

數理化學習叢書

三角學習指導

周士宜編著

香港 上海圖書文具公司 出版

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三角函數真數表

11/22/99/01

角	sin	tan	sec	csc	cot	cos	
0° 0'	.0000	.0000	1.000	∞	∞	1.000	0°90°
10'	.0029	.0029	1.000	343.8	343.8	1.000	50'
20'	.0058	.0058	1.000	171.9	171.9	1.000	40'
30'	.0087	.0087	1.000	114.6	114.6	1.000	30'
40'	.0116	.0116	1.000	85.95	85.94	.9999	20'
50'	.0145	.0145	1.000	68.76	68.75	.9999	10'
1° 0'	.0175	.0175	1.000	57.30	57.29	.9998	0°89°
10'	.0204	.0204	1.000	49.11	49.10	.9998	50'
20'	.0233	.0233	1.000	42.98	42.96	.9997	40'
30'	.0262	.0262	1.000	38.20	38.19	.9997	30'
40'	.0291	.0291	1.000	34.38	34.37	.9996	20'
50'	.0320	.0320	1.001	31.26	31.24	.9995	10'
2° 0'	.0349	.0349	1.001	28.65	28.64	.9994	0°88°
10'	.0378	.0378	1.001	26.45	26.43	.9993	50'
20'	.0407	.0407	1.001	24.56	24.54	.9992	40'
30'	.0436	.0437	1.001	22.93	22.90	.9990	30'
40'	.0465	.0466	1.001	21.49	21.47	.9989	20'
50'	.0494	.0495	1.001	20.23	20.21	.9988	10'
3° 0'	.0523	.0524	1.001	19.11	19.08	.9986	0°87°
10'	.0552	.0553	1.002	18.10	18.07	.9985	50'
20'	.0581	.0582	1.002	17.20	17.17	.9983	40'
30'	.0610	.0612	1.002	16.38	16.35	.9981	30'
40'	.0640	.0641	1.002	15.64	15.60	.9980	20'
50'	.0669	.067	1.002	14.96	14.92	.9978	10'
4° 0'	.0698	.0699	1.002	14.34	14.32	.9976	0°86°
10'	.0727	.0720	1.003	13.76	13.73	.9974	50'
20'	.0756	.0758	1.003	13.23	13.20	.9971	40'
30'	.0785	.0787	1.002	12.75	12.71	.9969	30'
40'	.0814	.0816	1.002	12.29	12.25	.9967	20'
50'	.0843	.0846	1.004	11.87	11.83	.9964	10'
5° 0'	.0872	.0875	1.004	11.43	11.43	.9962	0°85°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	cot	cos	
5° 0'	.0872	.0875	1.004	11.47	11.43	.9962	0°85°
10'	.0901	.0904	1.004	11.10	11.06	.9959	50'
20'	.0929	.0934	1.004	10.76	10.71	.9957	40'
30'	.0958	.0963	1.005	10.43	10.39	.9954	30'
40'	.0987	.0992	1.005	10.13	10.08	.9951	20'
50'	.1016	.1022	1.005	9.839	9.788	.9948	10'
6° 0'	.1045	.1051	1.006	9.567	9.514	.9945	0°84°
10'	.1074	.1080	1.006	9.309	9.255	.9942	50'
20'	.1103	.1110	1.006	9.065	9.010	.9939	40'
30'	.1132	.1139	1.006	8.834	8.777	.9936	30'
40'	.1161	.1169	1.007	8.614	8.556	.9932	20'
50'	.1190	.1198	1.007	8.405	8.345	.9929	10'
7° 0'	.1219	.1228	1.008	8.206	8.144	.9925	0°83°
10'	.1248	.1257	1.008	8.016	7.953	.9922	50'
20'	.1276	.1287	1.008	7.834	7.770	.9918	40'
30'	.1305	.1317	1.009	7.664	7.596	.9914	30'
40'	.1334	.1346	1.009	7.496	7.429	.9911	20'
50'	.1363	.1376	1.009	7.337	7.269	.9907	10'
8° 0'	.1392	.1405	1.010	7.185	7.110	.9903	0°82°
10'	.1421	.1435	1.010	7.040	6.988	.9899	50'
20'	.1449	.1465	1.011	6.900	6.827	.9894	40'
30'	.1478	.1495	1.011	6.765	6.691	.9890	30'
40'	.1507	.1524	1.012	6.636	6.561	.9886	20'
50'	.1536	.1504	1.012	6.512	6.425	.9881	10'
9° 0'	.1564	.1584	1.012	6.392	6.314	.9877	0°81°
10'	.1593	.1614	1.013	6.277	6.197	.9872	50'
20'	.1622	.1644	1.013	6.166	6.184	.9868	40'
30'	.1650	.1673	1.014	6.059	5.976	.9863	30'
40'	.1679	.1703	1.014	5.955	5.871	.9858	20'
50'	.1708	.1733	1.015	5.855	5.769	.9853	10'
10° 0'	.1736	.1763	1.015	5.759	5.671	.9843	0°80°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	cot	cos	
10° 0'	.1736	.1763	1.015	5.759	5.671	.9848	0°80°
10'	.1765	.1793	1.016	5.665	5.576	.9843	50'
20'	.1794	.1823	1.016	5.575	5.485	.9838	40'
30'	.1822	.1853	1.017	5.487	5.296	.9833	30'
40'	.1851	.1882	1.018	5.403	5.309	.9827	20'
50'	.1880	.1914	1.018	5.320	5.226	.9822	10'
11° 0'	.19 8	.1944	1.019	5.241	5.145	.9816	0°79°
10'	.1937	.1974	1.019	5.164	5.066	.9811	50'
20'	.1965	.2004	1.020	5.089	4.989	.9805	40'
30'	.1994	.2035	1.0 0	5.016	4.915	.9799	30'
40'	.2022	.2065	1.021	4.945	4.843	.9193	20'
50'	.2051	.2095	1.021	4.876	4.773	.9787	10'
12° 0'	.2079	.2126	1.022	4.810	4.705	.9781	0°78°
10'	.2108	.2156	1.023	4.745	4.638	.9775	50'
20'	.2136	.2186	1.024	4.682	4.574	.9769	40'
30'	.2164	.2217	1.024	4.620	4.511	.9763	30'
40'	.2193	.2247	1.025	4.565	4.449	.9757	20'
50'	.2221	.2278	1.026	4.502	4.390	.9750	10'
13° 0'	.2250	.2309	1.026	4.445	4.331	.9744	0°77°
10'	.2278	.2339	1.027	4.390	4.276	.9737	50'
20'	.2306	.2370	1.028	4.336	4.219	.9730	40'
30'	.2334	.2401	1.0 8	4.284	4.165	.9724	30'
40'	.2363	.2435	1.059	4.232	4.113	.9717	20'
50'	.2391	.2462	1.030	4.182	4.061	.9710	10'
14° 0'	.2419	.2493	1.031	4.134	4.011	.9703	0°76°
10'	.2447	.2524	1.031	4.086	3.962	.9696	50'
20'	.2476	.2555	1.032	4.039	3.914	.9689	40'
30'	.2504	.2586	1.033	3.994	3.867	.9681	30'
40'	.2532	.2617	1.034	3.950	3.821	.9674	20'
50'	.2560	.2648	1.034	3.906	3.776	.9667	10'
15° 0'	.2588	.2679	1.035	3.864	3.732	.9659	0°75°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	cot	cos	
15° 0'	.2588	.2679	1.035	3.864	3.732	.9659	0°75°
10'	.2616	.2711	1.036	3.822	3.689	.9652	50'
20'	.2644	.2742	1.037	3.782	3.647	.9644	40'
30'	.2672	.2773	1.038	3.742	3.606	.9636	30'
40'	.2700	.2804	1.039	3.703	3.566	.9628	20'
50'	.2728	.2836	1.039	3.665	3.526	.9621	10'
16° 0'	.2756	.2867	1.040	3.628	3.487	.9613	0°74°
10'	.2784	.2899	1.041	3.592	3.450	.9605	50'
20'	.2812	.2931	1.042	3.556	3.412	.9596	40'
30'	.2840	.2962	1.043	3.531	3.376	.9588	30'
40'	.2868	.2994	1.044	3.487	3.340	.9580	20'
50'	.2896	.3026	1.045	3.453	3.305	.9572	10'
17° 0'	.2924	.3057	1.046	3.420	3.271	.9563	0°73°
10'	.2952	.3089	1.047	3.388	3.237	.9555	50'
20'	.2979	.3121	1.048	3.356	3.204	.9546	40'
30'	.3007	.3153	1.049	3.326	3.172	.9537	30'
40'	.3035	.3185	1.049	3.296	3.140	.9523	20'
50'	.3062	.3217	1.050	3.265	3.108	.9520	10'
18° 0'	.3090	.3249	1.051	3.236	3.078	.9511	0°72°
10'	.3118	.3281	1.052	3.207	3.047	.9502	50'
20'	.3145	.3314	1.053	3.179	3.018	.9492	40'
30'	.3173	.3346	1.054	3.152	2.989	.9483	30'
40'	.3201	.3378	1.056	3.124	2.960	.9474	20'
50'	.3228	.3411	1.057	3.098	2.932	.9465	10'
19° 0'	.3256	.3443	1.058	3.072	2.904	.9455	0°71°
10'	.3282	.3475	1.059	3.046	2.877	.9446	50'
20'	.3311	.3508	1.060	3.021	2.850	.9436	40'
30'	.3338	.3541	1.061	2.996	2.824	.9426	30'
40'	.3365	.3574	1.062	2.971	2.798	.9417	20'
50'	.3393	.3607	1.063	2.947	2.773	.9407	10'
20° 0'	.3420	.3640	1.064	2.924	2.747	.9397	0°70°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	cot	cos	
20° 0'	.3420	.3640	1.064	2.924	2.747	.9397	0°70°
10'	.3448	.3673	1.065	2.801	2.723	.9387	50'
20'	.3475	.3703	1.066	2.878	2.699	.9377	40'
30'	.3502	.3739	1.068	2.855	2.675	.9367	30'
40'	.3529	.3772	1.069	2.833	2.651	.9356	20'
50'	.3557	.3805	1.070	2.812	2.628	.9346	10'
21° 0'	.3584	.3839	1.071	2.790	2.605	.9336	0°60°
10'	.3611	.3872	1.072	2.769	2.583	.9325	50'
20'	.3638	.3906	1.074	2.749	2.560	.9315	40'
30'	.3665	.3939	1.075	2.729	2.539	.9304	30'
40'	.3692	.3973	1.076	2.709	2.517	.9293	20'
50'	.3719	.4006	1.077	2.689	2.496	.9283	10'
22° 0'	.3746	.4040	1.079	2.669	2.475	.9272	0°68°
10'	.3773	.4074	1.080	2.650	2.455	.9261	50'
20'	.3800	.4108	1.081	2.632	2.434	.9250	40'
30'	.3827	.4142	1.082	2.613	2.414	.9239	30'
40'	.3854	.416	1.084	2.595	2.394	.9228	20'
50'	.3881	.4210	1.083	2.577	2.375	.9216	10'
23° 0'	.3907	.4245	1.086	2.559	2.356	.9205	0°67°
10'	.3934	.4279	1.088	2.542	2.337	.9194	50'
20'	.3961	.4314	1.089	2.525	2.318	.9182	40'
30'	.3987	.4348	1.090	2.508	2.300	.9171	30'
40'	.4014	.433	1.092	2.491	2.282	.9159	20'
50'	.4041	.4417	1.093	2.475	2.264	.9146	10'
24° 0'	.4067	.4452	1.095	2.459	2.246	.9135	0°66°
10'	.4094	.4487	1.096	2.443	2.229	.9124	50'
20'	.4120	.4522	1.097	2.427	2.211	.9112	40'
30'	.4147	.4557	1.099	2.411	2.194	.9100	30'
40'	.4173	.4592	1.100	2.396	2.177	.9088	20'
50'	.4200	.4628	1.102	2.381	2.161	.9075	10'
25° 0'	.4226	.4663	1.003	2.366	2.145	.9063	0°65°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	co.	cos	
25° 0'	.4228	.4663	1.103	2.363	2.145	.9063	0°65°
10'	.4253	.4699	1.105	2.352	2.128	.9051	30'
20'	.4279	.4734	1.106	2.337	2.112	.9038	40'
30'	.4395	.4770	1.108	2.323	2.097	.9026	30'
40'	.4381	.4806	1.109	2.309	2.081	.9013	20'
50'	.4358	.4841	1.111	2.295	2.066	.9001	10'
26° 0'	.4384	.4877	1.113	2.281	2.050	.8988	0°64°
10'	.4410	.4913	1.114	2.268	2.035	.8975	50'
20'	.4436	.4950	1.116	2.254	2.020	.8962	40'
30'	.4462	.4986	1.117	2.241	2.006	.8949	30'
40'	.4488	.5022	1.119	2.228	1.991	.8936	20'
50'	.4514	.5059	1.121	2.215	1.977	.8923	10'
27° 0'	.4540	.5095	1.122	2.203	1.963	.8910	0°63°
10'	.4566	.5132	1.124	2.190	1.949	.8897	50'
20'	.4592	.5169	1.126	2.178	1.935	.8884	40'
30'	.4617	.5206	1.127	2.166	1.921	.8870	30'
40'	.4643	.5243	1.129	2.154	1.907	.8857	20'
50'	.4669	.5280	1.131	2.142	1.894	.8843	10'
28° 0'	.4695	.5317	1.133	2.130	1.881	.8829	0°62°
10'	.4720	.5354	1.134	2.118	1.868	.8816	50'
20'	.4746	.5392	1.136	2.107	1.855	.8802	40'
30'	.4772	.5430	1.138	2.096	1.842	.8788	30'
40'	.4797	.5467	1.140	2.085	1.829	.8774	20'
50'	.4823	.5505	1.142	2.074	1.816	.8760	10'
29° 0'	.4848	.5543	1.143	2.063	1.804	.8746	0°61°
10'	.4874	.5581	1.145	2.052	1.792	.8732	0'
20'	.4899	.5619	1.147	2.041	1.780	.8718	0'
30'	.4924	.5658	1.149	2.031	1.767	.8704	0'
40'	.4950	.5696	1.151	2.020	1.756	.8689	0'
50'	.4975	.5735	1.153	2.010	1.744	.8675	0'
30° 0'	.5000	.5774	1.155	2.000	1.732	.8660	0°60°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	cot	cos	
30° 0'	.5000	.5774	1.155	2.000	1.732	.8990	0°60°
10'	.5025	.581	1.157	1.990	1.720	.8646	50'
20'	.5050	.5851	1.157	1.98	1.709	.8631	40'
30'	.5075	.5890	1.161	1.970	1.698	.8616	35'
40'	.5100	.59 0	1.163	1.961	1.686	.8601	20'
50'	.5125	.5969	1.165	1.951	1.675	.8587	10'
31° 0'	.5150	.6009	1.167	1.942	1.664	.8572	0°59°
10'	.5175	.6048	1.169	1.932	1.653	.8557	50'
20'	.5200	.6088	1.171	1.923	1.643	.8542	40'
30'	.5225	.6128	1.173	1.914	1.632	.8526	30'
40'	.5250	.6168	1.175	1.905	1.621	.8511	25'
50'	.5275	.6208	1.177	1.896	1.611	.8496	10'
32° 0'	.5299	.6249	1.179	1.887	1.600	.8480	0°58°
10'	.5324	.6289	1.181	1.878	1.590	.8465	50'
20'	.5348	.6330	1.184	1.870	1.580	.8450	40'
30'	.5373	.6371	1.186	1.861	1.570	.8434	30'
40'	.5398	.6412	1.188	1.853	1.560	.8418	20'
50'	.5422	.6453	1.190	1.844	1.550	.8403	10'
33. 0'	.5446	.6494	1.192	1.836	1.540	.8 87	0°57°
10'	.5471	.6536	1.195	1.828	1.530	.8 71	50'
20'	.5495	.6577	1.197	1.820	1.520	.8355	40'
30'	.5519	.6619	1.199	1.812	1.511	.8339	30'
40'	.5544	.66 1	1.202	1.804	1.501	.8323	20'
50'	.5568	.6703	1.204	1.796	1.492	.8307	10'
34° 0'	.5592	.6745	1.206	1.788	1.483	.8290	0°56°
10'	.5616	.6787	1.209	1.781	1.473	.8274	50'
20'	.5640	.6830	1.211	1.773	1.464	.8258	40'
30'	.5664	.6873	1.213	1.766	1.45	.8241	30'
40'	.5688	.6916	1.216	1.758	1.446	.8225	20'
50'	.5712	.6959	1.218	1.751	1.437	.8208	10'
35. 0'	.5736	.7002	1.221	1.743	1.428	.8292	0°55°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	cot	cos	
35° 0'	.5736	.7002	1.221	1.743	1.428	.8192	0°55°
10'	.5760	.7046	1.223	1.736	1.419	.8175	50'
20'	.5783	.7089	1.226	1.729	1.411	.8158	40'
30'	.5807	.7133	1.228	1.722	1.402	.8141	30'
40'	.5831	.7177	1.231	1.715	1.393	.8124	20'
50'	.5854	.7221	1.233	1.708	1.385	.8107	10'
36° 0'	.5878	.7265	1.236	1.701	1.376	.8090	0°54°
10'	.5901	.7310	1.239	1.695	1.368	.8073	50'
20'	.5925	.7355	1.241	1.688	1.360	.8056	40'
30'	.5948	.7400	1.244	1.681	1.351	.8039	30'
40'	.5972	.7445	1.247	1.675	1.343	.8021	20'
50'	.5995	.7490	1.249	1.668	1.335	.8004	10'
37° 0'	.6018	.7536	1.252	1.662	1.327	.7986	0°53°
10'	.6041	.7581	1.255	1.955	1.319	.7969	50'
20'	.6065	.7627	1.258	1.649	1.311	.7951	40'
30'	.6088	.7673	1.260	1.643	1.303	.7934	30'
40'	.6111	.7720	1.263	1.636	1.295	.7916	20'
50'	.6134	.7766	1.266	1.630	1.288	.7898	10'
38° 0'	.6157	.7813	1.269	1.624	1.280	.7880	0°52°
10'	.6180	.7860	1.272	1.618	1.272	.7862	50'
20'	.6202	.7907	1.275	1.612	1.265	.7844	40'
30'	.6225	.7954	1.278	1.606	1.257	.7826	30'
40'	.6248	.8002	1.281	1.601	1.250	.7808	20'
50'	.6271	.8050	1.284	1.595	1.242	.7790	10'
39° 0'	.6293	.8098	1.287	1.589	1.235	.7771	0°51°
10'	.6316	.8146	1.290	1.583	1.228	.7753	50'
20'	.6338	.8195	1.293	1.578	1.220	.7735	40'
30'	.6361	.8243	1.296	1.572	1.213	.7716	30'
40'	.6383	.8292	1.299	1.567	1.206	.7698	20'
50'	.6406	.8342	1.302	1.561	1.199	.7679	10'
40° 0'	.6428	.8391	1.305	1.556	1.192	.7660	0°50°
	cos	cot	csc	sec	tan	sin	角

角	sin	tan	sec	csc	cot	cos	
40° 0'	.6428	.8391	1.305	1.556	1.192	.7660	0° 50'
10'	.6450	.8441	1.309	1.550	1.185	.7642	50'
20'	.6472	.8491	1.312	1.545	1.178	.7623	40'
30'	.6494	.8541	1.315	1.540	1.171	.7604	30'
40'	.6517	.8591	1.318	1.535	1.164	.7585	20'
50'	.6539	.8642	1.322	1.529	1.157	.7566	10'
41° 0'	.6561	.8696	1.325	1.524	1.150	.7547	0° 49'
10'	.6583	.8744	1.338	1.519	1.144	.7528	50'
20'	.6604	.8796	1.332	1.514	1.137	.7509	40'
30'	.6626	.8847	1.335	1.509	1.130	.7490	30'
40'	.6648	.8899	1.339	1.504	1.124	.7470	20'
50'	.6670	.8952	1.342	1.499	1.117	.7451	10'
42° 0'	.6691	.9004	1.346	1.494	1.111	.7431	0° 48'
10'	.6713	.9057	1.349	1.480	1.104	.7412	50'
20'	.6734	.9110	1.353	1.485	1.098	.7392	40'
30'	.6756	.9163	1.356	1.480	1.091	.7373	30'
40'	.6777	.9217	1.360	1.476	1.085	.7353	20'
50'	.6799	.9271	1.361	1.471	1.079	.7333	10'
43° 0'	.6820	.9325	1.390	1.466	1.072	.7314	0° 47'
10'	.6841	.9380	1.371	1.462	1.066	.7294	50'
20'	.6862	.9435	1.375	1.457	1.060	.7274	40'
30'	.6884	.9490	1.379	1.453	1.054	.7254	30'
40'	.6905	.9545	1.382	1.448	1.048	.7234	20'
50'	.6926	.9601	1.386	1.444	1.042	.7214	10'
44° 0'	.6947	.9657	1.390	1.440	1.036	.7193	0° 46'
10'	.6967	.9713	1.394	1.435	1.030	.7173	50'
20'	.6988	.9770	1.398	1.431	1.024	.7153	40'
30'	.7009	.9827	1.402	1.427	1.018	.7133	30'
40'	.7030	.9884	1.406	1.423	1.012	.7112	20'
50'	.7050	.9962	1.410	1.418	1.006	.7092	10'
45° 0'	.7071	1.000	1.414	1.414	1.000	.7071	0° 45'
	cos	cot	csc	sec	tan	sin	角

編輯大意

1. 研究數學者在多思索，多習題，而‘題’有千變萬化，層出不窮，在天才聰穎者，固可聞一而知十，但在資質稍遜者，即不能舉一以反三，或得其解法，而苦於記述整頓者，或自覺解法不精，欲加一番考索，以求巧妙者，設一一從師訪友，就而正之，其難得‘時’與‘地’者，比比皆是也。編者有見及此，特將現今風行各中學之三角學教科書中之習題，以及高中歷年入學試題，及歷屆高初中會考，以及各參考書，各刊物，各雜誌內之三角題中，選其‘要’與‘粹’者，彙成一千餘題，一一示以‘模範解法’以供學生自修，參考、補習、複習，以及應試準備，專門研究之用。

2. 本書編制，仍依尋常教科書之次序分章，每章先列要點，以引起讀者之注意，而收連貫之效。次列題解，或依其淺深之程序，或圖其前後有關聯，法則簡明，解釋淺顯。故本書為今日之三角教科書及參考書精華之總集合，誠學者不可不備之參考書也。

3. 凡專屬於一種教科書之詳解，固足以阻礙學者之進步，本書則大異其趣，使學者多得範例，以啓發解題之思路。

4. 學數學不苦思，即無進步，本書各題，雖已解出，然學者參閱時，宜先以己意解之，後視其與是書合否，合則考其孰繁孰簡，不合則考其誤在何處，庶易得益。若作練習時，翻開對抄，毫不思索，或第按文循誦，而白易解易解，則非編者之本意也。

5. 本書之提要力求賅備簡明，解法力求新穎淺顯，排版與校對力求合理而正確；惟編者學識淺陋，錯誤欠妥之處，在所難免，敬乞海內外先達，不吝指教，以便修正為幸！

數理化學習叢書

三角學習指導

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數理化學習叢書

三角學習指導

第一章 角度

I. 提要

1. 六十分制 此制亦名英國制，分一直角為 90 等份，各曰一度，分一度為 60 等份，各曰一分；復分一分為 60 等份，各曰一秒。度，分，秒恆以符號 $^{\circ}$ ， $'$ ， $''$ 表之，例如 $40^{\circ}25'20''$ ，即表四十度二十五分二十秒。

2. 百分制 此制亦名法國制，分一直角為 100 度，每度分為 100 分，每分分為 100 秒。其符號為 $^{\circ}$ ， $'$ ， $''$ ，如 $30^{\circ}15'45''$ ，即表三十度十五分四十五秒。

3. 弧度制 在任意圓周上，取與半徑等長之弧，此弧所對之圓心角，稱曰弧度單位，

設一圓之半徑為 R ，則其圓周為 $2\pi R$ ，故一周角 360° 為 $\frac{2\pi R}{R} = 2\pi$ 個弧度單位，即弧度單位 $= \frac{360^{\circ}}{2\pi} = 57^{\circ}.2956$ 。

4. 三種角度制換算之公式

設 六十分度為 D ，百分度為 G ，弧度為 θ 。

$$\text{則 } D = \frac{180}{\pi} \times \theta \quad G = \frac{200}{\pi} \times \theta \quad \theta = \frac{\pi}{180} \times D,$$

$$D = G - \frac{1}{10} G \quad G = D + \frac{1}{9} D \quad \theta = \frac{\pi}{200} \times G.$$

II. 題解

1. 有二角其差為 10° , 其和為 45° , 求各角?

解: 設大角之度數為 x , 小角之度數為 y , 而 10° 為

$$10 - \frac{1}{10} \times 10 = 9^\circ,$$

$$\text{故 } x - y = 9^\circ, x + y = 45^\circ,$$

$$\text{解之得 } x = 27^\circ, y = 18^\circ,$$

2. 設分 45° 為二部, 其一部之六十分度數對於他部百分度數之比為 9 比 5, 求各部若干?

解: 設一部之度數為 x , 則他部之度數為 $45^\circ - x$,

$$\text{從而第二部之百分度數為 } \frac{10}{9}(45 - x),$$

$$\text{於是由題意得 } x : \frac{10}{9}(45 - x) = 9 : 5,$$

$$\text{即 } 5x = 10(45 - x), \text{ 即 } 15x = 450 \therefore x = 30^\circ,$$

$$\text{從而他一部之度數為 } 45^\circ - 30^\circ = 15^\circ,$$

3. 設一角為 n° 分成二部, 其一部之六十分度之分數等於他部之百分度之分數, 求各部?

解: 設一部之度數為 x , 則他部之度數為 $n - x$,

$$\text{而 } x \text{ 度之分數為 } 60x \text{ 又 } (n - x) \text{ 度之百分度數為 } \frac{10}{9}(n - x),$$

$$\text{即其百分分數為 } \frac{10}{9} \times 100(n - x), \text{ 由題意得 } 60x = \frac{1000}{9}n - x$$

$$\text{解之得 } x = \frac{50}{77}n, \text{ 從而 } n - x = \frac{27}{77}n,$$

4. 弧度 $\frac{\pi}{3}, \frac{\pi}{6}, \frac{\pi}{4}$ 之角, 合六十分度數若干?