

## CARDINAL POINTS

In the case of Refraction through a thin lens the thickness of the lens has been neglected in calculating the various formulae.

But we cannot apply the above approximation for an optical system consisting of a combination of lens.

⇒ one way of calculating the position and size of the image formed by an optical system is to consider refraction at each surface of a lens successively but this method is very typical and complex.

⇒ In 1841 Gauss showed that any number of coaxial lenses could be treated as a single unit without the necessity of treating the single surfaces of lenses separately.

The lens formula can be applied to the system provided the distances are measured from two hypothetical parallel planes. These are known as cardinal planes and the points of intersection of these planes with the axis are called the principal points or Gauss's points.

There are six points which characterise a ~~any~~ optical system.

- (i) Two focal points
- (ii) Two principle points
- (iii) Two nodal points

