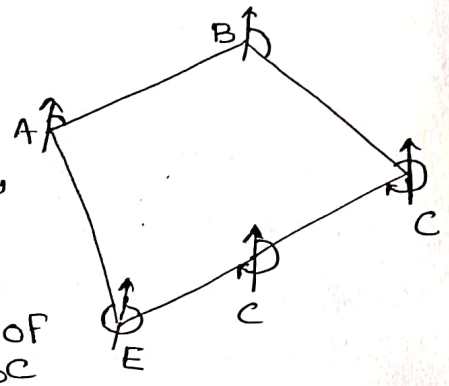
For the following question find out the included angle and correct bearing of line.

Line	FB	BB
AB	68°15'	248°15'
BC	148°15'	326°15'
CD	224°30'	46°00'
DE	217°15'	38°15'
EA	327°45'	147°45'

05.05.20

Ans :-

(a) Calculation of included angles



Included angle $\angle A$ = BB of EA − FB of AB

$= 147°45' - 68°15'$

$= 79°30'$

Included angle $\angle B$ = BB of AB − FB of BC

$= 248°15' - 148°45'$

$= 99°30'$

Included angle $\angle C$ = BB of BC − FB of CD

$= 326°15' - 224°30'$

$= 101°45'$

Included angle $\angle D$ = BB of CD − FB of DE

$= 46°00' - 217°15'$

$= -171°15' + 360°$

$= 188°45'$

Included angle $\angle E$ = BB of DE − FB of EA

$= 38°15' - 327°45'$

$= -289°30' + 360°$

$= 70°30'$

Check, $(2N-4) \times 90° = (2 \times 5 - 4) \times 90° = 540°00'$

$\angle A + \angle B + \angle C + \angle D + \angle E = 540°00'$

(b) Calculation of corrected bearing

We observed that Line AB is free from Local attractio

So, station A, B is free from Local attraction.

(i) FB of BC should be correct.

Actual BB of BC should be,

$148°15' + 180° = 328°45'$

But the observed bearing is 326°15'.

Correction = 328°45' − 326°15' = +2°30'

(ii) Correct FB of CD = 224°30' + 2°30'

= 227°0'

The actual BB of CD should be,

227°0' − 180° = 47°

But the observing bearing of CD = 46°0'

So, a correction = 47° − 46° = +1°

(iii) Correct FB of DE = 217°15' + 1° = 218°15'

The actual BB of DE = 218°15' − 180° = 38°15'

Which is equal to the observed BB of DE. So, station E is also free from local attraction.

(iv) Since stations A and E are both free from local attraction the FB and BB of EA are correct.

Line	Corrected FB	Corrected BB
AB	68°15'	248°15'
BC	148°45'	328°45'
CD	227°00'	47°00'
DE	218°15'	38°15'
EA	327°45'	147°45'

Unit - II

16/04/20

Local Attraction

→ A magnetic needle indicates the north direction when properly suspended. But if the needle comes in contact with the magnetic substance such as iron ore. It is found to deflects from its true direction and does n't show the actual north. Thus disturbing influence at the magnetic substance is called local attraction.

→ By measuring the FB and BB helps to detect local attraction by the relation of, $BB \pm FB = 180°$

'+' sign choosen when $FB < 180°$.

'-' sign choosen when ~~BB~~ $FB > 180°$

Problem:-

Following are the observed bearing of the lines of a traverse ABCDEA with a compass in a place where local attraction is suspended. Find which station is free from local attraction.

Line	AFB	BB
AB	191°45'	13°0'
BC	39°30'	222°30'
CD	22°15'	200°30'
DE	242°45'	62°45'
EA	330°15'	147°45'

→ By the relation, $FB - BB = 180°$

For line AB, $191°45' - 13° = 178°45'$

We observed that ~~line EA~~ station E is free from local attraction.

(i) FB of EA = 330°15' (correct)

BB of EA = 147°15' (observed)

Actual BB of EA = 330°15' − 180° = 150°15'

Correction = 150°15' − 147°15' = +2°30'

(ii) Correct FB AB = 191°45' + 2°30' = 194°15'

Actual BB AB should be,

194°15' − 180° = 14°15'

Correction = 14°15' − 13° = +1°15'

(iii) Correct FB of BC = $39°30' + 1°15' = 40°45'$

Actual BB of BC = $40°45' + 180° = 220°45'$

Correction = $220°45' - 222°30' = -1°45'$

(iv) Correct FB of CD = $22°15' - 1°45'$

$= 20°30'$

Actual BB of CD = $20°30' + 180° = 200°30'$

~~Correction = 200°30'~~

Line	Corrected FB	Corrected BB
AB	194°15'	14°15'
BC	40°45'	220°45'
CD	20°30'	200°30'
DE	222°45'	62°45'
EA	330°15'	150°15'