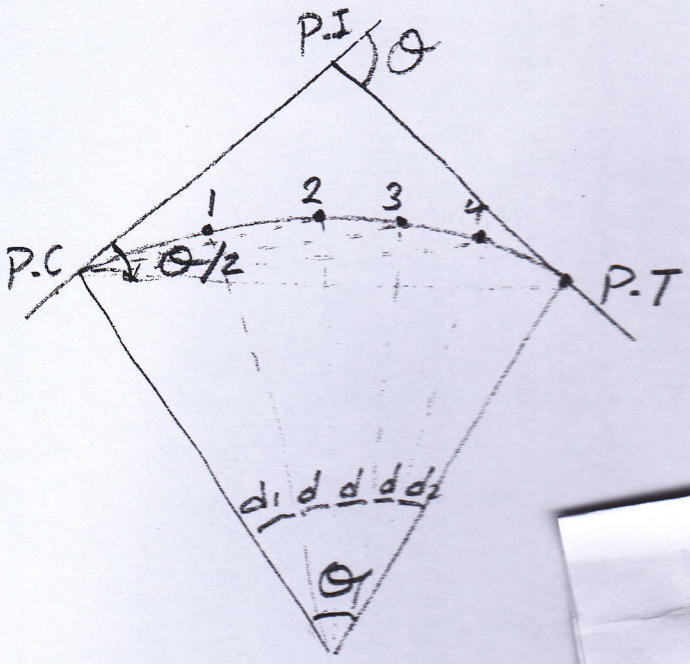
Setting out a simple circular curve by measuring angle and distance (theodolite and tape)



Example/ Two tangents intersected at 1190 m with deflection angle 36°. Calculate all necessary data for setting out a simple circular curve with R = 300m. Use deflection angle method with using pegs at 30m interval.

(2)

Sol. $T = R \tan\frac{\theta}{2} = 300 \tan\frac{36^\circ}{2} = 97.48\ m$

$L = R * \theta * \frac{\pi}{180} = 300 * 36 * \frac{\pi}{180} = 188.50m$

$P.C = P.I - T = 1190 - 97.48 = 1092.52\ m$

$P.T = P.C + L = 1092.52 + 188.50 = 1281.02m$

0, 30, 60, ----- , 1080, 1110, 1140, 1170, 1200,

↑ 1092.52 (P.C)

1230, 1260, 1290, -----

↑ 1281.02 (P.T)

∴ The length of first sub chord = 1110 − 1092.52
= 17.48 m

the length of last sub chord = 1281.02 − 1260
= 21.02 m

no. of sub-chord at equally distance $= \frac{185.5 - (17.48 + 21.02)}{30}$

$= 5$

station	chord (m)	deflection angle of sub-chord	Cumulative defl. angle
1092.52	0	0°	0
1110	17.48	* 1° 40′ 9″	1° 40′ 9″
1140	30	** 2° 51′ 53″	+ = 4° 32′ 2″
1170	30	2 51′ 53″	+ = 7° 23′ 55″
1200	30	2 51′ 53″	10° 15′ 48″
1230	30	2 51′ 53″	13° 07′ 41″
1260	30	2 51′ 53″	15° 59′ 34″
1281.02	21.02	2° 00′ 26″	18° 00′ 00″ = Θ/2

* deflection angle of sub-chord $= \left(\frac{L * 180}{\pi R}\right)/2$

$= \left(\frac{17.48 * 180}{\pi * 300}\right)/2$

$= 1° 40′ 9″$

** " at equ... 1) $= \left(\frac{30 * 180}{\pi * 300}\right)/2$

$= 2° 51′ 53″$

* $1° 40′ 9″ + 2° 51′ 53″ = 4° 32′ 02″$

$4° 32′ 02″ + 2° 51′ 53″ = 7° 23′ 55″$