

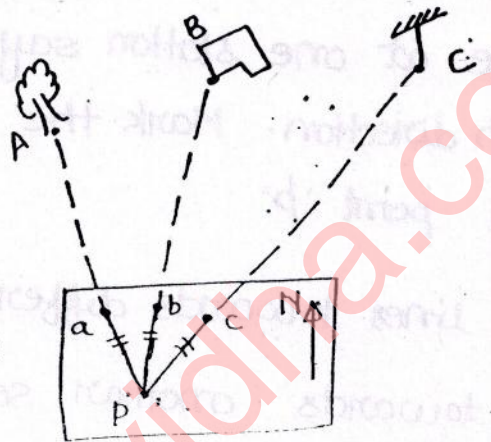
PLANE TABLE SURVEYING

There are 4 methods:-

- | | | |
|------------------|---|---|
| (1) Radiation | } | used for <u>locating</u> the <u>position</u> of objects on the drawing. |
| (2) Intersection | | |
| (3) Traversing | } | used for locating the position of instrument station on the drawing. |
| (4) Resection | | |

(1) Radiation :-

- (i) Fix the table over the station. Make the table in a suitable dirⁿ.



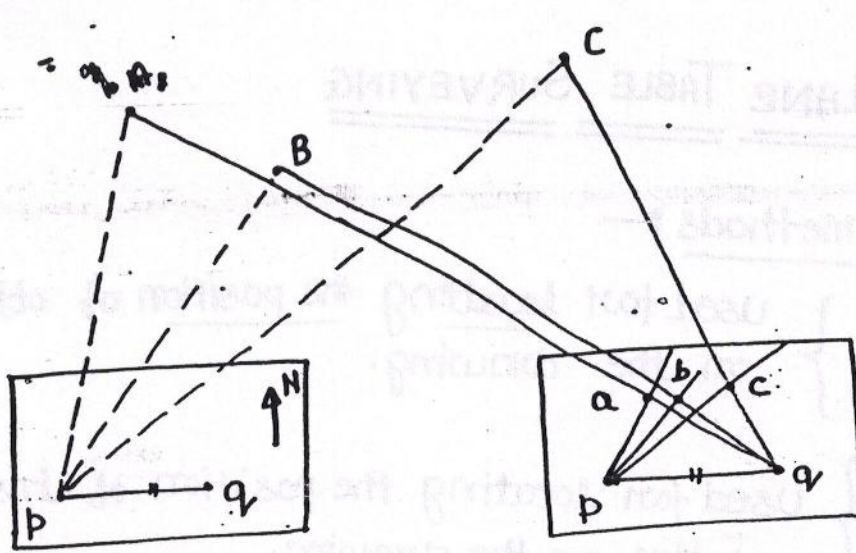
- (ii) Draw orientation line in North dirⁿ.

- (iii) Locate the position of instrument station P' on drawing as P using U-fork.

- (iv) Now draw lines from P towards different objects A, B & C.

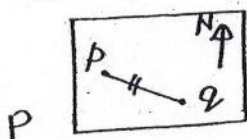
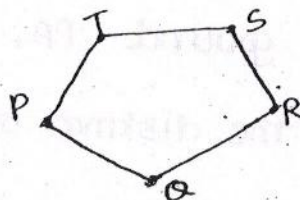
- (v) Measure the distance on ground PA, PB and PC (of objects) from P point and mark the distance on the lines using a suitable scale.

(2) Intersection :-



- (i) Fix the table at one station say 'P'. Draw orientation line in North direction. Mark the location of P on the drawing as point 'p'.
- (ii) Now draw lines towards different objects say A, B & C. Draw a line towards another selected station 'Q'. Measure and mark the distance PQ and get the location of Q.
- (iii) Now shift the table to Q. Correct the orientation of table by compass or by back orientation towards P.
- (iv) Now again draw lines towards different objects. Intersection points will be the location of objects on the drawing.

(3) Traversing 8-



- (i) same as above.
- (ii) Draw a line towards another selected station 'a'. Measure and mark the distance PA and get the location of q.
- (iii) same as above.
- (iv) Now draw the line towards next station & mark the distance.
- (v) This process is repeated till the traverse get closed.

(4) *** Resection :-

→ Resection is the method of locating the position of instrument station on the drawing with the help of already marked position of some objects on the drawing after correcting the orientation of the table.

Methods :-

- ✓ (1) By Compass
- ✓ (2) By back orientation.
- (3) Three point problem.
- (4) Two point problem.

(#) Three point Problem :-

- (1) Tracing paper method.
- (2) Bessel's graphical method.
- (3) Lehman's method.

(1) Tracing Paper Method :-

⇒ ① Put a tracing paper on the drawing.

② From any tentative location of point P, say P' on tracing paper. Draw

3 lines towards station A, B & C.

③ Now rotate the tracing paper on the drawing such that all the 3 points A, B & C come exactly over 3 lines drawn on tracing paper.

④ Transfer location of P' on the drawings that is the correct location of instrument station (P say).

⑤ Now rotate the table such that line Pa is towards A. This is the correct orientation of the table.

⑥ In this position all the lines drawn Aa , Bb & Cc will meet at the single pt. P .

02/01/2014

(2) Bessel's Graphical Method :-

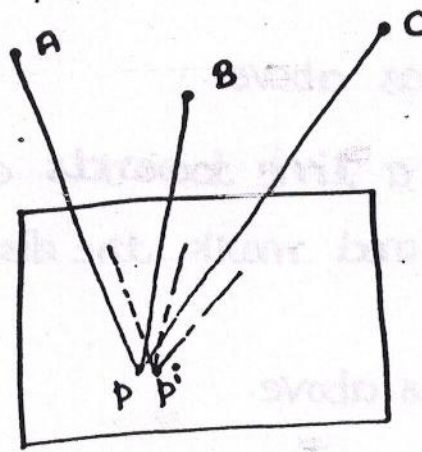
(i) $ab \rightarrow B$

(ii) $b'a \rightarrow A$

(iii) Intersection = P'

rotate $P'C \rightarrow C$

Correct orientation.



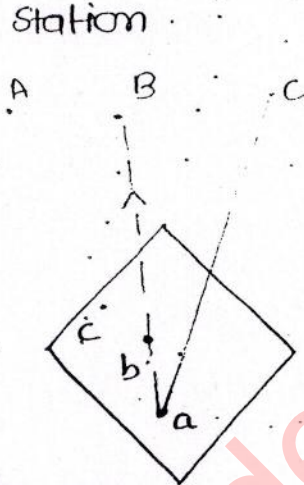
(IV) Join Aa , Bb , Cc at P point.

→ Rotate the table so that line ab is towards B and in this position draw a line from a towards c .

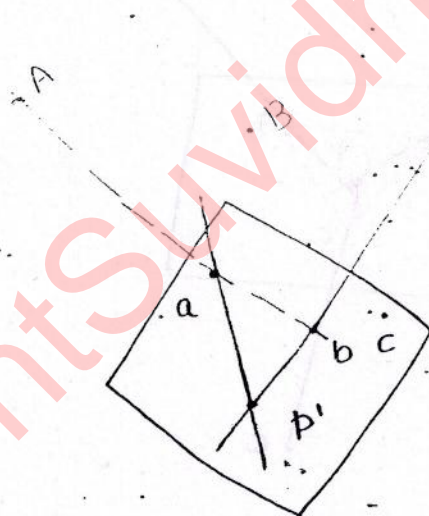
→ Now again rotate the table so that line ba is toward A again draw a line from b towards c .

→ Intersection point of above two lines draw is p' point. Now rotate the table so that $p'c$ is towards C . This is the correct orientation of the table.

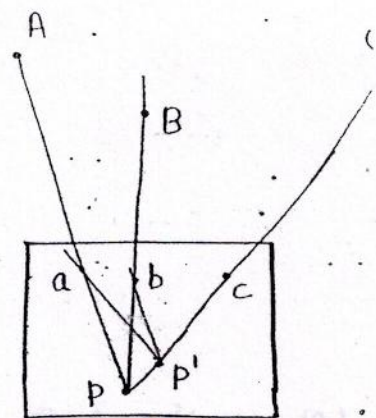
→ In this position draw lines Aa , Bb , & Cc they will get at a single point P that is the location of instrument station.



Step 1 \Rightarrow $\vec{ab} \rightarrow B$



Step-2
 $\vec{ba} \rightarrow A$



Step 3 & 4

(3) Lehman's Method 8-

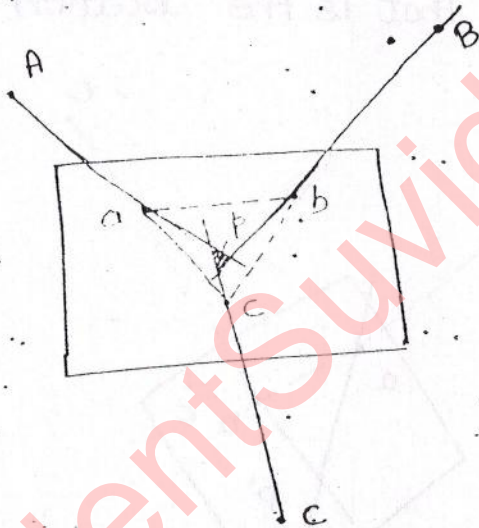
\Rightarrow If orientation of the table is not correct, the lines drawn from 3 points a , b & c will not meet at a single point they will form a triangle called "triangle of error".

⇒ Lehman's method is eliminating this triangle of error by selecting another suitable location of instrument station by following some rules called Lehman's rules so that this triangle of error can be reduced to a point by taking different trials.

⇒ This is also called trial & error method.

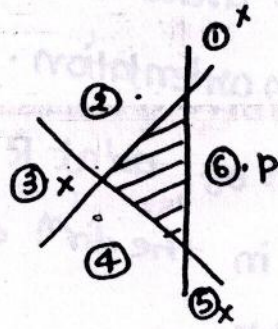
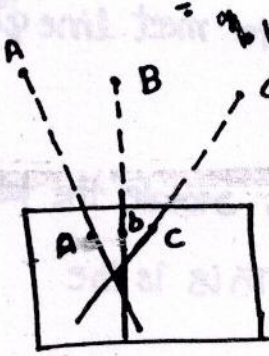
⇒ Lehman's Rules :-

① If the Δ of error is within major triangle abc .
The possible error point shall be within the triangle.



② If the Δ of error is outside the major Δ , the possible point shall be outside the Δ of error.

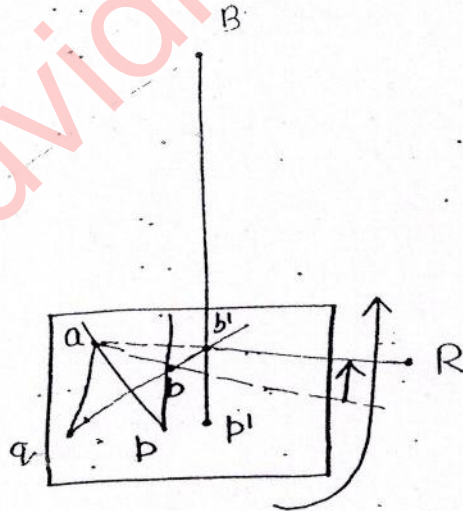
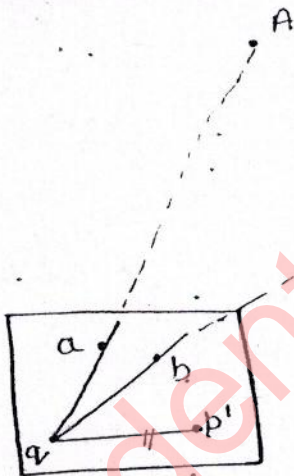
③ The possible point should be taken opposite to the Δ (opposite to the side of a Δ).



④ The possible point should be taken on the same side of all the 3 lines drawn.

⑤ The point P should be selected such that distance pa , pb and pc are proportional to ground distance PA , PB & PC .

Two Point Problem :-



① A & B are the two objects, for which position on the drawing are a & b.

② Fix the table at another station a.

③ keeping approx orientation draw line Aa & Bb to meet at q.

④ Draw a line from q towards p, measure and mark distance qp on the drawing to get point P.

④ Now shift the table to P. draw a line p'B to meet line q'a at b'. $\angle b'ab$ is the error in orientation.

⑤ Now fix a flag in the dirⁿ of ab' at R now rotate the table such that line ab comes in the dirⁿ of R. This is the correct orientation of the table.

⑥ Now draw line Aa & Bb to meet at p that is the correct location of instrument station P.

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