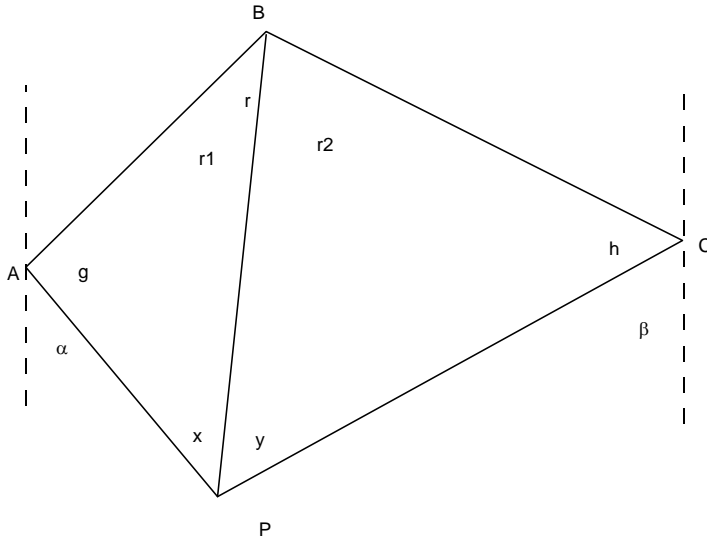


Three Point Resection

Given: Coordinates of three points (A, B, C)

Find: Coordinates of a fourth point that you occupy (P)



Steps to solve for P

1. Occupy P and measure the angles labeled x and y.
2. From the given coordinates calculate distances AB and BC
3. From the given coordinates calculate azimuths AB and BC
4. From azimuths AB and BC calculate the angle labeled r.
5. Determine J (the sum of g+h) by subtracting x, y, and r from 360.
6. Determine the value K from the following relationship

$$K = \frac{\sin(g) \cdot BC \sin(x)}{\sin(h) \cdot AB \sin(y)}$$

7. Now let $g = J - h$ (from 5 above) and substitute into 6.,
8. We have $K \sin(h) = \sin(J - h)$
9. From the difference formula of sines set $\sin(J - h)$ to $\sin(J)\cos(h) - \cos(J)\sin(h)$
10. Substitute into 8 so that we have $K \sin(h) = \sin(J)\cos(h) - \cos(J)\sin(h)$
11. Divide both sides by $\cos(h)$ and you will have $K \tan(h) = \sin(J) - \cos(J)\tan(h)$
12. Rearranging gives $\tan(h) = \frac{\sin(J)}{K + \cos(J)}$
13. Remember that $J = g + h$ you can solve for h and then g
14. Calculate r1
15. Using the law of sines calculate AP
16. Calculate the angle α representing the bearing of AP
17. Determine the latitude and departure for AP
18. Calculate the coordinates Px and Py
19. You can repeat steps 14-18 calculating r2, CP, β , and latitude and departure CP so that you can determine Px and Py from C as a check.