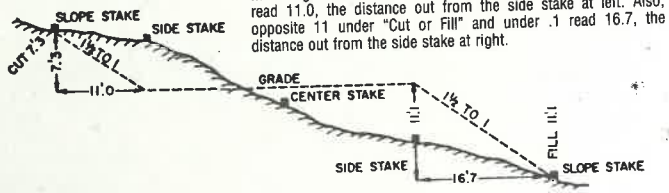
Forestry Suppliers, Inc.
1-800-647-5368
#49354 Level Book

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	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
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		8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3						10.2	10.4	6
7	10.5	10.7	10.8							11.9	7
8	12.0	12.2	12.3								8
9	13.5	13.7	13.8	1							9
10	15.0	15.2	15.3	1							10
11	16.5	16.7	16.8	17							11
12	18.0	18.2	18.3	18							12
13	19.5	19.7	19.8	20.							13
14	21.0	21.2	21.3	21.							14
15	22.5	22.7	22.8	23.0							15
16	24.0	24.2	24.3	24.5							16
17	25.5	25.7	25.8	26.0							17
18	27.0	27.2	27.3	27.5							18
19	28.5	28.7	28.8	29.0							19
20	30.0	30.2	30.3	30.5							20
21	31.5	31.7	31.8	32.0							21
22	33.0	33.2	33.3	33.5							22
23	34.5	34.7	34.8	35.0							23
24	36.0	36.2	36.3	36.5							24
25	37.5	37.7	37.8	38.0	3						25
26	39.0	39.2	39.3	39.5	3						26
27	40.5	40.7	40.8	41.0	41						27
28	42.0	42.2	42.3	42.5	42.6						28
29	43.5	43.7	43.8	44.0	44.1	44.3					29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9			47.9	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.			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

962-2835

245-2355

Dorin

Info Gene Shaw

445 46 49

850 2215-2365

Wendy Sellers

352-284-2909

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

CONTENTS

PAGE NO.	REFERENCE	DATE

#5 March 18, 2004

NAD83

3/18/04 On site for coring off JAX. Fl.
set bow & stern anchors
seas less than 2'
30°25.973
81°19.792
water depth 59'
time 9:20 Am
vibrated for ≈10 minutes
penetration steady
First Attempt recovered 13' of core
core catcher is vector finger
sticking partially out will
make second attempt this location
Second Attempt #5A
30°25.997
81°19.790
Water depth 59 ft
time
10:09 started vibrating 10:03
vibrated 15 min.
when recovered shoe was
lodged in head indicating
full penetration. Mud smeared
all the way up core
17'5" recovery

March 18, 2004

Lost Shoe from platform
on ~~the~~ stern while
try Vibracoring without it.
11:50 on station for
Core #6 vibrator chore
on the the way down
30 29.486
81 17.257
Water depth 56'
1202 Started vibrating
vibrated 8 minutes until penetration
stopped recovered 2 feet of
sediment very coarse &
shelly bagged a sample
when washed out core pipe
for retry.
30 29.421 Accurate to 19 feet
81 17.255
Water depth 55'
12:36 started Vibrating
Core #6A
Vibrated 11 minutes
recovering at 12:43
core tube bent
recovered ≥ 3 feet of core
refusal

Core #7 45' water depth
30 31.198
81 18.163
1:41 Pm vibrating
1:47:45 retrieving core barrel
Core tube broken off about
2 feet from bottom end.
Attempting second try same site
Core #7A water depth 46'
30 31.192
81 18.166
2:03 Pm start Vibrating
vibrated 9.5 minutes
retrieving core 2:09
core tube broken off about
2 feet from bottom end as before

April 6, 2004 3:00P Cloudless
day seas 1 to 2'
Core #8 N 30° 29.427
W81° 18.899
Accurate to 18 feet
Water depth 53'
~4:00 P core sampler with weight down rigged with 4 floats vibrated 4 minutes and proceeded to recovery.
Approximately 17' feet of recovery fine sand with some shell on top coarse sand & bottom of core.

April 7, 2004 10:00 Am Cloudless
Day seas 2-3'
Core #9 N30° 30.373
NNA-1 W81° 20.363
Accurate to 18 feet
Water depth 54' rigged with 4 floats vibrated 5.5 minutes and proceeded to recovery approximately 18' of recovered core, Note: Core catcher did not deploy properly ~5' of core lost from bottom of core

Core #10 N 30° 30.015
Water depth 49' W 81° 21.402
Accurate to 16 feet rigged with 4 floats Vibrated 5.5 minutes
19'2" of recovery fine sand at top & bottom of core

Core #11 N 30° 33.024
Accurate to 18 feet W 81 21.463
Water depth 40'
Vibrated 6 minutes with slow to minimal penetration recovered equipment ~10' of core recovered F sand at top stiff clay at bottom

Core #12 N 30° 33.865
Accurate to 16 feet W 81° 23.046
38 ft of water depth
Vibrated for 5 minutes
17.5' recovered in core
clay at top and bottom of core

NAD 83

June 9, 2004 Cloudless
seas 1 to 2' +-19'
Core # NA4 W/D 49'
30 [redacted] 34.006
10:19 Am 81 11.299
rigged with 4 floats
vibrated 5 min Nore
7' of - sand core
[illegible]
Try again
10:53 N 30 33.999
W 81 11.306
Accumulate to 13 feet
Core NA4
vibrated 20 minutes
11:43 retrieving core core
Tube lost will try
again
11:37 one bottom
N 30 33.992
W 081 11.306
Accumulate to 14 feet
11:41 vibrated 10 min.
Lost vibration head
calling for [illegible]
Accumulate to 16 feet
N 30 33.988 .984
W 0 81 11.300 .301

NAD 83

June 23, 2004
Cloudless seas 1 to 2' [illegible] 37
Core # NA5 W/D
30 34.758
81 21.203
9:10 Am [illegible]
[illegible]

Nov. 15, 2004 Flagler Co
12:58 Flagler Beach [illegible]
at [illegible]

VO-1 BB N 29 25.038
W081 05.876
MB N 29 25.040
W081 05.872
Photo #1 Looking south

VO-2 BB N 29 24.298
W081 05.532
Photo #2 Looking South
MB N 29 24.297
W081 05.527

Am Pm
6:30 → 7:30

July 20, 2004

Shot 4 Lines ≃ 33 miles
29°57' ≃ 9 miles, 29°56 ≃ 8 miles
29°55' ≃ 7 mile, 29°54 ≃ 7 miles

July 21, 2004
7:00 Am - 3:30 Pm Shot 5 lines ≃ 35 miles
29°53 ≃ 7 miles 29°52' ≃ 7 miles
29°51 ≃ 7 miles 29°50' ≃ 6 miles
during return of equipment
drainage well into prop

7:30 Am July 22, 2004
8:00 PM got heavy Cut Start waiting
on drive shot one tie line
≃ 6 miles long

6:30 Am July 23, 2004
7:30 Pm Shot 3 E-W lines ≃ 10, 10 + 13 miles long

7:00 Am July 24, 2004
7:30 Pm Shot 3 E-W lines ≃ 12, 7, 8

7:00 Am July 25, 2004
6:00 PM Equipment failure
after line Shot returned
to port

6:30 Am July 26, 2004
7:00 PM Shot 3 E-W lines

7:30 Am July 27, 2004 Made repairs
7:30 PM Shot tie lines in South SJ + Flagler

7:00 Am July 28, 2004
7:00 PM Shot tie lines in South SJ + Flagler

7:00 Am July 29, 2004
5:30 PM Shot tie lines north to Duval

7:00 Am July 30, 2004
5:00? Shot tie lines off Nassau/Duval
weather blew up pulled equipment
in

Photo #3 Looking N[illegible]
VO-3 BB N29 23.554
W081 05.194
VO-3 MB N29 23.556
± 14 feet
W081 05.186

VO-4 BB N29 22.827
W081.04.860
MB N29 22.829
W081 04.836

VO-5
2 Photos #4/5 front looking
west [illegible] O looking at
erosion toe.
VO-5 BB N29 22.092
W081 04.520
VO-5 MB N29 22.095
W081 04.510
VO-6
Photo #6 Sampling
VO-6 BB 29 21.367
81 04.182
MB 29 21.375
81 04.173

VO7 Photo 7 looking
north

VO7 BB N29 20.666
± 14 feet
W081 03.827
MB N29 20.671
W081 03.813

VO8 Photo #8 Sampling toward
VO8 BB N29 19.983
W081 03.507

VO8 MB N29 19.971
W081 03.495

VO9 Photo #9 + 10
#9 [illegible] shot #10 looking
north
VO9 BB 29 19.273
± 29 feet
W081 03.186
MB 29 19.276
W081 03.183
Photo #10
VO10 BB 29 18.513
± 20 feet
W081 02.822
MB 29 18.512
W081 02.806

VO-11 Photo 10 & 11 Sample of mound area

VO-11 BB 29 17.771
WO81 02.476
MB 29 17.778
WO81 02.451

Photo 12 Looking South

VO-12 BB 29 17.047
WO81 02.115
MB 29 17.058
WO81 02.101

VO-13 Photo 13 Looking North
Photo 14 Looking at Samples

VO-13 BB 29 16.349
WO81 01.759
MB 29 16.354
WO81 01.779

Photo 15 access ramp

Photo 16 Looking South

VO 14 BB N 29 15.626
WO81 01.394
MB N 29 15.632
WO81 01.384

VO15 BB 29 14.892
WO81 01.049

Photo 17 Looking South

MB 29 14.897
81 01.027

VO16 BB 29 14.179
WO81 00.674
VO16 MB 29 14.179
WO81 00.656

Photo 18 Removal dune Looking west

VO17 BB N 29 13.443
WO81 00.335
± 18 feet
MB N29 13.447
WO81 00.318

Photo 19 Removal dune looking west

VO-18 BB 29 12.738
W080 00.004

VO 18 MB 29 12,744
W080 59.990

I 23 feet ~~VO 18~~ 29
Photo Looking North

VO 19 BB 29 12.026
±39 feet W080 59.649
MB 29 12.039
±18 feet 80 59.629
Photo 21 Looking North

VO 20
VO-20 BB 29 11.331
W080 59.287
Photo MB 29 11.355
22 Looking N 80 59.278
Photo 23 Looking S

±19 feet VO-21 BB 29 10.589
W080 58.908
MB 29 10.595
W080 58.942

Photos 23 North
24 South
25 Junction Erosion
26 Dam & Erosion

11/16/04

VO-22 BB 2909.846
80 58.481
VO-22 MB 2909.846
80 58.477
Three Photos #27 Sorgum
#28 North
#29 South

VO-23 BB 2909.101
Two Photos 80 58.094
#30 North MB 2909.101
#31 South 80 58.095

±12 feet VO-24 BB 2908.432
80 57.737
Three Photos MB 2908.434
32 North 80 57.737
33 South
34 Erosion at Ramp

One Stop Photo VO-25 BB 2907.739
80 57.341
35 N
36 S
37 Erosion
38 Erosion

VO-26 BB 29 07.044
80 56.934
3 Photos MB 29 07.047
39 ~~North~~ Sampling 80 56.926
40 North
41 South

VO-27 BB 29 06.383
2 Photos 80 56.483
42 North MB 29 06.384
43 South 80 56.479

VO-28 BB 29 05.731
80 55.984
3 Photos MB 29 05.730
? 44 Sampling 80 55.984
45 North
46 South

VO-29 BB 29 05 106
47 N 55.500
48 S MB 29 05.106
49 Sampling BB 80 55.488
55.500

VO-30 MB 29 04.727
80 55.162
~~[illegible]~~
BB 29 04.724
50 N 80 55.165
51 Sampling at BB
52 S Across inlet
53 S Across inlet
54, 55, 56 Lighthouse
57, 58, 59, 60, 61 Inlet
62 Lighthouse
63 Dunes
Lost point Sample North of Ponce Inlet

Shot East of chip 2 photos of @ Tortone w/ Panorama starting from east moving to the north

VO-31 BB 29 04.276
80 54.663
MB 29 04.283
80 54.650

± 18'

VO-32 BB 29 03.589
w08054.370
MB 29 03.590
80 54.370

New Photos 4 Photos
1-N
2-S
3,4 Samples only

VO-33 BB N 29 02.878
W080 54.050

2 Photos
6 N
7 S

VO-34 Took no Samples
wave breaking against
Sea wall ~2 hrs after high tide

Photos
8 S
9 S
10 N

VO-35 BB 29 01.442
W080 53.220
MB 29 01.442
W080 53.220

Photos
11 N
12 N
13 S

One Sample only

VO-36 BB 29 00.738
80 52.802

4 Photos
14 S
15 N
16 S
17 N

VO-37 No Beach Sample
waves wash against Sea wall
No access to beach

Photos
18 N
19 S

VO-38 MB 28 59.375
80 51.920
BB 28 59.376
80 51.928

Photos
20 N
21 S

VO-39 BB 28 58.677
80 51.463
MB 28 58.680
80 51.459

Photos
22 N
23 S

VO-40 MB 28 58.081
80 51.036
BB 28 58.059
80 51.039

Photos
24 N
25 S

±14'

VO-41 BB 2857.392
80 50.587
Photo 26 N 27 S
MB 2857.396
80 50.582

VO-42 BB 2856.738
80 50.128
Photo 28 N 29 S
MB 2856.751
80 50.125

VO-43 MB 2856.555
80 49.633
Photo 30 N 31 S
BB 2856.552
80 49.645

11/17/04

VO-44 BB 2855.462
80 49.235
Photo 32 33 34 35 Sampling DA Down A+V
MB 2855.465
80 49.231

VO-45 BB 2854.684
80 48.708
MB 2854.687
80 48.702
Photo 36

VO-46 BB 2854.057
80 48.273
Photo 37
MB 2854.061
80 48.267

VO-47 BB 2853.358
±15' 80 47.794
MB 2853.363
80 47.786
Sand Sample Photo 38

VO-48 BB 2852.832
Photo 40 N 41 S Sampling 80 47.441
MB 2852.834
80 47.434

VO-49 BB 2852.235
±19' 80 47.051
MB 2852.239
80 47.044

VO 50 BB 2851.660
Photo 42 8046.677
South looking Dam? MB 2851.663
8046.668

VO 51 (NPS 28) BB 2851.090
8046.320
Photo 43 MB 2851.095
N looking with Dam? 8046.316

(NPS 31) VO 52 BB 2850.522
8045.959
MB 2850.526
8045.953

VO 53 BB 2849.952
8045.602
MB 2849.958
8045.598

VO 54 BB N 2849.379
near Photo 44 8045.247
NPS (36) Looking W MB 2849.379
across park 8045.246

VO 55 BB 2848.804
±50' North of (NPS 39) 8044.877
Photo 45 MB 2848.804
8044.868

VO 56 BB 2848.223
±15' 8044.488
Photo 46 MB 2848.226
8044.489

VO 57 BB 2847.663
8044.117
MB 2847.667
8044.111

March 10, 2005 1:05 PM

Proceeding to survey area in Apalachee Bay

R/V Geo Search – Pilot [illegible] Strange

SSS operators D.C. Phelps, J. Ladner

J. Balsillie also on vessel

weather: partly cloudy temp ~68°

Frequency 600 KHz

Running to the position of line first turned equipment on started shooting to test at 2:15

Start of line 2:53 seas 1 to 2 feet and cross [illegible] to boat just getting [illegible] about 4 miles into line system shut down [illegible] [illegible].

Brought system back on line and continued shooting

March 08, 2006

Side Scan Sonar S[illegible]

Turkey Point:

April 19th
10:13 Am deployed fish balanced, Starting w/
1 at 3.9 knots
Eol line 1 at 11:48
SOL 2 at 11:56

April 18 hit bottom? in tr[illegible]
6:15 Am EOL 2 at 1:15
6:00 PM Shortened lines w/ wet [illegible]
April 19 deckp [illegible]
7:00 Am SOL 3 ~~[illegible]~~ 2:40
7:00 PM EOL 3 3:00
April 20 SOL 4 3:
7:00 Am
6:30 Pm
April 21
7:00 Am

~~April [illegible]~~ May 8, 2006
May 7 Steinhatchee CAMA Study
11:30 Am
8:30 Pm
May 8
7:00 Am
5:30 Pm
May 9
7:15 Am
7:30 Pm
May 10
6:30 Am
4:30 Pm

May 15

May 15 Start 7:00
8:00 Am Left sunny
Sheds [illegible]
May 16
7:30 Am
9:30 Pm
May 17
8:00 am
6:30 Pm

May 21, 2006

May 21	Running to north contact
5:30 PM	hold line about
9:00 PM	ran north and shut
May 22	South
7:00 AM	Running second line first
7:00 PM	half MAV shutdown
May 23	rebooted + brought up
7:00 AM	Running 3rd line complete
8:00 PM	Shut down went around
May 24	and picked up gap.
6:30 AM	Near end of 8th line now
4:30 PM	contact went around to
May 25	push up gap.
7:00 AM	8th line fouled a
6:30 PM	crab trap & cleared it
	then found the fish
	eating jammy checked
	it and cleared seaweed
	ball

29	38	~~.1724~~	40.056
83	33	~~.7029~~	42.960
29	38.	~~3817~~	17.676
83	33.	~~3738~~	16.47

29.37.~~2321~~	18.036
83.32.~~3075~~	21.432
29.37.~~0821~~	1.506
83 32.~~0779~~	1.410
29.36.~~0305~~	04.356
83.31.~~0977~~	08.532
29.35.~~8790~~	51.582
83.30.~~9380~~	53.256
29. 39	06.930
83 34	12.276
29 38	55.~~96~~926
83 33	59.364

May 25

11:00 AM checked life vests (6) of the 6 three were lacking lights or the lights were inoperable due to lack of batteries in the lights. Checked flare box three para flares expire this month and one red smoke pot as well.

(next page) ~~[illegible]~~

Pizza Jones were not prepared
stocked according to their
packaging instructions.
DeRulfo

May 30
7:30 Am 2:30 Left Am
7:00 Pm
May 31
7:00 Am
6:00 PM
June 1
7:30 Am
7:30 PM
June 2
7:30 Am
2:30 PM

June 6
~~Approximately~~ 8:15 Am
Left Survey 10:00 Am
7:00 Pm
June 7 7:00 Am
5:30 Pm
June 8 7:30 Am
12:30 PM
Left Survey

Henry Cuellar 850-882-7378

~~Sept~~ Oct 25, 2006

Travel FGS – ~~St~~ ADP – St Marks

Ft Walton Beach

60 Start 7:30 ~~Pelco~~

End 8:30? 13 hrs

~~Sept~~ Oct 26, 2006

8. Start 7:00

Proceeding to start of Line

06C01A in area

06MM51

Shot last line work

the segment start line

06C01 with 06C01A

Simultaneous End 6:00 11 hrs

Sept ~~Oct~~ 27, 2006

8. Start 7:00

Shot 2 # A, B, C, D 12 hrs

~~End~~ End 7:00

Sept ~~Oct~~ 28, 2006

8. Start 06:30

End 04:30 10 hrs

Sept ~~Oct~~ 29, 2006

80 Start ~~07:00~~ 12 hrs

End ~~05~~ 9:00

Sept ~~Oct~~ 30, 2006

90 Start 8:00 14 hrs.

If no cad to start line eq 1-B

End 10:00

~~Oct~~ 1, 2006

80 Start 7:30 13 hrs

8:30

Oct 2, 2006

Start 7:30

End 9:00

April 3, 2008

Grab samples off of Dauphin Island

DIGS 1
~~30 22 24.4~~
~~87 11 46.6~~
30 22 06.9
87 11 25.4
WD 11.9'
Silt?

DIGS 2
30 21 57.8
87 ~~8~~ 11, 22.9
WD 8'
Silt?

DI GS 3
30 41 57.6
87 11 32.1
WD 10' Shelly

DI GS ~~4~~
30 21 55.0
87 11 44.9
WD 11.5'
Silt?

DI GS ~~4~~ 5
30 21 52.5
87 11 59.8
WD 11'
Silt + Sand

DI GS 6

Multiple Attempts Completed

~~30~~ 30 21 50.4
87 12 11.5
WD 8'
Sand

DI GS 7

30 21 58.2
87 12 22.7
WD 15'
Silt

Multiple Attempts Completed

DI GS 8
30 22. 19.6
87 11 37.3
WD 4'
Sand

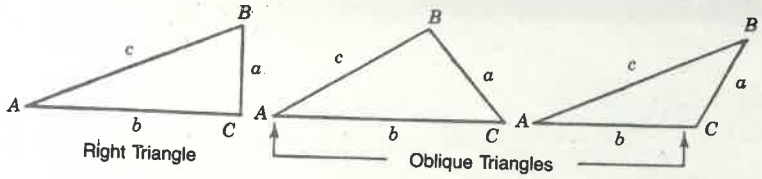
1# 83 55 02.62
8/to17' 29 56 47.27

2 Beam 2# 83 56 31.60
29 58 19.59

Read Plot 3#

3# 83 49 25.13
29 54 58.64

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

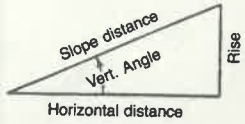
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	
a, b	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	$B = 90° - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90° - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90° - A$, $a = c \sin A$, $b = c \cos A$,

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180° - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180° - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180° - C$, $\tan \frac{1}{2}(A - B) = \frac{(a-b)\tan \frac{1}{2}(A+B)}{a+b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{b\,c}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{a\,c}}$, $C = 180° - (A + B)$
a, b, c	Area	$s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{b\,c \sin A}{2}$
A, B, C, a	Area	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° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .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° 10′ = .9959. 1 – .9959 = .0041. 319.4 × .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.