

PROJECTIONS OF STRAIGHT LINES.

Information regarding a line *means*

It's length,

Position of it's ends with HP & VP

It's inclinations with HP & VP will be given.

AIM:- TO DRAW IT'S PROJECTIONS - MEANS FV & TV

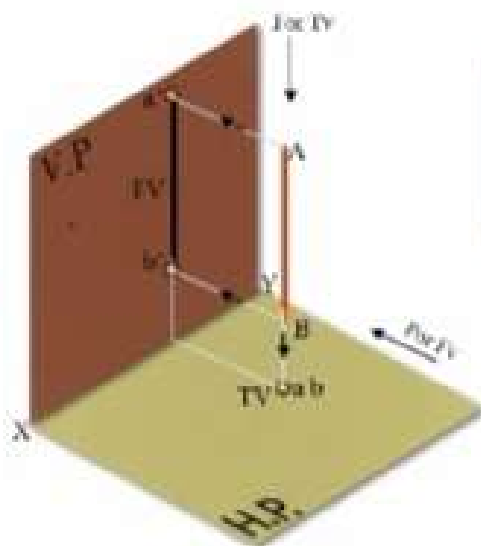
SIMPLE CASES OF THE LINE

1. A VERTICAL LINE (LINE PERPENDICULAR TO HP & // TO VP)
1. LINE PARALLEL TO BOTH HP & VP.
1. LINE INCLINED TO HP & PARALLEL TO VP.
1. LINE INCLINED TO VP & PARALLEL TO HP.
1. LINE INCLINED TO BOTH HP & VP.

STUDY ILLUSTRATIONS GIVEN ON NEXT PAGE
SHOWING CLEARLY THE NATURE OF FV & TV
OF LINES LISTED ABOVE AND NOTE RESULTS.

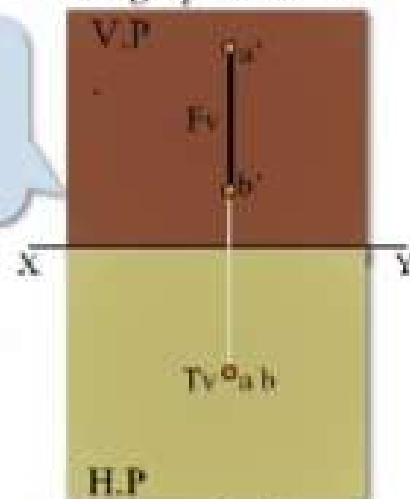
1

A Line
perpendicular
to Hp
&
// to Vp

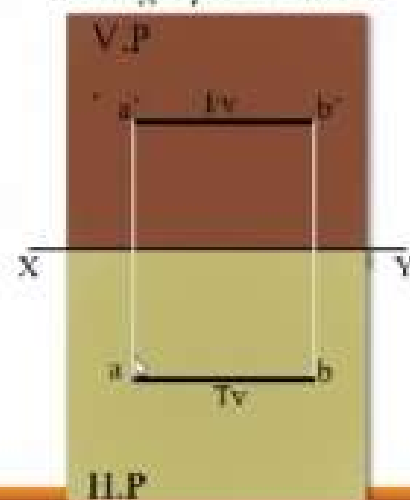


Fv is a vertical line
Showing True
Length &
Tv is a point.

Orthographic Pattern

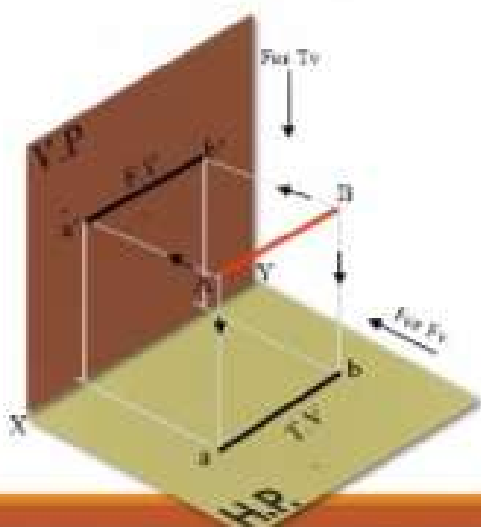


Orthographic Pattern



2

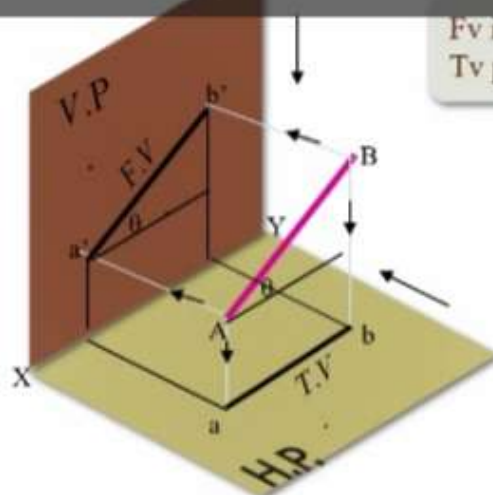
A Line
// to Hp
&
// to Vp



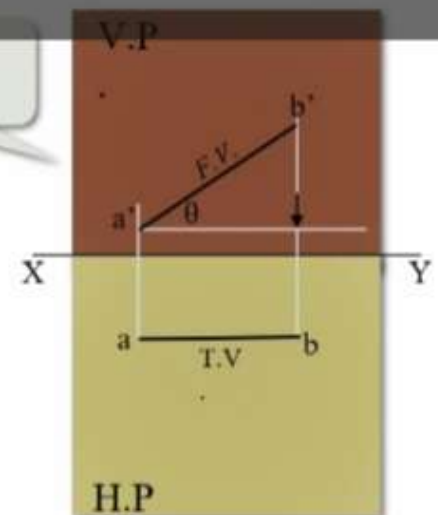
ndrakumar M started recording

3

A Line inclined to Hp
and
parallel to Vp



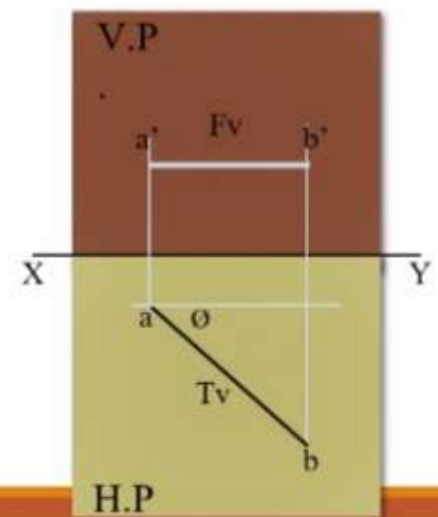
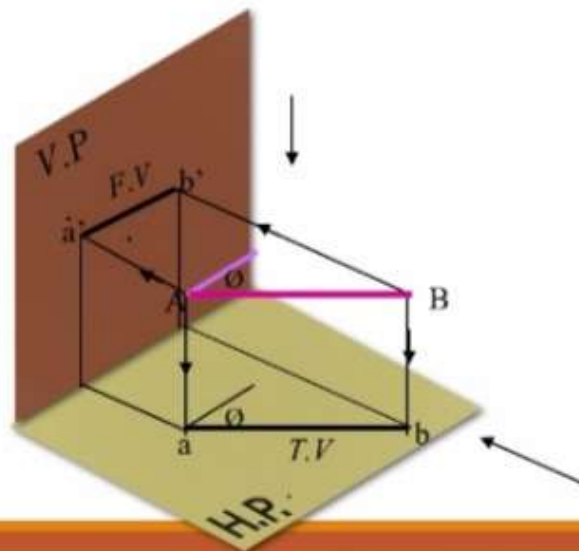
Fv inclined to xy
Tv parallel to xy.

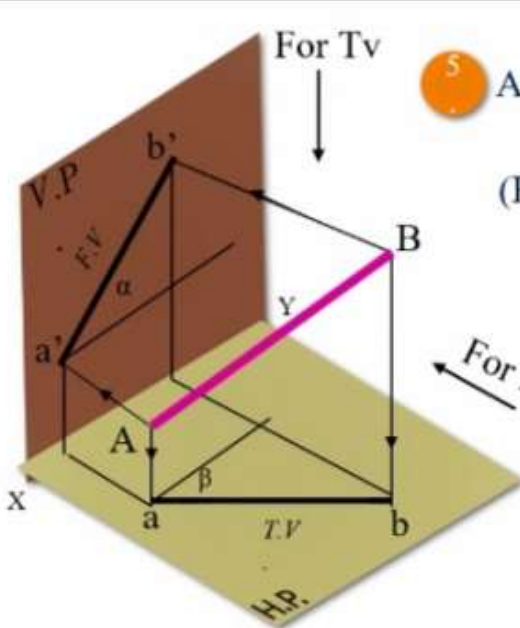


Orthographic Projections

4

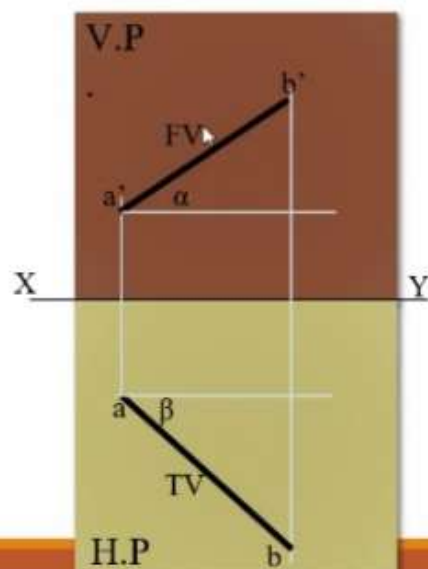
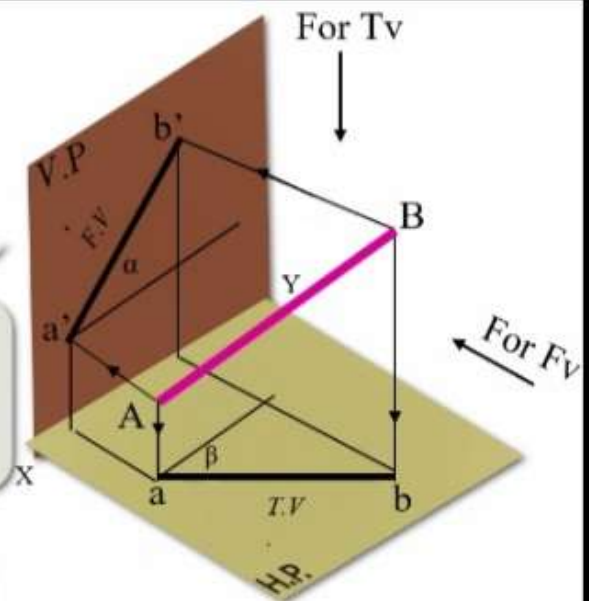
A Line inclined to Vp
and
parallel to Hp

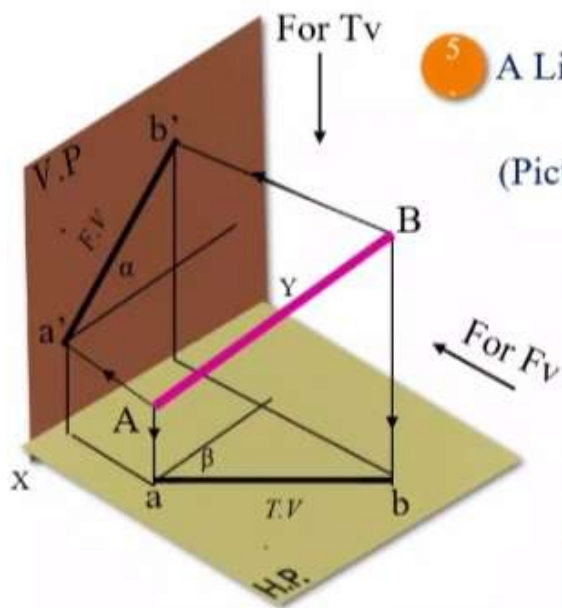




A Line inclined to both
Hp and Vp
(Pictorial presentation)

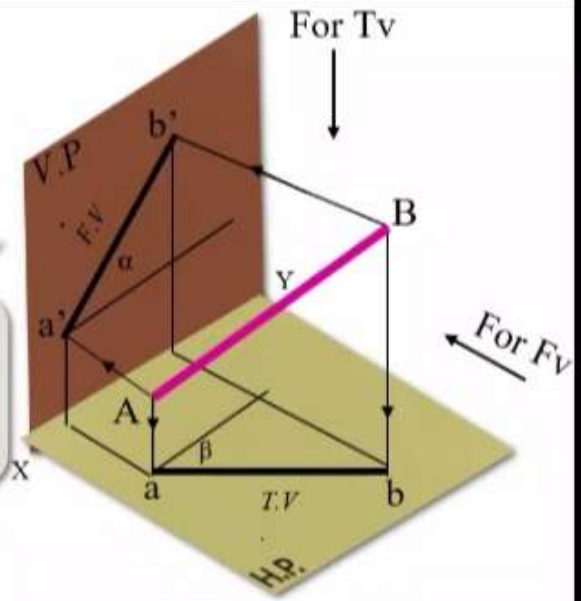
On removal of object
i.e. Line AB
Fv as a image on Vp.
Tv as a image on Hp,



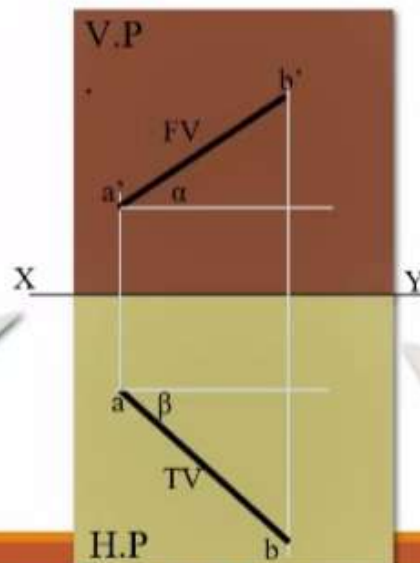


5 A Line inclined to both
Hp and Vp
(Pictorial presentation)

On removal of object
i.e. Line AB
Fv as a image on Vp.
Tv as a image on Hp,

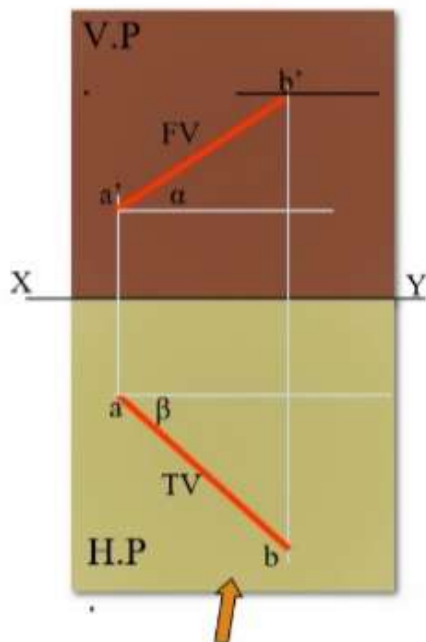


Orthographic Projections
Fv is seen on Vp clearly.
To see Tv clearly, HP is
rotated 90° downwards,
Hence it comes below xy.



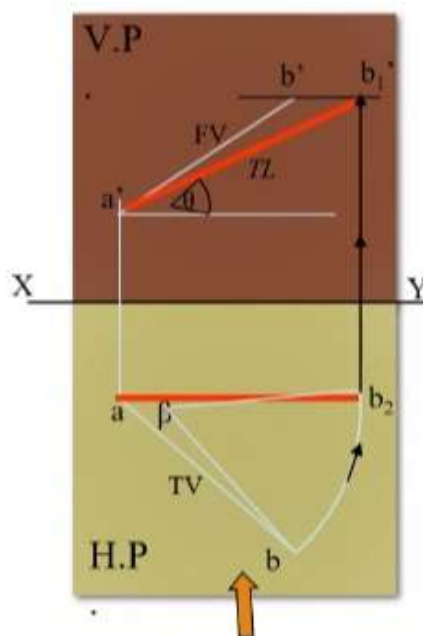
Note These Facts:-
Both Fv & Tv are inclined to xy.
(No view is parallel to xy)
Both Fv & Tv are reduced lengths.
(No view shows True Length)

Orthographic Projections
Means Fv & Tv of Line AB
are shown below,
with their apparent Inclinations
 α & β



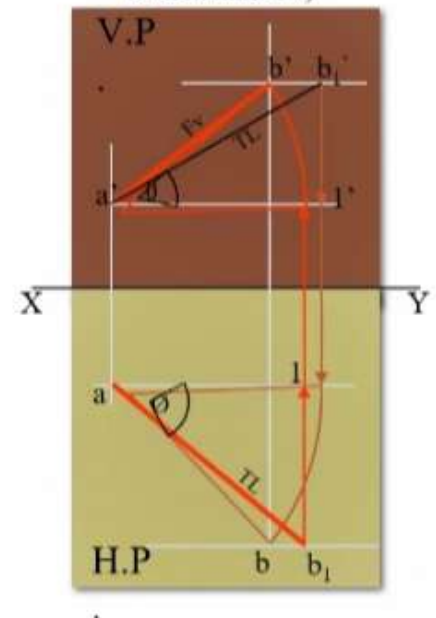
Here TV (ab) is not // to XY line
Hence it's corresponding FV
 $a' b'$ is not showing
True Length &
True Inclination with Hp.

Note the procedure
When Fv & Tv known,
How to find True Length.
(Views are rotated to determine
True Length & it's inclinations
with Hp & Vp).



In this sketch, TV is rotated
and made // to XY line.
Hence it's corresponding
FV $a' b_1'$ is showing
True Length & True
Inclination with Hp.

Note the procedure
When True Length is known,
How to locate Fv & Tv.
(Component a-1 of TL is drawn
which is further rotated
to determine Fv)



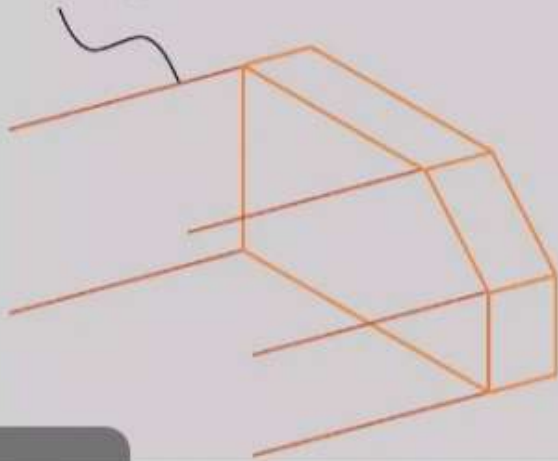
PROJECTION METHOD

Line of sight is an imaginary ray of light between observer's eye and an object.

There are 2 types of LOS : parallel and converge

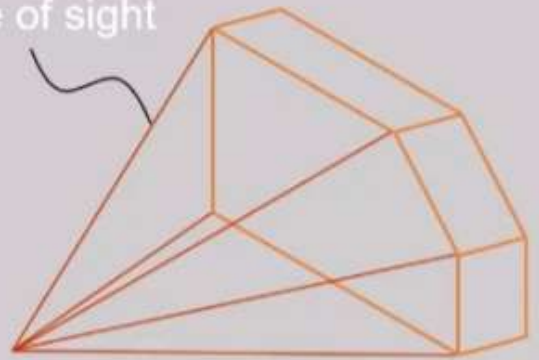
Parallel projection

Line of sight



Perspective projection

Line of sight





Disadvantage of Perspective Projection

Perspective projection is *not* used by engineer for manufacturing of parts, because

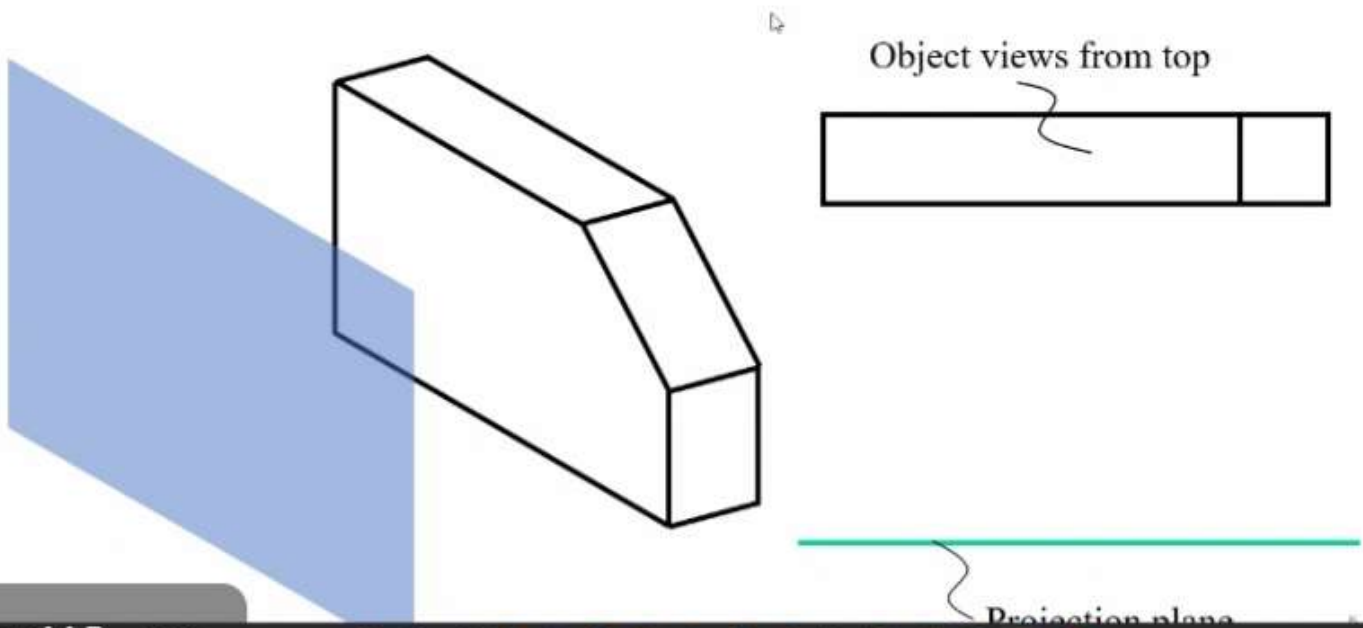
- 1) It is difficult to create.
- 2) It does not reveal exact shape and size.



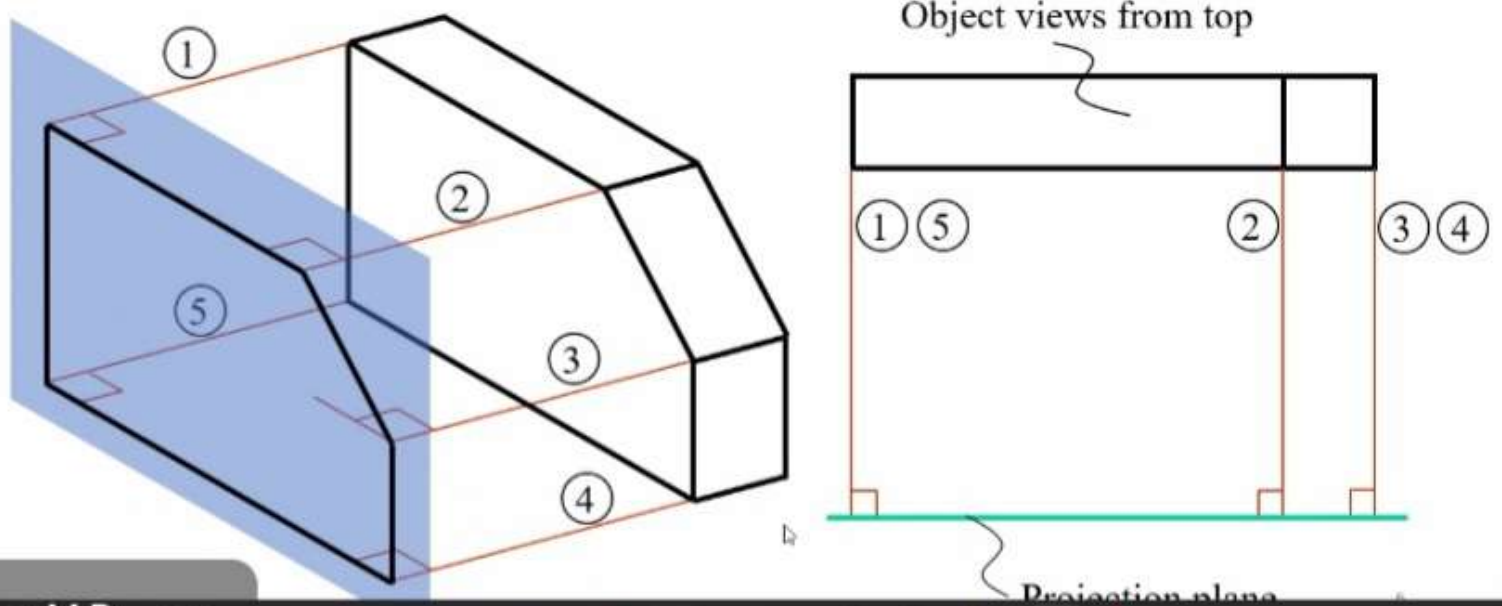


Orthographic projection

Orthographic projection is a parallel projection technique in which the parallel lines of sight are *perpendicular* to the projection plane



Orthographic projection is a parallel projection technique in which the parallel lines of sight are *perpendicular* to the projection plane



ORTHOGRAPHIC VIEW

- Orthographic projection technique can produce either
 1. *Multiview drawing*
that each view show an object in two dimensions.
 2. *Axonometric drawing*
that show all three dimensions of an object in one view.

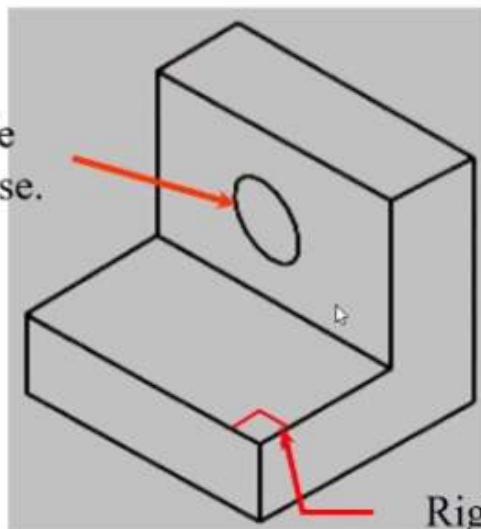
Axonometric (Isometric) Drawing

Advantage Easy to understand

Disadvantage Shape and angle distortion

Example Distortions of shape and size in isometric drawing

Circular hole becomes ellipse.



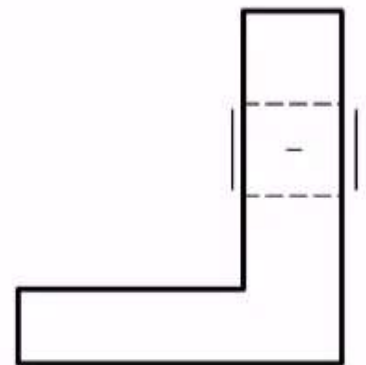
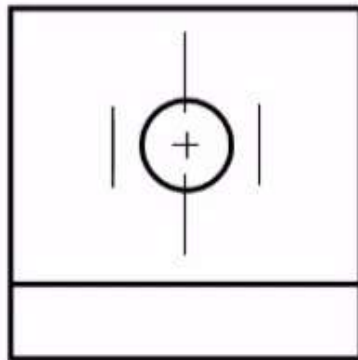
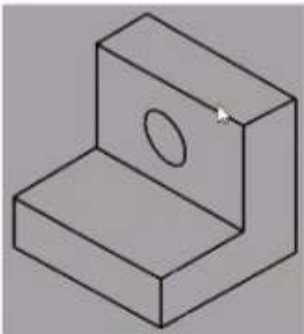
Right angle becomes obtuse angle.

Multiview Drawing

Advantage It represents accurate **shape and size**.

Disadvantage Require practice in writing and reading.

Example Multiviews drawing (2-view drawing)

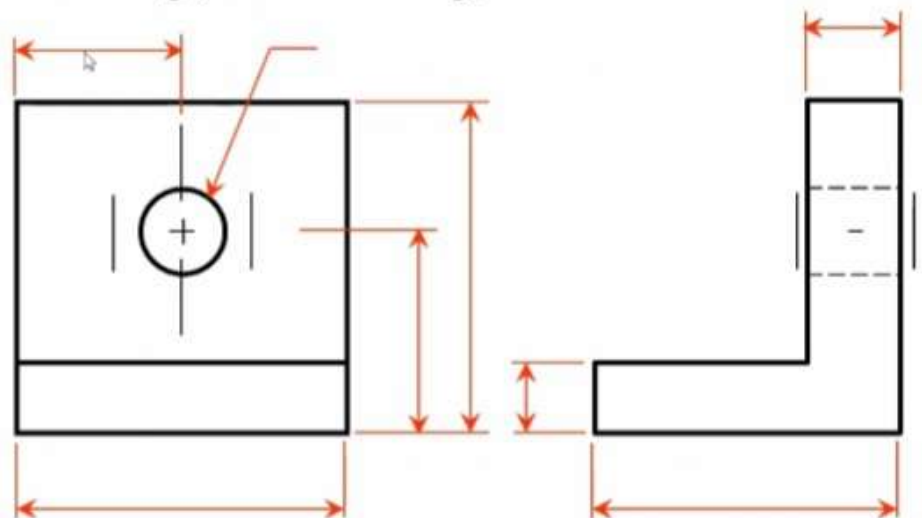


Multiview Drawing

Advantage It represents accurate **shape and size**.

Disadvantage Require practice in writing and reading.

Example Multiviews drawing (2-view drawing)



ORTHOGRAPHIC PROJECTIONS:

It is a technical drawing in which different views of an object are projected on different reference planes observing perpendicular to respective reference plane

Different Reference planes are

Horizontal Plane (HP),
Vertical Frontal Plane (VP)
Side Or Profile Plane (PP)

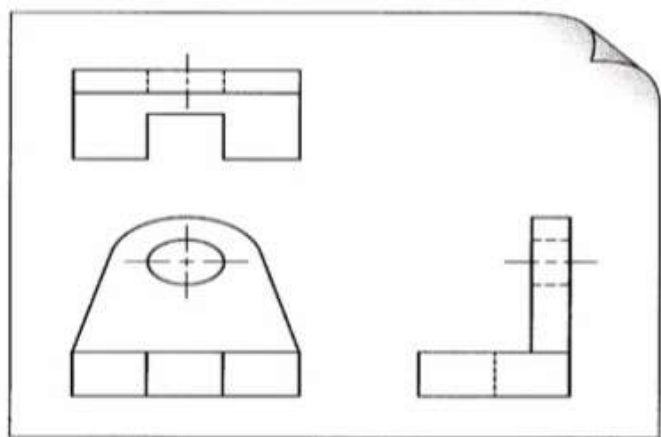
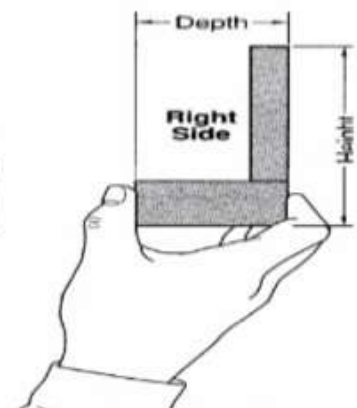
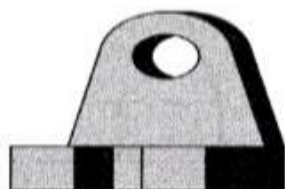
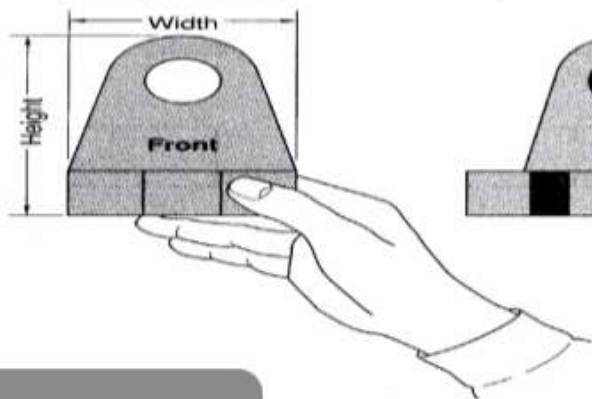
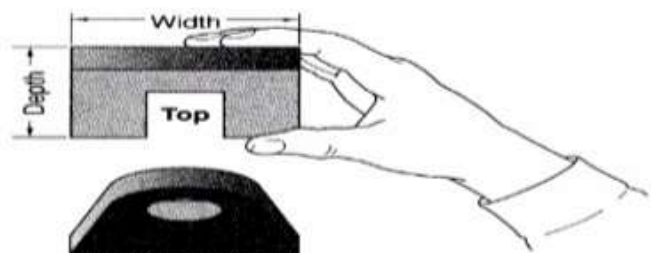
and

Different Views are Front View (FV), Top View (TV) and Side View (SV)

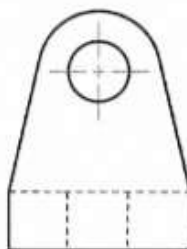
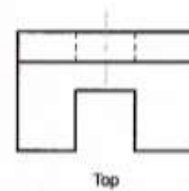
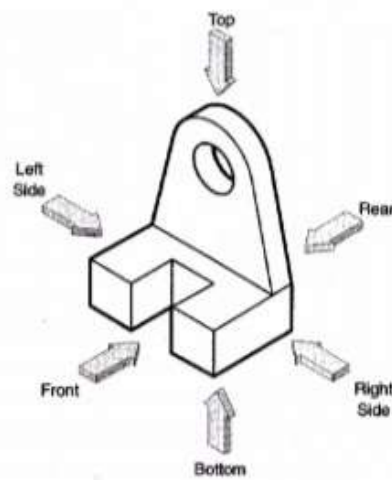
FV is a view projected on VP.

TV is a view projected on
HP.

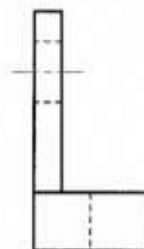
SV is a view projected on PP.



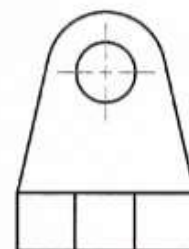
Orthographic Projections are a collection of 2-D drawings that work together to give an accurate overall representation of an object.



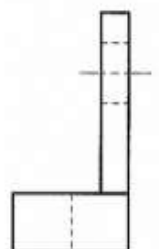
Rear



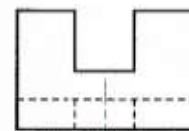
Left Side



Front



Right Side

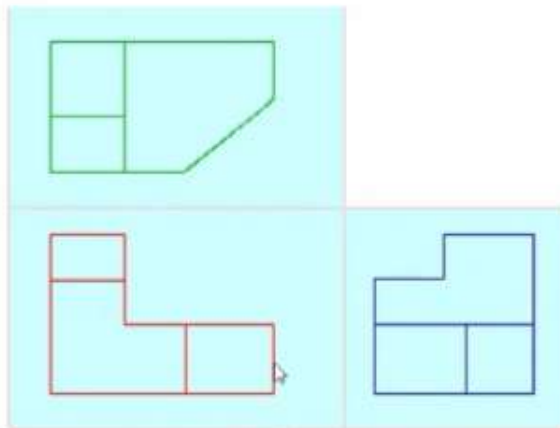


Defining the Six Principal Views or Orthographic Views

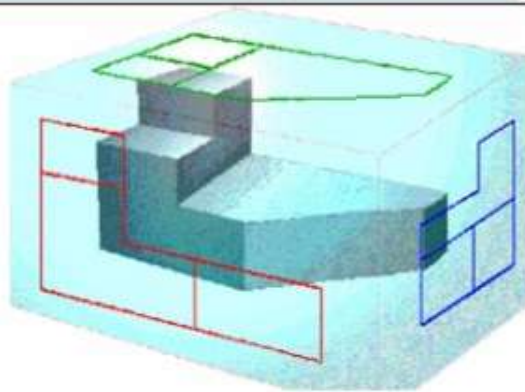


Glass Box Approach

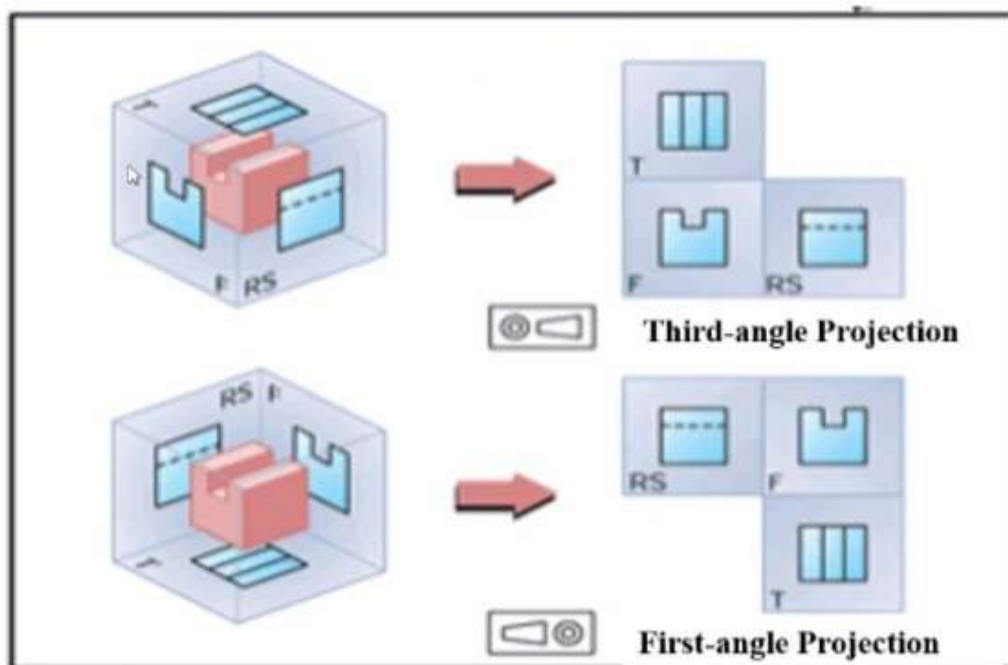
Unfolded
glass-box



Object in the
glass-box



First and Third Angle Projections



- First Angle
- Third Angle