

Definition.

A parabola is the locus of a point which moves in a plane such that its distance from a fixed point (*i.e.*, focus) in the plane is always equal to its distance from a fixed straight line (*i.e.*, directrix) in the same plane.

General equation of a parabola: Let S be the focus, ZZ' be the directrix and let P be any point on the parabola. Then by definition,

$$SP = PM \quad (\because e = 1)$$

$$\sqrt{(x - \alpha)^2 + (y - \beta)^2} = \frac{Ax + By + C}{\sqrt{A^2 + B^2}}$$

$$\text{Or } (A^2 + B^2)\{(x - \alpha)^2 + (y - \beta)^2\} = (Ax + By + C)^2$$

