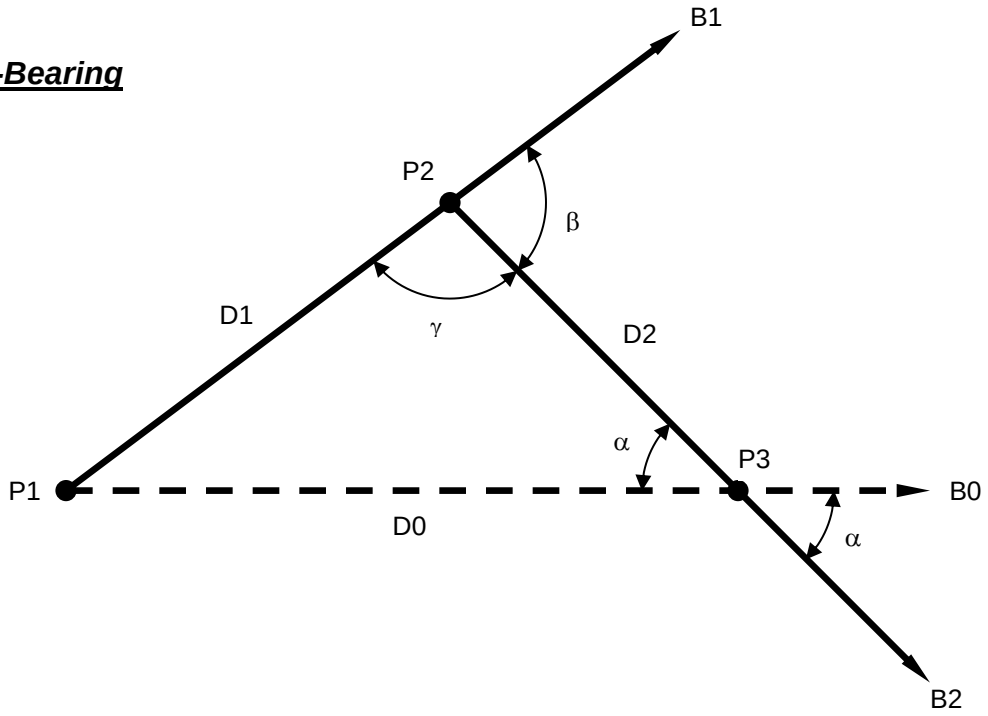
Bearing-Bearing



Note:	P1, P3 known implies…		B0, D0 known
Given:	B0	base bearing	(azimuth)
	D0	base distance	
	B1	initial bearing	(azimuth)
	B2	closing bearing	(azimuth)
Find:	D1	initial distance…	

$$\alpha = B2 - B0$$

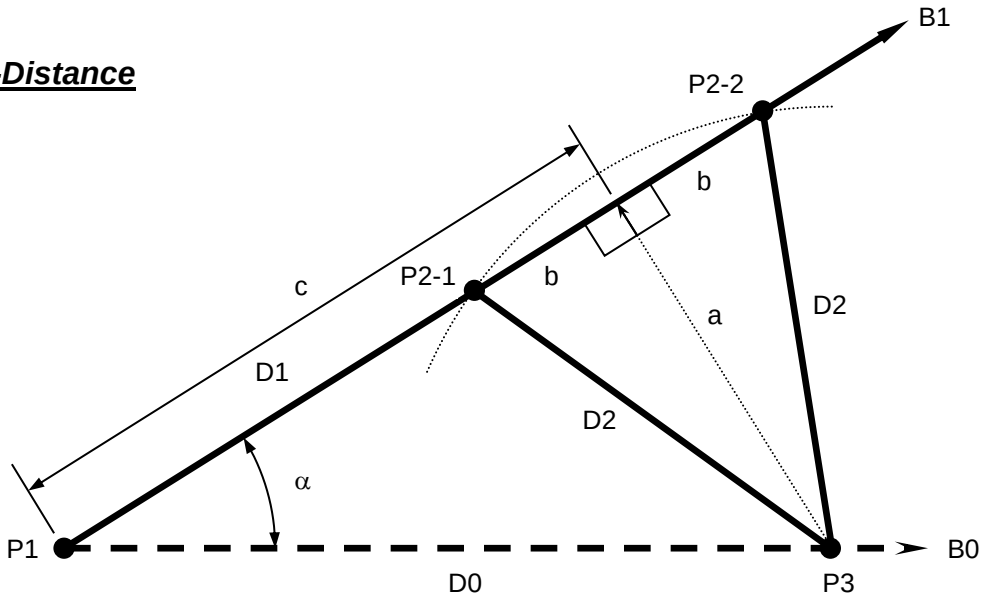
$$\beta = B2 - B1$$

$$sin(\gamma) = sin(\beta)$$

$$\frac{D1}{sin(\alpha)} = \frac{D0}{sin(\gamma)}$$

$$\boxed{B1 = D0 \cdot \frac{sin(B2 - B0)}{sin(B2 - B1)}}$$

Bearing-Distance



Note:	P1, P3 known implies…		B0, D0 known
Given:	B0	base bearing	(azimuth)
	D0	base distance	
	B1	initial bearing	(azimuth)
	D2	closing distance	
Find:	D1	initial distance…	

$$\alpha = B0 - B1$$

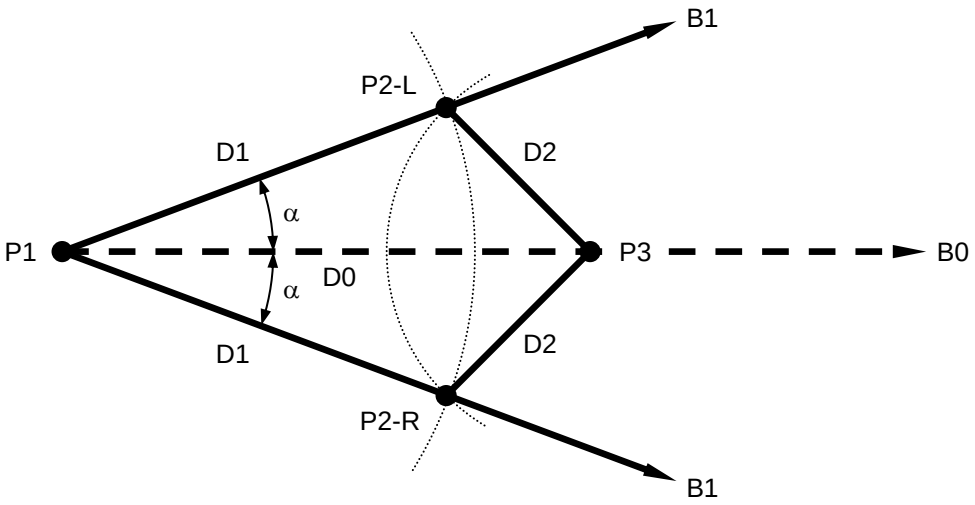
$$a = D0 \cdot sin(\alpha) \qquad c = D0 \cdot cos(\alpha)$$

$$b^2 = D2^2 - a^2$$

$$D1 = c \pm b$$

$$D1 = D0 \cdot cos(B0 - B1) \pm \sqrt{D2^2 - D0^2 \cdot \sin^2(B0 - B1)}$$

Distance-Distance



Note:	P1, P3 known implies…		B0, D0 known
Given:	B0	base bearing	(azimuth)
	D0	base distance	
	D1	initial distance	
	D2	closing distance	
Find:	B1	initial bearing…	

$$D2^2 = D0^2 + D1^2 - 2 \cdot D0 \cdot D1 \cdot cos(\alpha)$$

$$\alpha = acos\left(\frac{D0^2 + D1^2 - D2^2}{2 \cdot D0 \cdot D1}\right)$$

$$B1 = B0 \pm \alpha$$

$$\boxed{B1 = B0 \pm acos\left(\frac{D0^2 + D1^2 - D2^2}{2 \cdot D0 \cdot D1}\right)}$$