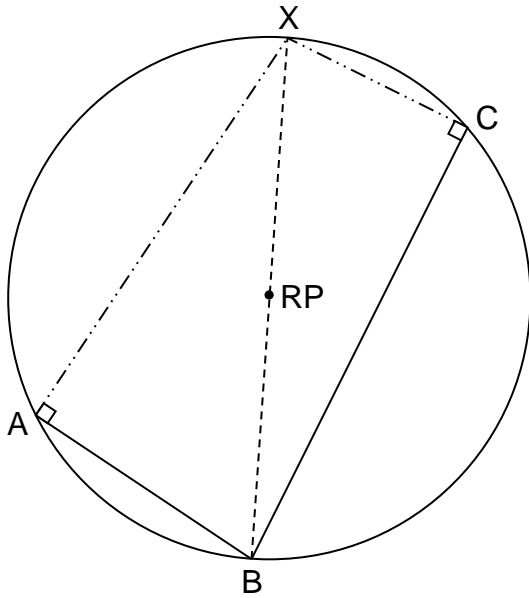


THREE-POINT CIRCLE



Example:

A =	5.0000 N	10.0000 E
B =	3.0000 N	13.0000 E
C =	9.0000 N	16.0000 E
X =	10.2500 N	13.5000 E
RP =	6.6250 N	13.2500 E

$$\begin{bmatrix} 5 - 3 & 10 - 13 \\ 9 - 3 & 16 - 13 \end{bmatrix} = \begin{bmatrix} 2 & -3 \\ 6 & 3 \end{bmatrix}$$

$$\begin{bmatrix} (5 - 3) \cdot 5 & (10 - 13) \cdot 10 \\ (9 - 3) \cdot 9 & (16 - 13) \cdot 16 \end{bmatrix} = \begin{bmatrix} -20 \\ 102 \end{bmatrix}$$

$$\begin{bmatrix} 2 & -3 \\ 6 & 3 \end{bmatrix} \cdot [N_X \quad E_X] = [-20 \quad 102]$$

$$\text{Slope of AB} = \frac{N_A - N_B}{E_A - E_B}$$

$$\text{Slope of AX} = \frac{-1}{\left(\frac{N_A - N_B}{E_A - E_B}\right)} = -\frac{E_A - E_B}{N_A - N_B}$$

$$\text{Equation of AX} = \frac{N - N_A}{E - E_A} = -\frac{E_A - E_B}{N_A - N_B}$$

$$(N_A - N_B) \cdot (N - N_A) = -(E_A - E_B) \cdot (E - E_A)$$

$$(N_A - N_B) \cdot N - (N_A - N_B) \cdot N_A = -(E_A - E_B) \cdot E + (E_A - E_B) \cdot E_A$$

$$(N_A - N_B) \cdot N + (E_A - E_B) \cdot E = (N_A - N_B) \cdot N_A + (E_A - E_B) \cdot E_A$$

$$\text{Slope of CB} = \frac{N_C - N_B}{E_C - E_B}$$

$$\text{Slope of CX} = \frac{-1}{\left(\frac{N_C - N_B}{E_C - E_B}\right)} = -\frac{E_C - E_B}{N_C - N_B}$$

$$\text{Equation of CX} = \frac{N - N_C}{E - E_C} = -\frac{E_C - E_B}{N_C - N_B}$$

$$(N_C - N_B) \cdot (N - N_C) = -(E_C - E_B) \cdot (E - E_C)$$

$$(N_C - N_B) \cdot N - (N_C - N_B) \cdot N_C = -(E_C - E_B) \cdot E + (E_C - E_B) \cdot E_C$$

$$(N_C - N_B) \cdot N + (E_C - E_B) \cdot E = (N_C - N_B) \cdot N_C + (E_C - E_B) \cdot E_C$$

$$\begin{bmatrix} N_A - N_B & E_A - E_B \\ N_C - N_B & E_C - E_B \end{bmatrix} \cdot \begin{bmatrix} (N_A - N_B) \cdot N_A + (E_A - E_B) \cdot E_A \\ (N_C - N_B) \cdot N_C + (E_C - E_B) \cdot E_C \end{bmatrix}$$