TA 101A:2019-20:II

Lecture 23 – Surface Intersections

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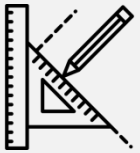
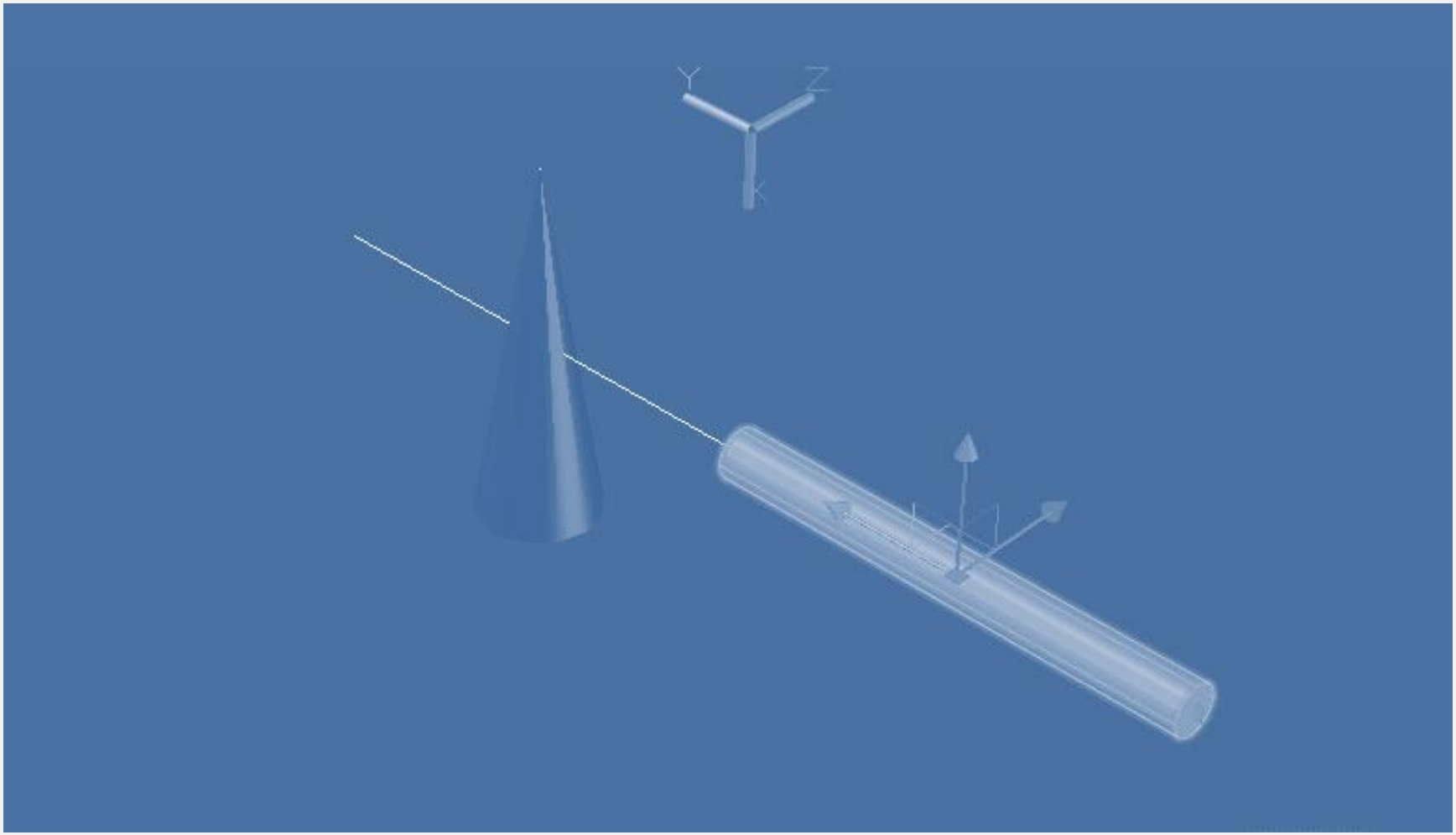
Recapitulation



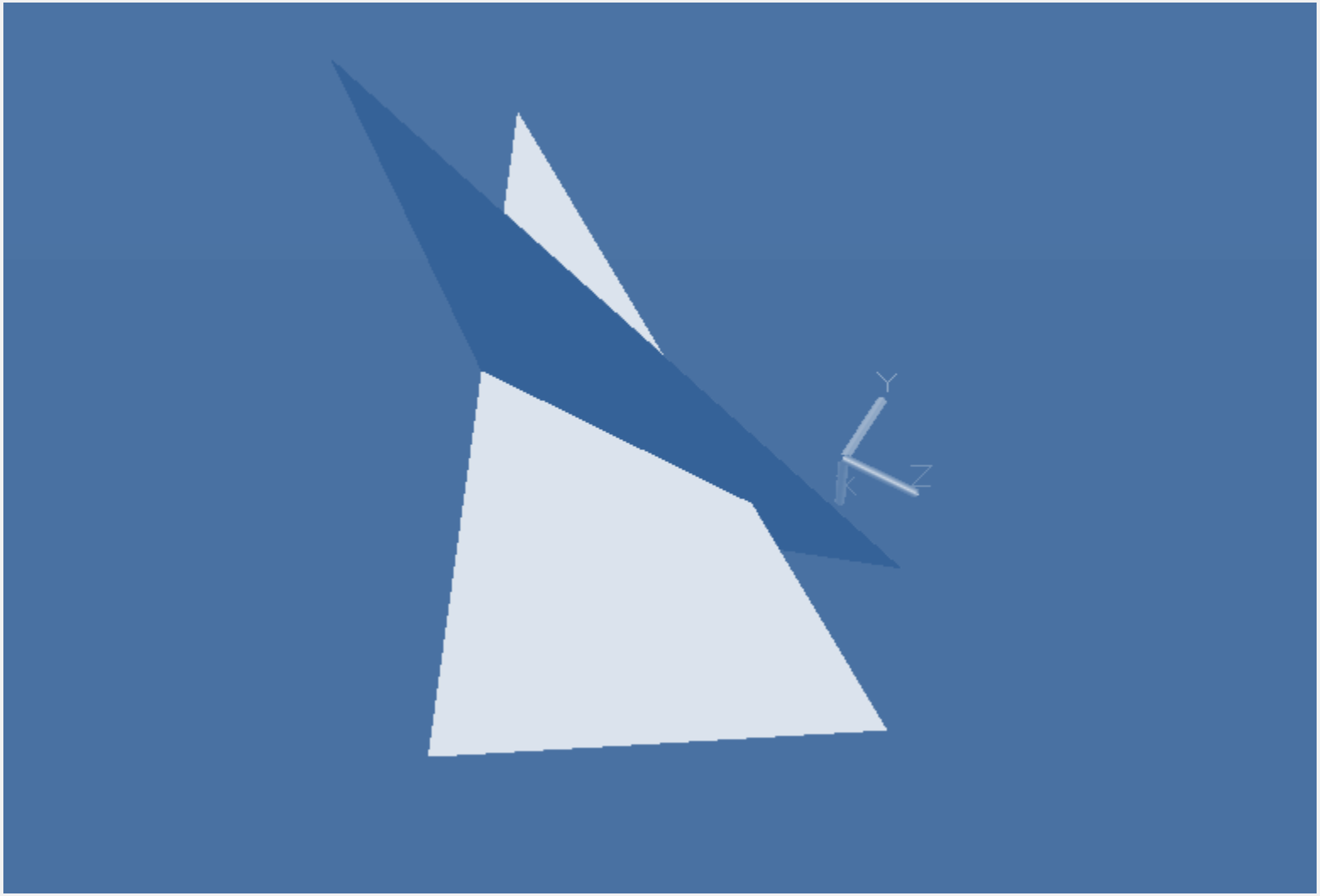
- Understood basics of space geometry
  - Line and plane relationships

- Application of same now in intersection

Surface Intersections

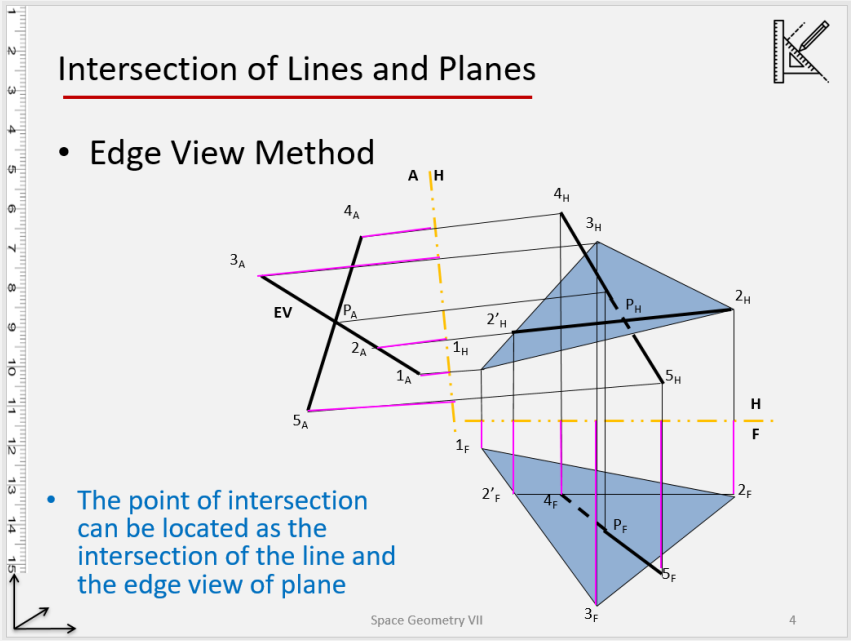


Surface Intersections

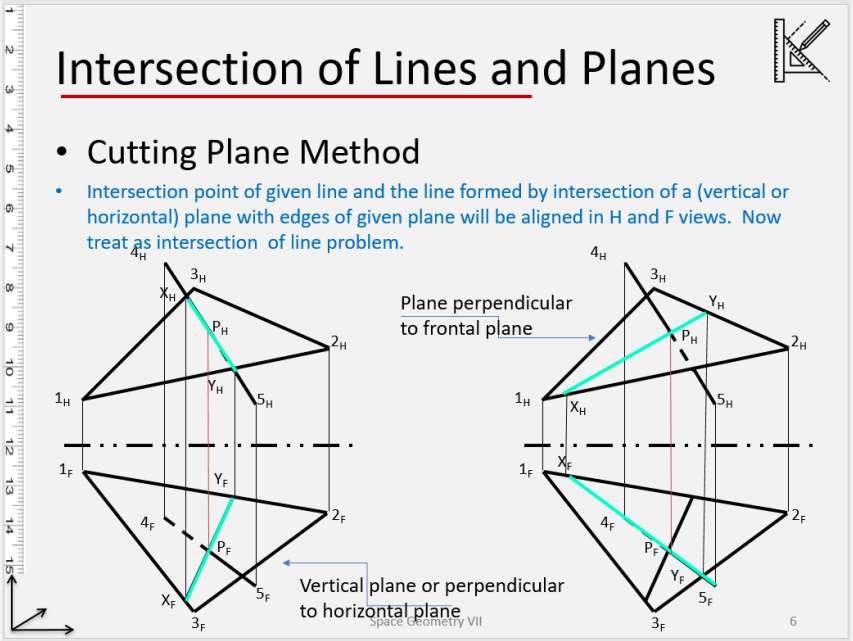


Intersection of a line and a plane

Edge view method

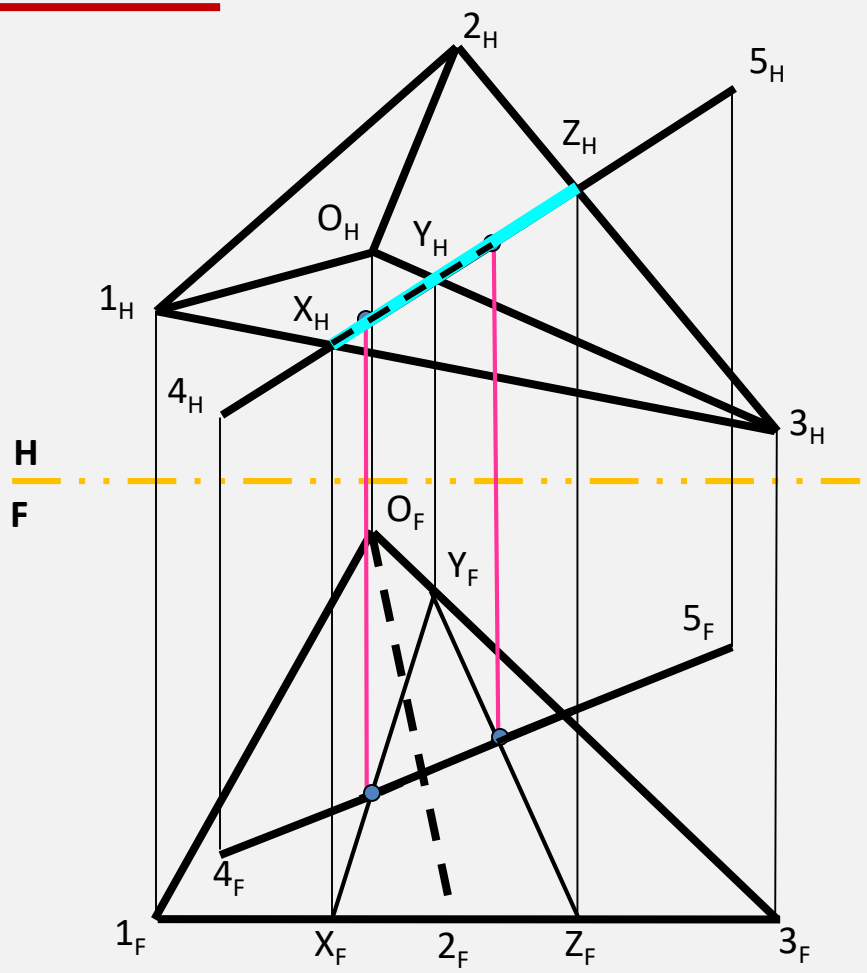


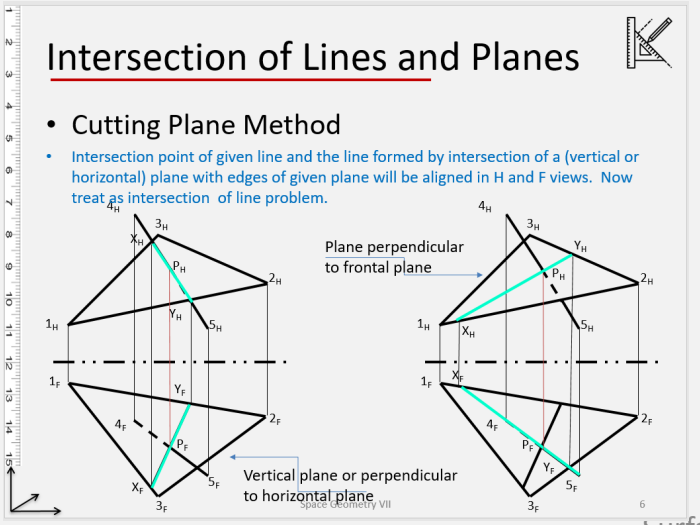
Cutting plane method



Intersection of a Line with a Solid- General Case

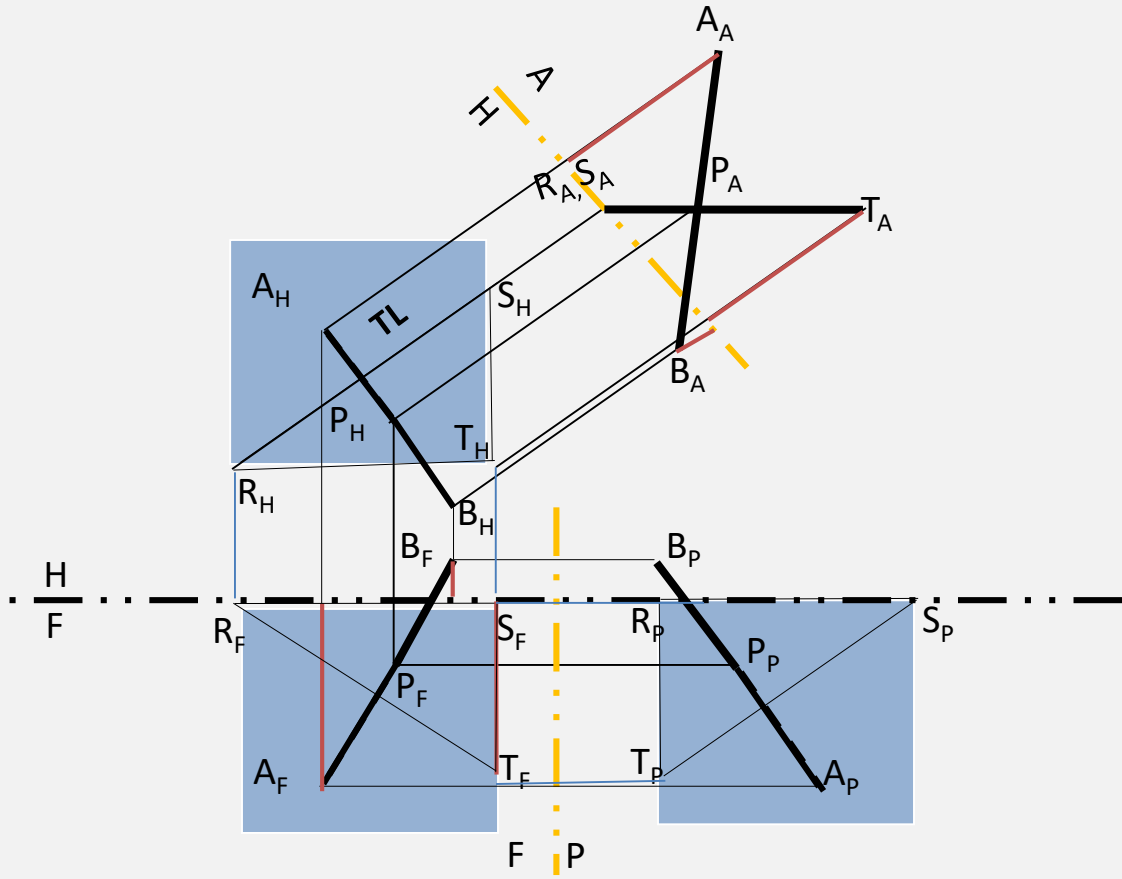
- Given are projections of a pyramid and a line.
- Determine the points of intersection of a pyramid with a line
- Cutting Plane Method
  - Apply cutting plane approach in line and planes of pyramid
  - More direct solution than edge view method





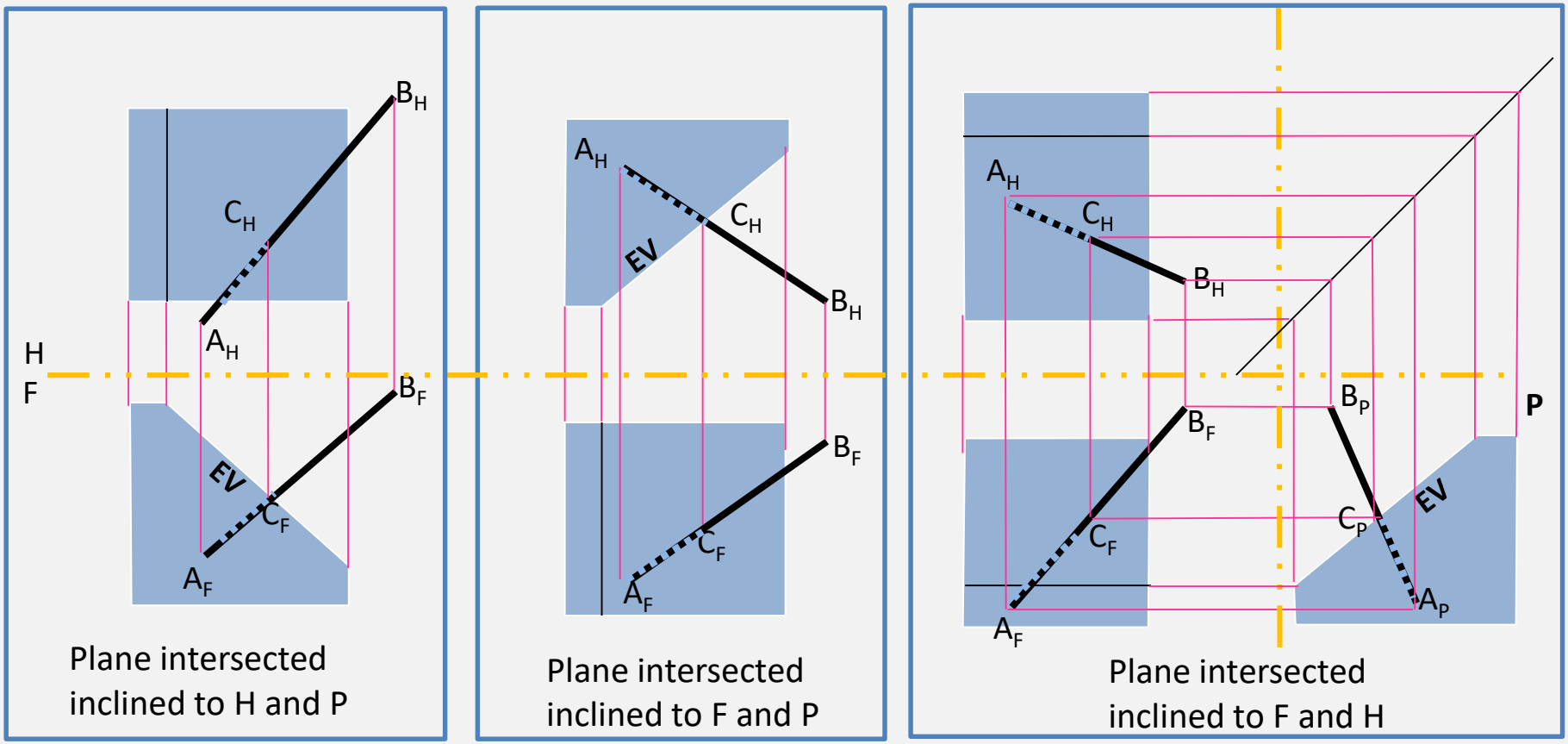
Intersection of a Line with a Solid- Specific Case

- Oblique line with oblique plane
  - Plane RST
  - Line AB
- Using edge view method



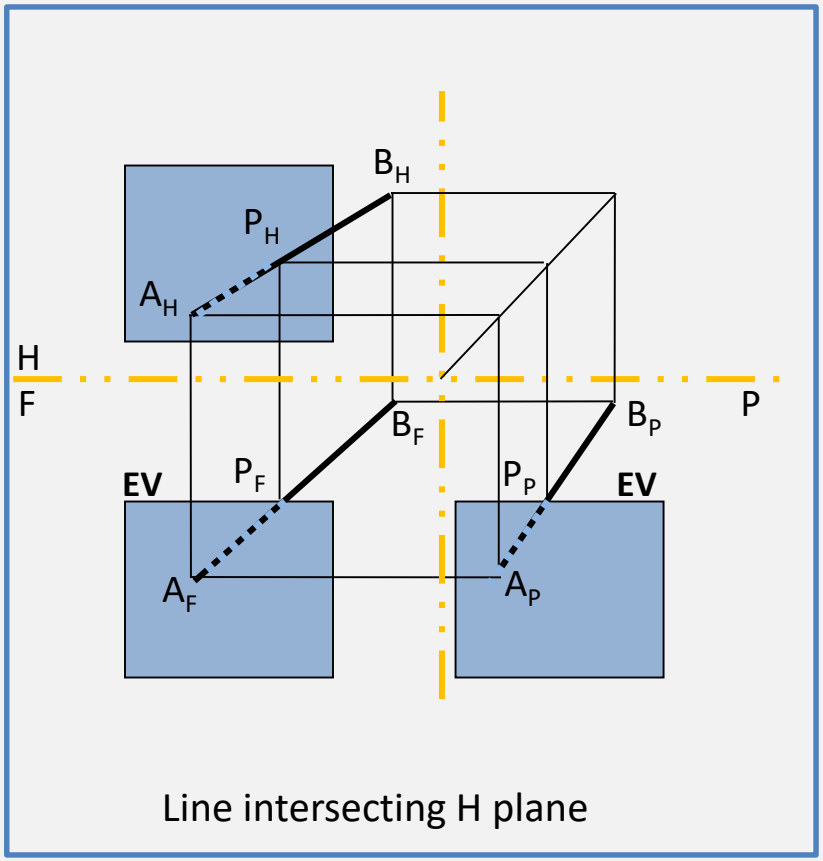
Intersection of a Line with a Solid- Specific Case

- Oblique line with inclined surface

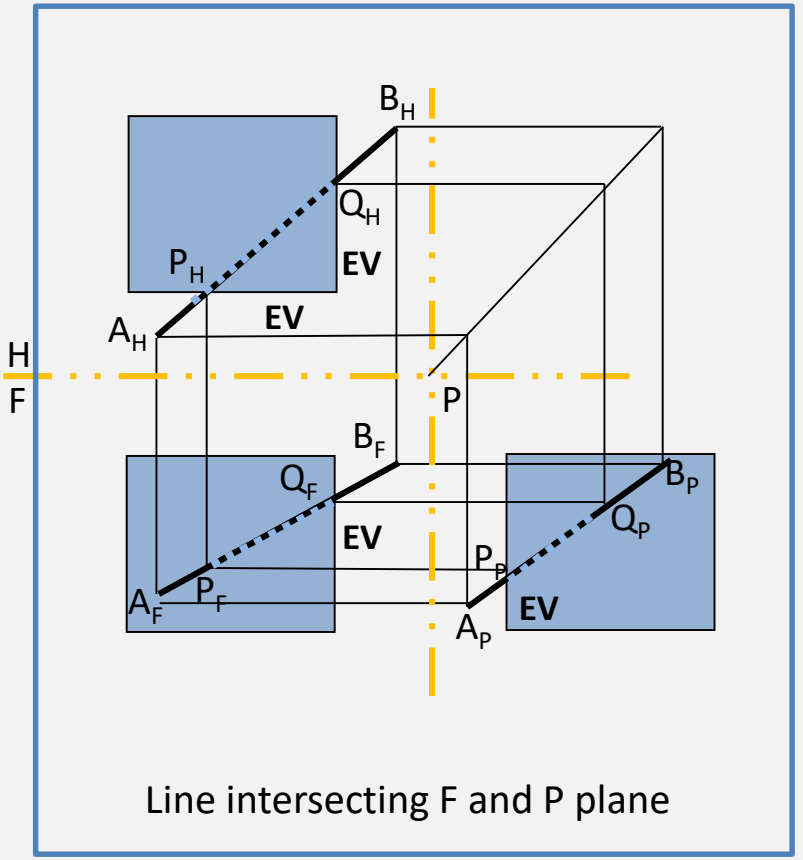


Intersection of a Line with a Solid- Specific Case

- Oblique line intersecting principal planes



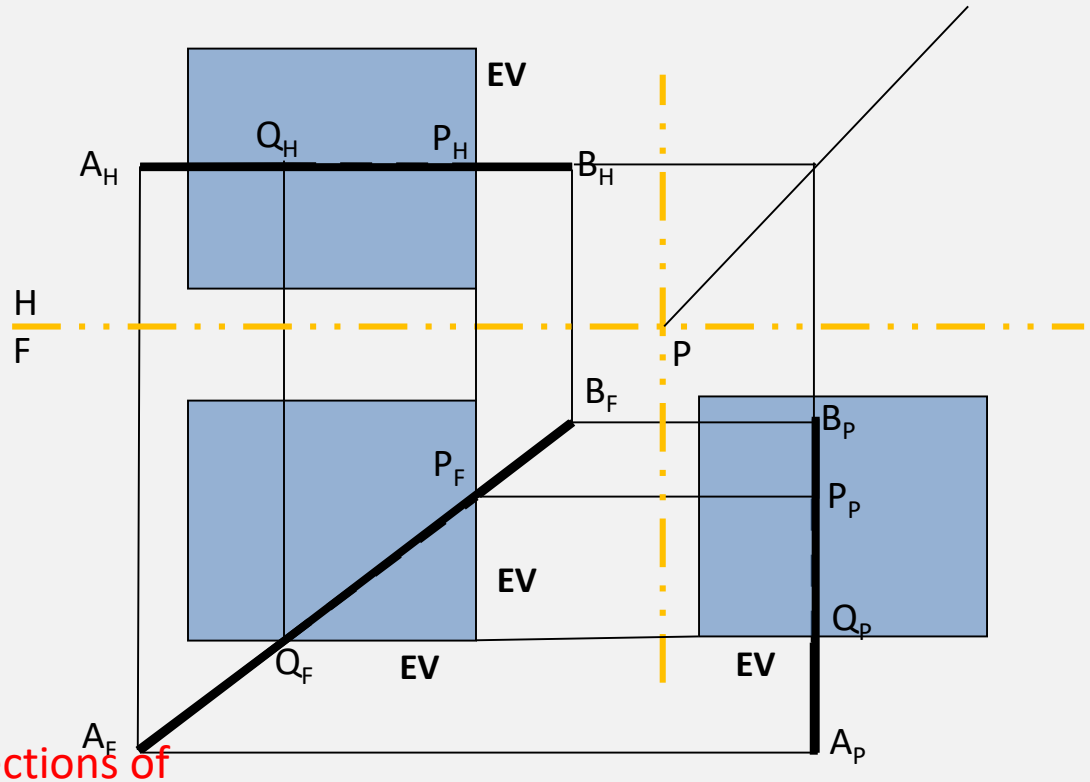
Line intersecting H plane



Line intersecting F and P plane

Intersection of a Line with a Solid- Specific Case

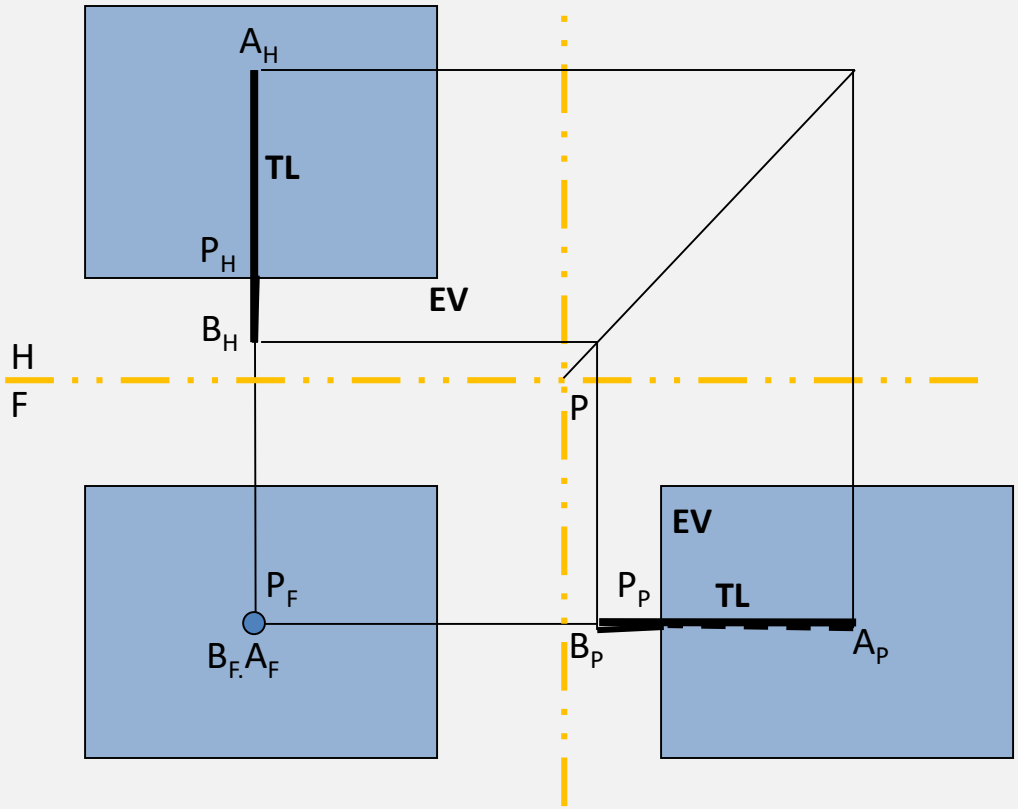
- Inclined line intersecting principal planes



Can you draw projections of point of intersection and hidden part of line?

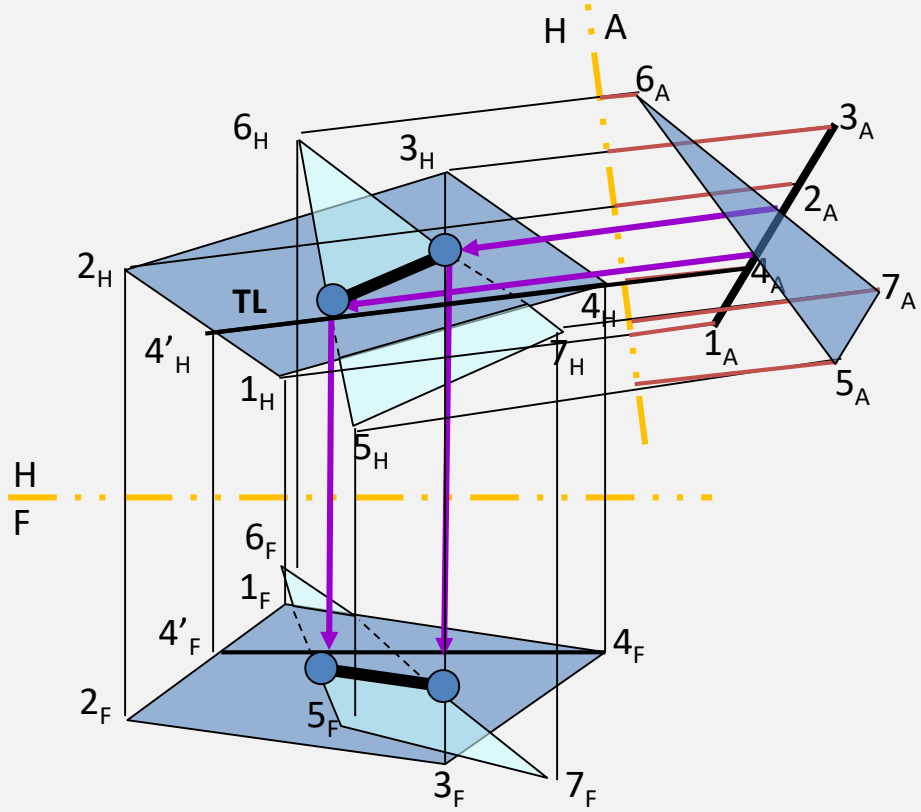
Intersection of a Line with a Solid- Specific Case

- Principal line intersecting a principal plane of solid
- Horizontal Profile line AB



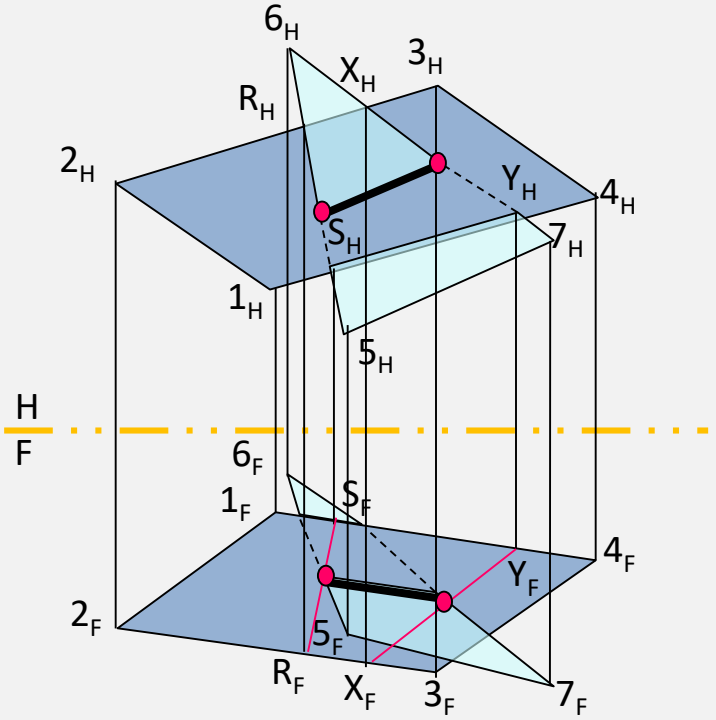
Intersection of Two Planes-General Case

- Given projections of two planes (1-2-3-4 and 5-6-7) on H and F. Determine the projections of line of intersection.
- Edge View Method
- EV of a plane will intersect other plane at the line of intersection
- Edge view of 1-2-3-4
  - EV Could have been for 5-6-7 also



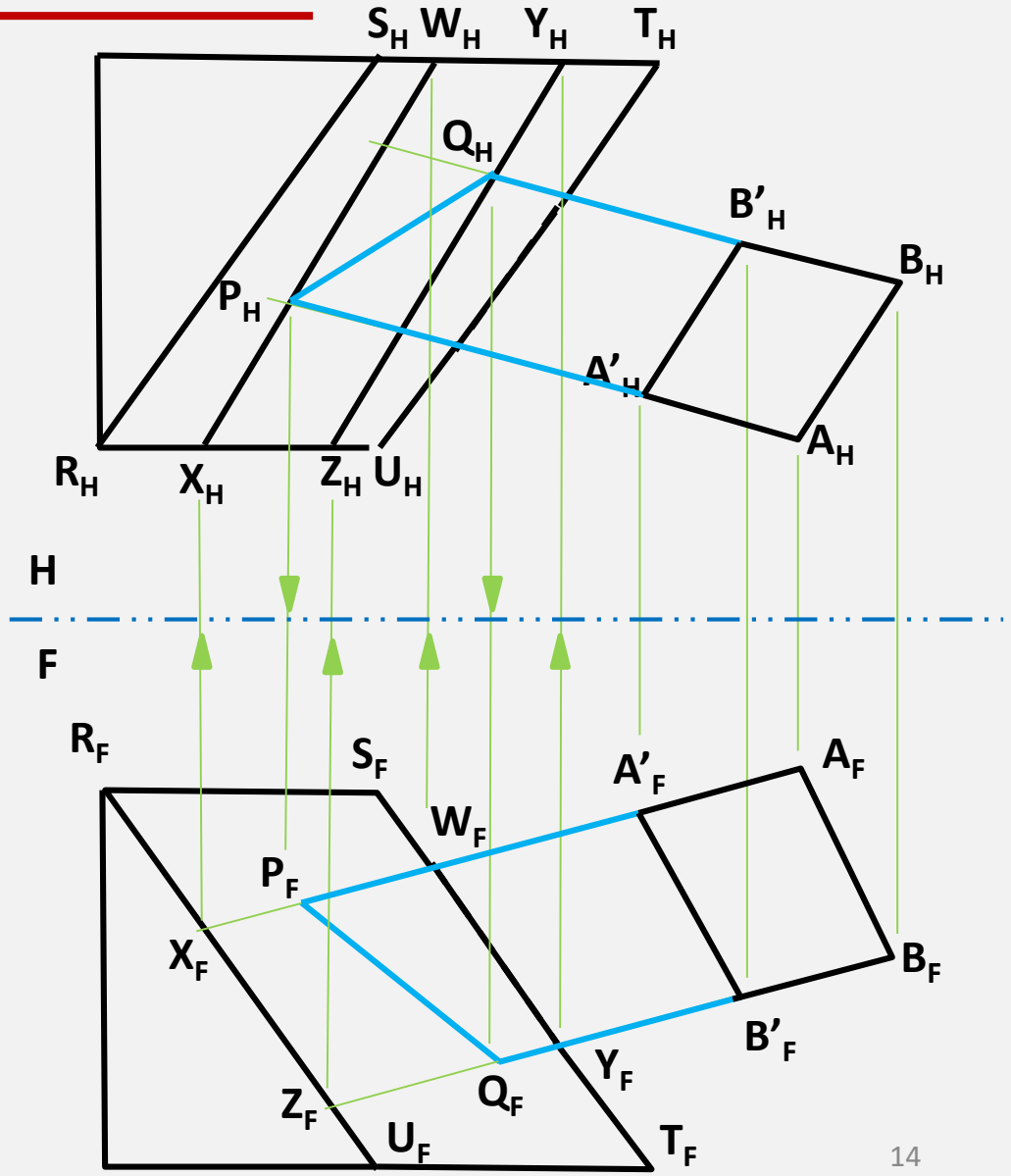
Intersection of Two Planes-General Case

- Given projections of two planes (1-2-3-4 and 5-6-7) on H and F. Determine the projections of line of intersection.
- Cutting Plane Method
  - Vertical cutting plane having line 6_H - 7_H
  - Vertical cutting plane having line 6_H - 5_H



Intersection of Two Planes-Specific Case

- Oblique plane intersecting an oblique plane of a solid
- Cutting plane method
- Two cutting planes perpendicular to Frontal
  - consisting of AA'
  - consisting of BB'
- PQ is the line of intersection



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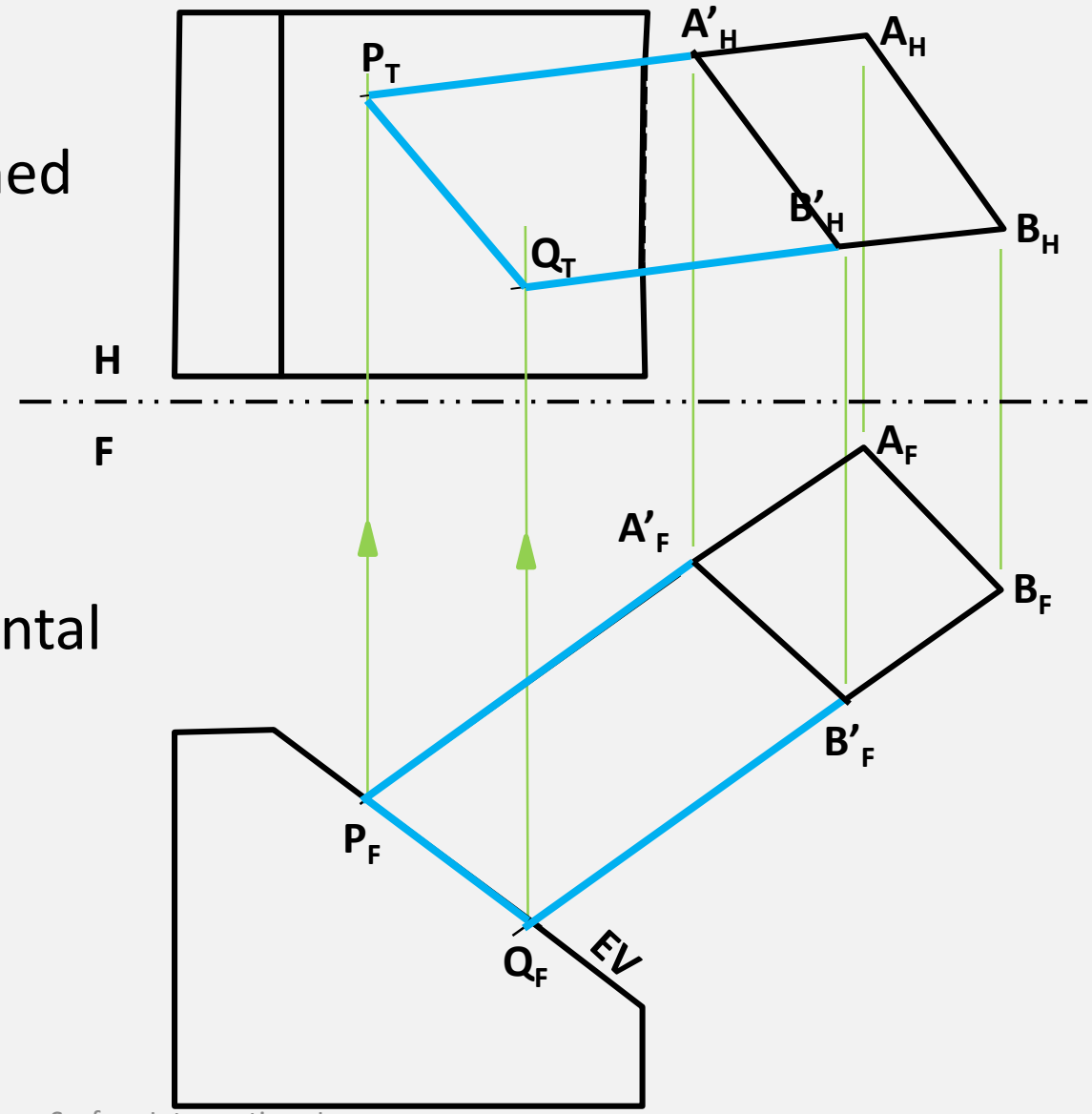
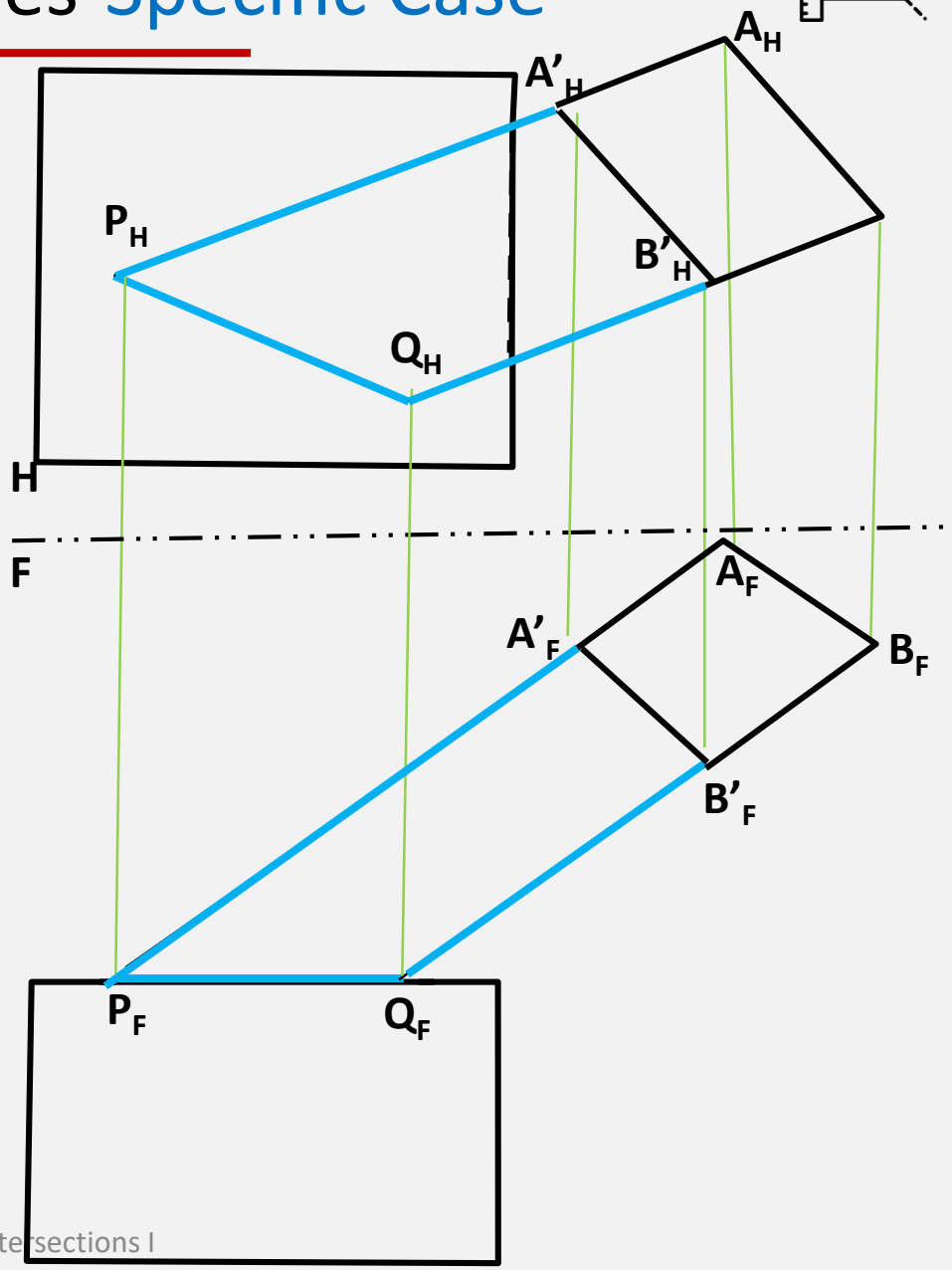
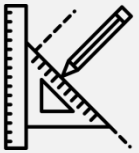


Intersection of Two Planes-Specific Case

- Oblique plane intersecting an principal plane of a solid
- Cutting plane method
- Two cutting planes perpendicular to Frontal
  - consisting of AA’
  - consisting of BB’
- PQ is the line of intersection





Thank you !