

St. Marks River Supratidal and Intertidal Sites

St. Marks River
Supratidal and
Intertidal Sites



Ben Meadows

1-800-241-6401

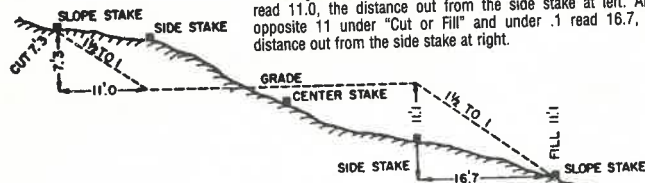
LEVEL BOOK

#101596

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

HAPPY

ANNIVERSARY

4-25-01

ST. MARKS

Two New SET LOCATIONS

1. Lower
(Inter tidal)

2. Upper
(Supratidal)

Initial reading 4-25-01 both stations

Feldspar placement 4-23-01

U.S. Staff / FTE / Cadner, J.

USGS 2000 / SET data / usgs 01

when the data is 11

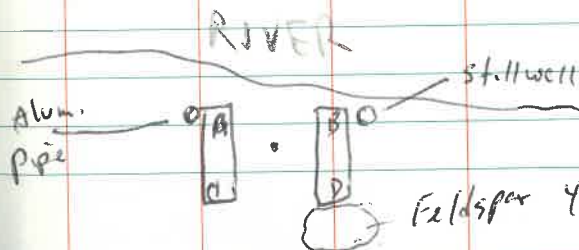
The paper in this book is made of 50% high grade rag stock with a WATER RESISTING surface sizing.

[illegible]

A NW B NE C SW D SE

* read from bump

Cost : 22.87
Tax = 24.0
Sub = 13.4



4/25/01
1:15-

St. Marks

Supratidal Site

A (NW) B (NE) C (SW) D (SE)

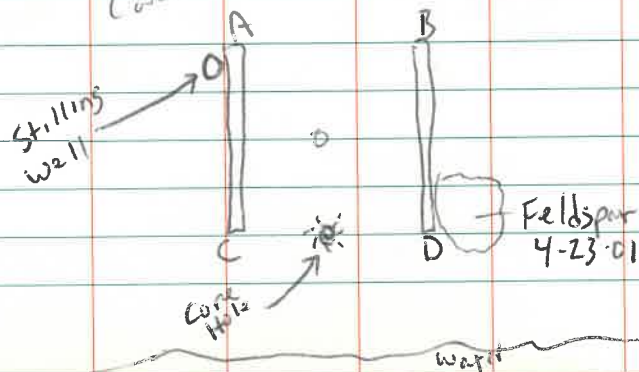
1	34.8	29.8	33.2	34.4
2	32.2	30.4	30.8	34.6
3	34.7	35.2	31.7	34.6
4	26.5	24.5	29.8	33.5
5	33.6	31.2	30.4	34.2
6	29.5	34.0	31.4	32.9
7	33.5	27.7	29.7	33.7
8	33.2	33.0	31.8	34.6
9	31.5	29.1	33.1	34.2

Cryo

Exposed -

1
2
3
4
5

Temp = 22.1°C
Salinity = 11.1 ppt
Cond = 18.3 µS



Jim B.
Jim L.
Brian C.

St Marks

7/17/01

Station 1 - Reference Station

Top of SET Pipe to instrument
(HI) = 4.62'

10:40 a.m. Water surface = 4.77'

10:40 a.m. Marsh surface = 5.23'

Station 2 - SET Pipe 4.628 ft.

10:35 a.m. Top Water = 4.795'

Marsh Surface = 5.241'

Shallow SET = 4.238'

Top Water = 4.785'

Marsh Surface = 5.170'

Station 1 - Shallow SET Pipe = 4.303'

Water Surface = 4.740'

Marsh Surface = 5.155'

(10:43 a.m.)
Station 3 - SET Pipe = 4.588'

Water Surface = 4.654'

Marsh Surface = 5.163'

(Unf) Shallow SET Pipe = 4.186'

Water Surface = 4.665'

10:46 a.m. Marsh Surface = 5.130'

(Fert) Shallow SET Pipe = 4.705'

Water Surface = 4.655'

10:48 a.m. Marsh Surface = 5.147'

10:57 a.m. Inter-tidal Station

Water Depth to SET Pipe = 1.150' going down

10:59 a.m.

Water Depth to Marsh Surface = 1.650' down

Upper Site

11:12 a.m. Water to Pipe = 0.130' ft.

Water to Marsh = 0.795 ft.

Stilling Well (11:13 a.m.)

Water to Base = 0.655'

11:14 a.m. Water to Base of
Threshold = 6.490'

Inter-tidal

Stilling Well

Top pipe to water = 3.14'

11:29 a.m. Pipe to mud = 5.39'

* SE wind 3-6 knots

High Tide

* May want to come back to ✓

@ low tidal condition

Henry F
Junc

8-20-01

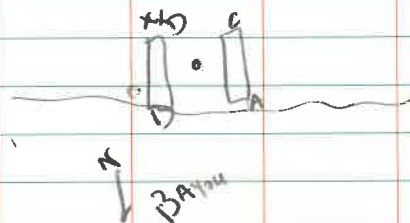
breezy - clear
12:04

St marshes Intertidal

	A	NW	B	NE	C	SW	D	SE
1	27.2		22.3		44.2 ^c		43.7	
2	26.0		22.8		42.8 ^c		44.4	
3	29.4		19.2		43.5 ^c		45.0	
4	28.3		20.8		44.8 ^c		44.0	
5	24.3		19.3		43.7 ^c		43.9	
6	24.0		21.8		42.2 ^c		44.7	
7	26.8		16.5		45.0 ^c		43.2	
8	26.1		17.9		44.5 ^c		44.3	
9	25.3		22.2		44.2 ^c		44.7	

C = Collier measure
QUAD A & B by feet - under water1st D^{1st} D^{3rd} D^{2nd} from

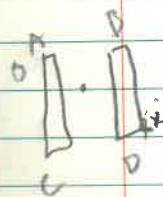
1	10.58	7.40
2	10.92	8.41
3	9.92	8.44
4	11.08	6.99
5	10.44	

Henry F
Junc

8-20-01

Supratidal
1:10

	A	NW	B	NE	C	SW	D	SE
1	31.3		30.2		36.0		33.6	
2	32.8		34.4		36.5		35.6	
3	34.2		33.3		32.6		31.9	
4	34.4		31.6		35.7		32.9	
5	30.5		33.4		31.4		34.4	
6	34.2		34.5		35.8		38.1	
7	33.7		33.5		33.3		34.5	
8	34.3		34.4		33.4		36.0	
9	28.9		34.2		35.2		35.3	

D D
Cyp 1
2 19.71
3
4
51st try = 0
2nd try = 0
3rd try = 0Site: Overgrown
Juncus

3/25/62

Robert D.

Rice
Intertidal

CSW
4310V

July 1

Henry F

10:42 AM

CSW
4310V

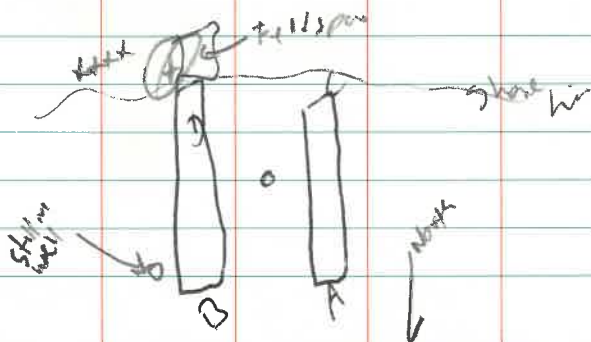
2nd

17 Sc

1	26.2	43.8	28.3	38.9
2	25.8	36.5	28.7	42.8
3	26.1	44.5	29.7	44.2
4	27.8	43.0 40.1	27.8	42.0
5	26.2	43.2	25.7	43.5
6	28.7	44.0	28.0	41.5
7	27.0	42.7	24.7	41.3
8	27.6	40.7	26.2	42.3
9	25.6	44.3	30.6	43.0

	D
Cryo 1	20.16
2	35.33
3	20.65
4	20.69
5	

Temp.	19.8 C
SAL.	14.0 ppt
Cond.	23.06 μ S



3/25/2

breezy - clear

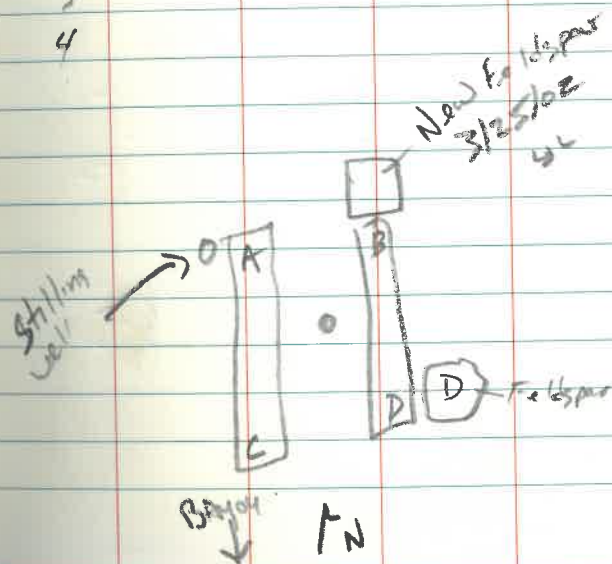
Supradel

Henry
Rick C
Robney D

Am

	A	B	C	D
1	34.3	32.7	21.1	34.5
2	26.7	33.7	34.5	33.9
3	34.5	33.7	32.7	34.1
4	34.1	33.8	33.3	32.5
5	34.5	31.1	32.6	32.6
6	35.0	32.6	32.7	36.4
7	34.9	32.5	35.0	33.2
8	34.2	31.7	33.0	33.3
9	33.9	32.7	34.7	34.5

		D
Cryo	1	X
	2	X
	3	
	4	



Rick SUPPLEMENTAL CORRECTION 7/15/03

Quadrant A

1	24.3	1	34.7
2	33.4	2	33.4
3	36.4	3	34.5
4	34.3	4	34.2
5	32.5	5	34.2
6	35.6	6	36.3
7	34.7	7	35.1
8	34.8	8	35.1
9	34.5	9	34.7

4 hours

1	34.8
2	31.9
3	35.0
4	32.8
5	34.1
6	37.0
7	34.3
8	34.3
9	34.6

DO NOT
USE

Set Subtotal

A	NO	7/15/03	B	NO	5
1	20.3	44.8	29.0	41.9	
2	24.9	42.8	28.3	42.8	
3	25.0	44.1	26.2	43.7	
4	25.8	40.2	28.4	41.7	
5	21.5	43.5	26.6	42.1	
6	25.0	45.1	28.5	40.8	
7	26.0	44.6	24.8	42.7	
8	26.0	40.9	24.2	43.0	
9	21.0	39.7	25.3	45.3	

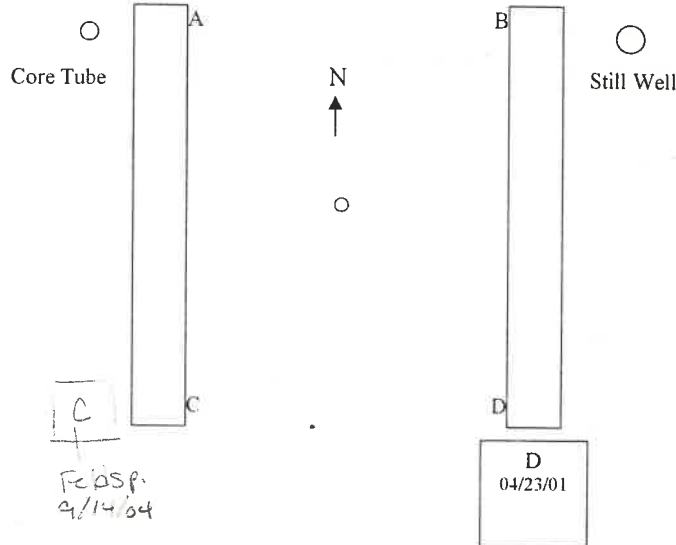
5/8/03

~~DO NOT~~
~~USE~~

Supplemental Readings
are in St. Marks I book

Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.
32	.5299	.6249	1.1792	1.887	1.600	.84805	58	.8293	.8098	1.2868	1.589	1.235	.77715
10	.5324	.6289	1.1813	1.878	1.590	.84650	50	.8316	.8146	1.2898	1.583	1.228	.77531
20	.5348	.6330	1.1835	1.870	1.580	.84495	40	.8338	.8195	1.2929	1.578	1.220	.77347
30	.5373	.6371	1.1857	1.861	1.570	.84339	30	.8361	.8243	1.2959	1.572	1.213	.77162
40	.5398	.6412	1.1879	1.853	1.560	.84182	20	.8383	.8292	1.2991	1.567	1.206	.76977
50	.5422	.6453	1.1901	1.844	1.550	.84025	10	.8406	.8342	1.3022	1.561	1.199	.76791
33	.5446	.6494	1.1924	1.836	1.540	.83867	57	.8428	.8391	1.3054	1.556	1.192	.76604
10	.5471	.6536	1.1946	1.828	1.530	.83708	50	.8450	.8441	1.3086	1.550	1.185	.76417
20	.5495	.6577	1.1969	1.820	1.520	.83549	40	.8472	.8491	1.3118	1.545	1.178	.76229
30	.5519	.6619	1.1992	1.812	1.511	.83389	30	.8494	.8541	1.3151	1.540	1.171	.76041
40	.5544	.6661	1.2015	1.804	1.501	.83228	20	.8517	.8591	1.3184	1.535	1.164	.75851
50	.5568	.6703	1.2039	1.796	1.492	.83066	10	.8539	.8642	1.3217	1.529	1.157	.75661
34	.5592	.6745	1.2062	1.788	1.483	.82904	56	.8561	.8693	1.3251	1.524	1.150	.75471
10	.5616	.6787	1.2086	1.781	1.473	.82741	50	.8583	.8744	1.3284	1.519	1.144	.75280
20	.5640	.6830	1.2110	1.773	1.464	.82577	40	.8604	.8796	1.3318	1.514	1.137	.75088
30	.5664	.6873	1.2134	1.766	1.455	.82413	30	.8626	.8847	1.3352	1.509	1.130	.74896
40	.5688	.6916	1.2158	1.758	1.446	.82248	20	.8648	.8899	1.3386	1.504	1.124	.74703
50	.5712	.6959	1.2183	1.751	1.437	.82082	10	.8670	.8952	1.3421	1.499	1.117	.74509
35	.5736	.7002	1.2208	1.743	1.428	.81915	55	.8691	.9004	1.3456	1.494	1.111	.74314
10	.5760	.7046	1.2233	1.736	1.419	.81748	50	.8713	.9057	1.3492	1.490	1.104	.74120
20	.5783	.7089	1.2258	1.729	1.411	.81580	40	.8734	.9110	1.3527	1.485	1.098	.73924
30	.5807	.7133	1.2283	1.722	1.402	.81412	30	.8756	.9163	1.3563	1.480	1.091	.73728
40	.5831	.7177	1.2309	1.715	1.393	.81242	20	.8777	.9217	1.3600	1.476	1.085	.73531
50	.5854	.7221	1.2335	1.708	1.385	.81072	10	.8799	.9271	1.3636	1.471	1.079	.73333
36	.5878	.7265	1.2361	1.701	1.376	.80902	54	.8820	.9325	1.3673	1.466	1.072	.73135
10	.5901	.7310	1.2387	1.695	1.368	.80730	50	.8841	.9380	1.3711	1.462	1.066	.72937
20	.5925	.7355	1.2413	1.688	1.360	.80558	40	.8862	.9435	1.3748	1.457	1.060	.72737
30	.5948	.7400	1.2440	1.681	1.351	.80386	30	.8884	.9490	1.3786	1.453	1.054	.72537
40	.5972	.7445	1.2466	1.675	1.343	.80212	20	.8905	.9545	1.3824	1.448	1.048	.72337
50	.5995	.7490	1.2494	1.668	1.335	.80038	10	.8926	.9601	1.3863	1.444	1.042	.72136
37	.6018	.7536	1.2521	1.662	1.327	.79864	53	.8947	.9657	1.3902	1.440	1.036	.71934
10	.6041	.7581	1.2549	1.655	1.319	.79688	50	.8967	.9713	1.3941	1.435	1.030	.71732
20	.6065	.7627	1.2577	1.649	1.311	.79512	40	.8988	.9770	1.3980	1.431	1.024	.71529
30	.6088	.7673	1.2605	1.643	1.303	.79335	30	.9009	.9827	1.4020	1.427	1.018	.71325
40	.6111	.7720	1.2633	1.636	1.295	.79158	20	.9030	.9884	1.4061	1.422	1.012	.71121
50	.6134	.7766	1.2661	1.630	1.288	.78980	10	.9050	.9942	1.4101	1.418	1.006	.70916
38	.6157	.7813	1.2690	1.624	1.280	.78801	52	.9071	1.0000	1.4141	1.414	1.000	.70711
10	.6180	.7860	1.2719	1.618	1.272	.78622	50						
20	.6202	.7907	1.2748	1.612	1.265	.78442	40						
30	.6225	.7954	1.2778	1.606	1.257	.78261	30						
40	.6248	.8002	1.2808	1.601	1.250	.78079	20						
50	.6271	.8050	1.2838	1.595	1.242	.77897	10						
Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle							Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle						

St. Marks River—Intertidal Site



St. Marks River—Supratidal Site

Stilling Well



Feldspar
5/18/03

0.3



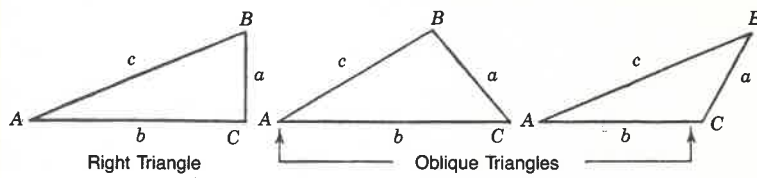
○

Feldspar
3/25/02



D
04/23/01

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

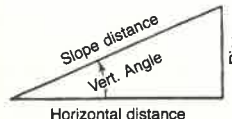
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\text{cosec} = \frac{c}{a}$

Given a, b	Required A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$
a, b, c	A, B, C	$c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2} A = \sqrt{\frac{(s - b)(s - c)}{b c}}$
a, b, c	A, B, C	$\sin \frac{1}{2} B = \sqrt{\frac{(s - a)(s - c)}{a c}}$
A, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{b c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.
Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine $5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately: — the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.