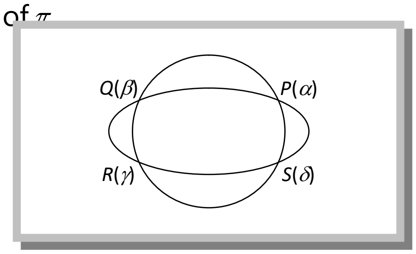
Concyclic points.

Any circle intersects an ellipse in two or four points. They are called concyclic points and the sum of their eccentric angles is an even multiple of π.



If $\alpha, \beta. \gamma, \delta$ be the eccentric angles of the four concyclic points on an ellipse, then $\alpha+\beta+\gamma+\delta=2n\pi$, where n is any integer.

Note: The common chords of a circle and an ellipse are equally inclined to the axes of the ellipse.

Important Tips

- The centre of a circle $x^2+y^2+2gx+2fy+c=0$ passing through the three points, on an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ (whose eccentric angles are a, β, γ) is $-g=\left(\frac{a^2-b^2}{4a}\right)\{\cos\alpha+\cos\beta+\cos\gamma+\cos(\alpha+\beta+\gamma)\}$ and $-f=\left(\frac{b^2-a^2}{4a}\right)\{\sin\alpha+\sin\beta+\sin\gamma-\sin(\alpha+\beta+\gamma)\}$

- $P'CP$ and $D'CD$ are conjugate diameters of an ellipse and α is the eccentric angles of P. Then the eccentric angles of the point where the circle through P, P', D again cuts the ellipse is $\pi/2-3\alpha$.