



# Orthographic Projections and Projection of Points

# What is Projections?

- When you through the light on an object at any angle, then the image is formed of the object on reference planes, that image is called **Projection**.
- If you through the light at  $90^{\circ}$  on an object, then the image formed of the object is perpendicular or straight, then that perpendicular image is called **Orthographic Projections**.  
(Continues in next slide)

# 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 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.**

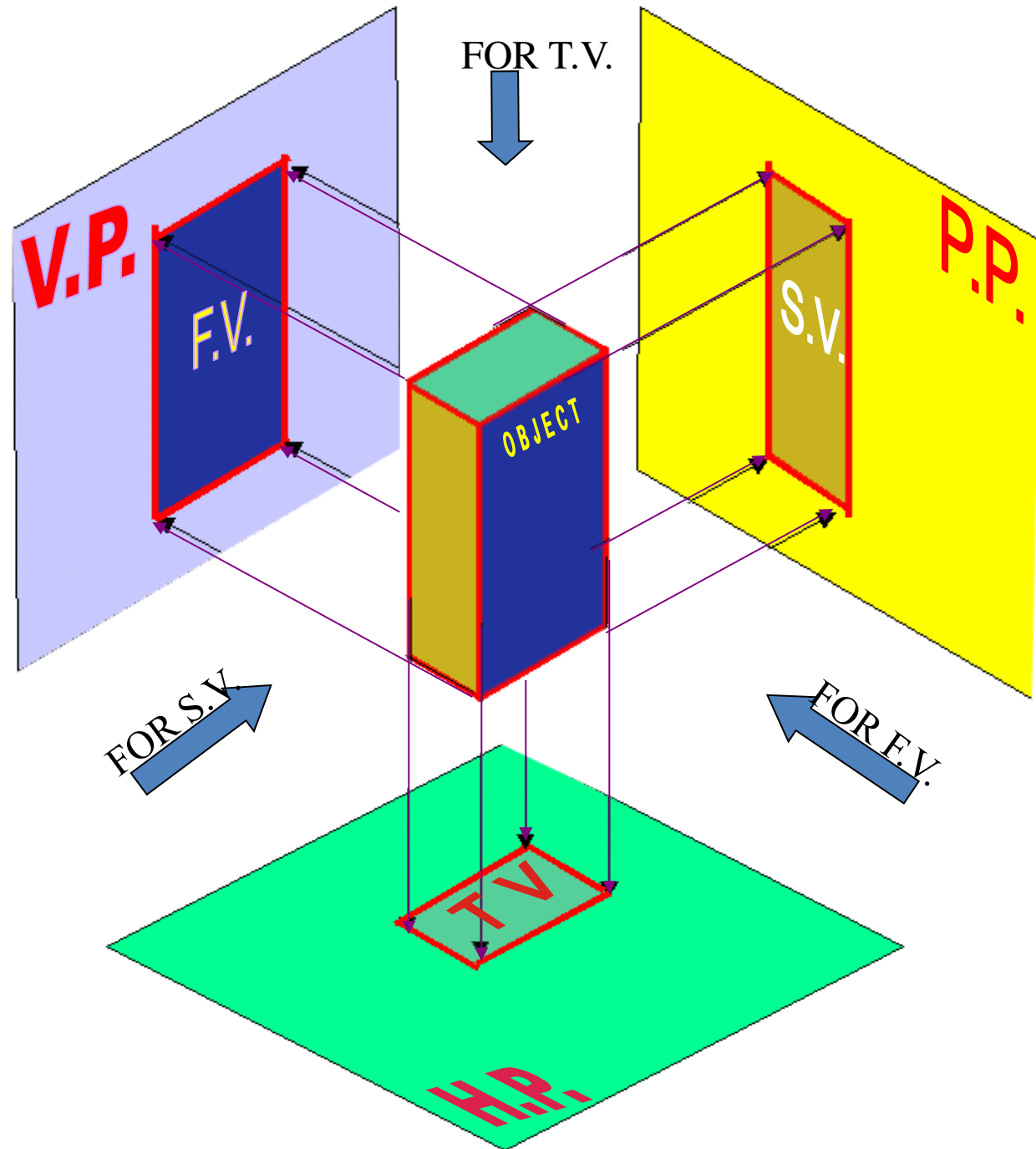
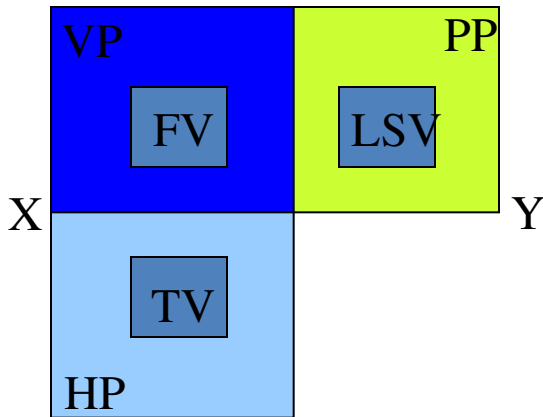
*IMPORTANT TERMS FOR UNDERSTANDING OF ORTHOGRAPHIC PROJECTIONS:*

1. Quadrant System
2. Planes.
3. Pattern of planes & Pattern of views
4. Methods of drawing Orthographic Projections

# FIRST ANGLE PROJECTION

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

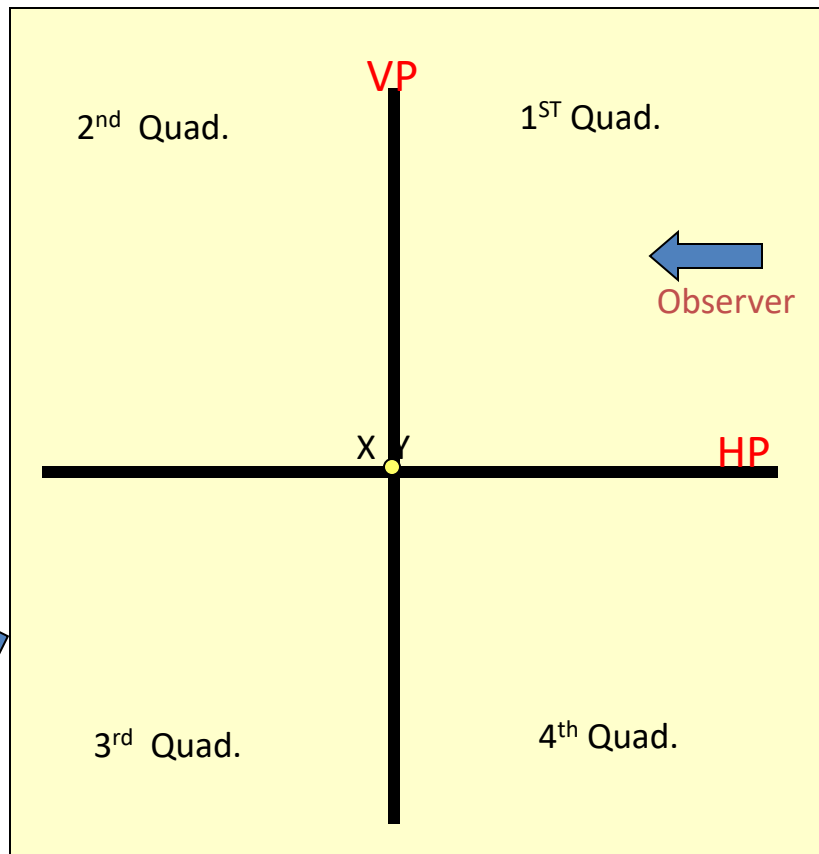
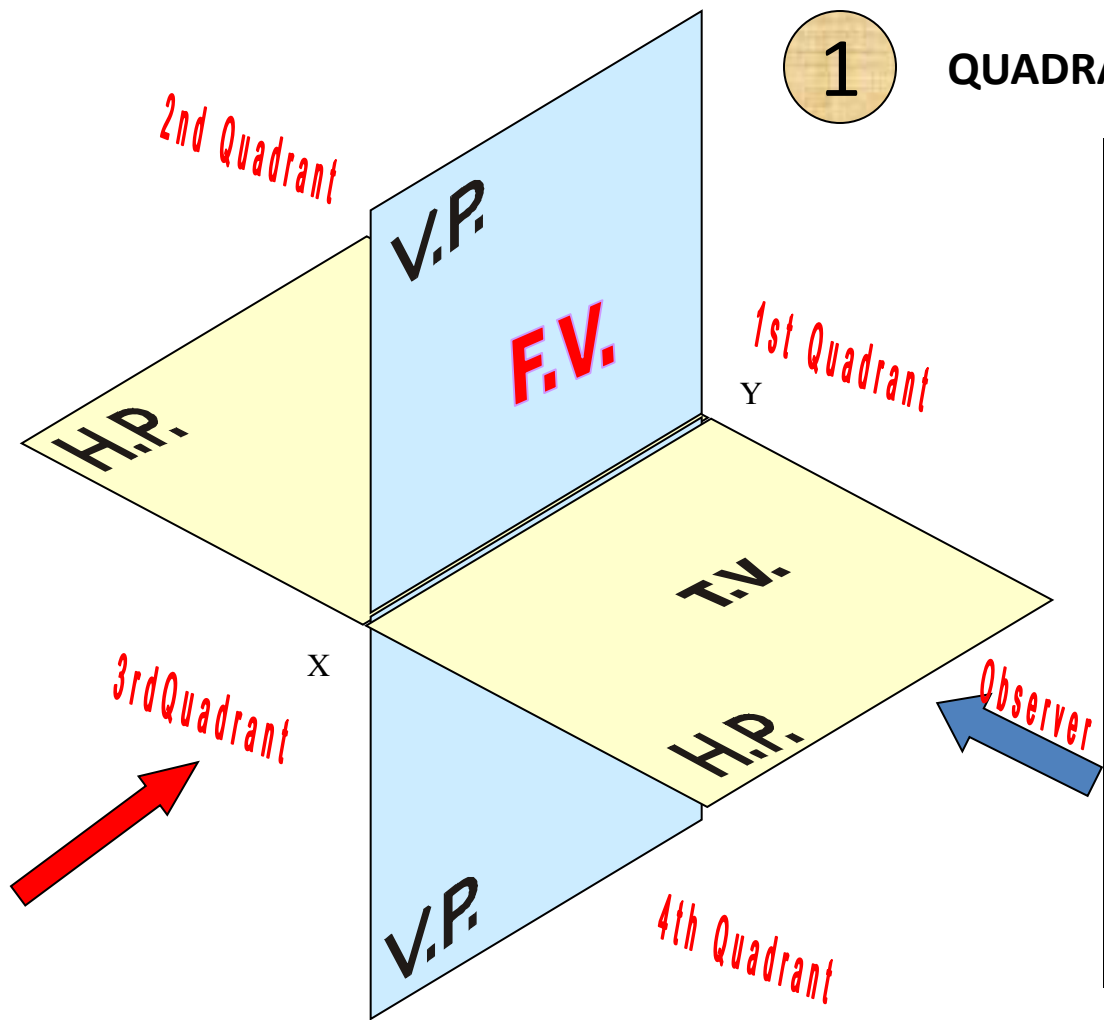
OBJECT IS INBETWEEN  
OBSERVER & PLANE.



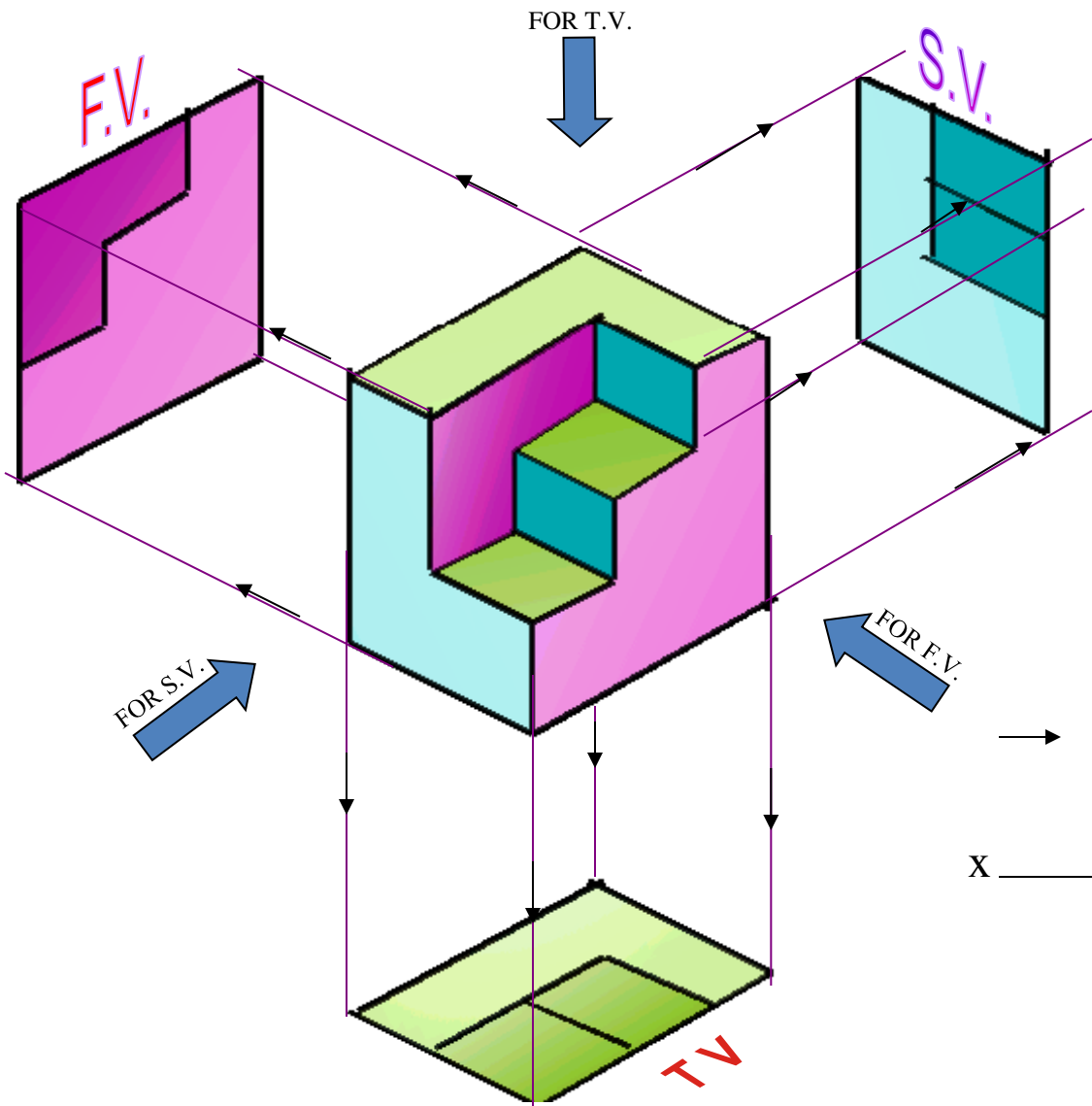
ACTUAL PATTERN OF  
PLANES & VIEWS  
IN  
FIRST ANGLE METHOD  
OF PROJECTIONS

1

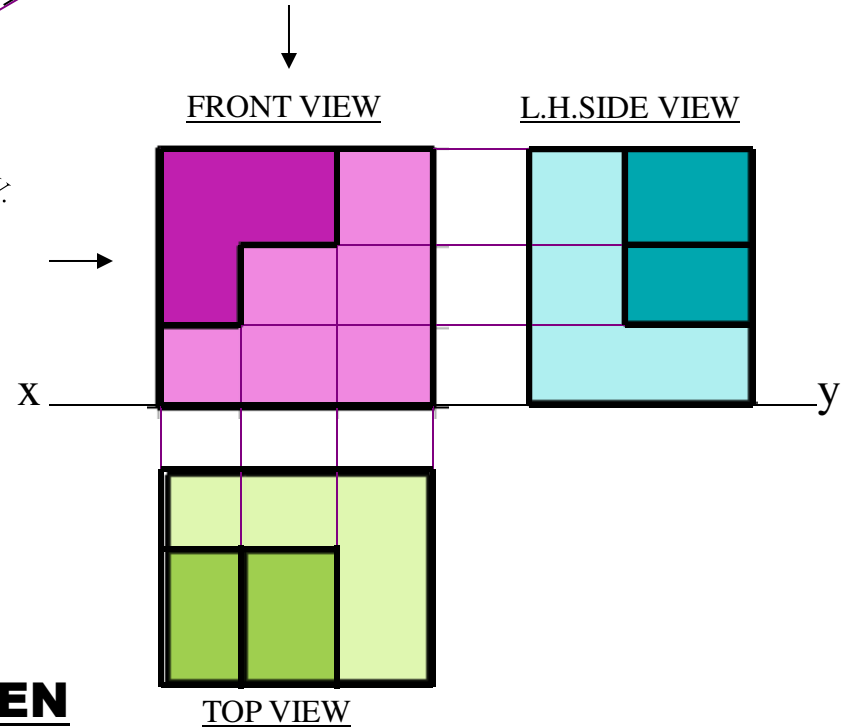
# QUADRANT SYSTEM



THIS QUADRANT PATTERN,  
IF OBSERVED ALONG X-Y LINE ( IN RED ARROW DIRECTION )  
WILL EXACTLY APPEAR AS SHOWN ON RIGHT SIDE AND HENCE,  
IT IS FURTHER USED TO UNDERSTAND ILLUSTRATION PROPERLY.



ORTHOGRAPHIC PROJECTIONS OF OBJECT



**PICTORIAL PRESENTATION IS GIVEN**

**DRAW THREE VIEWS OF THIS OBJECT  
BY FIRST ANGLE PROJECTION METHOD**

# ORTHOGRAPHIC PROJECTIONS

OF POINTS, LINES, PLANES, AND SOLIDS.

TO DRAW PROJECTIONS OF ANY OBJECT,  
ONE MUST HAVE FOLLOWING INFORMATION

A) OBJECT

{ WITH IT'S DESCRIPTION, WELL DEFINED. }

B) OBSERVER

{ ALWAYS OBSERVING PERPENDICULAR TO RESP. REF.PLANE. }

C) LOCATION OF OBJECT,

{ MEANS IT'S POSITION WITH REFERENCE TO H.P. & V.P. }

TERMS 'ABOVE' & 'BELOW' WITH RESPECTIVE TO H.P.  
AND TERMS 'INFRONT' & 'BEHIND' WITH RESPECTIVE TO V.P  
FORM 4 QUADRANTS.

OBJECTS CAN BE PLACED IN ANY ONE OF THESE 4 QUADRANTS.

IT IS INTERESTING TO LEARN THE EFFECT ON THE POSITIONS OF VIEWS ( FV, TV )  
OF THE OBJECT WITH RESP. TO X-Y LINE, WHEN PLACED IN DIFFERENT QUADRANTS.

STUDY ILLUSTRATIONS GIVEN ON NEXT PAGES AND NOTE THE RESULTS. TO MAKE IT EASY  
HERE A POINT **A** IS TAKEN AS AN OBJECT. BECAUSE IT'S ALL VIEWS ARE JUST POINTS.

## NOTATIONS

FOLLOWING NOTATIONS SHOULD BE FOLLOWED WHILE NAMING DIFFERENT VIEWS IN ORTHOGRAPHIC PROJECTIONS.

OBJECT	POINT A	LINE AB
IT'S TOP VIEW	a	a b
IT'S FRONT VIEW	a'	a' b'
IT'S SIDE VIEW	a''	a'' b''

*SAME SYSTEM OF NOTATIONS SHOULD BE FOLLOWED  
INCASE NUMBERS, LIKE 1, 2, 3 – ARE USED.*

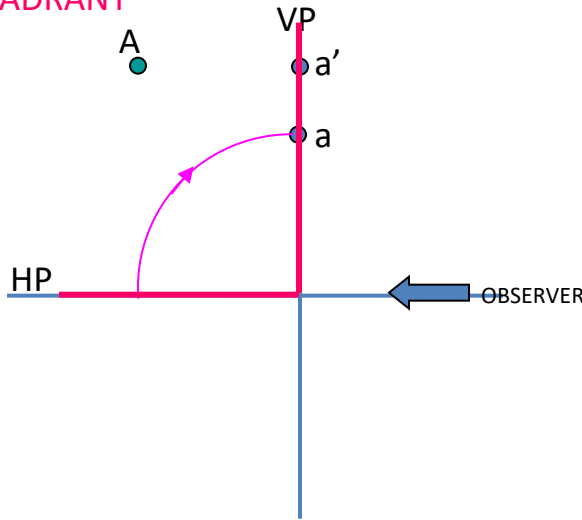


# PROJECTION OF POINTS

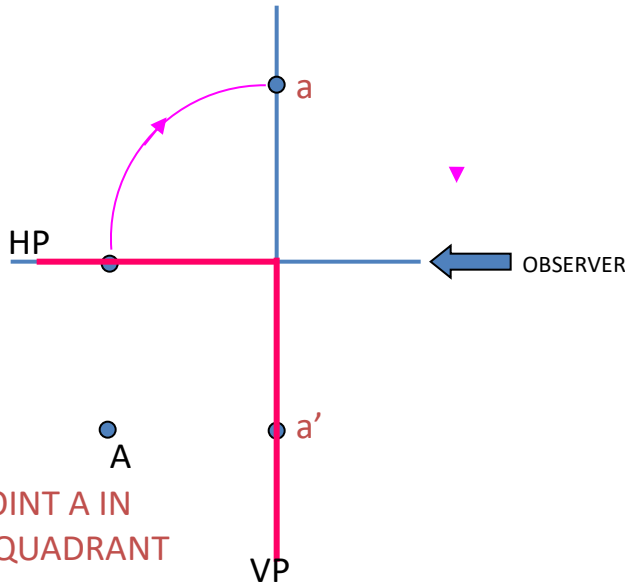
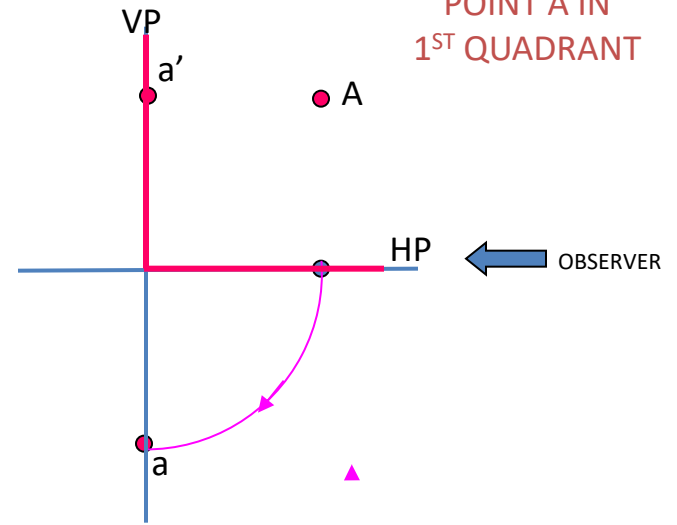
- Point is a dimensionless. It has no Length, Breadth and Height.

# PROJECTION OF POINTS IN DIFFERENT QUADRANTS

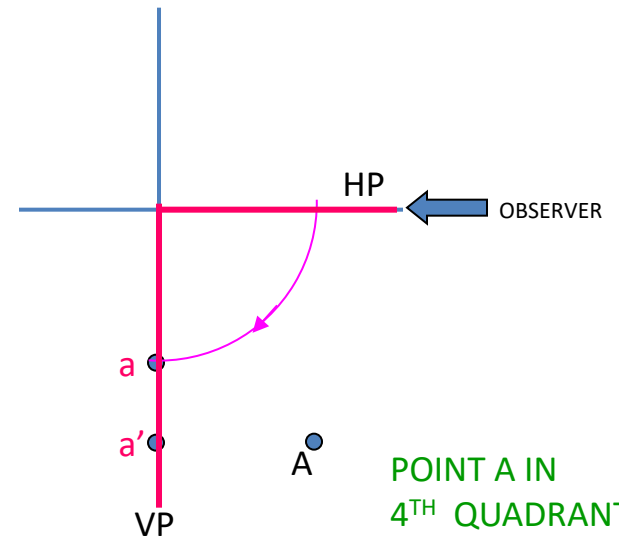
POINT A IN  
2<sup>ND</sup> QUADRANT



POINT A IN  
1<sup>ST</sup> QUADRANT



POINT A IN  
3<sup>RD</sup> QUADRANT

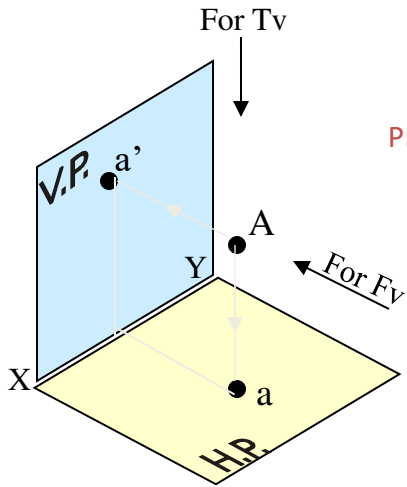


POINT A IN  
4<sup>TH</sup> QUADRANT

Point A is Placed In different quadrants and it's FV & TV are brought in same plane for Observer to see clearly. FV is visible as it is a view on VP. But as TV is a view on Hp, it is rotated downward 90°, In clockwise direction. The In front part of Hp comes below XY line and the part behind VP comes above. Observe and note the process.

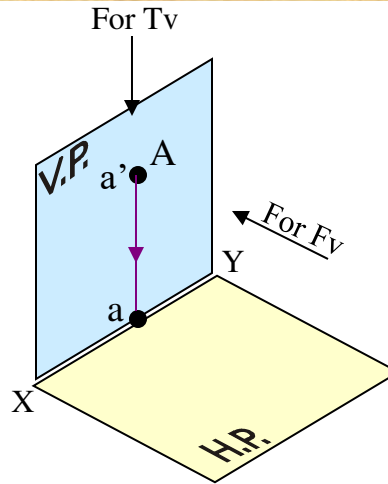
# PROJECTIONS OF A POINT IN FIRST QUADRANT.

POINT A ABOVE HP  
& IN FRONT OF VP



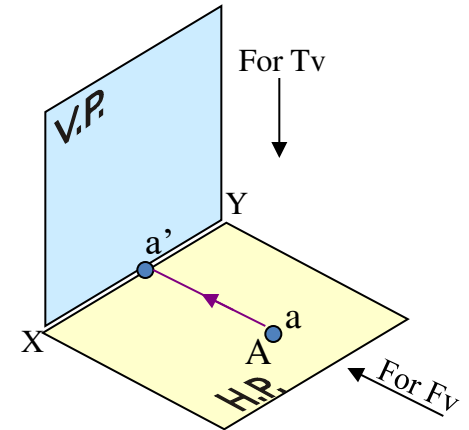
PICTORIAL  
PRESENTATION

POINT A ABOVE HP  
& IN VP



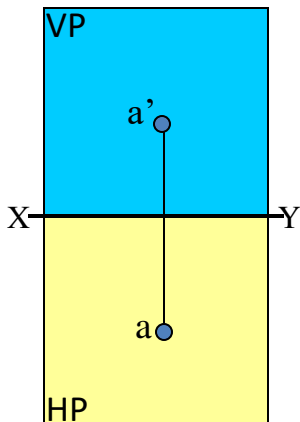
PICTORIAL  
PRESENTATION

POINT A IN HP  
& IN FRONT OF VP

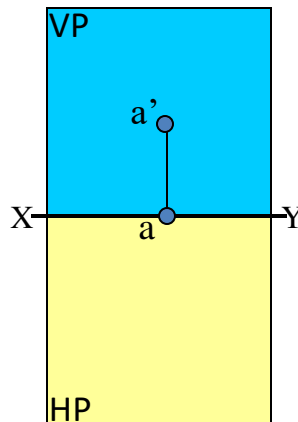


ORTHOGRAPHIC PRESENTATIONS  
OF ALL ABOVE CASES.

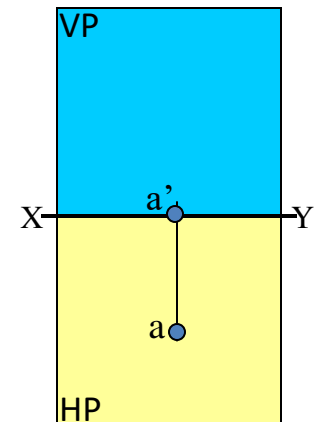
*Fv above xy,  
Tv below xy.*



*Fv above xy,  
Tv on xy.*



*Fv on xy,  
Tv below xy.*



# Different Problems of Projection of Points

*Thank You*