

# Activity 21

## OBJECTIVE

To construct different types of conic sections.

## MATERIAL REQUIRED

Transparent sheet, scissors, hardboard, adhesive, white paper.

## METHOD OF CONSTRUCTION

1. Take a hardboard of convenient size and paste a white paper on it.
2. Cut a transparent sheet in the shape of sector of a circle and fold it to obtain a right circular cone as shown in Fig.21.1.
3. Form 4 more such cones of the same size using transparent sheet. Put these cones on a hardboard.
4. Cut these cones with a transparent plane sheet in different positions as shown in Fig. 21.2 to Fig. 21.5.

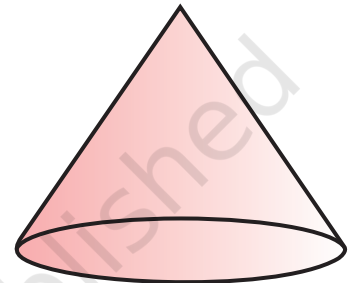


Fig 21.1

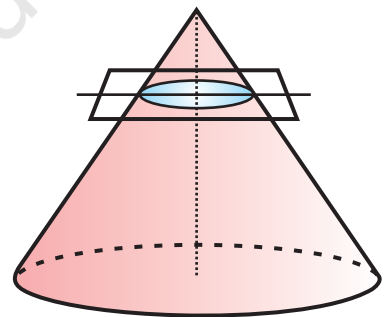


Fig 21.2

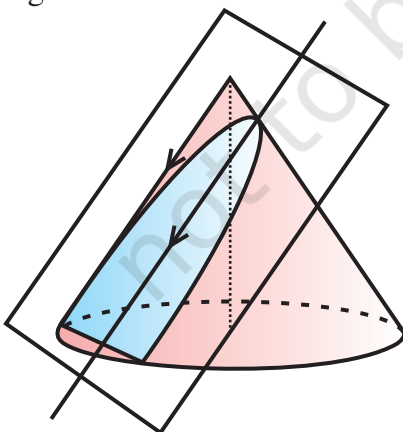


Fig 21.4

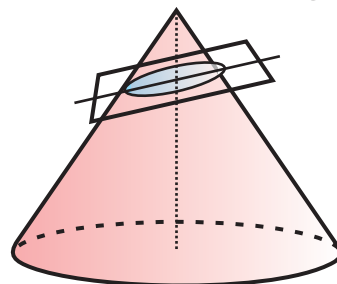


Fig 21.3

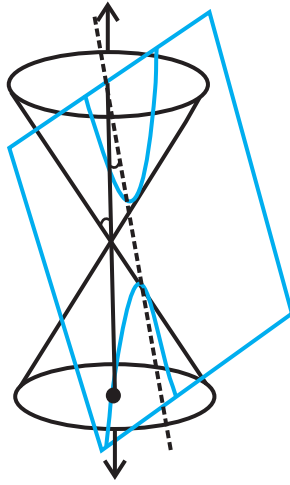


Fig 21.5

### DEMONSTRATION

1. In Fig. 21.2, the transparent plane sheet cuts the cone in such a way that the sheet is parallel to the base of the cone. The section so obtained is a circle.
2. In Fig. 21.3, the plane sheet is inclined slightly to the axes of the cone. The section so obtained is an ellipse.
3. In Fig. 21.4, the plane sheet is parallel to a generator (slant height) of the cone. The section so obtained is a parabola.
4. In Fig. 21.5 the plane is parallel to the axis of the cone. The sections so obtained is a part of a hyperbola.

### OBSERVATION

1. In Fig. 21.2, the transparent plane sheet is \_\_\_\_\_ to the base of the cone. The section obtained is \_\_\_\_\_.
2. In Fig. 21.3, the plane sheet is inclined to \_\_\_\_\_. The conic section obtained is \_\_\_\_\_.
3. In Fig. 21.4, the plane sheet is parallel to the \_\_\_\_\_. The conic section so obtained is \_\_\_\_\_.
4. In Fig. 21.5, the plane sheet is \_\_\_\_\_ to the axis. The conic section so obtained is a part of \_\_\_\_\_.

## APPLICATION

This activity helps in understanding various types of conic sections which have wide spread applications in real life situations and modern sciences. For example, conics have interesting geometric properties that can be used for the reflection of light rays and beams of sound, i.e.

1. Circular disc reflects back the light issuing from centre to the centre again.
2. Elliptical disc reflects back the light issuing from one focus to the other focus.
3. Parabolic disc reflects back the light issuing from one focus parallel to its axis.
4. Hyperbolic disc reflects back the light issuing from one focus as if coming from other focus.