CE331 Assignment-2

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1 1).

angle misclosure(e) = $\sum_{i=1}^{5} \theta_i - (n-2) \times 180$
e = 11”
$C_e = -\frac{e}{n} = -\frac{11''}{5} = -2.2''$

S No.	Point	Interior angle	Correction	Corrected value of interior angle
1	A	100°45′37″	-2.2”	100°45′34.8″
2	B	231°23′43″	-2.2”	100°45′40.8″
3	C	17°12′59″	-2.2”	100°45′56.8″
4	D	89°3′28″	-2.2”	100°45′25.8″
5	E	101°34′11″	-2.2”	100°45′8.8″

let $C_e = -2''$

Line	WCB
AB	126°55′17″
BC	178°19′0″
CD	15°31′57″
DE	284°35′23″
EA	206°9′42″

finding ΔE and ΔN

Line	Length	ΔE	ΔN
AB	647.25	517.450	-388.815
BC	203.03	5.964	-202.942
CD	720.35	192.898	694.041
DE	610.24	-590.562	153.716
EA	285.13	-125.7155	-255.919
Total	2466	0.0356	0.0815

$e_L = \sqrt{(}0.0356^2 + 0.0815^2) = 0.089$
Quality of traverse = $\frac{e_L}{2466} = 3.609 \times e^{-}5$

Point	E	N
A	5000	10000
B	5517.4507	9611.184
C	5523.4147	9408.242
D	5716.3136	10102.284
E	5125.7511	10256.0009
A	5000.0356	10000.0815

Line	Length	δE	δN
AB	647.25	-0.0093	-0.0214
BC	203.03	-0.0029	-0.0067
CD	720.35	-0.0104	-0.0238
DF	610.24	-0.0088	-0.0202
EA	285.13	-0.0041	-0.0094
Total	2466	-0.0356	-0.0815

2 2).

let slope of line AB be m let slope of line AC be m1 let slope of line BC be m2

at angle A : $tanA = \frac{m-m1}{1+m\times m1}$

at angle B : $tanB = \frac{m-m2}{1+m\times m2}$

Therefore,

$m1 = \frac{m-tanA}{1+m\times tanA} = k1(let)$

$m2 = \frac{m-tanB}{1+m\times tanB} = k2(let)$

since m, tanA, tanB are known therefore k1 and k2 are known

now putting values of m1 and m2,
$x_c = \frac{(k_1x_a-k_2x_b)+(y_b-y_a)}{k1-k2}$, $y_c = \frac{(k_1y_b-k_2y_a)+(x_a-x_b)}{k1-k2}$

3 3).

Let $\angle EAB = \theta$ Since, AB is considered as true length therefore, horizontal line will intersect it at right angle(since AB is along plumb line) therefore,

$\cos\theta = \frac{AB}{AE}$
$error = AE - AB = AE(1 - cos\theta)$