"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

"Rite in the Rain" - A unique All-Weather Writing Paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather.

K+E Keuffel & Esser Company

82 0020

# Weatherproof Field Book

Logan-Cache AirporT

"Rite in the Rain"® All-Weather Paper

32 Leaves

4⅝" X 7"

18 December 2002

Level Net To Jet Building Office for AT

Bench Mark US Geodetic Survey 5-EAM 1964

EL = 4452.476 South End of Runway 35

| STA | | + | HI | − | ELEV. |
|---|---|---|---|---|---|
| BM | 5-EAM | | | | 4452.476 |
| | | 2 52 | 55 00 | | |
| | | | | 5 57 | 49 43 |
| | | 5 18 | 54 61 | | |
| | | | | 6 40 | 48 21 |
| | | 4 60 | 52 81 | | |
| | | | | 6 87 | 45 94 |
| | | 5 45 | 51 39 | | |
| | | | | 4 59 | $\boxed{46\ 80}$ |
| | | +3 50 to counter | | | |
| | | 4 45 | 51 25 | | |
| | | | | 4 06 | 47 19 |
| | | 6 29 | 53 48 | | |
| | | | | 4 36 | 49 12 |
| | | 5 88 | 55 00 | | |
| | | | | 2 30 | 52 70 |
| | | | | | +.22 |

Carl Zeiss Ni2 3

⊼ P. Ward # J Bishop Weather 34° Cloudy

Logan - Cache Airport

NOTES

$$
\begin{array}{r}
46\ 80 \\
3\ 50 \\
\hline
4450\ 30
\end{array}
$$

RE-RUN AIRPORT LEVELS

WARD - BISHOP 12-20-02

BM $4452^{\underline{48}}$

| | + | HI | − | ELEV |
|---|---|---|---|---|
| | | | | $52^{\underline{48}}$ |
| | $2^{\underline{59}}$ | $55^{\underline{07}}$ | | |
| | | | $6^{\underline{40}}$ | $48^{\underline{67}}$ |
| | $5^{39}$ | $54^{\underline{06}}$ | | |
| | | | $6^{\underline{65}}$ | $47^{\underline{41}}$ |
| | $5^{\underline{36}}$ | $52^{\underline{77}}$ | | |
| | | | $6^{\underline{10}}$ | $46^{\underline{67}}$ |
| | $4^{\underline{25}}$ | $50^{\underline{92}}$ | | |
| | | | $4^{\underline{11}}$ | $46^{81}$ |

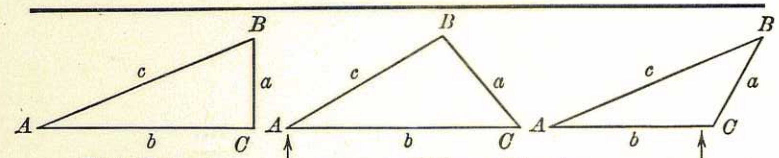
52 48
2 59
55 07
6 40
48 67
5 39
54 06
6 65
47 41
5 36
52 77
6 10
46 67
4 25
50 92
4 11
46 81

9 15
50 606
6 870
43 736
5 450
49 186
4 590
44 596
3 50
48 096

4460
+445
4805
−406
4399
+629
5028
−436
4592
+588
5180
−230
4950

4950

# TRIGONOMETRIC FORMULÆ




Right Triangle — Oblique Triangles

## Solution of Right Triangles

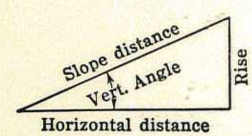
For Angle $A$. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

| 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 | |
|---|---|---|
| $A, B, a$ | $b, c, C$ | $b = \frac{a \sin B}{\sin A},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$ |
| $A, a, b$ | $B, c, C$ | $\sin B = \frac{b \sin A}{a},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$ |
| $a, b, C$ | $A, B, c$ | $A+B = 180° - C,\ \tan \frac{1}{2}(A-B) = \frac{(a-b)\tan\frac{1}{2}(A+B)}{a+b},\ c = \frac{a \sin C}{\sin A}$ |
| $a, b, c$ | $A, B, C$ | $s = \frac{a+b+c}{2},\ \sin\frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}},\ \sin\frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{ac}},\ C = 180° - (A+B)$ |
| $a, b, c$ | Area | $s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$ |
| $A, b, c$ | Area | area $= \frac{bc \sin A}{2}$ |
| $A, B, C, a$ | 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.