

KSU CET UNIT

FIRST YEAR NOTES



10

Conversion of pictorial views into orthographic views.

Conversion of pictorial views into orthographic views requires sound knowledge of both orthographic projection and isometric projection. Orthographic views can be drawn by two methods:

1. First angle projection method.
2. Third angle projection method.

In first angle projection method, the object is assumed to be kept in the first quadrant, i.e. above HP and in front of VP, and then projected on these planes.

In third angle projection method, the object is assumed to be kept in the third quadrant, i.e. below HP and behind VP and then projected on these planes.

In this book, first angle projection method is used to draw the orthographic views. For converting a pictorial view of an object into orthographic views, i.e, front view, top view and side view, the direction from which the object is to be viewed is indicated by an arrow.

The view from this direction is the front view of the object. The top view should be drawn below this front view and the side view should be drawn at the right side or left side of the elevation. In first angle projection method the view from right side of the object should be drawn at the left side of the front view and view from left side of the object should be drawn at the right side of front view. Fig.10.1 shows the pictorial view of a rectangular prism and its orthographic projections.

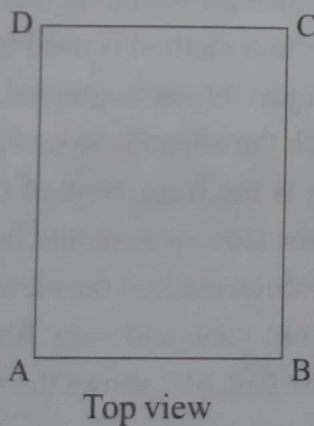
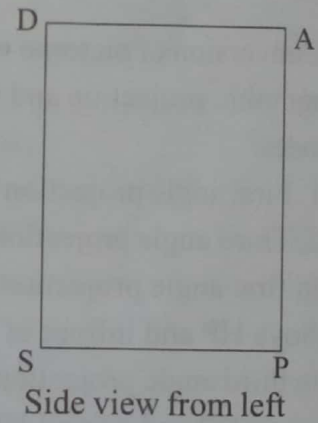
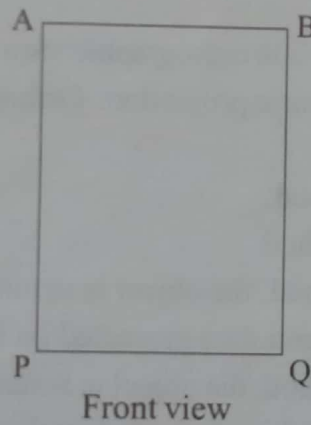
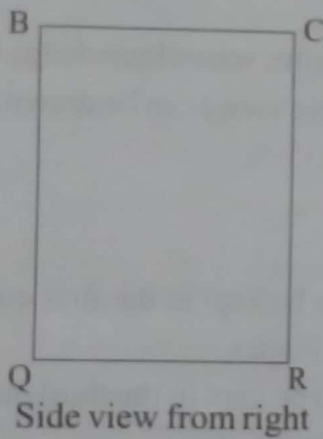
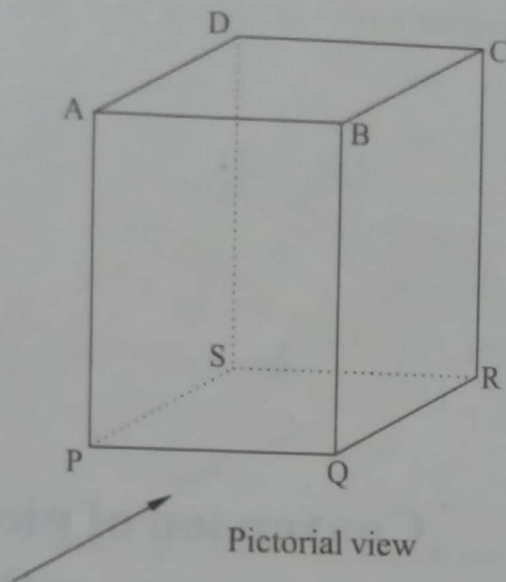
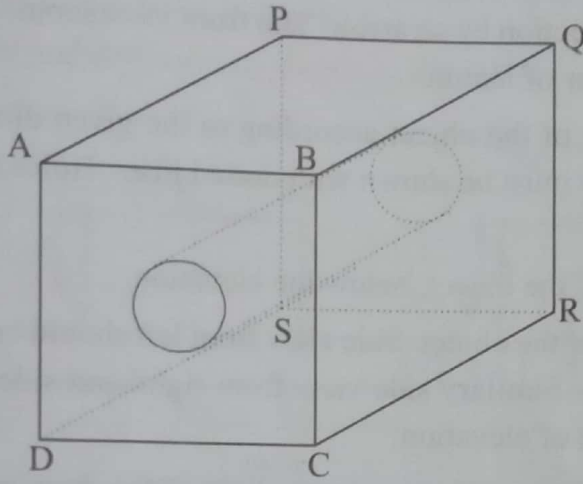


Fig. 10.1

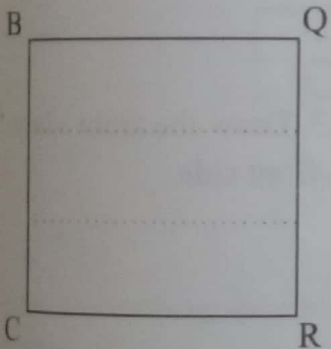
Looking from front (in the direction of arrow), only a square face ABQP can be seen. Looking from top the face ABCD is seen. Looking from left side of the prism the rectangular face APSD can be seen and it is drawn at the right side of the front view. Similarly looking from right side of the prism, the face BCRQ is visible. It is drawn at the left side of front view.

Principles of orthographic projections.

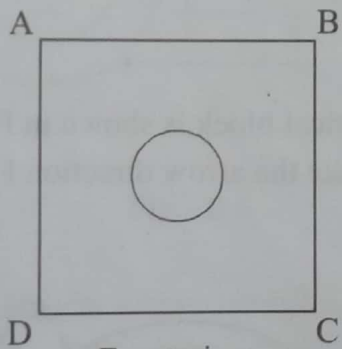
1. The front view and top view are always in line, vertically.
2. The front view and side view are always in line, horizontally.
3. Each view gives two dimensions. The front view gives length and height, the top view gives length and width and the side view gives height and width.



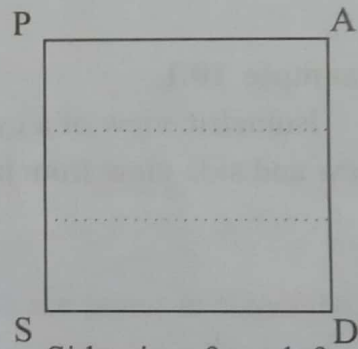
Pictorial view



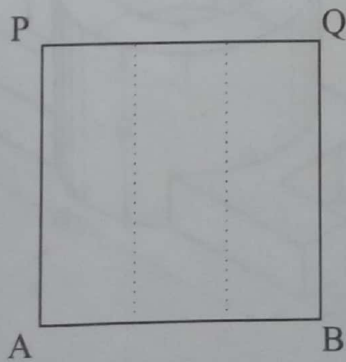
Side view from right



Front view



Side view from left



Top view

Fig. 10.2

4. When a surface is parallel to a plane of projection, then projection of the surface on that plane will be the true shape of the surface.

The following steps are involved in drawing the orthographic views of an object.

1. Determine the number of views required to show all the features of the object. Generally three views, front view, top view and side view are required to identify the object completely.
2. Based on the shape of the object, select the direction of view for the front view of the object. Show this direction by an arrow. The front view should be the one which shows the maximum number of features.
3. Draw the front view of the object according to the given dimensions. If there is any hidden features, they must be shown with dotted lines. Holes and slots must be shown with centreline.
4. Draw the top view of the object, below the elevation.
5. Draw the side view of the object. Side view from left should be drawn at the right hand side of the elevation. Similar side view from righthand side of the object should be drawn at the left side of elevation.

All the construction lines and unnecessary lines in the drawing are to be erased. Draw the necessary dotted lines and mark the dimensions. Duplication of the dimensional values should be avoided. The dimensional values should be distributed in all the views.

Example 10.1

Isometric view of a cylindrical block is shown in Fig. 10.3. Draw the front view, top view and side view from left. Take the arrow direction F as the front side.

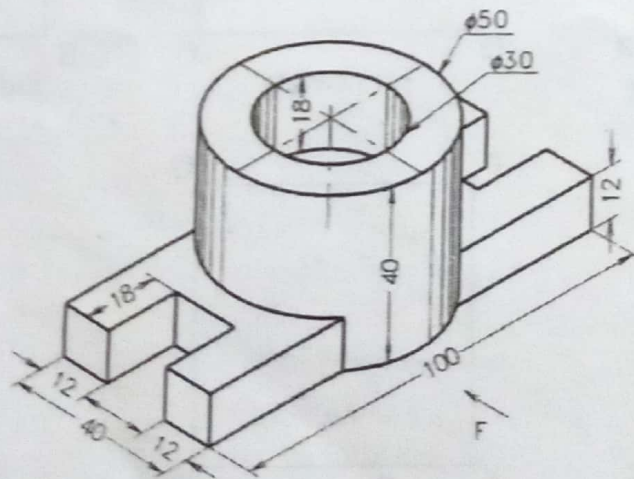


Fig. 10.3

Solution

1. Draw the top view of the block. For this draw a rectangle 100mm x 40mm and locate its center.
2. Draw two concentric circles with this point as center and radius 15mm and 25mm.
3. Complete the top view as shown in Fig 10.4.
4. Complete the front and side view as shown in Fig. 10.4.

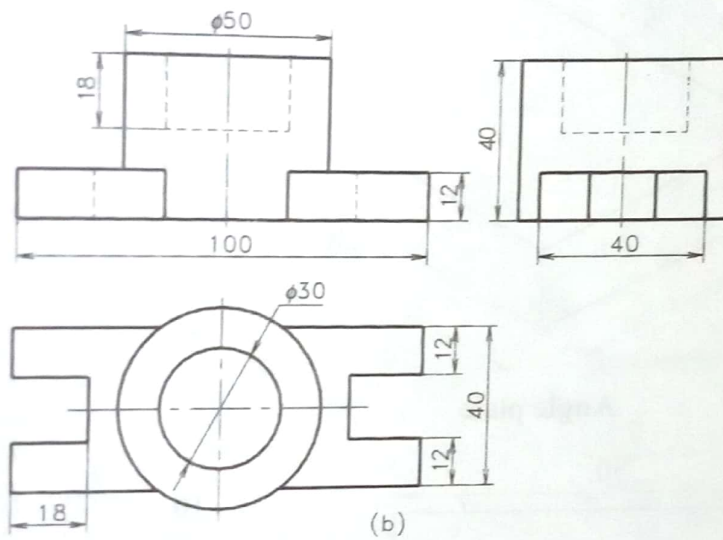


Fig. 10.4

Draw the orthographics of the objects whose isometric views are given in figure 10.5 to 10.12.

10.6

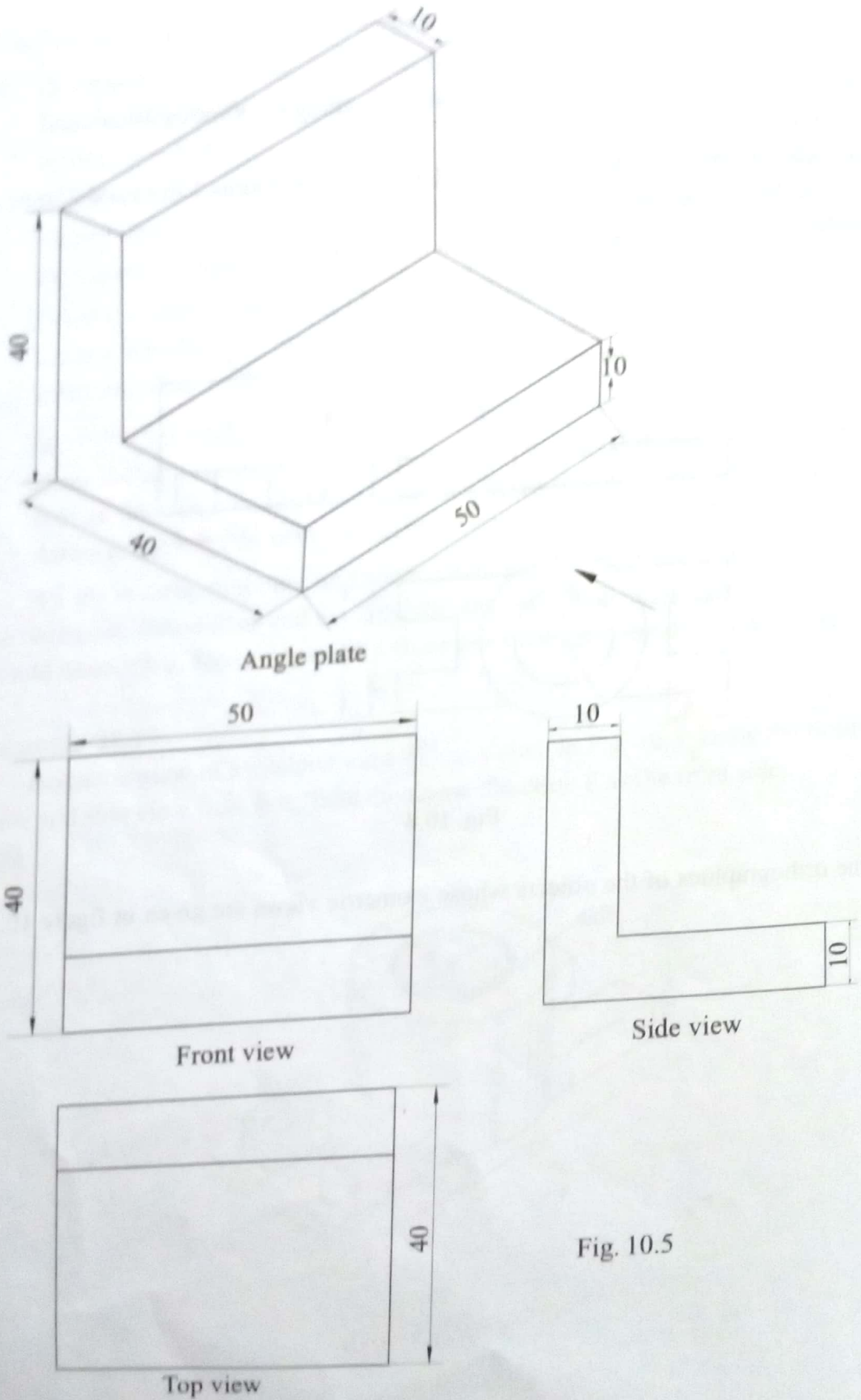


Fig. 10.5

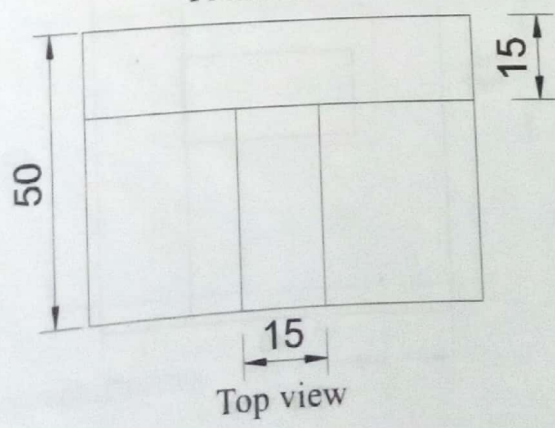
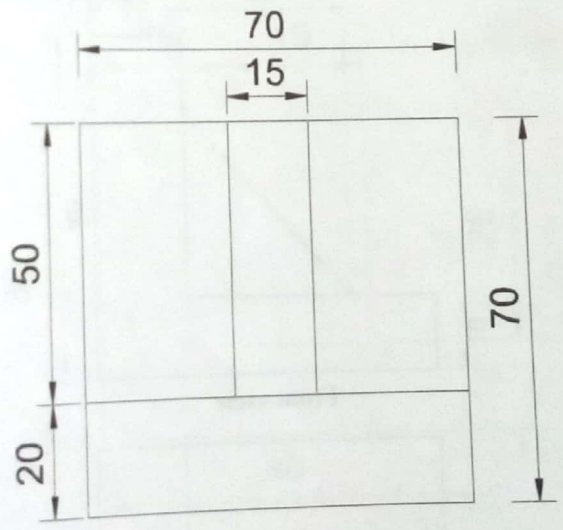
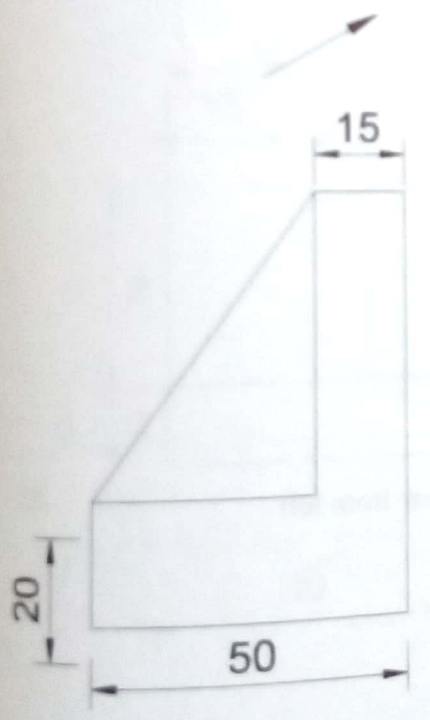
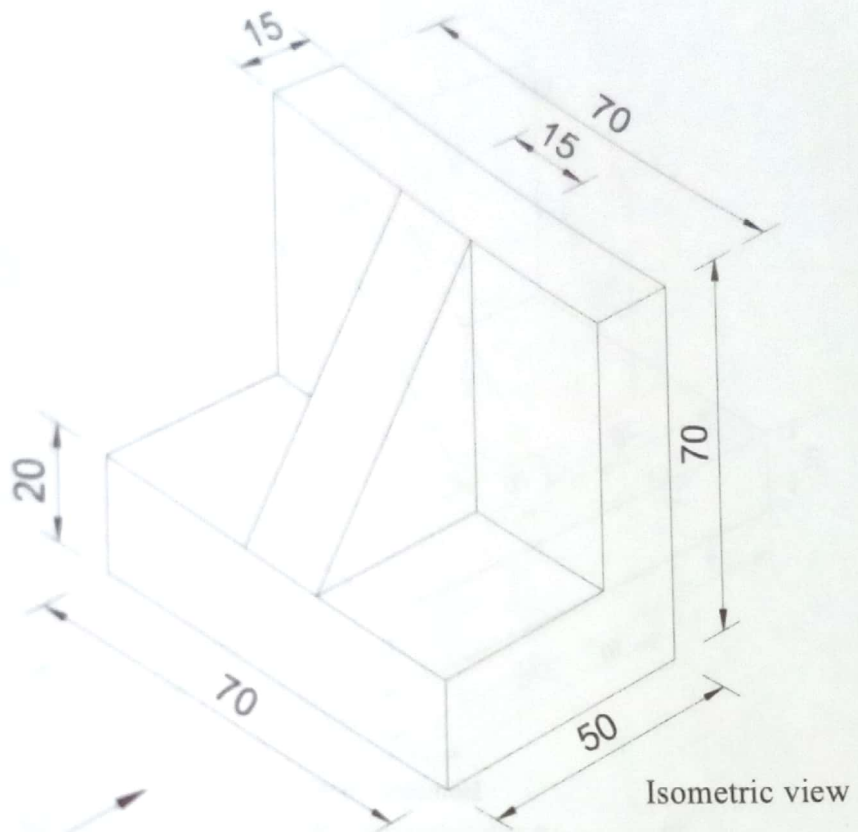


Fig. 10.6

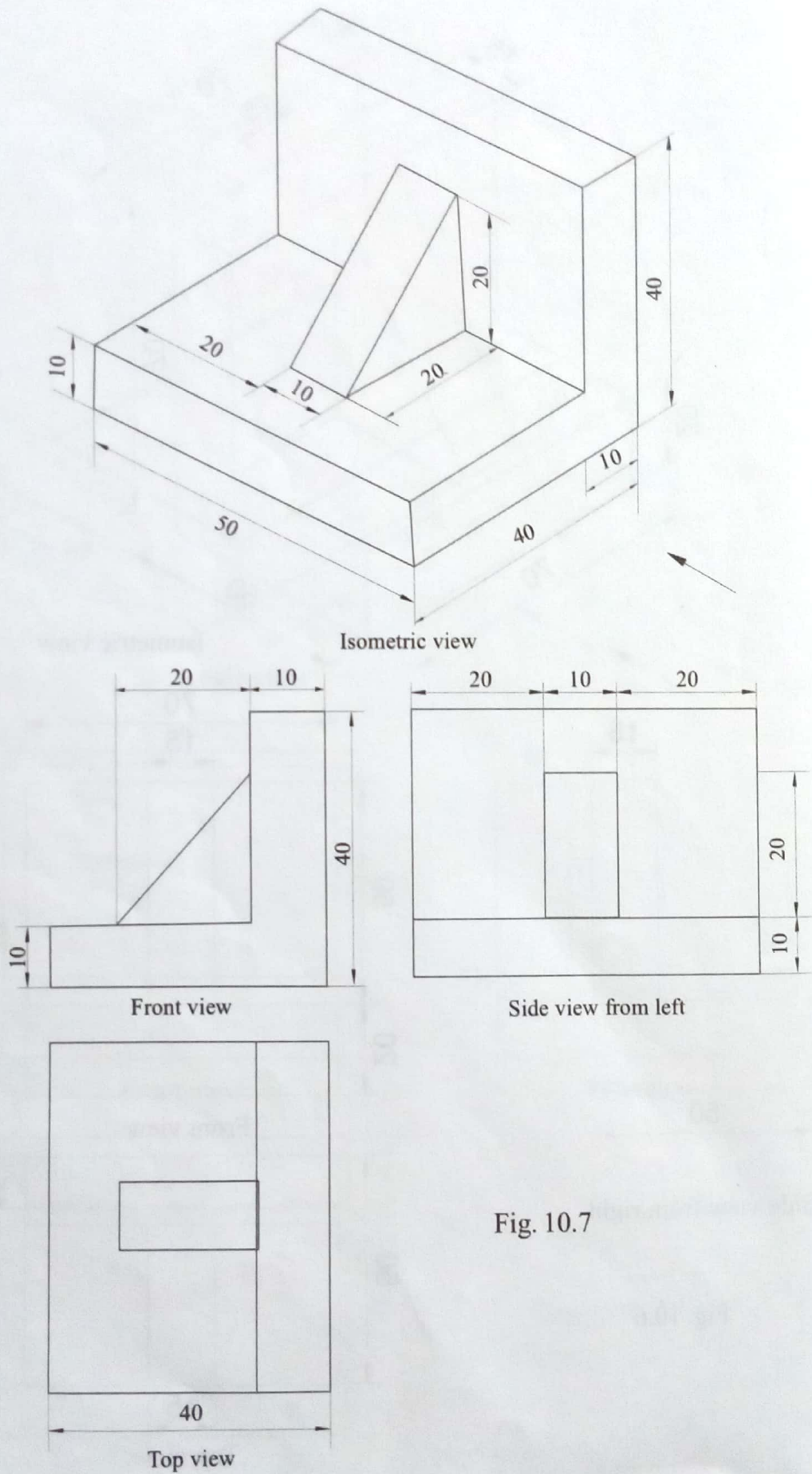
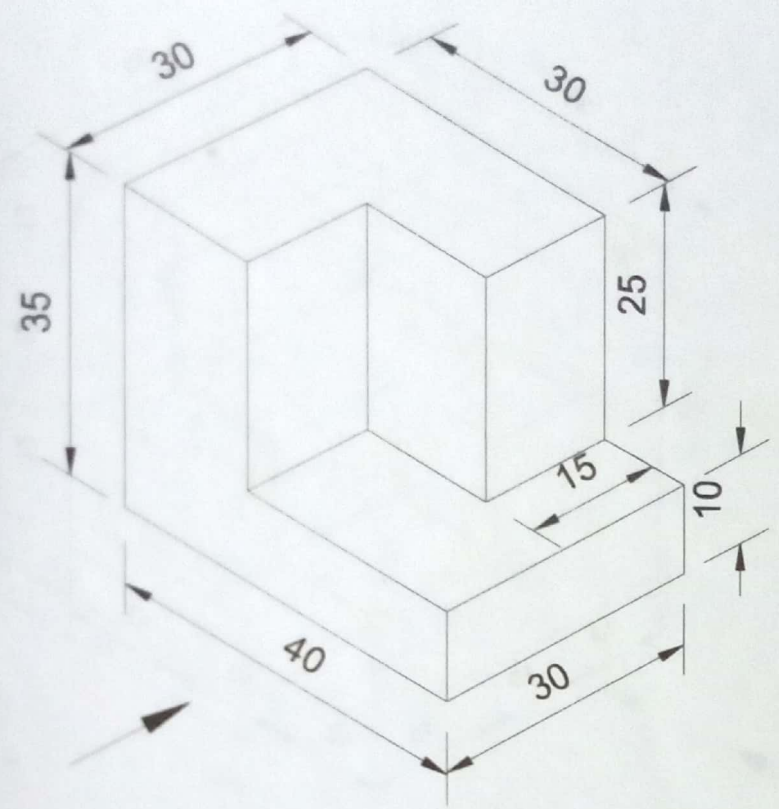
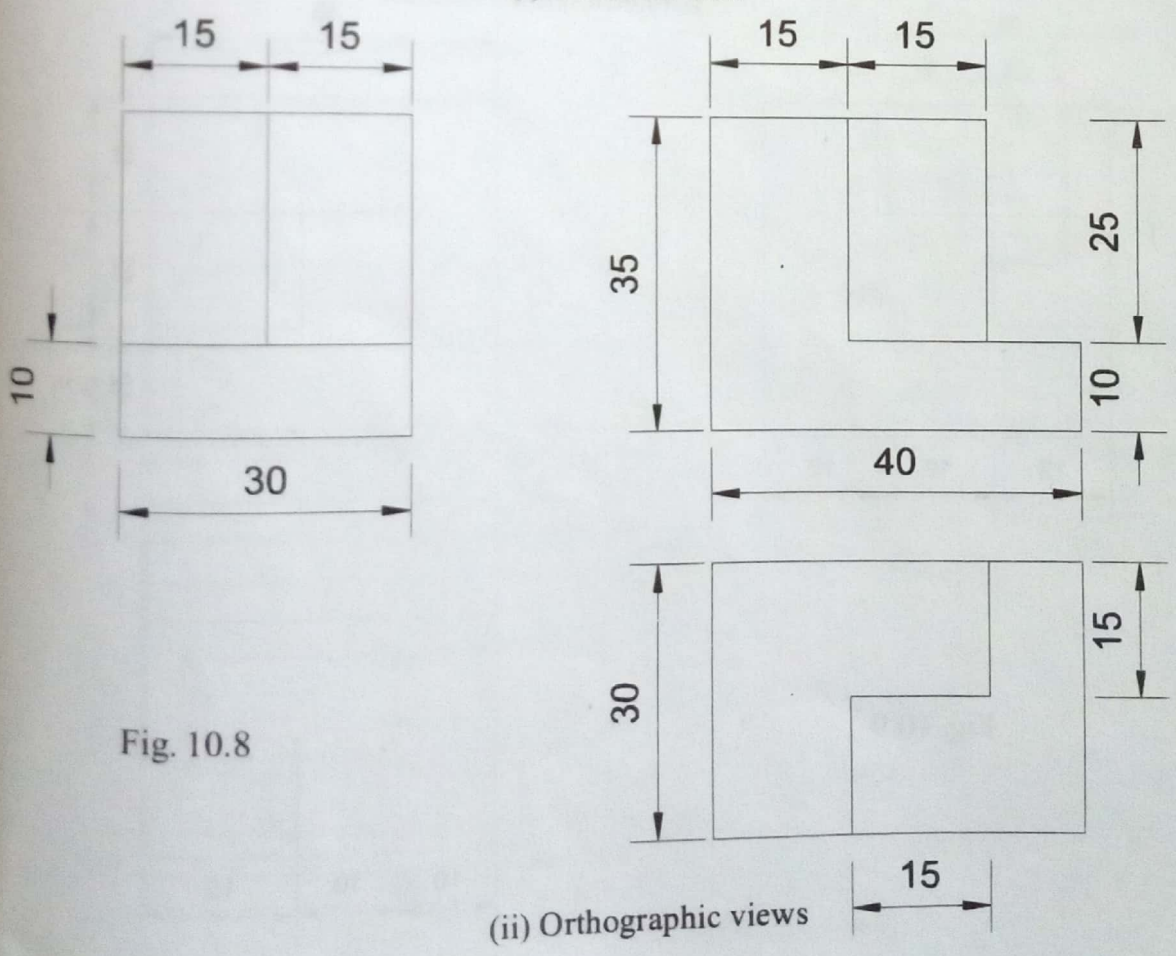


Fig. 10.7



(i) Isometric view



(ii) Orthographic views

Fig. 10.8

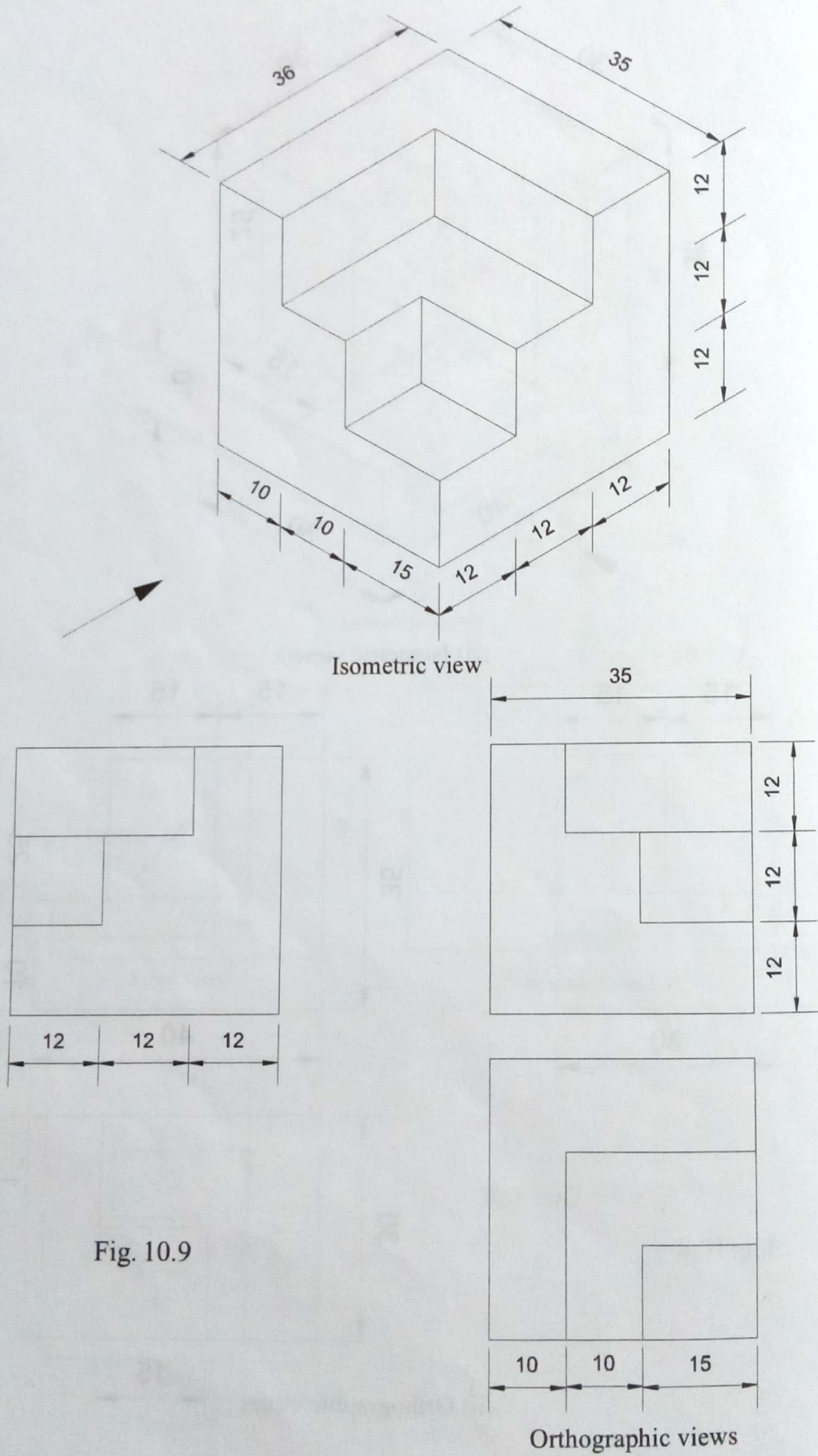
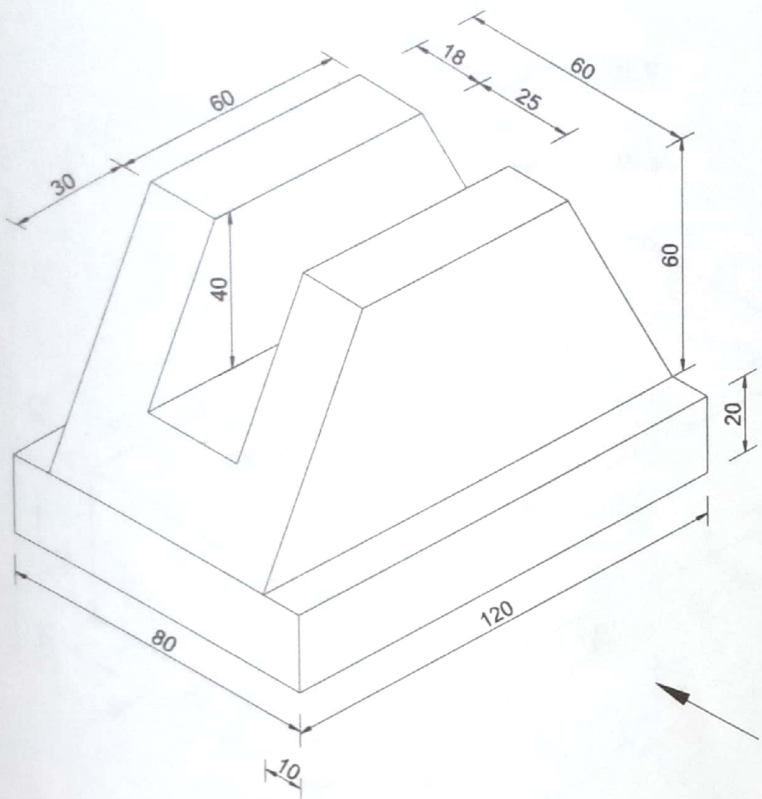
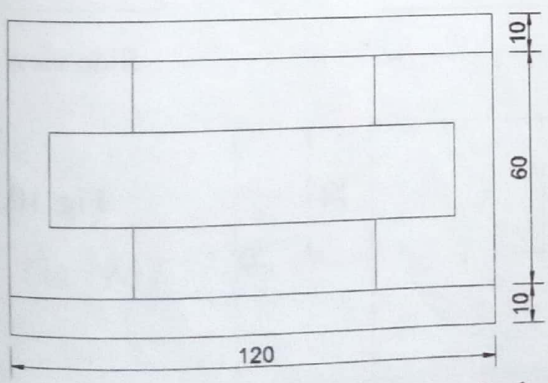
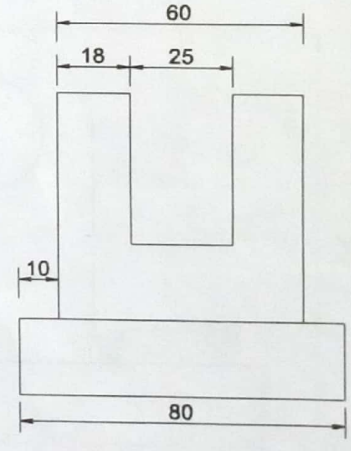
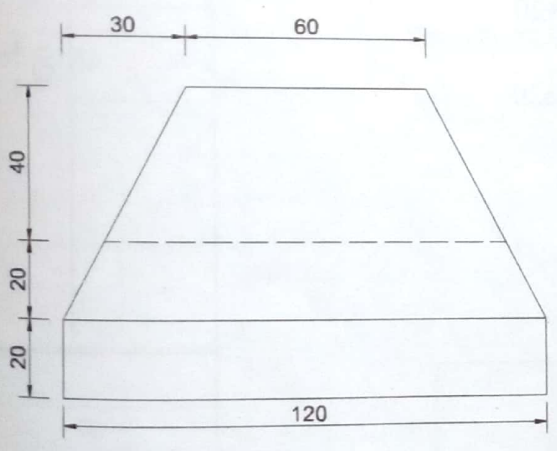


Fig. 10.9

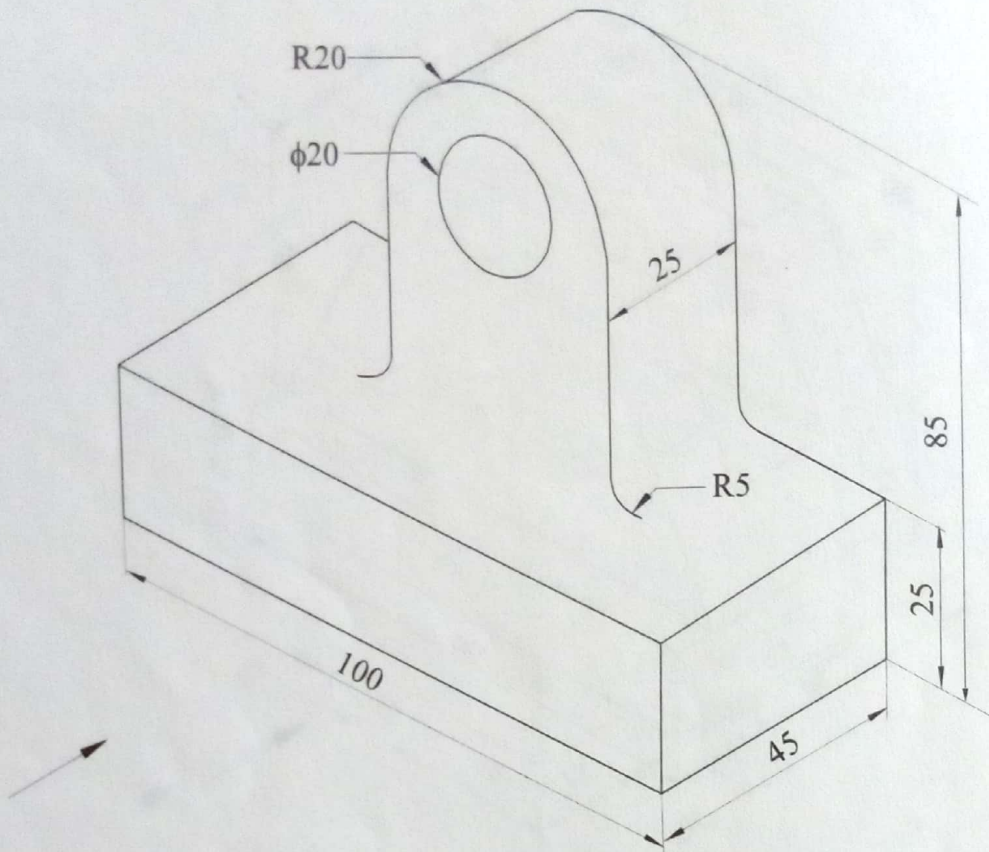


Isometric view

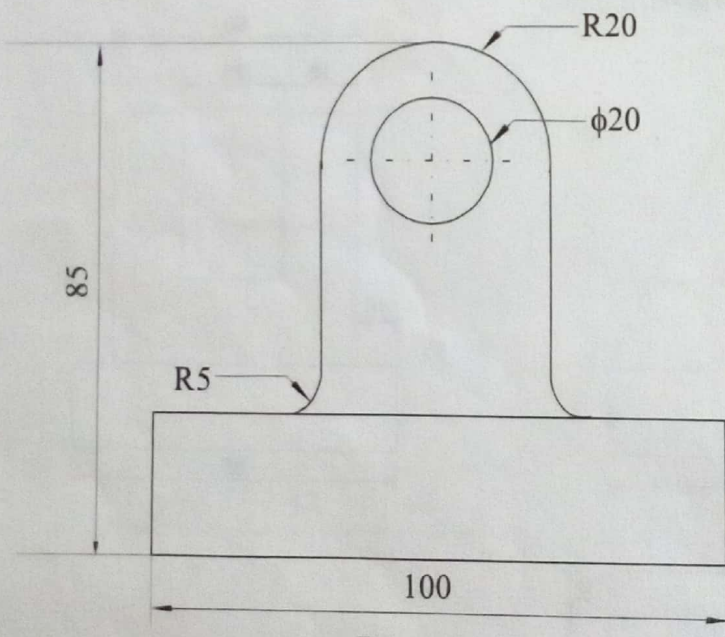


Orthographic views

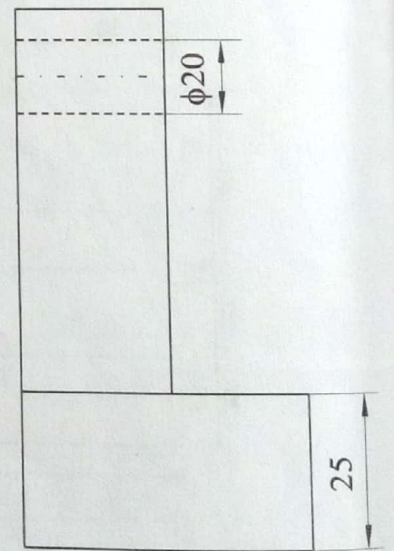
Fig. 10.10



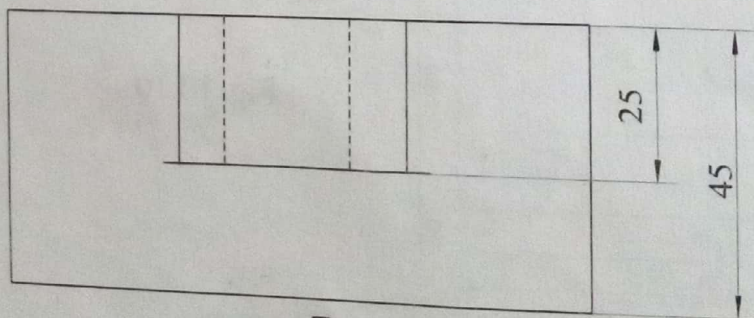
Isometric view



Front view

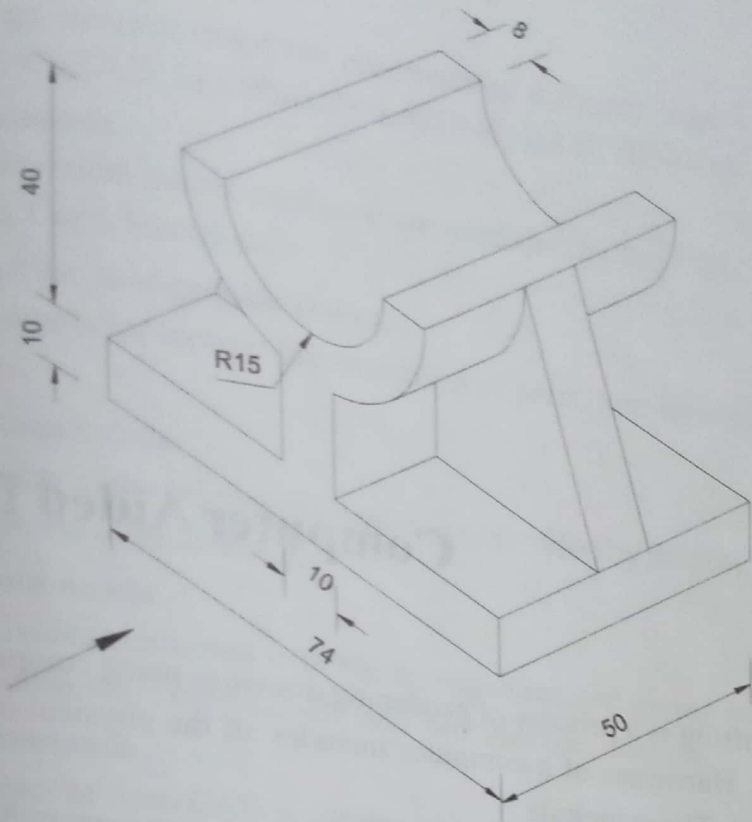


Side view from left

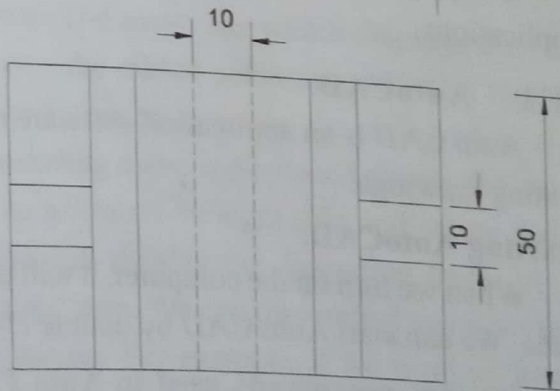
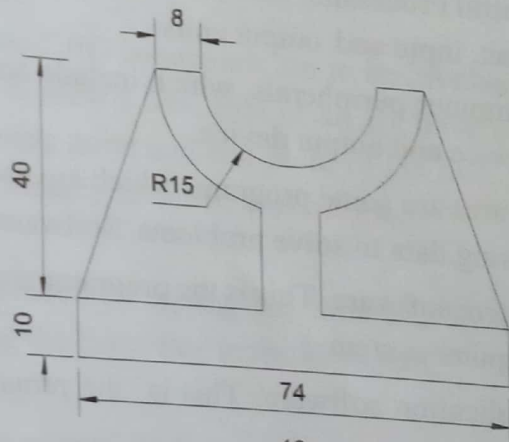
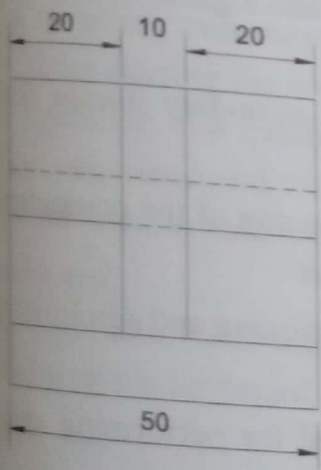


Top view

Fig. 10.11



Isometric view



Orthographic views

Fig. 10.12