TA 101A:2019-20:II

Lecture 15 –Space Geometry II

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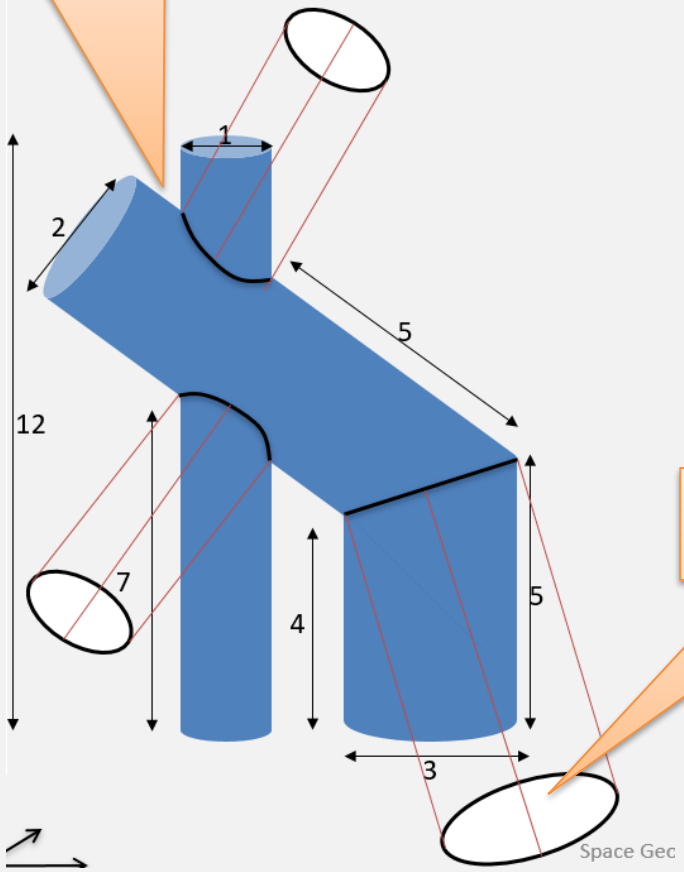
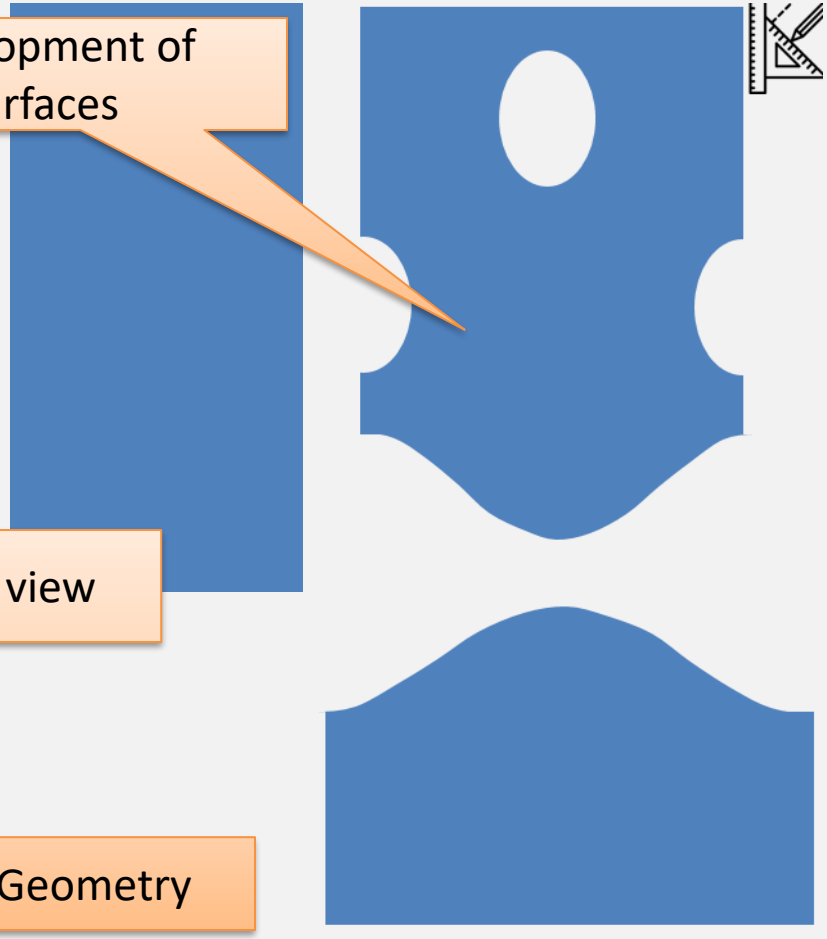
Recapitulation

Intersection of surfaces



Development of surfaces

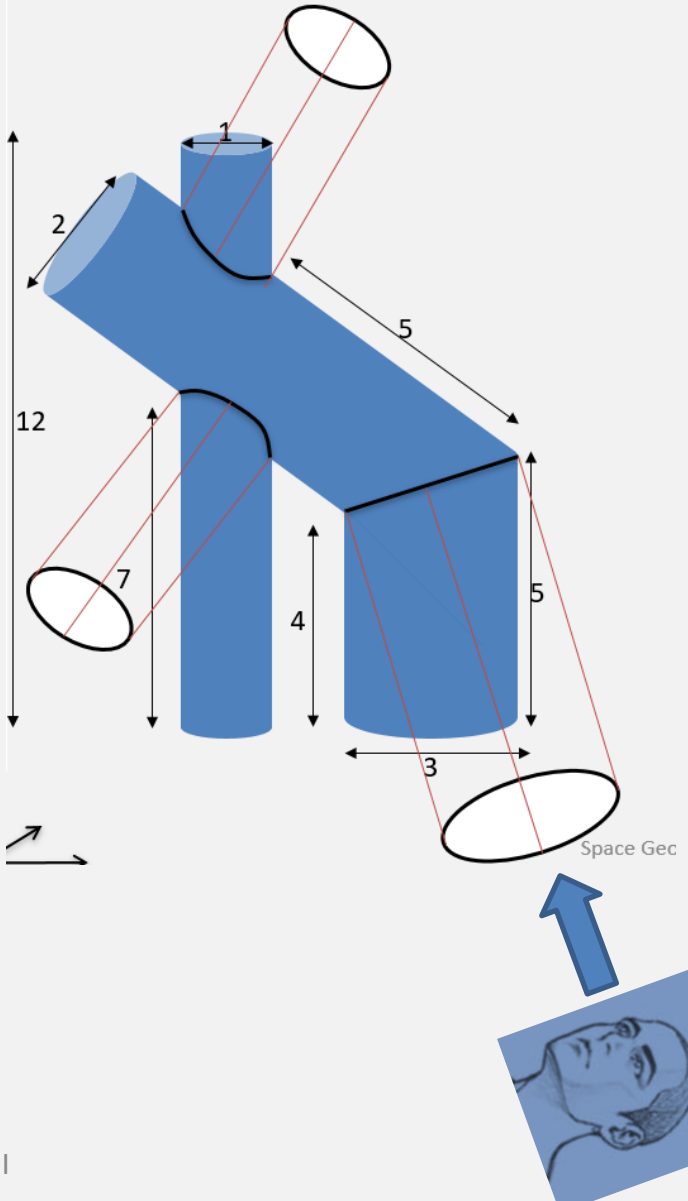


Auxiliary view

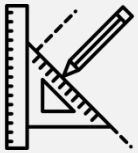
Space Geometry

Auxiliary Views – Viewing Direction

- The view that gives normal view is in the viewing direction which is perpendicular to the surface.
- Some views
  - Normal view of a line
  - Point view of a line
  - Normal view of a plane
  - Edge view of a plane

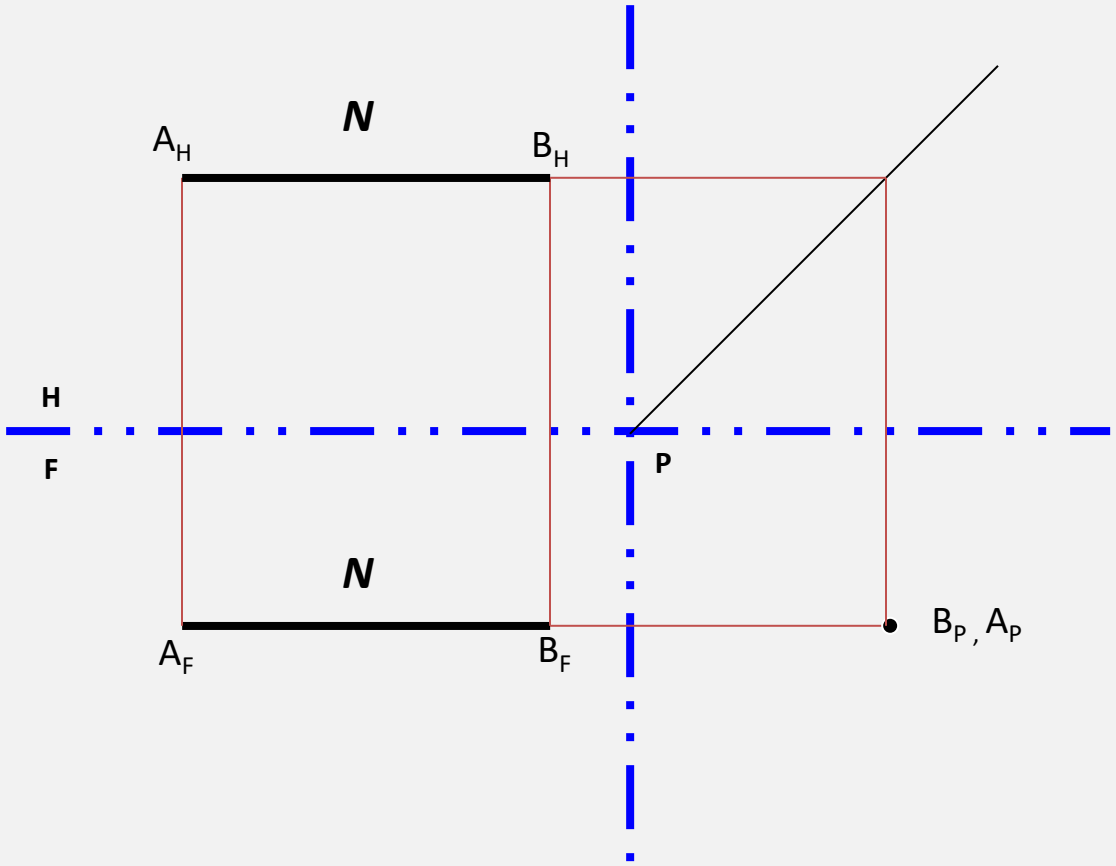


Projection of Lines



- A line is considered to be of infinite length, and the portion between any two points on it simply specifies a segment.
- A straight line segment is the shortest distance between its end points.
- Direction of line in space known if line is known in two adjacent orthographic views.
- The space direction (bearing and slope) and one point will also locate a line.

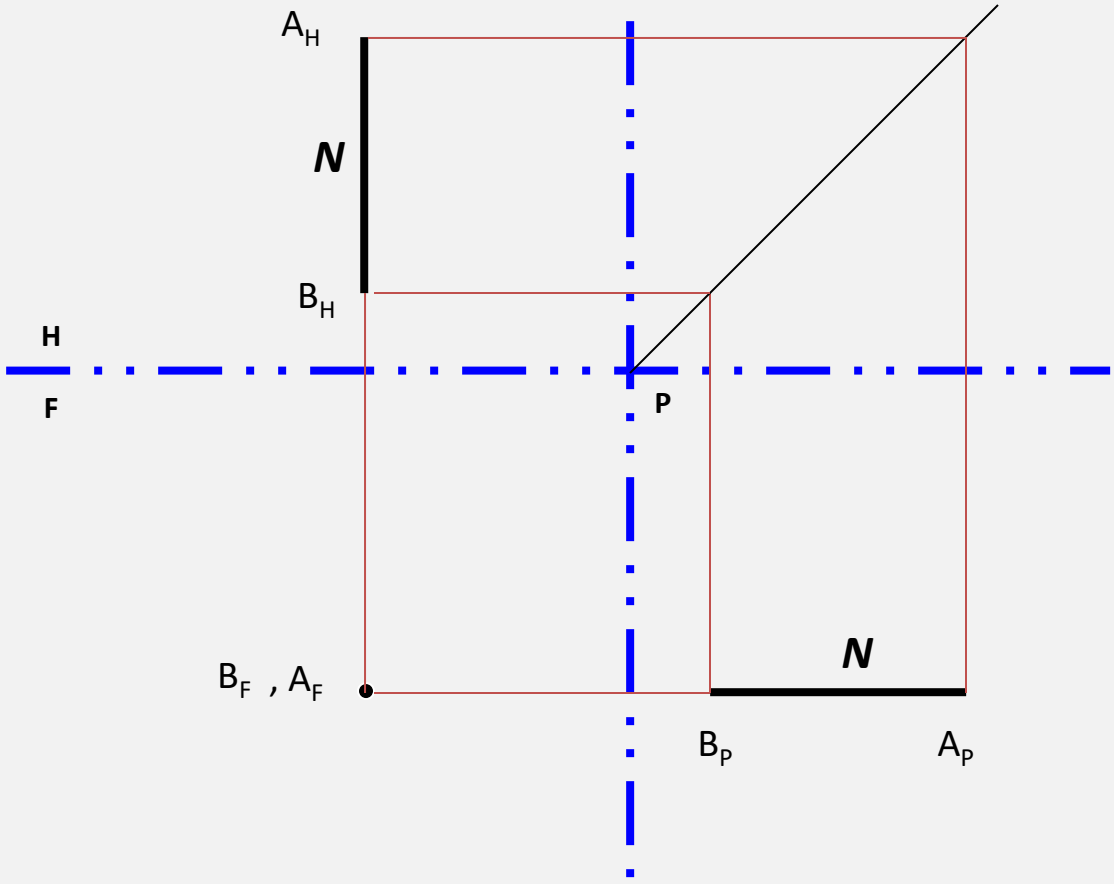
Classification of Lines



N stands for Normal View of Line

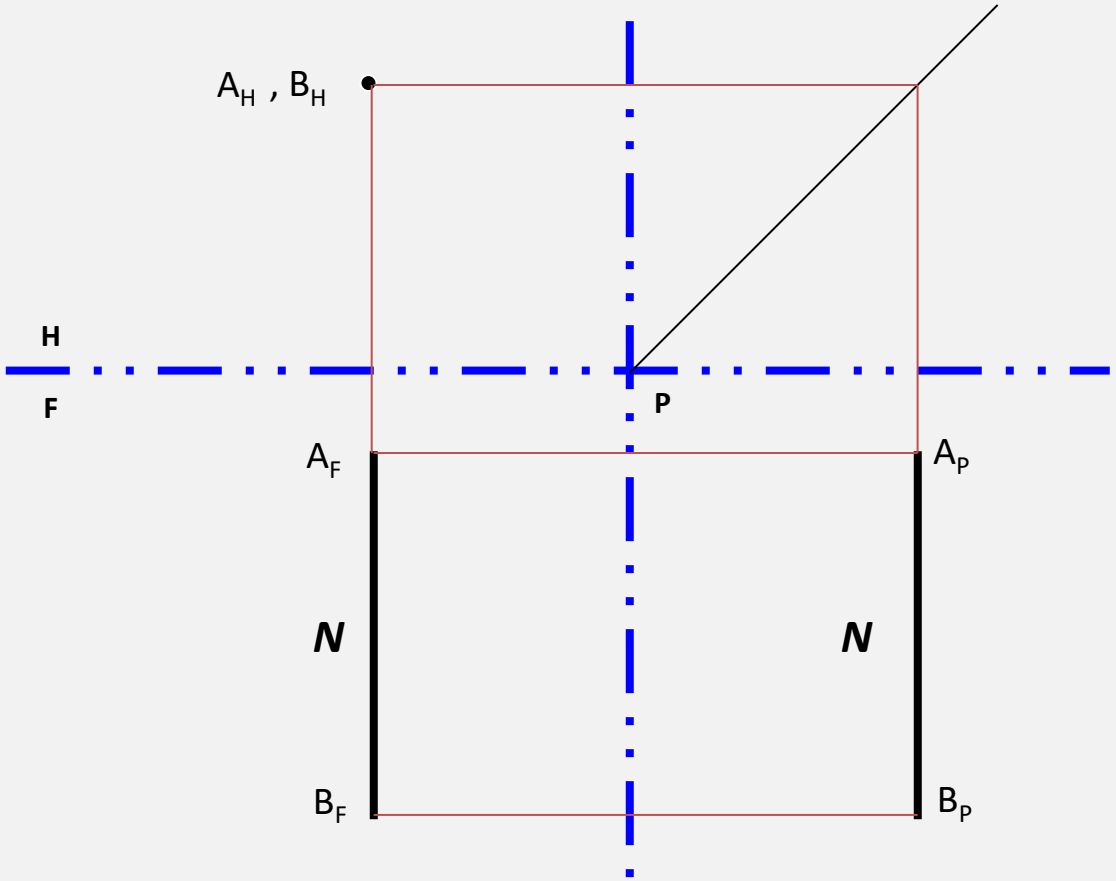
The line is called HORIZONTAL-FRONTAL
Having normal view in Hz and F plane

Classification of Lines



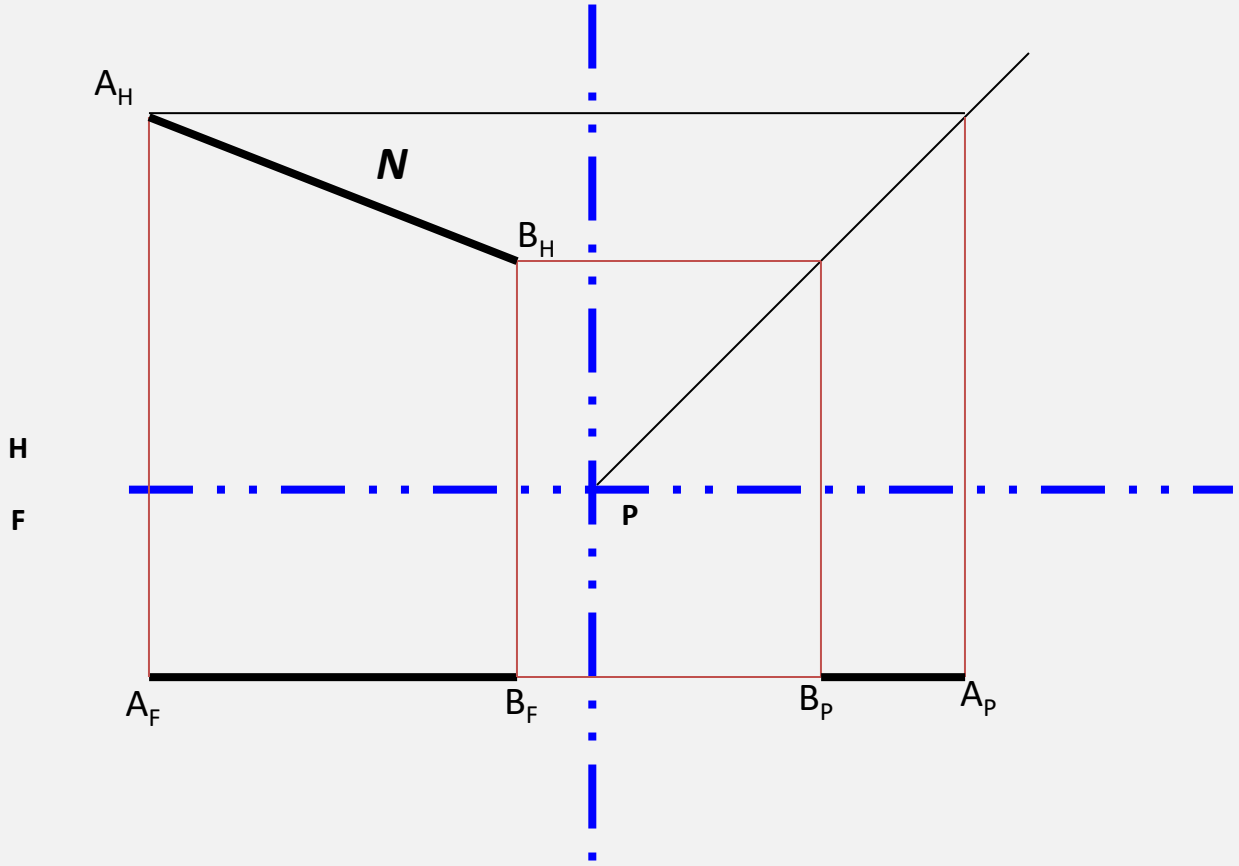
HORIZONTAL -PROFILE

Classification of Lines



Draw in your notebook for FRONTAL -PROFILE

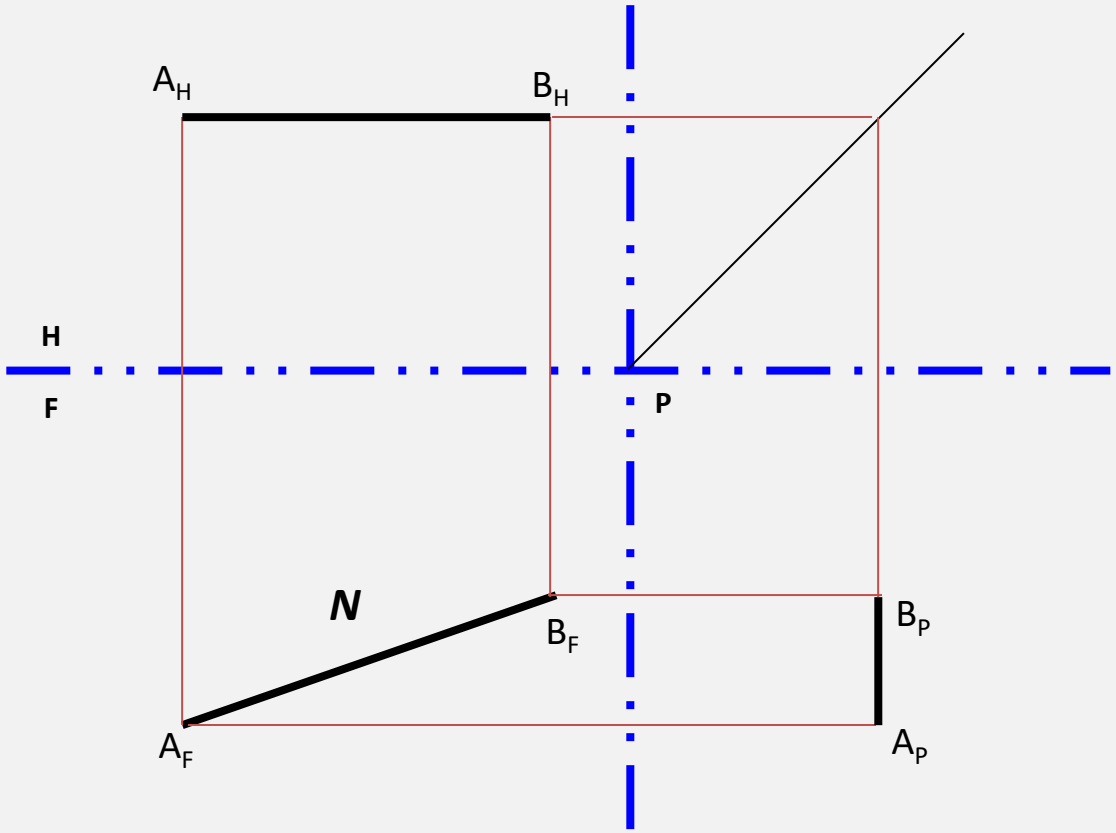
Classification of Lines



HORIZONTAL

Inclined to Frontal and Profile

Classification of Lines

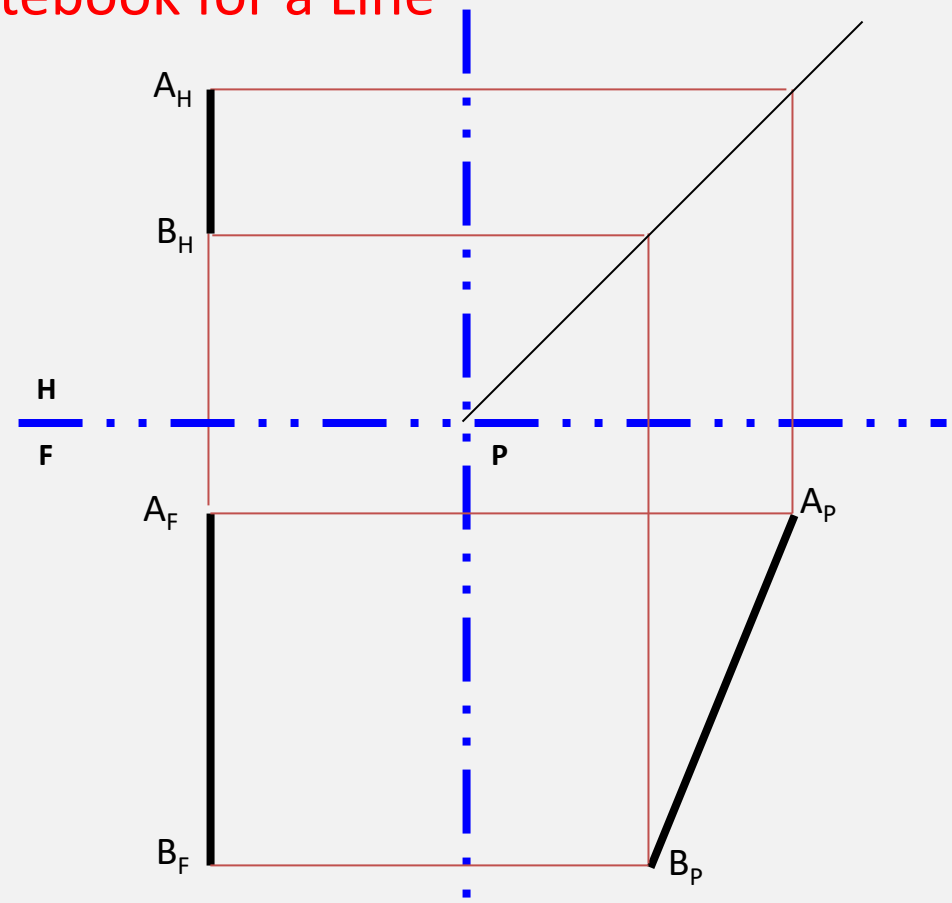


FRONTAL

Inclined to Horizontal and Profile

Classification of Lines

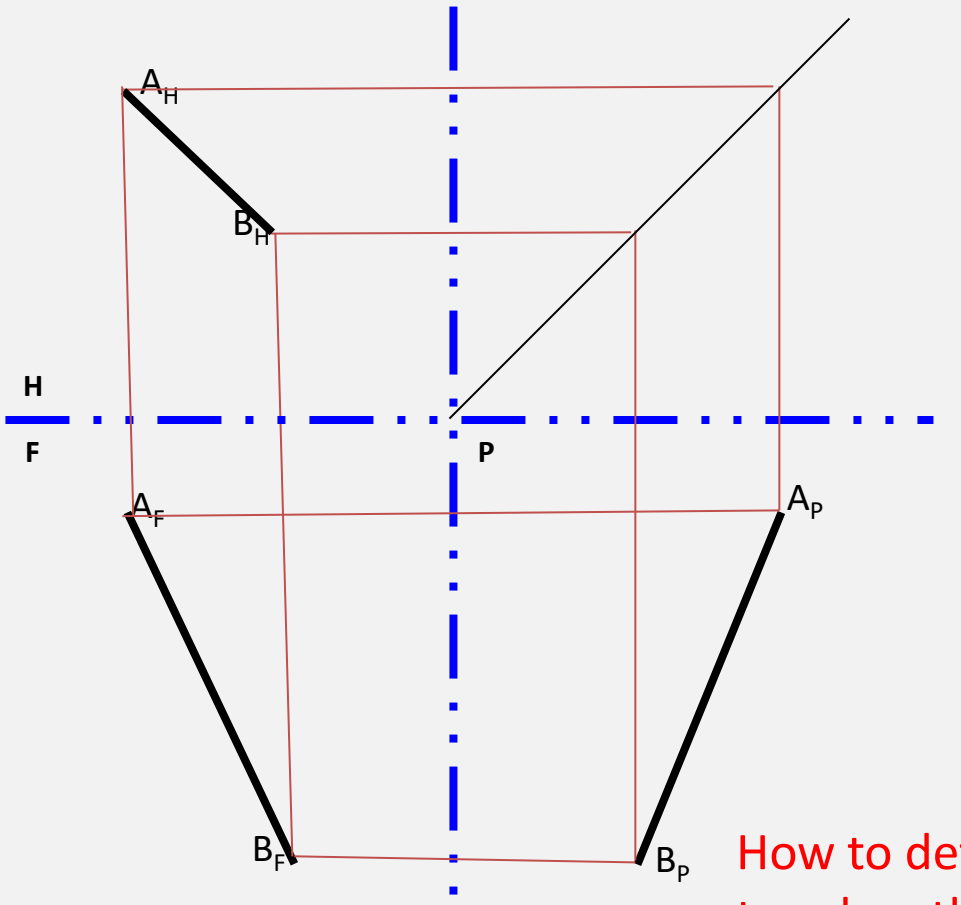
Draw in your notebook for a Line

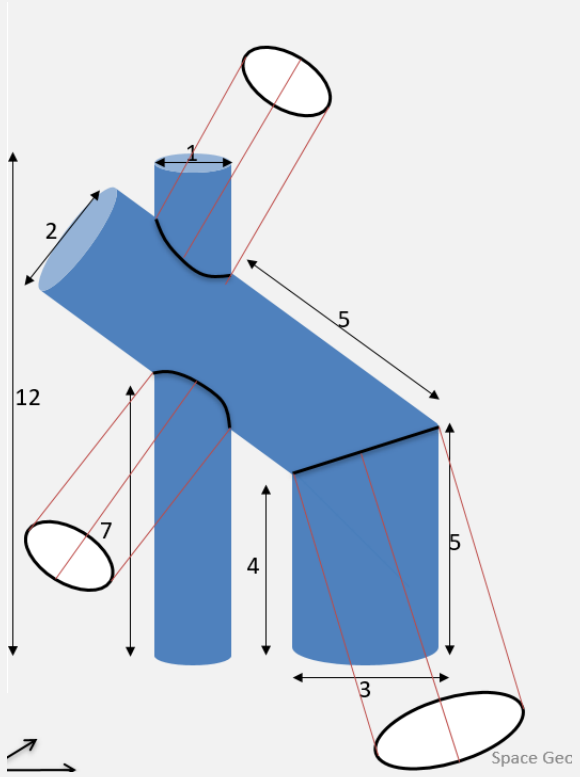


PROFILE

Inclined to Horizontal and Frontal

Classification of Lines



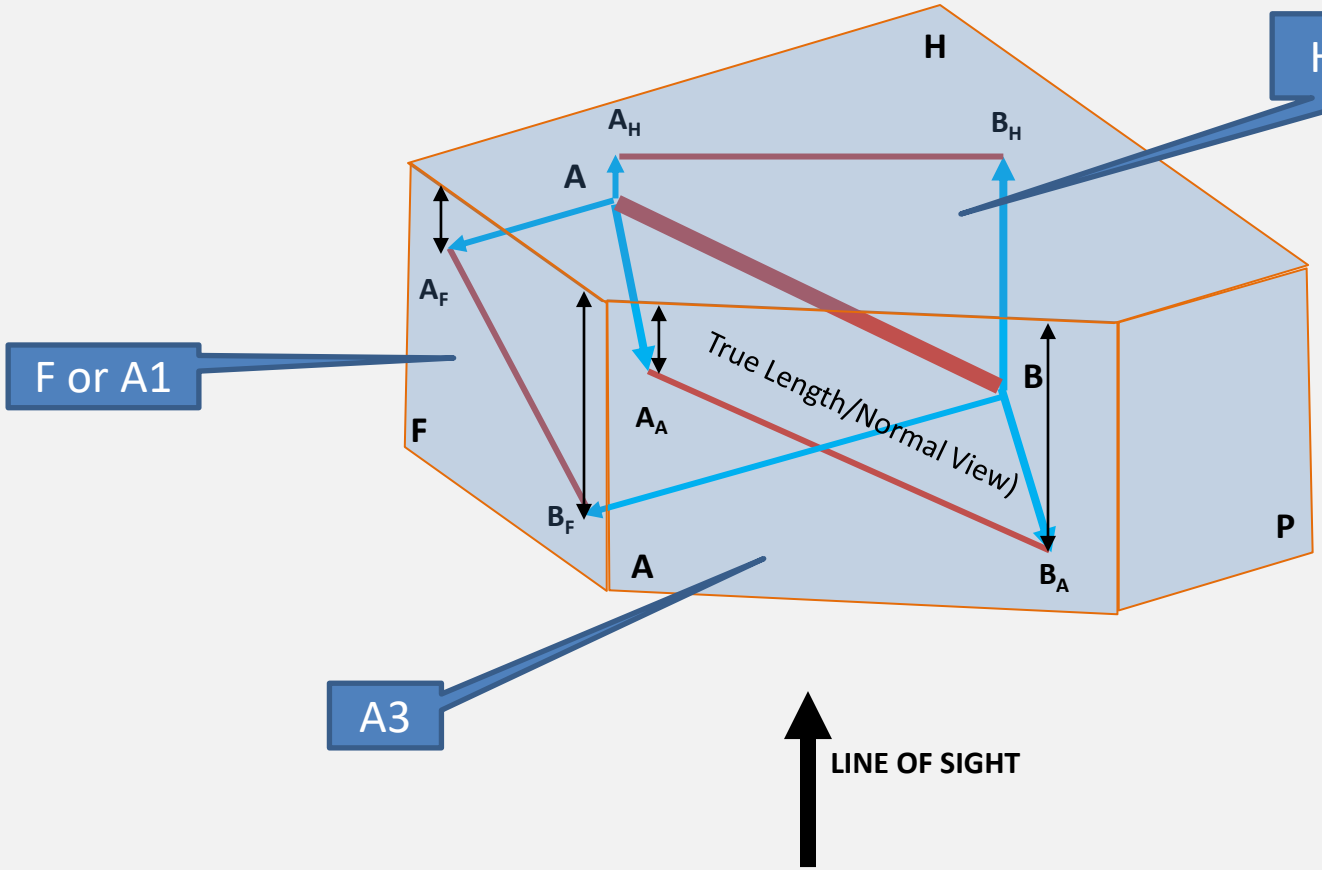


Oblique

Inclined to all planes

How to determine the true length of this line or true slope and azimuth, i.e., how to know the Normal View of line.

Auxiliary View of an Oblique Line

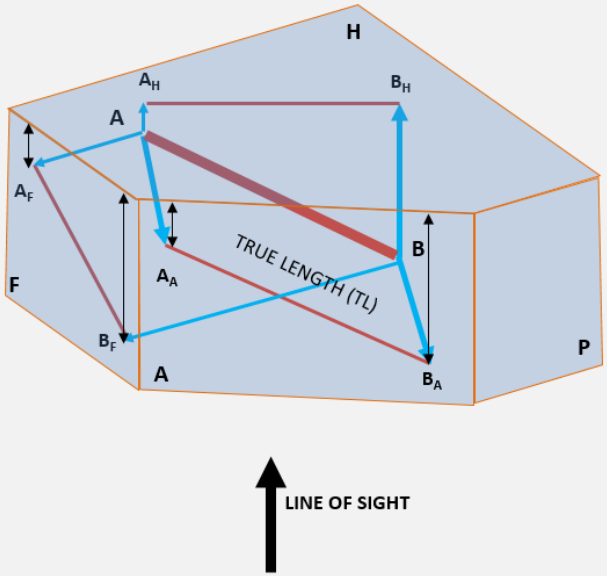


Where is the Point View of line?

What are the distances of the ends of Normal Line on A3 from hinge between A2 and A3 ?

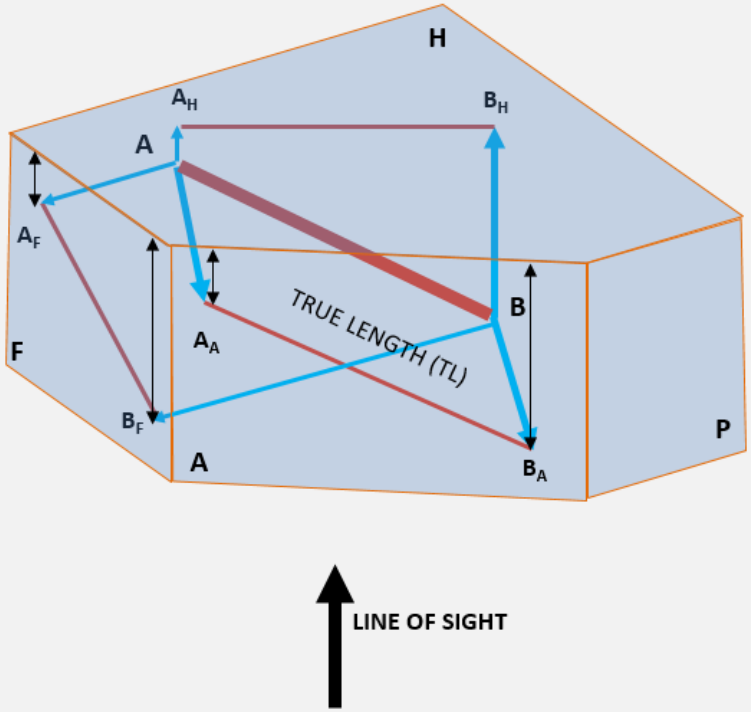
Three adjacent Planes for Auxiliary View

1. Plane on which Auxiliary View is Projected (A3)
2. Plane from which Projectors are drawn (A2)
3. Plane from which measurements are taken (A1)



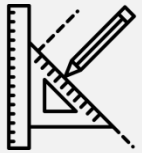
Auxiliary View of an Oblique Line

- First Step
  - Identification of Auxiliary Plane
  - If a view of a line on a plane (A2) is parallel to an Edge View of another plane (A3), then the view of that line will be Normal View on that plane (A3)

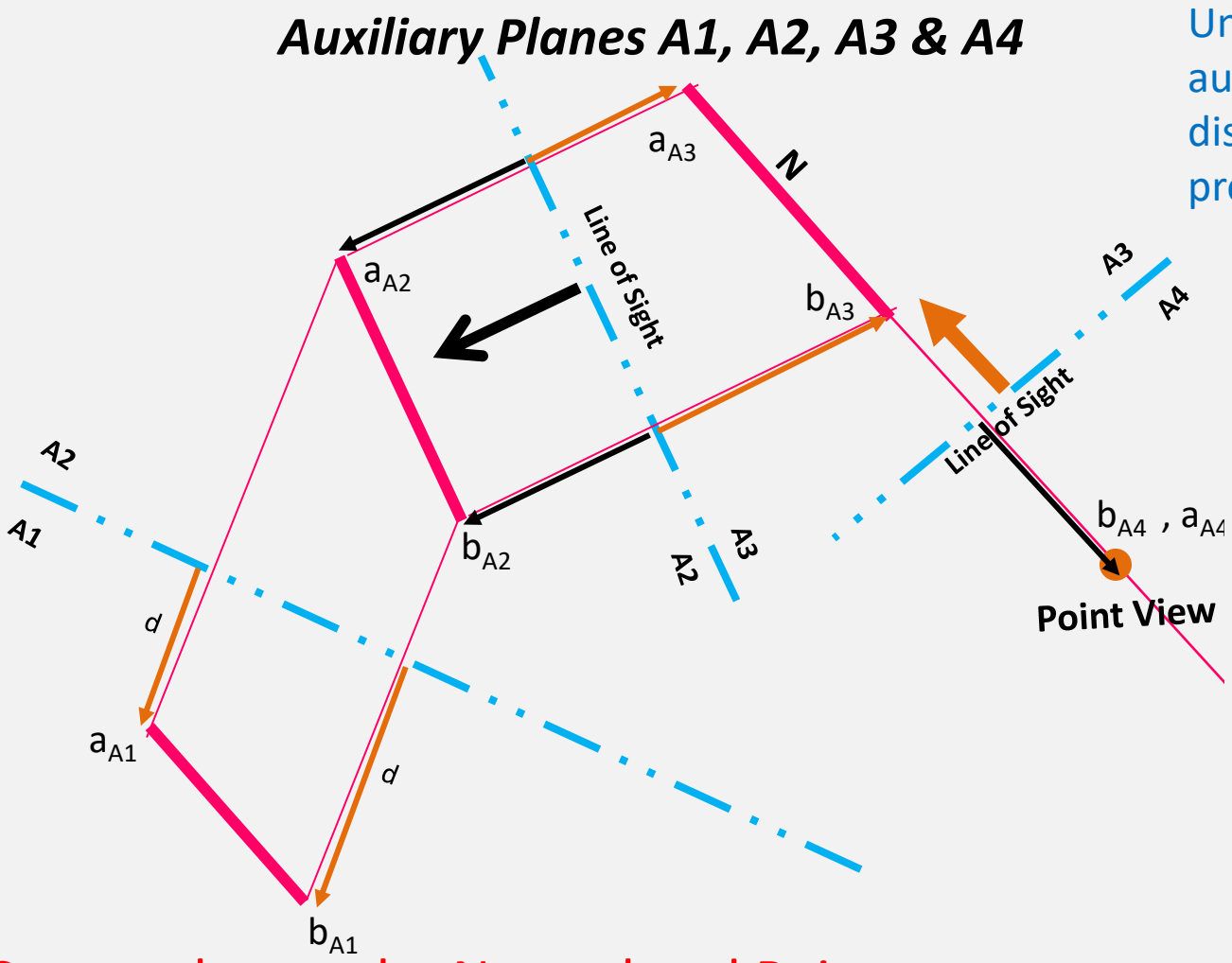


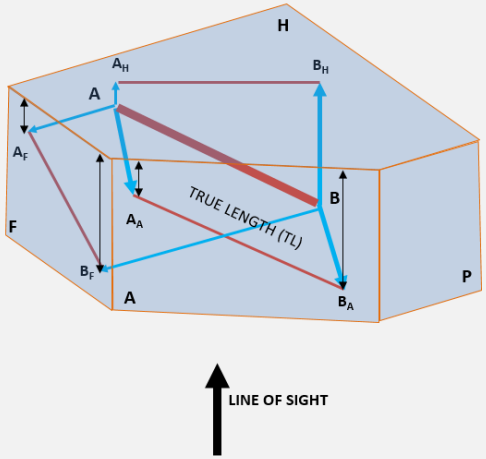
- Second Step
  - Distance of line on Auxiliary Plane from hinge line
  - The distances to the line on A3 will be same as in previous view (A1) from A2

Normal View of Oblique Lines



Understand the concept of auxiliary planes and distances measured along projectors.

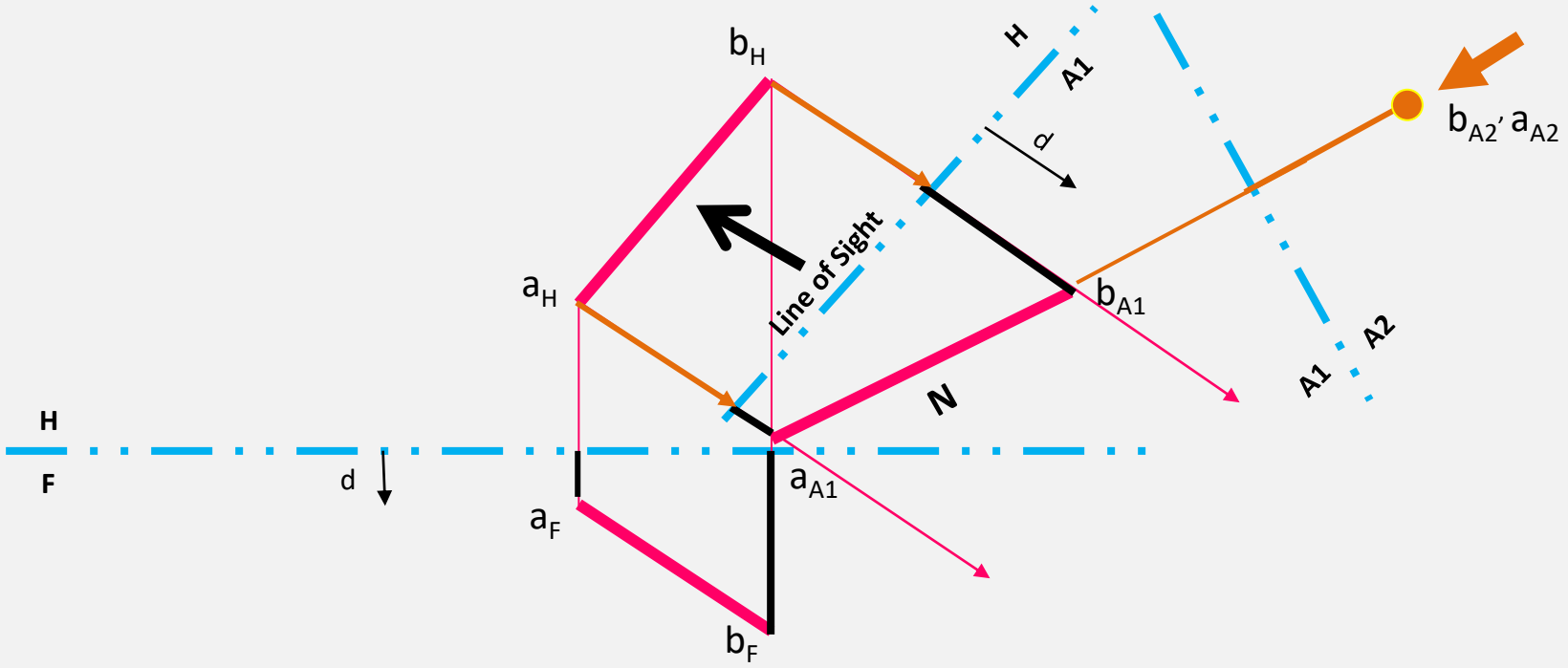




Can you locate the Normal and Point Views of line AB?

Normal View of Oblique Lines

Projected from the Top/Horizontal View

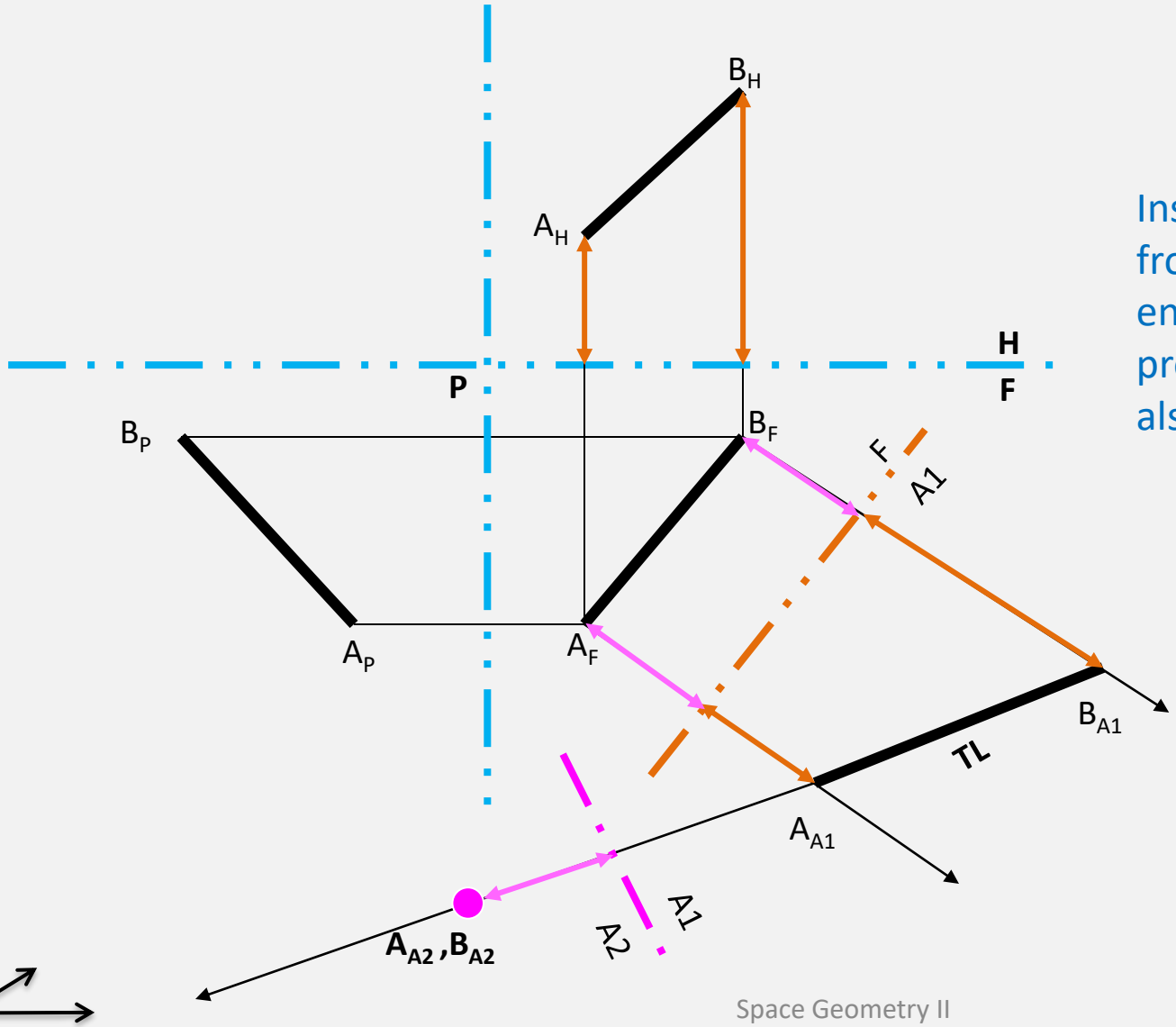


Notice the direction of Projectors

Notice the distance Measurements along Projectors

Normal View of Oblique Lines

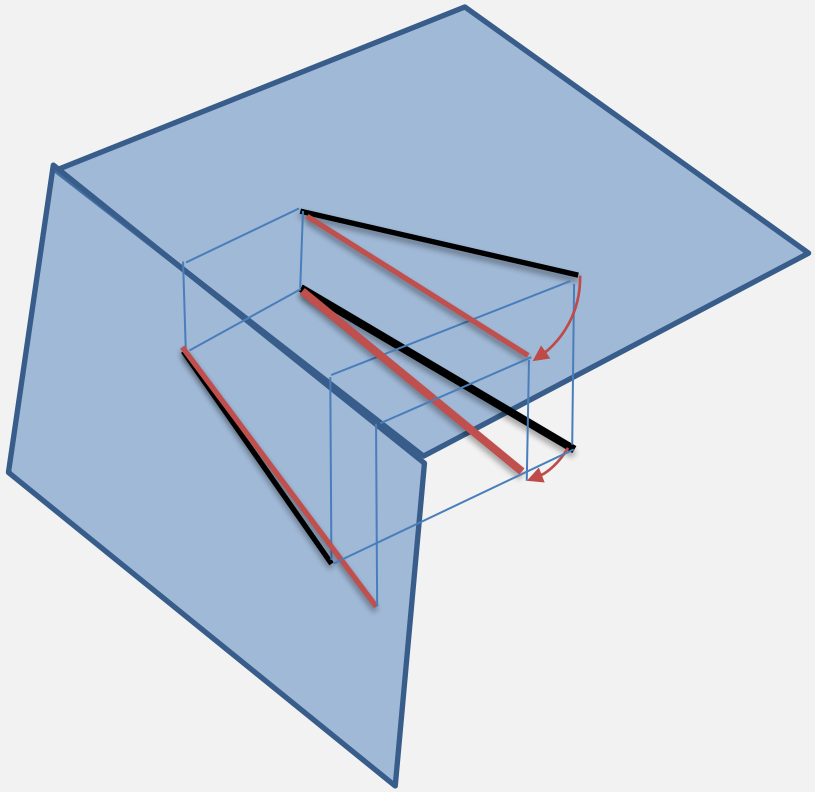
Projected from the Front View



Instead of taking distances from Horizontal view to the ends of the line along projectors the same can be also taken from profile view.

Auxiliary View of an Oblique Line

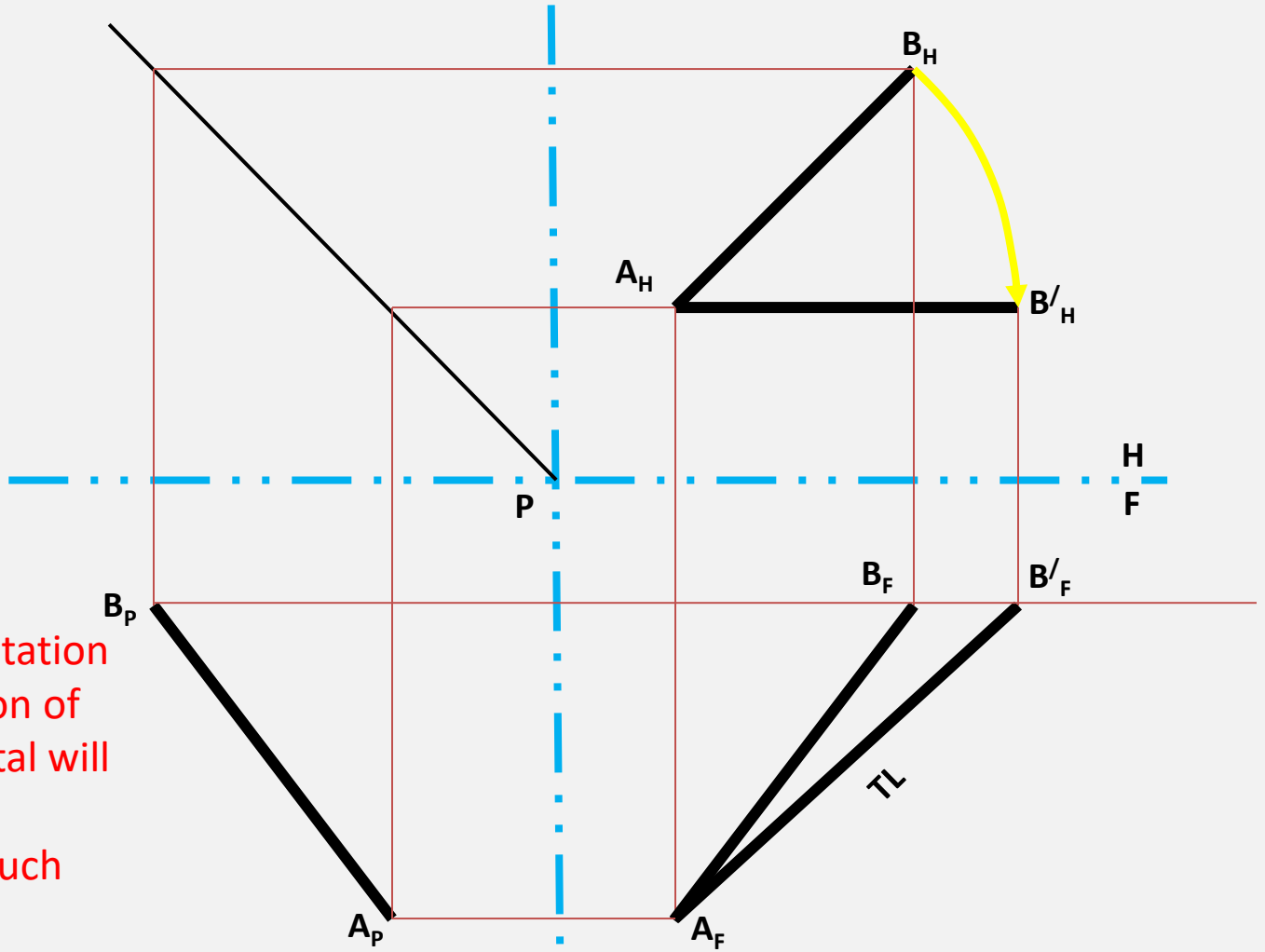
- By Rotation in a View



- Hold one end of line and rotate the other end in horizontal
- If we rotate the projected view on H plane this means there is not rotation in vertical but only horizontal rotation of line.
- On Front view the rotation will reflect as movement of one end of line along horizontal line

True Length of a Line

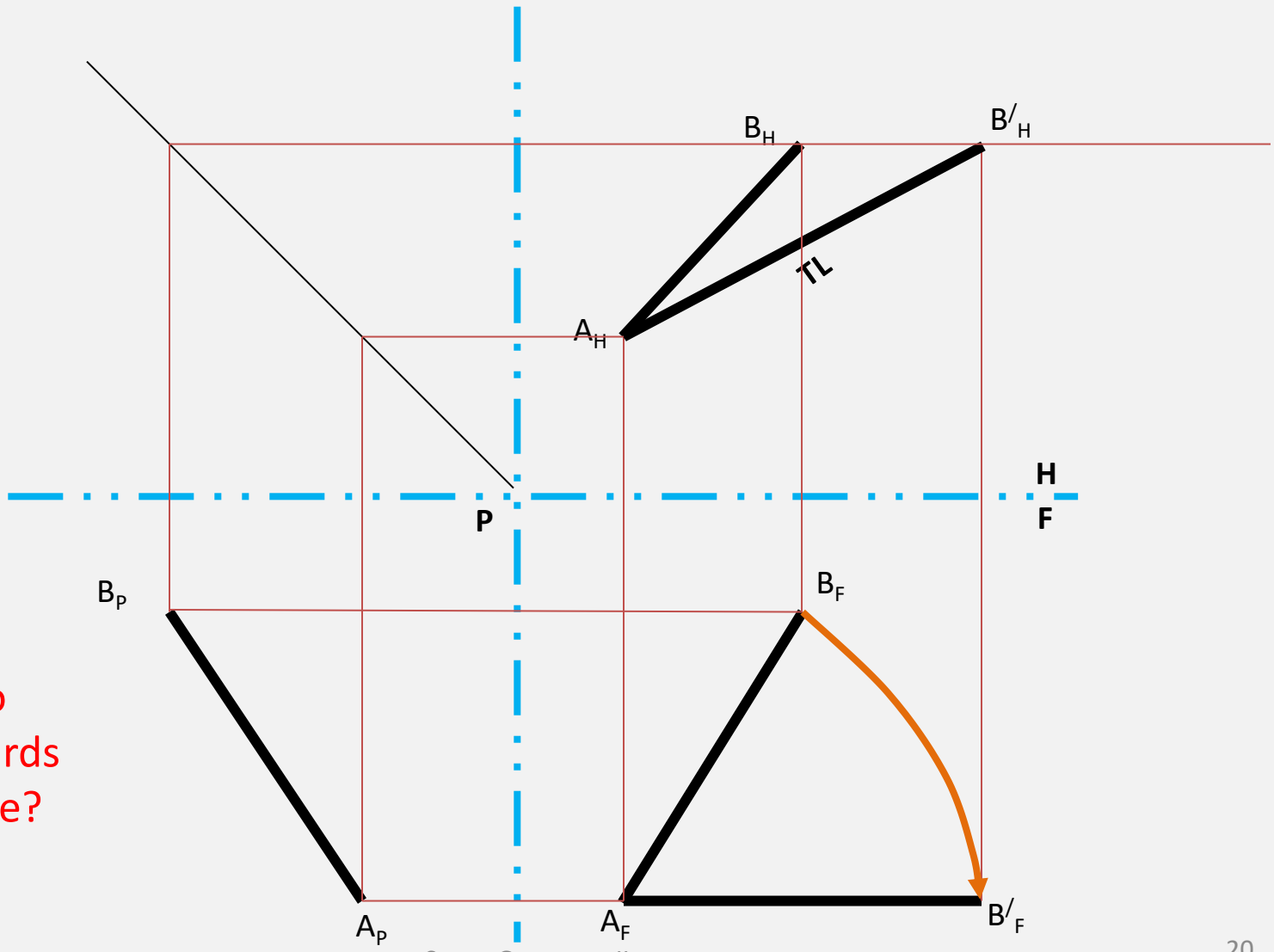
By rotation towards Frontal Plane, i.e., make parallel to Frontal Plane



For which rotation the projection of line on Frontal will be smallest?
How many such cases ?

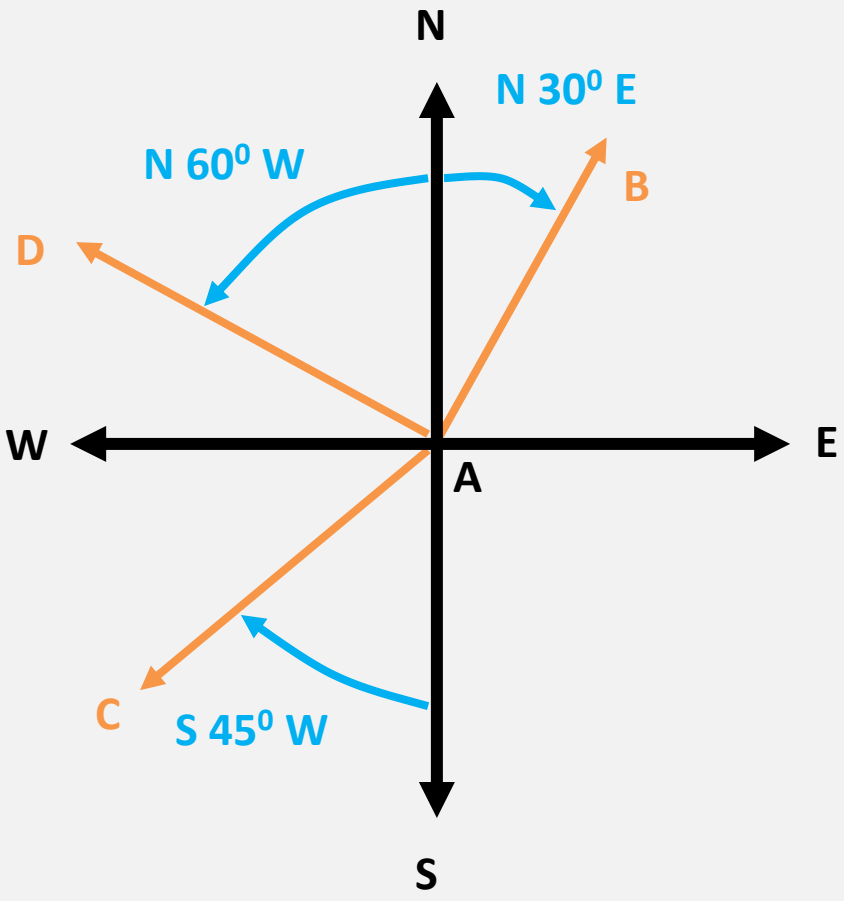
True Length of a Line

By rotation towards Horizontal Plane, i.e., make parallel to Horizontal Plane



Can we also rotate towards Profile plane?

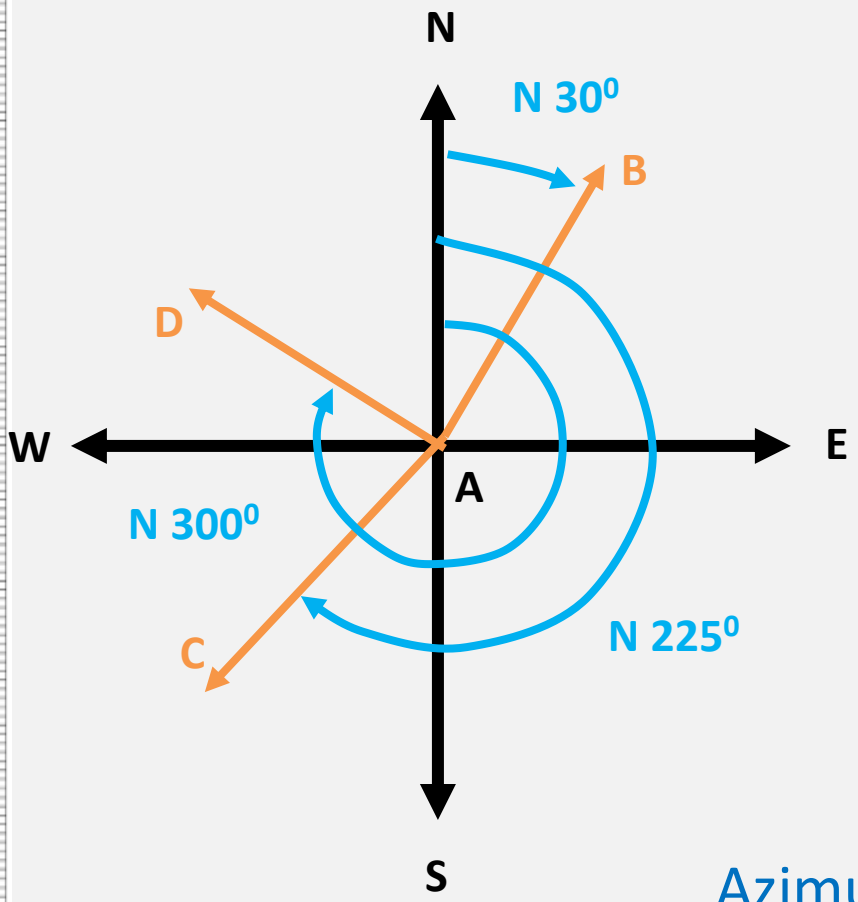
Bearing of a Line



- Bearing can be seen on/from the horizontal view only
- Maps are always in Horizontal Views
- The acute angle (<90°) is always used
- Due North, Due East, Due South, Due West

Bearing is the deviation from North or South point of a compass

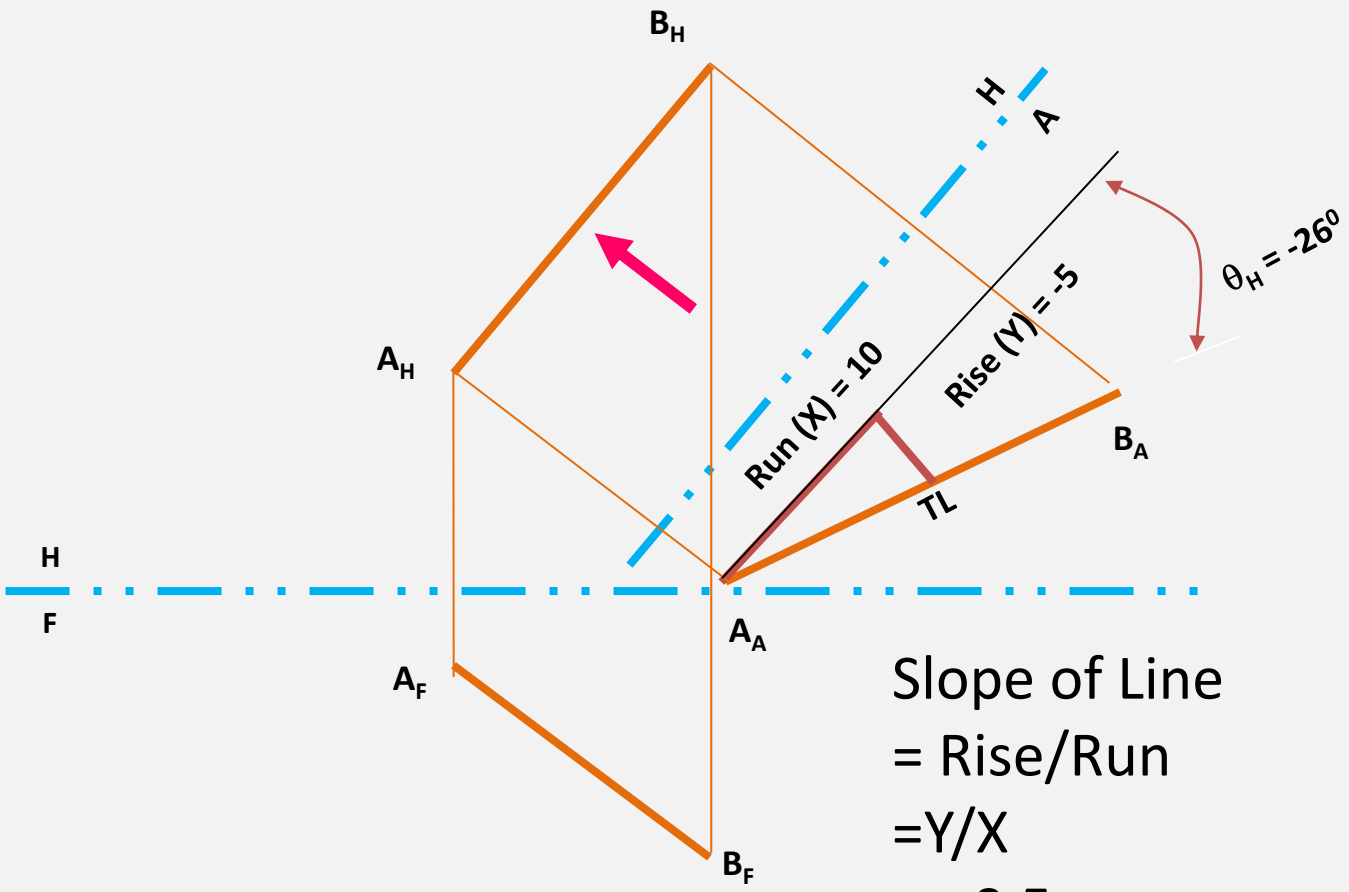
Azimuth of a Line



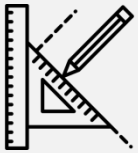
- Azimuth is always read clockwise from the North arrow and uses only the letter N together with the clockwise angle
- Also called whole circle bearing

Azimuth of a line is a alternative way to express Bearing

Slope of an Oblique line



Slope of Line
= Rise/Run
=Y/X
= - 0.5
= - 50 % Slope



Thank you !