Orthographic Projections - Basics

1. Drawing – The fact about
2. Drawings - Types
3. Orthographic (Definitions and Important terms)
4. Planes - Classifications
5. Pattern of planes & views
6. Methods of orthographic projections
7. 1st angle and 3rd angle method – two illustrations

Conversion of pictorial views in to orthographic views.

1. Explanation of various terms
2. 1st angle method - illustration
3. 3rd angle method – illustration
4. To recognize colored surfaces and to draw three Views
5. Seven illustrations (no.1 to 7) draw different orthographic views
6. Total nineteen illustrations (no.8 to 26)

DRAWINGS:

(A Graphical Representation)

The Fact about:

If compared with Verbal or Written Description,
Drawings offer far better idea about the Shape, Size & Appearance of any object or situation or location, that too in quite a less time.

Hence it has become the Best Media of Communication not only in Engineering but in almost all Fields.

Drawings
(Some Types)

Nature Drawings
(landscape, scenery etc.)

Geographical
Drawings
(maps etc.)

Botanical Drawings
(plants, flowers etc.)

Zoological Drawings
(creatures, animals etc.)

Portraits
(human faces, expressions etc.)

Engineering Drawings,
(projections.)

Building Related Drawings.

Machine component Drawings

Orthographic Projections
(Fv,Tv & Sv.-Mech.Engg terms)
(Plan, Elevation- Civil Engg.terms)
(Working Drawings 2-D type)

Isometric (Mech.Engg.Term.)
or Perspective(Civil Engg.Term)
(Actual Object Drawing 3-D)

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)

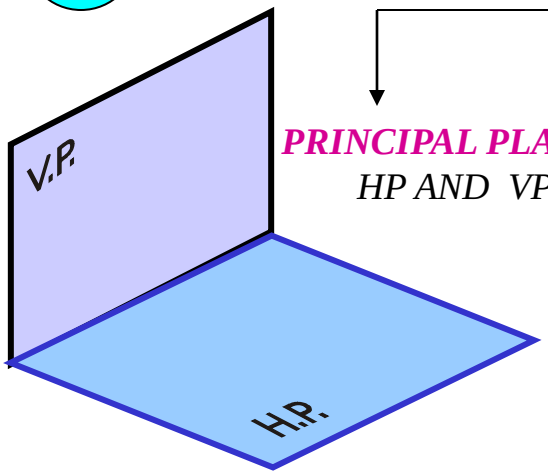
FV is a view projected on VP.
TV is a view projected on HP.
SV is a view projected on PP.

IMPORTANT TERMS OF ORTHOGRAPHIC PROJECTIONS:

1. **Planes.**
2. **Pattern of planes & Pattern of views**
3. **Methods of drawing Orthographic Projections**

PLANES

1

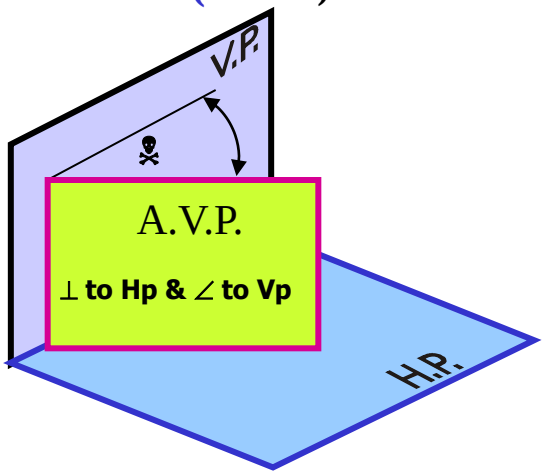


PRINCIPAL PLANES

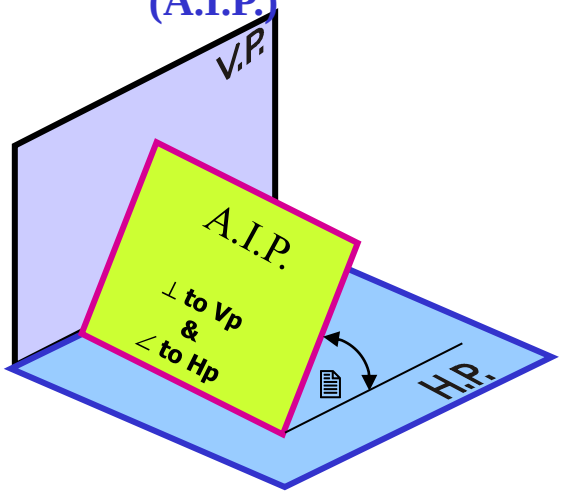
HP AND VP

AUXILIARY PLANES

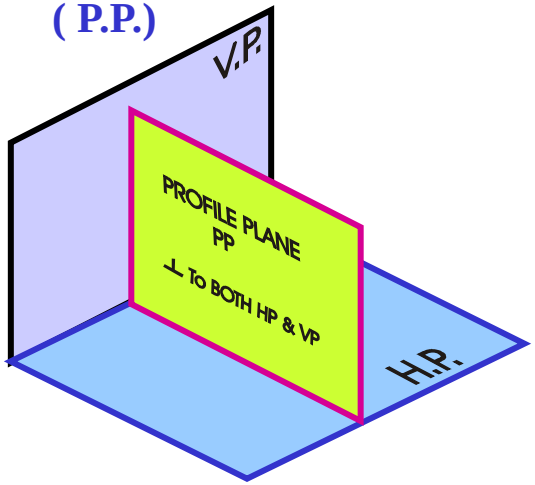
Auxiliary Vertical Plane (A.V.P.)



Auxiliary Inclined Plane (A.I.P.)

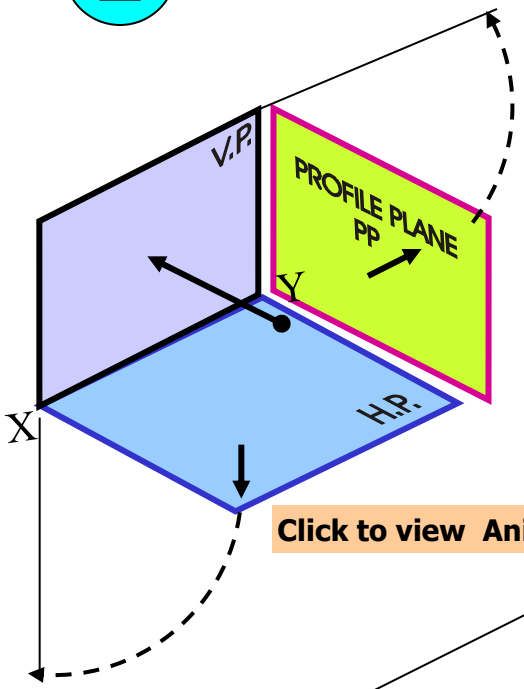


Profile Plane (P.P.)



PATTERN OF PLANES & VIEWS (First Angle Method)

2



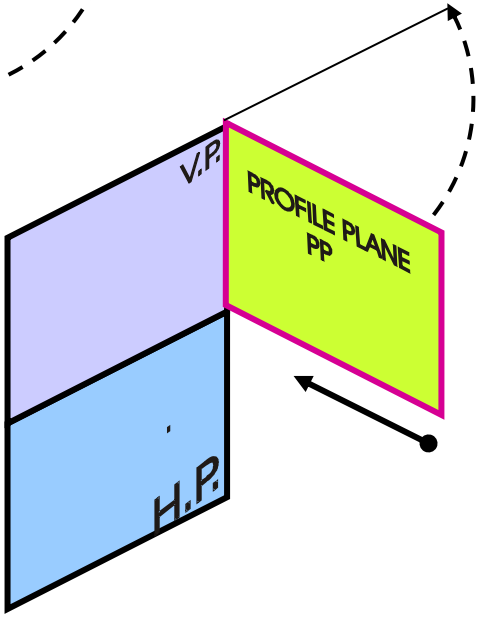
THIS IS A PICTORIAL SET-UP OF ALL THREE PLANES.
ARROW DIRECTION IS A NORMAL WAY OF OBSERVING THE OBJECT.
BUT IN THIS DIRECTION ONLY VP AND A VIEW ON IT (FV) CAN BE SEEN.
THE OTHER PLANES AND VIEWS ON THOSE CAN NOT BE SEEN.

PROCEDURE TO SOLVE ABOVE PROBLEM:-

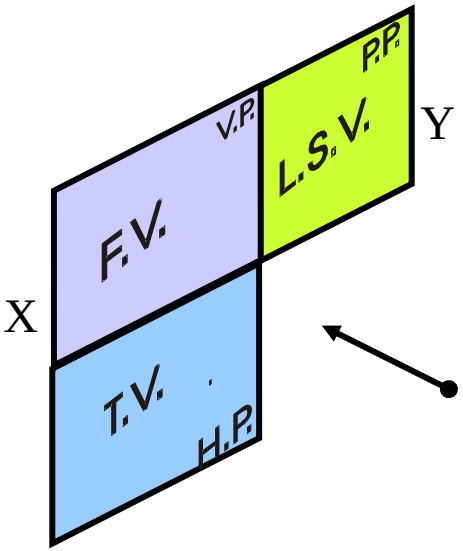
TO MAKE THOSE PLANES ALSO VISIBLE FROM THE ARROW DIRECTION,
A) HP IS ROTATED 90^0 DOUNWARD
B) PP, 90^0 IN RIGHT SIDE DIRECTION.
THIS WAY BOTH PLANES ARE BROUGHT IN THE SAME PLANE CONTAINING VP.

Click to view Animation

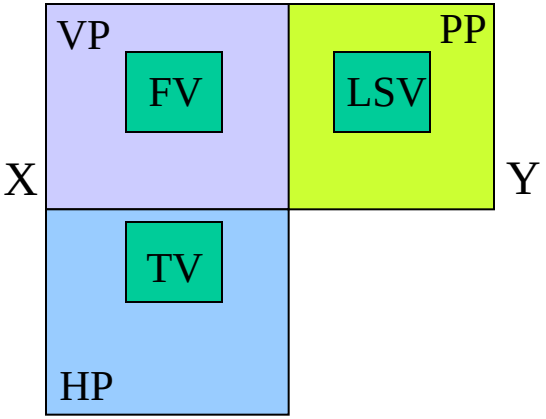
On clicking the button if a warning comes please click YES to continue, this program is safe for your pc.



HP IS ROTATED DOWNWARD 90^0
AND
BROUGHT IN THE PLANE OF VP.



PP IS ROTATED IN RIGHT SIDE 90^0
AND
BROUGHT IN THE PLANE OF VP.



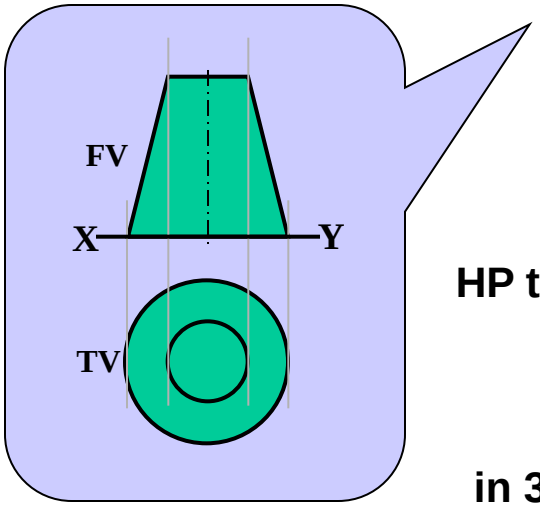
ACTUAL PATTERN OF PLANES & VIEWS
OF ORTHOGRAPHIC PROJECTIONS
DRAWN IN
FIRST ANGLE METHOD OF PROJECTIONS

3

Methods of Drawing Orthographic Projections

First Angle Projections Method

Here views are drawn
by placing object
in 1st Quadrant
(Fv above X-y, Tv below X-y)



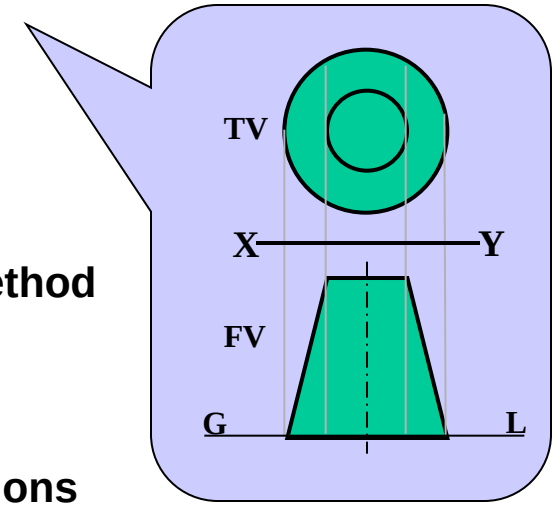
SYMBOLIC PRESENTATION OF BOTH METHODS WITH AN OBJECT STANDING ON HP (GROUND) ON IT'S BASE.

NOTE:-

HP term is used in 1st Angle method
&
For the same
Ground term is used
in 3rd Angle method of projections

Third Angle Projections Method

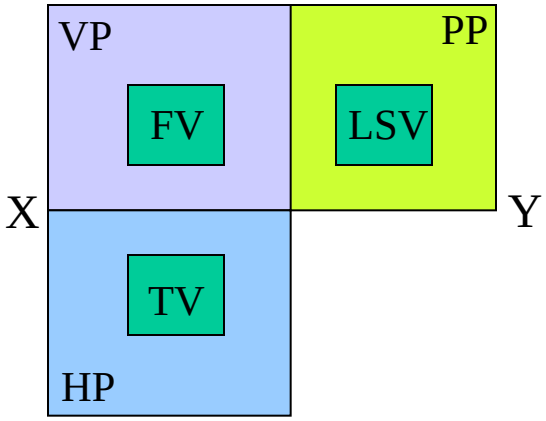
Here views are drawn
by placing object
in 3rd Quadrant.
(Tv above X-y, Fv below X-y)



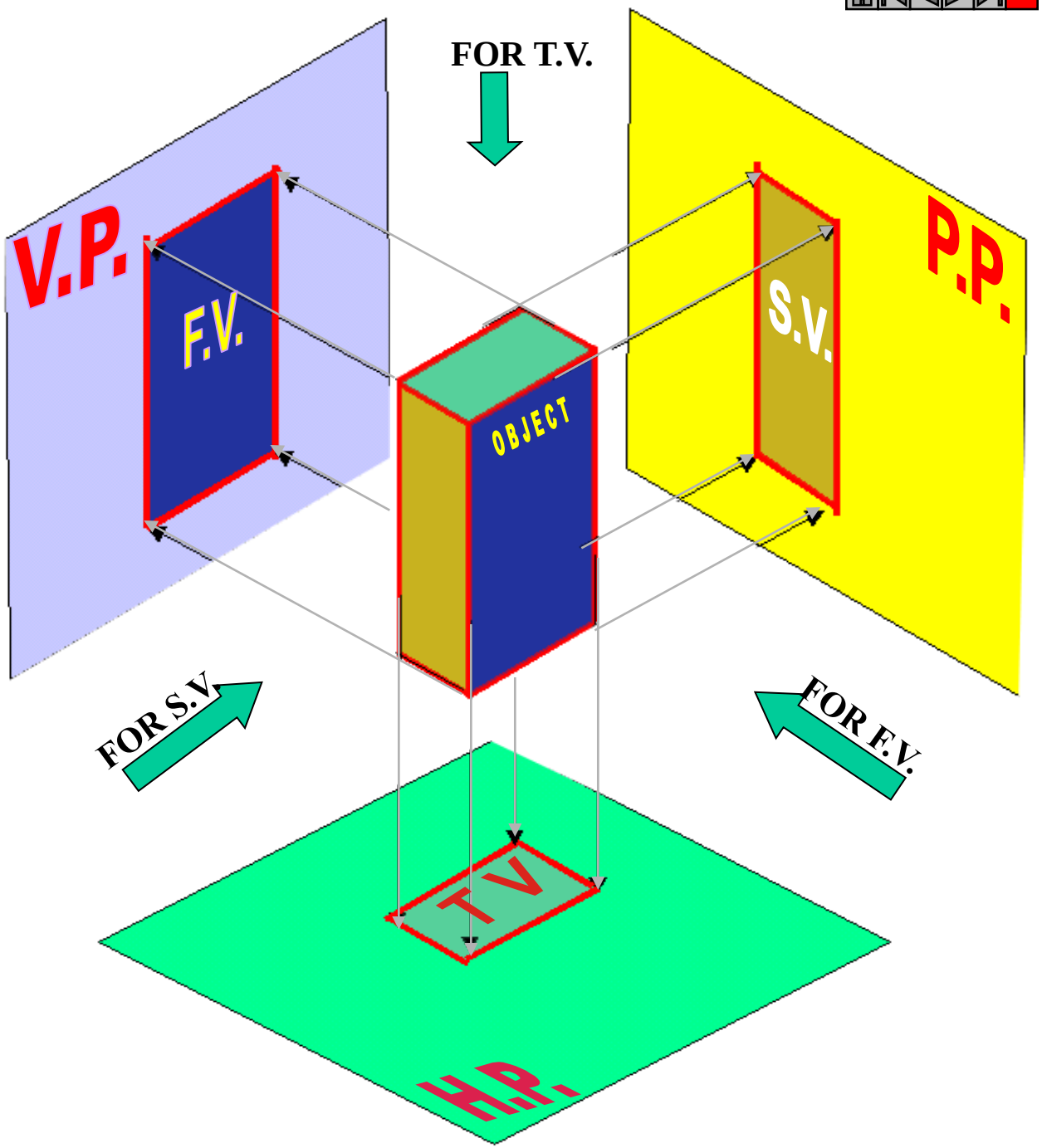
FIRST ANGLE PROJECTION

**IN THIS METHOD,
THE OBJECT IS ASSUMED TO BE SITUATED IN FIRST QUADRANT
MEANS
ABOVE HP & INFRONT OF VP.**

OBJECT IS INBETWEEN OBSERVER & PLANE.



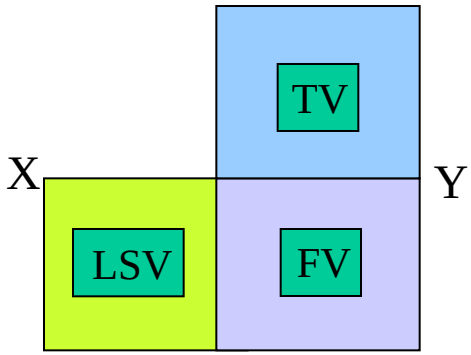
ACTUAL PATTERN OF PLANES & VIEWS IN FIRST ANGLE METHOD OF PROJECTIONS



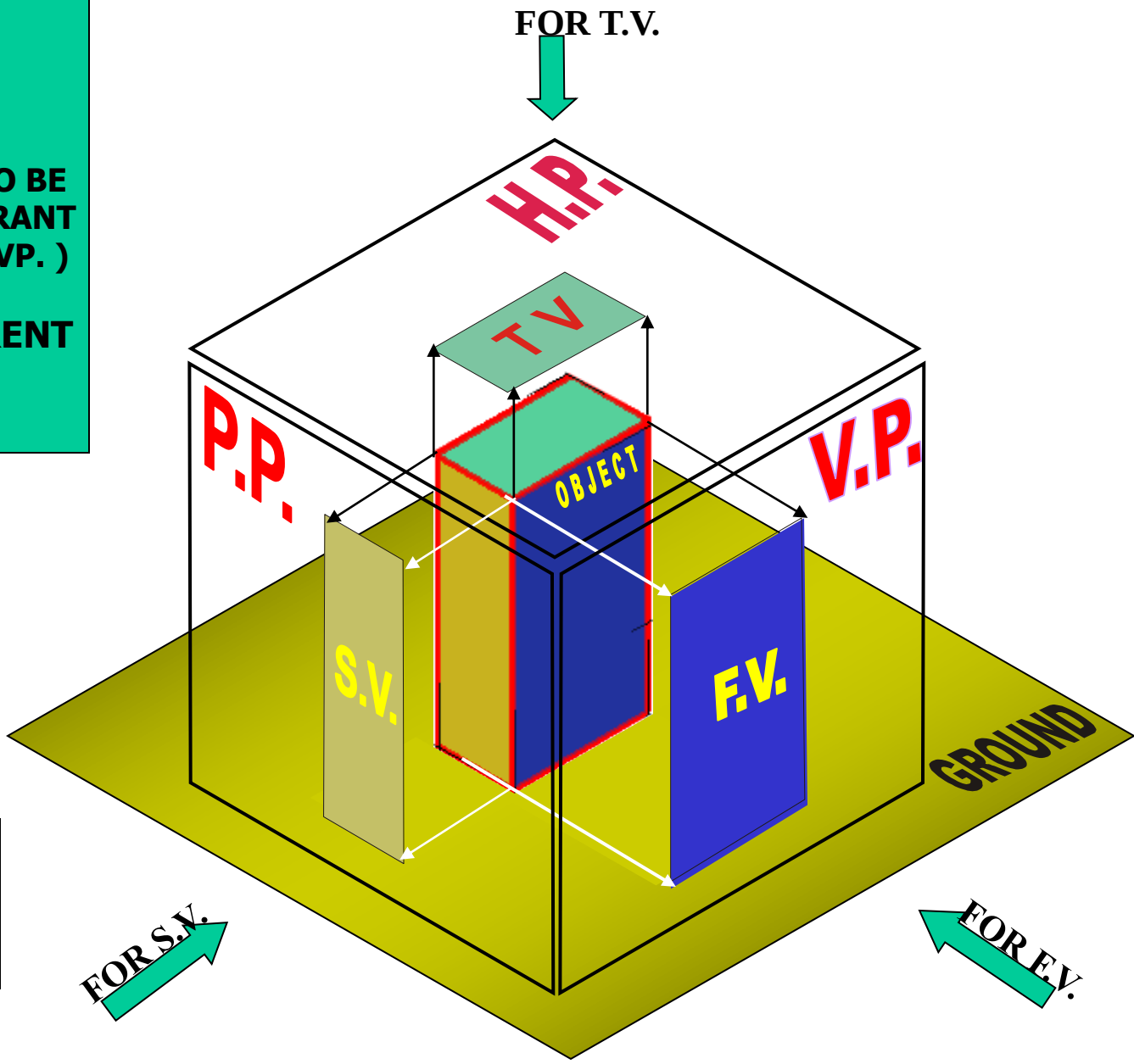
THIRD ANGLE PROJECTION

**IN THIS METHOD,
THE OBJECT IS ASSUMED TO BE SITUATED IN THIRD QUADRANT
(BELOW HP & BEHIND OF VP.)**

PLANES BEING TRANSPERENT AND INBETWEEN OBSERVER & OBJECT.



ACTUAL PATTERN OF PLANES & VIEWS OF THIRD ANGLE PROJECTIONS



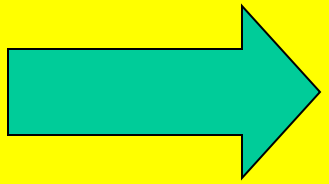
ORTHOGRAPHIC PROJECTIONS
{ MACHINE ELEMENTS }

OBJECT IS OBSERVED IN THREE DIRECTIONS.
THE DIRECTIONS SHOULD BE NORMAL
TO THE RESPECTIVE PLANES.
AND NOW PROJECT THREE DIFFERENT VIEWS ON THOSE PLANES.
THESE VEWS ARE FRONT VIEW , TOP VIEW AND SIDE VIEW.

FRONT VIEW IS A VIEW PROJECTED ON VERTICAL PLANE (VP)
TOP VIEW IS A VIEW PROJECTED ON HORIZONTAL PLANE (HP)
SIDE VIEW IS A VIEW PROJECTED ON PROFILE PLANE (PP)

FIRST STUDY THE CONCEPT OF 1^{ST} AND 3^{RD} ANGLE
PROJECTION METHODS

AND THEN STUDY NEXT 26 ILLUSTRATED CASES CAREFULLY.
TRY TO RECOGNIZE SURFACES
PERPENDICULAR TO THE ARROW DIRECTIONS



FIRST ANGLE PROJECTION

**IN THIS METHOD,
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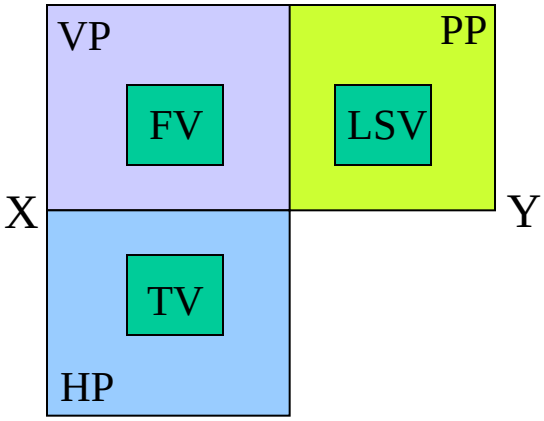
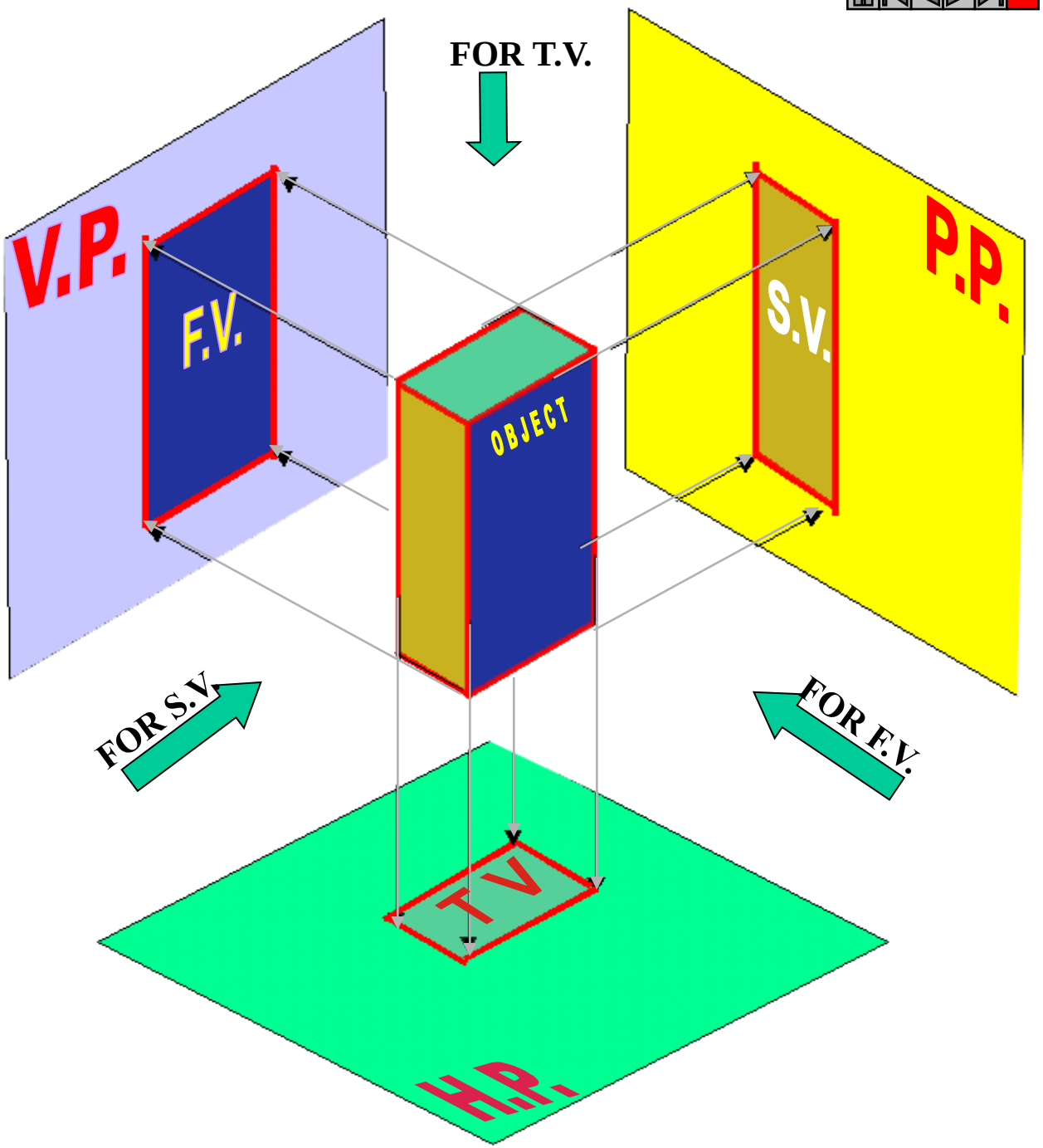
MEANS
ABOVE HP & INFRONT OF VP.**

OBJECT IS INBETWEEN OBSERVER & PLANE.



ACTUAL PATTERN OF PLANES & VIEWS IN FIRST ANGLE METHOD OF PROJECTIONS



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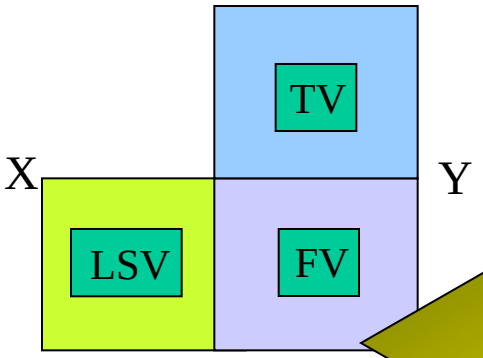
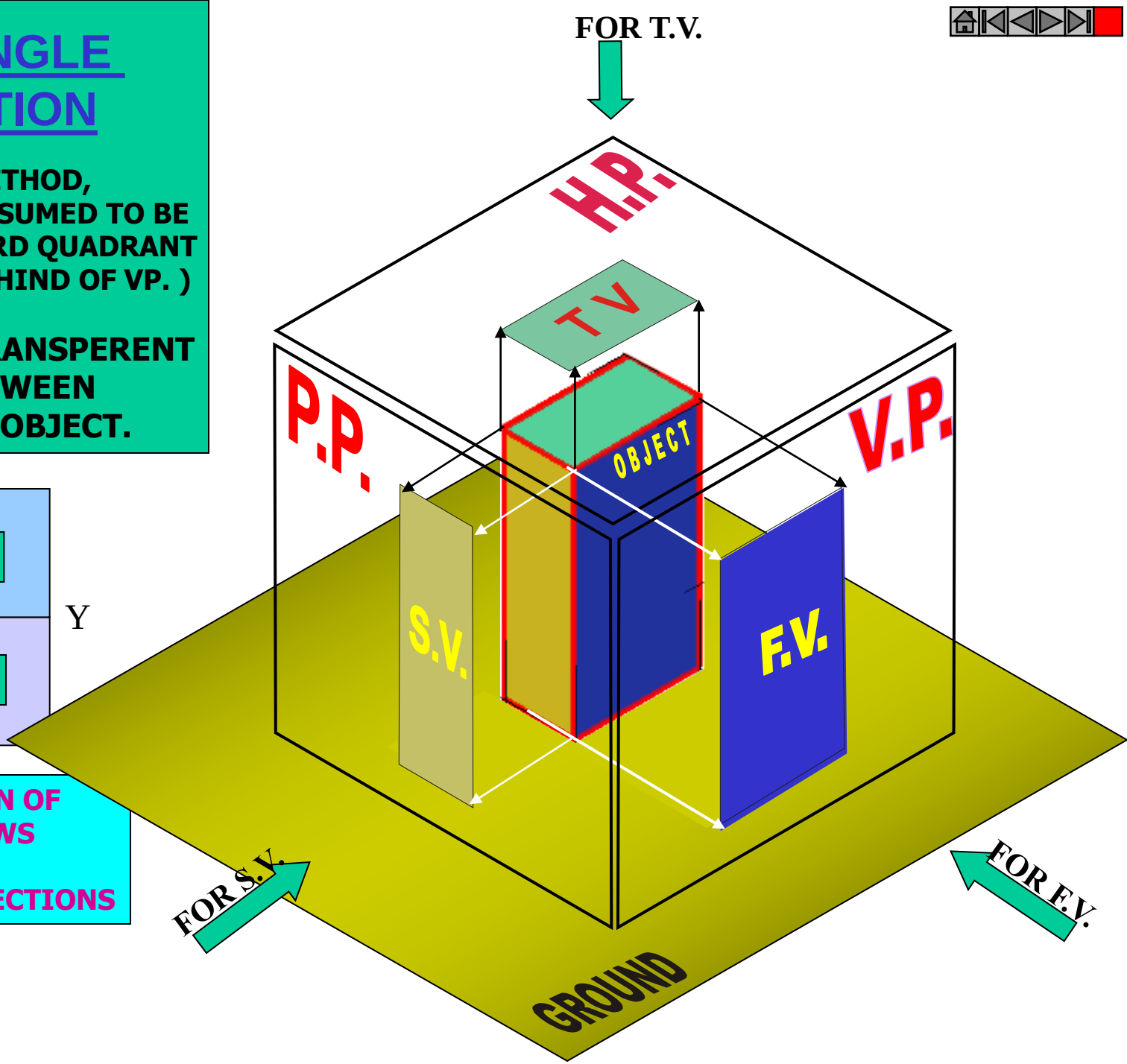
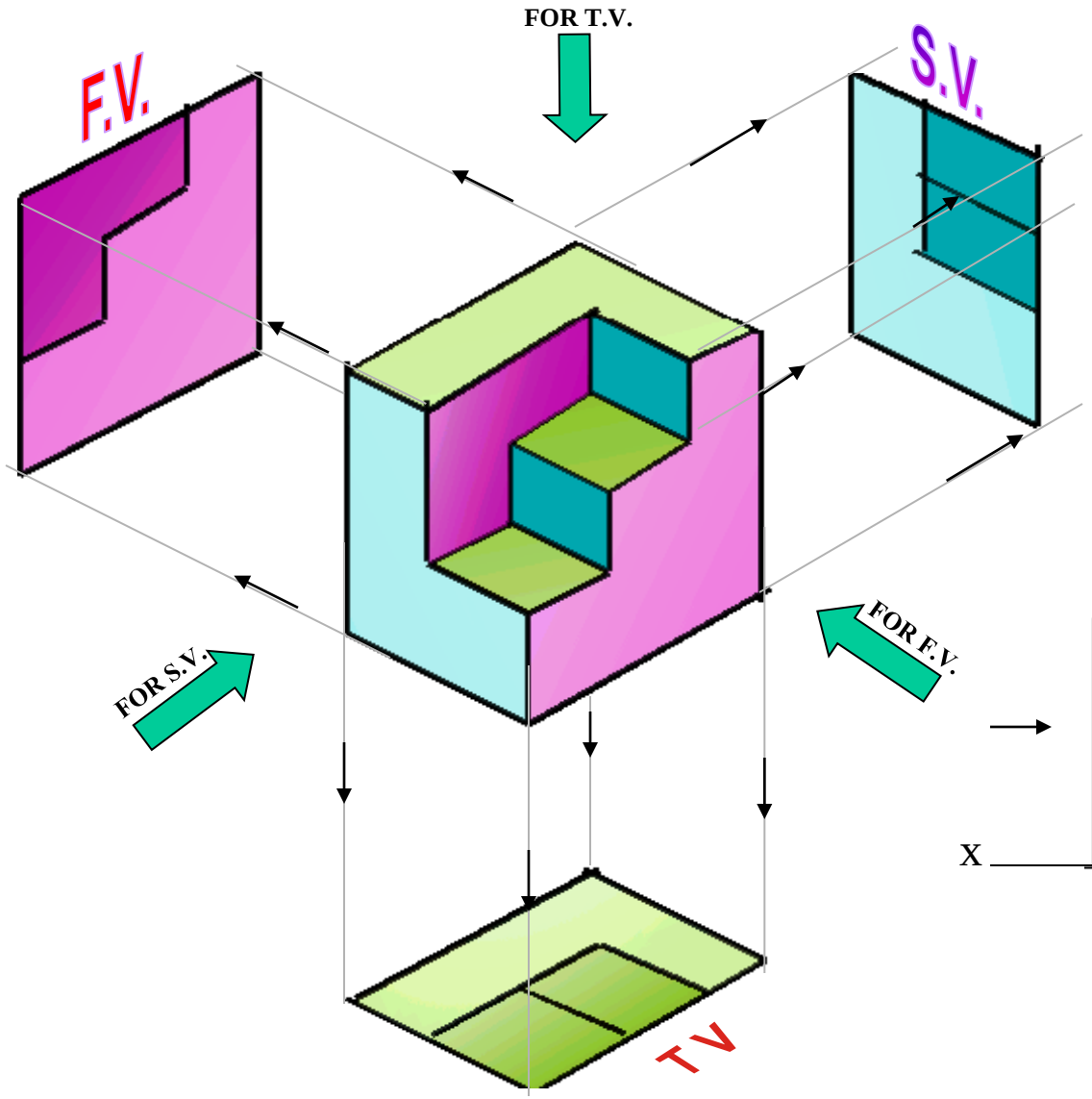
PLANES BEING TRANSPERENT AND INBETWEEN OBSERVER & OBJECT.

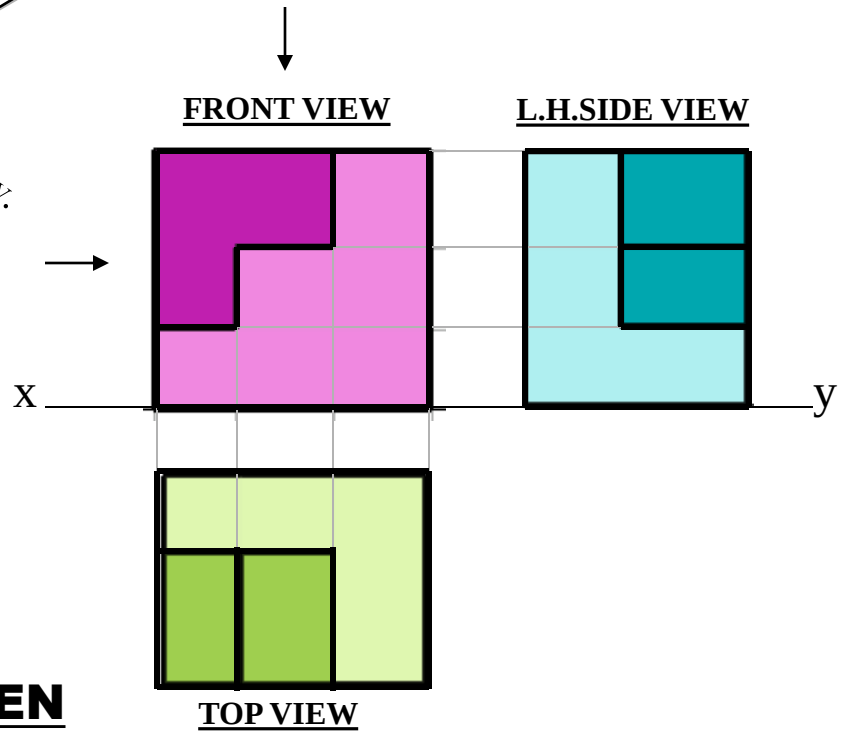


ACTUAL PATTERN OF PLANES & VIEWS OF THIRD ANGLE PROJECTIONS



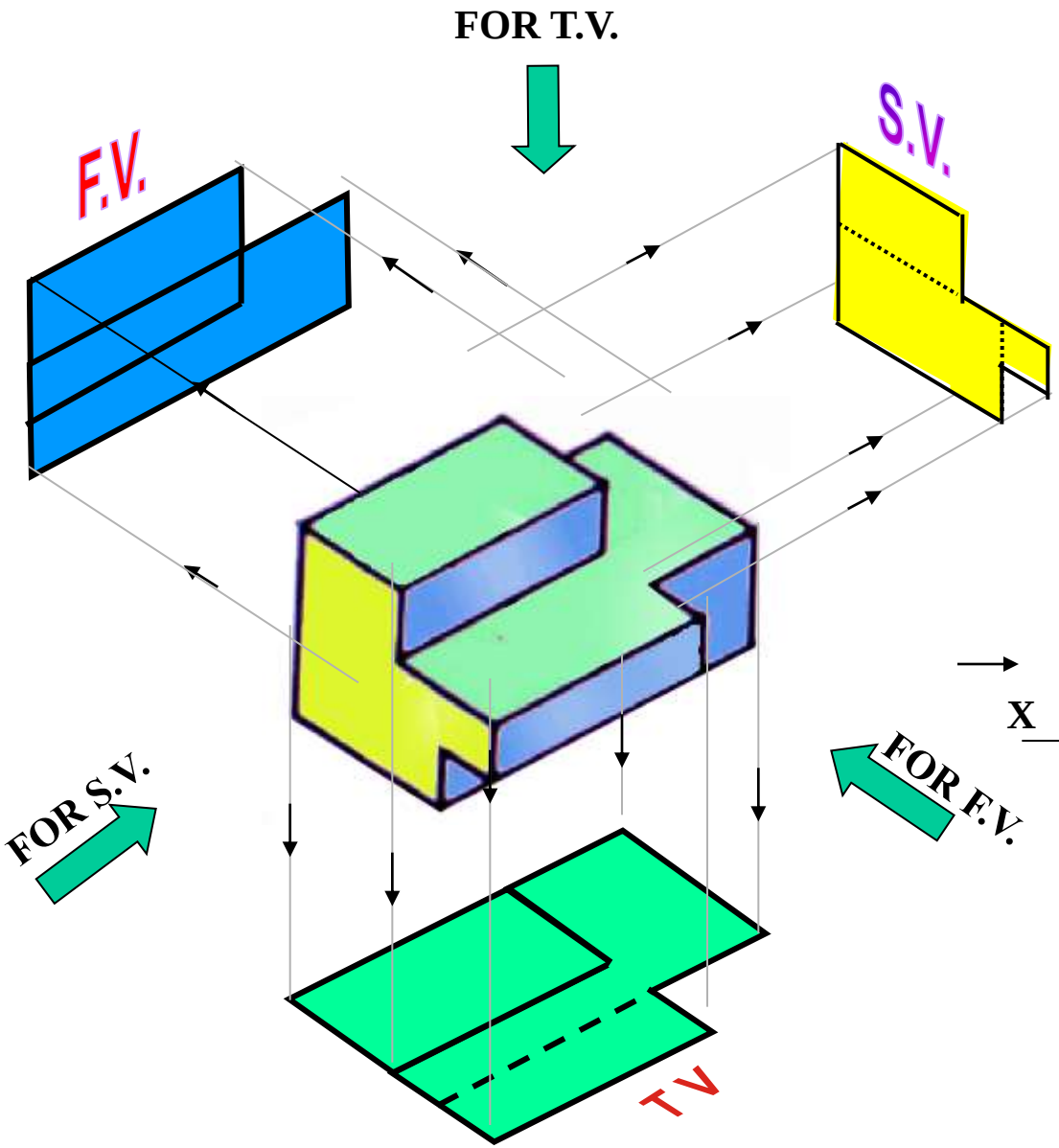


ORTHOGRAPHIC PROJECTIONS



PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD



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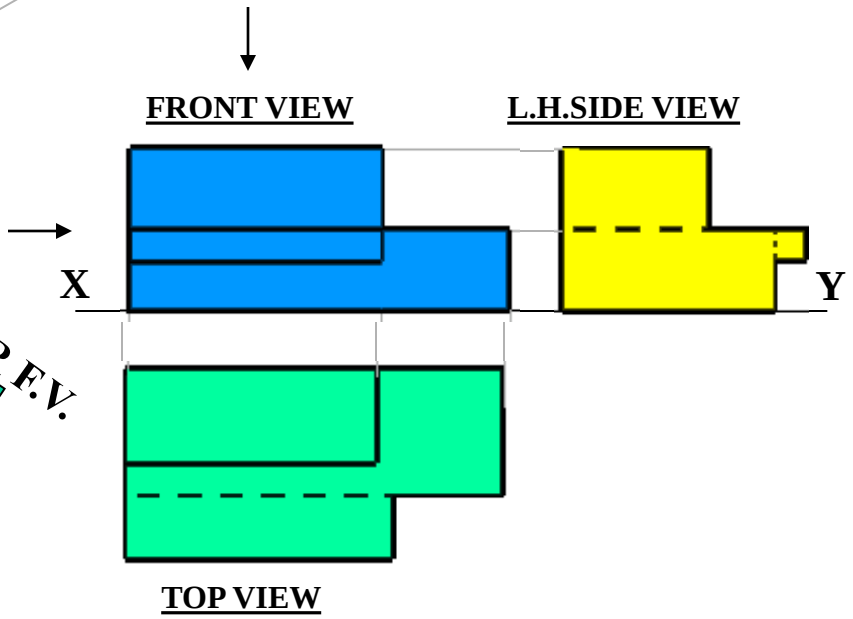

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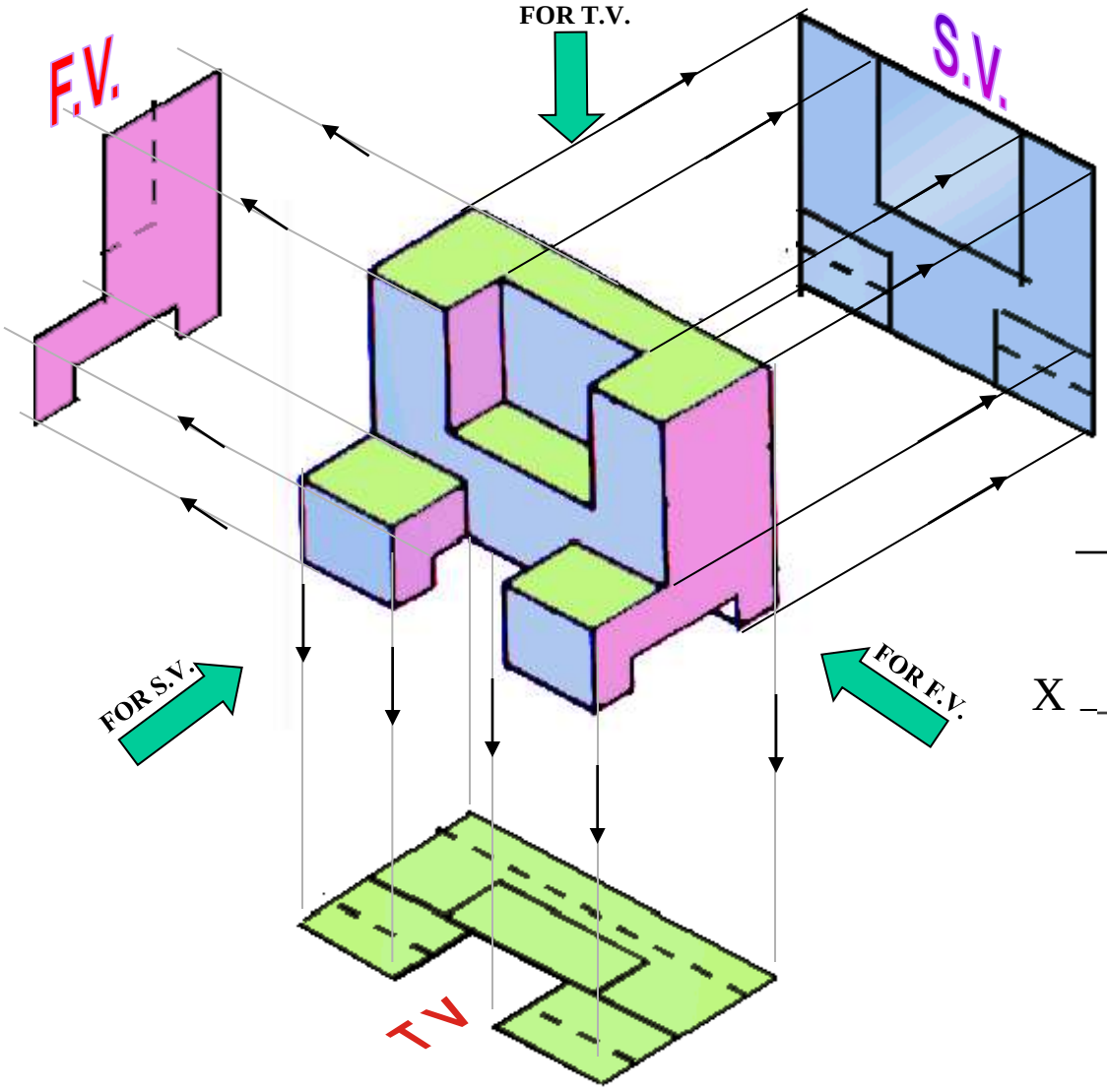

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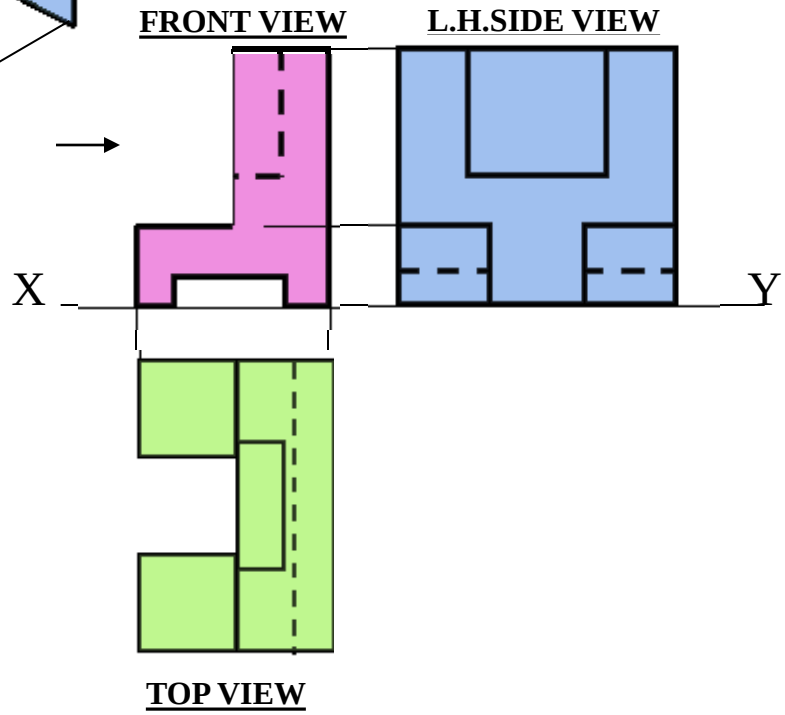
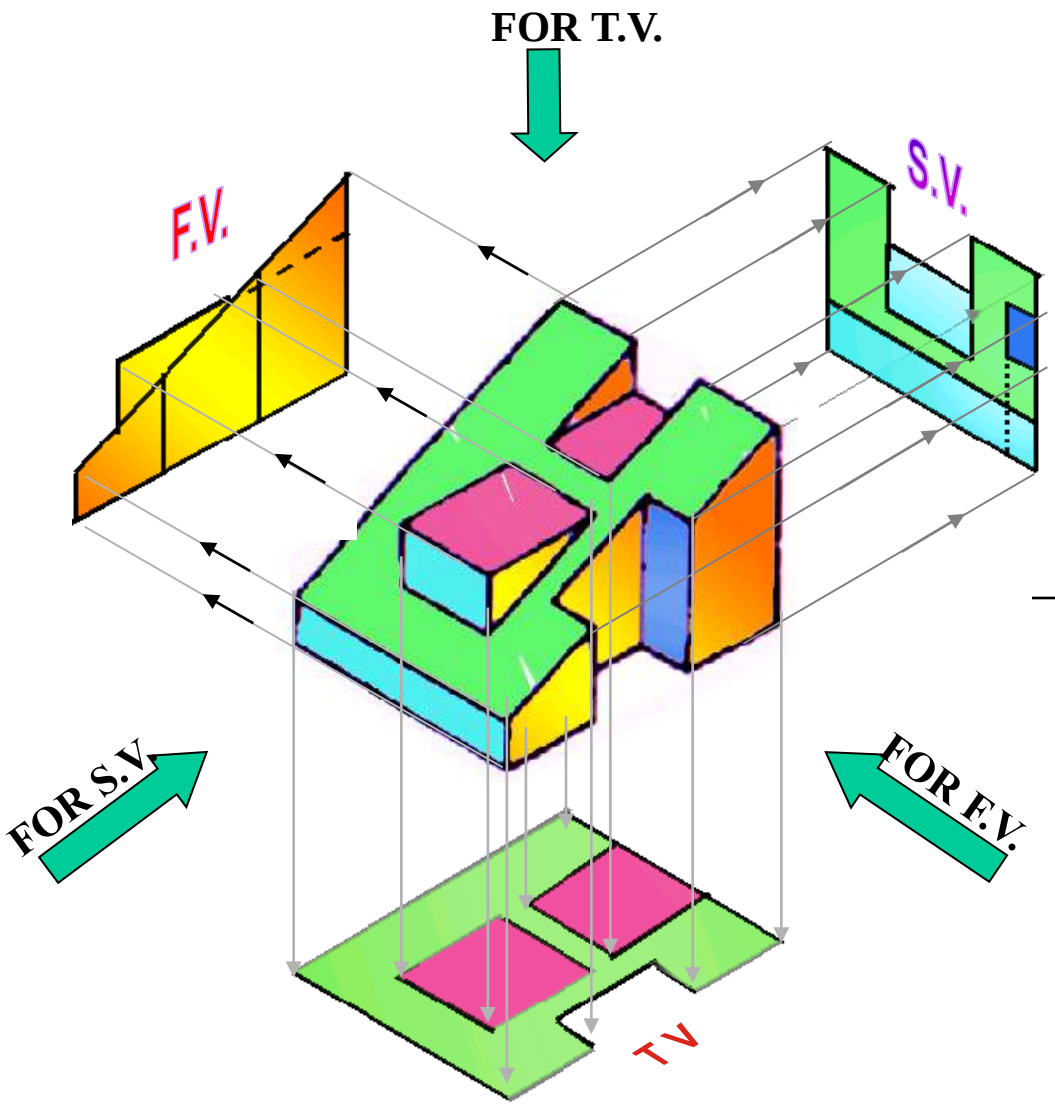


PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD



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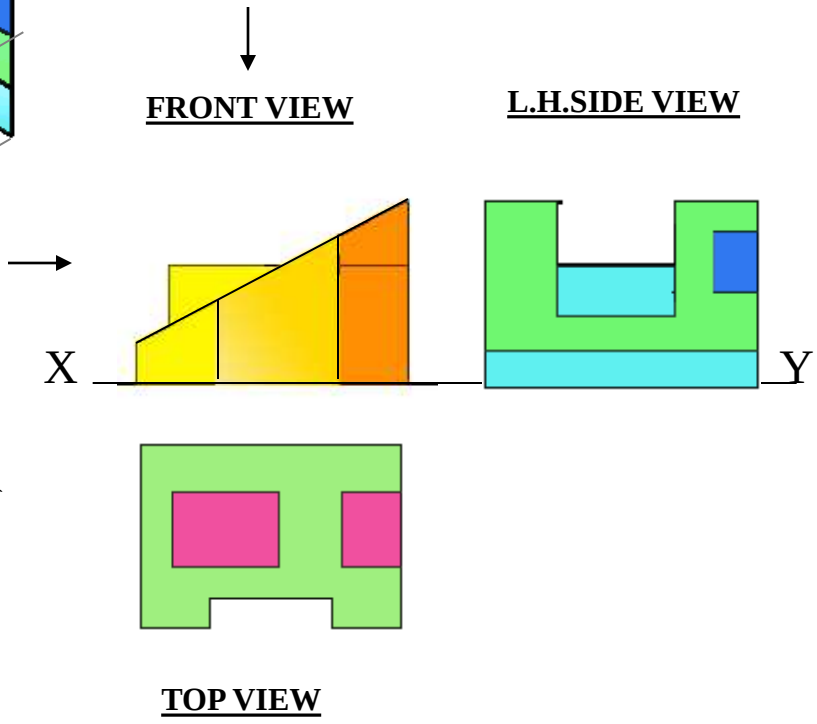

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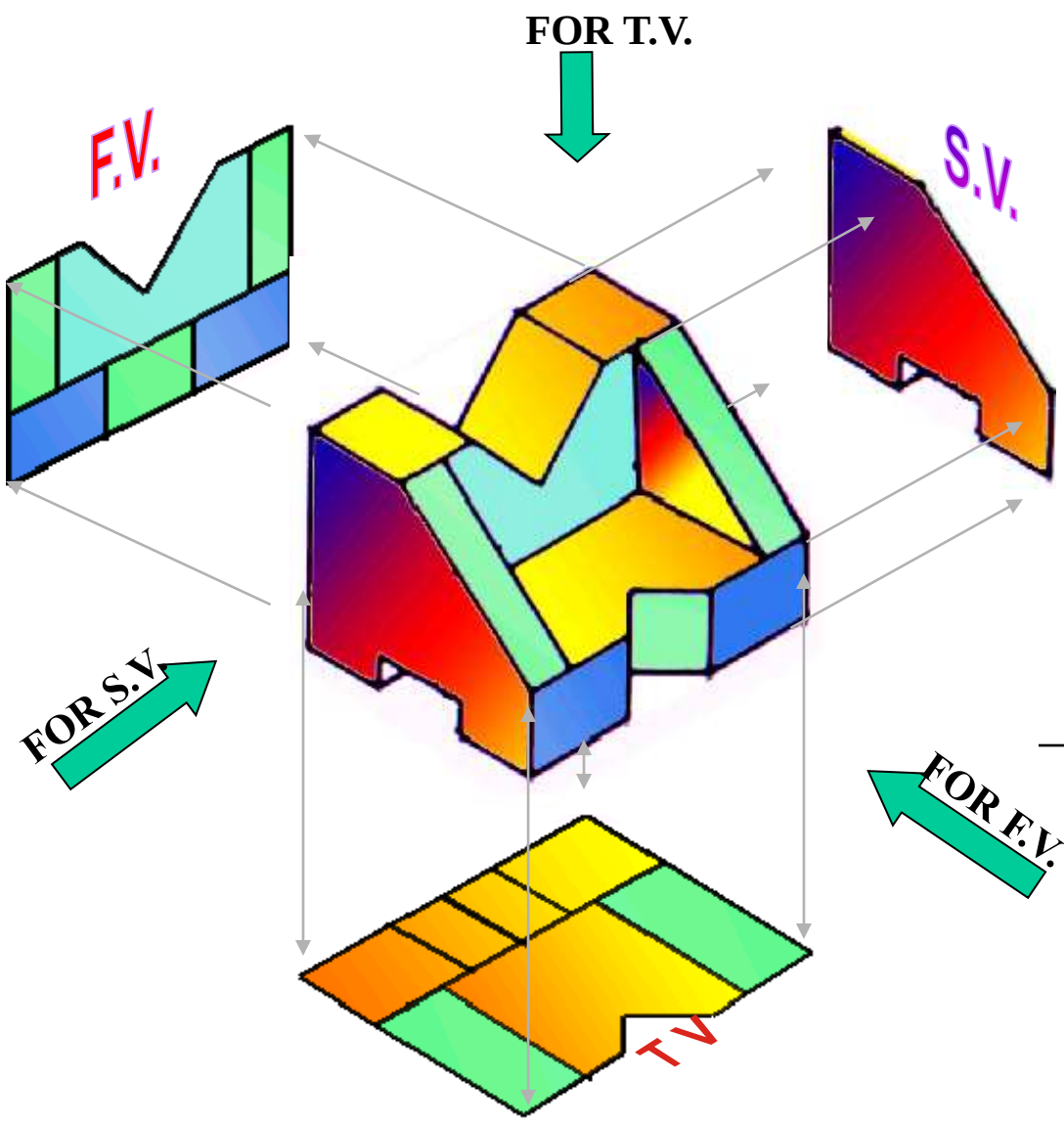

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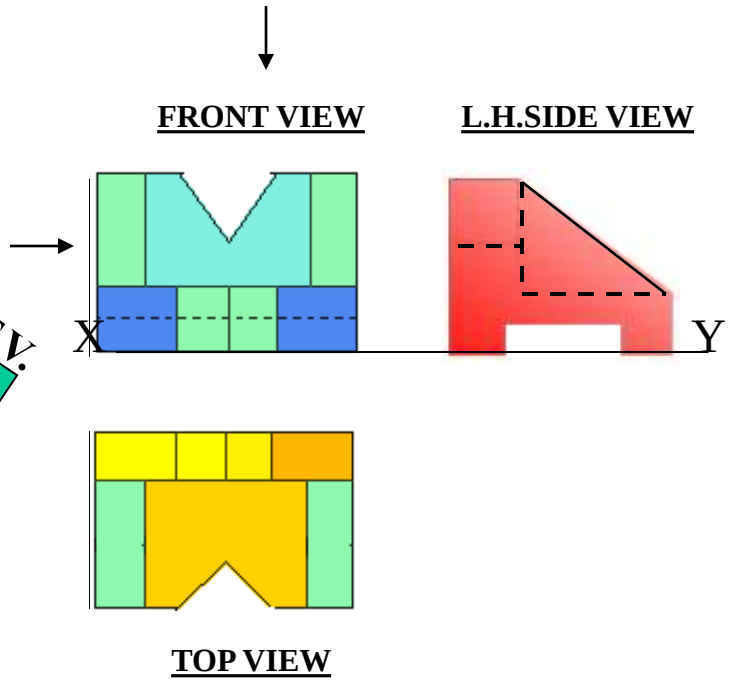

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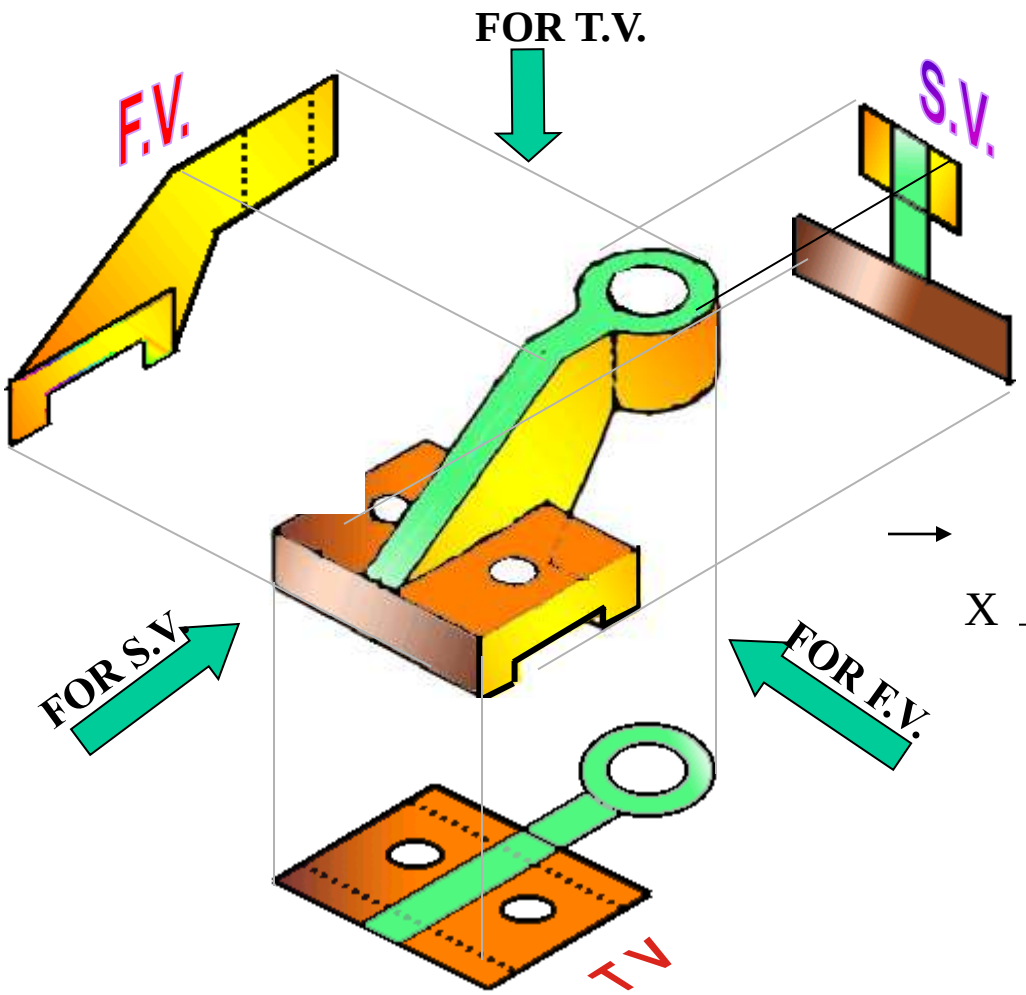

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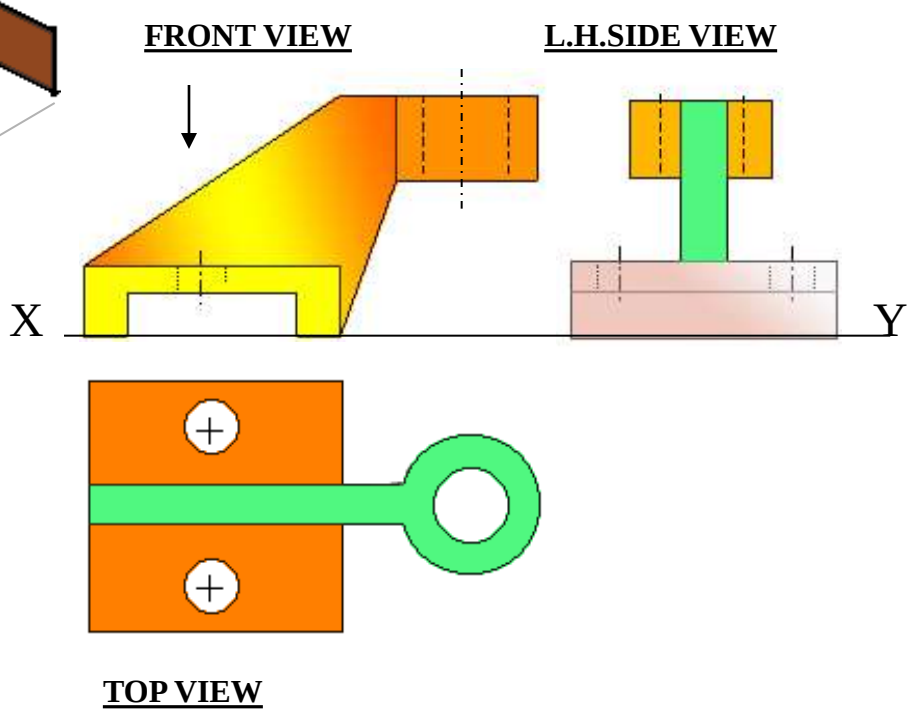
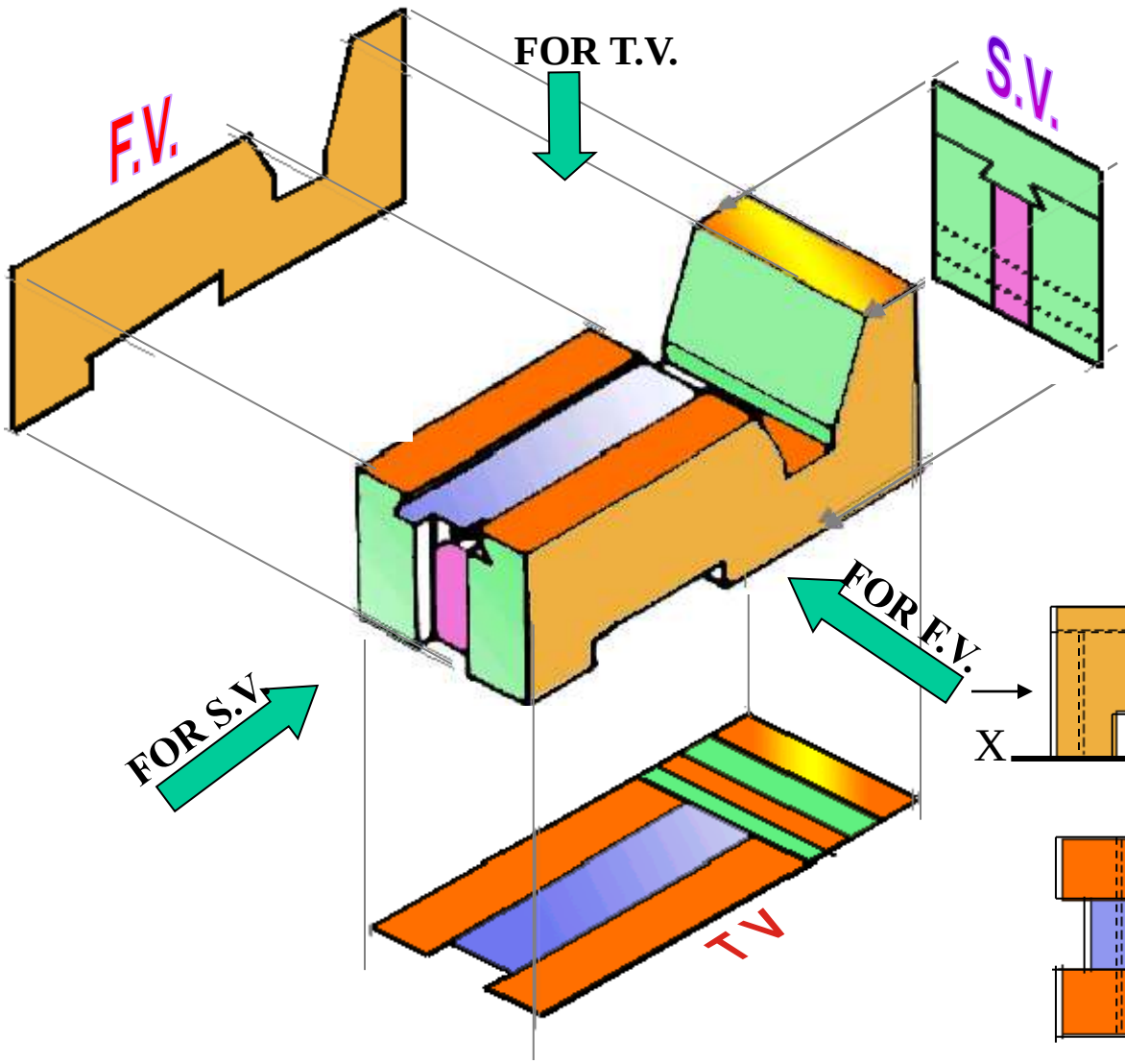


PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD



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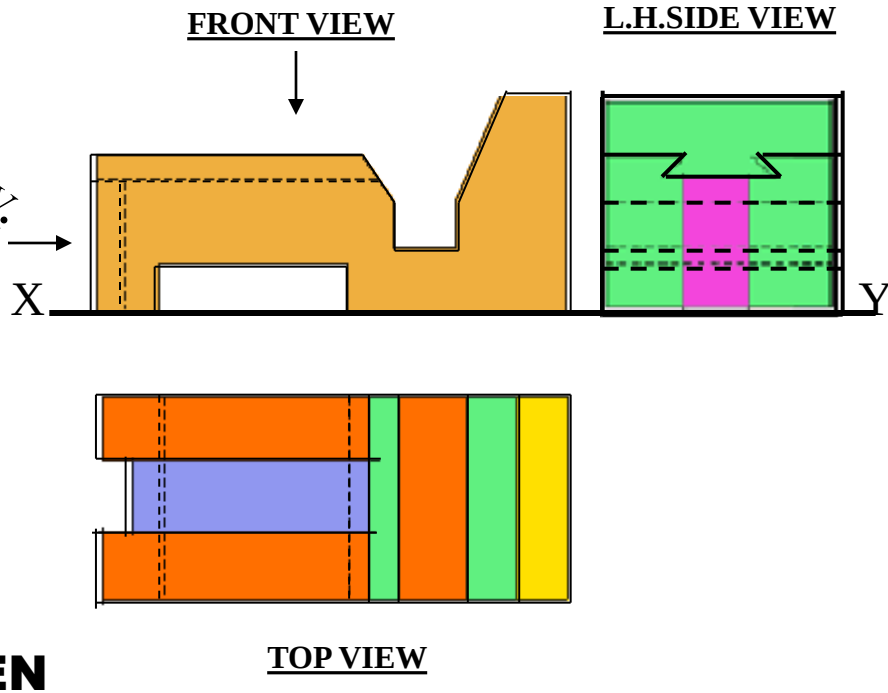


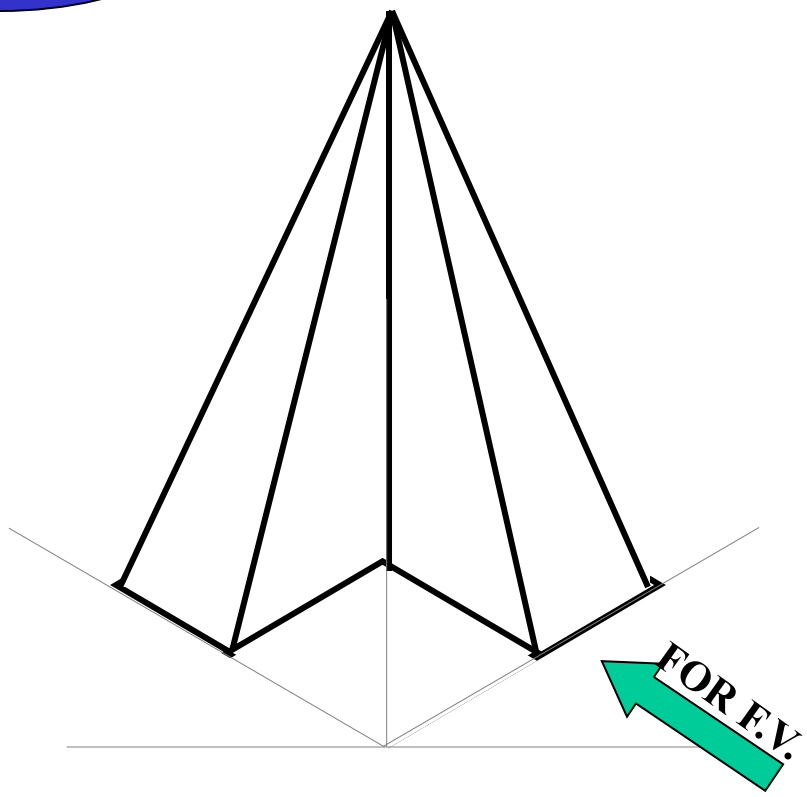
PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

STUDY ILLUSTRATIONS

Z

FOR T.V.



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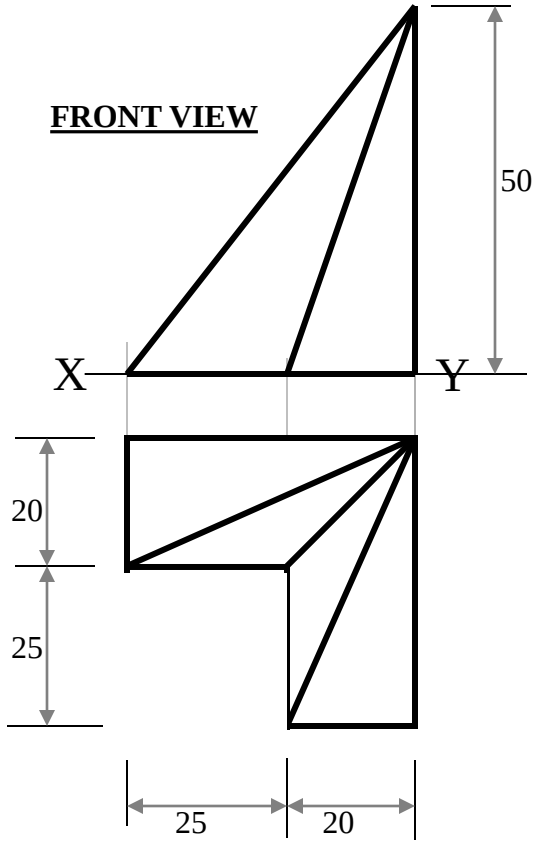
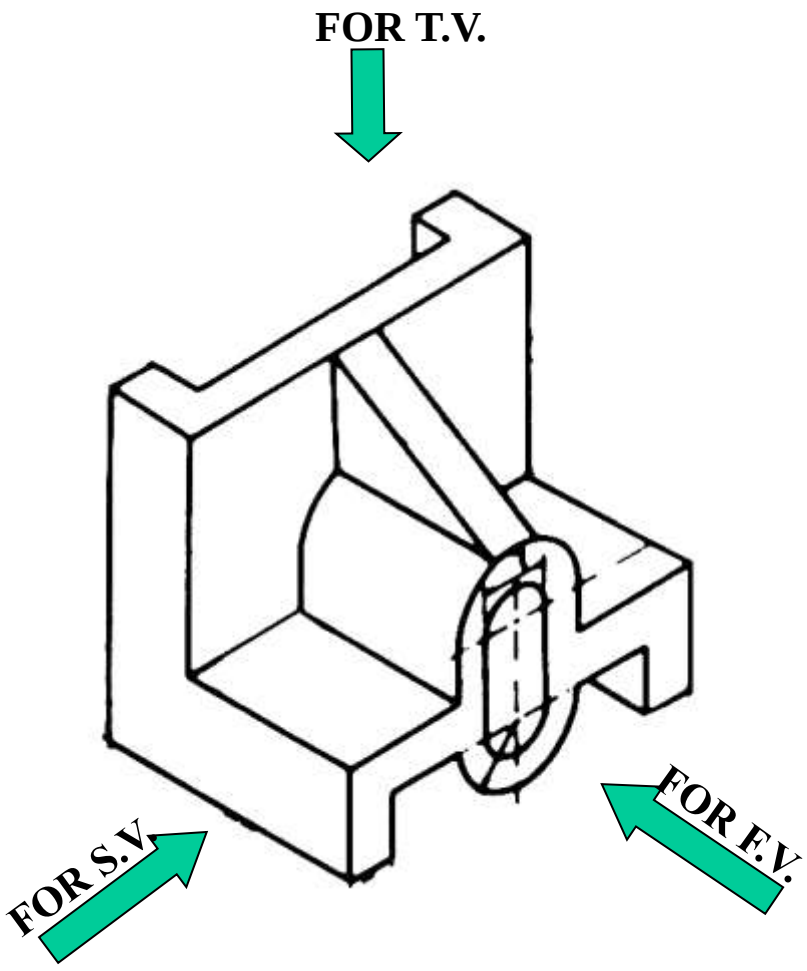


TOP VIEW

PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD



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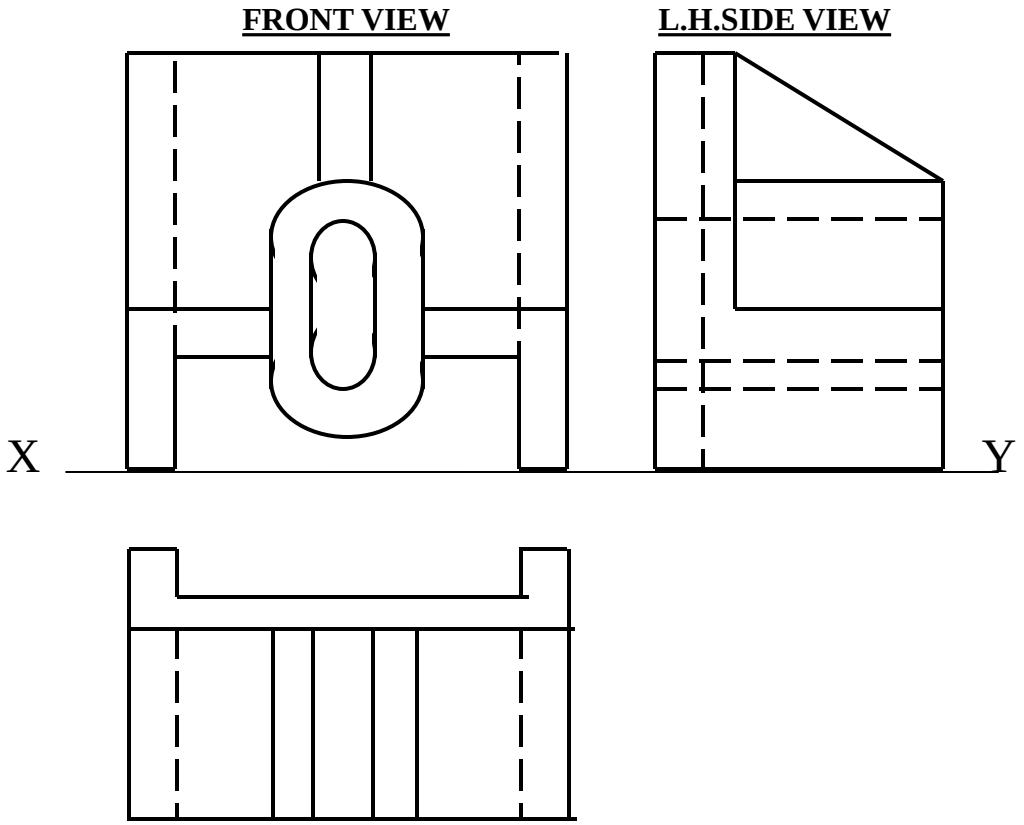
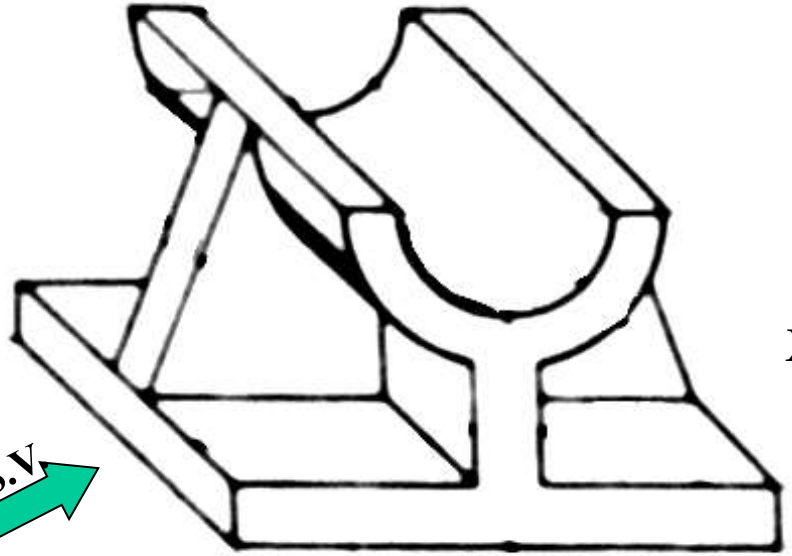


PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS

FOR T.V.

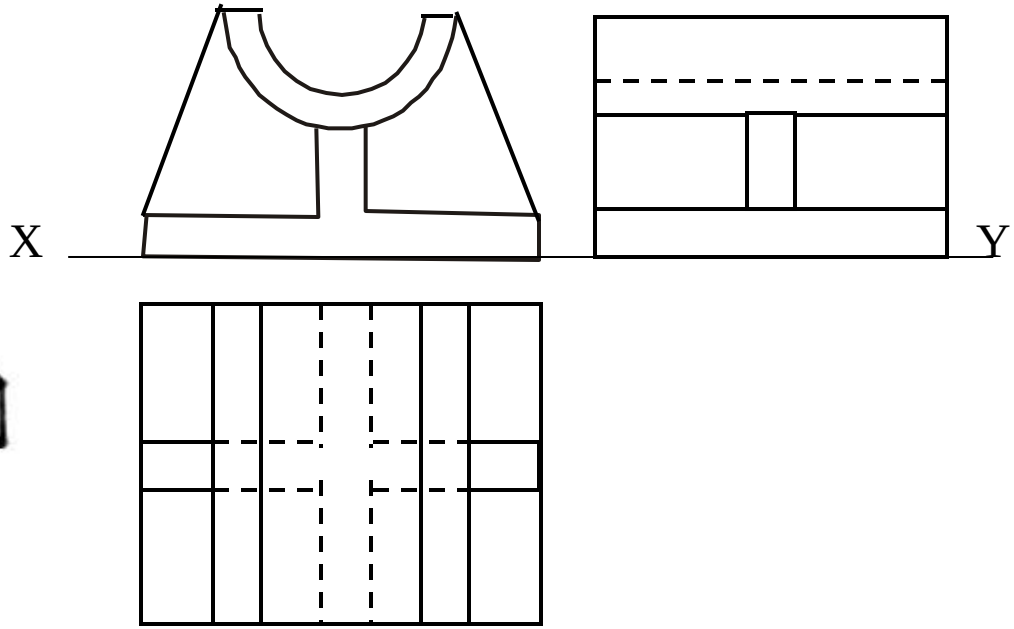


FOR S.V.

FOR F.V.

FRONT VIEW

L.H.SIDE VIEW

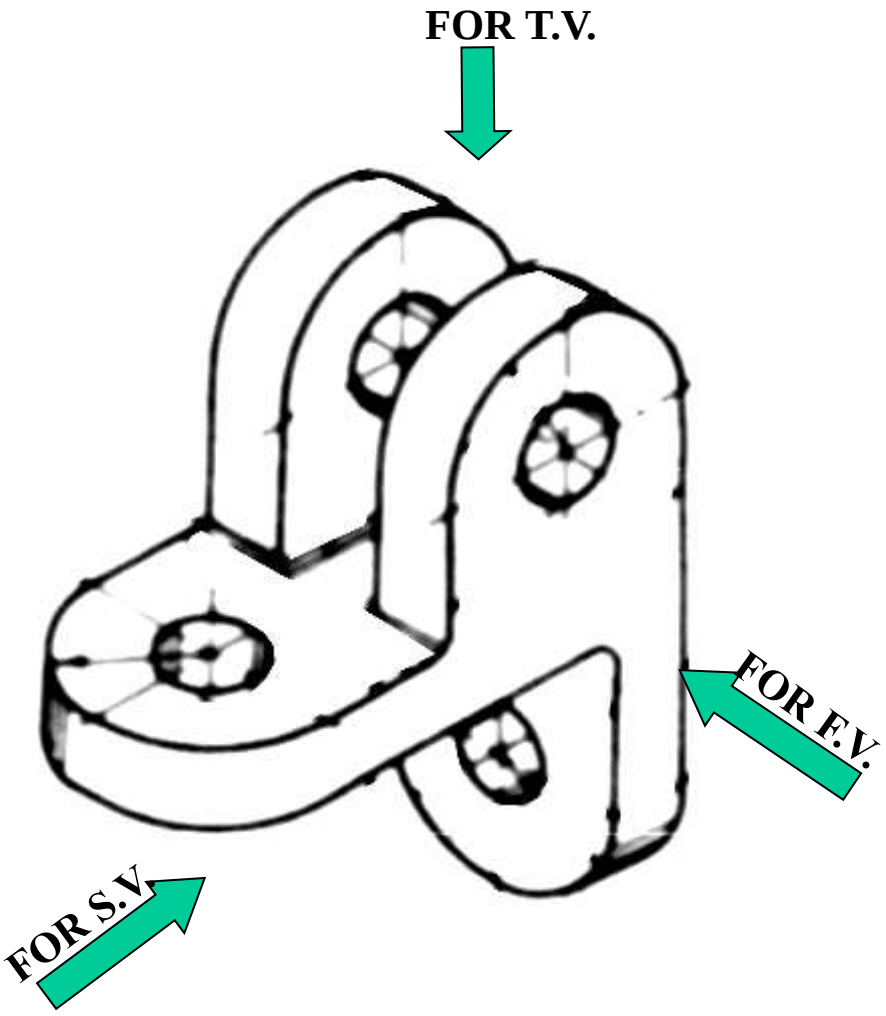


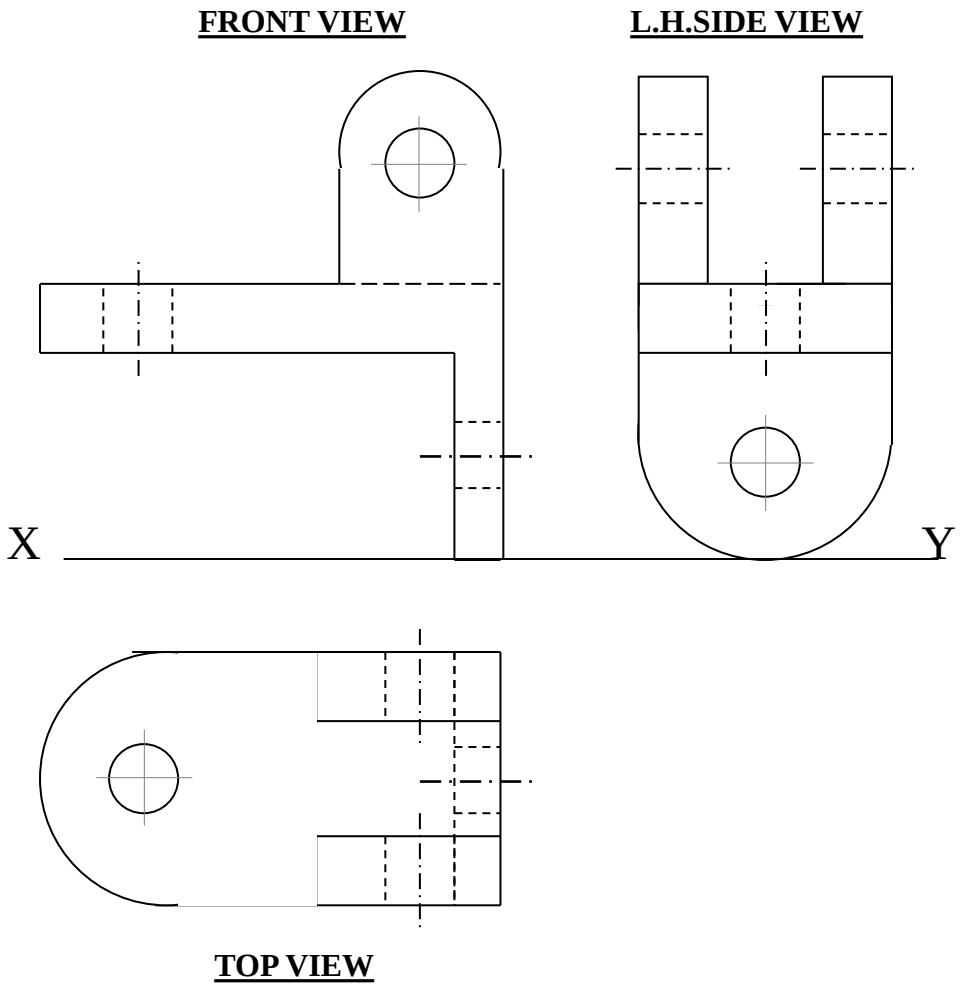
TOP VIEW

PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

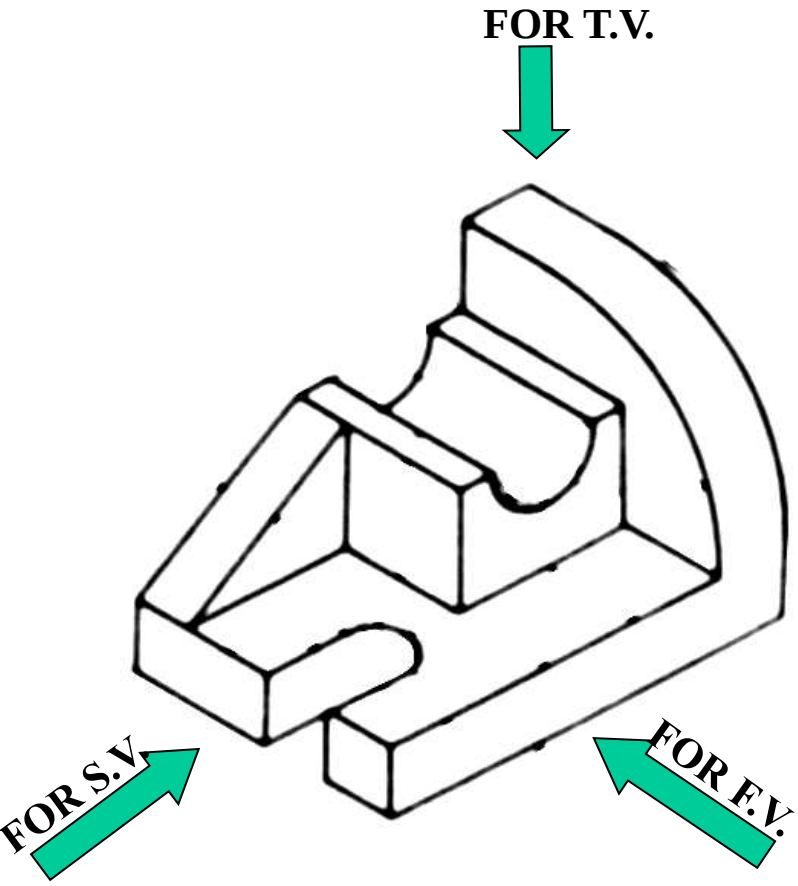
ORTHOGRAPHIC PROJECTIONS



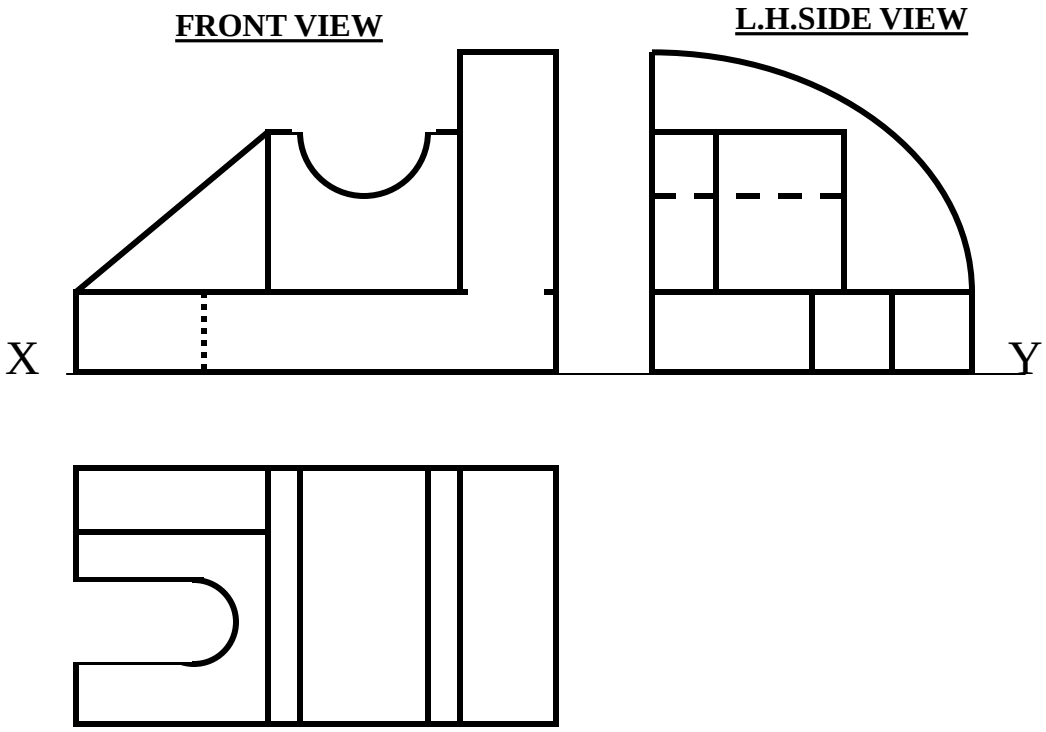


PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD



ORTHOGRAPHIC PROJECTIONS

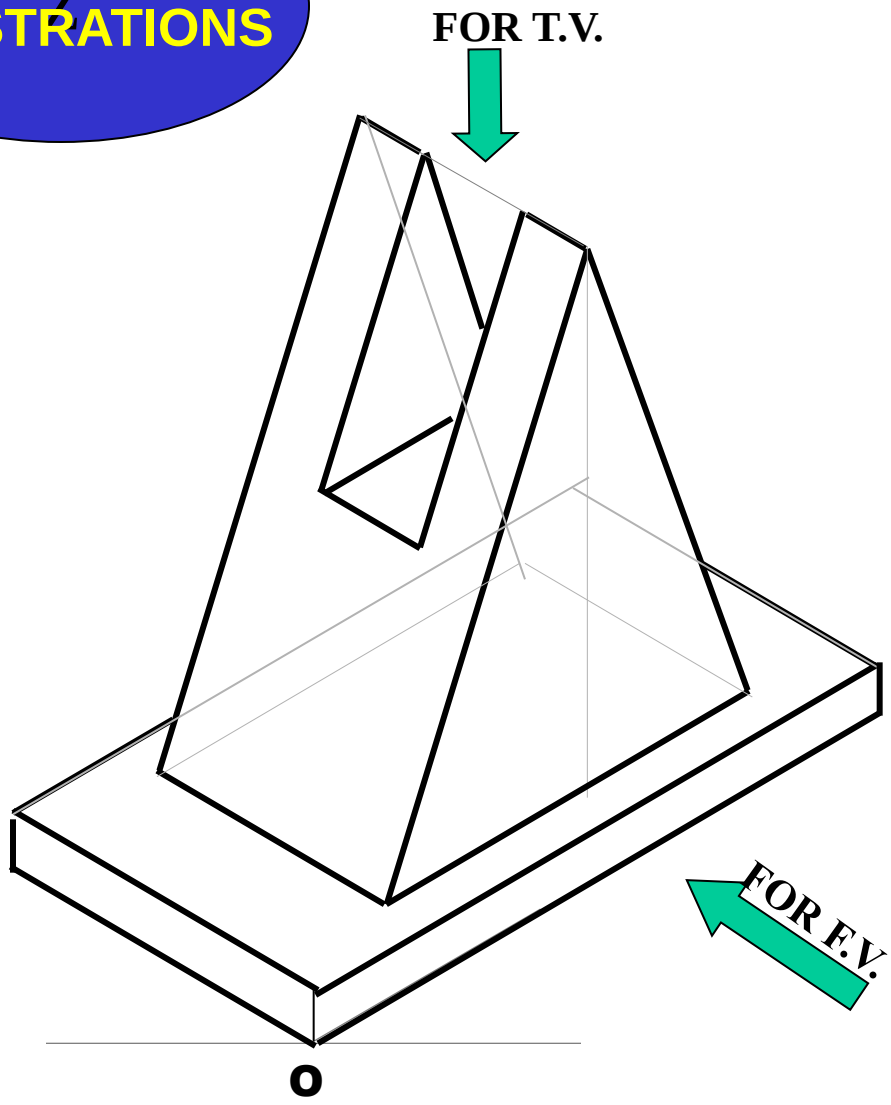


PICTORIAL PRESENTATION IS GIVEN

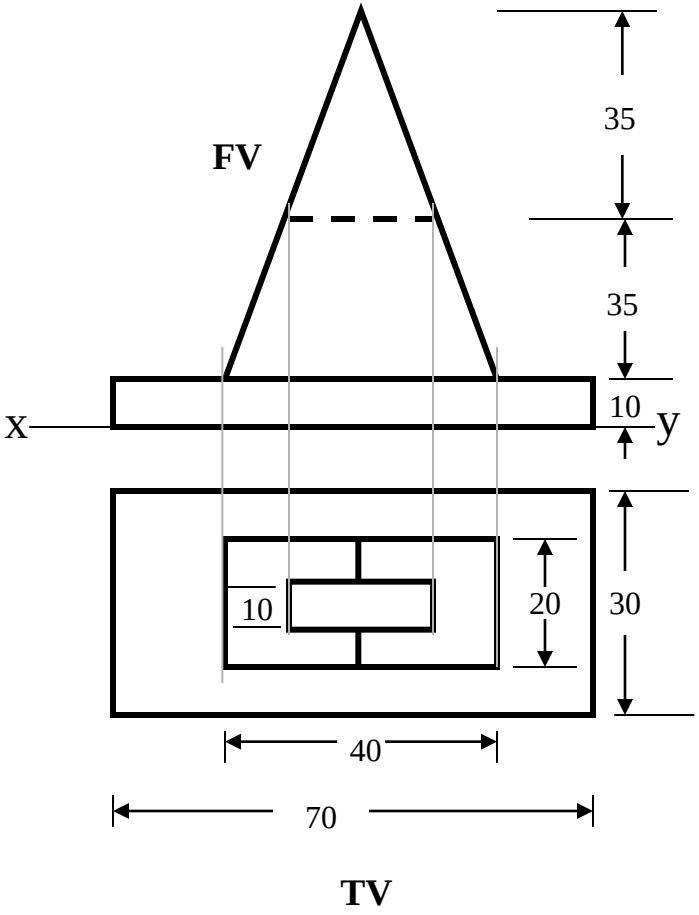
DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

STUDY ILLUSTRATIONS

7



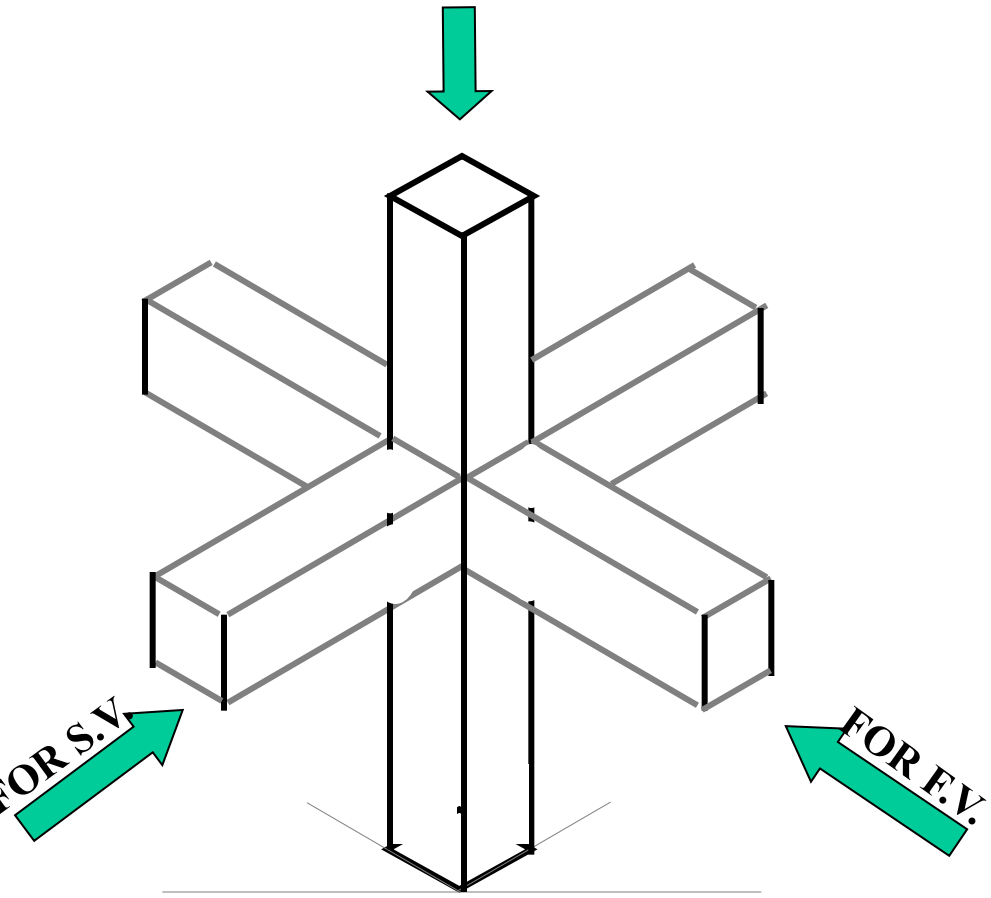
ORTHOGRAPHIC PROJECTIONS



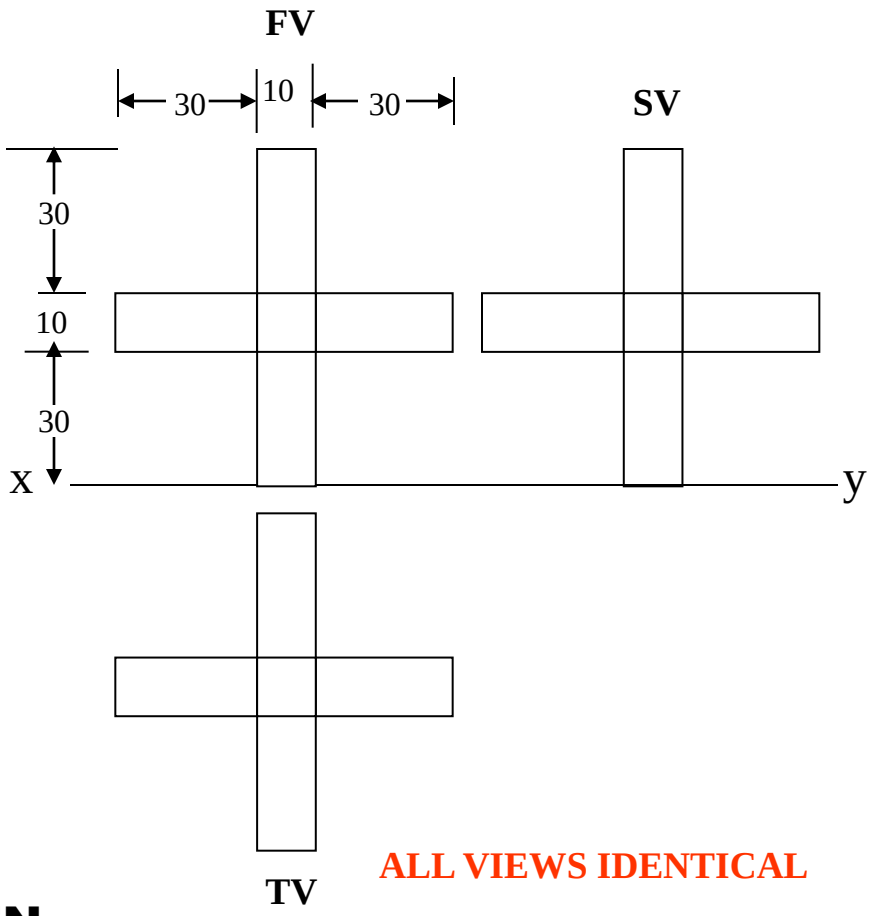
PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

STUDY ILLUSTRATIONS



ORTHOGRAPHIC PROJECTIONS



ALL VIEWS IDENTICAL

PICTORIAL PRESENTATION IS GIVEN

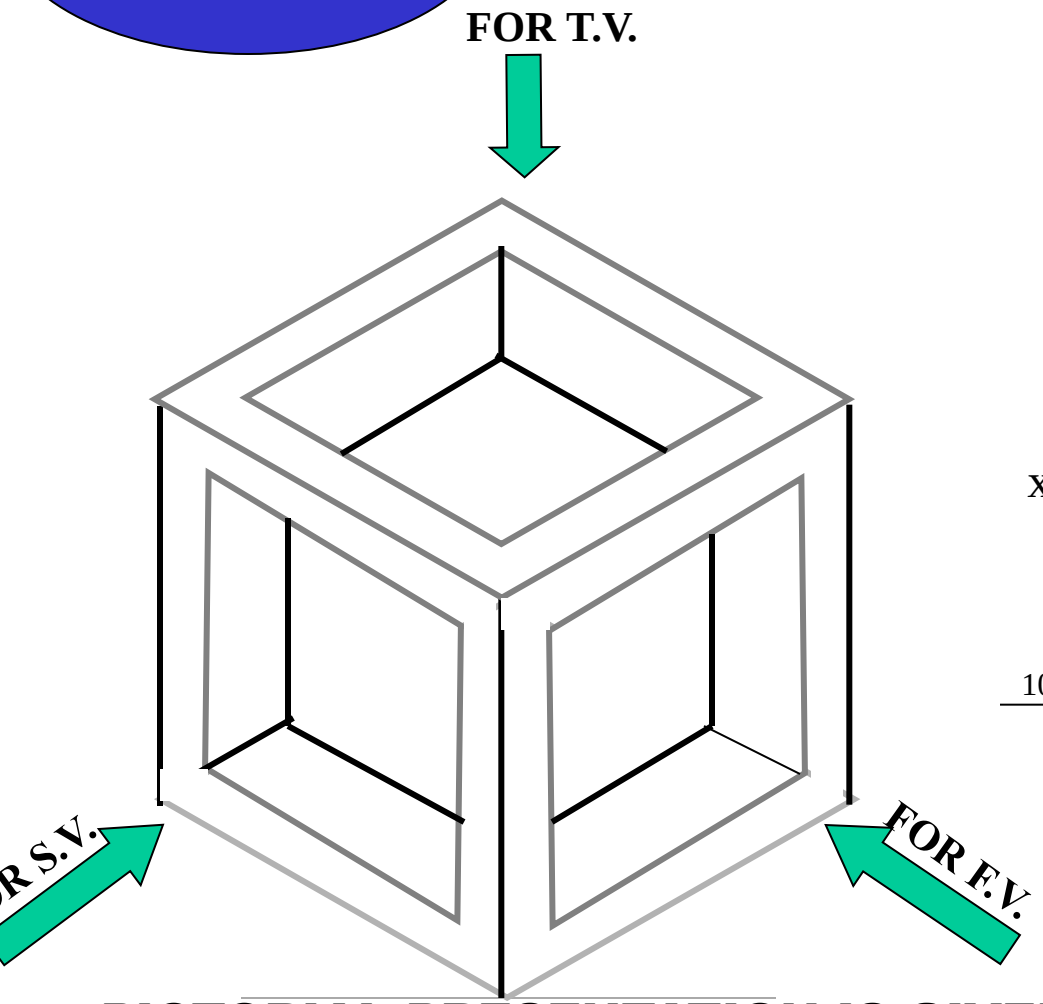
DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

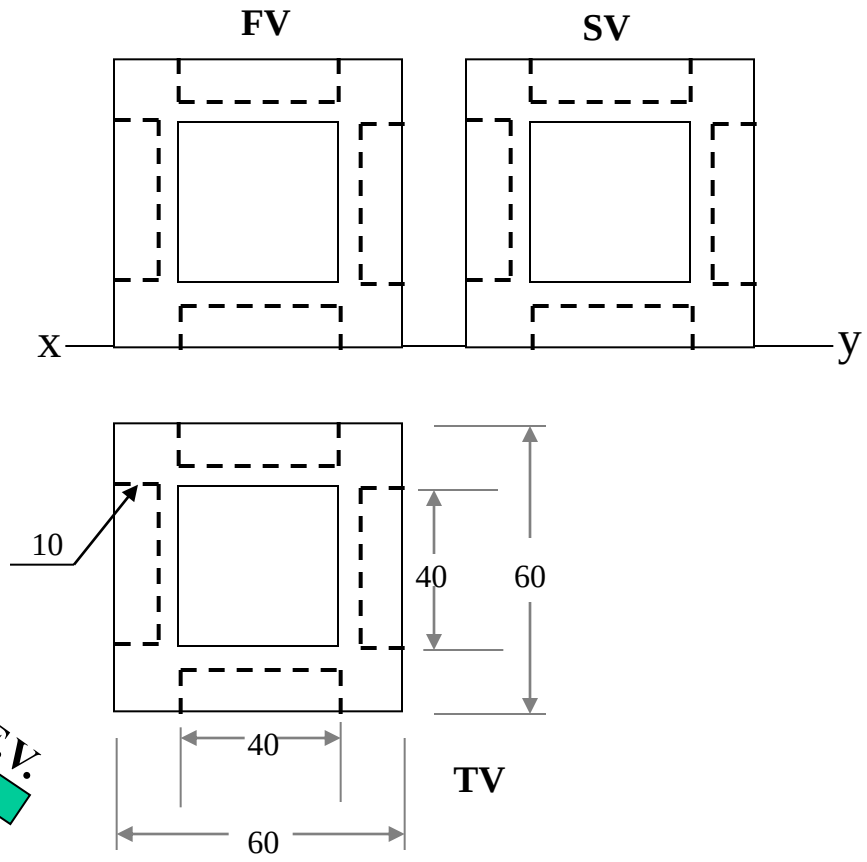
STUDY ILLUSTRATIONS

7

ORTHOGRAPHIC PROJECTIONS

ALL VIEWS IDENTICAL

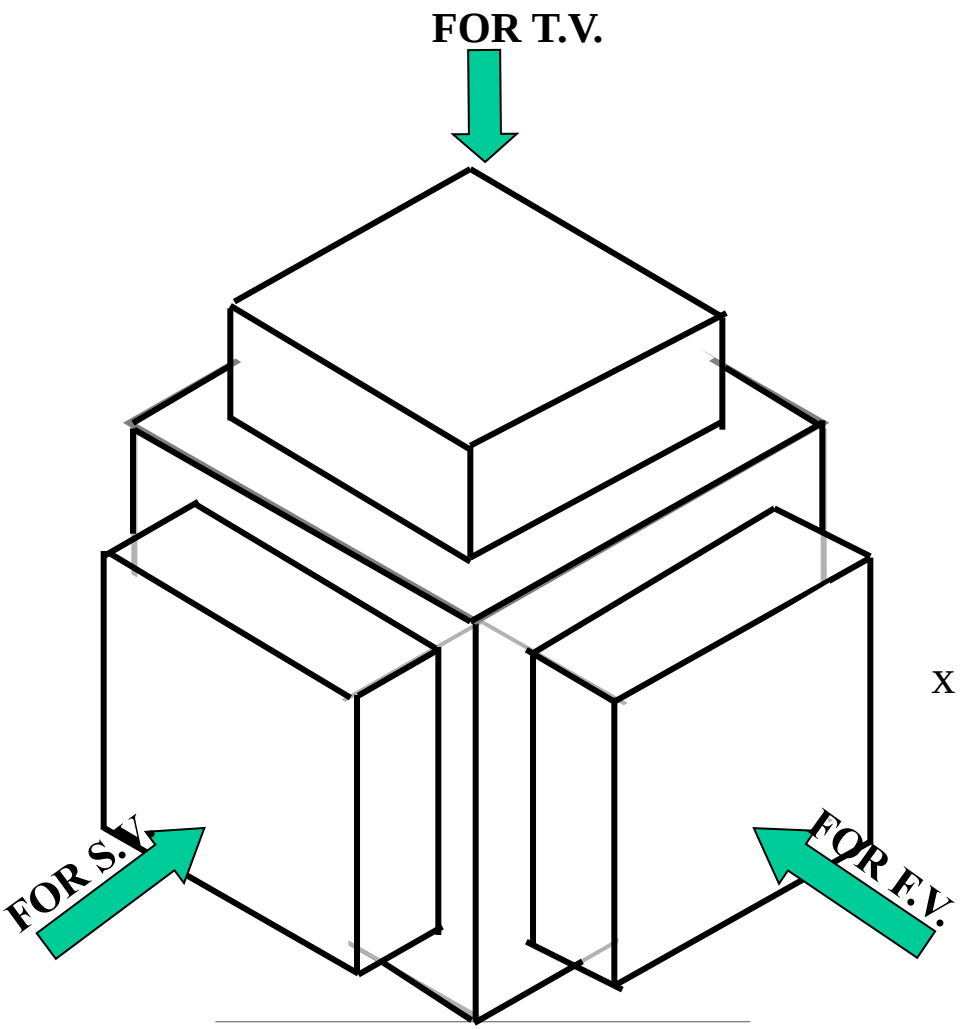




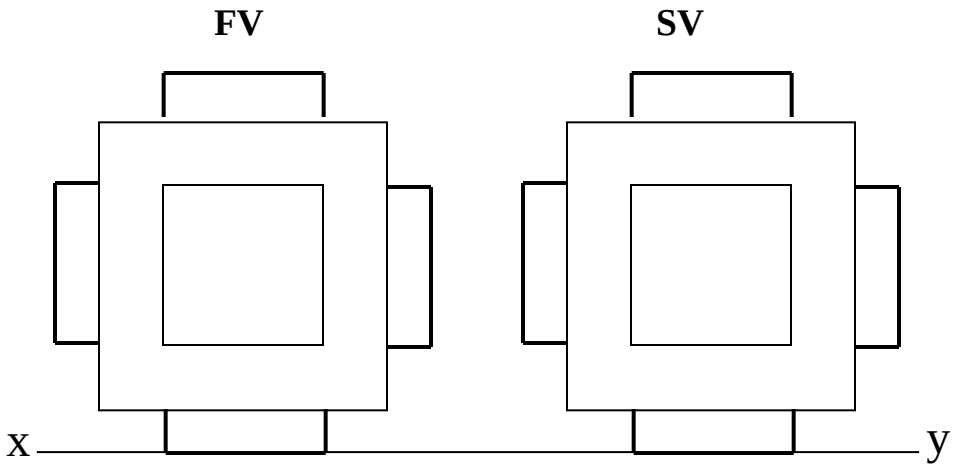
PICTORIAL PRESENTATION IS GIVEN

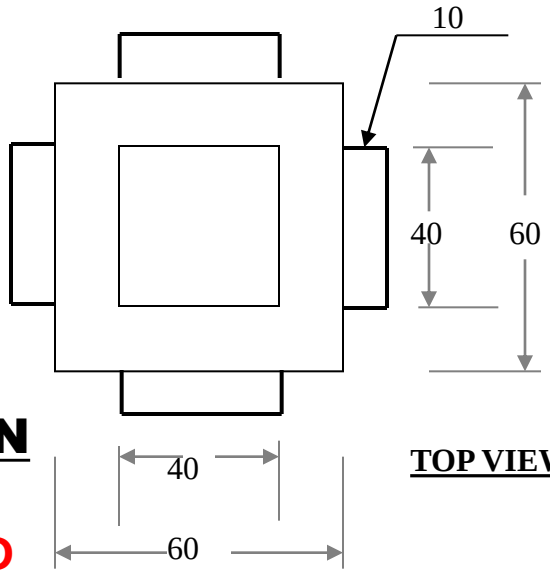
DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS



ALL VIEWS IDENTICAL



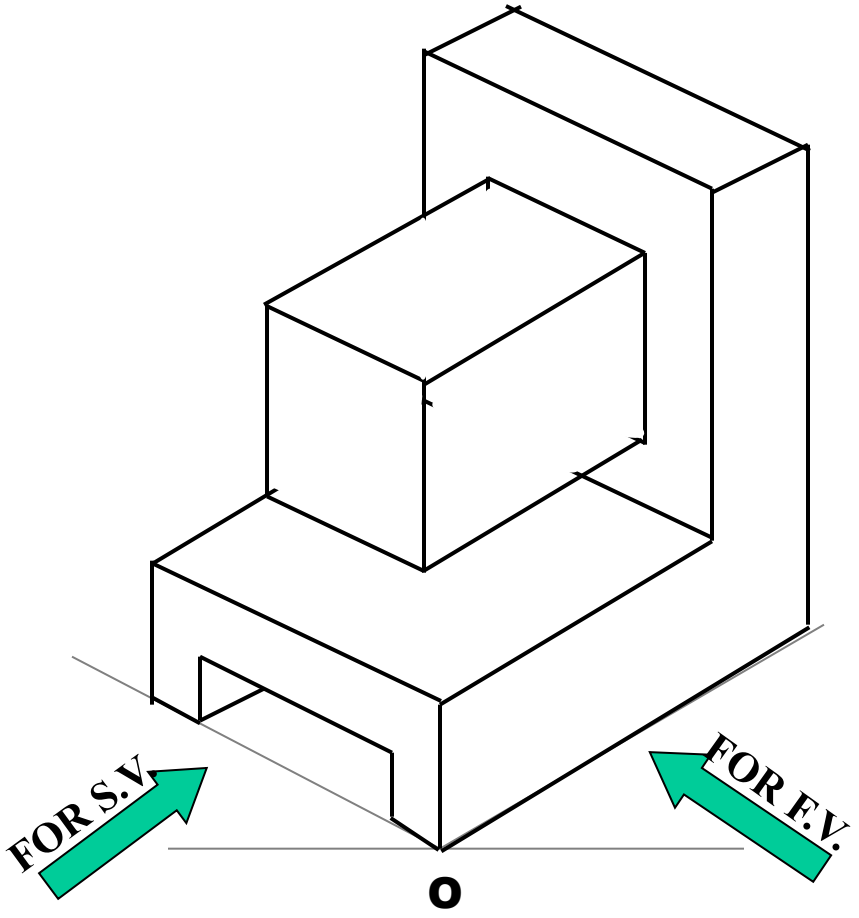


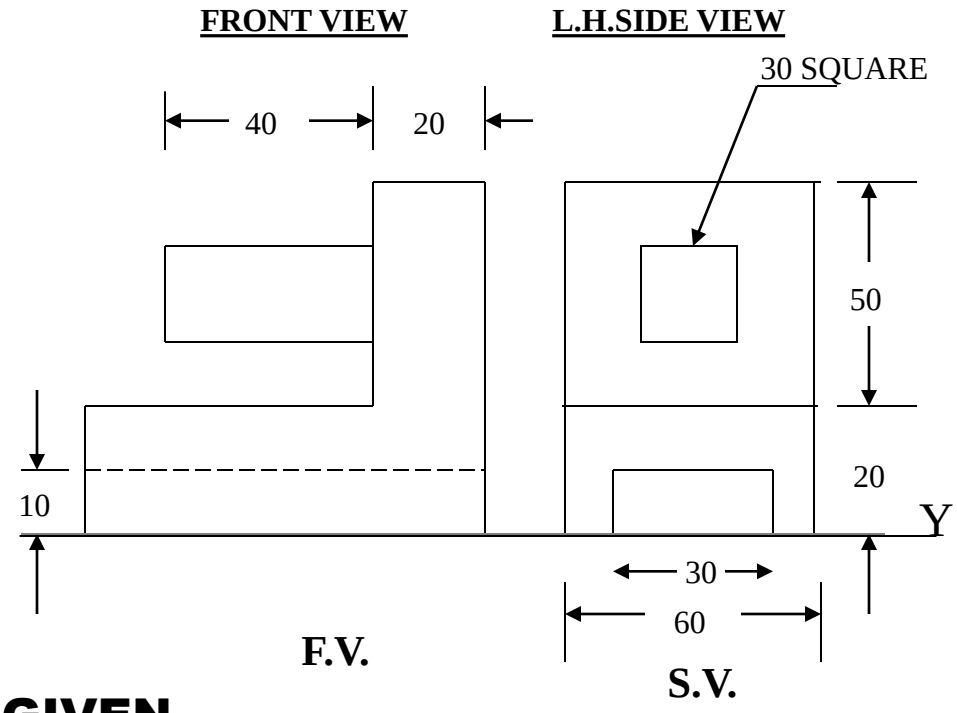
TOP VIEW

PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS

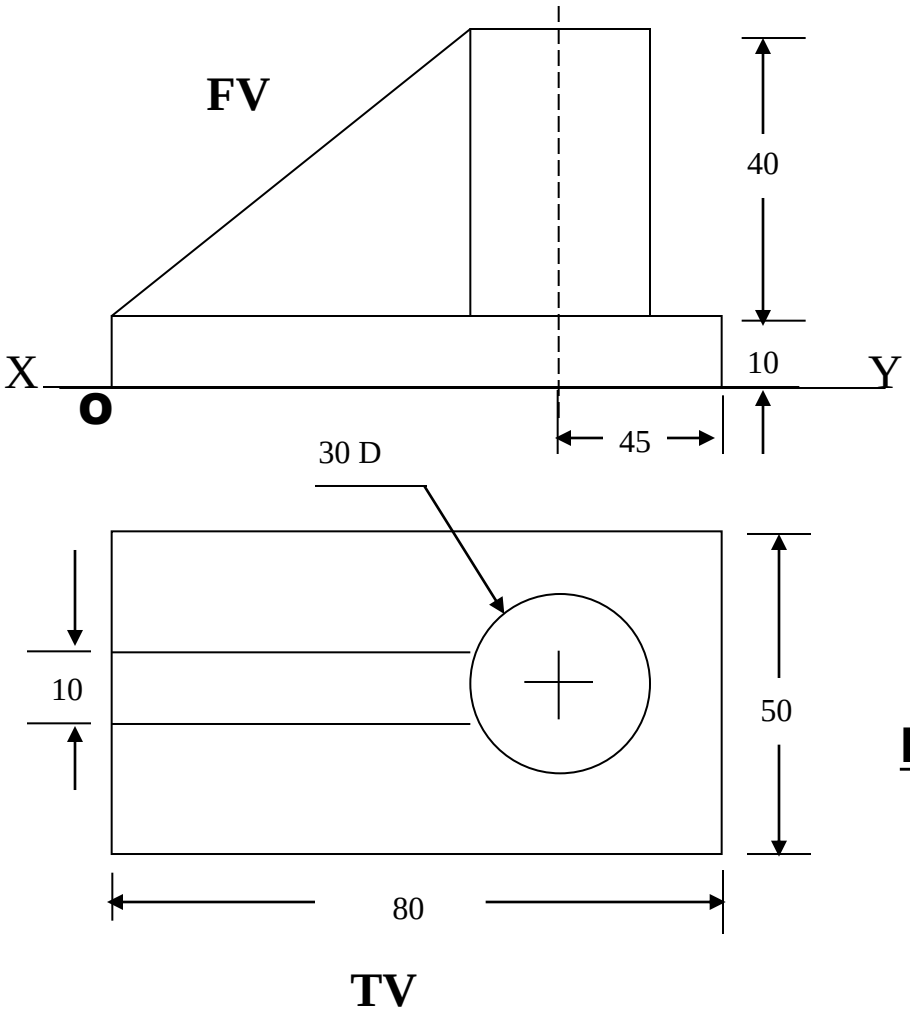


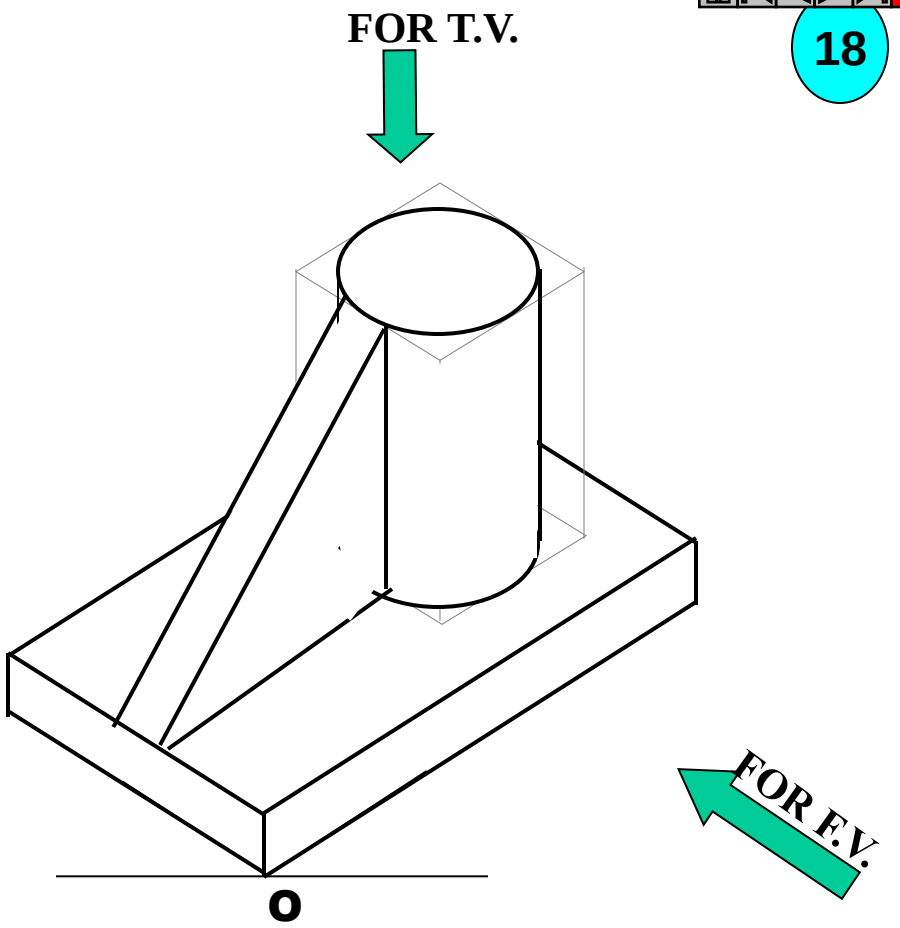


PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND SV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS

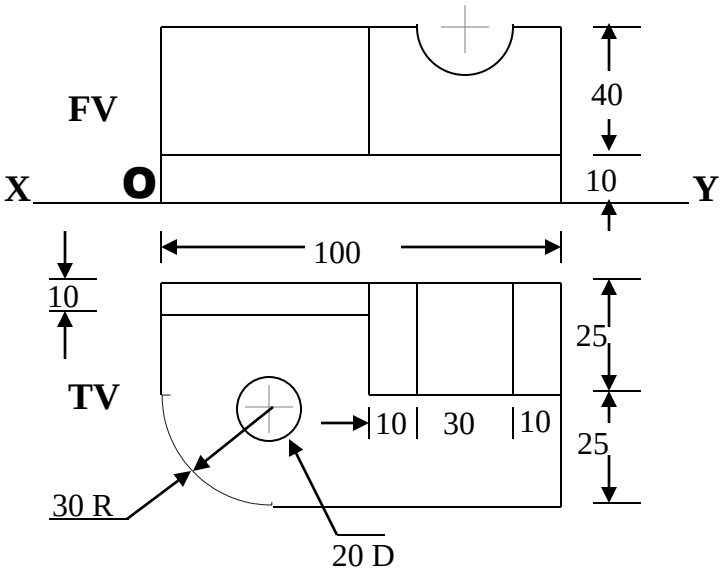


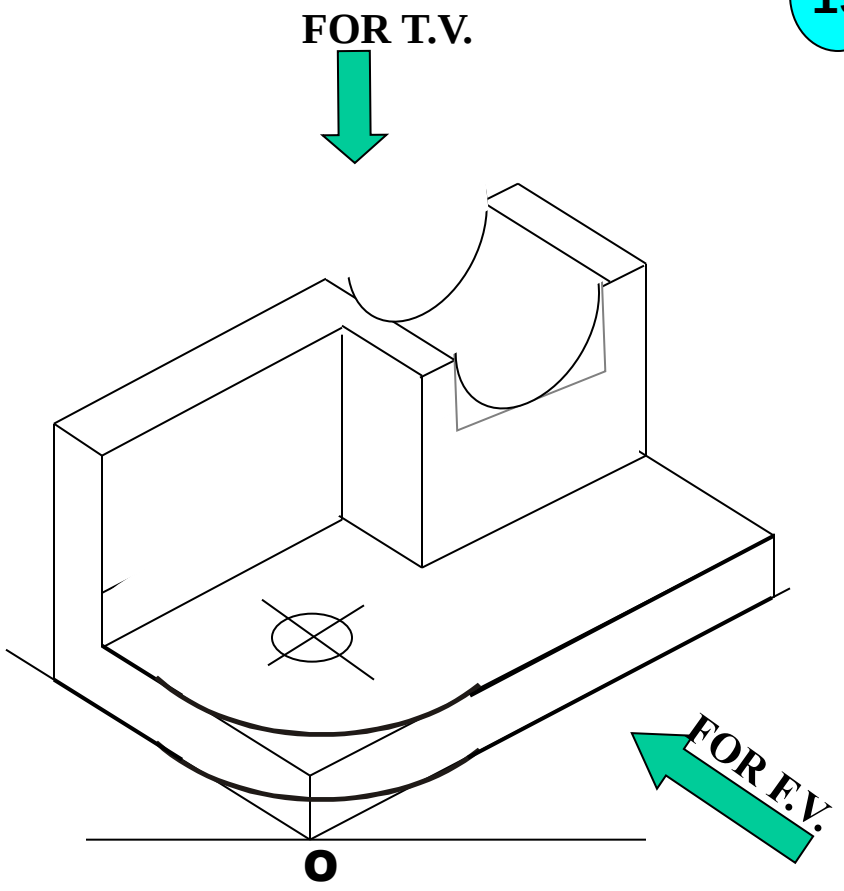


PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND TV OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS





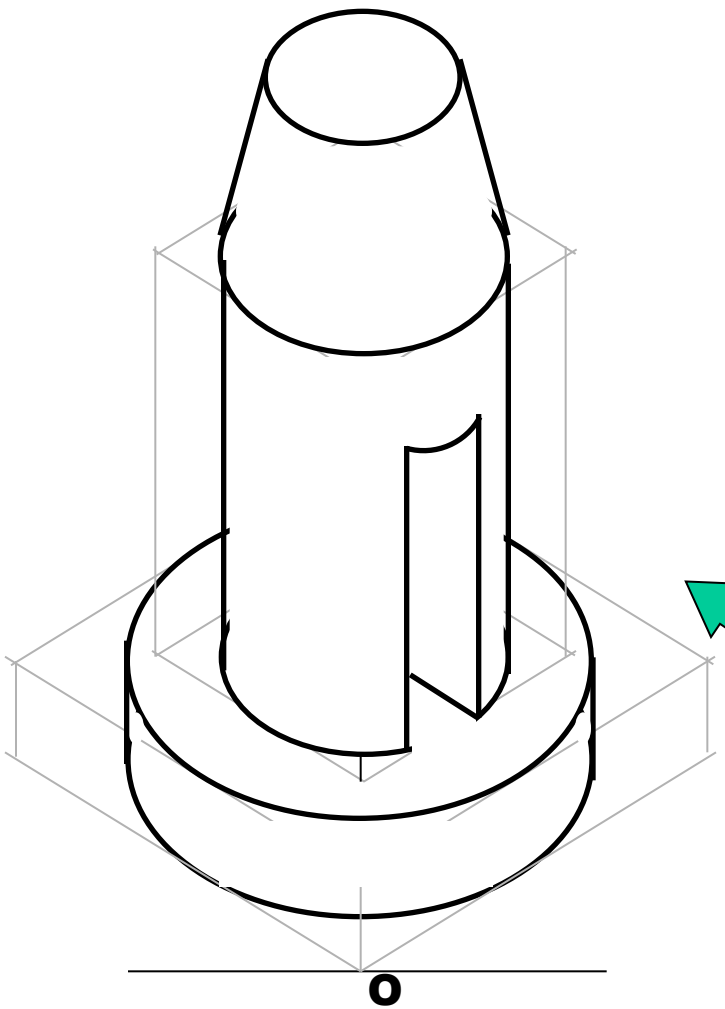
PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

PICTORIAL PRESENTATION IS GIVEN

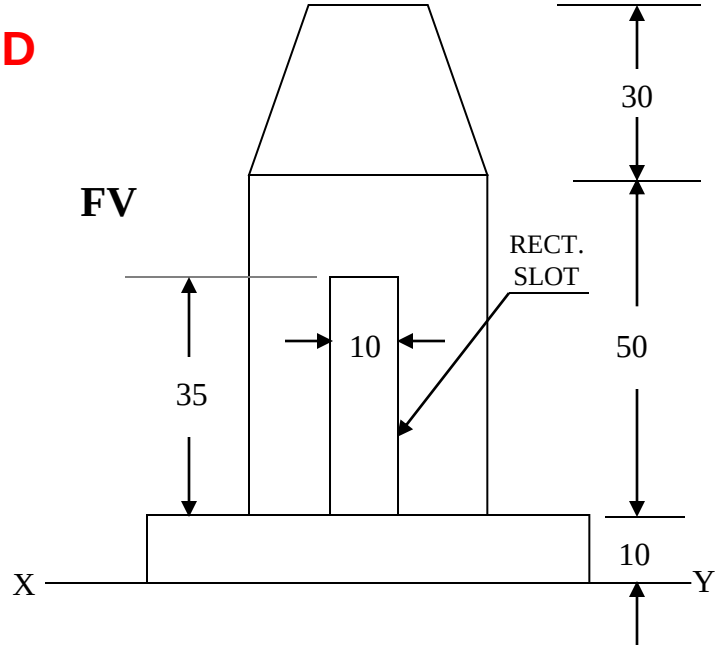
DRAW FV AND TV OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

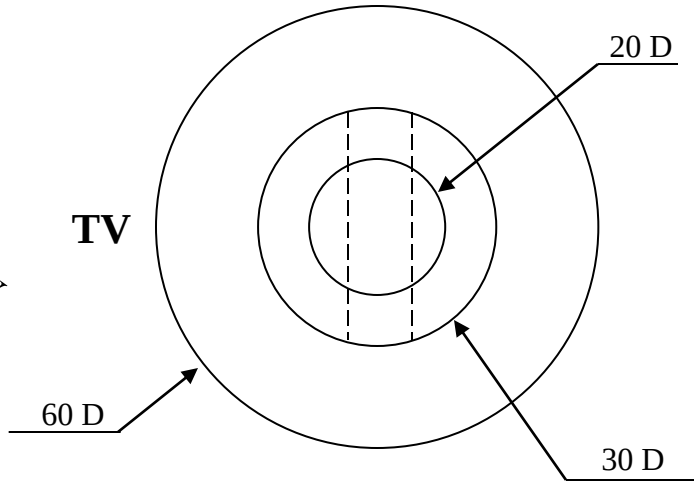
FOR T.V.



FOR F.V.

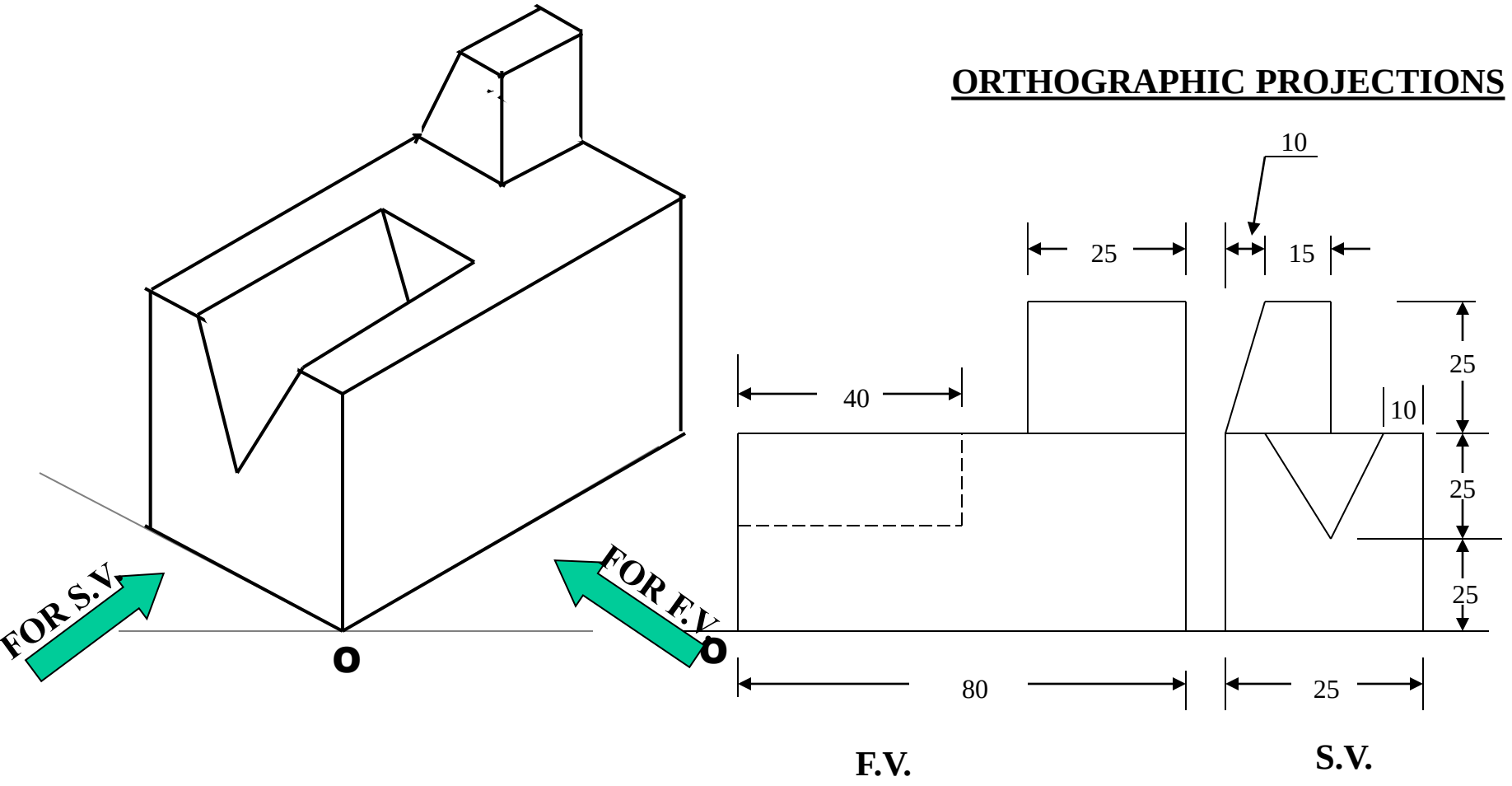
ORTHOGRAPHIC PROJECTIONS





TOP VIEW

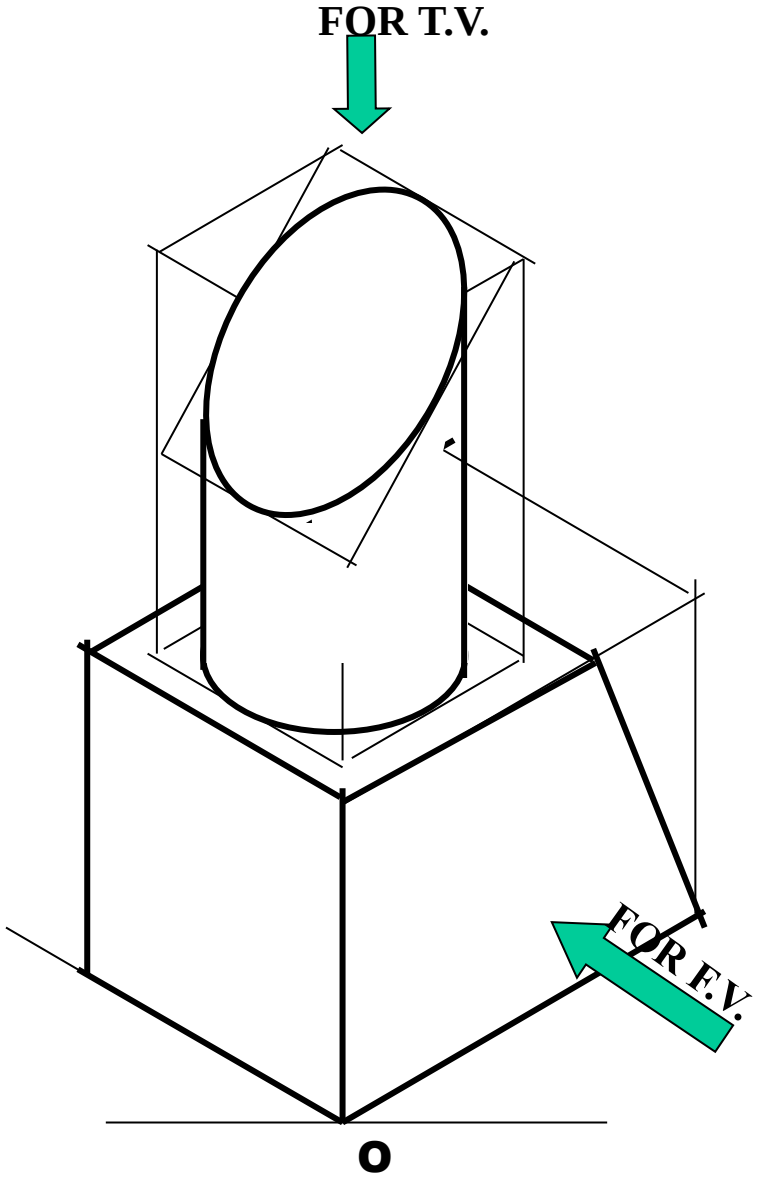
ORTHOGRAPHIC PROJECTIONS

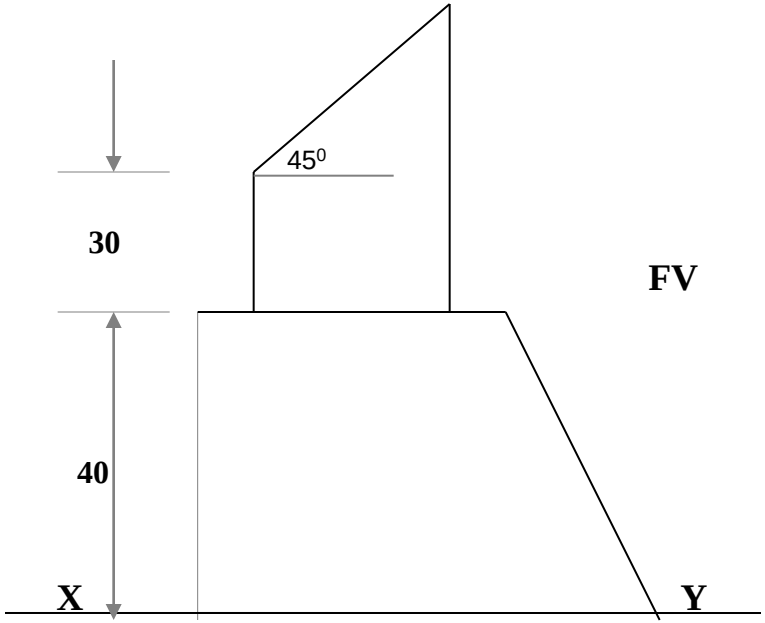


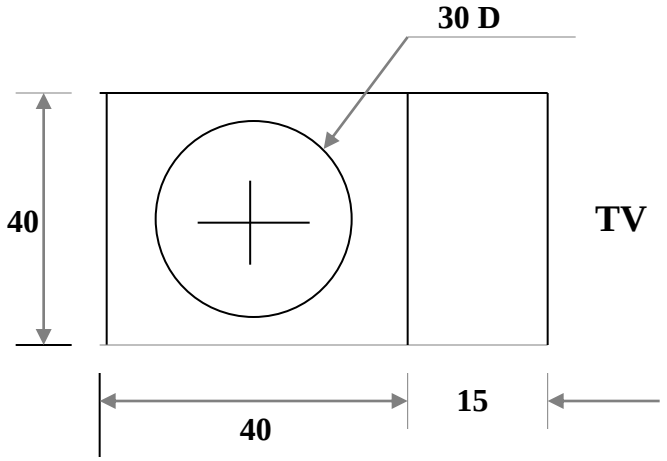
PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND SV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS



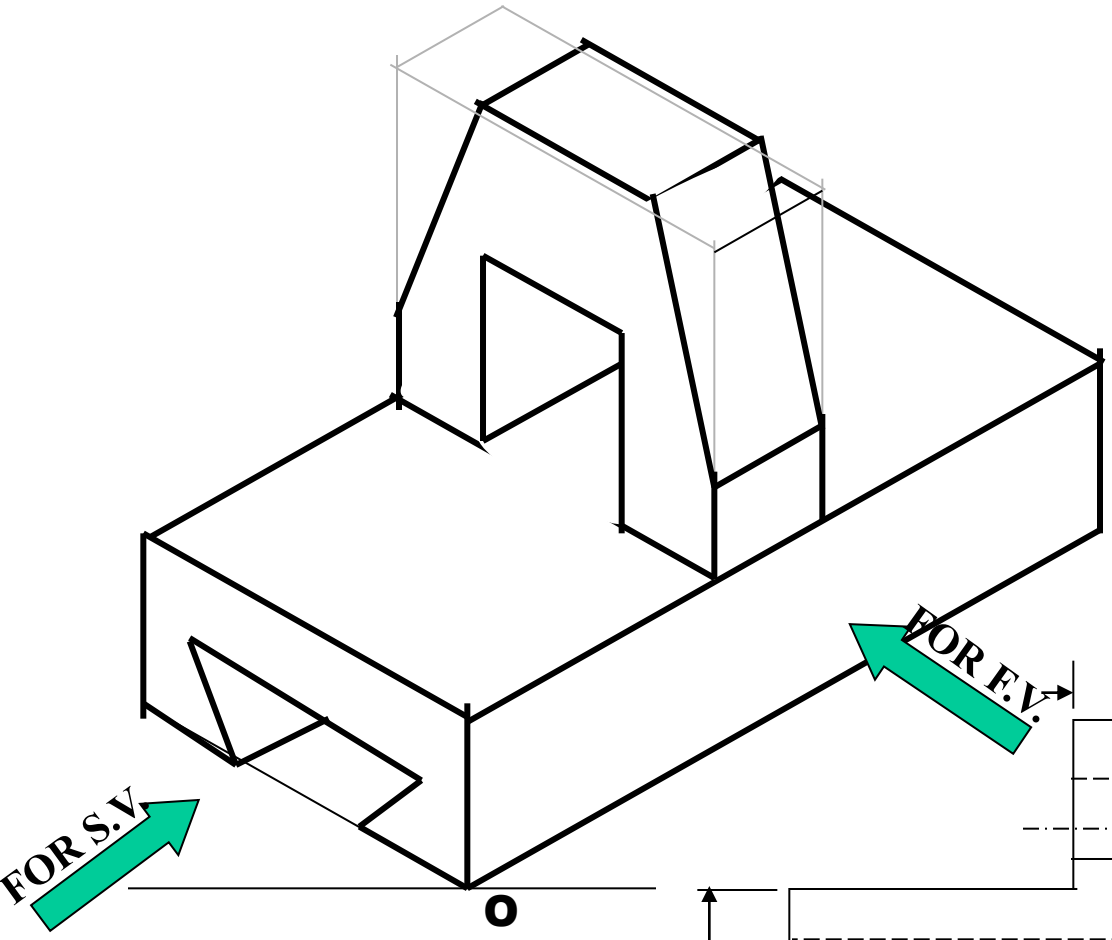


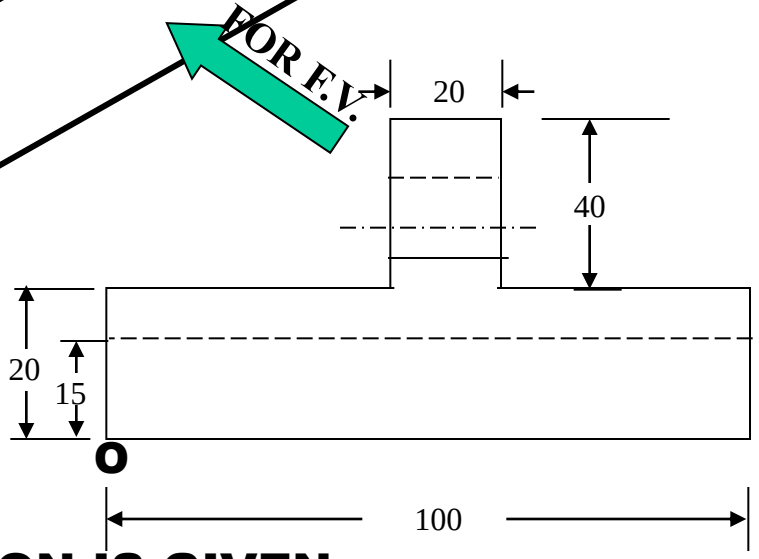


PICTORIAL PRESENTATION IS GIVEN

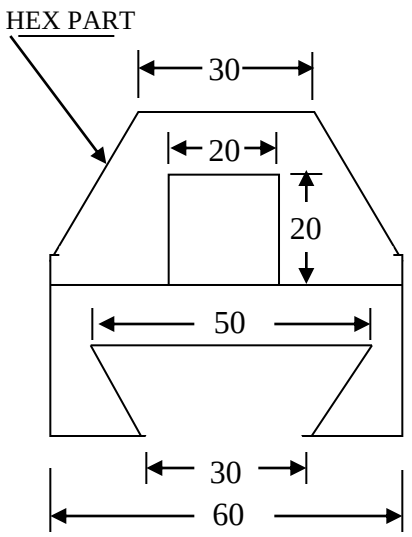
DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS





FRONT VIEW

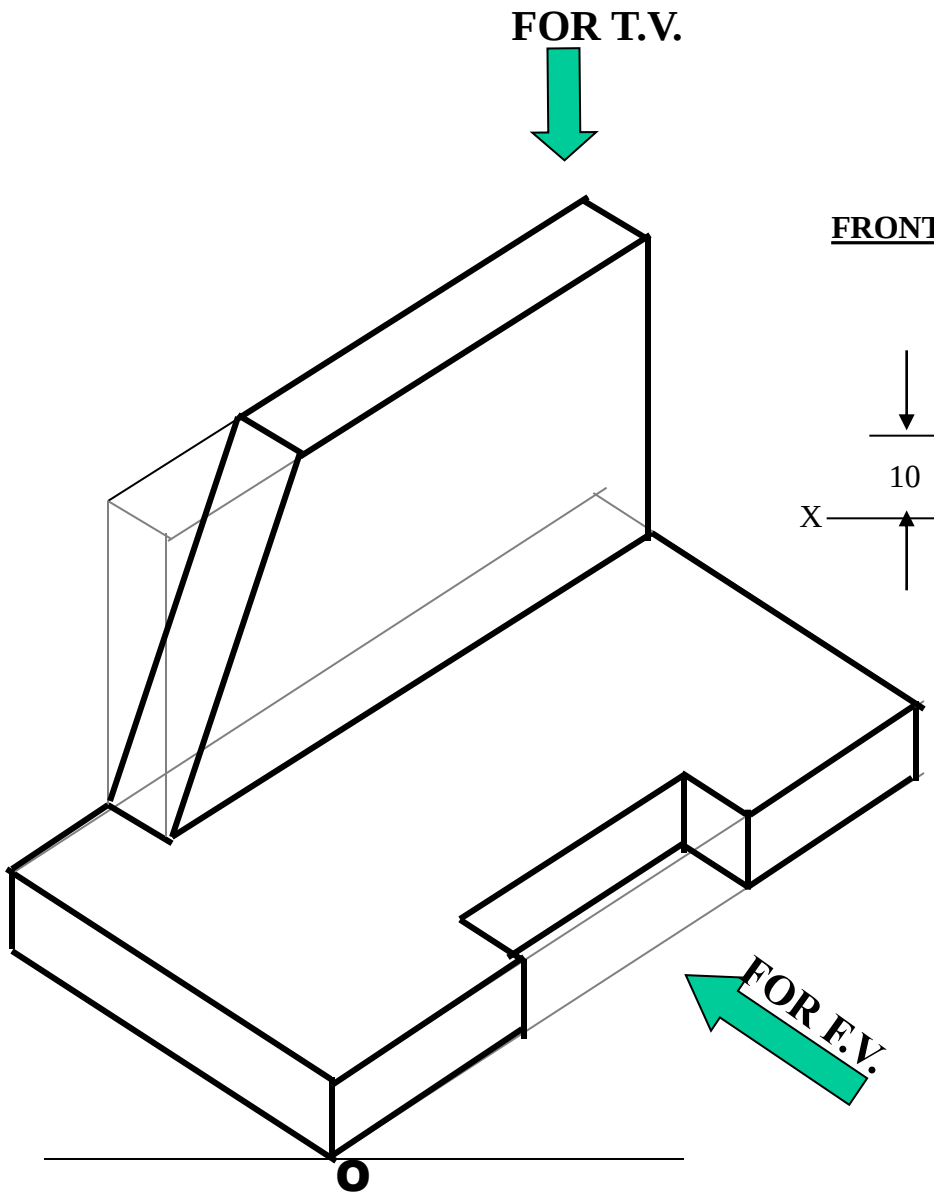


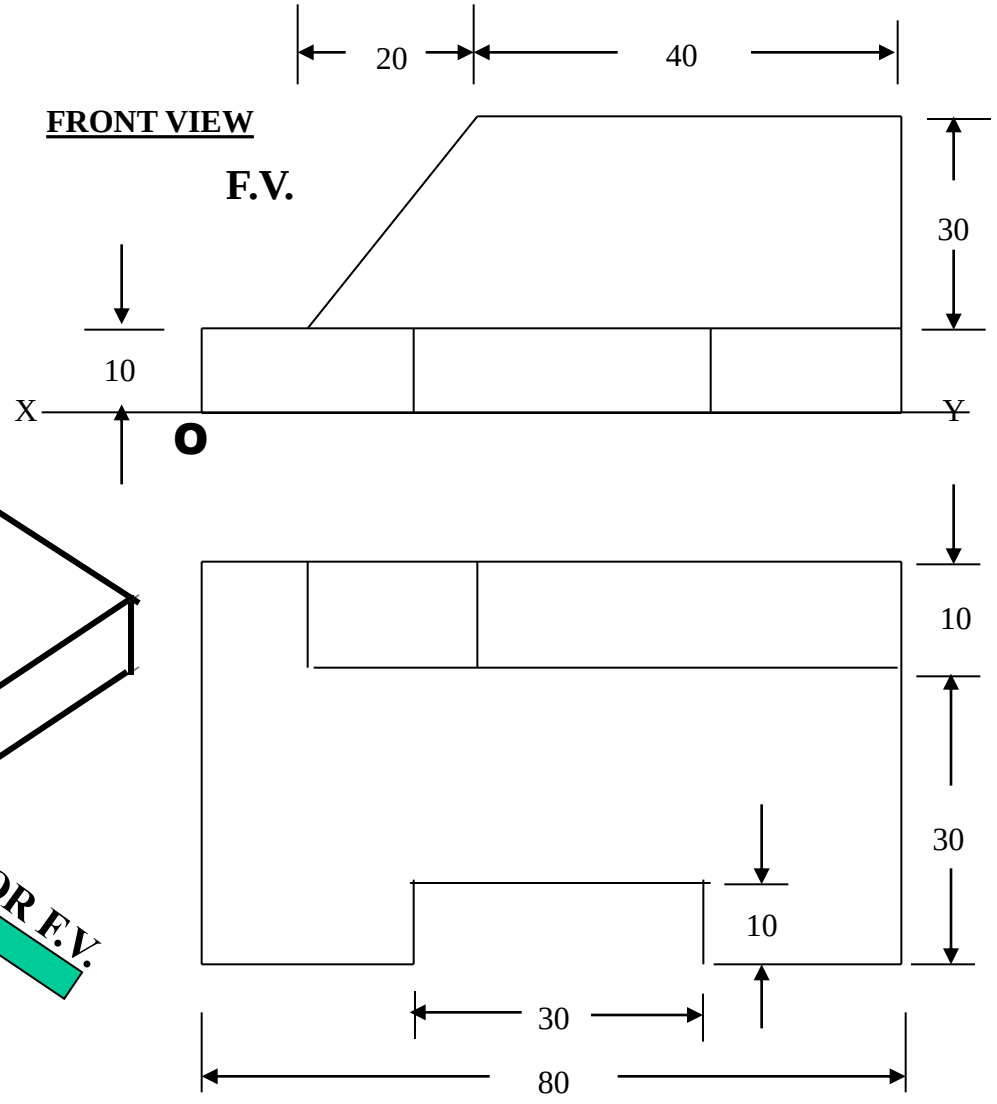
L.H.SIDE VIEW

PICTORIAL PRESENTATION IS GIVEN

DRAW FV ABD SV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS



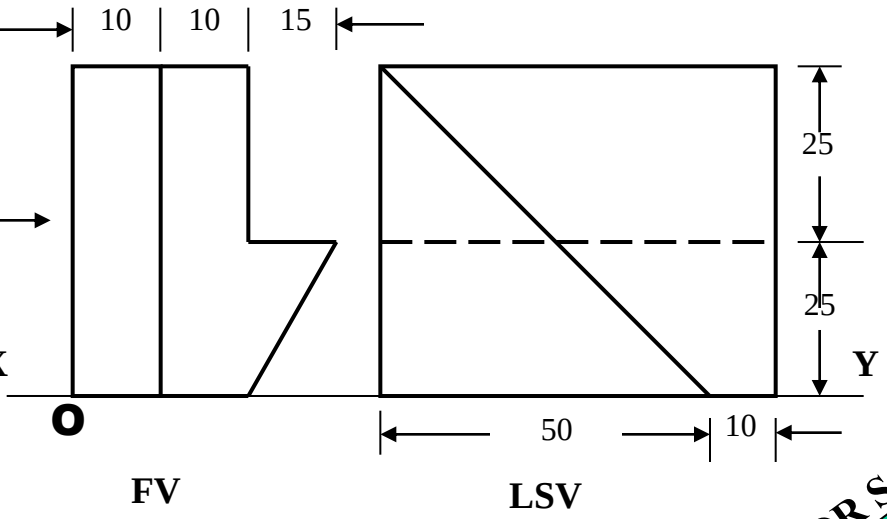


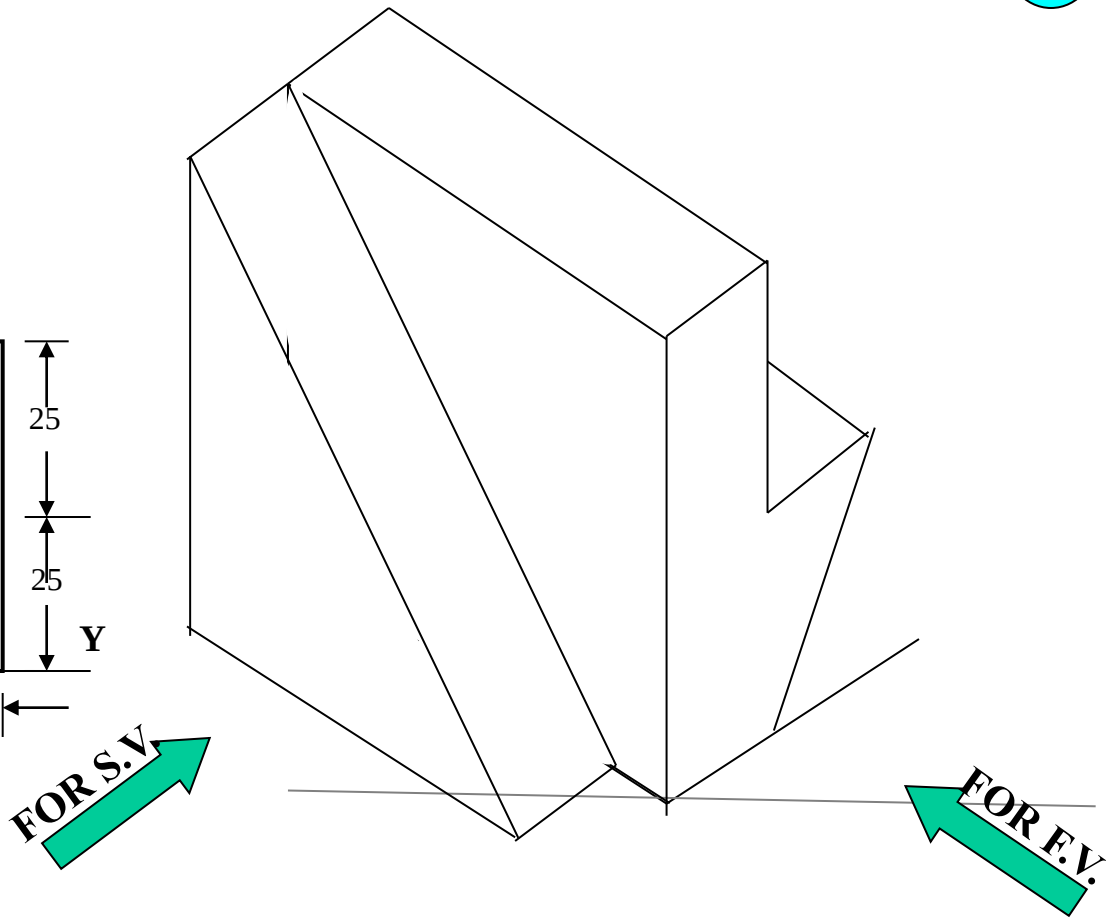
T.V. TOP VIEW

PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND TV OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS



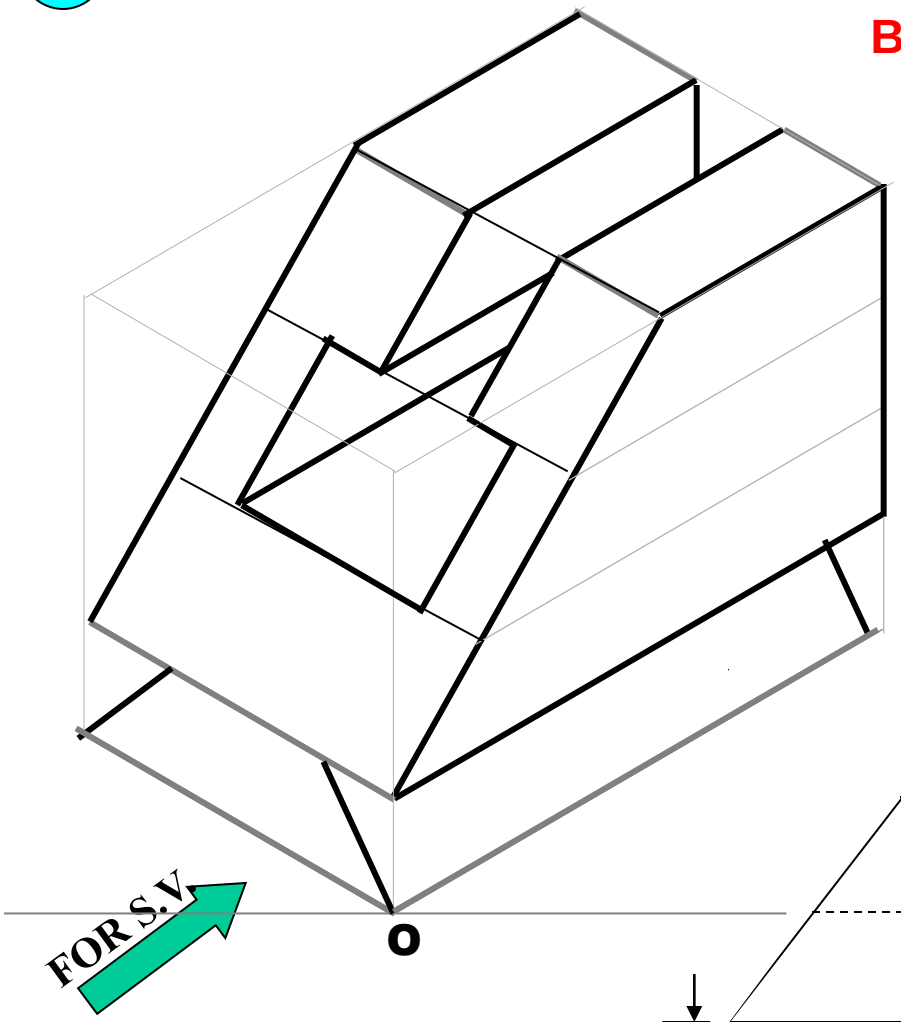


PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND LSV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND SV OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD



ORTHOGRAPHIC PROJECTIONS