

EFFICIENT PRODUCTION

IS THE

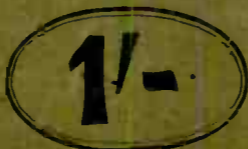


KEY TO

V I C T O R Y

**AMALGAMATED
ENGINEERING
REFERENCE TABLES
and DATA CHARTS**

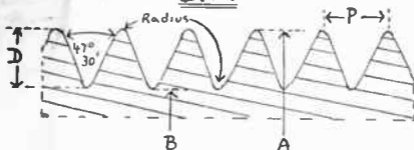
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TOOLROOM
INSPECTION DEPT.
MACHINE SHOP
DRAWING OFFICE USE
Etc., Etc.



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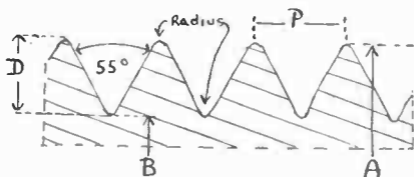
BRITISH ASSOCIATION THREADS

B.A.



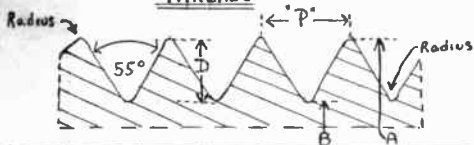
B.A. No	THRDS PER INCH	OUTSIDE DIA "A"	CORE DIA "B"	PITCH "P"	DEPTH "D"	RADIUS "R"
0	25.38	.2362	.1890	.0394	.0236	.0072
1	28.25	.2087	.1663	.0354	.0212	.0064
2	31.35	.1850	.1468	.0319	.0191	.0058
3	34.84	.1614	.1272	.0287	.0172	.0052
4	38.46	.1417	.1105	.0260	.0156	.0047
5	43.10	.1260	.0980	.0232	.0139	.0042
6	47.85	.1102	.0852	.0209	.0125	.0038
7	52.91	.0984	.0758	.0189	.0113	.0034
8	59.17	.0866	.0664	.0169	.0101	.0031
9	64.94	.0748	.0564	.0154	.0092	.0028
10	72.46	.0669	.0503	.0138	.0083	.0025
11	81.97	.0591	.0445	.0122	.0073	.0022
12	90.91	.0511	.0375	.0110	.0066	.0020
13	102.0	.0472	.0354	.0098	.0059	.0018
14	109.9	.0394	.0284	.0091	.0055	.0016
15	120.5	.0354	.0254	.0083	.0050	.0015
16	133.3	.0311	.0221	.0075	.0045	.0014
17	149.3	.0276	.0196	.0067	.0040	.0012
18	169.5	.0244	.0174	.0059	.0035	.0011
19	181.8	.0213	.0147	.0055	.0033	.0010
20	212.8	.0189	.0133	.0047	.0028	.0009
21	232.6	.0165	.0113	.0043	.0026	.0008
22	256.4	.0146	.0100	.0039	.0023	.0007
23	285.7	.0130	.0088	.0035	.0021	.0006
24	323.6	.0114	.0076	.0031	.0019	.0006

BRITISH STANDARD FINE THREADS (B.S.F.)



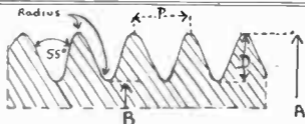
DIA	OUTSIDE DIA "A"	CORE DIA "B"	THRDS PER INCH	PITCH "P"	DEPTH "D"	RADIUS "R"
7/32	•21875	•1731	28	•03571	•0229	•0049
1/4	•250	•2007	26	•0385	•0246	•0053
9/32	•28125	•2320	26	•0385	•0246	•0053
5/16	•3125	•2543	22	•0454	•0291	•0062
3/8	•375	•3110	20	•050	•0320	•0069
7/16	•4375	•3664	18	•0556	•0356	•0076
1/2	•500	•420	16	•0625	•040	•0086
9/16	•5625	•4825	16	•0625	•040	•0086
5/8	•625	•5335	14	•0714	•0457	•0098
11/16	•6875	•596	14	•0714	•0457	•0098
3/4	•750	•6433	12	•0833	•0534	•0114
13/16	•8125	•7058	12	•0833	•0534	•0114
7/8	•875	•7586	11	•09091	•0582	•0125
1"	1•000	•8719	10	•1000	•064	•0137
1 1/8	1•125	•9827	9	•1111	•0711	•0153
1 1/4	1•250	1•1077	9	•1111	•0711	•0153
1 3/8	1•375	1•2149	8	•1250	•080	•0172
1 1/2	1•500	1•3399	8	•1250	•080	•0172
1 5/8	1•625	1•4649	8	•1250	•080	•0172
1 3/4	1•750	1•567	7	•1428	•0915	•0196
2	2•000	1•817	7	•1428	•0915	•0196
2 1/4	2•250	2•0366	6	•1667	•1067	•0229
2 1/2	2•500	2•2866	6	•1667	•1067	•0229
2 3/4	2•750	2•5366	6	•1667	•1067	•0229
3	3•000	2•7439	5	•2000	•1281	•0275

BRITISH STANDARD WHITWORTH THREADS



DIA	OUTSIDE DIA "A"	CORE DIA "B"	THRDS PER INCH	PITCH "P"	DEPTH "D"	RADIUS "R"
1/16	•0625	•0412	60	•0167	•0107	•0023
3/32	•0937	•067	48	•0283	•0133	•0029
1/8	•125	•093	40	•0250	•016	•0034
5/32	•1562	•1162	32	•03125	•020	•0043
3/16	•1875	•1341	24	•04167	•0267	•0057
7/32	•2187	•1653	24	•04167	•0267	•0057
1/4	•250	•186	20	•0500	•032	•0069
5/16	•3125	•2414	18	•0556	•0356	•0076
3/8	•375	•295	16	•0625	•040	•0086
7/16	•4375	•346	14	•07143	•0457	•0098
1/2	•500	•3933	12	•0833	•0534	•0114
9/16	•5625	•4558	12	•0833	•0534	•0114
5/8	•625	•5086	11	•0909	•0582	•0125
11/16	•6875	•5711	11	•0909	•0582	•0125
3/4	•750	•6219	10	•1000	•0640	•0137
13/16	•8125	•6844	10	•1000	•0640	•0137
7/8	•875	•7327	9	•1111	•0711	•0153
15/16	•9375	•7952	9	•1111	•0711	•0153
1"	1•000	•8399	8	•125	•0800	•0172
1 1/8	1•125	•942	7	•1428	•0915	•0196
1 1/4	1•250	1•067	7	•1428	•0915	•0196
1 3/8	1•375	1•1616	6	•1667	•1067	•0229
1 1/2	1•500	1•2866	6	•1667	•1067	•0229
1 5/8	1•625	1•3689	5	•200	•1281	•0275
1 3/4	1•750	1•4939	5	•200	•1281	•0275
1 7/8	1•875	1•5904	4 1/2	•2222	•1423	•0305
2"	2•000	1•7154	4 1/2	•2222	•1423	•0305

BRITISH STANDARD GAS THREADS



SIZE	THRS PER INCH	OUTSIDE DIA "A"	CORE DIA "B"	PITCH "P"	DEPTH "D"	RAD "R"	OUTSIDE DIA OF PIPE
1/8	28	.383	.337	.0357	.0229	.0049	.410
1/4	19	.518	.451	.0526	.0335	.0072	.535
3/8	19	.656	.589	.0526	.0335	.0072	.690
1/2	14	.825	.734	.0714	.0457	.0098	.845
5/8	14	.902	.811	.0714	.0457	.0098	.940
3/4	14	1.041	.950	.0714	.0457	.0098	1.065
7/8	14	1.189	1.098	.0714	.0457	.0098	1.220
1"	11	1.309	1.193	.0909	.0582	.0125	1.350
1 1/4	11	1.650	1.534	.0909	.0582	.0125	1.690
1 1/2	11	1.882	1.766	.0909	.0582	.0125	1.910
1 3/4	11	2.116	2.000	.0909	.0582	.0125	2.160
2	11	2.347	2.231	.0909	.0582	.0125	2.380

GAS TAPPING DRILLS

SIZE	DRILL DIA	SIZE	DRILL DIA	SIZE	DRILL DIA	SIZE	DRILL DIA	SIZE	DRILL DIA
1/8	11/32	1/4	29/64	1/2	47/64	3/4	61/64	1"	1 13/64
1/8	R	3/8	19/32	5/8	15/16	7/8	17/64		

GAS CLEARANCE DRILLS

SIZE	DRILL DIA	SIZE	DRILL DIA	SIZE	DRILL DIA	SIZE	DRILL DIA	SIZE	DRILL DIA
1/8	25/64	1/4	17/32	1/2	53/64	3/4	1 3/64	1"	1 5/16
1/8	W	3/8	43/64	5/8	29/32	7/8	1 13/64		

B.A. TAPPING DRILLS

B.A. N°	DRAILL SIZE	B.A. N°	DRAILL SIZE	B.A. N°	DRAILL SIZE	B.A. N°	DRAILL SIZE
0	N° 12	5	N° 40	10	56	15	N° 72
1	N° 19	6	N° 44	11	58	16	N° 74
2	N° 26	7	N° 48	12	63	17	N° 76
3	N° 30	8	N° 51	13	65	18	N° 77
4	N° 34	9	N° 53	14	70	19	N° 79

WHITWORTH TAPPING DRILLS

DIA	DRAILL SIZE	DIA	DRAILL SIZE	DIA	DRAILL SIZE	DIA	DRAILL SIZE
1/8	N° 42	3/8	19/64	9/16	15/32	1 1/8	61/64
3/16	N° 29	3/8	"M"	5/8	33/64	1 1/4	1 5/64
1/4	3/16	7/16	"S"	3/4	5/8	1 1/2	1 19/64
1/4	N° 12	1/2	"X"	7/8	47/64	1 3/4	1 1/2
5/16	"D"	1/2	13/32	1"	27/32	2"	1 47/64

WHITWORTH CLEARANCE DRILLS

DIA	DRAILL SIZE	DIA	DRAILL SIZE	DIA	DRAILL SIZE	DIA	DRAILL SIZE
1/8	9/64	3/16	"O"	3/4	49/64	1 5/8	1 41/64
1/8	N° 30	3/8	25/64	7/8	57/64	1 3/4	1 49/64
3/16	13/64	3/8	"V"	1"	1 1/64	1 7/8	1 57/64
3/16	N° 11	7/16	29/64	1 1/8	1 9/64	2"	2 1/64
1/4	17/64	1/2	33/64	1 1/4	1 17/64	2 1/4	2 17/64
1/4	"F"	9/16	37/64	1 3/8	1 25/64	2 1/2	2 33/64
5/16	21/64	5/8	41/64	1 1/2	1 33/64	3"	3 1/64

FRACTION AND DECIMAL EQUIVALENTS

FRA	DECIMAL	FRA	DECIMAL	FRA	DECIMAL	FRA	DECIMAL
1/64	0.01562	17/64	0.26562	33/64	0.5156	49/64	0.76562
1/32	0.03125	9/32	0.28125	17/32	0.5312	25/32	0.78125
3/64	0.04687	19/64	0.29687	35/64	0.5469	51/64	0.79687
1/16	0.0625	5/16	0.3125	9/16	0.5625	13/16	0.8125
5/64	0.07812	21/64	0.32812	37/64	0.5781	53/64	0.82812
3/32	0.09375	11/32	0.34375	19/32	0.5937	27/32	0.84375
7/64	0.10937	23/64	0.35937	39/64	0.6094	55/64	0.85937
1/8	0.125	3/8	0.375	5/8	0.625	7/8	0.875
9/64	0.14062	25/64	0.3906	41/64	0.6406	57/64	0.89062
5/32	0.15625	13/32	0.4062	21/32	0.6562	29/32	0.90625
11/64	0.17187	27/64	0.4219	43/64	0.6719	59/64	0.92187
3/16	0.1875	7/16	0.4375	11/16	0.6875	15/16	0.9375
13/64	0.2031	29/64	0.4531	45/64	0.7031	61/64	0.95312
7/32	0.2187	15/32	0.4687	23/32	0.7187	31/32	0.96875
15/64	0.2344	31/64	0.4844	47/64	0.7344	63/64	0.98437
1/4	0.250	1/2	0.500	3/4	0.750	1"	1.000

B.S.F. TAPPING DRILLS.

DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE
1/4	13/64	3/8	"O"	9/16	31/64	3/4	21/32	1"	7/8
1/4	N°7	7/16	"U"	5/8	35/64	13/16	23/32	1 1/8	63/64
5/16	"F"	1/2	27/64	11/16	39/64	7/8	49/64	1 1/4	1 7/64

B.S.F. CLEARANCE DRILLS

DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE
1/4	17/64	3/8	25/64	9/16	37/64	13/16	53/64	1 1/4	1 17/64
1/4	"F"	3/8	"V"	5/8	41/64	7/8	57/64	1 3/8	1 25/64
5/16	21/64	7/16	29/64	11/16	45/64	1"	1 1/64	1 1/2	1 33/64
5/16	"O"	1/2	33/64	3/4	49/64	1 1/8	1 9/64	1 5/8	1 41/64

NEWALL LIMIT AND FITS

CLASS	LIMIT	UP TO $\frac{1}{2}$ "	$\frac{9}{16}$ " TO 1"	$1\frac{1}{16}$ " TO 2"	$2\frac{1}{16}$ " TO 3"	$3\frac{1}{16}$ " TO 4"
A	HIGH	+ .0002	+ .0005	+ .0007	+ .001	+ .001
	LOW	- .0002	- .0002	- .0002	- .0005	- .0005
	TOL	.0004	.0007	.0009	.0015	.0015
B	HIGH	+ .0005	+ .0007	+ .001	+ .0012	+ .0015
	LOW	- .0005	- .0005	- .0005	- .0007	- .0007
	TOL	.001	.0012	.0015	.0019	.0022
D	HIGH	+ .0005	+ .001	+ .0015	+ .0025	+ .003
	LOW	+ .0002	+ .0007	+ .001	+ .0015	+ .002
	TOL	.0003	.0003	.0005	.001	.001
F	HIGH	+ .001	+ .002	+ .004	+ .006	+ .008
	LOW	+ .0005	+ .0015	+ .003	+ .0045	+ .006
	TOL	.0005	.0005	.001	.0015	.002
P	HIGH	- .0002	- .0002	- .0002	- .0005	- .0005
	LOW	- .0007	- .0007	- .0007	- .001	- .001
	TOL	.0005	.0005	.0005	.0005	.0005
X	HIGH	- .001	- .0012	- .0015	- .002	- .0025
	LOW	- .002	- .0027	- .0035	- .0042	- .005
	TOL	.001	.0015	.0018	.0022	.0025
Y	HIGH	- .0007	- .001	- .0012	- .0015	- .002
	LOW	- .0012	- .002	- .0025	- .003	- .0035
	TOL	.0005	.001	.0013	.0015	.0015
Z	HIGH	- .0005	- .0007	- .0007	- .001	- .001
	LOW	- .0007	- .0012	- .0015	- .002	- .0022
	TOL	.0002	.0005	.0008	.001	.0012

B.A. CLEARANCE DRILLS

B.A N°	DRILL SIZE	B.A N°	DRILL SIZE	B.A N°	DRILL SIZE	B.A N°	DRILL SIZE
0	"C"	4	N°26	8	N°42	12	N°54
1	N°3	5	N°29	9	N°46	13	N°54
2	N°11	6	N°32	10	N°49	14	$\frac{3}{64}$
3	N°19	7	N°37	11	N°51	15	N°60

DRILL SIZES

LETTER DRILLS

LETTER	SIZE	L	SIZE	L	SIZE	L	SIZE
A	•234	H	•266	O	•316	V	•377
B	•238	I	•272	P	•323	W	•386
C	•242	J	•277	Q	•332	X	•397
D	•246	K	•281	R	•339	Y	•404
E	•250	L	•290	S	•348	Z	•413
F	•257	M	•295	T	•358		
G	•261	N	•302	U	•368		

NUMBER DRILLS

N ^o	SIZE	N ^o	SIZE	N ^o	SIZE	N ^o	SIZE
1	•228	21	•159	41	•096	61	•039
2	•221	22	•157	42	•0935	62	•038
3	•213	23	•154	43	•089	63	•037
4	•209	24	•152	44	•086	64	•036
5	•2055	25	•1495	45	•082	65	•035
6	•204	26	•147	46	•081	66	•033
7	•201	27	•144	47	•0785	67	•032
8	•199	28	•1405	48	•076	68	•031
9	•196	29	•136	49	•073	69	•0292
10	•1935	30	•1285	50	•070	70	•028
11	•191	31	•120	51	•067	71	•026
12	•189	32	•116	52	•0635	72	•025
13	•185	33	•113	53	•0595	73	•024
14	•182	34	•111	54	•055	74	•0225
15	•180	35	•110	55	•052	75	•021
16	•177	36	•1065	56	•0465	76	•020
17	•173	37	•104	57	•043	77	•018
18	•1695	38	•1015	58	•042	78	•016
19	•166	39	•0995	59	•041	79	•0145
20	•161	40	•098	60	•040	80	•0135

BIRMINGHAM SHEET METAL GAUGE (B.G.)

N ^o	SIZE	N ^o	SIZE	N ^o	SIZE	N ^o	SIZE
7/0	•6666	9	•1398	24	•0247	39	•0043
6/0	•625	10	•125	25	•022	40	•0038
5/0	•5883	11	•1113	26	•0196	41	•0034
4/0	•5416	12	•0991	27	•0174	42	•0030
3/0	•500	13	•0882	28	•0156	43	•0027
2/0	•4452	14	•0785	29	•0139	44	•0024
0	•3964	15	•0699	30	•0123	45	•0021
1	•3532	16	•0625	31	•011	46	•0019
2	•3147	17	•0556	32	•0098	47	•0017
3	•2804	18	•0495	33	•0087	48	•0016
4	•250	19	•044	34	•0077	49	•0013
5	•2225	20	•0392	35	•0069	50	•0012
6	•1981	21	•0349	36	•0061		
7	•1764	22	•0312	37	•0054		
8	•1570	23	•0278	38	•0048		

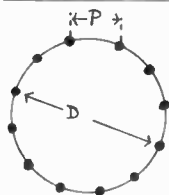
BRITISH IMPERIAL WIRE GAUGE (S.W.G.)

N ^o	SIZE	N ^o	SIZE	N ^o	SIZE	N ^o	SIZE
7/0	•500	9	•144	24	•022	39	•0052
6/0	•464	10	•128	25	•020	40	•0048
5/0	•432	11	•116	26	•018	41	•0044
4/0	•400	12	•104	27	•0164	42	•0040
3/0	•372	13	•092	28	•0148	43	•0036
2/0	•348	14	•080	29	•0136	44	•0032
0	•324	15	•072	30	•0124	45	•0028
1	•300	16	•064	31	•0116	46	•0024
2	•276	17	•056	32	•0108	47	•0020
3	•252	18	•048	33	•0100	48	•0016
4	•232	19	•040	34	•0092	49	•0012
5	•212	20	•036	35	•0084	50	•0010
6	•192	21	•032	36	•0076		
7	•176	22	•028	37	•0068		
8	•160	23	•024	38	•0060		

METRIC TO DECIMAL EQUIVALENTS

M/M	INCH	M/M	INCH	M/M	INCH	M/M	INCH
.01	.0004	.32	.0126	.63	.0249	.94	.03701
.02	.0008	.33	.013	.64	.0252	.95	.0374
.03	.0012	.34	.0134	.65	.0256	.96	.0378
.04	.0016	.35	.0138	.66	.026	.97	.0382
.05	.0020	.36	.0142	.67	.0264	.98	.0386
.06	.0024	.37	.0146	.68	.0268	.99	.0388
.07	.0028	.38	.0150	.69	.0272	1	.0394
.08	.0032	.39	.0154	.70	.0276	2	.0787
.09	.0036	.40	.0158	.71	.0279	3	.1181
.10	.004	.41	.0162	.72	.0283	4	.1575
.11	.0043	.42	.0166	.73	.0287	5	.1968
.12	.0047	.43	.0169	.74	.0291	6	.2362
.13	.0051	.44	.0173	.75	.0295	7	.2756
.14	.0055	.45	.0177	.76	.0299	8	.315
.15	.0059	.46	.0181	.77	.0303	9	.3543
.16	.0063	.47	.0185	.78	.0307	10	.3937
.17	.0067	.48	.0189	.79	.0311	11	.4331
.18	.0071	.49	.0193	.80	.0315	12	.4724
.19	.0075	.50	.0197	.81	.0319	13	.5118
.20	.0079	.51	.0201	.82	.0323	14	.5512
.21	.0083	.52	.0205	.83	.0327	15	.5905
.22	.0087	.53	.0209	.84	.0331	16	.6299
.23	.0091	.54	.0213	.85	.0335	17	.6693
.24	.0095	.55	.0217	.86	.0339	18	.7082
.25	.0099	.56	.0221	.87	.0343	19	.748
.26	.0103	.57	.0225	.88	.0347	20	.7874
.27	.0106	.58	.0228	.89	.0350	21	.8268
.28	.0110	.59	.0232	.90	.0354	22	.8661
.29	.0114	.60	.0236	.91	.0358	23	.9055
.30	.0118	.61	.0240	.92	.0362	24	.9449
.31	.0122	.62	.0244	.93	.0366	25	.9842

DIVIDING CIRCLES



LET

D = DIAMETER OF CIRCLE

N = NUMBER OF HOLES

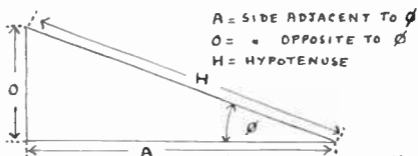
P = PITCH ALONG CHORD

K = CONSTANT

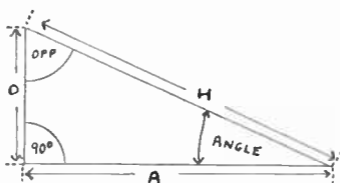
THEN P = D x K

N°	K	N°	K	N°	K	N°	K
3	.86603	28	.11197	53	.05924	78	.04027
4	.70711	29	.10812	54	.05914	79	.03976
5	.58779	30	.10453	55	.05709	80	.03926
6	.50000	31	.10117	56	.05607	81	.03877
7	.43388	32	.09802	57	.05509	82	.03830
8	.38268	33	.09506	58	.05414	83	.03784
9	.34202	34	.09227	59	.05322	84	.03739
10	.30902	35	.08964	60	.05234	85	.03695
11	.28173	36	.08716	61	.05148	86	.03652
12	.25882	37	.08480	62	.05065	87	.03610
13	.23932	38	.08258	63	.04984	88	.03569
14	.22252	39	.08047	64	.04907	89	.03529
15	.20791	40	.07846	65	.04831	90	.03490
16	.19509	41	.07655	66	.04758	91	.03452
17	.18375	42	.07473	67	.04687	92	.03414
18	.17365	43	.07299	68	.04618	93	.03377
19	.16460	44	.07134	69	.04551	94	.03341
20	.15643	45	.06976	70	.04486	95	.03306
21	.14904	46	.06824	71	.04423	96	.03272
22	.14232	47	.06679	72	.04362	97	.03238
23	.13617	48	.06540	73	.04302	98	.03205
24	.13053	49	.06407	74	.04244	99	.03173
25	.12523	50	.06279	75	.04187	100	.03141
26	.12054	51	.06156	76	.04132		
27	.11609	52	.06038	77	.04079		

SOLUTION OF RIGHT ANGLE TRIANGLES



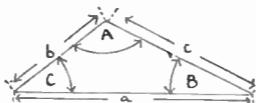
$$\begin{aligned} \text{SINE } \phi &= \frac{O}{H} & \text{TANGENT } \phi &= \frac{O}{A} & \text{SECANT } \phi &= \frac{H}{A} \\ \text{COSINE } \phi &= \frac{A}{H} & \text{COTANGENT } \phi &= \frac{A}{O} & \text{COSECANT } \phi &= \frac{H}{O} \end{aligned}$$



PARTS GIVEN	PARTS TO BE FOUND				
	HYP	ADJ SIDE	OPP SIDE	ANGLE	OPP ANGLE
HYPOTENUSE AND ADJACENT	—	—	$\sqrt{HYP^2 - ADJ^2}$	$\text{COSINE } \frac{ADJ}{HYP}$	$\text{SINE } \frac{ADJ}{HYP}$
HYPOTENUSE AND OPPOSITE	—	$\sqrt{HYP^2 - OPP^2}$	—	$\text{SINE } \frac{OPP}{HYP}$	$\text{COSINE } \frac{OPP}{HYP}$
HYPOTENUSE AND ANGLE	—	HYP X COSINE	HYP X SINE	—	$90^\circ - \text{ANGLE}$
ADJACENT AND OPPOSITE	$\sqrt{ADJ^2 + OPP^2}$	—	—	—	$\text{COTAN } \frac{OPP}{ADJ}$
ADJACENT AND ANGLE	$\frac{ADJ}{\text{COSINE}}$	—	ADJ X TANGENT	—	$90^\circ - \text{ANGLE}$
OPPOSITE AND ANGLE	$\frac{OPP}{\text{SINE}}$	OPP X COTAN	—	—	$90^\circ - \text{ANGLE}$

SOLUTION OF OBLIQUE ANGLED TRIANGLES

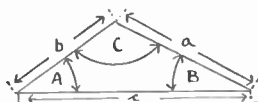
ANGLES



PARTS GIVEN	ANGLES TO BE FOUND		
	ANGLE A	ANGLE B	ANGLE C
a, b, c	$\frac{b^2+c^2-a^2}{2bc} = \cos A$	$\frac{a^2+c^2-b^2}{2ac} = \cos B$	$\frac{a^2+b^2-c^2}{2ab} = \cos C$
b, c, ANGLE A	=====	$\frac{b \sin A}{c-b \cos A} = \tan B$	$\frac{c \sin A}{b-c \cos A} = \tan C$
a, c, ANGLE B	$\frac{a \sin B}{c-a \cos B} = \tan A$	=====	$\frac{c \sin B}{a-c \cos B} = \tan C$
a, b, ANGLE C	$\frac{a \sin C}{b-a \cos C} = \tan A$	$\frac{b \sin C}{b-a \cos C} = \tan B$	=====
a, b, ANGLE A	=====	$\frac{b \sin A}{a} = \sin B$	$180^\circ - (A+B)$
a, b, ANGLE B	$\frac{a \sin B}{b} = \sin A$	=====	$180^\circ - (A+B)$
a, c, ANGLE A	=====	$180^\circ - (A+C)$	$\frac{c \sin A}{a} = \sin C$
a, c, ANGLE C	$\frac{a \sin C}{c} = \sin A$	$180^\circ - (A+C)$	=====
b, c, ANGLE B	$180^\circ - (B+C)$	=====	$\frac{c \sin B}{b} = \sin C$
a, ANGLE A, B	=====	=====	$180^\circ - (A+B)$
a, ANGLE A, C	=====	$180^\circ - (A+C)$	=====
b, ANGLE B, C	$180^\circ - (B+C)$	=====	=====
b, ANGLE A, B	=====	=====	$180^\circ - (A+B)$
b, ANGLE A, C	=====	$180^\circ - (A+C)$	=====
b, ANGLE B, C	$180^\circ - (B+C)$	=====	=====
b, c, ANGLE C	$180^\circ - (B+C)$	$\frac{b \sin C}{c} = \sin B$	=====
c, ANGLE A, B	=====	=====	$180^\circ - (A+B)$
c, ANGLE A, C	=====	$180^\circ - (A+C)$	=====

SOLUTION OF OBLIQUE ANGLED TRIANGLES

SIDES



PARTS GIVEN	SIDES TO BE FOUND		
	Side a =	Side b =	Side c =
b, c ANGLE A	$\sqrt{b^2 + c^2 - 2bc \cos A}$	_____	_____
a, c ANGLE B	_____	$\sqrt{a^2 + c^2 - 2ac \cos B}$	_____
a, b ANGLE C	_____	_____	$\sqrt{a^2 + b^2 - 2ab \cos C}$
a, b ANGLE A	_____	_____	$\frac{a \times \sin C}{\sin A}$
a, b ANGLE B	_____	_____	$\frac{b \times \sin C}{\sin B}$
a, c ANGLE A	_____	$\frac{a \times \sin B}{\sin A}$	_____
a, c ANGLE C	_____	$\frac{c \times \sin B}{\sin C}$	_____
b, c ANGLE B	$\frac{b \times \sin A}{\sin B}$	_____	_____
b, c ANGLE C	$\frac{c \times \sin A}{\sin C}$	_____	_____
a ANGLES A, B	_____	$\frac{a \times \sin B}{\sin A}$	$\frac{a \times \sin C}{\sin A}$
a ANGLES A, C	_____	$\frac{a \times \sin B}{\sin A}$	$\frac{a \times \sin C}{\sin A}$
a ANGLES B, C	_____	$\frac{a \times \sin B}{\sin A}$	$\frac{a \times \sin C}{\sin A}$
b ANGLES A, B	$\frac{b \times \sin A}{\sin B}$	_____	$\frac{b \times \sin C}{\sin B}$
b ANGLES A, C	$\frac{b \times \sin A}{\sin B}$	_____	$\frac{b \times \sin C}{\sin B}$
b ANGLES B, C	$\frac{b \times \sin A}{\sin B}$	_____	$\frac{b \times \sin C}{\sin B}$
c ANGLES A, B	$\frac{c \times \sin A}{\sin C}$	$\frac{c \times \sin B}{\sin C}$	_____
c ANGLES A, C	$\frac{c \times \sin A}{\sin C}$	$\frac{c \times \sin B}{\sin C}$	_____
c ANGLES B, C	$\frac{c \times \sin A}{\sin C}$	$\frac{c \times \sin B}{\sin C}$	_____

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