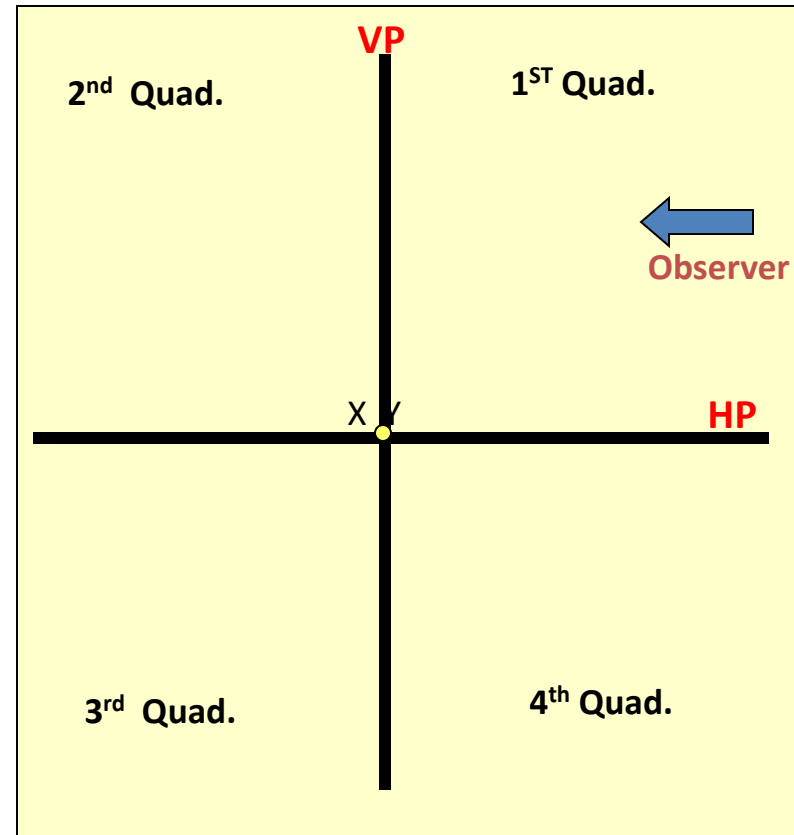
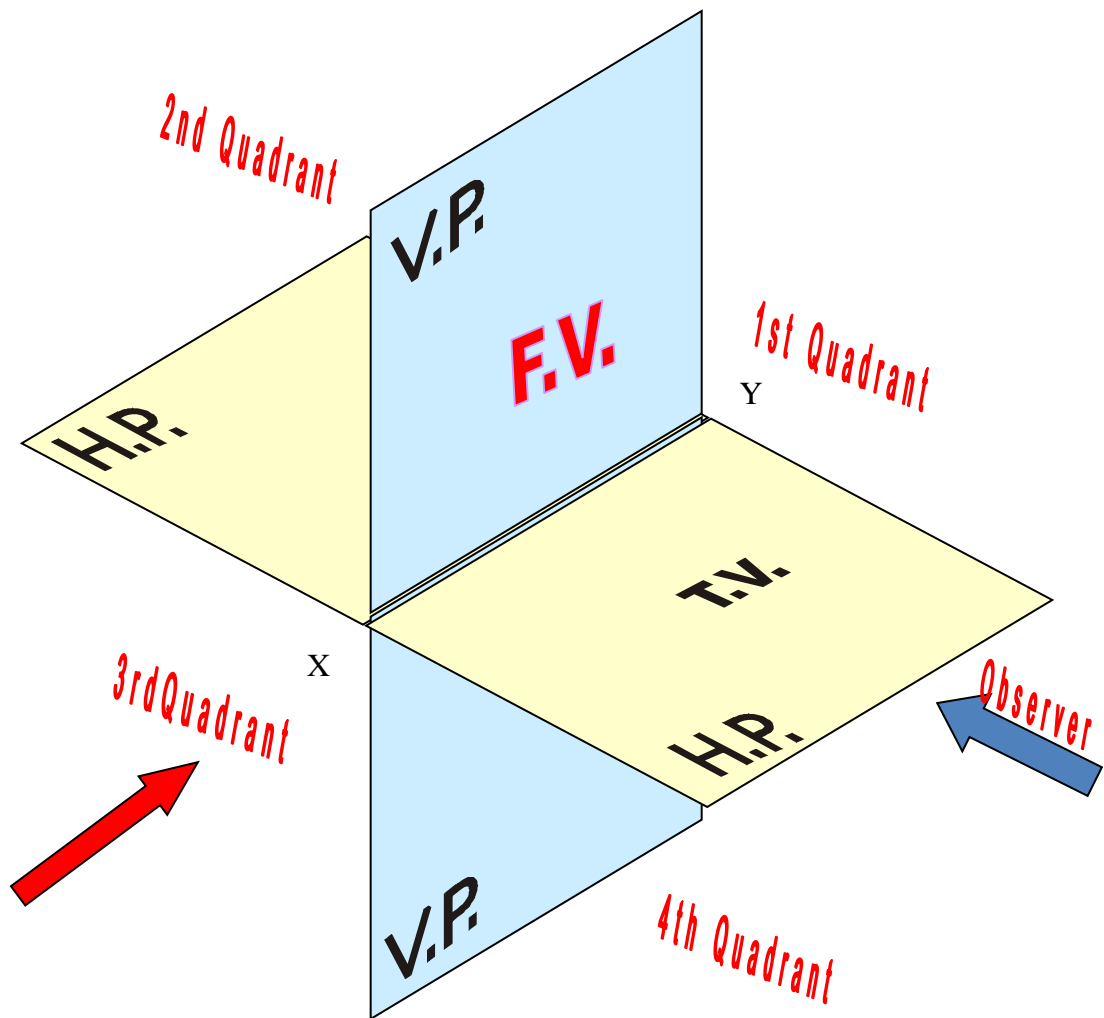
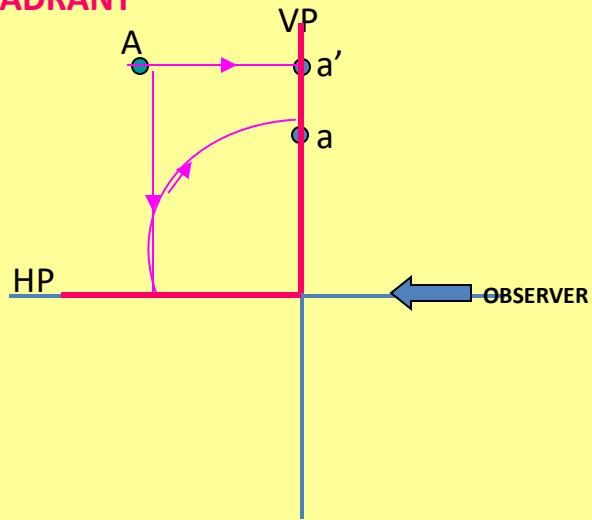


Engineering Graphics

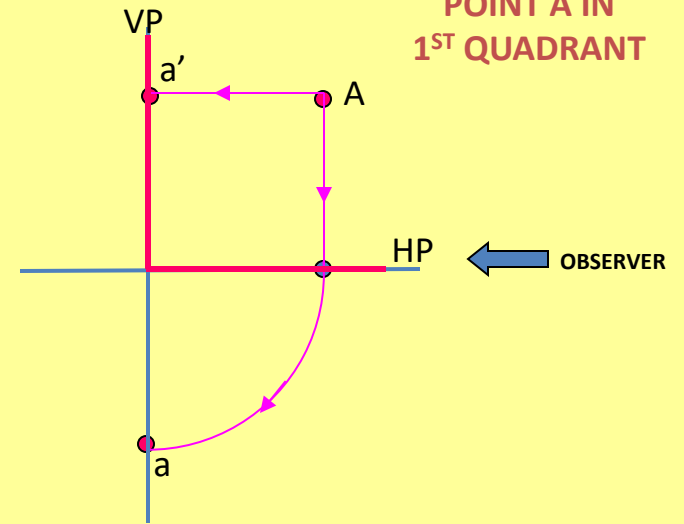
Projections of a Point & Line



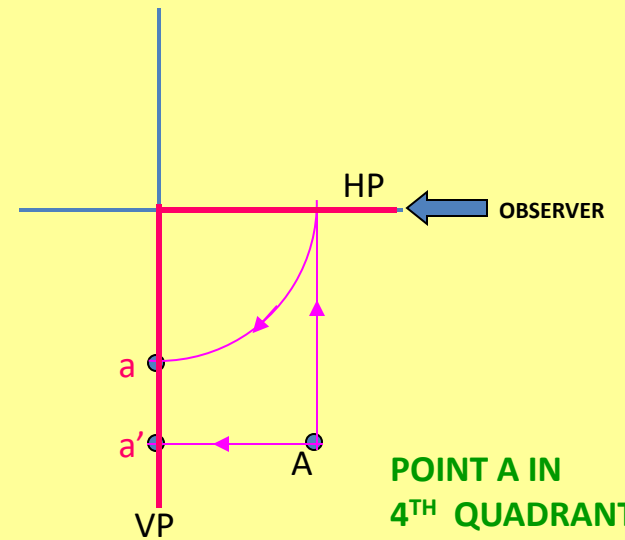
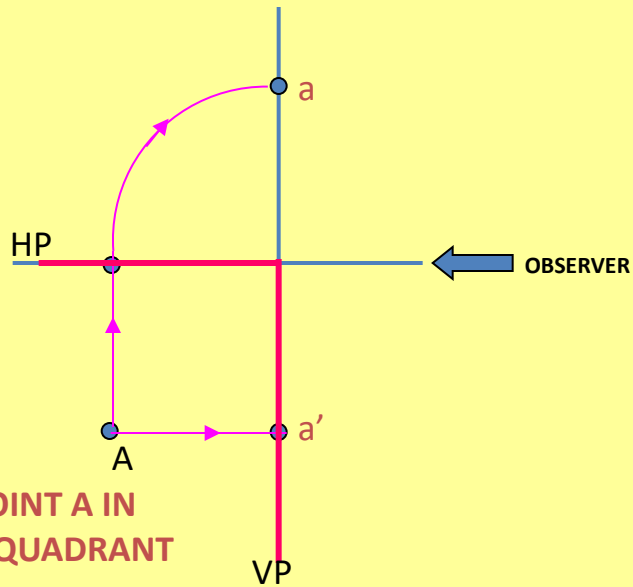
**POINT A IN
2ND QUADRANT**



**POINT A IN
1ST QUADRANT**



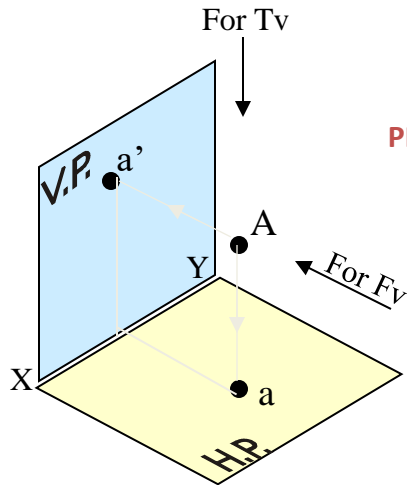
**POINT A IN
3RD QUADRANT**



**POINT A IN
4TH QUADRANT**

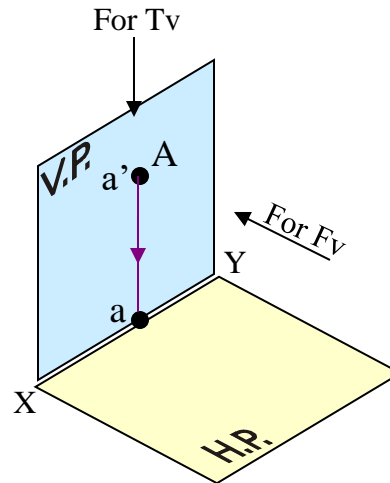
PROJECTIONS OF A POINT IN FIRST QUADRANT.

**POINT A ABOVE HP
& IN FRONT OF VP**



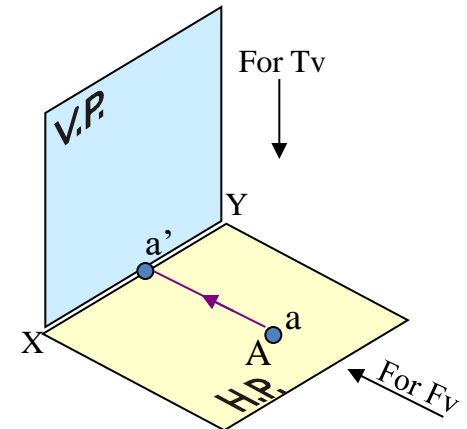
PICTORIAL
PRESENTATION

**POINT A ABOVE HP
& IN VP**



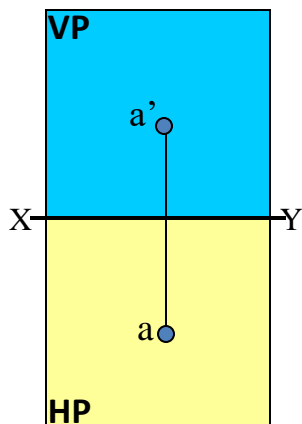
PICTORIAL
PRESENTATION

**POINT A IN HP
& IN FRONT OF VP**

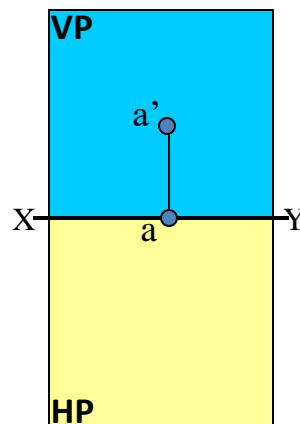


ORTHOGRAPHIC PRESENTATIONS
OF ALL ABOVE CASES.

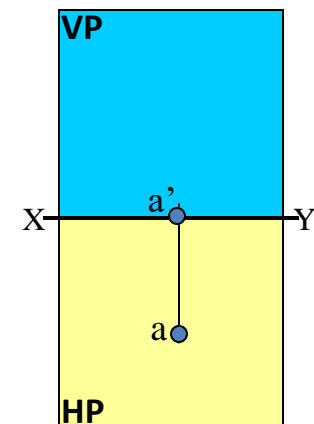
*Fv above xy,
Tv below xy.*



*Fv above xy,
Tv on xy.*



*Fv on xy,
Tv below xy.*

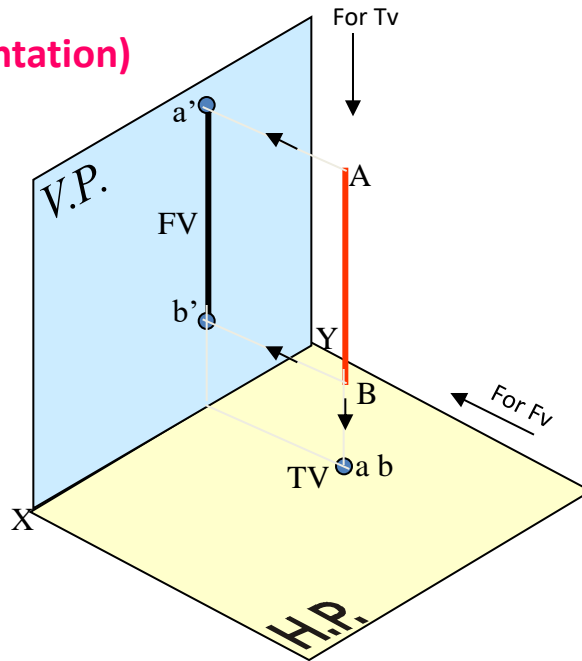


Projections of Line

- **Line:**
 - The shortest distance between two points
 - A locus of infinite number of points.
 - A segment of an arc with infinite radius
 - A one dimensional object
- **True Length:**
 - Every line has only & only one True Length (TL).
 - TL of a line in FV, TV, SV remains the same.
- **Concept:**
 - If any line is parallel to any one reference plane, then view obtained in that reference plane is always True Length.
 - When any one view of a line represents TL, then its correspondence view is always parallel to XY & is apparent length.
 - For example: If FV is a TL, then its corresponding view is TV as Plan Length (PL).
 - For example: If TV is a TL, then its corresponding view is FV as Elevation Length (EPL).

(Pictorial Presentation)

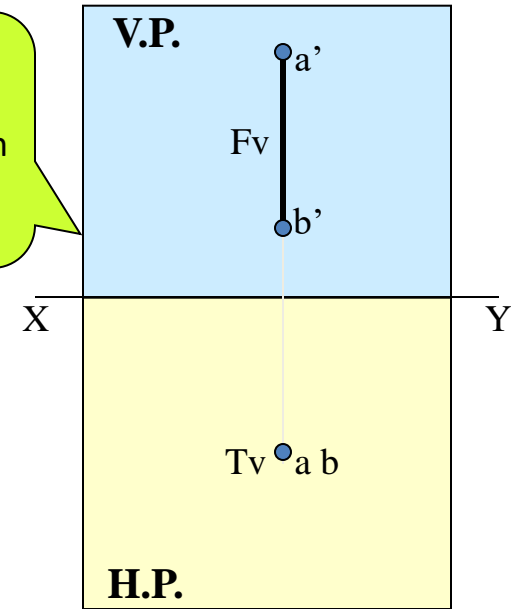
1.
A Line
perpendicular
to Hp
&
// to Vp



Note:

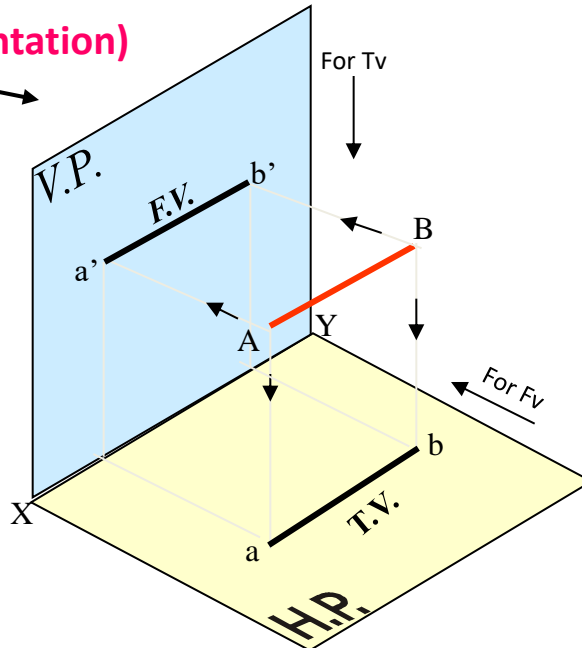
Fv is a vertical line
Showing True Length
&
Tv is a point.

Orthographic Pattern



(Pictorial Presentation)

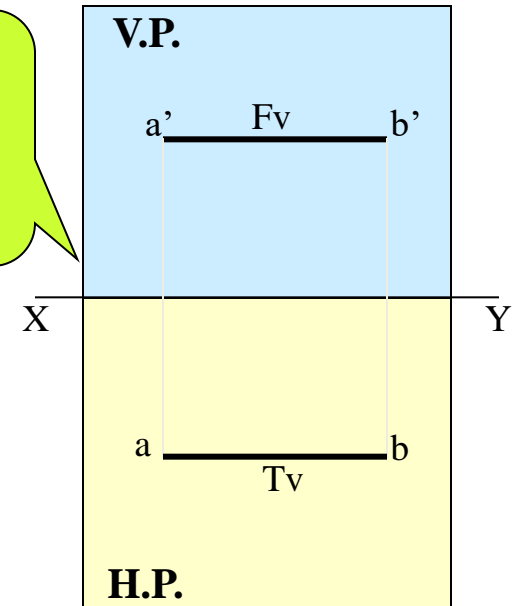
2.
A Line
// to Hp
&
// to Vp



Note:

Fv & Tv both are
// to xy
&
both show T. L.

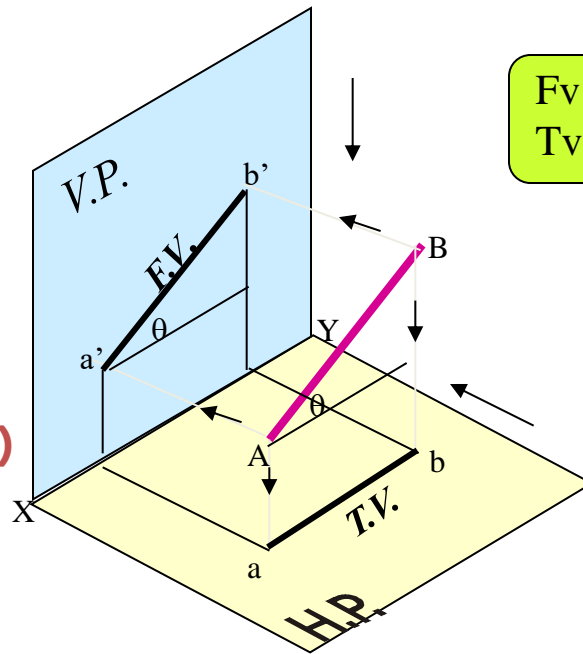
Orthographic Pattern



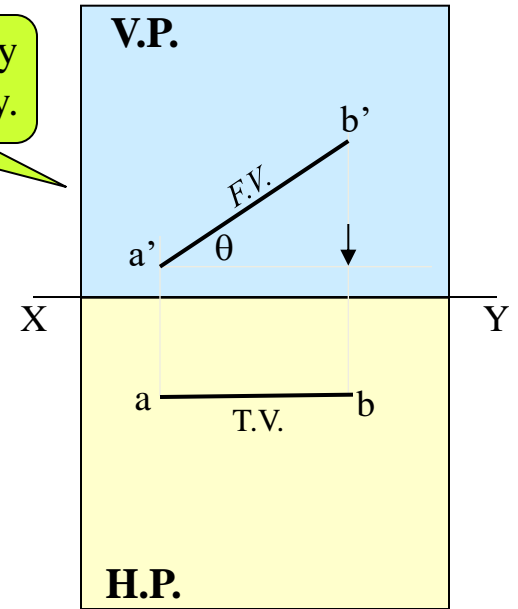
3.

A Line inclined to Hp
and
parallel to Vp

(Pictorial presentation)



Fv inclined to xy
Tv parallel to xy.

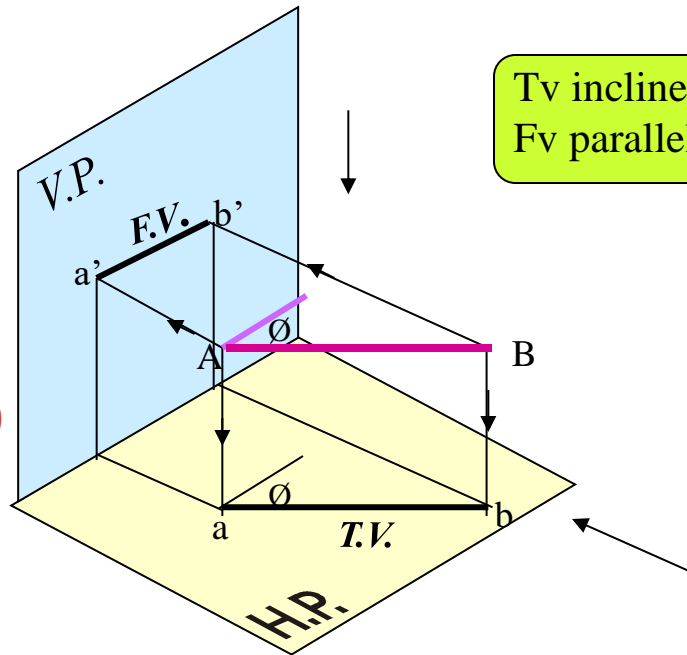


Orthographic Projections

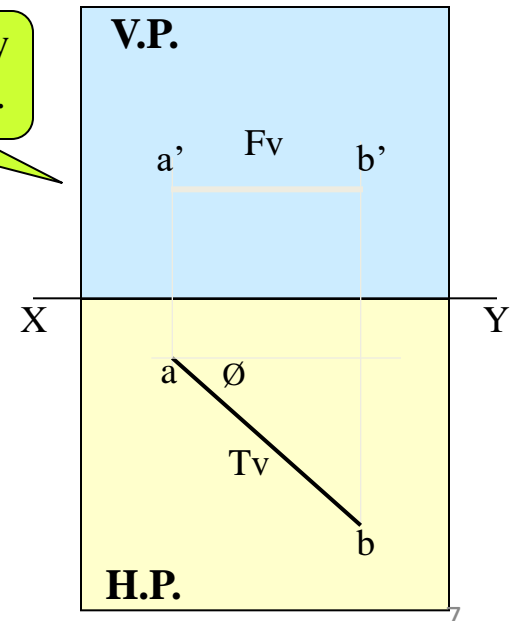
4.

A Line inclined to Vp
and
parallel to Hp

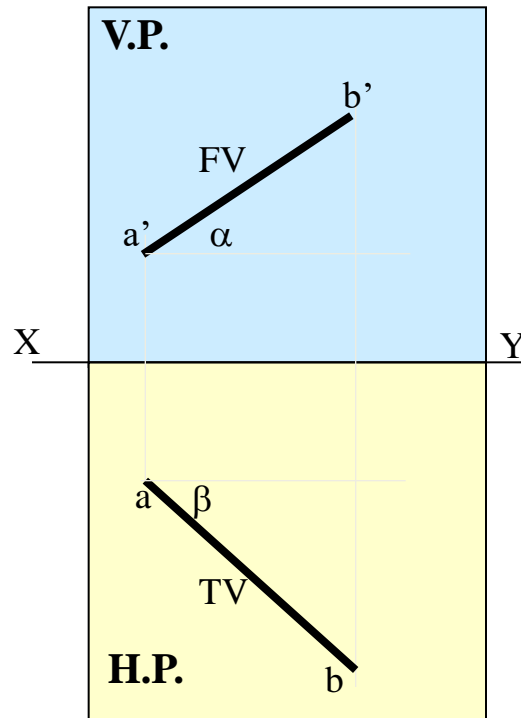
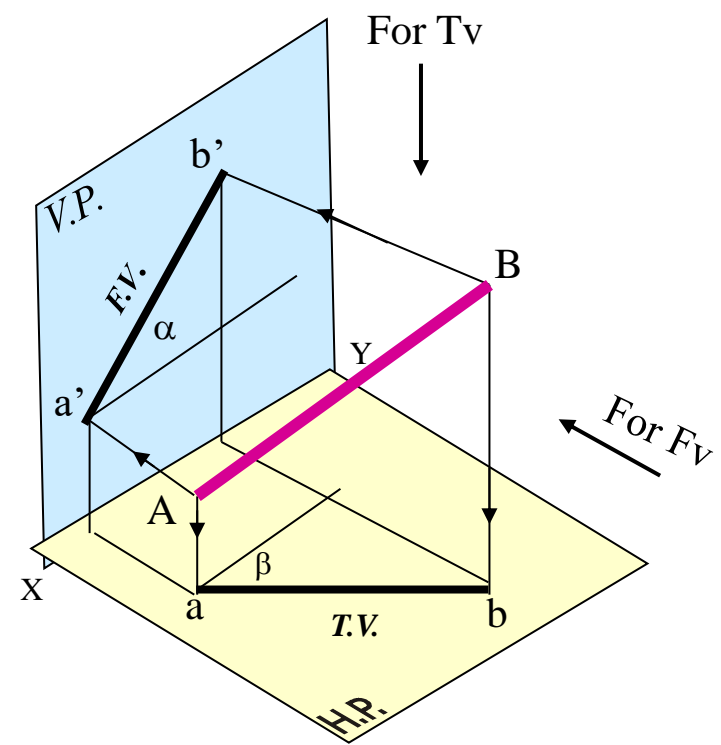
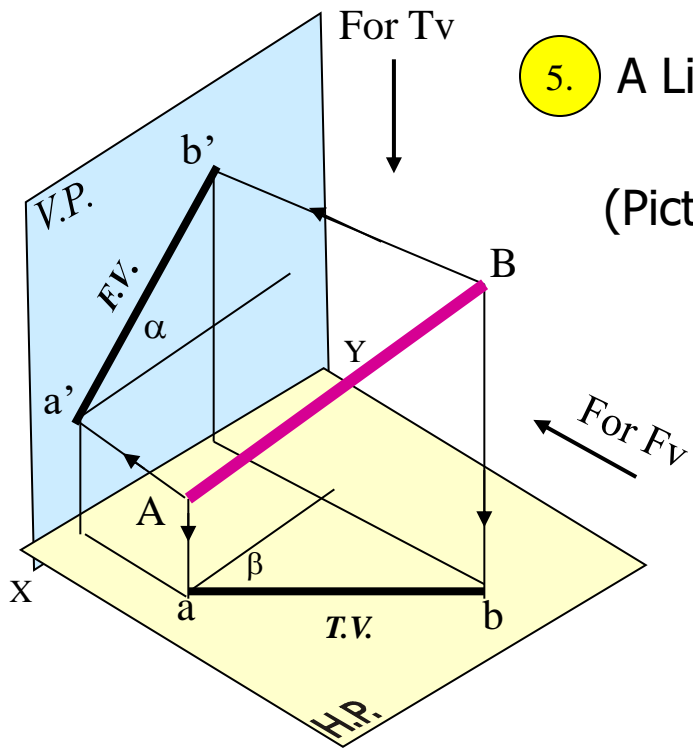
(Pictorial presentation)



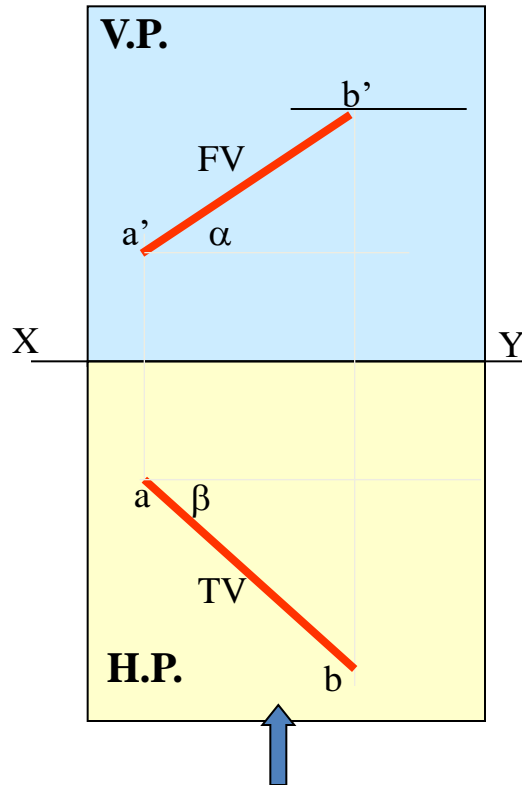
Tv inclined to xy
Fv parallel to xy.



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

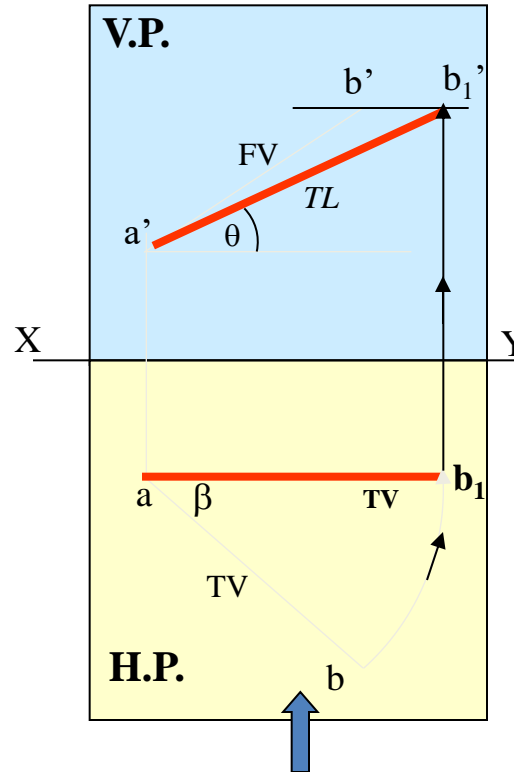


Orthographic Projections
Means Fv & Tv of Line AB
are shown below,
with their apparent Inclinations
 α & β



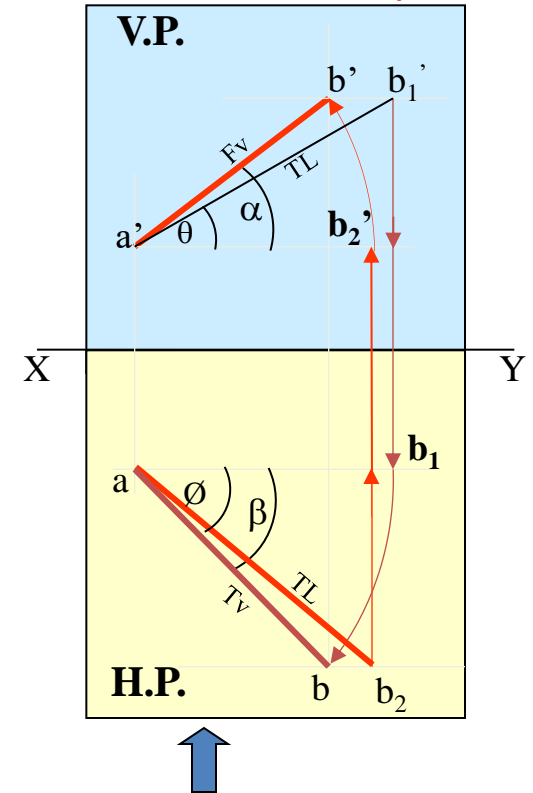
Here TV (ab) is not // to XY line
Hence it's corresponding FV
 $a' b'$ is **not** showing
True Length &
True Inclination with Hp.

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).



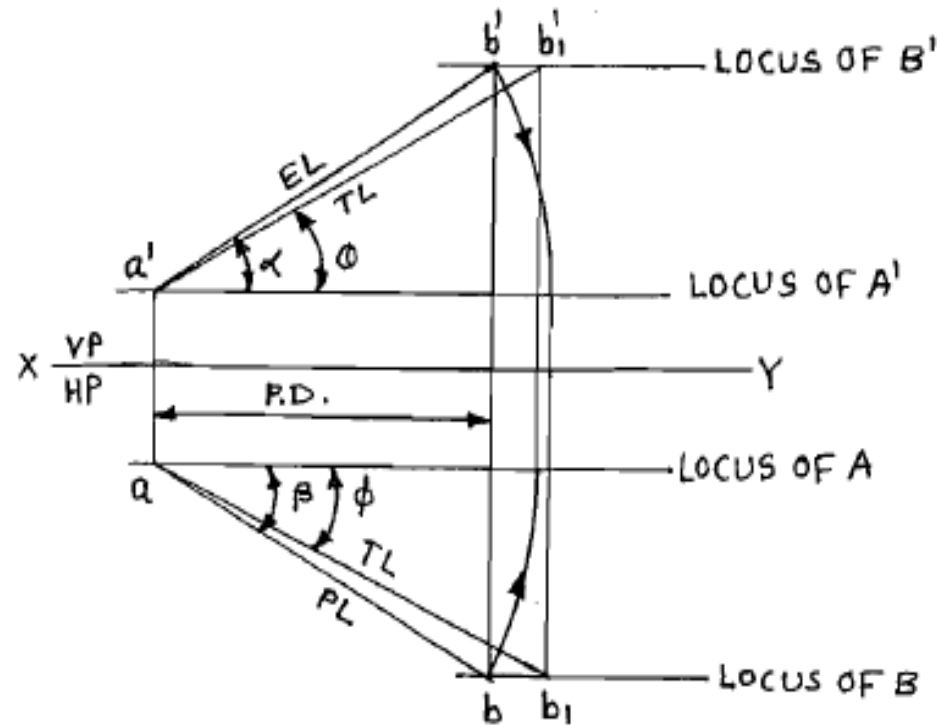
In this sketch, TV is rotated
and made // to XY line.
Hence it's corresponding
FV $a' b_1'$ is showing
True Length
&
True Inclination with Hp.

Note the procedure
When True Length is known,
How to locate FV & TV.
(Component $a' b_2'$ of TL
which is further rotated
to determine FV)



Here $a' b_1'$ is component
of TL ab_1 gives length of FV.
Hence it is brought Up to
Locus of a' and further rotated
to get point b' . $a' b'$ will be Fv.
Similarly drawing component
of other TL ($a' b_1'$) TV can be drawn.

Projections of Line



A Line inclined to both HP & VP

- a' Point above HP
- a Point in front of VP
- b' Point above HP
- b Point in front of VP
- $a'b'$ Elevation or FV length, EL
- ab Plan or TV length, PL
- TL True length = $a'b'_1 = ab_1$
- α Apparent angle made by EL
- β Apparent angle made by PL
- θ True inclination with HP by TL
- ϕ True inclination with VP by TL
- PD Projector distance parallel to XY
- $a'a$ Lies on the same Projector
- $b'b$ Lies on the same Projector
- HT Horizontal trace
- VT Vertical trace
- a', b', h, VT are collinear & lies on EL
- a, b, v, HT are collinear & lies on PL
- h & v are always on XY

Hints to solve the problems

- Line is inclined to HP or XY represents ' θ ' while to VP or XY represents ' Φ '.
- FV makes, FV line is inclined, Elevation makes - represents ' α ', while TV makes, TV line is inclined, Plan makes - represents ' β '.
- If apparent lengths & apparent angles are known, then rotate them upto the locus through the point of rotation and make it parallel to XY. Then project it to the corresponding view to find its TL (e.g. EL & ' α ' are known, then rotate EL, make it parallel to XY & project it into TV to find corresponding TL & ' Φ ').).
- If true length & true inclinations are known, then project them into corresponding view & rotate it to find the EL or PL. [Reverse of above procedure].

Points to remember while solving problems

- The point of a line which you rotate, project it on the locus of the same point in corresponding view.
- Never extend true line to intersect XY to find out the traces of a line.
- Projections of any point on EL or PL are always lying on the same projector.
- Draw only EL & PL as visible lines, TL & XY as thin lines while all the projectors, projections, rotations etc. should be as faint as possible.
- When EL or PL is rotated, then show the direction of rotation by arrow.
- Put the given data in the drawing while write separate answers for the findings with the corresponding units.
- Use all capital letters for any write up on the sheet.