JASON E. FOOSE, PS

HP35s Sliding Predetermined Area

BIG TIME DISCLAIMER!
This is an academic exercise. The solution method is not inclusive of all possible scenarios but rather limited to just that which is shown.

Parting off a tract of land with a parallel line sliding along two sidelines can be accomplished by storing a few equations. The basic concept is predetermining a desired area then solving distances along the sidelines to place corners. The sliding line is set parallel with a chosen baseline. The following formulas are presented in the HP 35's equation entry format.

Eq1: Computes the total area. Since we know the area and certain other variables we'll use the solver to compute "B" the perpendicular distance to baseline

A=B×(TAN(X)×B)÷2+(B×F)+B×(TAN(Y)×B)÷2

Eq2: Computes the line distance along the left side

L=INV(COS(X))×B

Eq3: Computes the line distance along the right side

R=INV(COS(Y))×B

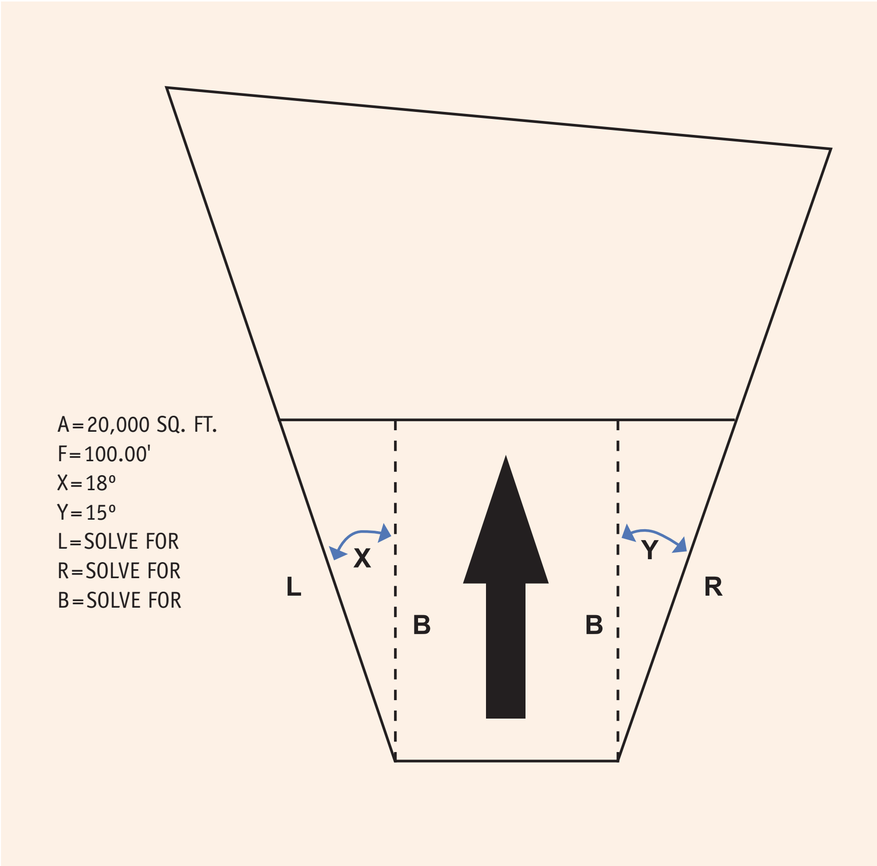
Eq4: Computes the line distance along the opposite parallel side

(O)PPOSITE (P)ARALLEL (S)IDE = TAN(X)×B+TAN(Y)×B+F

Basically you are manipulating a solution of the area of a rectangle and two triangular wings. However, in this case you know the solution and want to back track to figure out the lengths of the side lines. Begin by storing the referenced algebraic equations in the EQN library. The equation academically considers two "outie" wings that are both added to the main rectangle area. Other combinations of "innies" and "outies" exist, however this example will not sufficiently address the math involved with those solutions.

It's apparent that the basic form is:

Area = main rectangle + the left wing + the right wing



CLOSURE REPORT

Set description: (No description)
Area: 19,999.56
0.46
Perimeter: 577.9143
Closure: 0.0000

Point #	Direction	Distance	Northing	Easting	Elevation	Station
1	90°00'00"	100.0000	5,000.0000	5,000.0000	100.00	0+00.0000
2	15°00'00"	146.0100	5,000.0000	5,100.0000	100.00	1+00.0000
3	269°59'57"	183.6143	5,141.0348	5,137.7902	100.00	2+46.0100
4	162°00'00"	148.2900	5,141.0322	4,954.1759	100.00	4+29.6243
1			5,000.0000	5,000.0000	100.00	5+77.9143

Using the supplied data I get the following results:

B=141.035874878 or 141.04' on the meridian.
L=148.293894697 or 148.29' up the left side.
R=146.011081844 or 146.01' up the right side.
O=183.615782401 or the same 183.61' on the closure sheet.

The coordinates of the closure report were entered to a precision of 0.01'. Bwahhh, so I'm a realist! Get over yourself and realize that 19,999.56 sq. ft. is the same as twenty thousand square feet. I could waste my client's dime by manipulating the data to a perceivably "exact" amount but face facts here. Unless you're working in Aspen, Los Altos, or on the Las Vegas strip, let's keep things to the square foot and in round zeros for the Planning and Zoning folks.

The "A=" formula is actually used to solve for "B". Queue it up then press **BRS** **EQN** **GTO** to set the solver to "B". You will be prompted to input the remaining variables. Simply queue up the left and right side equations then press **ENTER** to initiate either. They are in the anticipated form and the variables are previously stored so you can blow through them quickly.

Feel free to send any questions or comments to *rls43185@gmail.com* ■

Jason Foose is the County Surveyor of Mohave County Arizona. He originally hails from The Connecticut Western Reserve Township 3, Range XIV West of Ellicott's Line Surveyed in 1785 but now resides in Township 21 North, Range 17 West of the Gila & Salt River Base Line and Meridian.