



Solution to Problem 45

1/100 of 1% of an acre is $43,560 / 10,000 = 4.356$ square feet.

$$(187.00\text{ft.} \pm 0.020')(232.941\text{ ft.} \pm x) = 43,560\text{ sq. ft.} \pm 4.356\text{ sq. ft.}$$

$$43,560 \pm 187x \pm 4.659 \pm .02x = 43,560 \pm 4.356$$

The term $0.02x$ is very small and is hereby dropped.

$$187x = \sqrt{4.356^2 + 4.659^2}$$

$$x = \pm 0.034'$$

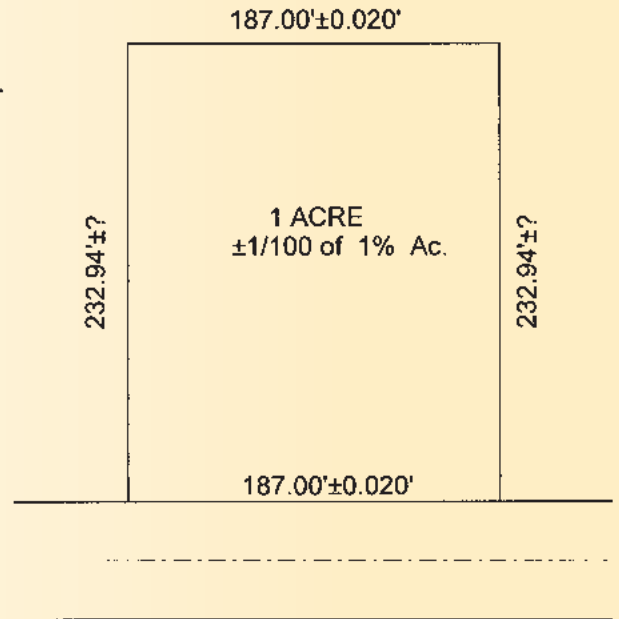
AS FOR YOUR TOTAL STATION:

$$5\text{ mm} = 0.0164'$$

$$1\text{ ppm of } 232.94' = 0.00023294', \text{ so } 5\text{ ppm} = 0.001165'$$

$$\pm(5\text{ mm} + 5\text{ ppm}) = \pm(0.0164' + 0.001165') = \pm 0.0176'$$

YOUR TOTAL STATION IS GOOD ENOUGH.



Solution to Problem 46

Extend PE to F so that PFO is a right angle. Draw OB and OC. Construct ED perpendicular to PE and parallel with OF. Draw perpendicular DG.

By traverse or triangles OE can be solved as $1020.989'$ and angle EOF as $18^\circ 48' 08''$. Then OF equals $1020.989 \cos 18^\circ 48' 08'' = 970.208'$ and EF equals $1020.989 \sin 18^\circ 48' 08'' = 317.987' = DG$.

OG equals $970.208' - R$, $DG = 317.987'$, OD equals $1105' - R$.

$$(1105 - R)^2 = 317.987^2 + (970.208 - R)^2$$

Expanding and rearranging yields $R = 662.525'$

$$\text{Angle CDE} = \text{angle DOG} = \arctan \frac{317.987}{(970.208 - 662.525)} = 45^\circ 56' 36''$$

$$\text{Angle BOC} = 71^\circ 17' 00'' - 45^\circ 56' 36'' = 25^\circ 20' 24''$$

