



## THE PROBLEM CORNER

### Solution to Problem Number 3

Angle GBE = Angle AGD and Angle BGF = Angle ADG

Let GB = x, then AG = 400' - x

$BF^2 = x^2 - 100^2$ , since GF = 100'

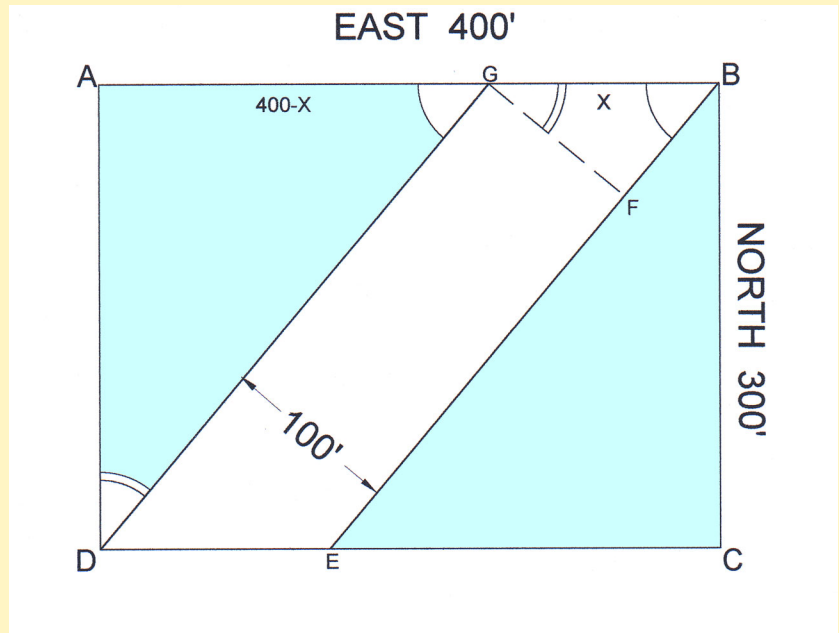
AG : AD :: BF : GF, By similar triangles

$$\frac{(400' - x)}{300'} = \sqrt{\frac{x^2 - 100^2}{100^2}}$$

Expanding and solving for x by the quadratic equation yields  $x = 133.7117'$

AG = 400' - x = 266.1352', AND GD = 401.1352' by the Pythagorean Theorem

The area is then 401.1352' times 100', 40,113.52 square feet, or 0.921 acres.



### Solution to Problem Number 4

Draw the intersection of the tangents at P. Draw TS & BV parallel with PE. Draw PW & T-R1 parallel with R2-R (the extension of R2-E).

ANGLE E-R2-R1 = 44°55' = ANGLE R2-R1-T. ANGLE B-R1-T = 128°45' - 44°55' = 83°50' = Angle E-R-N, the Delta for the new curve. The new semi-tangent = PQ + QE = BV - BW + T-PRC + PRC-S.

$PRC-S = 161' \sin 44^\circ 55' = 113.6785'$ ,  $T-PRC = 269' \sin 44^\circ 55' = 189.9349'$

$SE = 161' - 161' \cos 44^\circ 55' = 46.9903'$ ,  $R1-T = 269' \cos 44^\circ 55' = 190.4882'$

$V-R1 = 269' \sin 6^\circ 10' = 28.8962'$ , SO  $QV = 190.4882' - 28.8962' - 46.9903' = 114.6017'$ .

$BW = 114.6017' \tan 6^\circ 10' = 12.3823'$  AND THE NEW SEMI-TANGENT = 558.675'.

The new radius is 558.675' divided by  $\tan 41^\circ 55' = 622.289'$ . The distance  $BN = 558.675' - PB = 558.675' - 114.6017' \sec 6^\circ 10' = 558.675' - 115.269' = 443.406'$

