85/49	0.00264	0.153%
87/50	0.00795	0.459%
88/51	0.00656	0.379%
90/52 = 45/26	0.00128	0.074%
92/53	0.00380	0.219%
94/54 = 47/27	0.00869	0.502%
95/55 = 19/11	0.00478	0.276%
97/56	0.00009	0.005%
99/57 = 33/19	0.00479	0.277%
100/58 = 50/29	0.00791	0.457%
102/59	0.00324	0.187%
104/60 = 26/15	0.00128	0.074%
106/61	0.00565	0.326%
107/62	0.00624	0.361%
109/63	0.00189	0.109%
111/64	0.00232	0.134%
113/65	0.00641	0.370%
114/66 = 19/11	0.00478	0.276%
116/67	0.00071	0.041%
118/68 = 59/34	0.00324	0.187%
120/69 = 40/23	0.00708	0.409%
121/70	0.00348	0.201%
123/71	0.00034	0.020%
125/72	0.00406	0.234%
126/73	0.00602	0.348%
128/74 = 64/37	0.00232	0.134%
130/75 = 26/15	0.00128	0.074%
132/76 = 33/19	0.00479	0.277%
133/77 = 19/11	0.00478	0.276%
135/78 = 45/26	0.00128	0.074%
137/79	0.00213	0.123%
139/80	0.00545	0.315%
140/81	0.00366	0.211%
142/82 = 71/41	0.00034	0.020%
144/83	0.00289	0.167%
145/84	0.00586	0.338%
147/85	0.00264	0.152%
149/86	0.00051	0.029%
151/87	0.00358	0.207%
152/88 = 19/11	0.00478	0.276%
154/89	0.00171	0.099%
156/90 = 26/15	0.00128	0.074%
158/91	0.00421	0.243%
159/92	0.00379	0.219%
161/93	0.00087	0.050%
163/94	0.00199	0.115%
165/95 = 33/19	0.00479	0.277%
166/96 = 83/48	0.00288	0.167%
168/97	0.00009	0.005%
170/98 = 85/49	0.00264	0.153%
171/99 = 19/11	0.00478	0.276%
173/100	0.00205	0.118%

Rational approximations to e:

fraction	abs. err.	pct. err.
3/1	0.28172	10.364%
5/2	0.21828	8.030%
8/3	0.05162	1.899%
11/4	0.03172	1.167%
14/5	0.08172	3.006%
16/6 = 8/3	0.05162	1.899%
19/7	0.00400	0.147%
22/8 = 11/4	0.03172	1.167%
24/9 = 8/3	0.05162	1.899%
27/10	0.01828	0.673%
30/11	0.00899	0.331%
33/12 = 11/4	0.03172	1.167%
35/13	0.02597	0.956%
38/14 = 19/7	0.00400	0.147%
41/15	0.01505	0.554%
43/16	0.03078	1.132%
46/17	0.01240	0.456%
49/18	0.00394	0.145%
52/19	0.01856	0.683%
54/20 = 27/10	0.01828	0.673%
57/21 = 19/7	0.00400	0.147%
60/22 = 30/11	0.00899	0.331%
63/23	0.02085	0.767%
65/24	0.00995	0.366%
68/25	0.00172	0.063%
71/26	0.01249	0.459%
73/27	0.01458	0.536%
76/28 = 19/7	0.00400	0.147%
79/29	0.00586	0.215%
82/30 = 41/15	0.01505	0.554%
84/31	0.00860	0.317%
87/32	0.00047	0.017%
90/33 = 30/11	0.00899	0.331%
92/34 = 46/17	0.01240	0.456%
95/35 = 19/7	0.00400	0.147%
98/36 = 49/18	0.00394	0.145%
101/37	0.01145	0.421%
103/38	0.00776	0.285%
106/39	0.00033	0.012%
109/40	0.00672	0.247%
111/41	0.01096	0.403%
114/42 = 19/7	0.00400	0.147%
117/43	0.00265	0.097%
120/44 = 30/11	0.00899	0.331%
122/45	0.00717	0.264%
125/46	0.00089	0.033%
128/47	0.00512	0.188%
130/48 = 65/24	0.00995	0.366%
133/49 = 19/7	0.00400	0.147%
136/50 = 68/25	0.00172	0.063%
139/51	0.00721	0.265%
141/52	0.00674	0.248%
144/53	0.00130	0.048%
147/54 = 49/18	0.00394	0.145%
150/55 = 30/11	0.00899	0.331%
152/56 = 19/7	0.00400	0.147%
155/57	0.00102	0.037%
158/58 = 79/29	0.00586	0.215%
160/59	0.00642	0.236%
163/60	0.00162	0.059%
166/61	0.00303	0.111%
169/62	0.00752	0.277%
171/63 = 19/7	0.00400	0.147%
174/64 = 87/32	0.00047	0.017%
177/65	0.00480	0.176%
179/66	0.00616	0.227%
182/67	0.00186	0.069%
185/68	0.00231	0.085%
188/69	0.00636	0.234%
190/70 = 19/7	0.00400	0.147%
193/71	0.00003	0.001%
196/72 = 49/18	0.00394	0.145%
198/73	0.00595	0.219%
201/74	0.00207	0.076%
204/75 = 68/25	0.00172	0.063%
207/76	0.00540	0.199%
209/77 = 19/7	0.00400	0.147%
212/78 = 106/39	0.00033	0.012%
215/79	0.00324	0.119%
217/80	0.00578	0.213%
220/81	0.00223	0.082%
223/82	0.00123	0.045%
226/83	0.00461	0.170%
228/84 = 19/7	0.00400	0.147%
231/85	0.00063	0.023%
234/86 = 117/43	0.00265	0.097%
236/87	0.00564	0.207%
239/88	0.00237	0.087%
242/89	0.00082	0.030%
245/90 = 49/18	0.00394	0.145%
247/91 = 19/7	0.00400	0.147%
250/92 = 125/46	0.00089	0.033%
253/93	0.00215	0.079%
256/94 = 128/47	0.00512	0.188%
258/95	0.00249	0.092%
261/96 = 87/32	0.00047	0.017%
264/97	0.00337	0.124%
266/98 = 19/7	0.00400	0.147%
269/99	0.00111	0.041%
272/100 = 68/25	0.00172	0.063%

Rational approximations to $\sqrt[3]{3}$:

fraction	abs. err.	pct. err.
1/1	0.44225	30.664%
3/2	0.05775	4.004%
4/3	0.10892	7.552%
6/4 = 3/2	0.05775	4.004%
7/5	0.04225	2.929%
9/6 = 3/2	0.05775	4.004%
10/7	0.01368	0.948%
12/8 = 3/2	0.05775	4.004%
13/9	0.00219	0.152%
14/10 = 7/5	0.04225	2.929%
16/11	0.01230	0.853%
17/12	0.02558	1.774%
19/13	0.01929	1.337%
20/14 = 10/7	0.01368	0.948%
22/15	0.02442	1.693%
23/16	0.00475	0.329%
25/17	0.02834	1.965%
26/18 = 13/9	0.00219	0.152%
27/19	0.02120	1.470%
29/20	0.00775	0.537%
30/21 = 10/7	0.01368	0.948%
32/22 = 16/11	0.01230	0.853%
33/23	0.00747	0.518%
35/24	0.01608	1.115%
36/25	0.00225	0.156%
37/26	0.01917	1.329%
39/27 = 13/9	0.00219	0.152%
40/28 = 10/7	0.01368	0.948%
42/29	0.00603	0.418%
43/30	0.00892	0.618%
45/31	0.00936	0.649%
46/32 = 23/16	0.00475	0.329%
48/33 = 16/11	0.01230	0.853%
49/34	0.00107	0.074%
50/35 = 10/7	0.01368	0.948%
52/36 = 13/9	0.00219	0.152%
53/37	0.00982	0.681%
55/38	0.00512	0.355%
56/39	0.00635	0.440%
58/40 = 29/20	0.00775	0.537%
59/41	0.00323	0.224%
61/42	0.01013	0.702%
62/43	0.00039	0.027%
63/44	0.01043	0.723%
65/45 = 13/9	0.00219	0.152%
66/46 = 33/23	0.00747	0.518%
68/47	0.00456	0.316%
69/48 = 23/16	0.00475	0.329%
71/49	0.00673	0.467%
72/50 = 36/25	0.00225	0.156%
74/51	0.00873	0.605%
75/52	0.00006	0.004%
76/53	0.00829	0.575%
78/54 = 13/9	0.00219	0.152%
79/55	0.00589	0.408%
81/56	0.00418	0.290%
82/57	0.00365	0.253%
84/58 = 42/29	0.00603	0.418%
85/59	0.00157	0.109%
87/60 = 29/20	0.00775	0.537%
88/61	0.00037	0.026%
89/62	0.00677	0.469%
91/63 = 13/9	0.00219	0.152%
92/64 = 23/16	0.00475	0.329%
94/65	0.00390	0.271%
95/66	0.00286	0.198%
97/67	0.00551	0.382%
98/68 = 49/34	0.00107	0.074%
100/69	0.00703	0.487%
101/70	0.00061	0.042%
102/71	0.00563	0.390%
104/72 = 13/9	0.00219	0.152%
105/73	0.00389	0.270%
107/74	0.00370	0.256%
108/75 = 36/25	0.00225	0.156%
110/76 = 55/38	0.00512	0.355%
111/77	0.00069	0.048%
112/78 = 56/39	0.00635	0.440%
114/79	0.00079	0.055%
115/80 = 23/16	0.00475	0.329%
117/81 = 13/9	0.00219	0.152%
118/82 = 59/41	0.00323	0.224%
120/83	0.00353	0.245%
121/84	0.00177	0.123%
123/85	0.00481	0.333%
124/86 = 62/43	0.00039	0.027%
125/87	0.00547	0.379%
127/88	0.00093	0.065%
128/89	0.00405	0.281%
130/90 = 13/9	0.00219	0.152%
131/91	0.00269	0.186%
133/92	0.00340	0.236%
134/93	0.00139	0.096%
136/94 = 68/47	0.00456	0.316%
137/95	0.00014	0.010%
138/96 = 23/16	0.00475	0.329%
140/97	0.00105	0.073%
141/98	0.00347	0.241%
143/99 = 13/9	0.00219	0.152%
144/100 = 36/25	0.00225	0.156%

Rational approximations to $\sqrt{5}$:

fraction	abs. err.	pct. err.
2/1	0.23607	10.557%
4/2 = 2/1	0.23607	10.557%
7/3	0.09727	4.350%
9/4	0.01393	0.623%
11/5	0.03607	1.613%
13/6	0.06940	3.104%
16/7	0.04965	2.220%
18/8 = 9/4	0.01393	0.623%
20/9	0.01385	0.619%
22/10 = 11/5	0.03607	1.613%
25/11	0.03666	1.639%
27/12 = 9/4	0.01393	0.623%
29/13	0.00530	0.237%
31/14	0.02178	0.974%
34/15	0.03060	1.368%
36/16 = 9/4	0.01393	0.623%
38/17	0.00077	0.035%
40/18 = 20/9	0.01385	0.619%
42/19	0.02554	1.142%
45/20 = 9/4	0.01393	0.623%
47/21	0.00203	0.091%
49/22	0.00880	0.393%
51/23	0.01868	0.835%
54/24 = 9/4	0.01393	0.623%
56/25	0.00393	0.176%
58/26 = 29/13	0.00530	0.237%
60/27 = 20/9	0.01385	0.619%
63/28 = 9/4	0.01393	0.623%
65/29	0.00531	0.238%
67/30	0.00273	0.122%
69/31	0.01026	0.459%
72/32 = 9/4	0.01393	0.623%
74/33	0.00636	0.284%
76/34 = 38/17	0.00077	0.035%
78/35	0.00750	0.335%
80/36 = 20/9	0.01385	0.619%
83/37	0.00718	0.321%
85/38	0.00077	0.035%
87/39 = 29/13	0.00530	0.237%
89/40	0.01107	0.495%
92/41	0.00783	0.350%
94/42 = 47/21	0.00203	0.091%
96/43	0.00351	0.157%
98/44 = 49/22	0.00880	0.393%
101/45	0.00838	0.375%
103/46	0.00306	0.137%
105/47	0.00203	0.091%
107/48	0.00690	0.309%
110/49	0.00883	0.395%
112/50 = 56/25	0.00393	0.176%
114/51 = 38/17	0.00077	0.035%
116/52 = 29/13	0.00530	0.237%
119/53	0.00922	0.412%
121/54	0.00467	0.209%
123/55	0.00030	0.013%
125/56	0.00393	0.176%
127/57	0.00800	0.358%
130/58 = 65/29	0.00531	0.238%
132/59	0.00122	0.055%
134/60 = 67/30	0.00273	0.122%
136/61	0.00656	0.293%
139/62	0.00587	0.262%
141/63 = 47/21	0.00203	0.091%
143/64	0.00169	0.076%
145/65 = 29/13	0.00530	0.237%
148/66 = 74/33	0.00636	0.284%
150/67	0.00274	0.122%
152/68 = 38/17	0.00077	0.035%
154/69	0.00418	0.187%
157/70	0.00679	0.304%
159/71	0.00337	0.151%
161/72	0.00004	0.002%
163/73	0.00319	0.143%
165/74	0.00634	0.283%
168/75 = 56/25	0.00393	0.176%
170/76 = 85/38	0.00077	0.035%
172/77	0.00230	0.103%
174/78 = 29/13	0.00530	0.237%
177/79	0.00444	0.198%
179/80	0.00143	0.064%
181/81	0.00150	0.067%
183/82	0.00436	0.195%
186/83	0.00490	0.219%
188/84 = 47/21	0.00203	0.091%
190/85 = 38/17	0.00077	0.035%
192/86 = 96/43	0.00351	0.157%
195/87 = 65/29	0.00531	0.238%
197/88	0.00257	0.115%
199/89	0.00011	0.005%
201/90 = 67/30	0.00273	0.122%
203/91 = 29/13	0.00530	0.237%
206/92 = 103/46	0.00306	0.137%
208/93	0.00049	0.022%
210/94 = 105/47	0.00203	0.091%
212/95	0.00449	0.201%
215/96	0.00352	0.157%
217/97	0.00105	0.047%
219/98	0.00137	0.061%
221/99	0.00374	0.167%
224/100 = 56/25	0.00393	0.176%

Rational approximations to $\sqrt{7}$:

fraction	abs. err.	pct. err.
3/1	0.35425	13.389%
5/2	0.14575	5.509%
8/3	0.02092	0.791%
11/4	0.10425	3.940%
13/5	0.04575	1.729%
16/6 = 8/3	0.02092	0.791%
19/7	0.06853	2.590%
21/8	0.02075	0.784%
24/9 = 8/3	0.02092	0.791%
26/10 = 13/5	0.04575	1.729%
29/11	0.00939	0.355%
32/12 = 8/3	0.02092	0.791%
34/13	0.03037	1.148%
37/14	0.00289	0.109%
40/15 = 8/3	0.02092	0.791%
42/16 = 21/8	0.02075	0.784%
45/17	0.00131	0.049%
48/18 = 8/3	0.02092	0.791%
50/19	0.01417	0.536%
53/20	0.00425	0.161%
56/21 = 8/3	0.02092	0.791%
58/22 = 29/11	0.00939	0.355%
61/23	0.00642	0.243%
63/24 = 21/8	0.02075	0.784%
66/25	0.00575	0.217%
69/26	0.00809	0.306%
71/27	0.01612	0.609%
74/28 = 37/14	0.00289	0.109%
77/29	0.00942	0.356%
79/30	0.01242	0.469%
82/31	0.00059	0.022%
85/32	0.01050	0.397%
87/33 = 29/11	0.00939	0.355%
90/34 = 45/17	0.00131	0.049%
93/35	0.01139	0.431%
95/36	0.00686	0.259%
98/37	0.00290	0.110%
101/38	0.01214	0.459%
103/39	0.00473	0.179%
106/40 = 53/20	0.00425	0.161%
108/41	0.01160	0.439%
111/42 = 37/14	0.00289	0.109%
114/43	0.00541	0.205%
116/44 = 29/11	0.00939	0.355%
119/45	0.00131	0.049%
122/46 = 61/23	0.00642	0.243%
124/47	0.00745	0.282%
127/48	0.00008	0.003%
130/49	0.00731	0.276%
132/50 = 66/25	0.00575	0.217%
135/51 = 45/17	0.00131	0.049%
138/52 = 69/26	0.00809	0.306%
140/53	0.00424	0.160%
143/54	0.00240	0.091%
146/55	0.00879	0.332%
148/56 = 37/14	0.00289	0.109%
151/57	0.00337	0.127%
153/58	0.00782	0.296%
156/59	0.00168	0.064%
159/60 = 53/20	0.00425	0.161%
161/61	0.00641	0.242%
164/62 = 82/31	0.00059	0.022%
167/63	0.00504	0.191%
169/64	0.00513	0.194%
172/65	0.00040	0.015%
175/66	0.00576	0.218%
177/67	0.00396	0.150%
180/68 = 45/17	0.00131	0.049%
183/69 = 61/23	0.00642	0.243%
185/70 = 37/14	0.00289	0.109%
188/71	0.00214	0.081%
190/72 = 95/36	0.00686	0.259%
193/73	0.00192	0.072%
196/74 = 98/37	0.00290	0.110%
198/75 = 66/25	0.00575	0.217%
201/76	0.00101	0.038%
204/77	0.00360	0.136%
206/78 = 103/39	0.00473	0.179%
209/79	0.00018	0.007%
212/80 = 53/20	0.00425	0.161%
214/81	0.00378	0.143%
217/82	0.00059	0.022%
220/83	0.00485	0.183%
222/84 = 37/14	0.00289	0.109%
225/85 = 45/17	0.00131	0.049%
228/86 = 114/43	0.00541	0.205%
230/87	0.00207	0.078%
233/88	0.00198	0.075%
235/89	0.00530	0.200%
238/90 = 119/45	0.00131	0.049%
241/91	0.00260	0.098%
243/92	0.00445	0.168%
246/93 = 82/31	0.00059	0.022%
249/94	0.00318	0.120%
251/95	0.00365	0.138%
254/96 = 127/48	0.00008	0.003%
257/97	0.00373	0.141%
259/98 = 37/14	0.00289	0.109%
262/99	0.00071	0.027%
265/100 = 53/20	0.00425	0.161%

Rational approximations to π:

fraction	abs. err.	pct. err.
3/1	0.14159	4.507%
6/2 = 3/1	0.14159	4.507%
9/3 = 3/1	0.14159	4.507%
13/4	0.10841	3.451%
16/5	0.05841	1.859%
19/6	0.02507	0.798%
22/7	0.00126	0.040%
25/8	0.01659	0.528%
28/9	0.03048	0.970%
31/10	0.04159	1.324%
35/11	0.04023	1.280%
38/12 = 19/6	0.02507	0.798%
41/13	0.01225	0.390%
44/14 = 22/7	0.00126	0.040%
47/15	0.00826	0.263%
50/16 = 25/8	0.01659	0.528%
53/17	0.02395	0.762%
57/18 = 19/6	0.02507	0.798%
60/19	0.01630	0.519%
63/20	0.00841	0.268%
66/21 = 22/7	0.00126	0.040%
69/22	0.00523	0.166%
72/23	0.01116	0.355%
75/24 = 25/8	0.01659	0.528%
79/25	0.01841	0.586%
82/26 = 41/13	0.01225	0.390%
85/27	0.00656	0.209%
88/28 = 22/7	0.00126	0.040%
91/29	0.00366	0.117%
94/30 = 47/15	0.00826	0.263%
97/31	0.01256	0.400%
101/32	0.01466	0.467%
104/33	0.00992	0.316%
107/34	0.00547	0.174%
110/35 = 22/7	0.00126	0.040%
113/36	0.00270	0.086%
116/37	0.00646	0.206%
119/38	0.01001	0.319%
123/39 = 41/13	0.01225	0.390%
126/40 = 63/20	0.00841	0.268%
129/41	0.00475	0.151%
132/42 = 22/7	0.00126	0.040%
135/43	0.00206	0.066%
138/44 = 69/22	0.00523	0.166%
141/45 = 47/15	0.00826	0.263%
145/46	0.01058	0.337%
148/47	0.00734	0.234%
151/48	0.00424	0.135%
154/49 = 22/7	0.00126	0.040%
157/50	0.00159	0.051%
160/51	0.00434	0.138%
163/52	0.00698	0.222%
167/53	0.00935	0.298%
170/54 = 85/27	0.00656	0.209%
173/55	0.00386	0.123%
176/56 = 22/7	0.00126	0.040%
179/57	0.00124	0.040%
182/58 = 91/29	0.00366	0.117%
185/59	0.00600	0.191%
188/60 = 47/15	0.00826	0.263%
192/61	0.00595	0.189%
195/62	0.00357	0.114%
198/63 = 22/7	0.00126	0.040%
201/64	0.00097	0.031%
204/65	0.00313	0.100%
207/66 = 69/22	0.00523	0.166%
210/67	0.00726	0.231%
214/68 = 107/34	0.00547	0.174%
217/69	0.00333	0.106%
220/70 = 22/7	0.00126	0.040%
223/71	0.00075	0.024%
226/72 = 113/36	0.00270	0.086%
229/73	0.00461	0.147%
232/74 = 116/37	0.00646	0.206%
236/75	0.00507	0.162%
239/76	0.00314	0.100%
242/77 = 22/7	0.00126	0.040%
245/78	0.00057	0.018%
248/79	0.00235	0.075%
251/80	0.00409	0.130%
254/81	0.00579	0.184%
258/82 = 129/41	0.00475	0.151%
261/83	0.00299	0.095%
264/84 = 22/7	0.00126	0.040%
267/85	0.00042	0.013%
270/86 = 135/43	0.00206	0.066%
273/87 = 91/29	0.00366	0.117%
276/88 = 69/22	0.00523	0.166%
280/89	0.00447	0.142%
283/90	0.00285	0.091%
286/91 = 22/7	0.00126	0.040%
289/92	0.00029	0.009%
292/93	0.00181	0.058%
295/94	0.00329	0.105%
298/95	0.00475	0.151%
302/96 = 151/48	0.00424	0.135%
305/97	0.00274	0.087%
308/98 = 22/7	0.00126	0.040%
311/99	0.00018	0.006%
314/100 = 157/50	0.00159	0.051%