



RS-44

(R424A)

THERMODYNAMIC TABLES

FAHRENHEIT

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Refrigerant Solutions Limited

**RS-44 (R424A)
PSIA
FAHRENHEIT**

Temp °F	Pressure bubble point psia	Pressure dew point psia	Density bubble point lb/ft ³	Density dew point lb/ft ³	Volume bubble point ft ³ /lb	Volume dew point ft ³ /lb	Enthalpy bubble point Btu/lb	Enthalpy dew point Btu/lb	Entropy bubble point Btu/R-lb	Entropy dew point Btu/R-lb
-80	4.3666	2.9539	92.058	0.0797	0.010863	12.553	52.915	142.35	0.16305	0.40228
-78	4.6618	3.1730	91.853	0.0852	0.010887	11.739	53.476	142.65	0.16452	0.40178
-76	4.9730	3.4052	91.649	0.0910	0.010911	10.988	54.037	142.95	0.16598	0.40128
-74	5.3008	3.6511	91.444	0.0972	0.010936	10.293	54.600	143.25	0.16744	0.40080
-72	5.6459	3.9114	91.238	0.1036	0.010960	9.6505	55.163	143.55	0.16890	0.40034
-70	6.0089	4.1867	91.032	0.1104	0.010985	9.0551	55.728	143.85	0.17035	0.39989
-68	6.3905	4.4775	90.825	0.1176	0.011010	8.5031	56.293	144.15	0.17180	0.39945
-66	6.7914	4.7846	90.617	0.1251	0.011035	7.9910	56.860	144.45	0.17324	0.39902
-64	7.2122	5.1085	90.409	0.1331	0.011061	7.5154	57.427	144.75	0.17467	0.39860
-62	7.6538	5.4501	90.201	0.1414	0.011086	7.0733	57.995	145.05	0.17610	0.39820
-60	8.1167	5.8099	89.992	0.1501	0.011112	6.6621	58.565	145.35	0.17753	0.39780
-58	8.6018	6.1887	89.782	0.1593	0.011138	6.2793	59.135	145.65	0.17895	0.39742
-56	9.1098	6.5871	89.571	0.1688	0.011164	5.9227	59.706	145.95	0.18036	0.39705
-54	9.6414	7.0061	89.360	0.1789	0.011191	5.5901	60.279	146.25	0.18178	0.39669
-52	10.197	7.4462	89.149	0.1894	0.011217	5.2797	60.852	146.55	0.18318	0.39634
-50	10.779	7.9083	88.936	0.2004	0.011244	4.9899	61.426	146.85	0.18459	0.39600
-48	11.386	8.3931	88.723	0.2119	0.011271	4.7191	62.002	147.15	0.18598	0.39567
-46	12.020	8.9015	88.509	0.2239	0.011298	4.4657	62.578	147.45	0.18738	0.39535
-44	12.682	9.4342	88.295	0.2365	0.011326	4.2286	63.156	147.75	0.18877	0.39504
-42	13.372	9.9922	88.080	0.2496	0.011353	4.0066	63.735	148.05	0.19015	0.39473
-40	14.092	10.576	87.864	0.2633	0.011381	3.7984	64.314	148.35	0.19153	0.39444
-38	14.842	11.187	87.648	0.2775	0.011409	3.6032	64.895	148.65	0.19291	0.39416
-36	15.623	11.826	87.430	0.2924	0.011438	3.4200	65.477	148.94	0.19428	0.39388
-34	16.435	12.493	87.212	0.3079	0.011466	3.2479	66.060	149.24	0.19565	0.39361
-32	17.281	13.189	86.993	0.3240	0.011495	3.0862	66.645	149.54	0.19702	0.39335
-30	18.161	13.917	86.774	0.3408	0.011524	2.9342	67.230	149.84	0.19838	0.39310
-28	19.075	14.675	86.553	0.3583	0.011554	2.7911	67.817	150.14	0.19974	0.39286
-26	20.024	15.466	86.332	0.3765	0.011583	2.6564	68.405	150.43	0.20109	0.39262
-24	21.011	16.290	86.110	0.3953	0.011613	2.5295	68.994	150.73	0.20244	0.39239



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-22	22.034	17.149	85.887	0.4150	0.011643	2.4098	69.584	151.02	0.20379	0.39217
-20	23.096	18.042	85.663	0.4354	0.011674	2.2969	70.176	151.32	0.20513	0.39196
-18	24.198	18.972	85.438	0.4565	0.011704	2.1904	70.768	151.61	0.20647	0.39175
-16	25.340	19.939	85.212	0.4785	0.011735	2.0898	71.362	151.91	0.20781	0.39155
-14	26.523	20.944	84.986	0.5013	0.011767	1.9948	71.958	152.20	0.20914	0.39135
-12	27.749	21.988	84.758	0.5250	0.011798	1.9049	72.554	152.49	0.21047	0.39116
-10	29.018	23.073	84.530	0.5495	0.011830	1.8199	73.152	152.78	0.21180	0.39098
-8	30.331	24.199	84.300	0.5749	0.011862	1.7394	73.751	153.08	0.21312	0.39080
-6	31.690	25.367	84.070	0.6012	0.011895	1.6633	74.352	153.37	0.21444	0.39063
-4	33.095	26.579	83.838	0.6285	0.011928	1.5911	74.954	153.66	0.21576	0.39047
-2	34.548	27.836	83.605	0.6568	0.011961	1.5226	75.557	153.95	0.21707	0.39031
0	36.050	29.138	83.371	0.6860	0.011995	1.4577	76.162	154.23	0.21838	0.39016
2	37.601	30.486	83.137	0.7163	0.012028	1.3962	76.768	154.52	0.21969	0.39001
4	39.202	31.883	82.901	0.7476	0.012063	1.3377	77.375	154.81	0.22100	0.38986
6	40.856	33.329	82.663	0.7799	0.012097	1.2822	77.984	155.09	0.22230	0.38972
8	42.562	34.825	82.425	0.8134	0.012132	1.2294	78.595	155.38	0.22360	0.38959
10	44.322	36.372	82.186	0.8480	0.012168	1.1792	79.207	155.66	0.22489	0.38946
12	46.137	37.972	81.945	0.8838	0.012203	1.1315	79.820	155.95	0.22619	0.38933
14	48.009	39.625	81.703	0.9207	0.012240	1.0861	80.435	156.23	0.22748	0.38921
16	49.937	41.333	81.459	0.9589	0.012276	1.0429	81.051	156.51	0.22877	0.38910
18	51.924	43.098	81.215	0.9983	0.012313	1.0017	81.670	156.79	0.23006	0.38898
20	53.971	44.919	80.968	1.0390	0.012350	0.9625	82.289	157.07	0.23134	0.38887
22	56.078	46.799	80.721	1.0810	0.012388	0.9251	82.911	157.35	0.23263	0.38877
24	58.247	48.739	80.472	1.1244	0.012427	0.8894	83.533	157.62	0.23391	0.38867
26	60.479	50.740	80.222	1.1691	0.012465	0.8553	84.158	157.90	0.23518	0.38857
28	62.776	52.803	79.970	1.2153	0.012505	0.8229	84.784	158.17	0.23646	0.38847
30	65.137	54.929	79.716	1.2629	0.012544	0.7918	85.412	158.45	0.23773	0.38838
32	67.566	57.120	79.461	1.3120	0.012585	0.7622	86.042	158.72	0.23901	0.38829
34	70.062	59.377	79.205	1.3626	0.012625	0.7339	86.674	158.99	0.24028	0.38821



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36	72.626	61.702	78.947	1.4148	0.012667	0.7068	87.307	159.26	0.24154	0.38812
38	75.261	64.095	78.687	1.4687	0.012709	0.6809	87.942	159.53	0.24281	0.38804
40	77.968	66.558	78.425	1.5241	0.012751	0.6561	88.579	159.79	0.24407	0.38797
42	80.747	69.093	78.162	1.5813	0.012794	0.6324	89.218	160.06	0.24534	0.38789
44	83.600	71.700	77.896	1.6402	0.012838	0.6097	89.859	160.32	0.24660	0.38782
46	86.527	74.381	77.629	1.7009	0.012882	0.5879	90.502	160.58	0.24786	0.38775
48	89.531	77.138	77.360	1.7634	0.012927	0.5671	91.146	160.84	0.24912	0.38768
50	92.613	79.971	77.089	1.8278	0.012972	0.5471	91.793	161.10	0.25037	0.38761
52	95.773	82.882	76.816	1.8941	0.013018	0.5280	92.442	161.35	0.25163	0.38755
54	99.014	85.873	76.541	1.9624	0.013065	0.5096	93.093	161.61	0.25288	0.38748
56	102.34	88.945	76.264	2.0328	0.013112	0.4919	93.746	161.86	0.25414	0.38742
58	105.74	92.099	75.984	2.1052	0.013161	0.4750	94.401	162.11	0.25539	0.38736
60	109.23	95.337	75.702	2.1798	0.013210	0.4588	95.058	162.36	0.25664	0.38730
62	112.80	98.660	75.418	2.2566	0.013259	0.4431	95.718	162.61	0.25789	0.38724
64	116.46	102.07	75.132	2.3357	0.013310	0.4281	96.380	162.85	0.25914	0.38718
66	120.21	105.57	74.843	2.4172	0.013361	0.4137	97.044	163.09	0.26039	0.38712
68	124.05	109.16	74.552	2.5010	0.013414	0.3998	97.711	163.33	0.26164	0.38707
70	127.98	112.83	74.258	2.5873	0.013467	0.3865	98.380	163.57	0.26288	0.38701
72	132.00	116.61	73.961	2.6762	0.013521	0.3737	99.052	163.81	0.26413	0.38695
74	136.11	120.47	73.661	2.7677	0.013576	0.3613	99.726	164.04	0.26538	0.38690
76	140.32	124.43	73.359	2.8620	0.013632	0.3494	100.40	164.27	0.26662	0.38684
78	144.62	128.49	73.054	2.9590	0.013689	0.3380	101.08	164.50	0.26787	0.38678
80	149.03	132.65	72.746	3.0589	0.013747	0.3269	101.76	164.72	0.26911	0.38672
82	153.53	136.91	72.434	3.1617	0.013806	0.3163	102.45	164.95	0.27036	0.38667
84	158.13	141.27	72.120	3.2677	0.013866	0.3060	103.14	165.17	0.27161	0.38661
86	162.83	145.73	71.802	3.3768	0.013927	0.2961	103.83	165.38	0.27285	0.38655
88	167.64	150.30	71.480	3.4891	0.013990	0.2866	104.52	165.59	0.27410	0.38649
90	172.55	154.98	71.155	3.6049	0.014054	0.2774	105.22	165.80	0.27535	0.38642
92	177.56	159.77	70.827	3.7242	0.014119	0.2685	105.92	166.01	0.27659	0.38636



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100	198.72	180.04	69.473	4.2388	0.014394	0.2359	108.75	166.80	0.28159	0.38608
102	204.29	185.40	69.123	4.3775	0.014467	0.2284	109.47	166.99	0.28284	0.38601
104	209.98	190.87	68.770	4.5206	0.014541	0.2212	110.19	167.17	0.28410	0.38593
106	215.78	196.47	68.411	4.6683	0.014618	0.2142	110.92	167.35	0.28535	0.38584
108	221.70	202.19	68.048	4.8206	0.014696	0.2074	111.64	167.53	0.28661	0.38576
110	227.75	208.04	67.679	4.9778	0.014776	0.2009	112.38	167.69	0.28787	0.38567
112	233.91	214.02	67.305	5.1402	0.014858	0.1946	113.11	167.86	0.28913	0.38557
114	240.20	220.12	66.925	5.3078	0.014942	0.1884	113.86	168.02	0.29040	0.38547
116	246.61	226.36	66.540	5.4811	0.015029	0.1825	114.60	168.17	0.29166	0.38537
118	253.15	232.73	66.148	5.6602	0.015118	0.1767	115.35	168.32	0.29293	0.38526
120	259.82	239.24	65.750	5.8453	0.015209	0.1711	116.11	168.46	0.29421	0.38514
122	266.61	245.89	65.345	6.0369	0.015303	0.1657	116.87	168.60	0.29549	0.38502
124	273.54	252.68	64.933	6.2352	0.015401	0.1604	117.63	168.73	0.29677	0.38489
126	280.61	259.61	64.513	6.4406	0.015501	0.1553	118.41	168.85	0.29805	0.38475
128	287.81	266.68	64.086	6.6534	0.015604	0.1503	119.18	168.96	0.29934	0.38460
130	295.15	273.91	63.650	6.8740	0.015711	0.1455	119.97	169.07	0.30064	0.38445
132	302.63	281.29	63.205	7.1030	0.015822	0.1408	120.76	169.17	0.30194	0.38428
134	310.24	288.82	62.751	7.3408	0.015936	0.1362	121.55	169.26	0.30324	0.38411
136	318.01	296.50	62.287	7.5879	0.016055	0.1318	122.36	169.34	0.30456	0.38393
138	325.92	304.35	61.812	7.8449	0.016178	0.1275	123.17	169.41	0.30588	0.38373
140	333.97	312.36	61.326	8.1126	0.016306	0.1233	123.99	169.47	0.30721	0.38352
142	342.18	320.53	60.828	8.3916	0.016440	0.1192	124.82	169.52	0.30854	0.38329
144	350.54	328.88	60.317	8.6827	0.016579	0.1152	125.65	169.56	0.30989	0.38305
146	359.05	337.40	59.791	8.9869	0.016725	0.1113	126.50	169.58	0.31125	0.38280
148	367.72	346.09	59.251	9.3053	0.016877	0.1075	127.36	169.59	0.31262	0.38252
150	376.55	354.97	58.693	9.6389	0.017038	0.1038	128.23	169.58	0.31400	0.38223
152	385.54	364.03	58.117	9.9893	0.017207	0.1001	129.11	169.56	0.31539	0.38191
154	394.69	373.28	57.522	10.358	0.017385	0.0965	130.00	169.52	0.31680	0.38157
156	404.01	382.73	56.904	10.747	0.017574	0.0931	130.91	169.46	0.31823	0.38120



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158	413.50	392.38	56.261	11.158	0.017774	0.0896	131.83	169.38	0.31968	0.38080
160	423.15	402.24	55.591	11.593	0.017989	0.0863	132.78	169.27	0.32115	0.38037
162	432.98	412.30	54.889	12.057	0.018219	0.0829	133.74	169.14	0.32265	0.37990
164	442.99	422.59	54.152	12.552	0.018467	0.0797	134.72	168.97	0.32418	0.37939
166	453.17	433.11	53.373	13.084	0.018736	0.0764	135.73	168.77	0.32574	0.37882
168	463.53	443.87	52.545	13.657	0.019031	0.0732	136.78	168.53	0.32734	0.37820
170	474.07	454.89	51.660	14.281	0.019357	0.0700	137.86	168.24	0.32900	0.37751
172	484.79	466.16	50.704	14.964	0.019722	0.0668	138.98	167.89	0.33072	0.37673
174	495.69	477.73	49.659	15.722	0.020137	0.0636	140.16	167.47	0.33252	0.37585
176	506.77	489.60	48.500	16.574	0.020619	0.0603	141.41	166.97	0.33442	0.37483
178	518.01	501.82	47.183	17.552	0.021194	0.0570	142.75	166.34	0.33647	0.37364
180	529.39	514.43	45.636	18.709	0.021913	0.0535	144.25	165.55	0.33873	0.37220



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PSIG
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-80	-10.3294	-11.7421	92.058	0.0797	0.010863	12.553	52.915	142.35	0.16305	0.40228
-78	-10.0342	-11.5230	91.853	0.0852	0.010887	11.739	53.476	142.65	0.16452	0.40178
-76	-9.7230	-11.2908	91.649	0.0910	0.010911	10.988	54.037	142.95	0.16598	0.40128
-74	-9.3952	-11.0449	91.444	0.0972	0.010936	10.293	54.600	143.25	0.16744	0.40080
-72	-9.0501	-10.7846	91.238	0.1036	0.010960	9.6505	55.163	143.55	0.16890	0.40034
-70	-8.6871	-10.5093	91.032	0.1104	0.010985	9.0551	55.728	143.85	0.17035	0.39989
-68	-8.3055	-10.2185	90.825	0.1176	0.011010	8.5031	56.293	144.15	0.17180	0.39945
-66	-7.9046	-9.9114	90.617	0.1251	0.011035	7.9910	56.860	144.45	0.17324	0.39902
-64	-7.4838	-9.5875	90.409	0.1331	0.011061	7.5154	57.427	144.75	0.17467	0.39860
-62	-7.0422	-9.2459	90.201	0.1414	0.011086	7.0733	57.995	145.05	0.17610	0.39820
-60	-6.5793	-8.8861	89.992	0.1501	0.011112	6.6621	58.565	145.35	0.17753	0.39780
-58	-6.0942	-8.5073	89.782	0.1593	0.011138	6.2793	59.135	145.65	0.17895	0.39742
-56	-5.5862	-8.1089	89.571	0.1688	0.011164	5.9227	59.706	145.95	0.18036	0.39705
-54	-5.0546	-7.6899	89.360	0.1789	0.011191	5.5901	60.279	146.25	0.18178	0.39669
-52	-4.4990	-7.2498	89.149	0.1894	0.011217	5.2797	60.852	146.55	0.18318	0.39634
-50	-3.9170	-6.7877	88.936	0.2004	0.011244	4.9899	61.426	146.85	0.18459	0.39600
-48	-3.3100	-6.3029	88.723	0.2119	0.011271	4.7191	62.002	147.15	0.18598	0.39567
-46	-2.6760	-5.7945	88.509	0.2239	0.011298	4.4657	62.578	147.45	0.18738	0.39535
-44	-2.0140	-5.2618	88.295	0.2365	0.011326	4.2286	63.156	147.75	0.18877	0.39504
-42	-1.3240	-4.7038	88.080	0.2496	0.011353	4.0066	63.735	148.05	0.19015	0.39473
-40	-0.6040	-4.1200	87.864	0.2633	0.011381	3.7984	64.314	148.35	0.19153	0.39444
-38	0.1460	-3.5090	87.648	0.2775	0.011409	3.6032	64.895	148.65	0.19291	0.39416
-36	0.9270	-2.8700	87.430	0.2924	0.011438	3.4200	65.477	148.94	0.19428	0.39388
-34	1.7390	-2.2030	87.212	0.3079	0.011466	3.2479	66.060	149.24	0.19565	0.39361
-32	2.5850	-1.5070	86.993	0.3240	0.011495	3.0862	66.645	149.54	0.19702	0.39335
-30	3.4650	-0.7790	86.774	0.3408	0.011524	2.9342	67.230	149.84	0.19838	0.39310
-28	4.3790	-0.0210	86.553	0.3583	0.011554	2.7911	67.817	150.14	0.19974	0.39286
-26	5.3280	0.7700	86.332	0.3765	0.011583	2.6564	68.405	150.43	0.20109	0.39262



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-24	6.3150	1.5940	86.110	0.3953	0.011613	2.5295	68.994	150.73	0.20244	0.39239
-22	7.3380	2.4530	85.887	0.4150	0.011643	2.4098	69.584	151.02	0.20379	0.39217
-20	8.4000	3.3460	85.663	0.4354	0.011674	2.2969	70.176	151.32	0.20513	0.39196
-18	9.5020	4.2760	85.438	0.4565	0.011704	2.1904	70.768	151.61	0.20647	0.39175
-16	10.6440	5.2430	85.212	0.4785	0.011735	2.0898	71.362	151.91	0.20781	0.39155
-14	11.8270	6.2480	84.986	0.5013	0.011767	1.9948	71.958	152.20	0.20914	0.39135
-12	13.0530	7.2920	84.758	0.5250	0.011798	1.9049	72.554	152.49	0.21047	0.39116
-10	14.3220	8.3770	84.530	0.5495	0.011830	1.8199	73.152	152.78	0.21180	0.39098
-8	15.6350	9.5030	84.300	0.5749	0.011862	1.7394	73.751	153.08	0.21312	0.39080
-6	16.9940	10.6710	84.070	0.6012	0.011895	1.6633	74.352	153.37	0.21444	0.39063
-4	18.3990	11.8830	83.838	0.6285	0.011928	1.5911	74.954	153.66	0.21576	0.39047
-2	19.8520	13.1400	83.605	0.6568	0.011961	1.5226	75.557	153.95	0.21707	0.39031
0	21.3540	14.4420	83.371	0.6860	0.011995	1.4577	76.162	154.23	0.21838	0.39016
2	22.9050	15.7900	83.137	0.7163	0.012028	1.3962	76.768	154.52	0.21969	0.39001
4	24.5060	17.1870	82.901	0.7476	0.012063	1.3377	77.375	154.81	0.22100	0.38986
6	26.1600	18.6330	82.663	0.7799	0.012097	1.2822	77.984	155.09	0.22230	0.38972
8	27.8660	20.1290	82.425	0.8134	0.012132	1.2294	78.595	155.38	0.22360	0.38959
10	29.6260	21.6760	82.186	0.8480	0.012168	1.1792	79.207	155.66	0.22489	0.38946
12	31.4410	23.2760	81.945	0.8838	0.012203	1.1315	79.820	155.95	0.22619	0.38933
14	33.3130	24.9290	81.703	0.9207	0.012240	1.0861	80.435	156.23	0.22748	0.38921
16	35.2410	26.6370	81.459	0.9589	0.012276	1.0429	81.051	156.51	0.22877	0.38910
18	37.2280	28.4020	81.215	0.9983	0.012313	1.0017	81.670	156.79	0.23006	0.38898
20	39.2750	30.2230	80.968	1.0390	0.012350	0.9625	82.289	157.07	0.23134	0.38887
22	41.3820	32.1030	80.721	1.0810	0.012388	0.9251	82.911	157.35	0.23263	0.38877
24	43.5510	34.0430	80.472	1.1244	0.012427	0.8894	83.533	157.62	0.23391	0.38867
26	45.7830	36.0440	80.222	1.1691	0.012465	0.8553	84.158	157.90	0.23518	0.38857
28	48.0800	38.1070	79.970	1.2153	0.012505	0.8229	84.784	158.17	0.23646	0.38847
30	50.4410	40.2330	79.716	1.2629	0.012544	0.7918	85.412	158.45	0.23773	0.38838
32	52.8700	42.4240	79.461	1.3120	0.012585	0.7622	86.042	158.72	0.23901	0.38829



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34	55.3660	44.6810	79.205	1.3626	0.012625	0.7339	86.674	158.99	0.24028	0.38821
36	57.9300	47.0060	78.947	1.4148	0.012667	0.7068	87.307	159.26	0.24154	0.38812
38	60.5650	49.3990	78.687	1.4687	0.012709	0.6809	87.942	159.53	0.24281	0.38804
40	63.2720	51.8620	78.425	1.5241	0.012751	0.6561	88.579	159.79	0.24407	0.38797
42	66.0510	54.3970	78.162	1.5813	0.012794	0.6324	89.218	160.06	0.24534	0.38789
44	68.9040	57.0040	77.896	1.6402	0.012838	0.6097	89.859	160.32	0.24660	0.38782
46	71.8310	59.6850	77.629	1.7009	0.012882	0.5879	90.502	160.58	0.24786	0.38775
48	74.8350	62.4420	77.360	1.7634	0.012927	0.5671	91.146	160.84	0.24912	0.38768
50	77.9170	65.2750	77.089	1.8278	0.012972	0.5471	91.793	161.10	0.25037	0.38761
52	81.0770	68.1860	76.816	1.8941	0.013018	0.5280	92.442	161.35	0.25163	0.38755
54	84.3180	71.1770	76.541	1.9624	0.013065	0.5096	93.093	161.61	0.25288	0.38748
56	87.6440	74.2490	76.264	2.0328	0.013112	0.4919	93.746	161.86	0.25414	0.38742
58	91.0440	77.4030	75.984	2.1052	0.013161	0.4750	94.401	162.11	0.25539	0.38736
60	94.5340	80.6410	75.702	2.1798	0.013210	0.4588	95.058	162.36	0.25664	0.38730
62	98.1040	83.9640	75.418	2.2566	0.013259	0.4431	95.718	162.61	0.25789	0.38724
64	101.7640	87.3740	75.132	2.3357	0.013310	0.4281	96.380	162.85	0.25914	0.38718
66	105.5140	90.8740	74.843	2.4172	0.013361	0.4137	97.044	163.09	0.26039	0.38712
68	109.3540	94.4640	74.552	2.5010	0.013414	0.3998	97.711	163.33	0.26164	0.38707
70	113.2840	98.1340	74.258	2.5873	0.013467	0.3865	98.380	163.57	0.26288	0.38701
72	117.3040	101.9140	73.961	2.6762	0.013521	0.3737	99.052	163.81	0.26413	0.38695
74	121.4140	105.7740	73.661	2.7677	0.013576	0.3613	99.726	164.04	0.26538	0.38690
76	125.6240	109.7340	73.359	2.8620	0.013632	0.3494	100.40	164.27	0.26662	0.38684
78	129.9240	113.7940	73.054	2.9590	0.013689	0.3380	101.08	164.50	0.26787	0.38678
80	134.3340	117.9540	72.746	3.0589	0.013747	0.3269	101.76	164.72	0.26911	0.38672
82	138.8340	122.2140	72.434	3.1617	0.013806	0.3163	102.45	164.95	0.27036	0.38667
84	143.4340	126.5740	72.120	3.2677	0.013866	0.3060	103.14	165.17	0.27161	0.38661
86	148.1340	131.0340	71.802	3.3768	0.013927	0.2961	103.83	165.38	0.27285	0.38655
88	152.9440	135.6040	71.480	3.4891	0.013990	0.2866	104.52	165.59	0.27410	0.38649
90	157.8540	140.2840	71.155	3.6049	0.014054	0.2774	105.22	165.80	0.27535	0.38642



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92	162.8640	145.0740	70.827	3.7242	0.014119	0.2685	105.92	166.01	0.27659	0.38636
94	167.9940	149.9740	70.494	3.8470	0.014186	0.2599	106.62	166.21	0.27784	0.38629
96	173.2240	154.9740	70.158	3.9737	0.014254	0.2517	107.33	166.41	0.27909	0.38623
98	178.5740	160.1040	69.817	4.1042	0.014323	0.2437	108.04	166.61	0.28034	0.38616
100	184.0240	165.3440	69.473	4.2388	0.014394	0.2359	108.75	166.80	0.28159	0.38608
102	189.5940	170.7040	69.123	4.3775	0.014467	0.2284	109.47	166.99	0.28284	0.38601
104	195.2840	176.1740	68.770	4.5206	0.014541	0.2212	110.19	167.17	0.28410	0.38593
106	201.0840	181.7740	68.411	4.6683	0.014618	0.2142	110.92	167.35	0.28535	0.38584
108	207.0040	187.4940	68.048	4.8206	0.014696	0.2074	111.64	167.53	0.28661	0.38576
110	213.0540	193.3440	67.679	4.9778	0.014776	0.2009	112.38	167.69	0.28787	0.38567
112	219.2140	199.3240	67.305	5.1402	0.014858	0.1946	113.11	167.86	0.28913	0.38557
114	225.5040	205.4240	66.925	5.3078	0.014942	0.1884	113.86	168.02	0.29040	0.38547
116	231.9140	211.6640	66.540	5.4811	0.015029	0.1825	114.60	168.17	0.29166	0.38537
118	238.4540	218.0340	66.148	5.6602	0.015118	0.1767	115.35	168.32	0.29293	0.38526
120	245.1240	224.5440	65.750	5.8453	0.015209	0.1711	116.11	168.46	0.29421	0.38514
122	251.9140	231.1940	65.345	6.0369	0.015303	0.1657	116.87	168.60	0.29549	0.38502
124	258.8440	237.9840	64.933	6.2352	0.015401	0.1604	117.63	168.73	0.29677	0.38489
126	265.9140	244.9140	64.513	6.4406	0.015501	0.1553	118.41	168.85	0.29805	0.38475
128	273.1140	251.9840	64.086	6.6534	0.015604	0.1503	119.18	168.96	0.29934	0.38460
130	280.4540	259.2140	63.650	6.8740	0.015711	0.1455	119.97	169.07	0.30064	0.38445
132	287.9340	266.5940	63.205	7.1030	0.015822	0.1408	120.76	169.17	0.30194	0.38428
134	295.5440	274.1240	62.751	7.3408	0.015936	0.1362	121.55	169.26	0.30324	0.38411
136	303.3140	281.8040	62.287	7.5879	0.016055	0.1318	122.36	169.34	0.30456	0.38393
138	311.2240	289.6540	61.812	7.8449	0.016178	0.1275	123.17	169.41	0.30588	0.38373
140	319.2740	297.6640	61.326	8.1126	0.016306	0.1233	123.99	169.47	0.30721	0.38352
142	327.4840	305.8340	60.828	8.3916	0.016440	0.1192	124.82	169.52	0.30854	0.38329
144	335.8440	314.1840	60.317	8.6827	0.016579	0.1152	125.65	169.56	0.30989	0.38305
146	344.3540	322.7040	59.791	8.9869	0.016725	0.1113	126.50	169.58	0.31125	0.38280
148	353.0240	331.3940	59.251	9.3053	0.016877	0.1075	127.36	169.59	0.31262	0.38252



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150	361.8540	340.2740	58.693	9.6389	0.017038	0.1038	128.23	169.58	0.31400	0.38223
152	370.8440	349.3340	58.117	9.9893	0.017207	0.1001	129.11	169.56	0.31539	0.38191
154	379.9940	358.5840	57.522	10.358	0.017385	0.0965	130.00	169.52	0.31680	0.38157
156	389.3140	368.0340	56.904	10.747	0.017574	0.0931	130.91	169.46	0.31823	0.38120
158	398.8040	377.6840	56.261	11.158	0.017774	0.0896	131.83	169.38	0.31968	0.38080
160	408.4540	387.5440	55.591	11.593	0.017989	0.0863	132.78	169.27	0.32115	0.38037
162	418.2840	397.6040	54.889	12.057	0.018219	0.0829	133.74	169.14	0.32265	0.37990
164	428.2940	407.8940	54.152	12.552	0.018467	0.0797	134.72	168.97	0.32418	0.37939
166	438.4740	418.4140	53.373	13.084	0.018736	0.0764	135.73	168.77	0.32574	0.37882
168	448.8340	429.1740	52.545	13.657	0.019031	0.0732	136.78	168.53	0.32734	0.37820
170	459.3740	440.1940	51.660	14.281	0.019357	0.0700	137.86	168.24	0.32900	0.37751
172	470.0940	451.4640	50.704	14.964	0.019722	0.0668	138.98	167.89	0.33072	0.37673
174	480.9940	463.0340	49.659	15.722	0.020137	0.0636	140.16	167.47	0.33252	0.37585
176	492.0740	474.9040	48.500	16.574	0.020619	0.0603	141.41	166.97	0.33442	0.37483
178	503.3140	487.1240	47.183	17.552	0.021194	0.0570	142.75	166.34	0.33647	0.37364
180	514.6940	499.7340	45.636	18.709	0.021913	0.0535	144.25	165.55	0.33873	0.37220