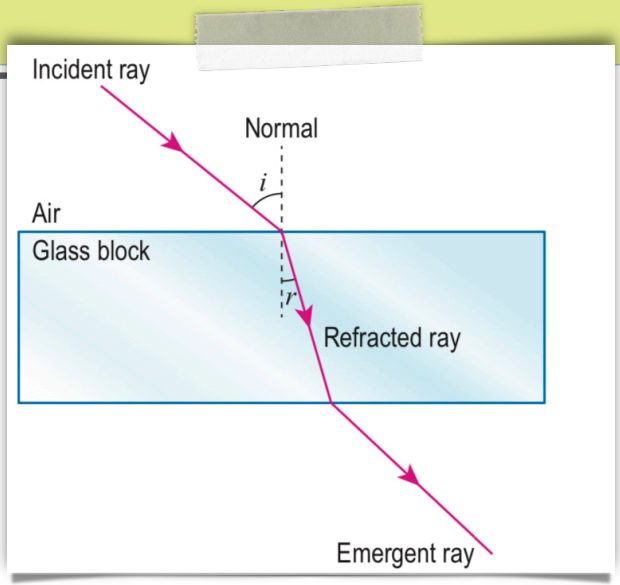
CHAPTER 6 F4

LIGHT

Law of refraction

The incident ray, the refracted ray and normal all lie in the same plane.
The ratio of sin i / sin r is a constant
(Snell's Law)



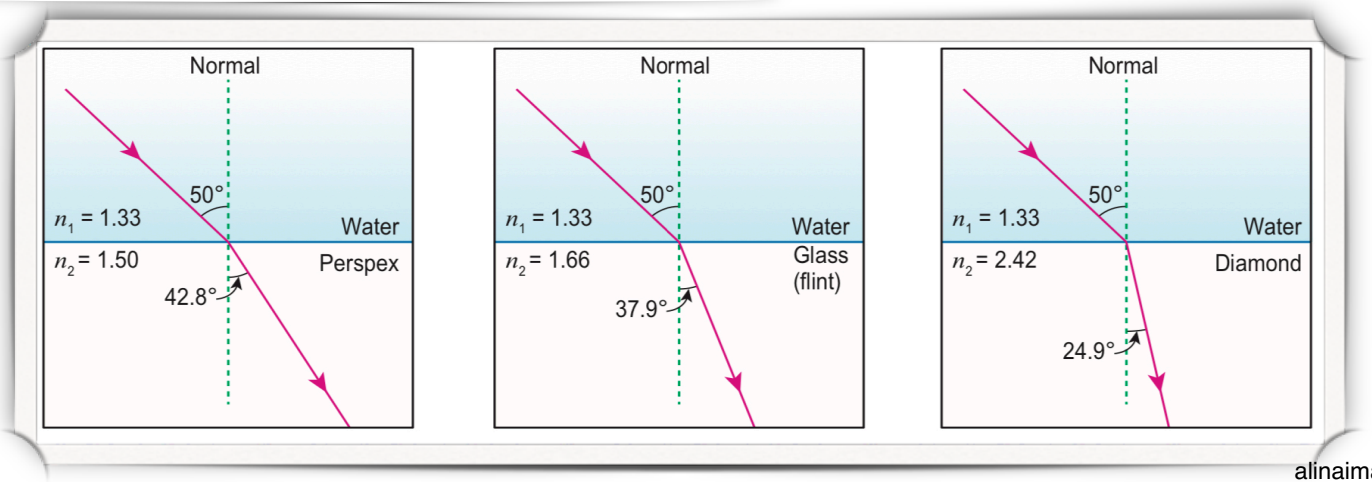
Refraction of light

The bending of light ray at the boundary as it travels from one medium to

Refractive index, n determines the degree to which light bends when traveling from vacuum to a medium

Refractive index, $n = \dfrac{\text{speed of light in vacuum}}{\text{speed of light in medium}} = \dfrac{c}{v}$

where $c = 3.0 \times 10^8$ m s^{-1}



CHAPTER 6 F4

LIGHT

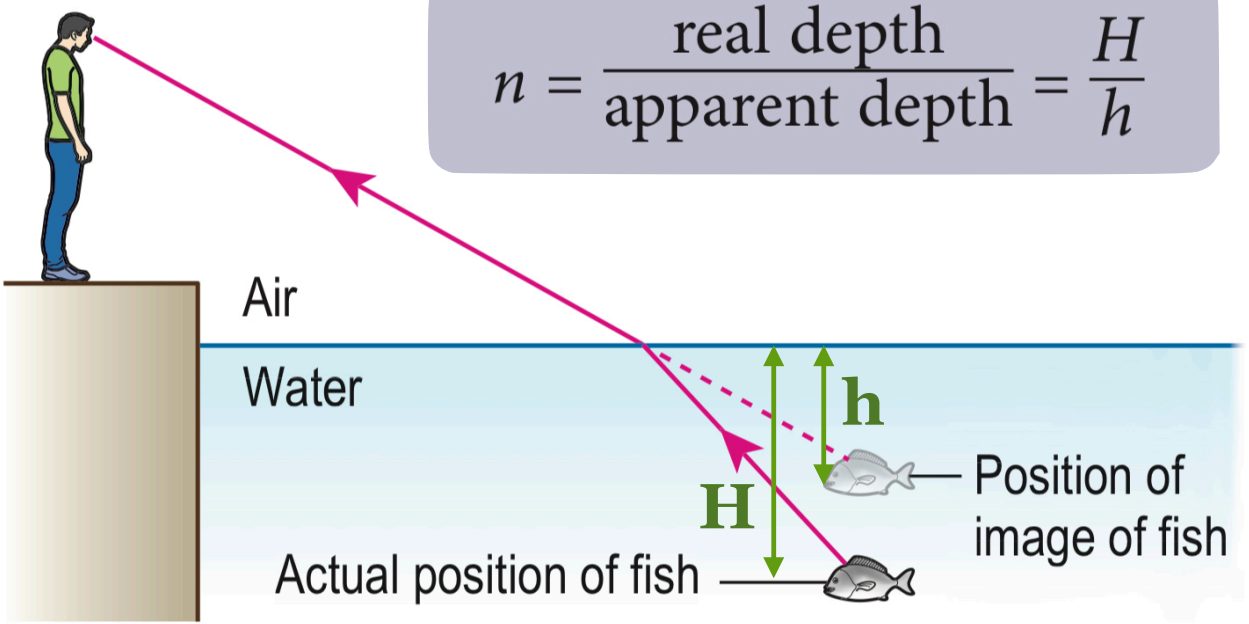
Real depth

The distance of the real object from the surface of a medium (eg: water, glass)

Apparent depth

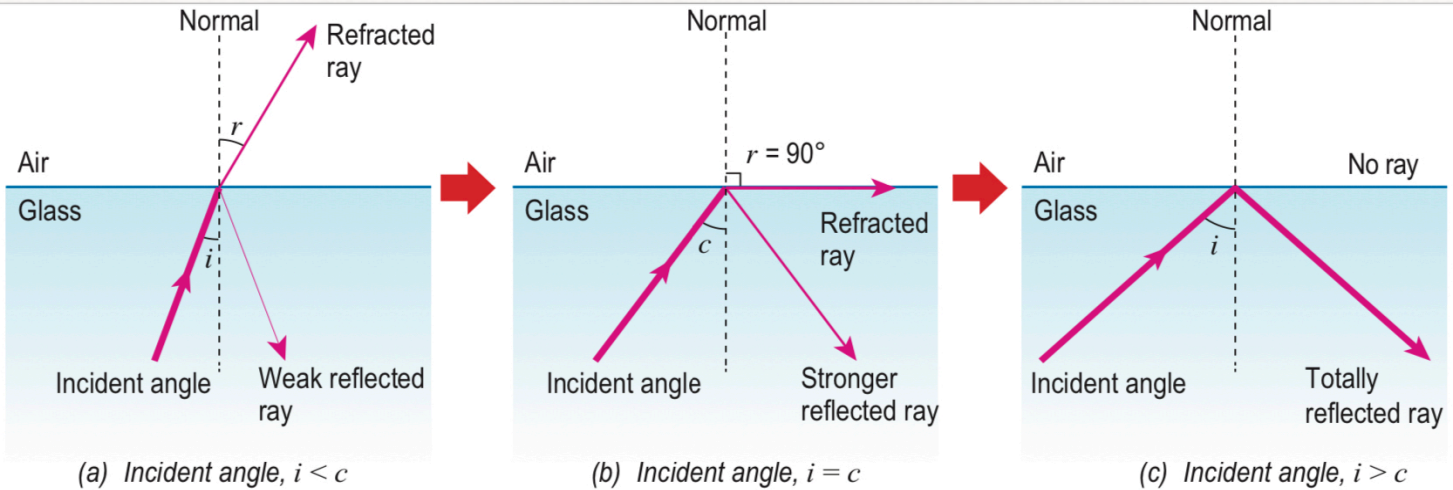
The distance of the virtual image from the surface of the medium (eg: water, glass)

$$n = \frac{\text{real depth}}{\text{apparent depth}} = \frac{H}{h}$$



CHAPTER 6 F4

LIGHT



Critical angle, c is the angle of incidence in the medium of high optical density when the angle of refraction in the medium of lower optical density is equals to 90 degree

light travel from higher density to low density

i > c

CHAPTER 6 F4

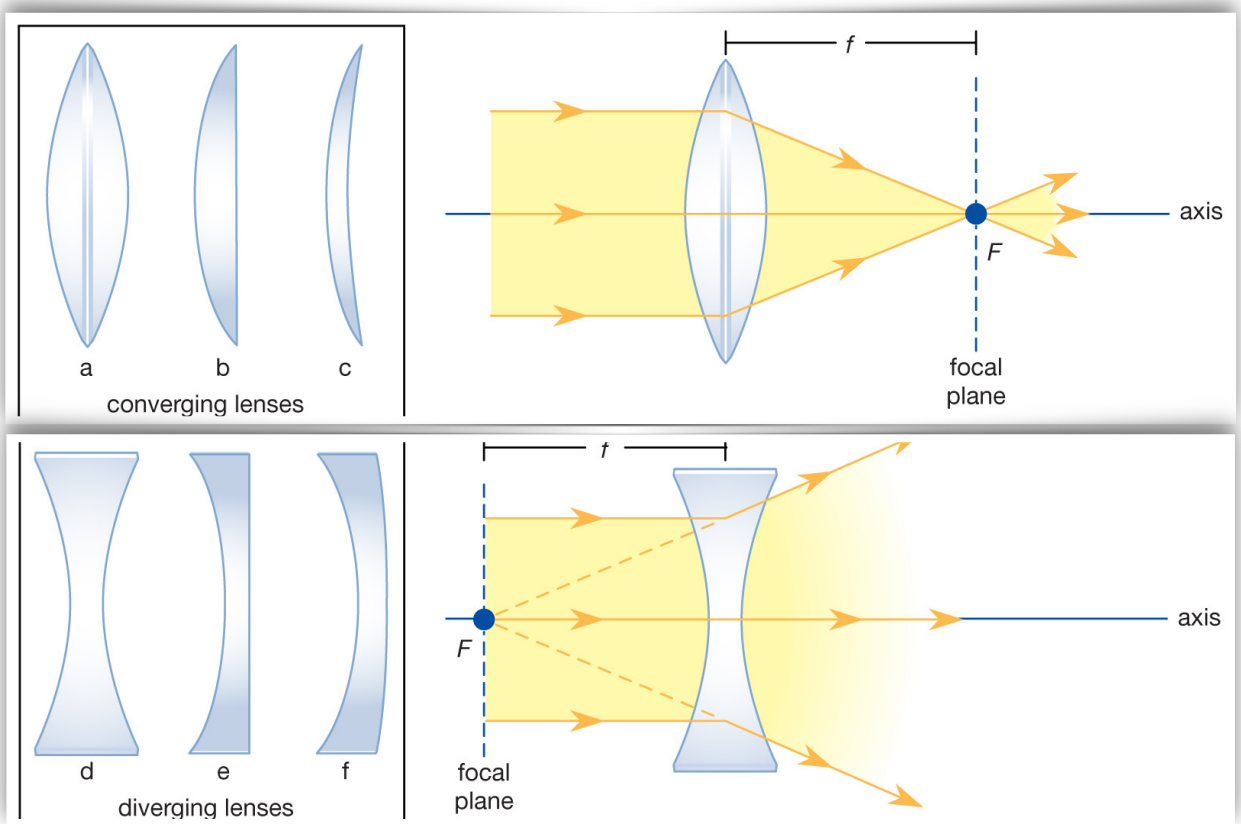
LIGHT

Real image

The image that can be formed / displayed on a screen

Virtual image

The image that cannot be formed on a screen



CHAPTER 6 F4

LIGHT

Focal point , F of a lens

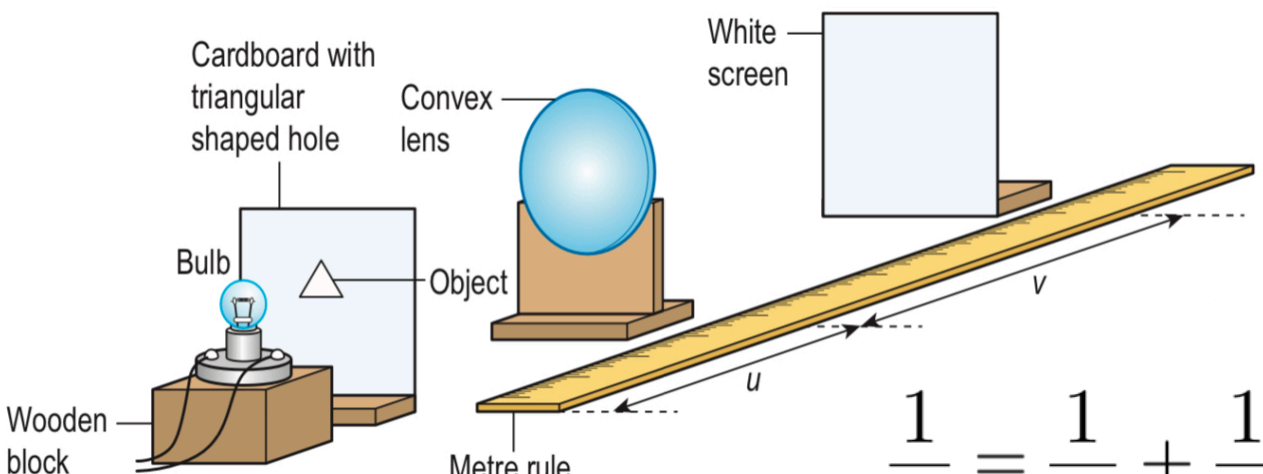
A common point on the principal axis where all the rays parallel to the axis converge to it after passing through a convex lens or appear to diverge from it after passing through a concave lens

Power of lens

The reciprocal of the focal length

Focal length, f

The distance between the focal point and the optical centre



$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

Linear magnification

The ratio of the image size to the object size OR the ratio of the image distance to object distance

$$\text{Linear magnification, } m = \frac{\text{image distance, } v}{\text{object distance, } u}$$

As such, linear magnification can be formulated as,

$$m = \frac{h_i}{h_o} = \frac{v}{u}, \text{ where } \begin{aligned} h_i &= \text{image height} \\ h_o &= \text{object height} \\ v &= \text{image distance} \\ u &= \text{object distance} \end{aligned}$$

Linear magnification, m does not have a unit.

$m < 1$	Image diminished
$m = 1$	Image same size as object
$m > 1$	Image magnified

CHAPTER 6 F4

LIGHT

Law of reflection

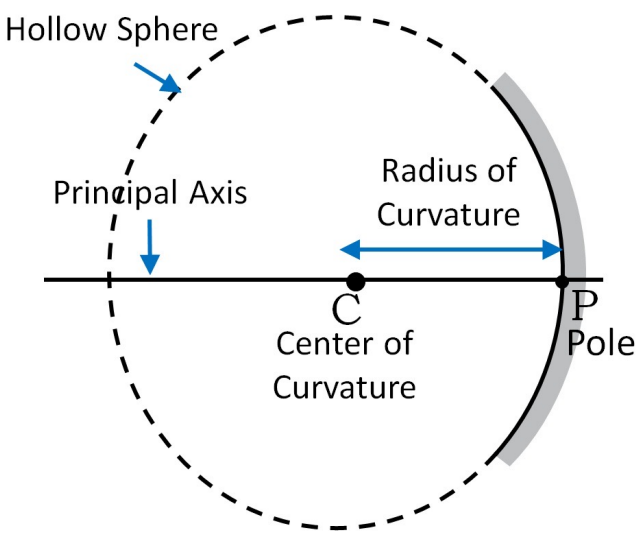
The incident ray, the reflected ray and the normal all lie in the same plane
The angle of incidence is equal to the angle of reflection

Principle axis of a curved mirror

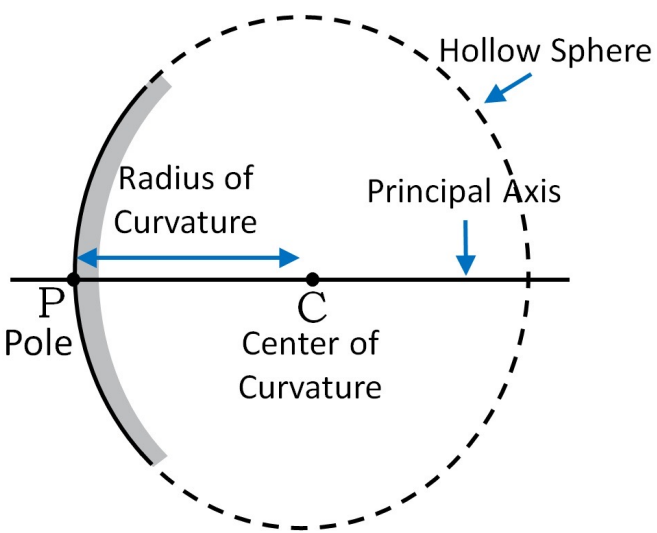
The line passing through the vertex, P and the centre of curvature, C

Mirrors as a part of Sphere

Concave Mirror

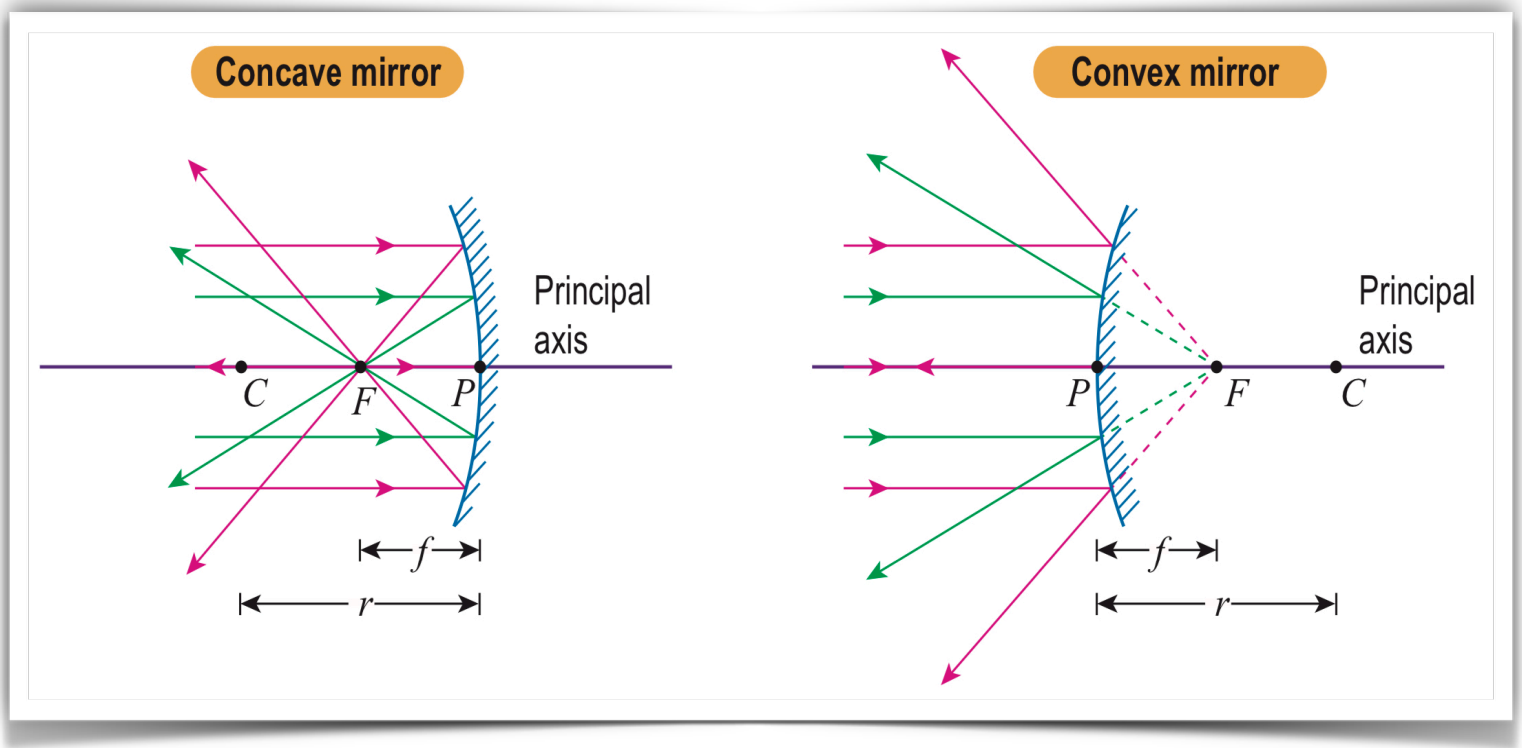


Convex Mirror



CHAPTER 6 F4

LIGHT



converging

diverging