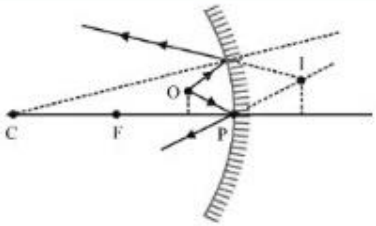
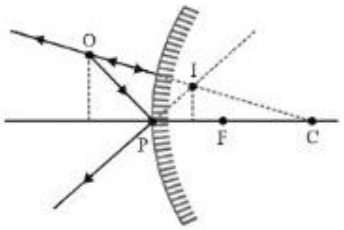
Continued… …….

(c)

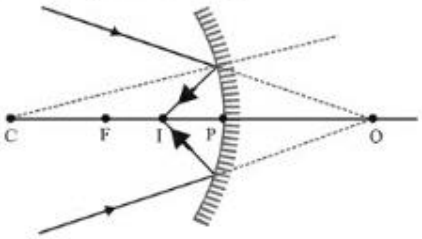


(d)

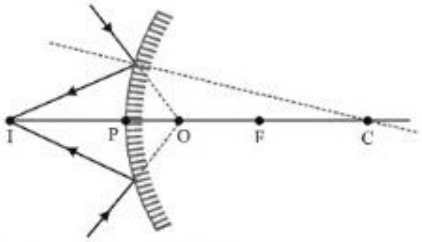


(iii) Virtual object and real image

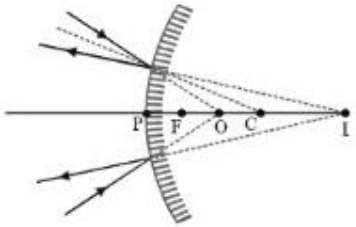
(a)



(b)

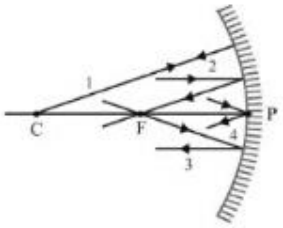


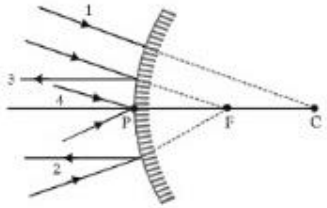
(iv) Virtual object and virtual image



Ray diagrams

We shall consider the small objects and mirrors of small aperture so that all rays are paraxial. To construct the image of a point object two of the following four rays are drawn passing through the object. To construct the image of an extended object the image of two end points is only drawn. The image of a point object lying on principles axis is formed on the principal axis itself. The four rays are as under :





Ray 1 : A ray through the centre of curvature which strikes the mirror normally and is reflected back along the same path.

Ray 2 : A ray parallel to principal axis after reflection either actually passes through the principal focus F or appears to diverge from it.

Ray 3 : A ray passing through the principal focus F or a ray which appears to converge at F is reflected parallel to the principal axis.

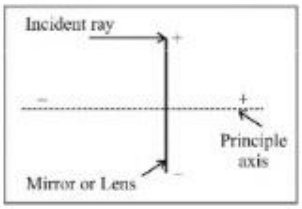
Ray 4 : A ray striking at pole P is reflected symmetrically back in the opposite side.

4.1 Sign conventions

(i) All distances are measured from the pole.

(ii) Distances measured in the direction of incident rays are taken as positive while in the direction opposite of incident rays are taken negative.

(iii) Distances above the principle axis are taken positive and below the principle axis are taken negative.



Note Same sign convention are also valid for lenses.