

Q. Netto 2 ②

Point of intersection = 2955m

tangent = 109.39m

T1 = = 2845.61

+ 1 = 216.42

T2 = 3062.03

length of Chord

C1 = 2865 - 2845.61

C1 = 19.39

No of chord = $\frac{216.42}{20} = 10.82 = 11$

C2 = C3 = C4 = C5 = C6 = C7 = C8 = C9 = C10 = 7

C = 3062.03 - 3045

= 17.03

By deflection angle

S1 = $\frac{1718.9 \times C1}{60 \times 600}$ degree

(Q. No. 102)

$$S_1 = \frac{17189 \times 19.37}{60 \times 600}$$

$$S_1 = 0^\circ 55' 32.95''$$

$$S_2 = \frac{1718.9 \times 20}{60 \times 600}$$

$$S_2 = 0^\circ 57' 17.8''$$

$$S_{II} = \frac{1718.9 \times 17.03}{60 \times 600}$$

$$S_{II} = 0^\circ 48' 47.29''$$

Total deflection (tangential)
angle for the chord is,

$$D_1 = S_1 = 0^\circ 55' 32.95''$$

$$D_2 = D_1 + S_2 = 1^\circ 52' 50.75''$$

$$D_3 = 2^\circ 50' 8.55''$$

$$D_4 = 3^\circ 47' 26.35''$$

$$D_5 = 4^\circ 44' 44.15''$$

Question #03:-

①

ANSWER NO #03

→ I.D.:- 7955

→ $\alpha = 180^\circ - 130^\circ = 150^\circ$

→ $\beta = 180^\circ - 140^\circ = 40^\circ$

→ $\phi = \alpha + \beta = 90^\circ$

→ $I = 180^\circ - 90^\circ = 90^\circ$

→ $KT_1 = KN = RL \tan\left(\frac{\alpha}{2}\right) = \text{---} \text{---}$

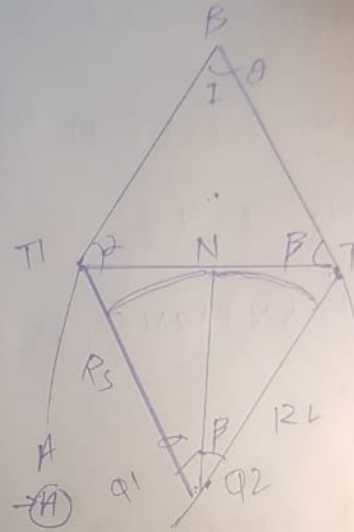
→ 1st situation is given (ID-300)

→ $(7955 - 300) \Rightarrow 7655$

→ $KN = R_s \tan\left(\frac{\alpha}{2}\right) = 7655 \tan\left(\frac{150^\circ}{2}\right)$

→ $KT_1 = KN \Rightarrow \boxed{3581.46m}$

→ $MT_2 = MN = RL \tan\left(\frac{\beta}{2}\right) \rightarrow ii$



→ $(30 - 400)m$

③

Question No. 1 Part (b)

ID = 7955

off set No	off set	Sim son multiply	Product 7955
0	79.55	1	79.55
30	16.955	4	43.82
60	11.955	2	23.91
90	5.955	4	23.82
120	3.955	2	7.91
150	4.955	1	4.955

$\Sigma = 112.37$

Area (h₁ - h₆)

$$= \frac{b}{3} \times 112.37$$

$$\Rightarrow \frac{30}{3} \times 112.37$$

$$= \boxed{1123.7 \text{ m}^2}$$

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→ Now, change of intersection point $\rightarrow (10-400)m$

$$\rightarrow 7955 - 400$$

$$\rightarrow = \boxed{7,555m}$$

→ change of intersection point - TL

$$\rightarrow 7,555 - 7,697.89$$

$$\rightarrow T1 = \boxed{-142.89m}$$

→ plus S = -121.383m

$$\frac{6,675.811m}{6,554.428m}$$

$$6,554.428m$$

→ change of compound

→ (W) plus LL

$$= 6554.428m + 5411.266m$$

$$T2 = \boxed{11,965.694m}$$

①

Question No. 1 Part a)

Tangent: meet at chainage = 7955 ft

Deflection angle = $14^{\circ}13'23''$

Degree of curve = 5°

Solution:

$$D = 5^{\circ}$$

$$R = \frac{5729.58}{D} \Rightarrow \frac{5729.58}{5 \text{ ft}} = 1145.91$$

$$\begin{aligned} \text{Tangent length} &= BT_1 = BT_2 = \\ &\Rightarrow R \tan\left(\frac{\theta}{2}\right) \end{aligned}$$

$$BT_1 = BT_2 = 1145.91 \times \tan\left(\frac{14^{\circ}13'23''}{2}\right)$$

$$BT_1 = BT_2 = 142.96 \text{ ft}$$

Length of curve:

$$L = \frac{\pi R \theta}{180^{\circ}}$$

$$L = \frac{\pi \times 1145.91 \times 14^{\circ}13'23''}{180^{\circ}}$$

$$L = 289.45 \text{ ft}$$

question #3 ③

$$\rightarrow \frac{BM}{\sin 2} = \frac{KM}{\sin I}$$

$$\rightarrow BM = \frac{KM \times \sin 2}{\sin(I)} = \frac{6,404.04 \times \sin(50)}{\sin(90)}$$

$$\rightarrow BM = \boxed{4,905.77m}$$

$$\rightarrow TL = KT_1 + BK = 4,116.43 + 3581.46 =$$

$$\rightarrow TL = \boxed{7,697.89m}$$

$$\rightarrow TS = MT_2 + BM = 2,822.58 + 4,905.77 = \boxed{7,728.35m}$$

$$\rightarrow L_s = \frac{\pi R_s \alpha}{180} = \frac{\pi \times 76.55 \times 50}{180}$$

$$\rightarrow L_s = \boxed{6,675.811m}$$

$$\rightarrow L_L = \frac{\pi R_L \beta}{180} = \frac{\pi \times 77.55 \times 40}{180}$$

$$\rightarrow L_L = \boxed{5,411.266m}$$

②

Change of intersection point = 7955 ft
minus tangent length = 142.96

$$T_1 = 7812.04$$

$$\text{Plus } L = 289.45$$

$$T_2 = 8101.49$$

length of chord = $I =$

$$\Rightarrow 2R \sin\left(\frac{\phi}{2}\right)$$

$$\Rightarrow 2 \times 1145.91 \times \sin\left(\frac{14^\circ 13' 23''}{2}\right)$$

$$= 283.72 \text{ ft}$$

Mid ordinate,

$$RC_1 = \cos\left(\frac{\phi}{2}\right)$$

$$1145.91 \left(1 - \cos\left(\frac{14^\circ 13' 23''}{2}\right)\right)$$

$$= 881 \text{ ft}$$

External distance:

$$R(\sec(\frac{\phi}{2}) - 1)$$

$$1145.91 (\sec(14^\circ 13' 23'') - 1)$$

$$= \boxed{8.88 \text{ ft}}$$

Q. No# 02 (3)

$$D_6 = 5^\circ 42' 1.95''$$

$$D_7 = 6^\circ 39' 19.75''$$

$$D_8 = 7^\circ 36' 37.55''$$

$$D_9 = 8^\circ 33' 55.35''$$

$$D_{10} = 9^\circ 31' 13.15''$$

$$D_{11} = 10^\circ 20' 0.44''$$

$$\text{Check} = \frac{20^\circ 40'}{2} = 10^\circ 20'$$

$$\text{error} = 0.73$$