

CLASS 7

LIGHT

Light is a form of energy which enables us to see.

Light always travel in straight line.
This is known as RECTILINEAR

PROPAGATION of LIGHT.

REFLECTION of LIGHT -

The phenomenon of bouncing of light energy when it travels/falls on any object is called REFLECTION of ENERGY.

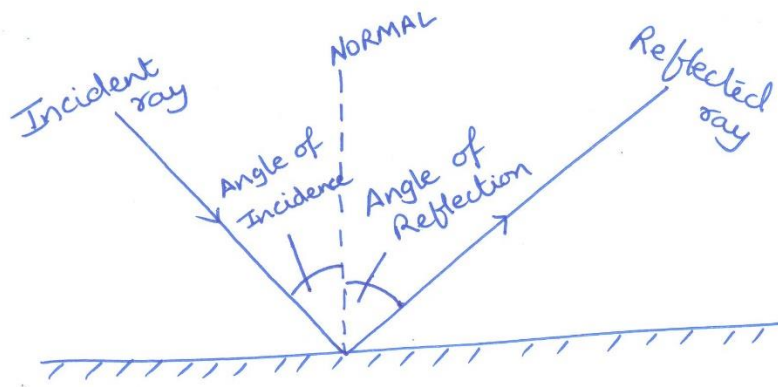


IMAGE -

The identical object that we see in a mirror is called IMAGE.

Images are of 2 types -
Virtual & Real.

VIRTUAL IMAGE

The image that cannot be formed on the screen is called VIRTUAL IMAGE.

It is always erect.

Plane mirror and Convex mirror always form virtual image.

REAL IMAGE

The image that can be formed on the screen is called REAL IMAGE.

It is always inverted.

Concave mirror always form real image.

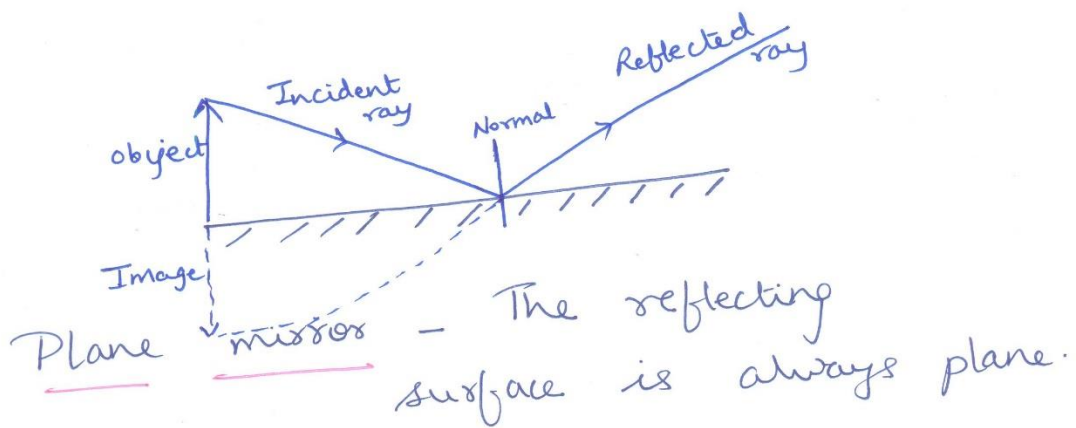
CHARACTERISTICS OF IMAGES FORMED BY A

PLANE MIRROR

- ① Image is of same size of the object.
- ② Image and object are equidistant.
- ③ Image is always erect.
- ④ The left of object appears as right of image and vice versa.

This is called LATERAL INVERSION.

- ③ The image is virtual and is formed behind the mirror.



The image formed by plane mirror is always virtual, same sized, erect.

SPHERICAL MIRRORS -

Curved polished surface is called Spherical Mirrors.

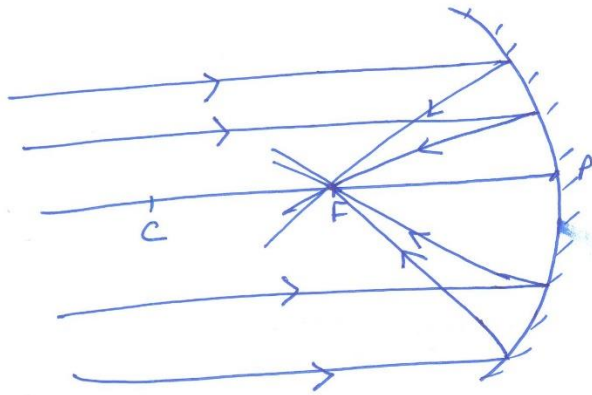
CONCAVE (CONVERGING) CONVEX (DIVERGING)

- The reflecting surface of mirror is bulged inwards.
- Image is erect when near and inverted when mirror is far.
- Image is laterally inverted.
- Object distance is not always equal to image distance.
- The reflecting surface of mirror is bulged outward.
- Image is always erect.
- Image size is laterally inverted.
- Object distance is not always equal to image distance.



SPHERICAL MIRRORS

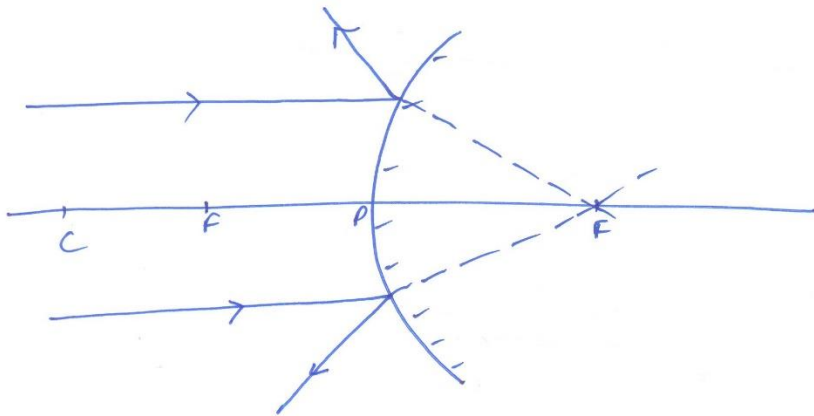
CONCAVE MIRROR — Converging mirror



Focal length - Distance between Pole (P) and Principal focus (F).

- * Concave mirror always forms real and inverted image.
- * It also forms virtual image in one case when the object is very close by (ie, between F and P).
- * Virtual image formed is highly enlarged.

CONVEX MIRROR - Diverging mirror

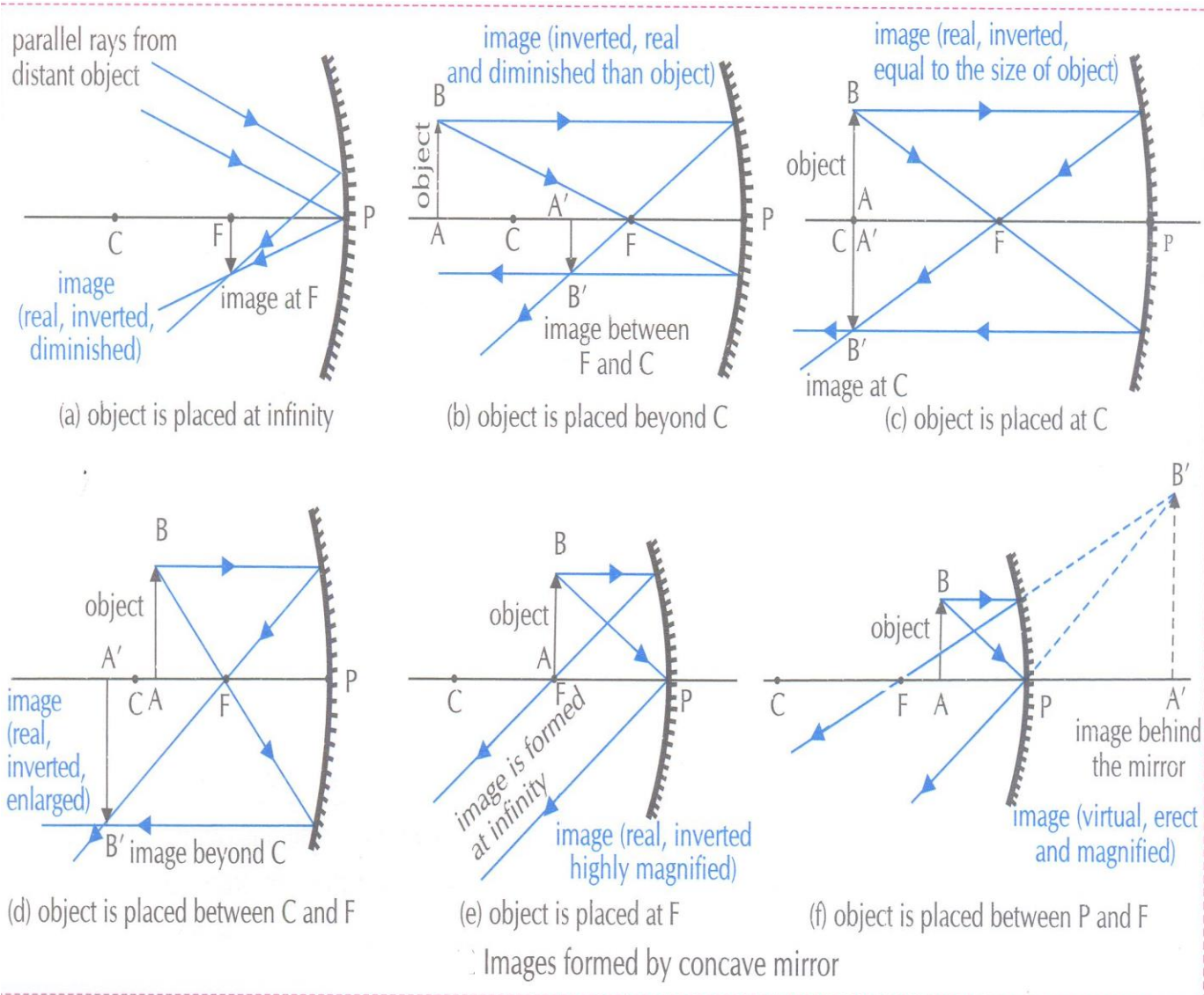


- * Convex mirrors always form virtual and erect image.
- * The image formed is always smaller in size.

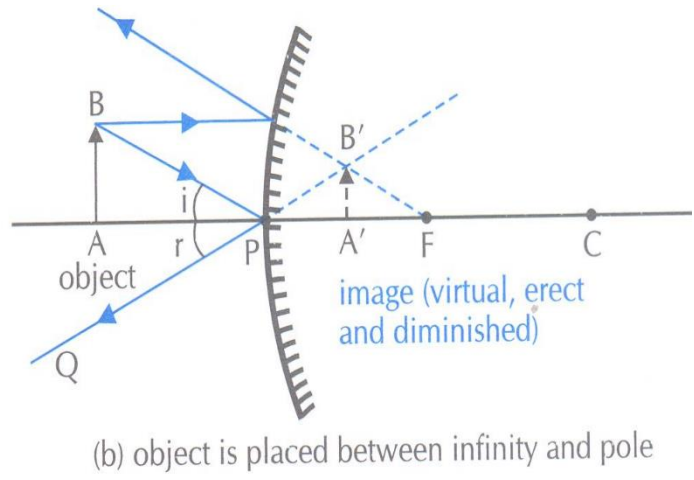
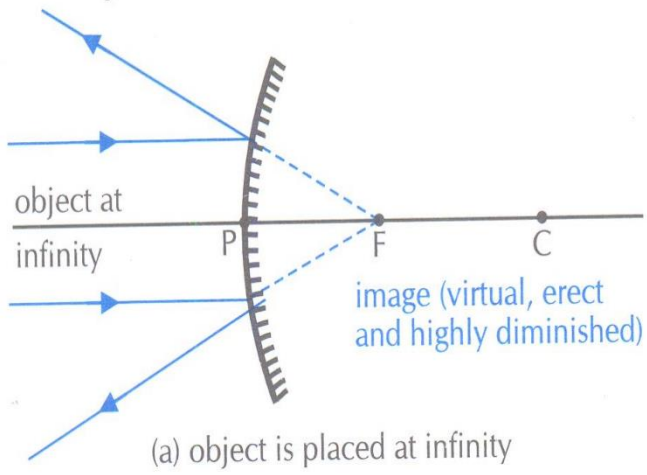
C - Centre of Curvature

P - Pole

F - Principal focus



FOR CONVEX MIRROR



USES OF CONCAVE & CONVEX MIRROR

CONCAVE MIRRORS -

- ① Used as doctor's mirror.
- ② Used as shaving mirror
- ③ Used in reflectors of torches and headlights of cars and scooters.

CONVEX MIRRORS -

- ① Used as rear view mirror of cars and other vehicles.
- ② Used as vigilance mirrors in shops.

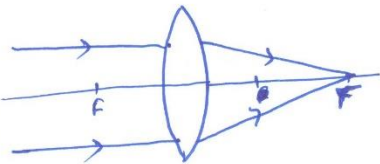
LENS -

Any transparent medium bounded by curved surfaces is called a LENS.

CONVEX LENS



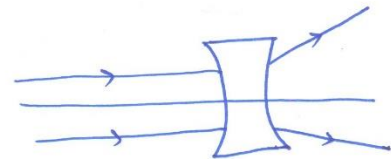
Converging lens

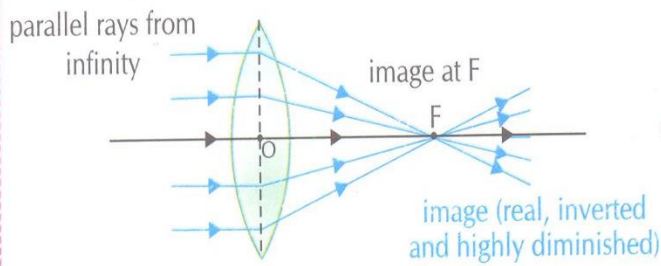


CONCAVE LENS

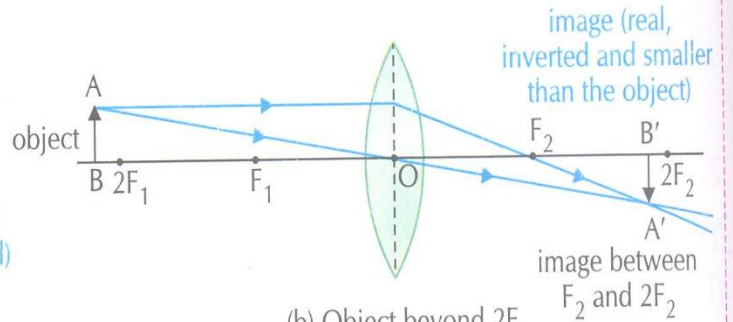


Diverging lens

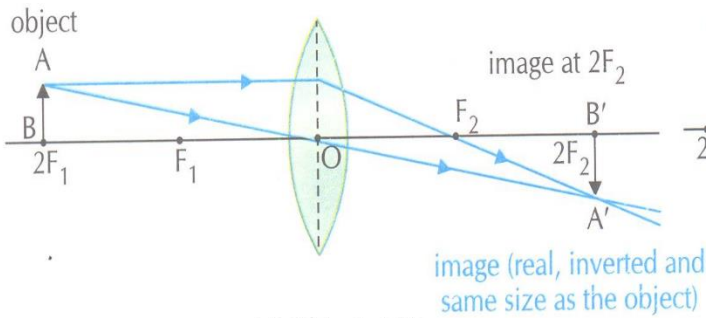




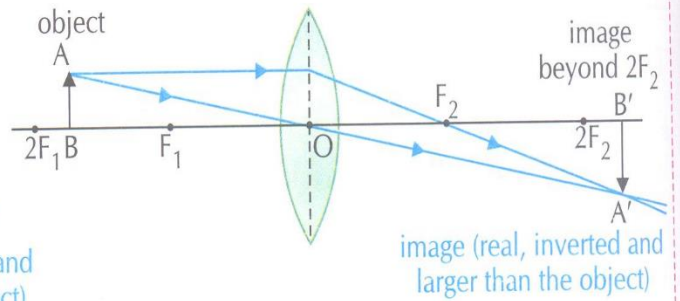
(a) Object at infinity



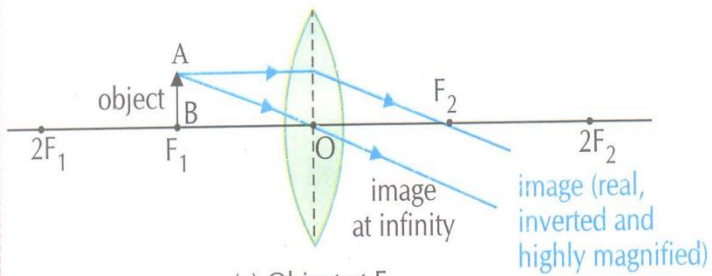
(b) Object beyond $2F_1$



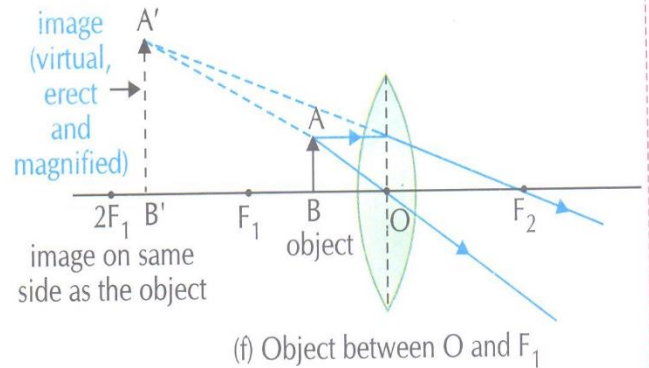
(c) Object at $2F_1$



(d) Object between F_1 and $2F_1$



(e) Object at F_1



(f) Object between O and F_1

Fig. 3.10 Nature of images formed by a convex lens for different positions of the object

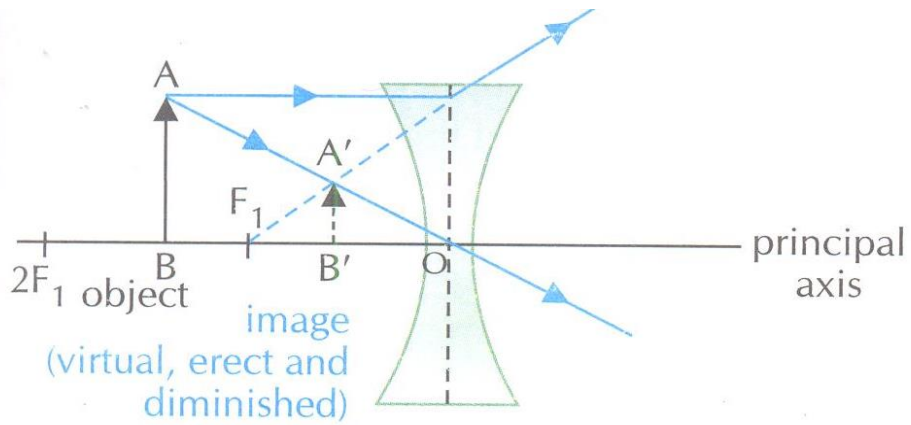
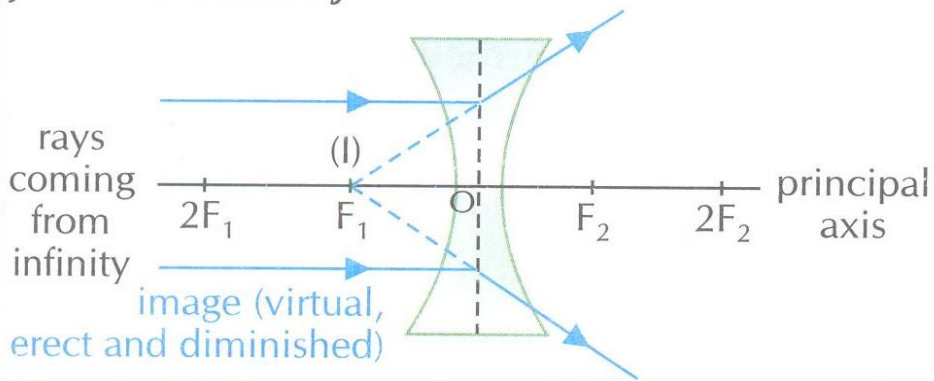


Fig. 30.2 Image formed by a concave lens when object is between F_1 and $2F_1$

Object is at infinity



USES OF SPHERICAL LENSES

CONVEX LENS

- ① Used as a magnifying glass.
- ② Used in spectacles for those who cannot see the near objects clearly.
- ③ Used in microscopes.

CONCAVE LENS -

- ① Used in spectacles for those persons who cannot see the far objects clearly.
- ② Used in cameras.
- ③ Used in microscope and telescope.

1) DISPERSION OF LIGHT

The process of splitting of white light into seven colours is called DISPERSION of light.

The Seven Colours are -

VIBGYOR - Violet, Indigo, Blue,
Green, Yellow, Orange,
Red

CASES

Q. How Rainbow forms ?

Ans - Rainbow forms when sunlight passes through tiny water droplets present in atmosphere after rain.

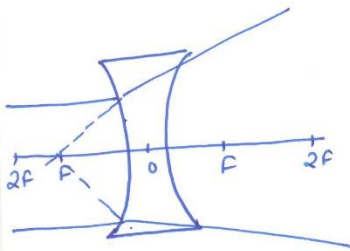
When white light passes through tiny water droplets, it splits into seven constituent colours of light.

* When white light reflects from the surface of CD many colours are seen.

* when we ^{blow} Soap bubbles, we see many colours.

The band of seven colours formed on a white screen, when light passes through prism is called SPECTRUM of white light.

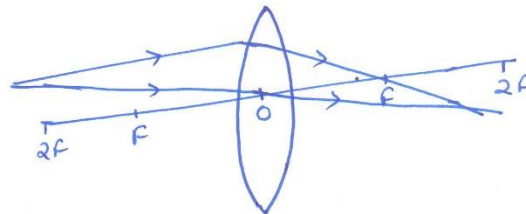
Concave lens -



Virtual, Erect image

Diverging lens

Convex lens -



Real, inverted image

Converging lens

F - Focus

2F - Twice of focus

O - Optical Centre