

Locus: The curve described by a point which moves under given condition or conditions is called its locus.

Equation to the locus of a point: The equation to the locus of a point is the relation, which is satisfied by the coordinates of every point on the locus of the point.

Algorithm to find the locus of a point

Step I: Assume the coordinates of the point say (h, k) whose locus is to be found.

Step II: Write the given condition in mathematical form involving h, k .

Step III: Eliminate the variable (s) , if any.

Step IV: Replace h by x and k by y in the result obtained in step III. The equation so obtained is the locus of the point which moves under some stated condition (s)

Note: Locus of a point P which is equidistant from the two point A and B is a straight line and is a perpendicular bisector of line AB .

□ In above case if $PA = kPB$ where $k \neq 1$, then the locus of P is a circle.

□ Locus of P if A and B is fixed.

(a) Circle, if $\angle APB = \text{constant}$

(b) Circle with diameter AB , if $\angle APB = \frac{\pi}{2}$

(c) Ellipse, if $PA + PB = \text{constant}$

(d) Hyperbola, if $PA - PB = \text{constant}$