



Orthographic Projection – Important terms

Horizontal Plane

A plane parallel to the floor is known as horizontal plane. Orthographic projection of an object on horizontal plane is known as top view (plan).

Vertical plane

One plane conveniently selected out of the planes perpendicular to horizontal plane is known as vertical plane. It is known as front view (elevation).

Auxiliary vertical plane

A plane perpendicular to both horizontal plane and vertical plane both is known as auxiliary vertical plane. Orthographic projection on A.V.P. is known as end view or side view.



Projection

If straight lines are drawn from various points on the contour of an object to meet a plane, object is said to be projected at that plane. The figure formed by joining in correct sequence the points at which the lines meet the plane is called a projection of the object.

- **Projectors**

- The lines from the object to the plane are called as the projectors

- **Plane of projection**

- The plane on which the projectors meet is known as the plane of projection

- **Orthographic projection**

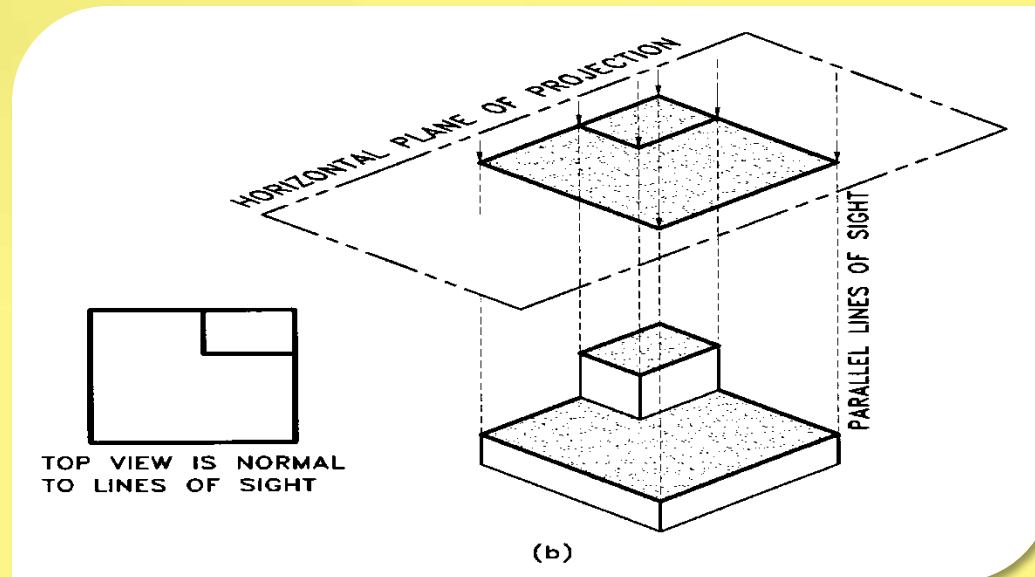
- When the projectors are parallel to each other and also perpendicular to the projection plane, the projection is called orthographic projection.



Orthographic Projection (Top View)

- **Horizontal Plane**

A plane parallel to the floor is known as horizontal plane. Orthographic projection of an object on horizontal plane is known as top view (plan).

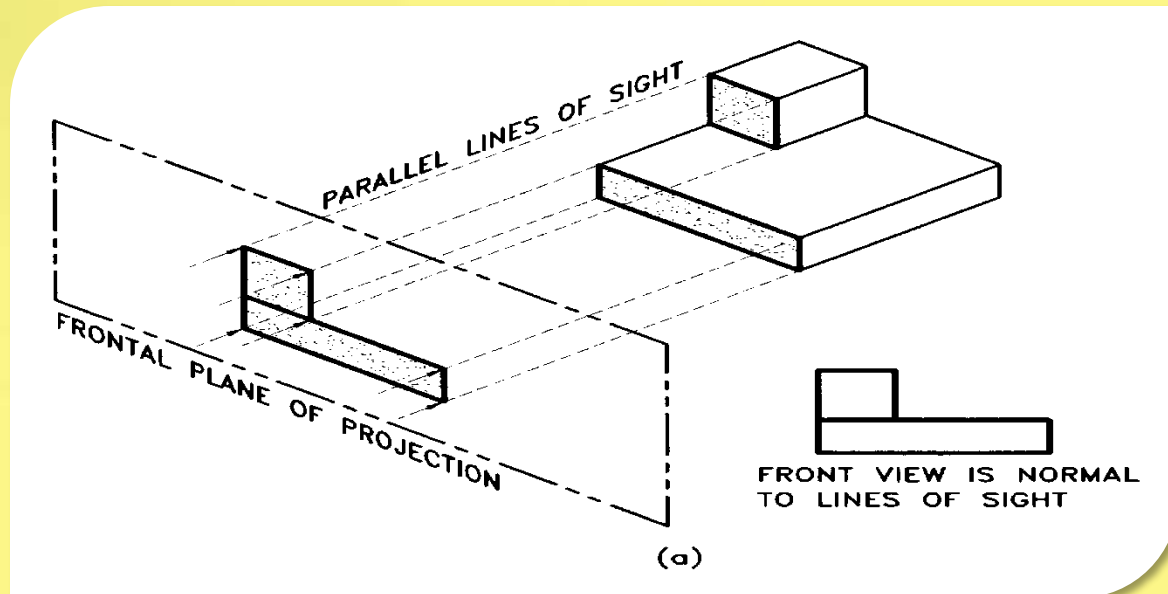




Orthographic Projection (Front View)

- **Vertical plane**

One plane conveniently selected out of the planes perpendicular to horizontal plane is known as vertical plane. It is known as front view (elevation).



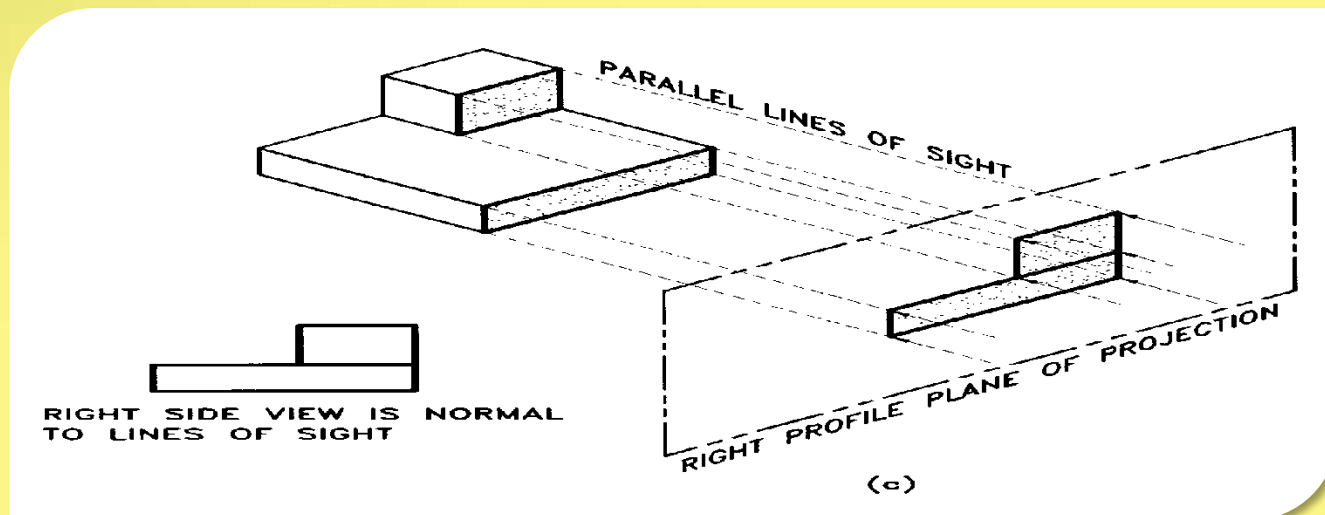


Orthographic Projection (Right Side View)

- **Auxiliary vertical plane**

A plane perpendicular to horizontal plane and vertical plane both is known as auxiliary vertical plane. Orthographic projection on

A.V.P. is known as end view or side view.





Conti.....

- Parallel edges of the object are shown by parallel lines.
- Right angle remains as it is.
- Semi circle also remains as such.
- Each view show only two dimensions of the object.

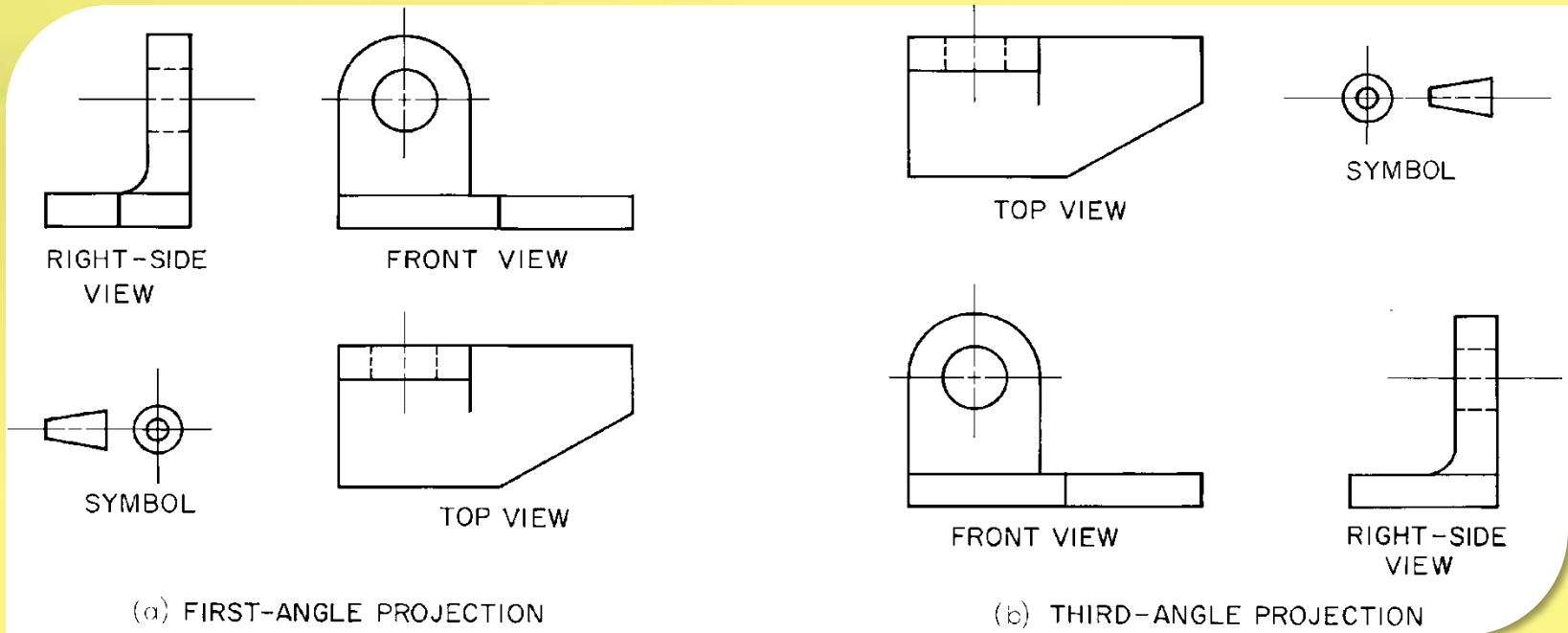


Difference between First angle projection and Third angle projection

No.	First angle projection	Third angle projection
1	The object is kept in the first quadrant.	The object is assumed to be kept in the third quadrant.
2	The object lies between the observer and the plane of projection.	The plane of projection lies between the observer and the object.
3	The plane of projection is assumed to be non-transparent.	The plane of projection is assumed to be transparent.
4	Plan comes below the elevation and left side view is drawn to the right of elevation.	Plan comes above the elevation and left side view is drawn to the left side of the elevation
5	This method of projection is now recommended in India	This method is used in USA and other countries.



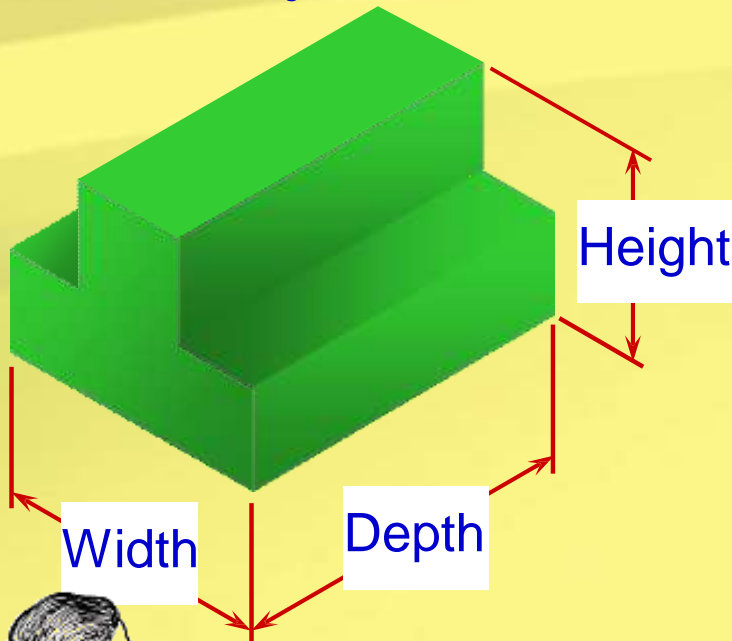
Symbols for 1st & 3rd Angle Projection





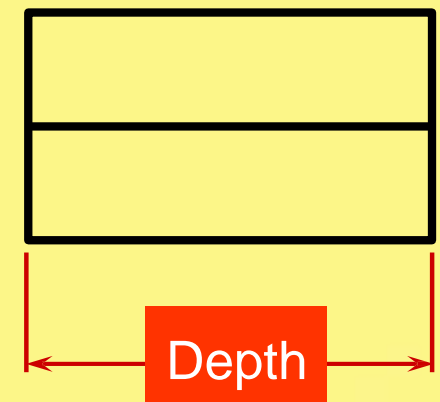
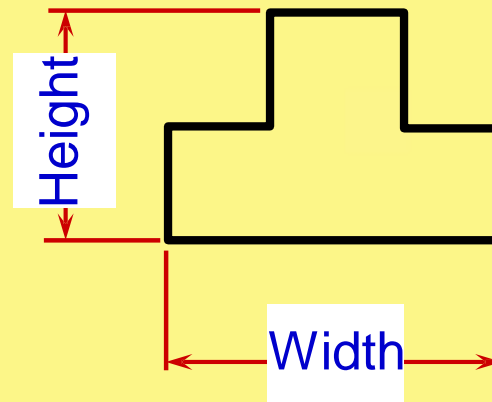
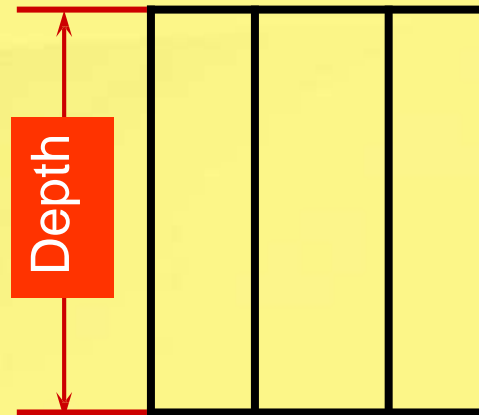
MULTIVIEW PROJECTION

Three principle dimensions
of an object ...



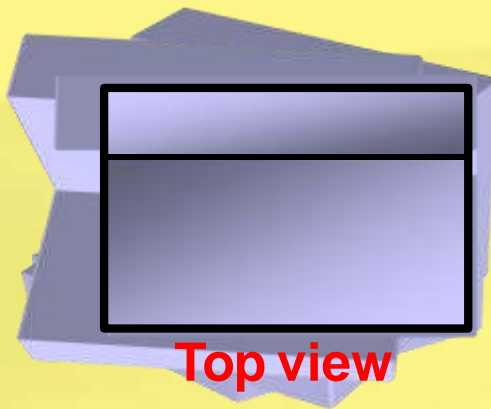
Each view will be represented
only two dimensions.

**Adjacent view(s)
is needed to
fulfill the size
description.**

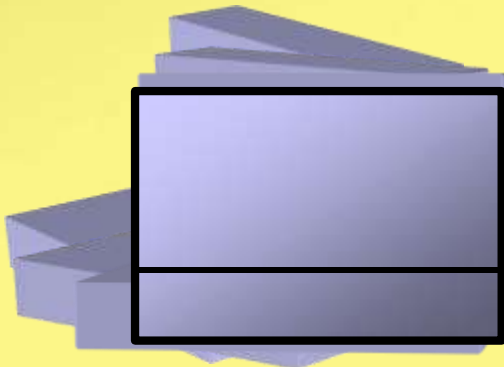




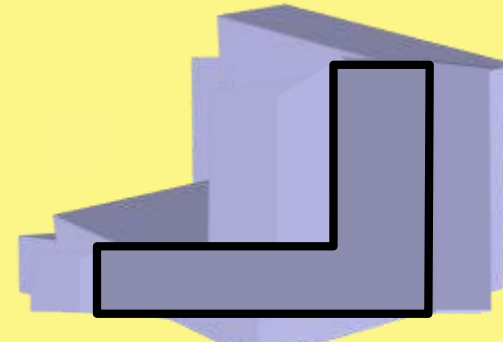
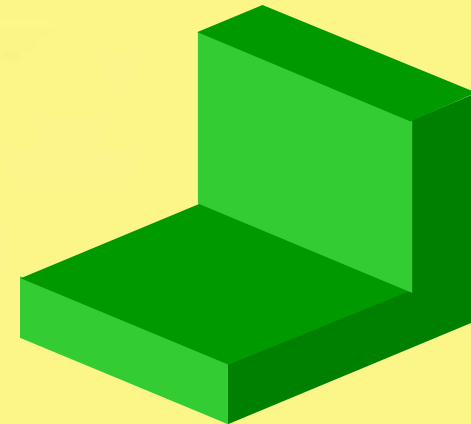
TO OBTAIN MULTIVIEW REVOLVE THE OBJECT



Top view



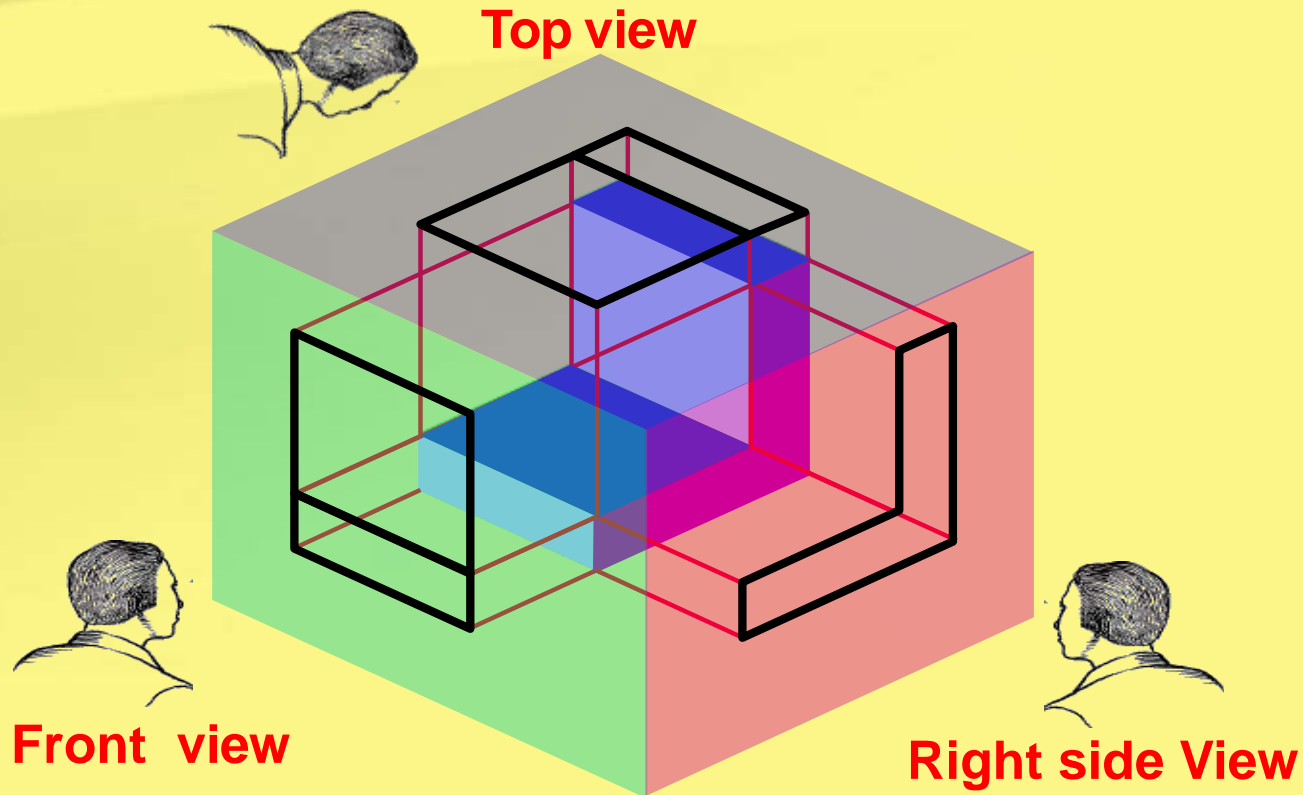
Front view



Right side view

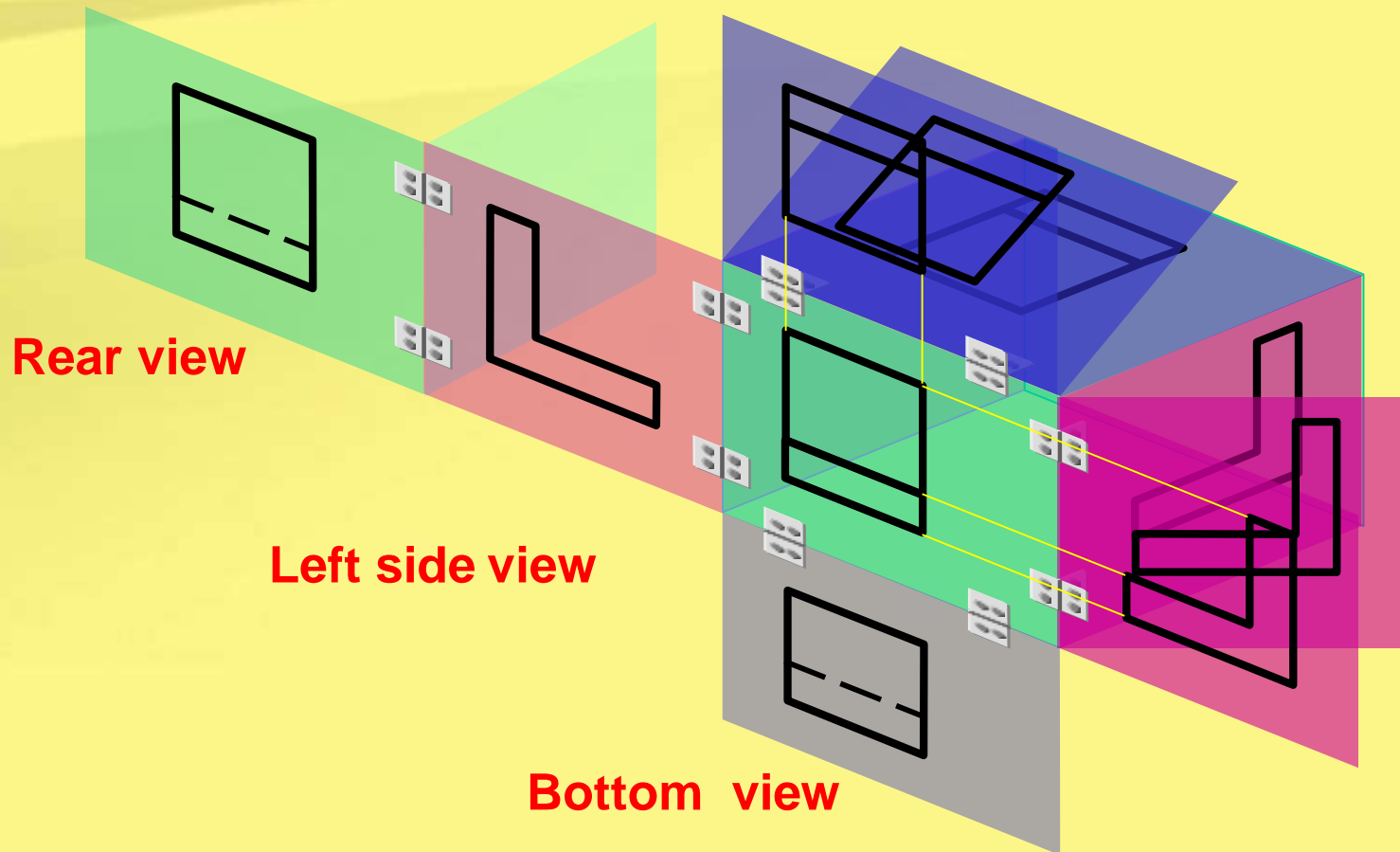


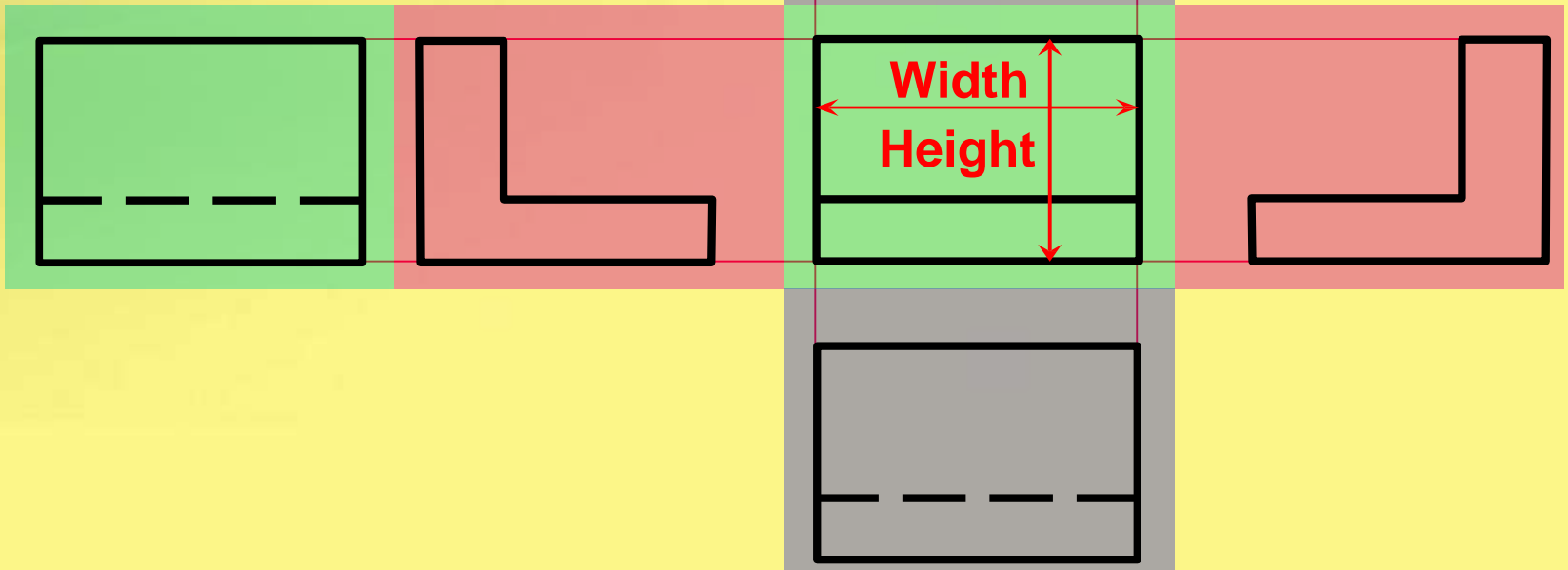
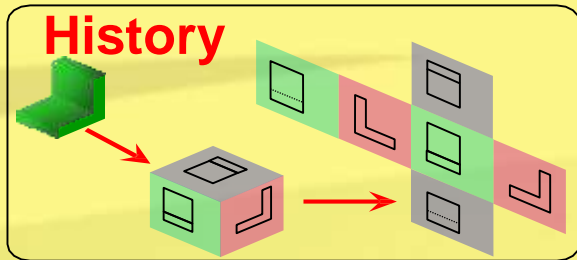
OBSERVER MOVE AROUND





THE GLASS BOX CONCEPT

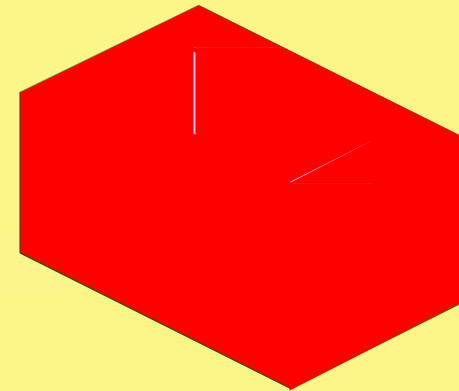
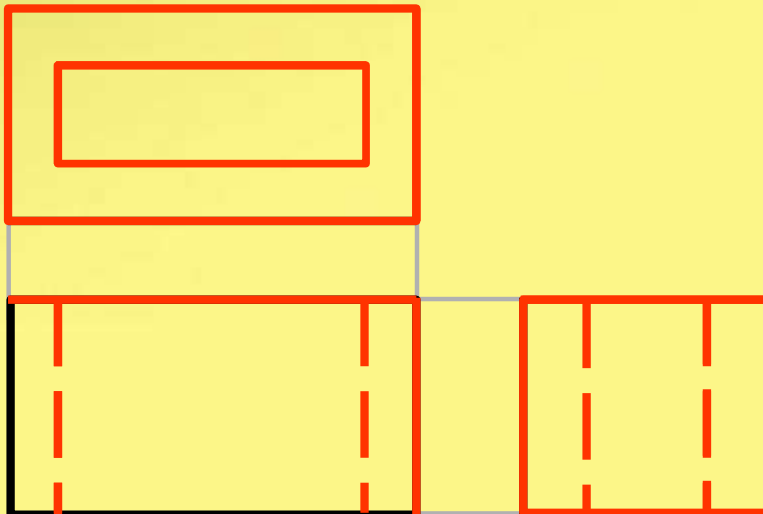






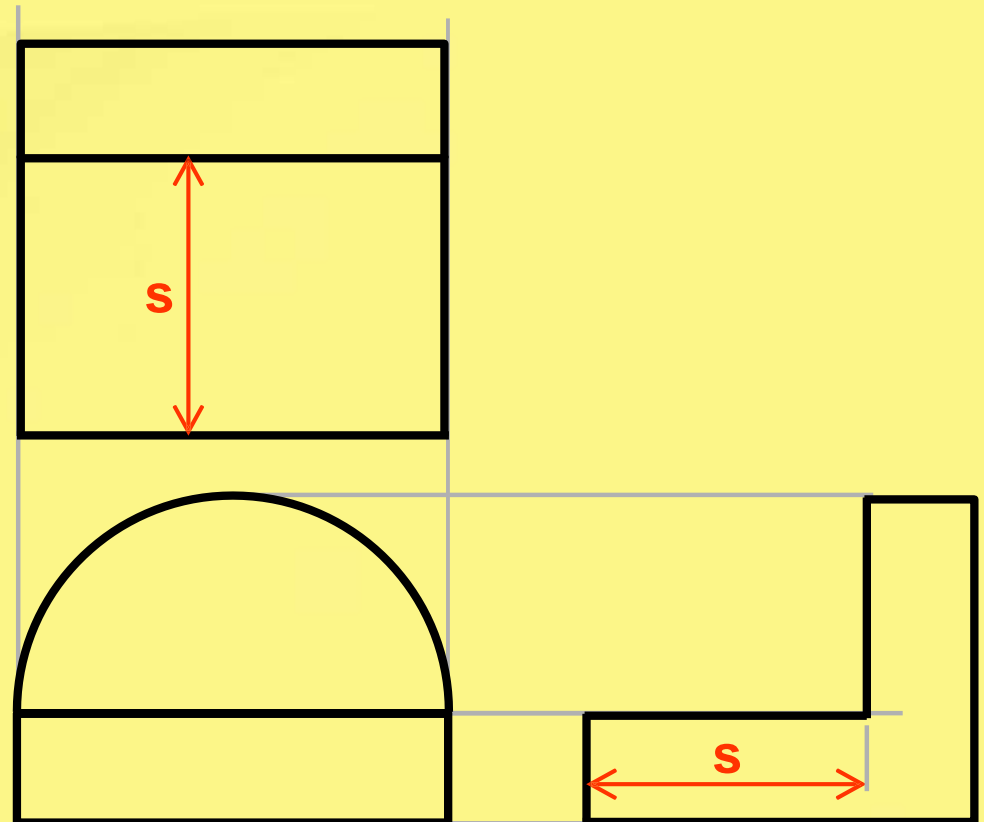
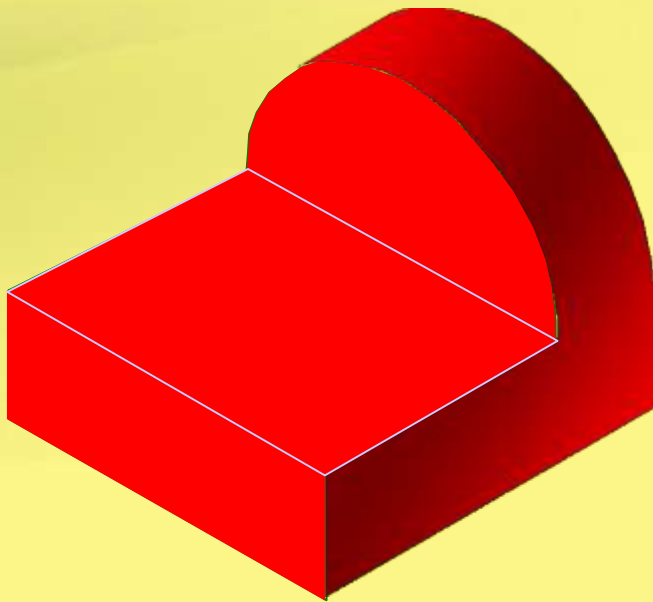
PROJECTION OF OBJECT

The views are obtained by projecting all object features to the picture plane.



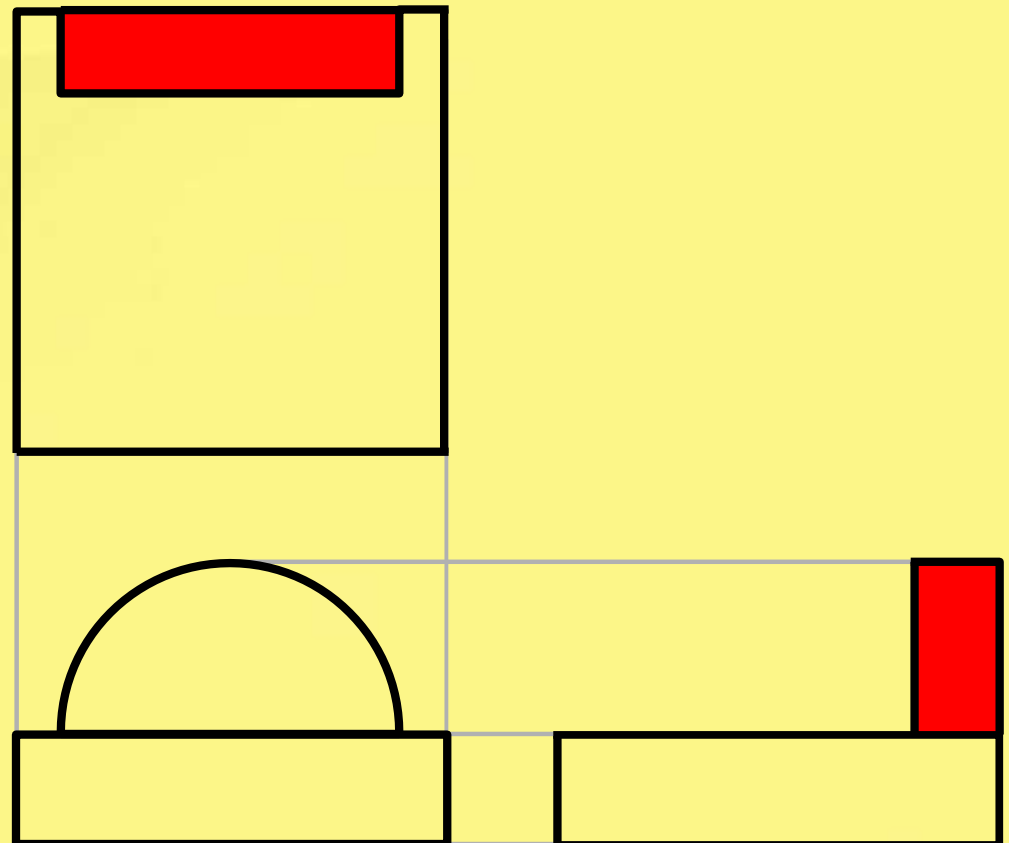
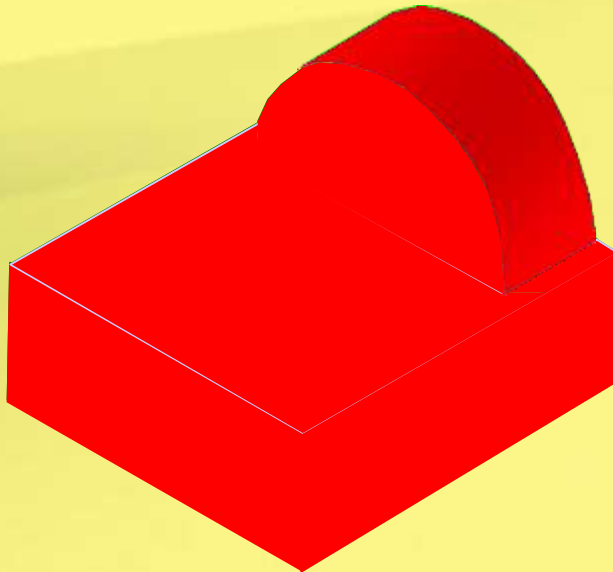


PROJECTION OF OBJECT





PROJECTION OF OBJECT





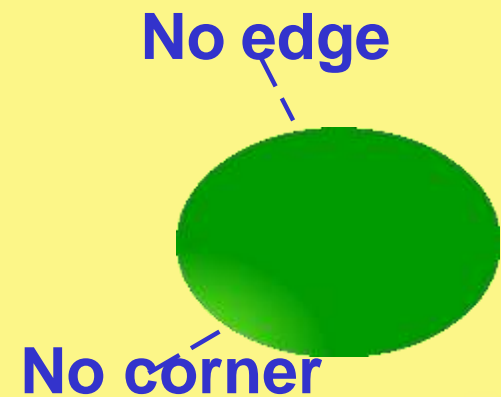
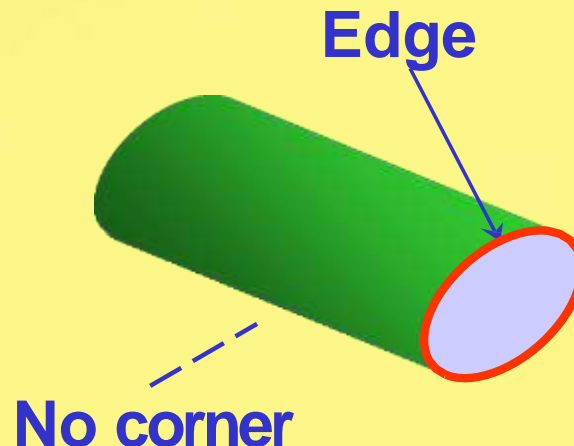
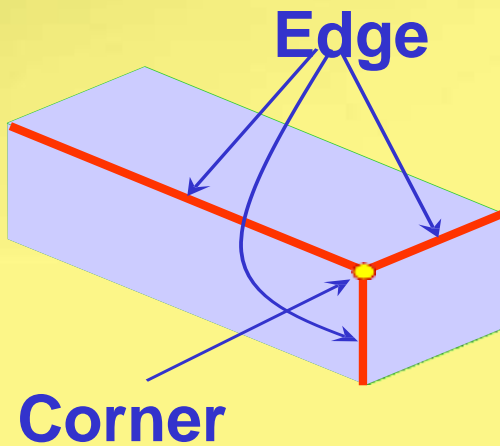
OBJECT FEATURES

Edges

are lines that represent the boundary between two faces.

Corners

Represent the intersection of two or more edges.





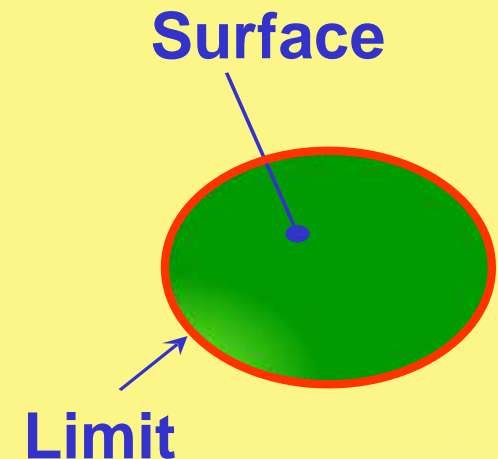
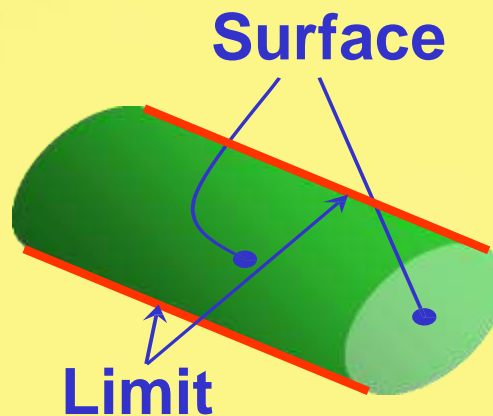
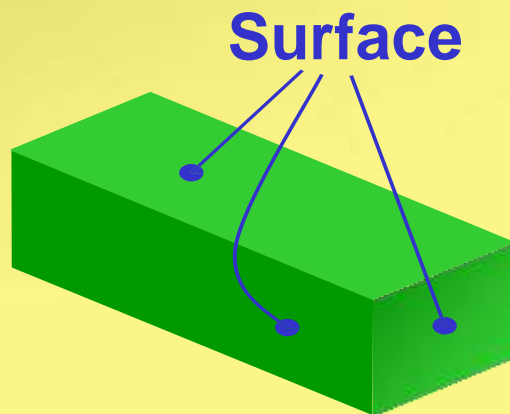
OBJECT FEATURES

Surfaces

are areas that are bounded by edges or limiting element.

Limiting element

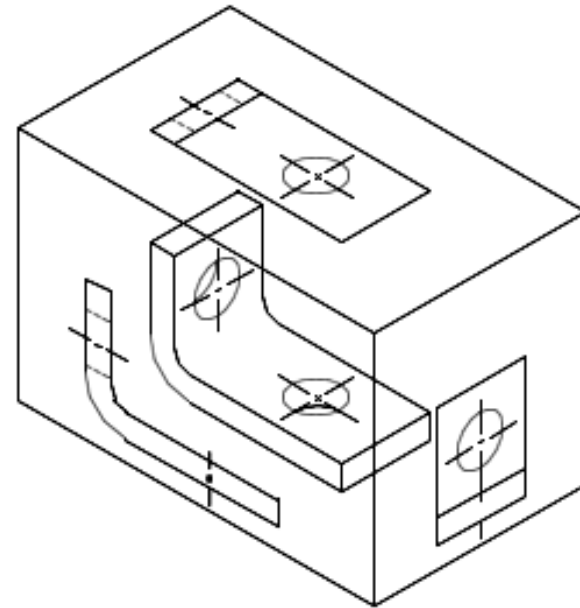
is a line that represents the last visible part of the curve surface.





Orthographic Projection

- Orthographic drawings represent three dimensional objects in three separate views arranged in a standard manner.





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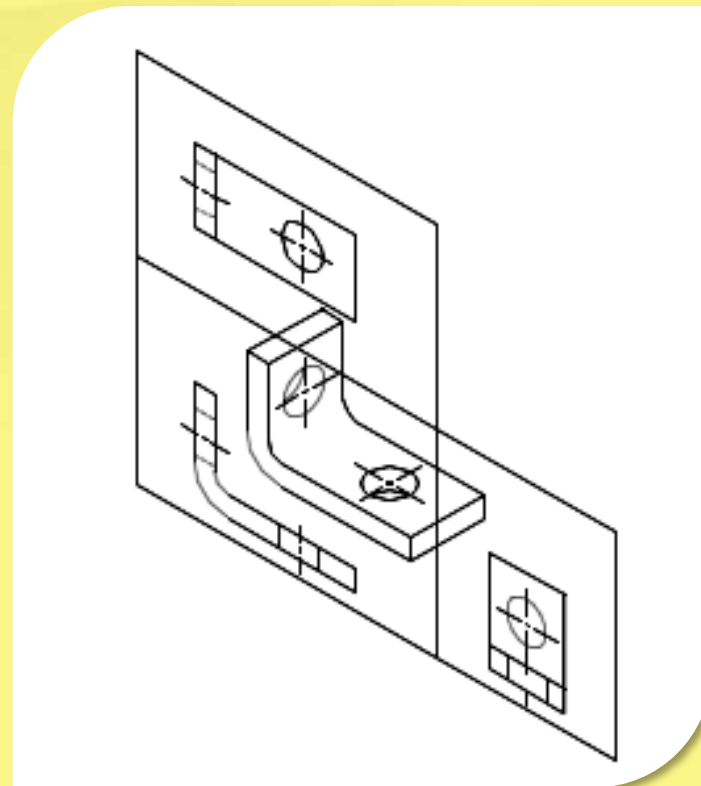
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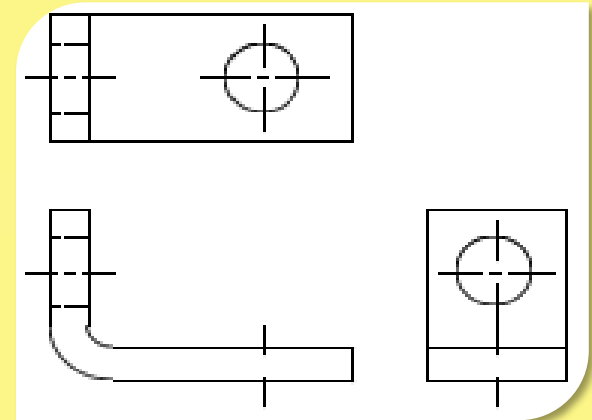
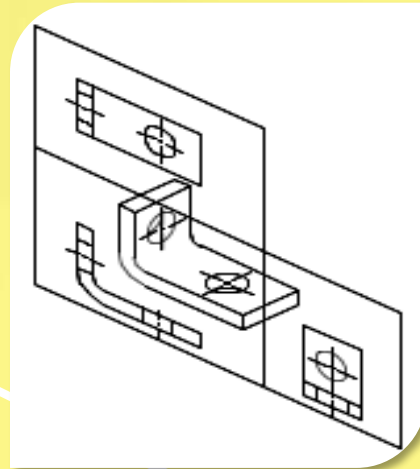
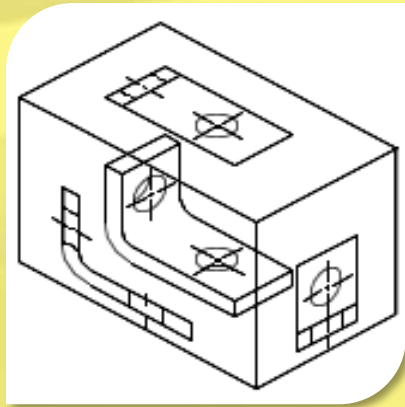
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Converting to Orthographic



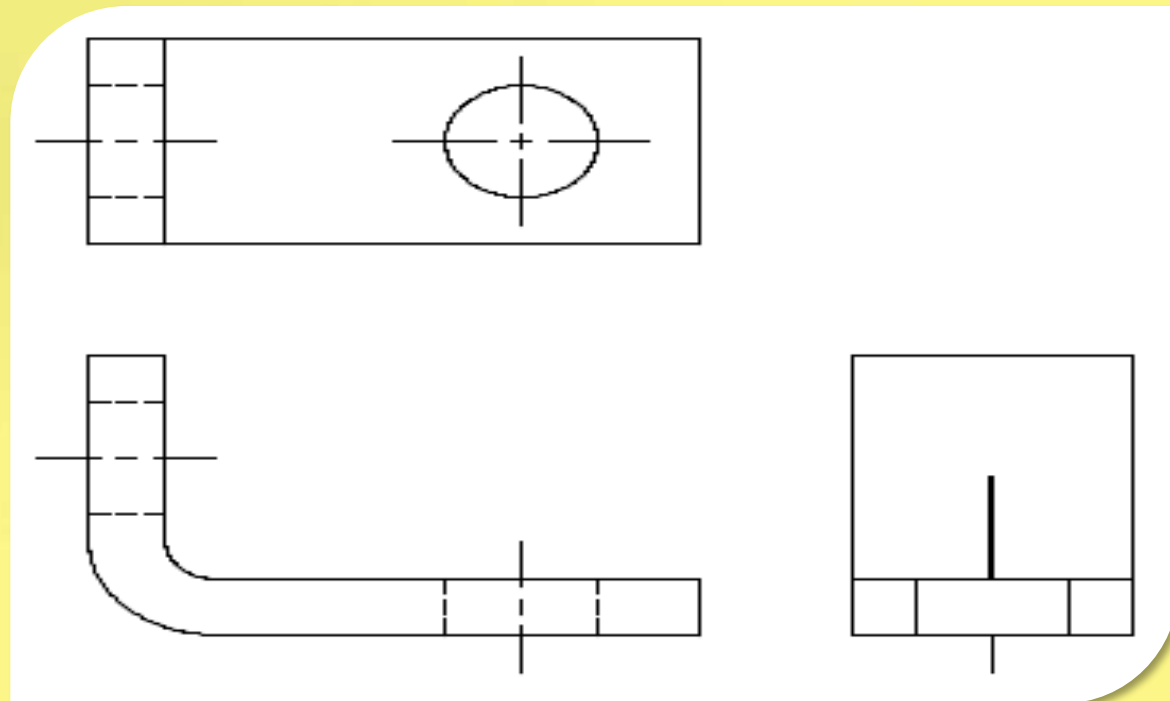


Converting to Orthographic





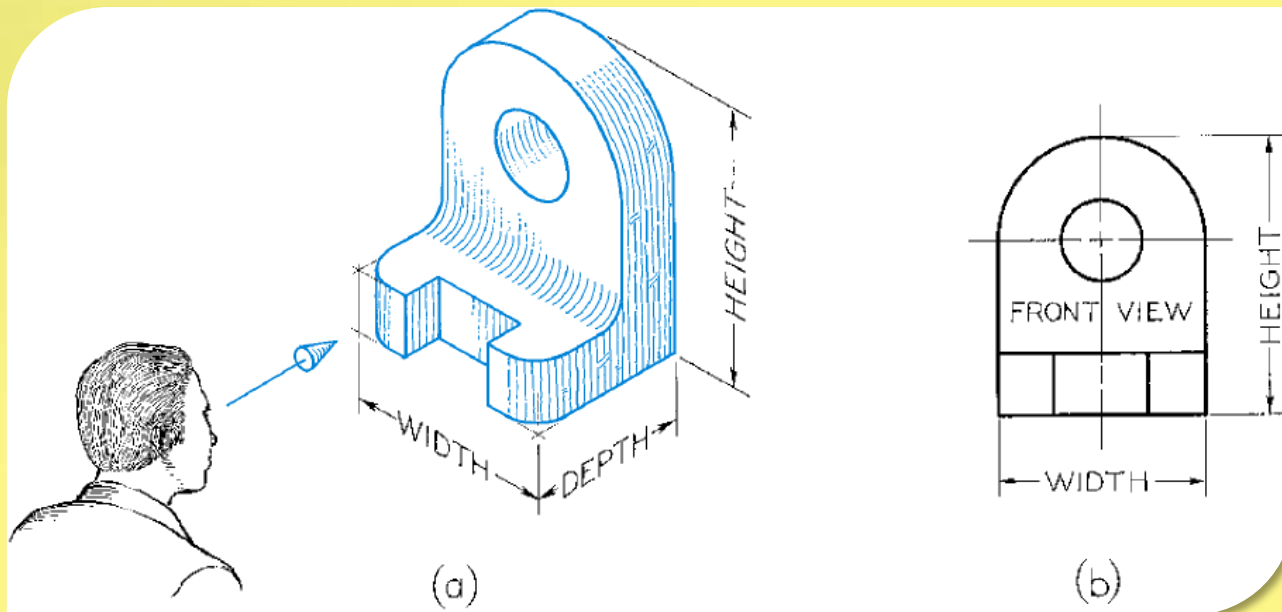
Orthographic Views





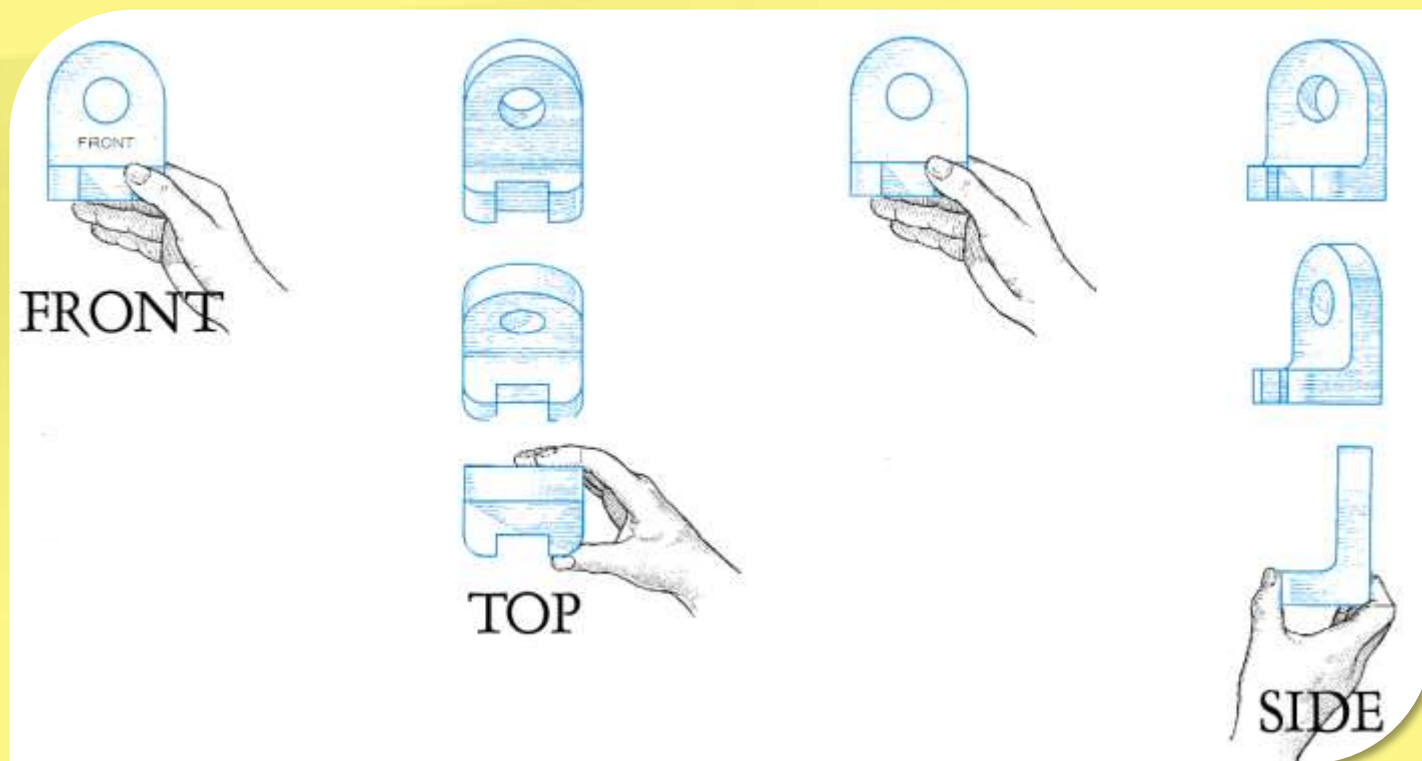
Orthographic Projection

A system of drawing views of an object using perpendicular projectors from the object to a plane of projection



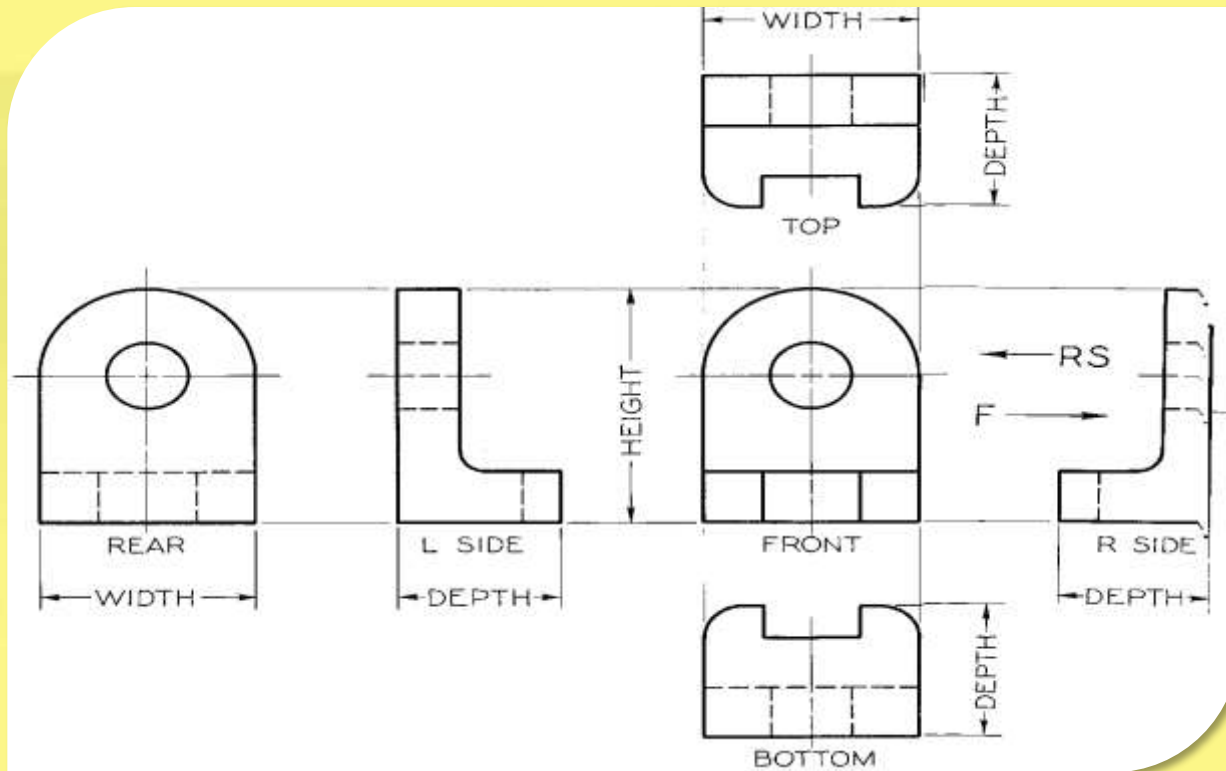


Revolving an Object to Produce the other Views





The Six Basic Views

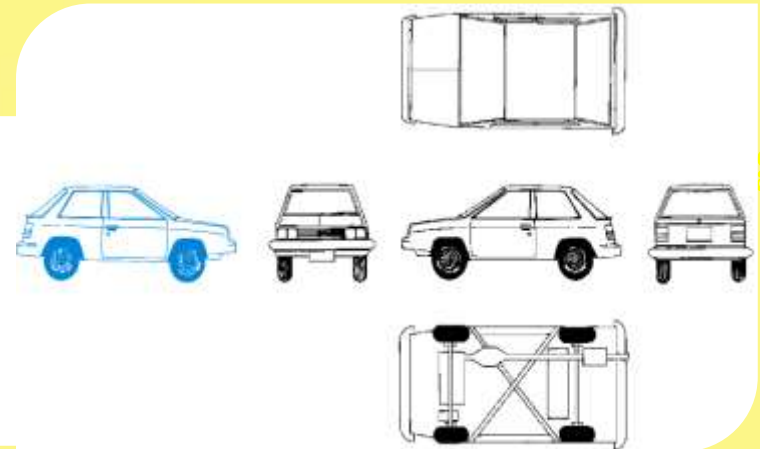




The Standard Arrangement of Views



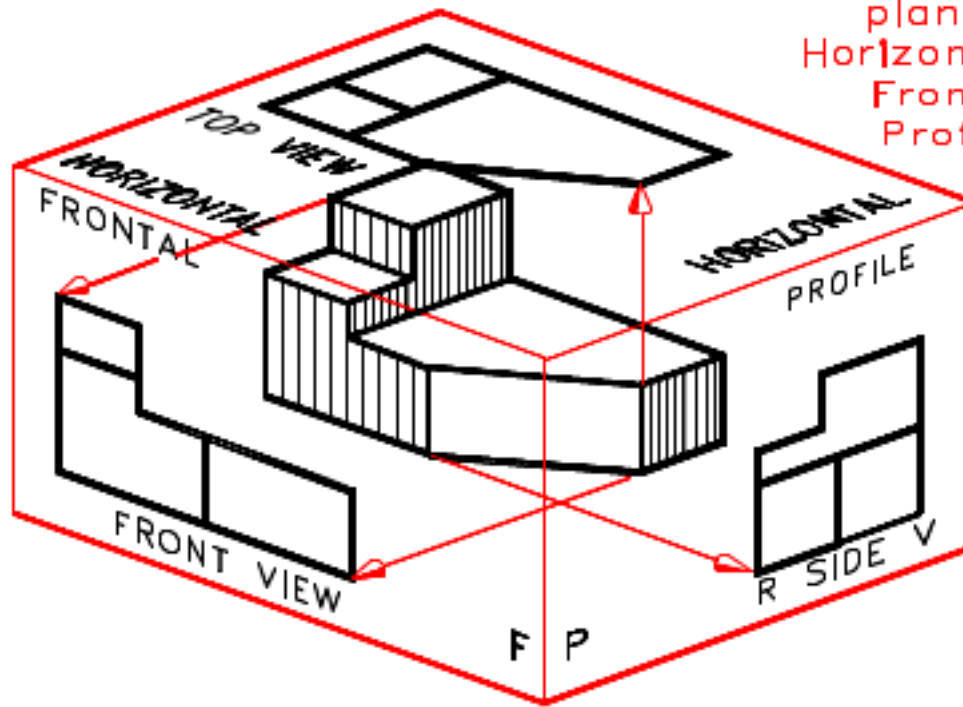
LEFT **TOP**
FRONT
RIGHT
BOTTOM
REAR





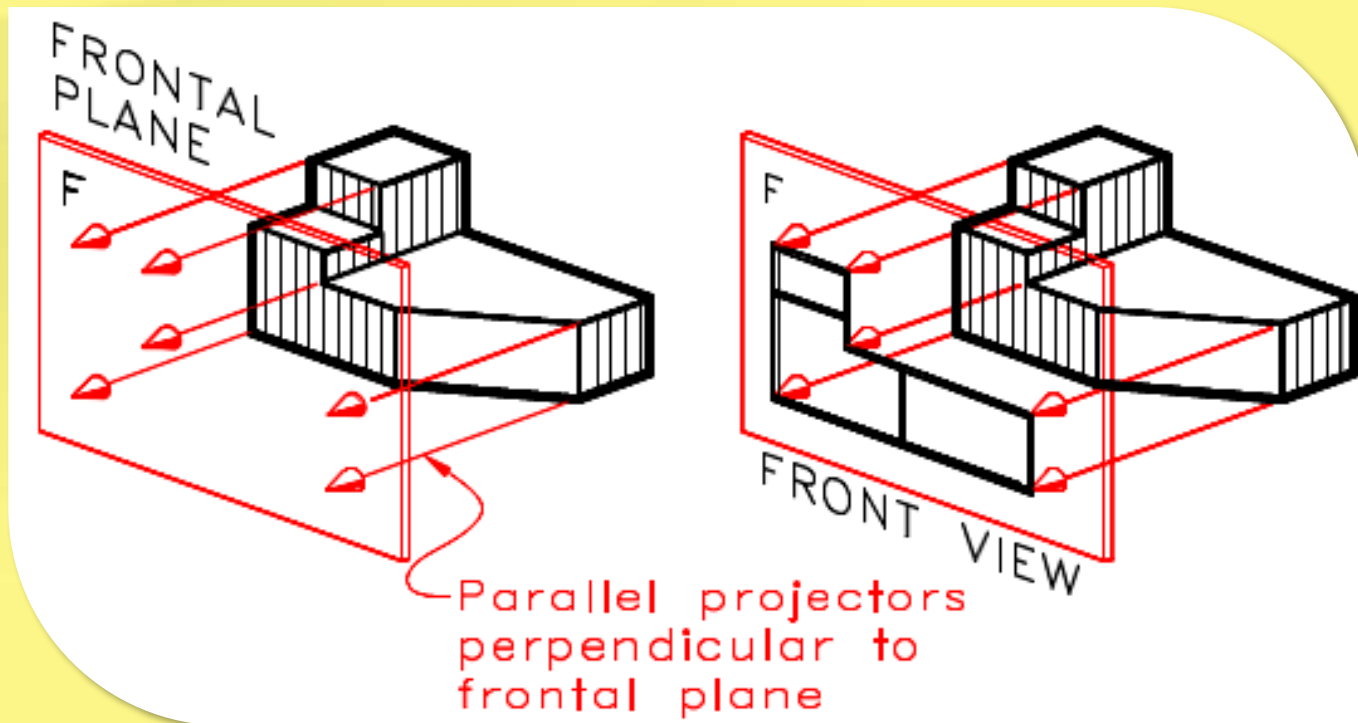
THE GLASS-BOX APPROACH

Principal projection
planes:
Horizontal
Frontal
Profile



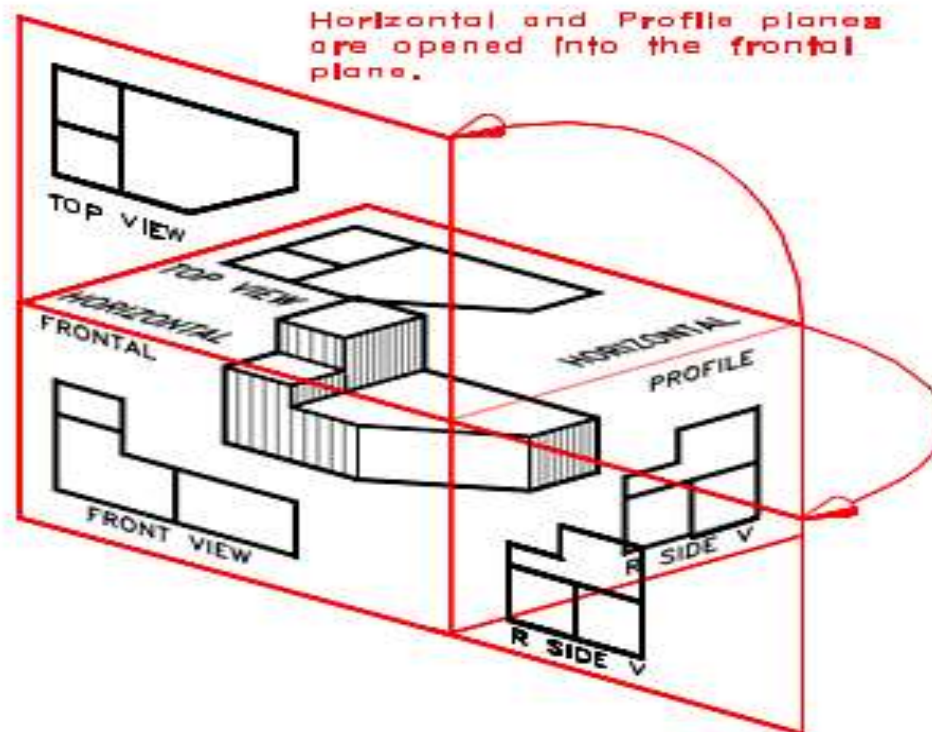


Orthographic Projection





Opening the Box



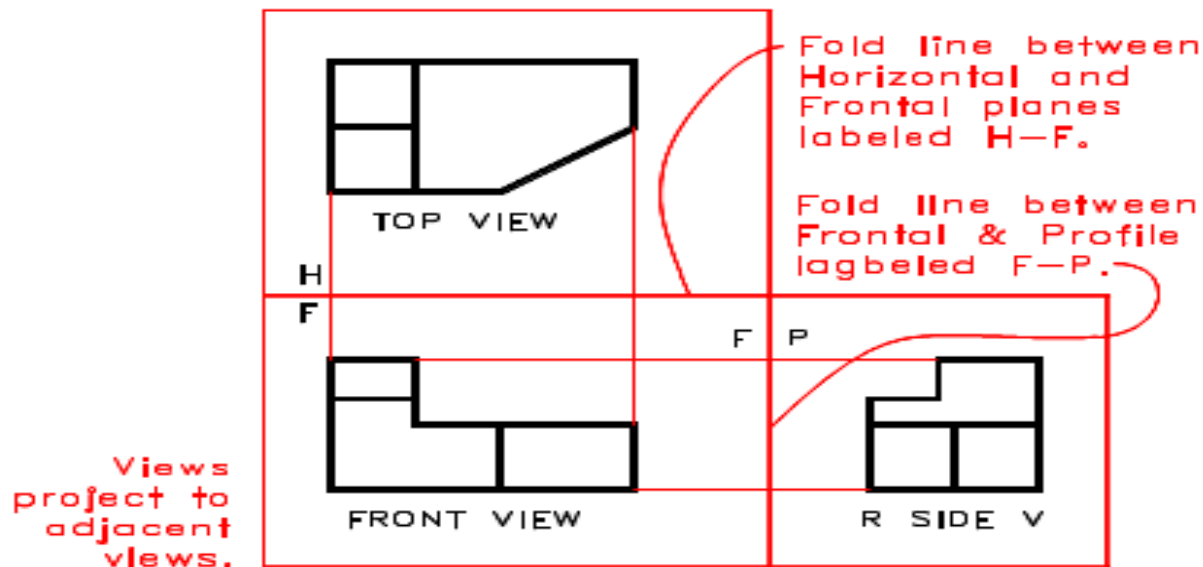


Final views for third angle projection method

The standard arrangement of three orthographic views:

Top View above the Front View

R Side View right of the Front View



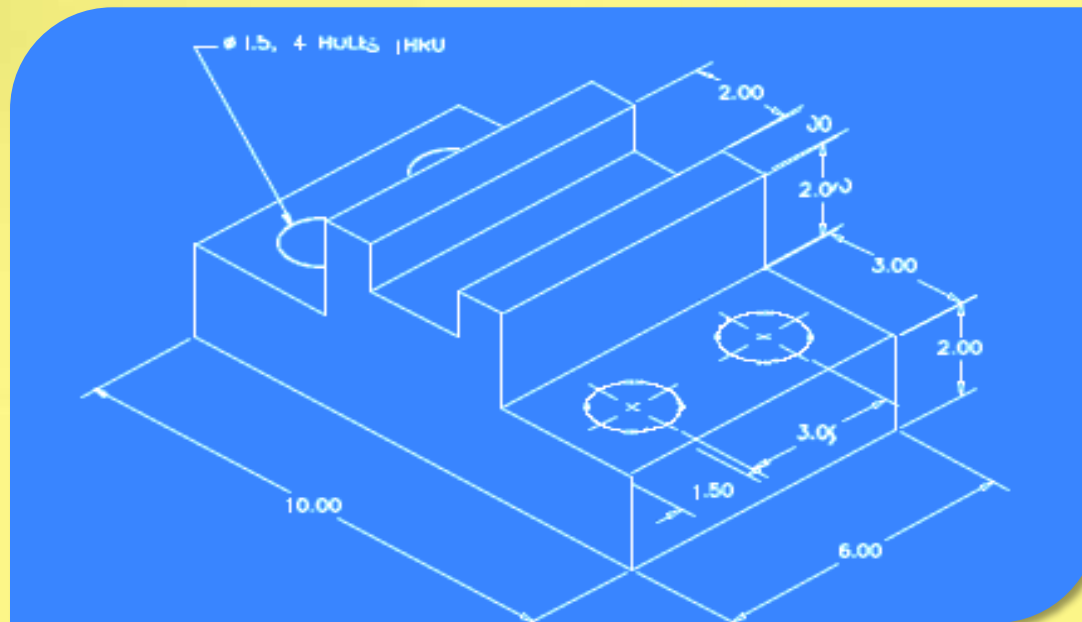
Views project to adjacent views.

Outlines of projection planes are omitted in final drawings.



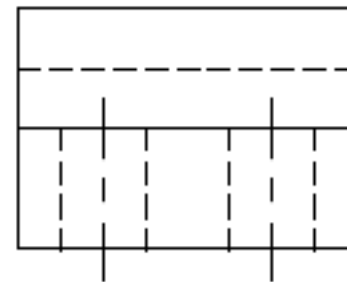
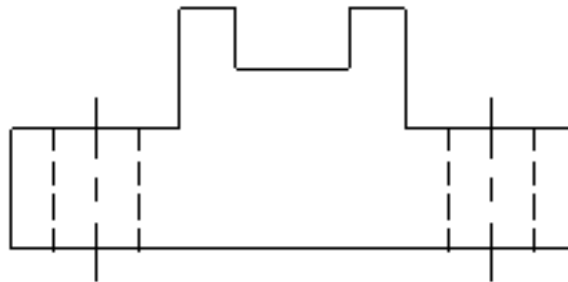
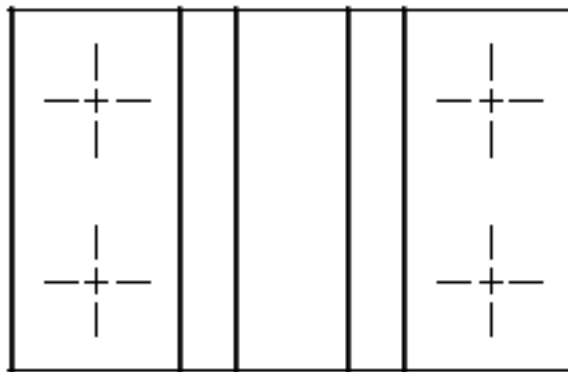
Object for exercise

- Complete three orthographic views of the object.
- Include visible, hidden, and center lines where appropriate.



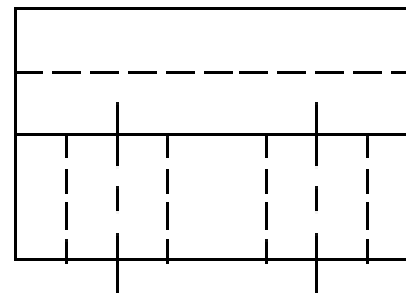
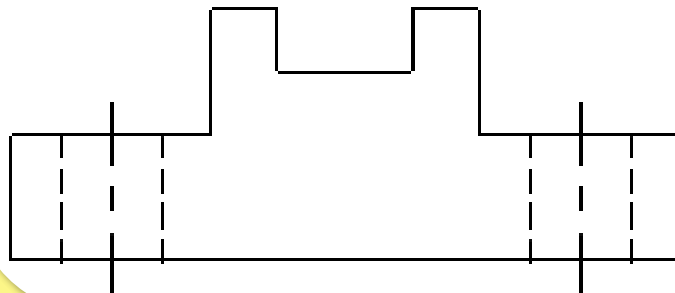
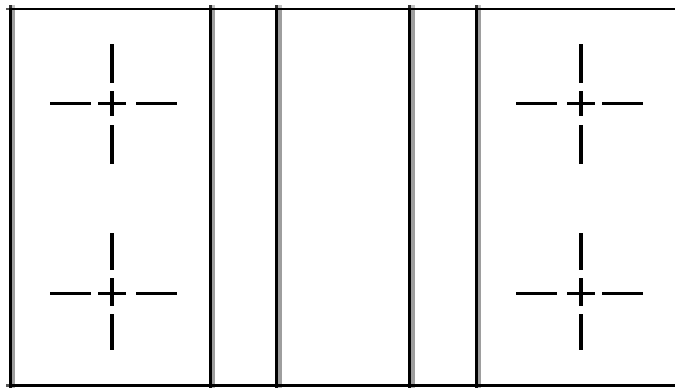


Solution





Solution





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The End

Thanks