TABLE 1. CIRCUMFERENCES AND AREAS OF CIRCLES

DIAMETER IN INCHES	AREA		CIRCUMFERENCE		DIAMETER IN INCHES	AREA		CIRCUMFERENCE	
	Sq. In.	Sq. Ft.	Inches	Feet		Sq. In.	Sq. Ft.	Inches	Feet
1/4	0.049	0.0003	0.785	0.0652	28	615.8	4.276	87.97	7.330
1/3	0.196	0.0014	1.571	0.1309	28 1/2	637.9	4.430	89.54	7.462
3/4	0.442	0.0031	2.356	0.1964	29	660.52	4.587	91.11	7.592
1	0.785	0.0054	3.142	0.2618	29 1/2	683.5	4.747	92.63	7.725
1 1/4	1.227	0.0085	3.927	0.3273	30	706.8	4.909	94.25	7.854
1 1/2	1.767	0.0123	4.712	0.3927	31	754.8	5.241	97.39	8.116
1 3/4	2.405	0.0167	5.498	0.4582	32	804.3	5.585	100.5	8.378
2	3.142	0.0218	6.283	0.5236	33	855.3	5.940	103.7	8.639
2 1/4	3.976	0.0276	7.069	0.5891	34	907.9	6.305	106.8	8.901
2 1/2	4.909	0.0341	7.854	0.6546	35	962.1	6.681	109.9	9.163
2 3/4	5.939	0.0412	8.639	0.7200	36	1018.0	7.069	113.1	9.425
3	7.069	0.0491	9.425	0.7854	37	1075.0	7.467	116.2	9.686
3 1/4	8.296	0.0576	10.21	0.8510	38	1134.0	7.876	119.4	9.948
3 1/2	9.621	0.0668	10.99	0.9160	39	1195.0	8.296	122.5	10.21
3 3/4	11.04	0.0767	11.78	0.9818	40	1256.0	8.727	125.6	10.47
4	12.57	0.0873	12.57	1.047	41	1320.0	9.168	128.8	10.73
4 1/4	14.19	0.0986	13.35	1.113	42	1385.0	9.621	131.9	10.99
4 1/2	15.90	0.1104	14.14	1.178	43	1452.0	10.08	135.1	11.26
4 3/4	17.72	0.1231	14.92	1.243	44	1521.0	10.56	138.2	11.52
5	19.64	0.1364	15.71	1.309	45	1590.0	11.04	141.4	11.78
5 1/4	21.65	0.1504	16.49	1.374	46	1662.0	11.54	144.5	12.04
5 1/2	23.76	0.1650	17.28	1.440	47	1735.0	12.05	147.7	12.30
5 3/4	25.97	0.1840	18.06	1.505	48	1810.0	12.51	150.8	12.57
6	28.27	0.1964	18.85	1.571	49	1886.0	13.09	153.9	12.83
6 1/4	30.68	0.2131	19.64	1.637	50	1963.0	13.64	157.1	13.09
6 1/2	33.18	0.2304	20.42	1.702	51	2043.0	14.19	160.2	13.35
6 3/4	35.79	0.2486	21.21	1.768	52	2124.0	14.75	163.4	13.61
7	38.49	0.2673	21.99	1.833	53	2206.0	15.32	166.5	13.88
7 1/4	41.28	0.2867	22.78	1.899	54	2290.0	15.90	169.6	14.14
7 1/2	44.18	0.3068	23.56	1.964	55	2376.0	16.50	172.8	14.40
7 3/4	47.17	0.3276	24.35	2.029	56	2463.0	17.10	175.9	14.66
8	50.27	0.3491	25.13	2.094	57	2552.0	17.72	179.1	14.92
8 1/4	53.46	0.3713	25.92	2.160	58	2642.0	18.35	182.2	15.18
8 1/2	56.75	0.3942	26.70	2.225	59	2734.0	18.99	185.4	15.45
8 3/4	60.13	0.4175	27.49	2.291	60	2827.0	19.63	188.5	15.71
9	63.62	0.4418	28.27	2.356	61	2922.0	20.29	191.6	15.97
9 1/4	67.20	0.4668	29.06	2.422	62	3019.0	20.97	194.8	16.23
9 1/2	70.88	0.4923	29.85	2.488	63	3117.0	21.65	197.9	16.49
9 3/4	74.66	0.5185	30.63	2.553	64	3217.0	22.34	201.1	16.76
10	78.54	0.5454	31.42	2.618	65	3318.0	23.04	204.2	17.02
10 1/2	86.59	0.6010	32.99	2.750	66	3421.0	23.76	207.3	17.28
11	95.03	0.6600	34.56	2.880	67	3526.0	24.48	210.5	17.54
11 1/2	103.9	0.7215	36.13	3.011	68	3632.0	25.22	213.6	17.80
12	113.1	0.7854	37.70	3.142	69	3739.0	25.97	216.8	18.06
12 1/2	122.7	0.8520	39.27	3.273	70	3848.0	26.73	219.9	18.33
13	132.7	0.9218	40.84	3.403	71	3959.0	27.49	223.1	18.59
13 1/2	143.1	0.9937	42.41	3.535	72	4072.0	28.27	226.2	18.85
14	153.9	1.069	43.98	3.665	73	4185.0	29.07	229.3	19.11
14 1/2	165.1	1.146	45.55	3.796	74	4301.0	29.87	232.5	19.37
15	176.7	1.227	47.12	3.927	75	4418.0	30.68	235.6	19.63
15 1/2	188.7	1.310	48.69	4.058	76	4536.0	31.50	238.8	19.90
16	201.1	1.396	50.27	4.189	77	4657.0	32.34	241.9	20.16
16 1/2	213.8	1.485	51.84	4.321	78	4778.0	33.18	245.0	20.42
17	226.9	1.576	53.41	4.451	79	4902.0	34.04	248.2	20.68
17 1/2	240.5	1.670	54.98	4.582	80	5027.0	34.91	251.3	20.94
18	254.5	1.767	56.55	4.712	81	5153.0	35.78	254.5	21.21
18 1/2	268.8	1.867	58.12	4.845	82	5281.0	36.67	257.6	21.47
19	283.5	1.969	59.69	4.974	83	5411.0	37.57	260.8	21.73
19 1/2	298.6	2.074	61.26	5.105	84	5542.0	38.48	263.9	21.99
20	314.2	2.182	62.83	5.236	85	5675.0	39.41	267.0	22.25
20 1/2	330.1	2.293	64.40	5.367	86	5809.0	40.34	270.2	22.51
21	346.4	2.405	65.97	5.498	87	5945.0	41.28	273.3	22.78
21 1/2	361.1	2.508	67.54	5.629	88	6082.0	42.24	276.5	23.04
22	380.1	2.640	69.12	5.760	89	6221.0	43.20	279.6	23.30
22 1/2	397.6	2.761	70.69	5.891	90	6362.0	44.18	282.7	23.56
23	415.5	2.885	72.26	6.021	91	6504.0	45.17	285.9	23.82
23 1/2	433.7	3.012	73.83	6.153	92	6648.0	46.16	289.0	24.09
24	452.4	3.142	75.40	6.283	93	6793.0	47.17	292.2	24.35
24 1/2	471.4	3.274	76.97	6.415	94	6940.0	48.19	295.3	24.61
25	490.9	3.409	78.54	6.545	95	7088.0	49.22	298.4	24.87
25 1/2	510.7	3.547	80.11	6.676	96	7238.0	50.27	301.6	25.13
26	530.9	3.687	81.68	6.807	97	7390.0	51.32	304.7	25.39
26 1/2	551.6	3.832	83.25	6.938	98	7543.0	52.38	307.9	25.66
27	572.6	3.976	84.82	7.069	99	7698.0	53.46	311.0	25.92
27 1/2	593.9	4.125	86.39	7.199	100	7854.0	54.54	314.2	26.18

Volume: $(V) = A \times L$. Unit, cubic foot.
Weight: (W) Unit, pound, which is 7000 grains avoirdupois, or 453.6 grams.

CONVERSION EQUATIONS

Temperature

Fahrenheit degrees = 9/5 centigrade degrees + 32.

Centigrade degrees = 5/9 (Fahrenheit degrees − 32).

Absolute temperature, expressed in Fahrenheit degrees = Fahrenheit degrees + 459.6. In heating and ventilating work, 460 is usually used.

Absolute temperature, expressed in centigrade degrees = centigrade degrees + 273.1.

Power, Work, Etc.

1 ton refrigeration	= 199.038 Btu per minute
1 Btu	= 777.6 ft-lb = 0.293 watt-hours = 252.02 mean calories
1 watt hour	= 2,655.2 ft-lb = 3.415 Btu = 3600 joules = 860.648 mean calories
1 mean calorie	= 0.003968 Btu = 3.085 ft-lb = 0.0011619 watt-hours
1 kilowatt (1000 watts)	= 1.3405 horsepower = 56.92 Btu per minute = 44,252.7 ft-lb per minute
1 horsepower	= 0.746 kilowatt = 42.44 Btu per minute = 33,000 ft-lb per minute = 550 ft-lb per second
1 boiler horsepower	= 33,523.7 Btu per hour

Weight and Volume

1 gal (U. S.)	= 231 cu in. = 0.13368 cu ft
1 British or Imperial gallon	= 277.274 cu in.
1 cu ft	= 7.4805 gal = 1728 cu in.
1 cu ft water at 60 F	= 62.37 lb
1 cu ft water at 212 F	= 59.76 lb
1 gal water at 60 F	= 8.34 lb
1 gal water at 212 F	= 7.99 lb
1 lb (avdp)	= 16 oz = 7000 grains
1 bushel	= 1.244 cu ft
1 short ton	= 2000 lb
1 long ton	= 2240 lb

TABLE 2. SPECIFIC GRAVITY OF LIQUIDS (WATER = 1)

Alcohol	0.789	Oils (mineral lubricants)	0.90 –0.93
Draft gage oil (ellison)	0.834	Turpentine	0.861–0.867
Gasoline	0.66–0.67	Water, 39.1 deg. fahr.	1.000
Hydrochloric acid	1.20	Water 212 deg. fahr.	0.958
Kerosene	0.75–0.86	Water (ice)	0.88 –0.92
Nitric acid	1.50	Water (fresh fallen snow)	0.125
Sulphuric acid	1.80	Water (sea)	1.02 –1.03