

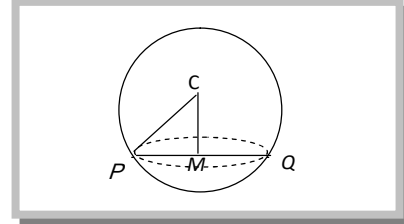
## Section of a sphere by a plane.

Consider a sphere intersected by a plane. The set of points common to both sphere and plane is called a plane section of a sphere. The plane section of a sphere is always a circle. The equations of the sphere and the plane taken together represent the plane section.

Let  $C$  be the centre of the sphere and  $M$  be the foot of the perpendicular from  $C$  on the plane. Then  $M$  is the centre of the circle and radius of the circle

is given by  $PM = \sqrt{CP^2 - CM^2}$

The centre  $M$  of the circle is the point of intersection of the plane and line  $CM$  which passes through  $C$  and is perpendicular to the given plane.



**Centre:** The foot of the perpendicular from the centre of the sphere to the plane is the centre of the circle.

$$(\text{radius of circle})^2 = (\text{radius of sphere})^2 - (\text{perpendicular from centre of spheres on the plane})^2$$

**Great circle:** The section of a sphere by a plane through the centre of the sphere is a great circle. Its centre and radius are the same as those of the given sphere.