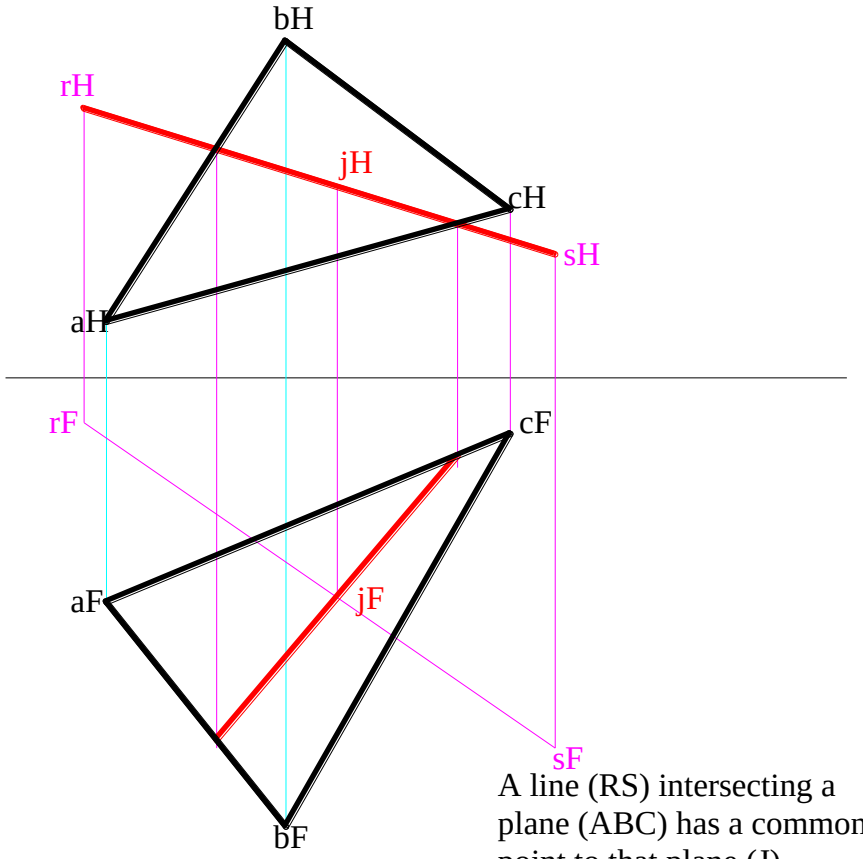
Line intersecting a plane

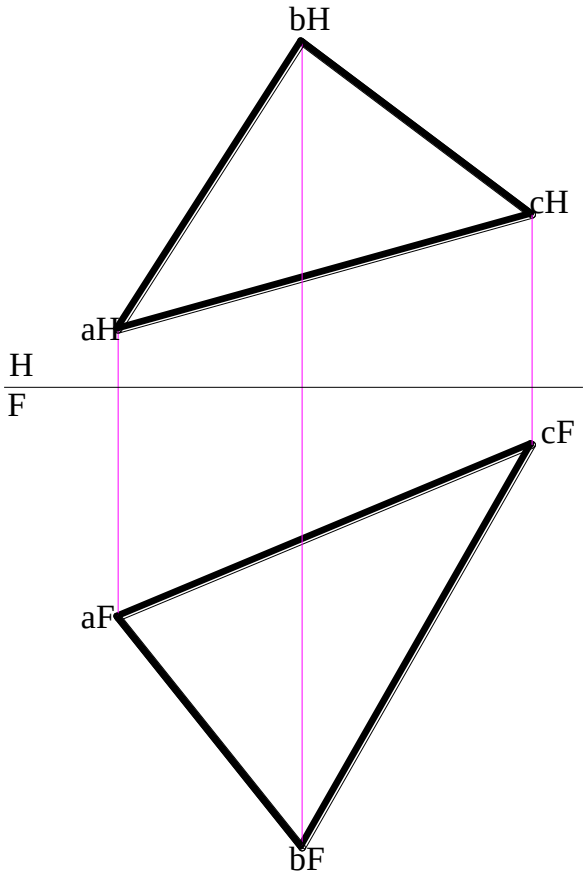
If the line is not parallel to the plane, it should intersect the plane and the common point is called the piercing point



A line (RS) intersecting a plane (ABC) has a common point to that plane (J)

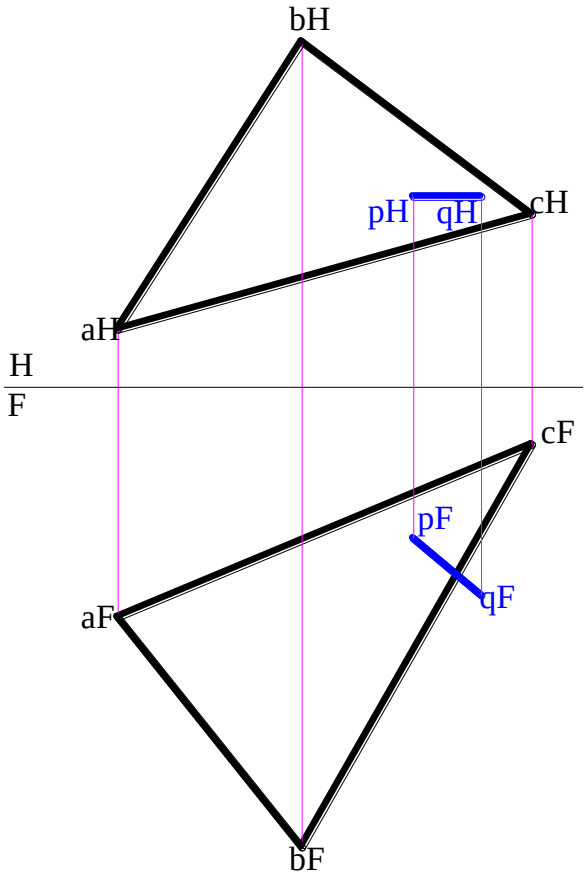
Intersection of line with plane – EV

Edge View Method to see piercing points



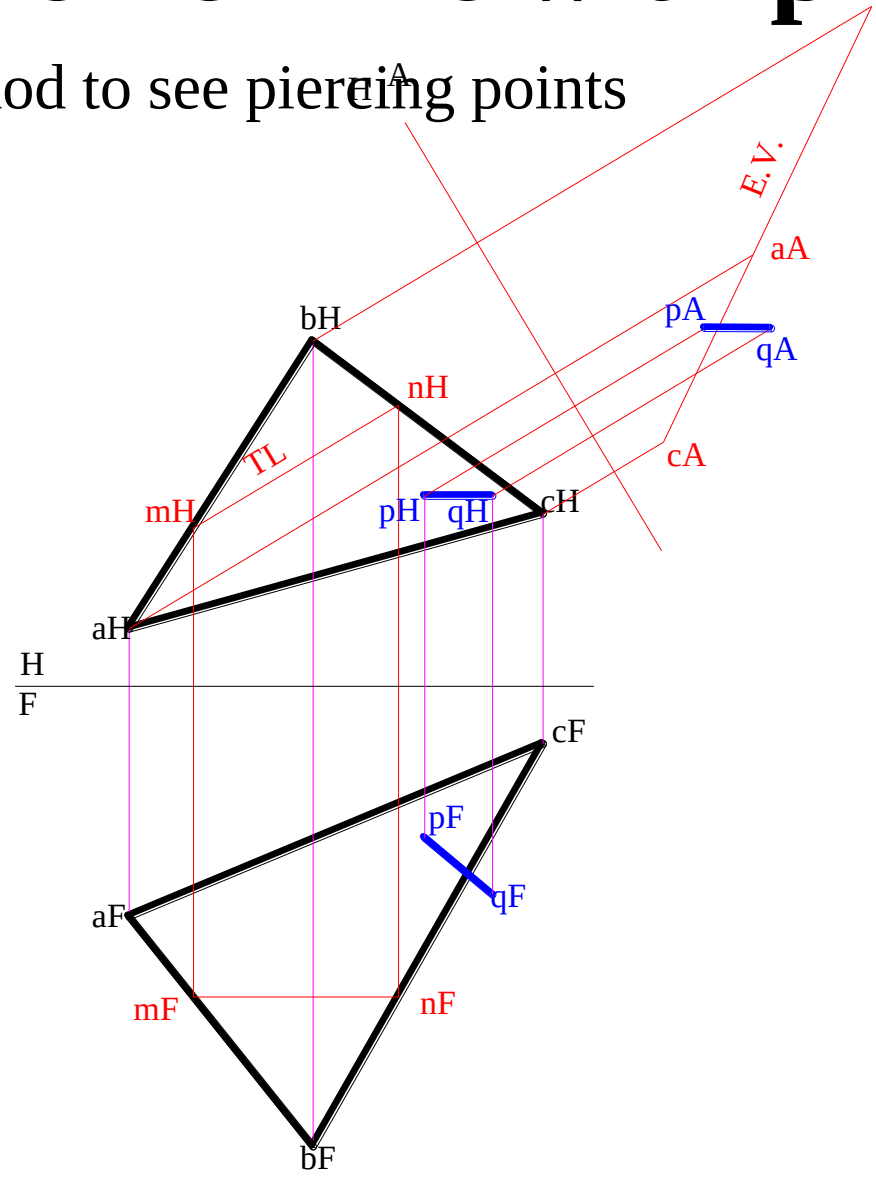
Intersection of line with plane – EV

Edge View Method to see piercing points



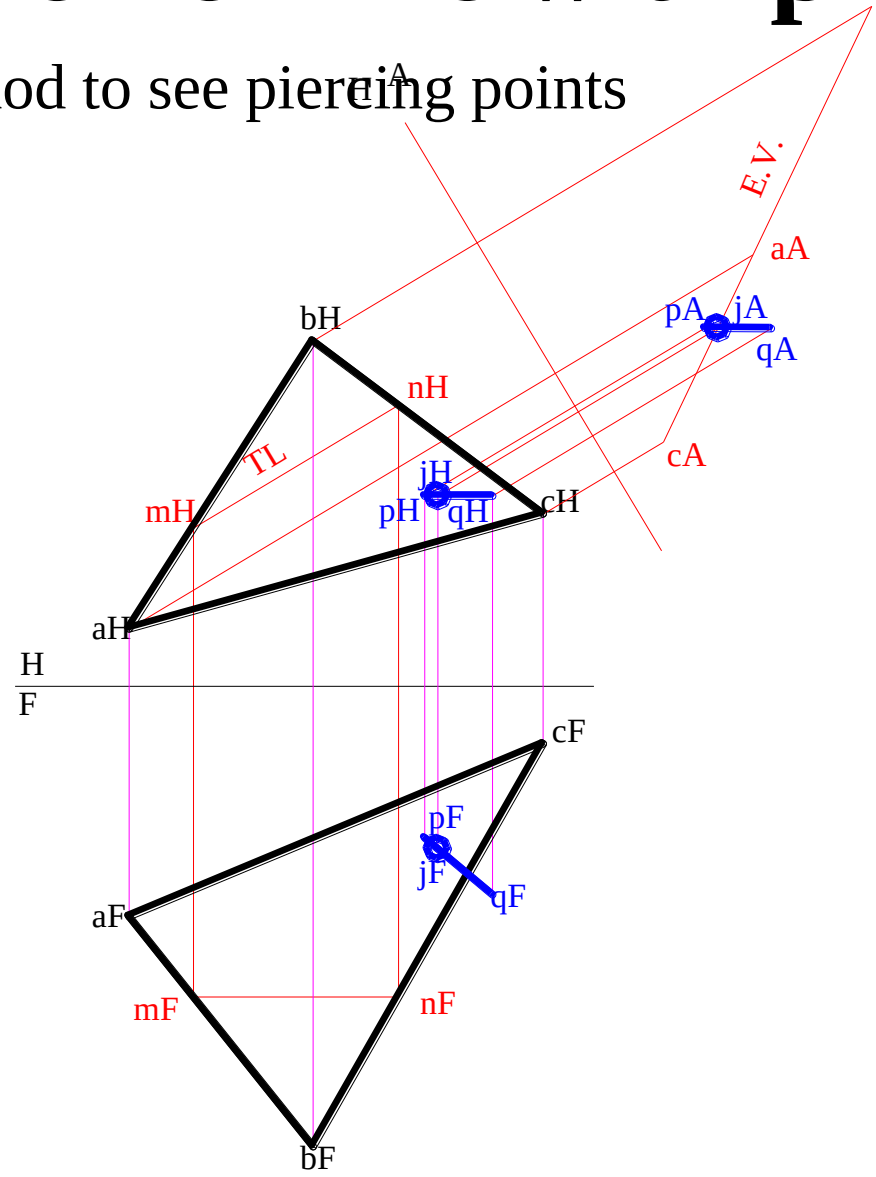
Intersection of line with plane – EV

Edge View Method to see piercing points



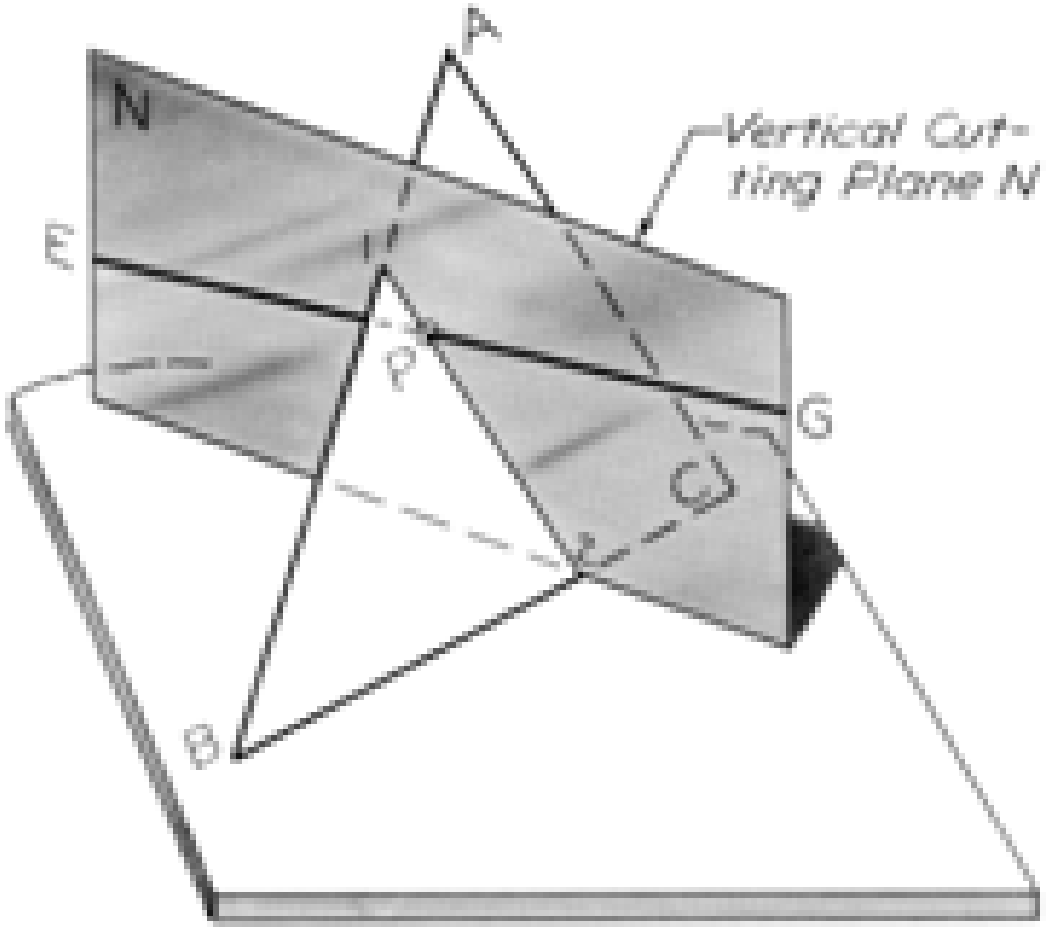
Intersection of line with plane – EV

Edge View Method to see piercing points



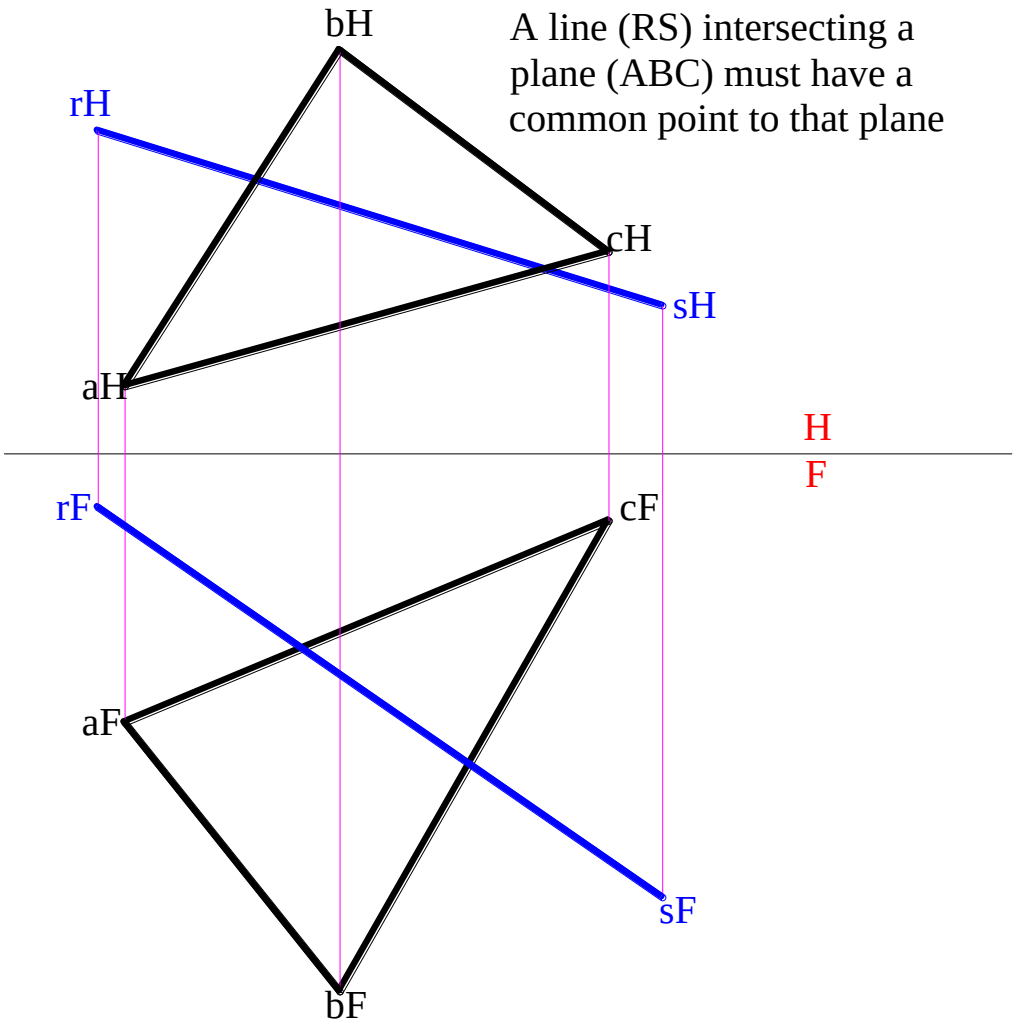
Intersection of line with plane – EV

Cutting Plane Method to see piercing points



Intersection of line with plane – CP

Cutting Plane Method to see piercing points



A line (RS) intersecting a plane (ABC) must have a common point to that plane

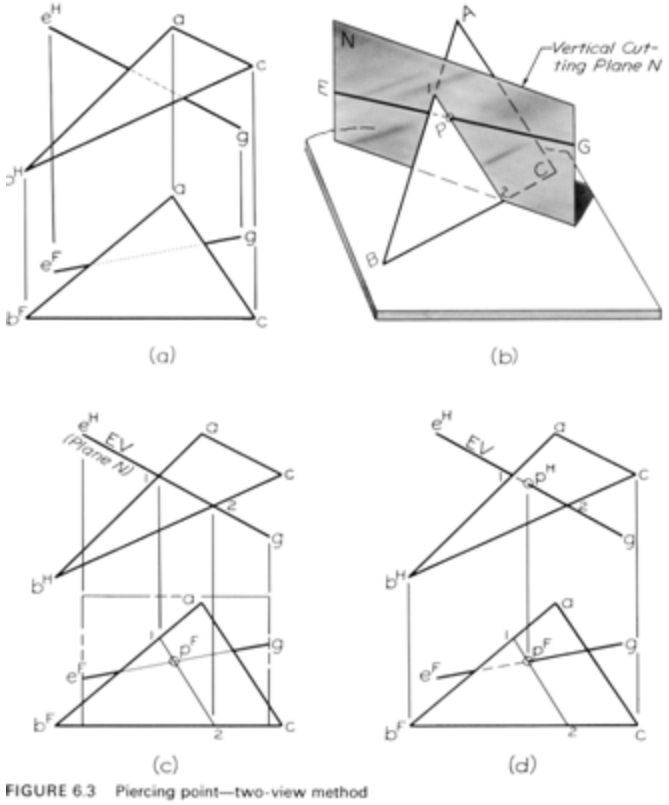
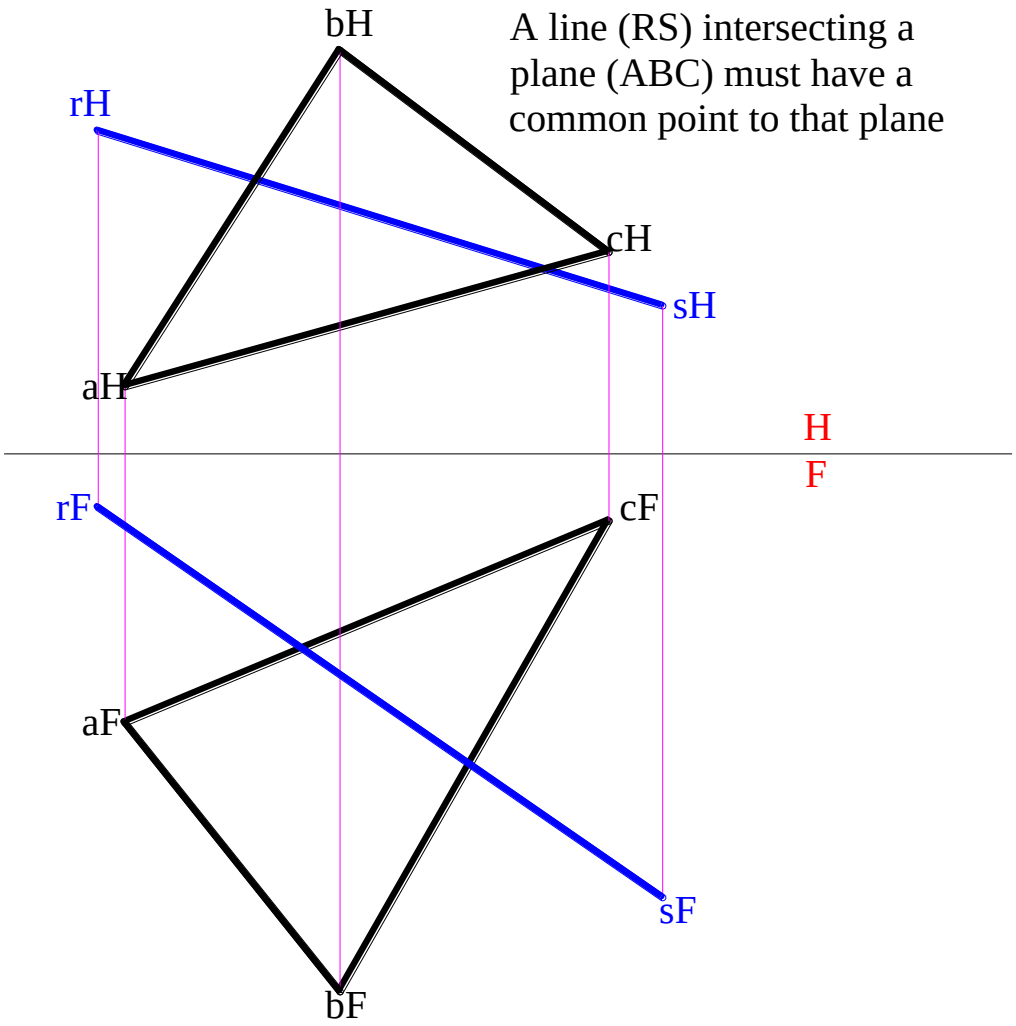


FIGURE 6.3 Piercing point—two-view method

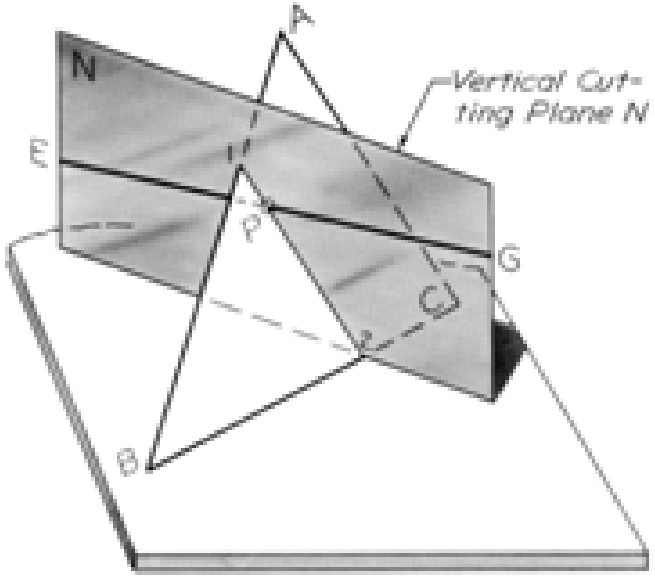
Intersection of line with plane – CP

Cutting Plane Method to see piercing points



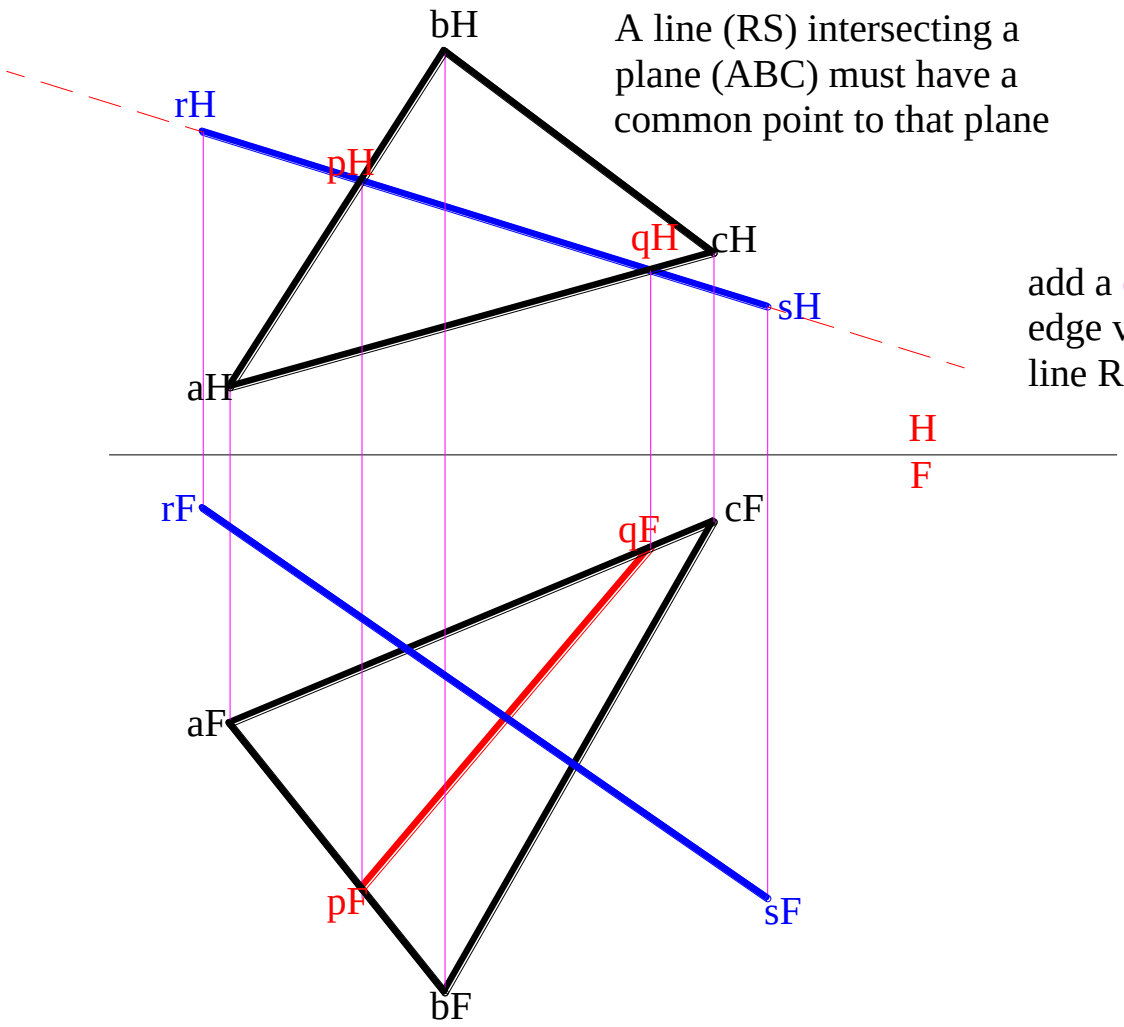
A line (RS) intersecting a plane (ABC) must have a common point to that plane

- If a CP with line RS is introduced to cut abc, the line RS will intersect at piercing point with abc



Intersection of line with plane – CP

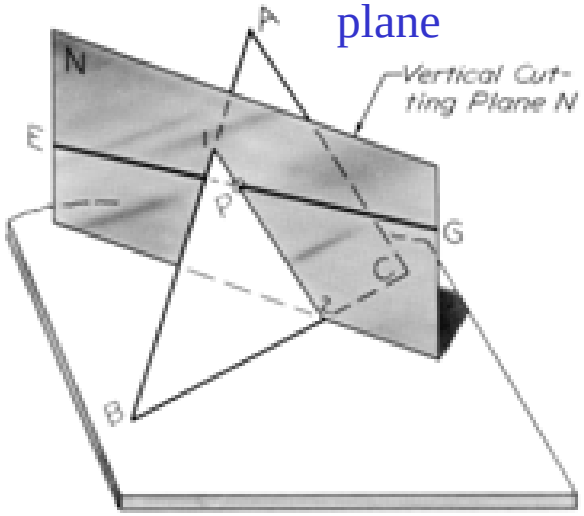
Cutting Plane Method to see piercing points



A line (RS) intersecting a plane (ABC) must have a common point to that plane

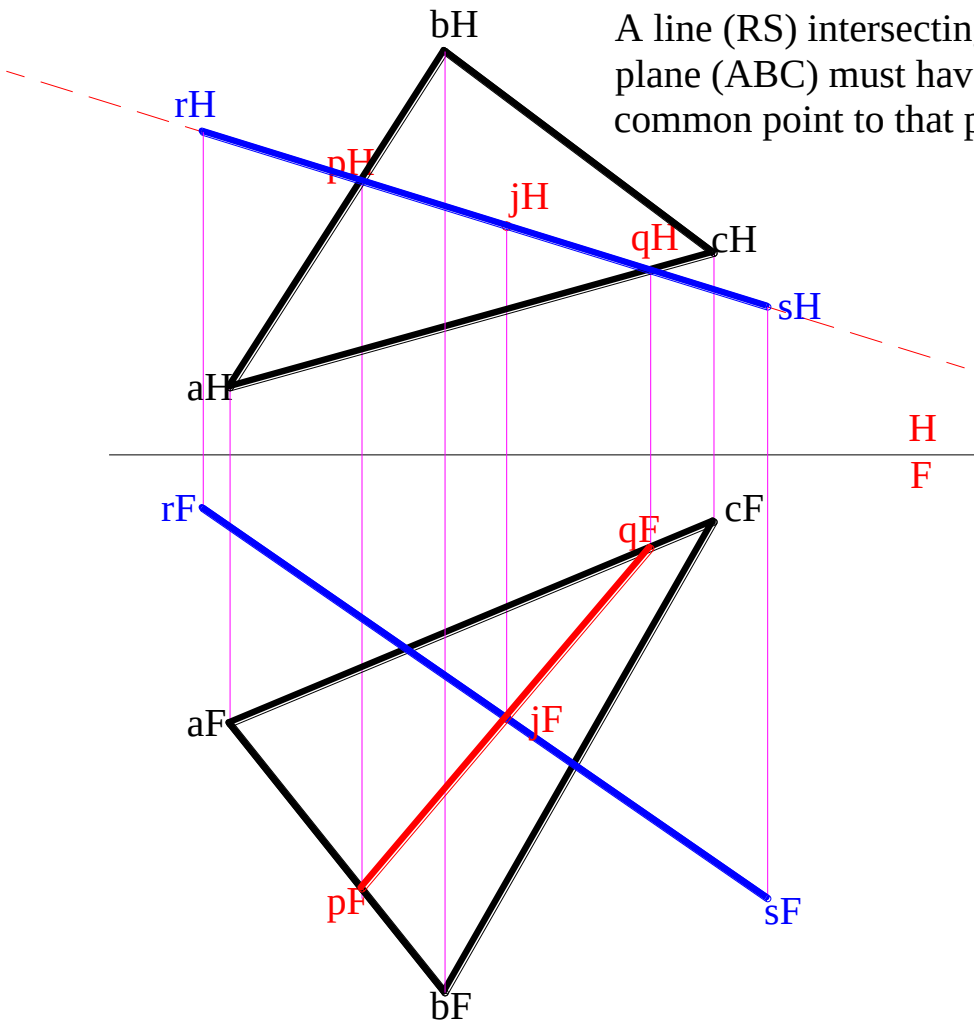
add a cutting plane whose edge view conincides with line RS in the top view

- Line RS is in the since the EV of CP coincides RS
- If the two lines are in a plane and if they are not parallel, they must intersect in the plane



Intersection of line with plane – CP

Cutting Plane Method to see piercing points



A line (RS) intersecting a plane (ABC) must have a common point to that plane

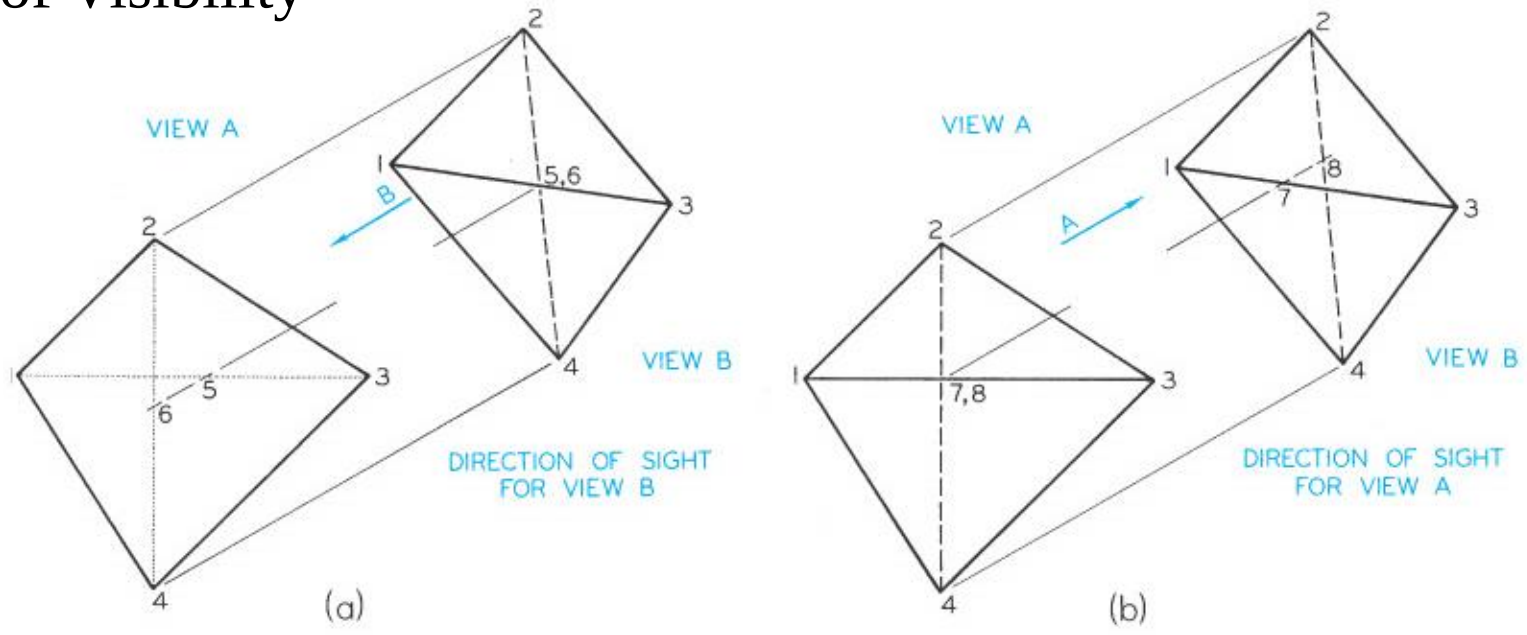
add a cutting plane whose edge view conincides with line RS in the top view

the point of intersection between the line RS and the projection of the CP in the front view will give the common point between the line RS and the plane abc. The point J is the piercing point

Intersection of line with plane – CP

Cutting Plane Method to see piercing points

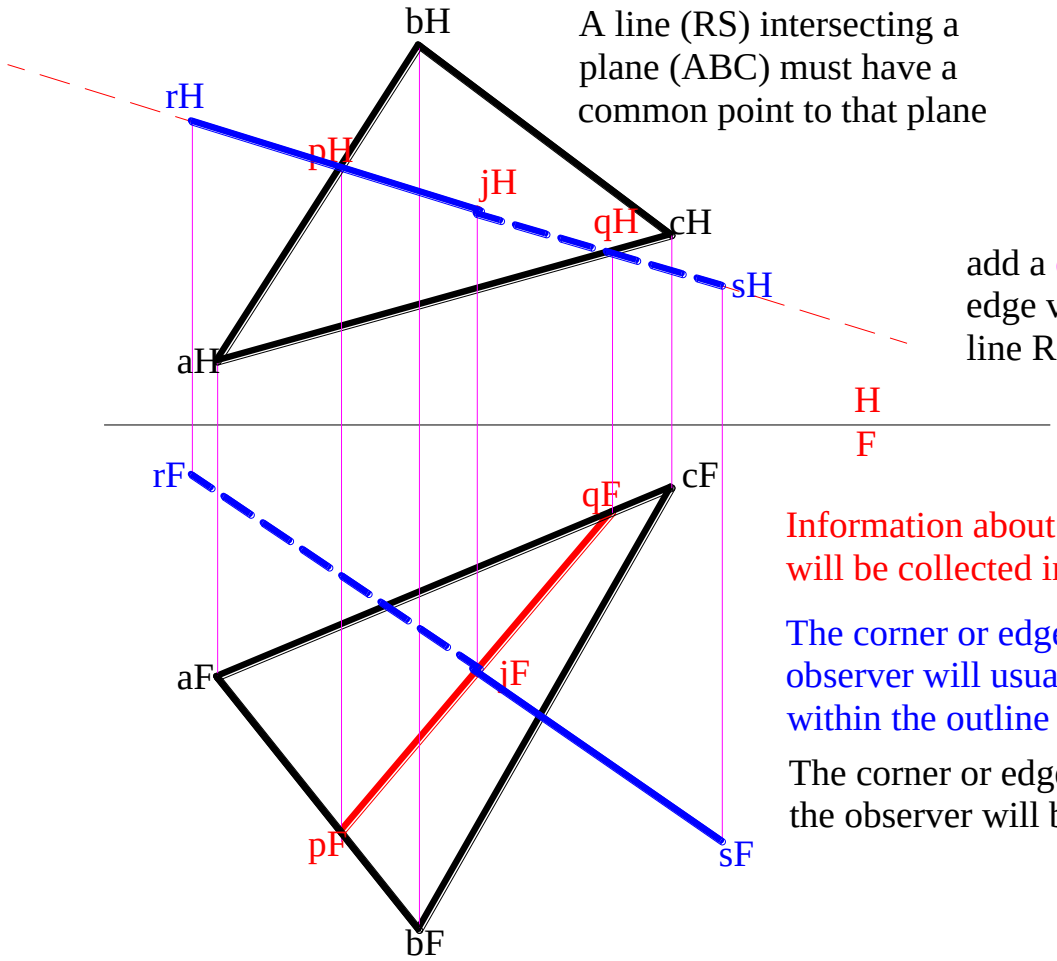
Rule of Visibility



- Information about visibility is collected in adjacent view
- Point 5 on edge 1-3 is nearer to the observer. So edge 1-3 is visible in view B
- Point 7 on edge 1-3 is nearer to the observer. So edge 1-3 is visible in view A

Intersection of line with plane – CP

Cutting Plane Method to see piercing points



A line (RS) intersecting a plane (ABC) must have a common point to that plane

add a cutting plane whose edge view conincides with line RS in the top view

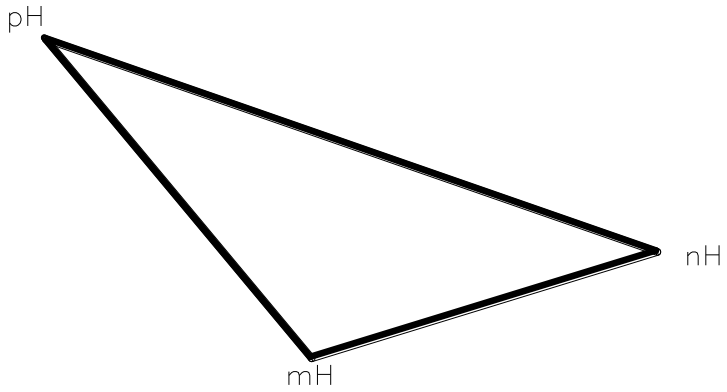
Information about the visibility in a view will be collected in any adjacent view.

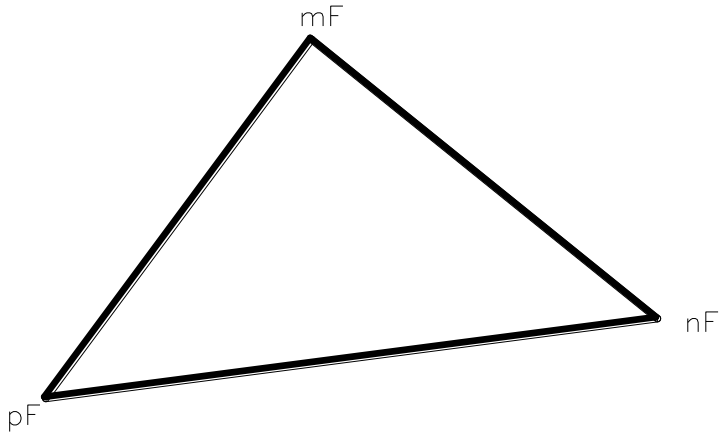
The corner or edge fartherest from the observer will usually be hidden if it lies within the outline of the view.

The corner or edge of the object nearest to the observer will be visible.

Intersection of two planes - EV

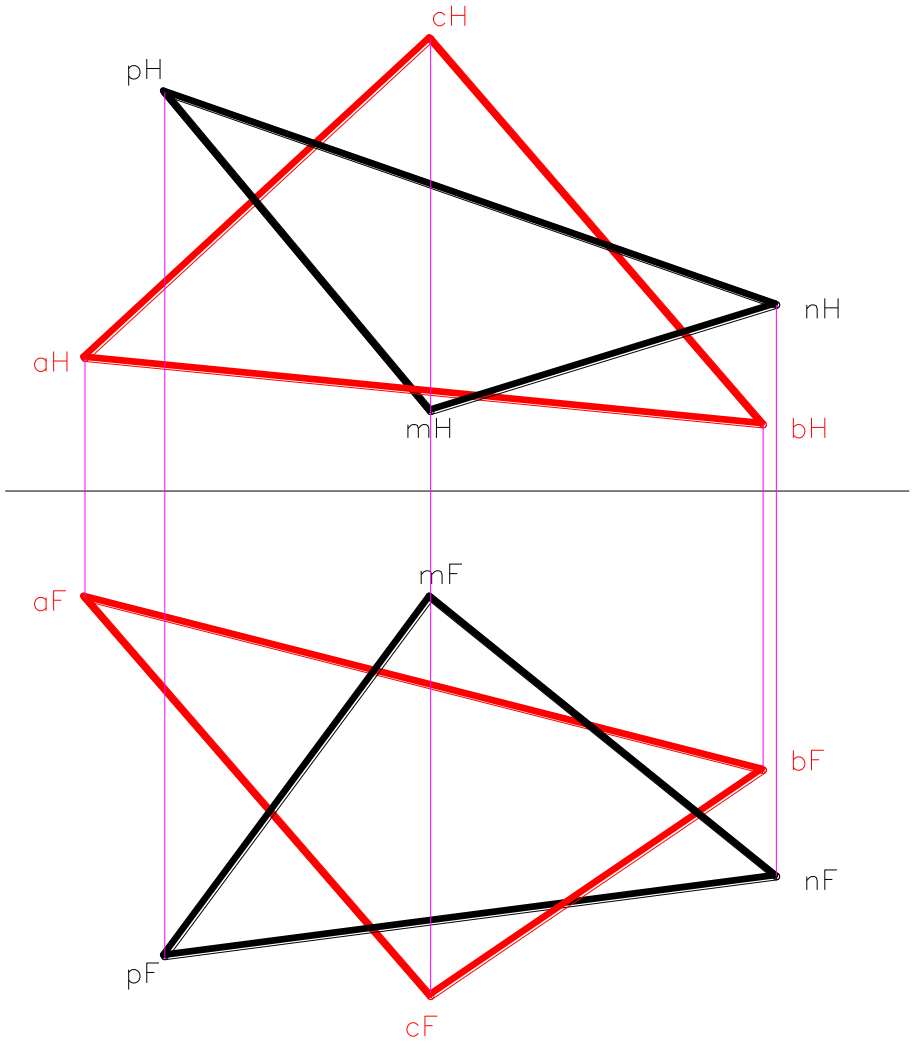
Edge View Method





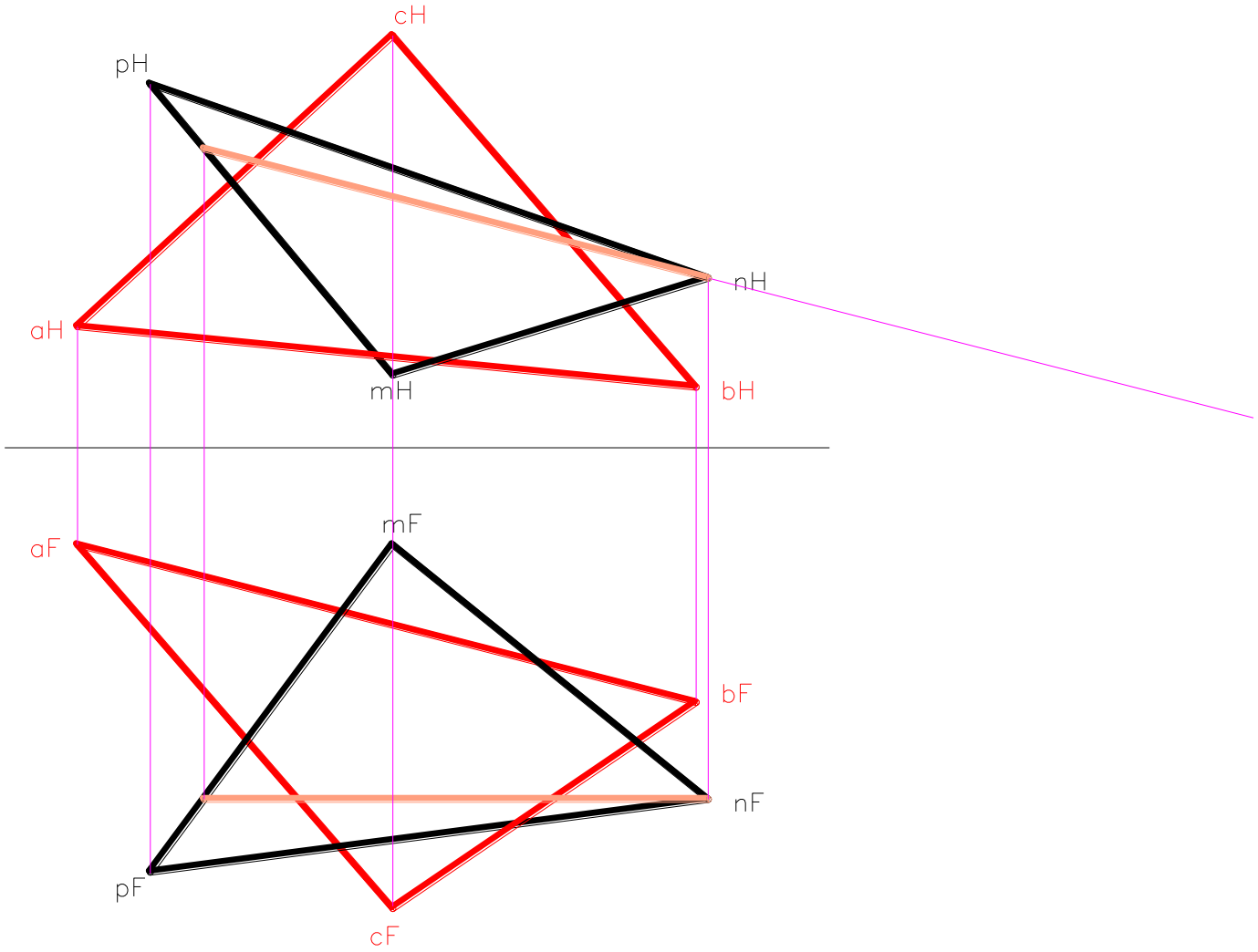
Intersection of two planes - EV

Edge View Method



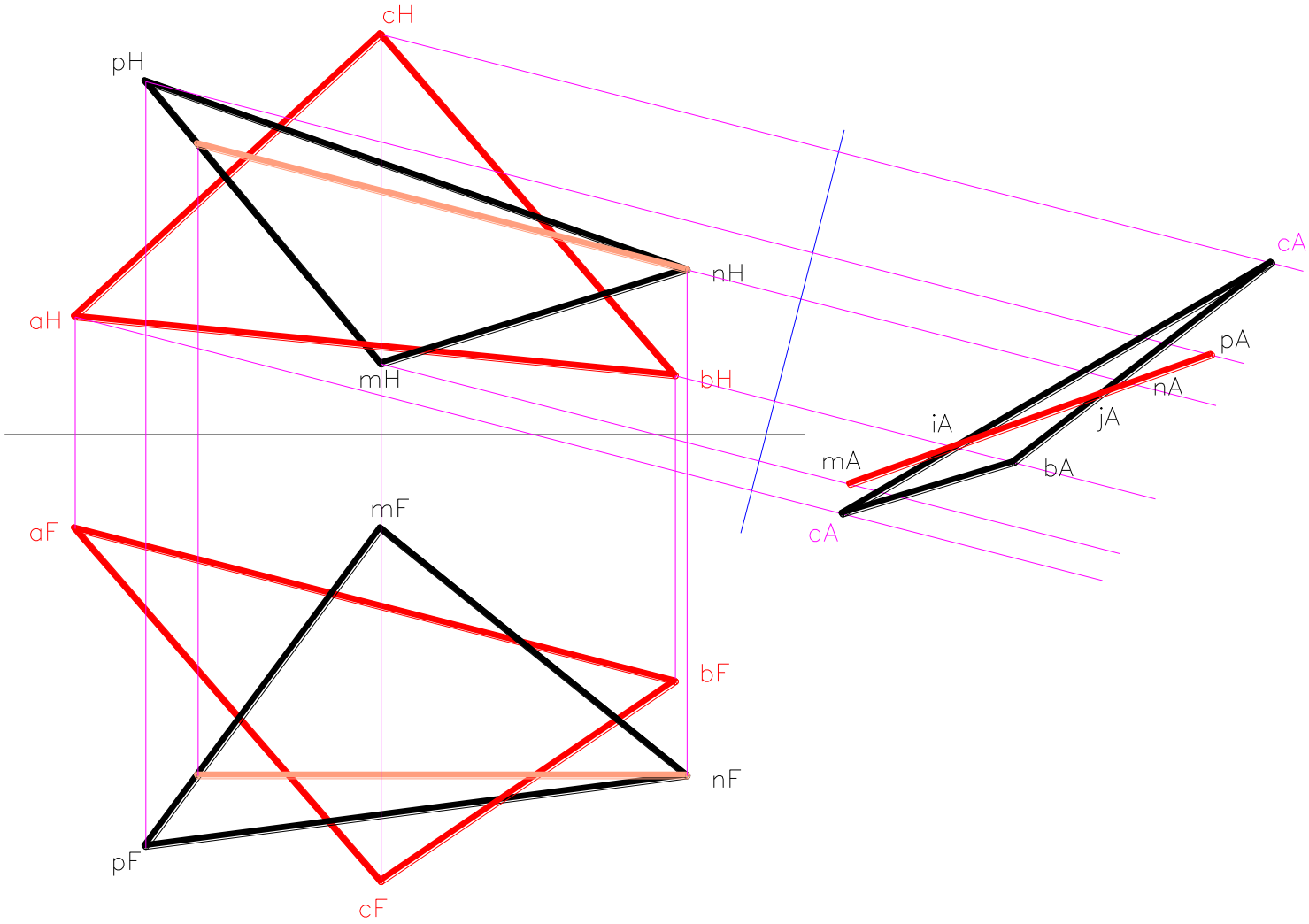
Intersection of two planes - EV

Edge View Method



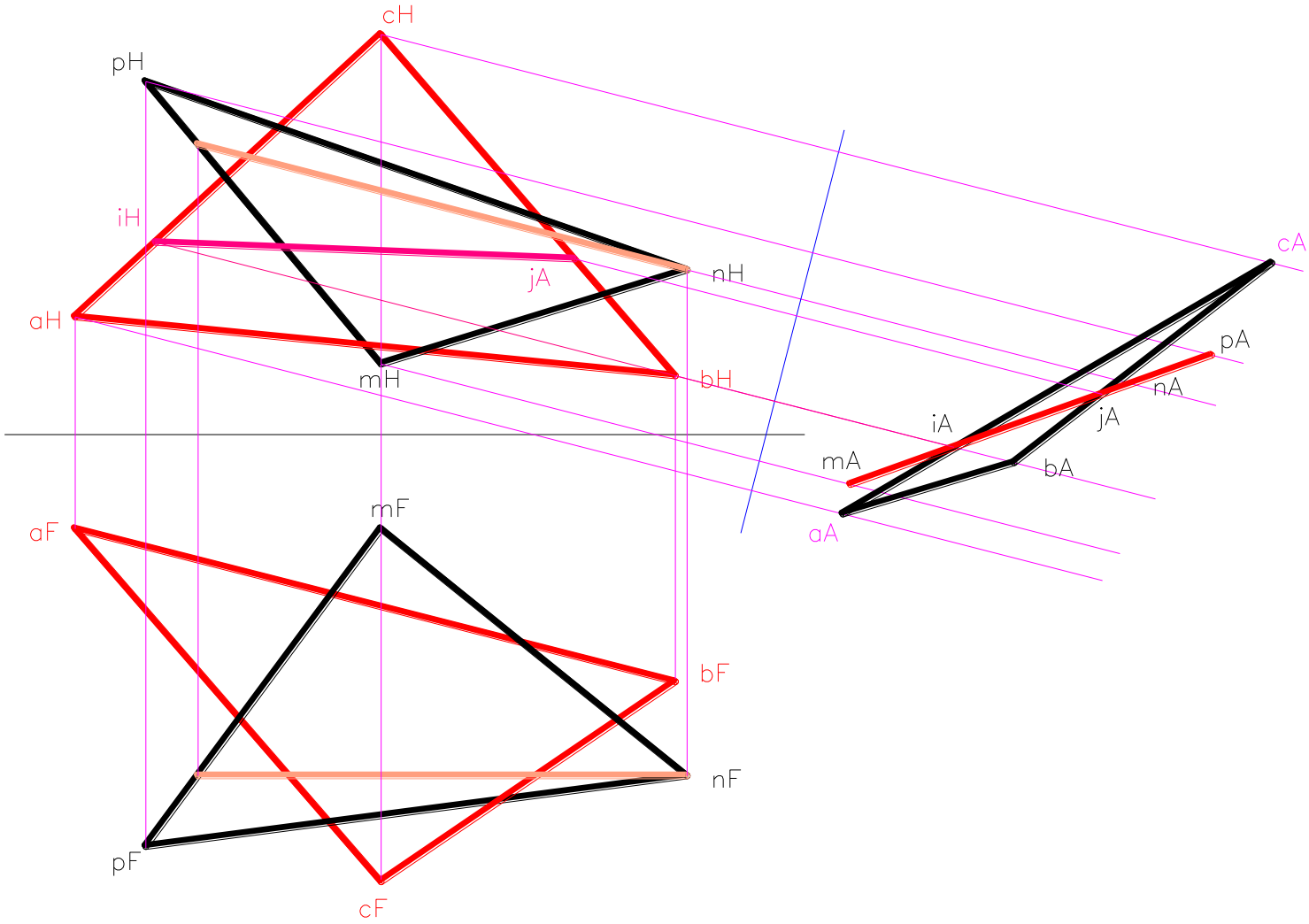
Intersection of two planes - EV

Edge View Method



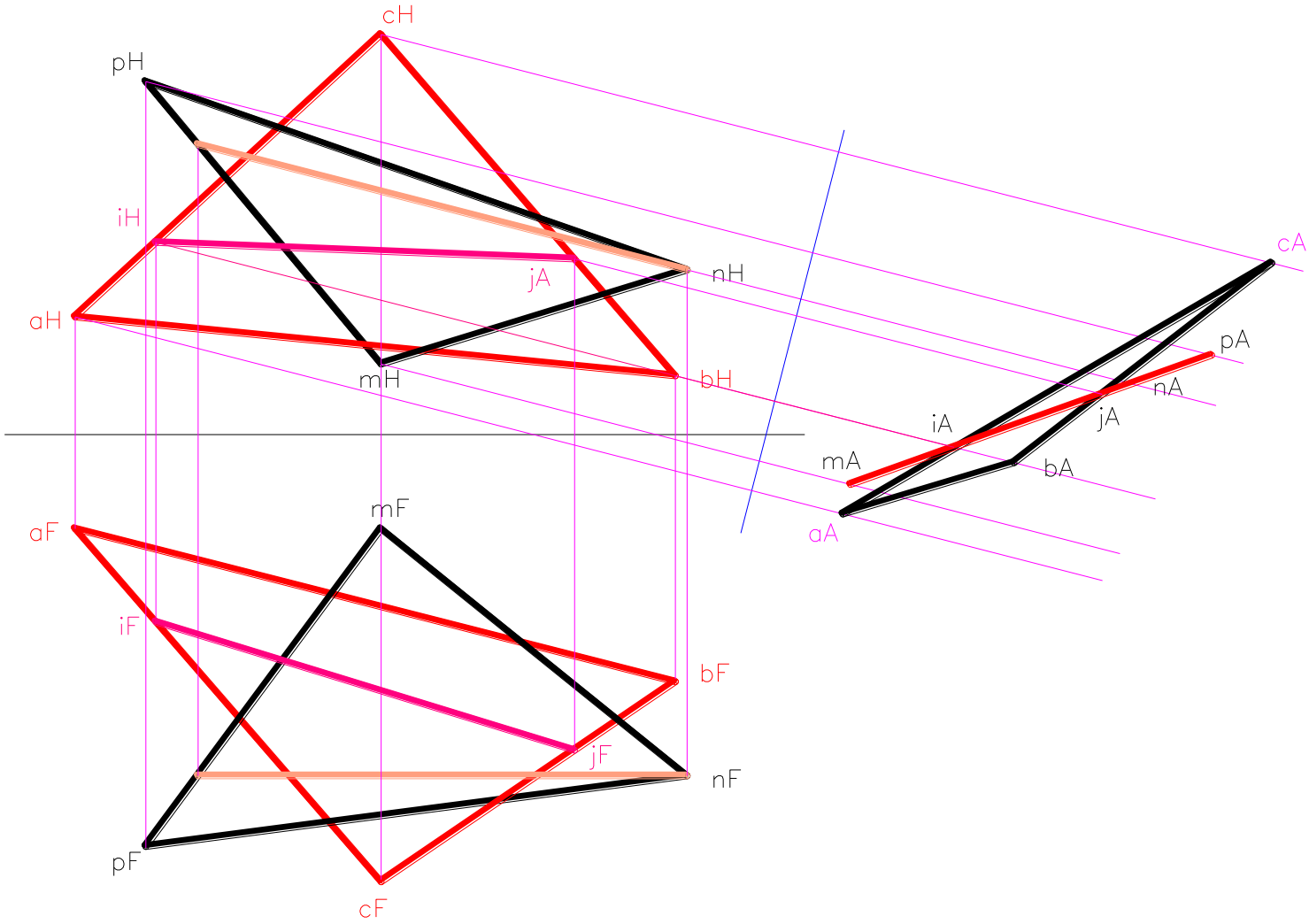
Intersection of two planes - EV

Edge View Method



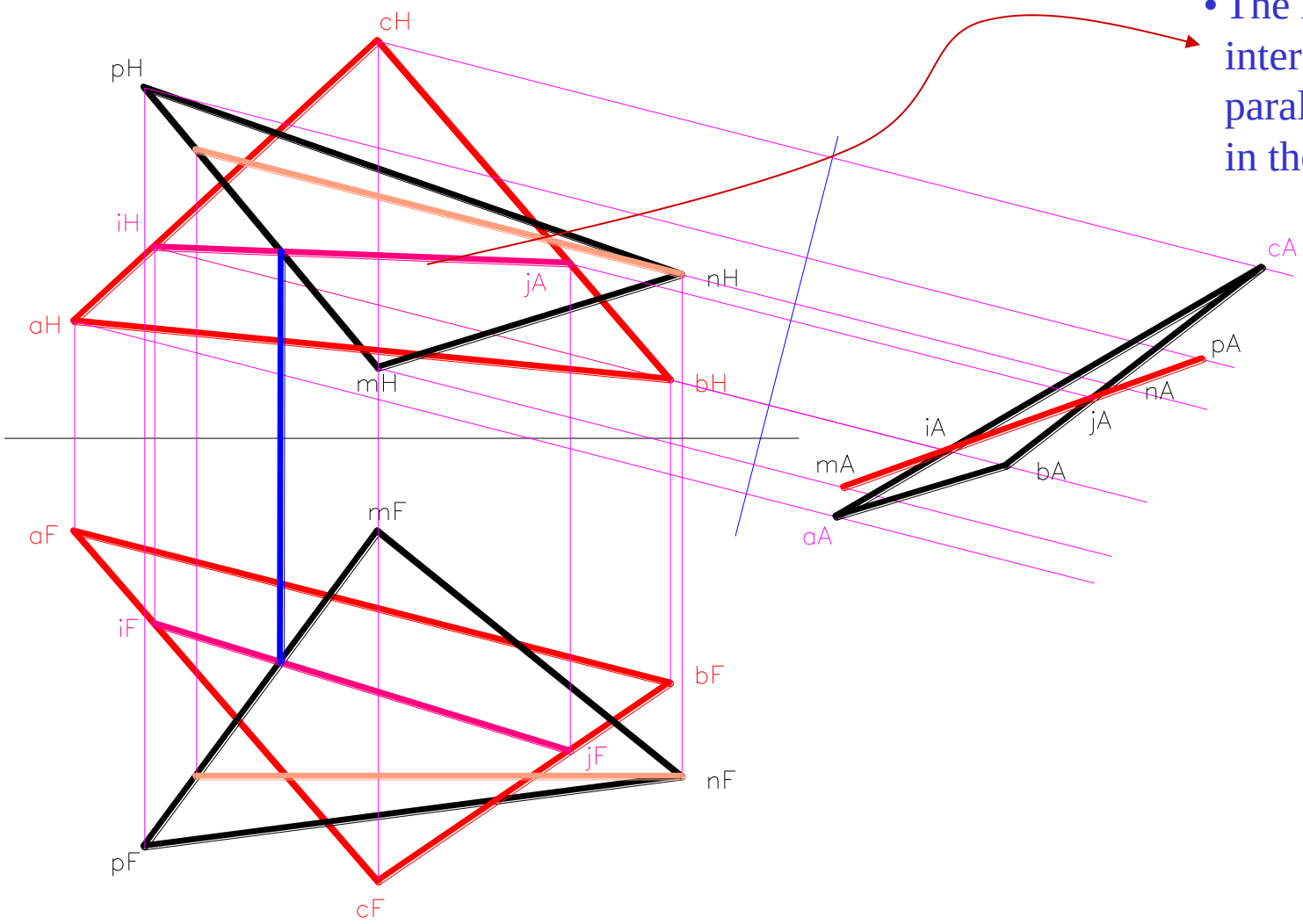
Intersection of two planes - EV

Edge View Method



Intersection of two planes - EV

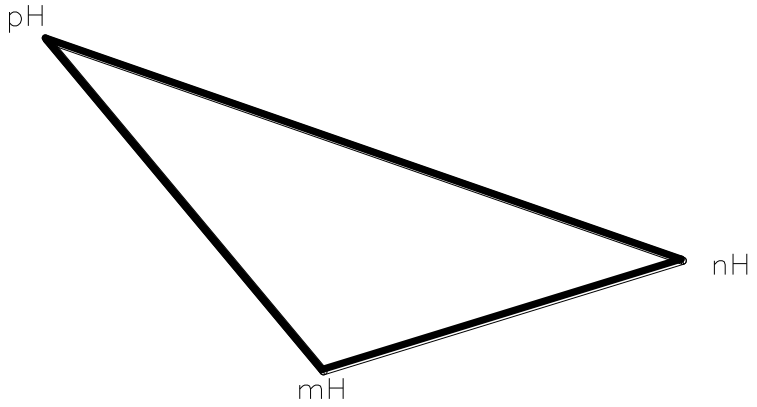
Edge View Method

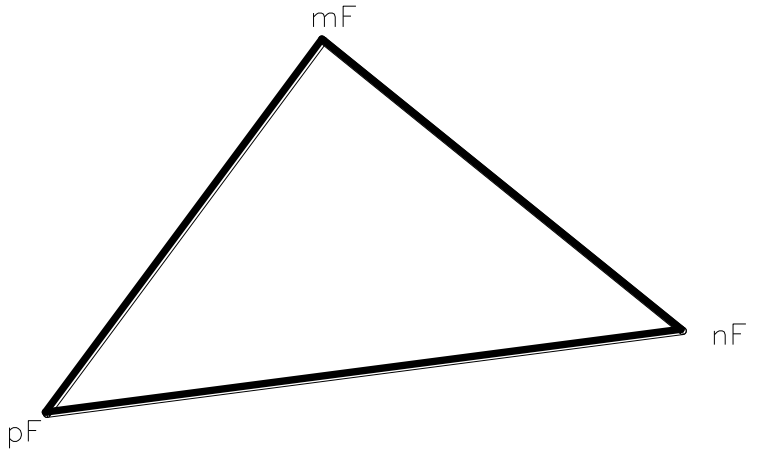


- The line must intersect or be parallel to the lines in the plane

Intersection of two planes – CP

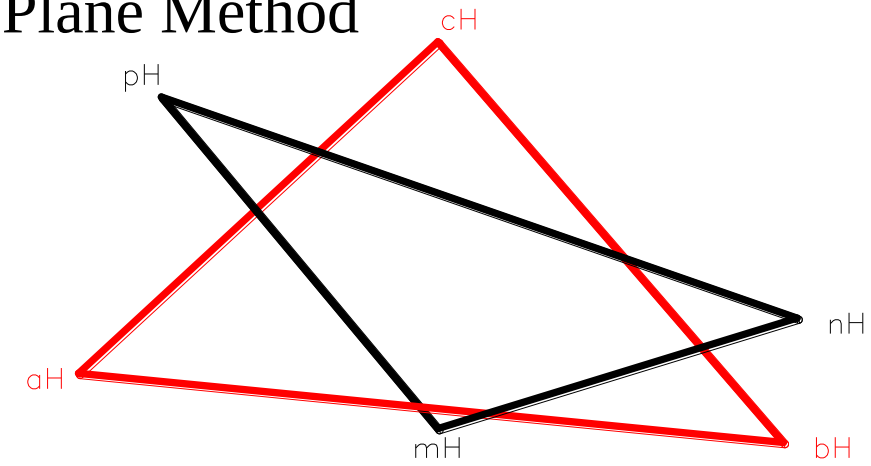
Cutting Plane Method

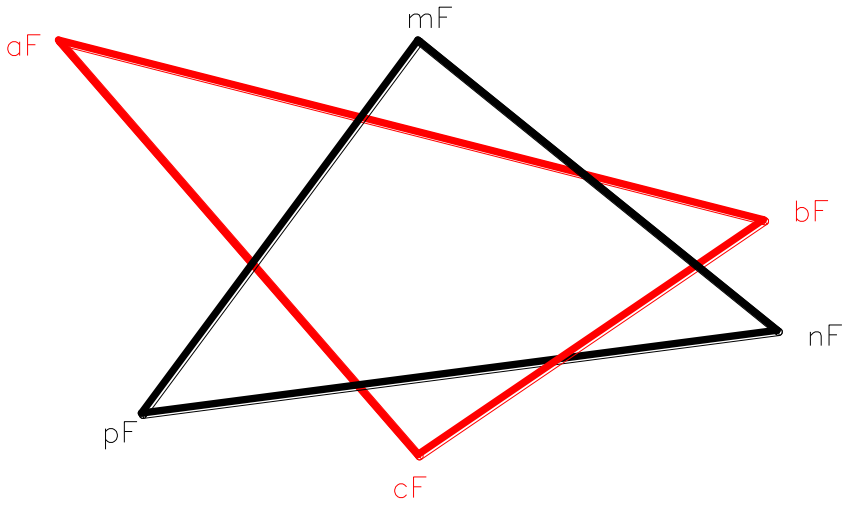




Intersection of two planes – CP

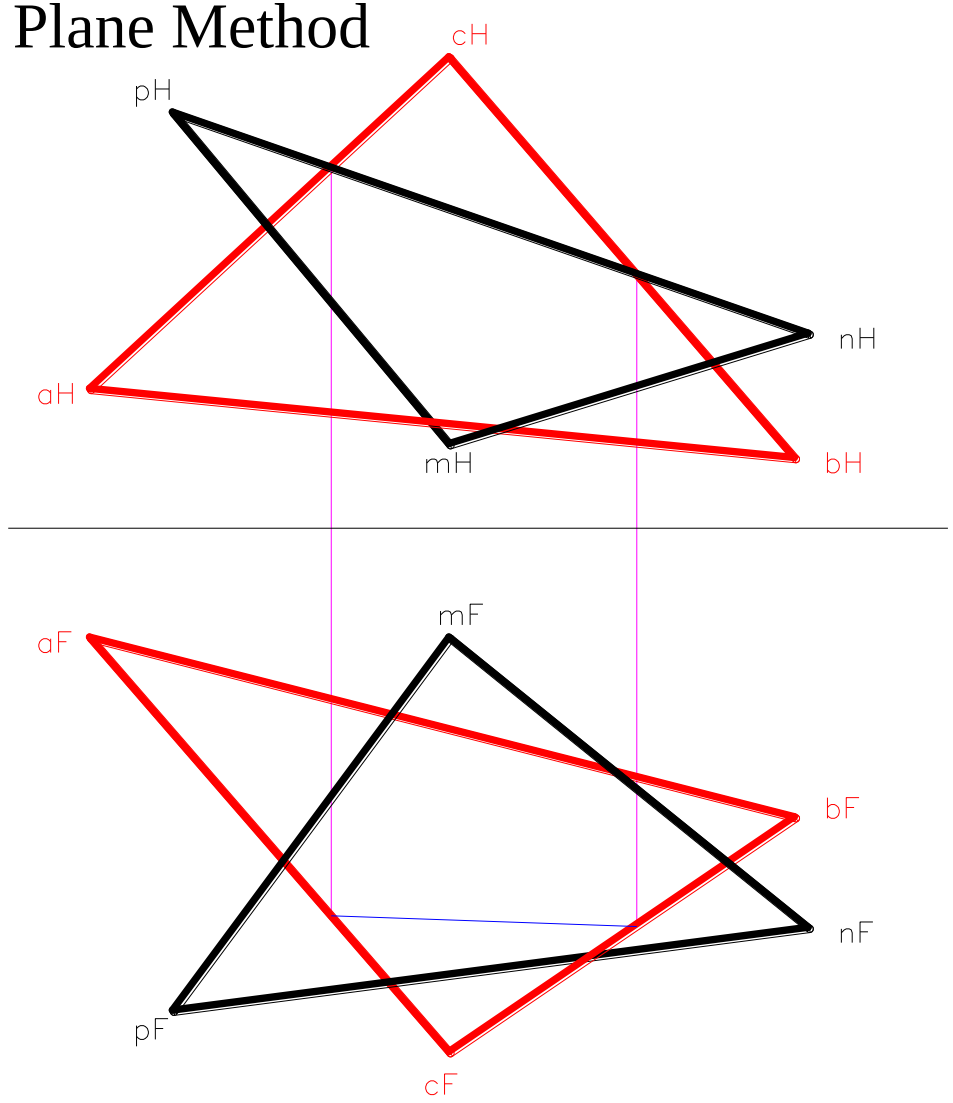
Cutting Plane Method





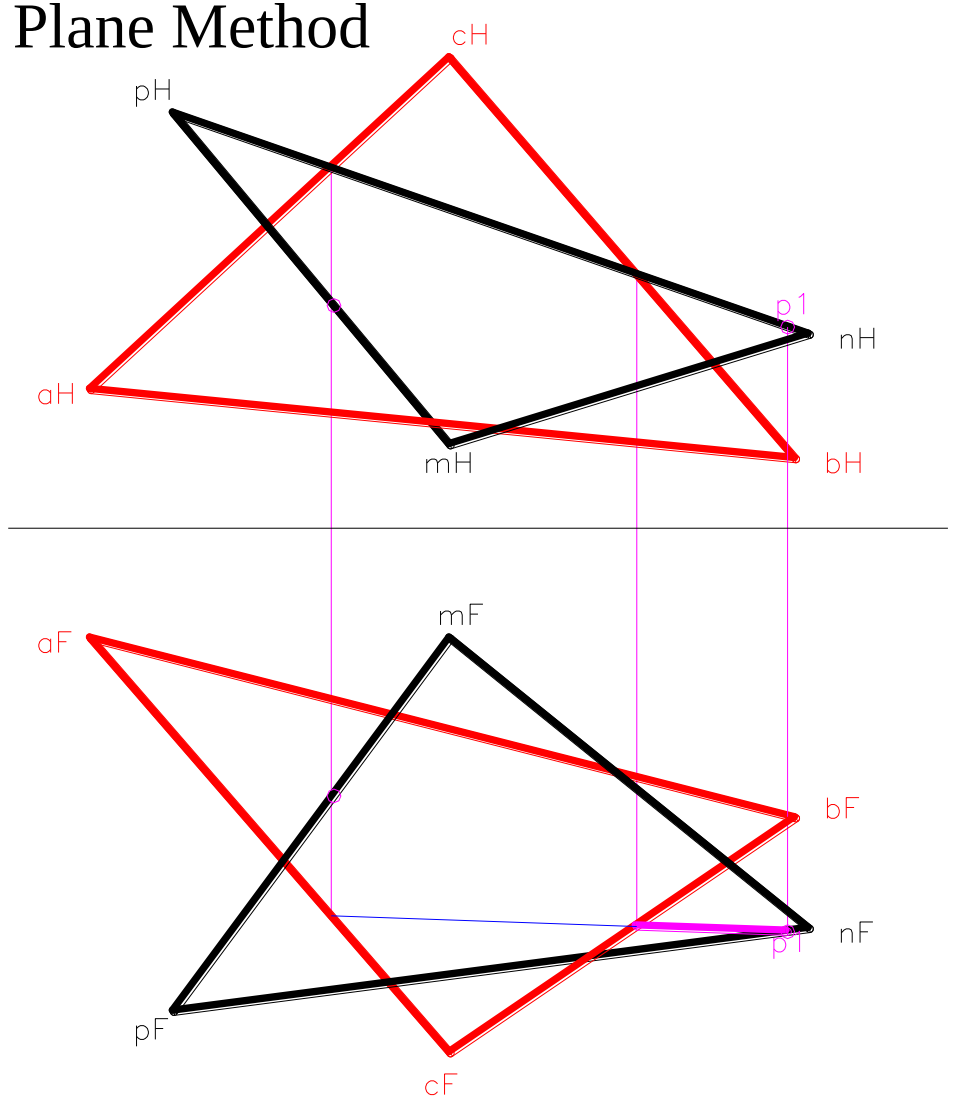
Intersection of two planes – CP

Cutting Plane Method



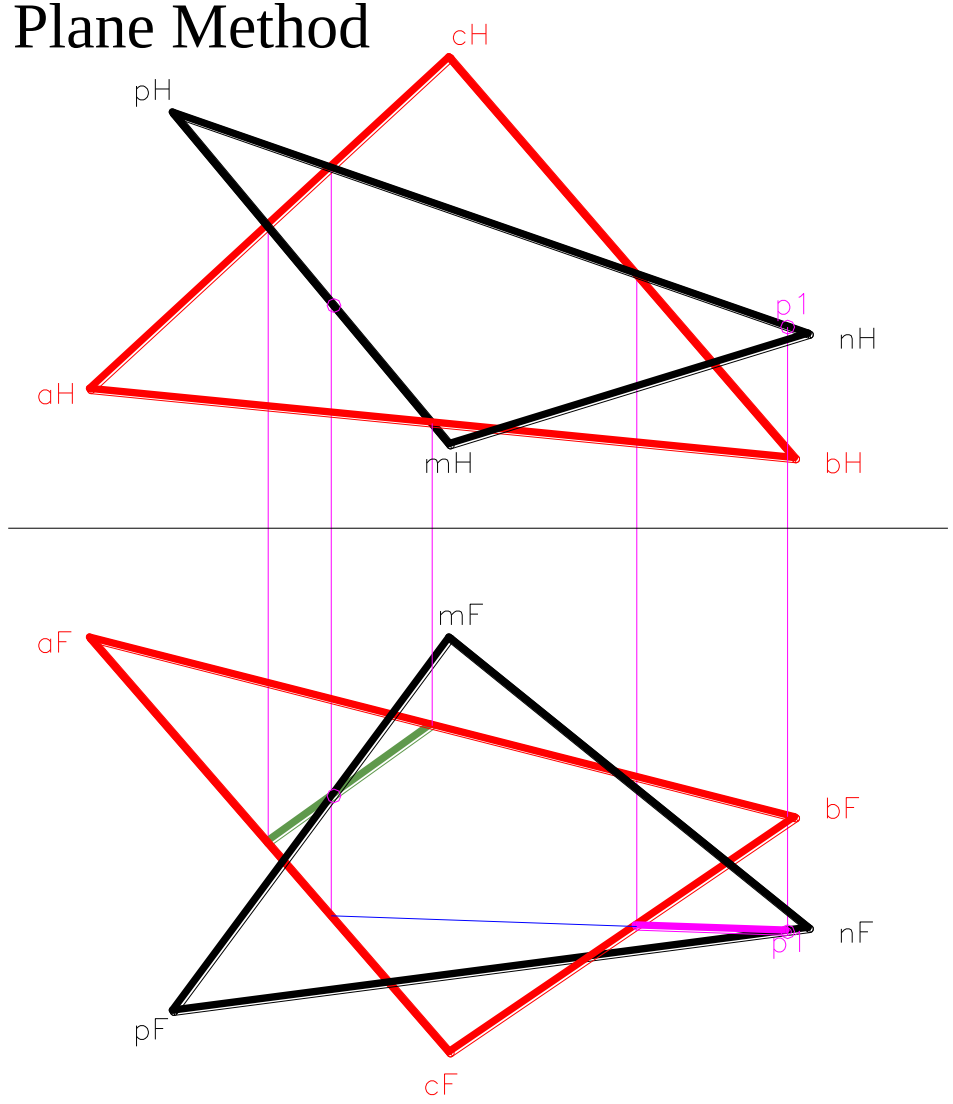
Intersection of two planes – CP

Cutting Plane Method



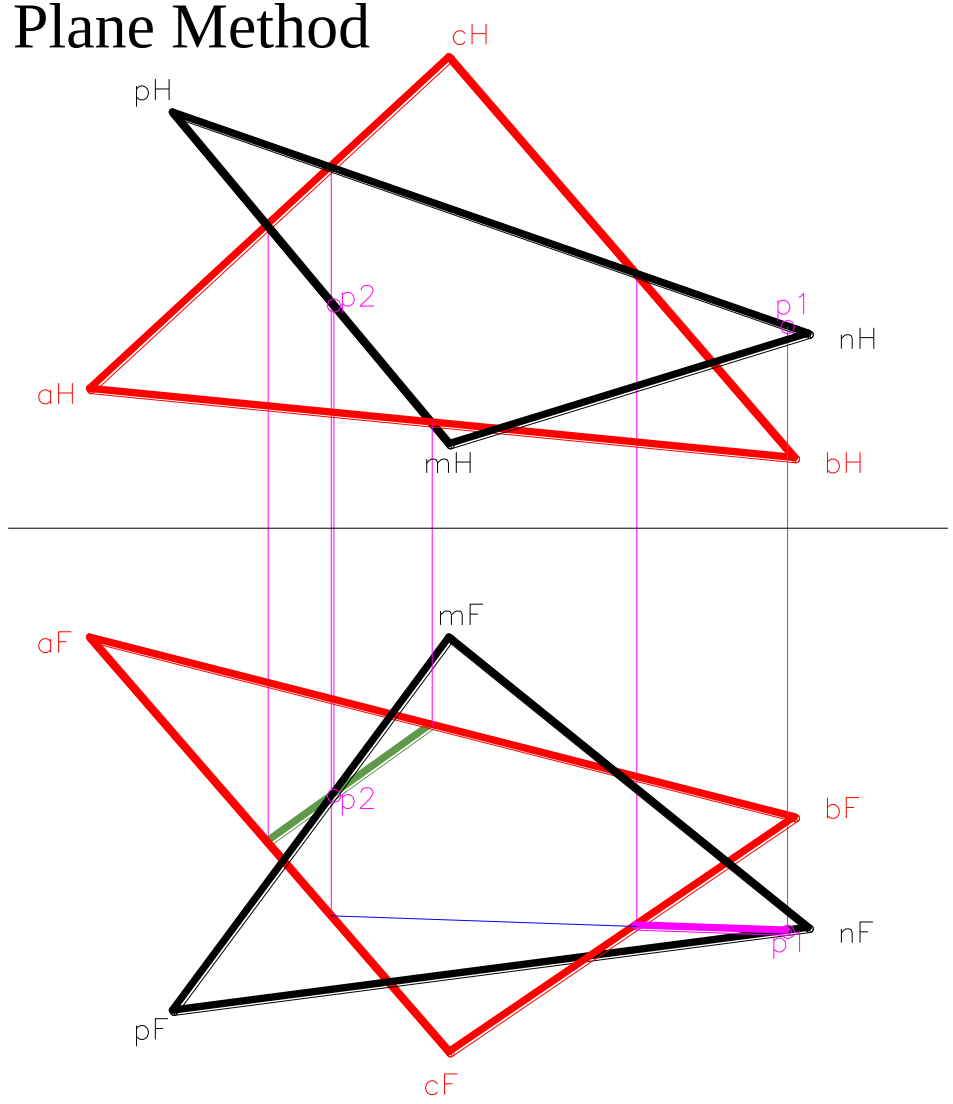
Intersection of two planes – CP

Cutting Plane Method



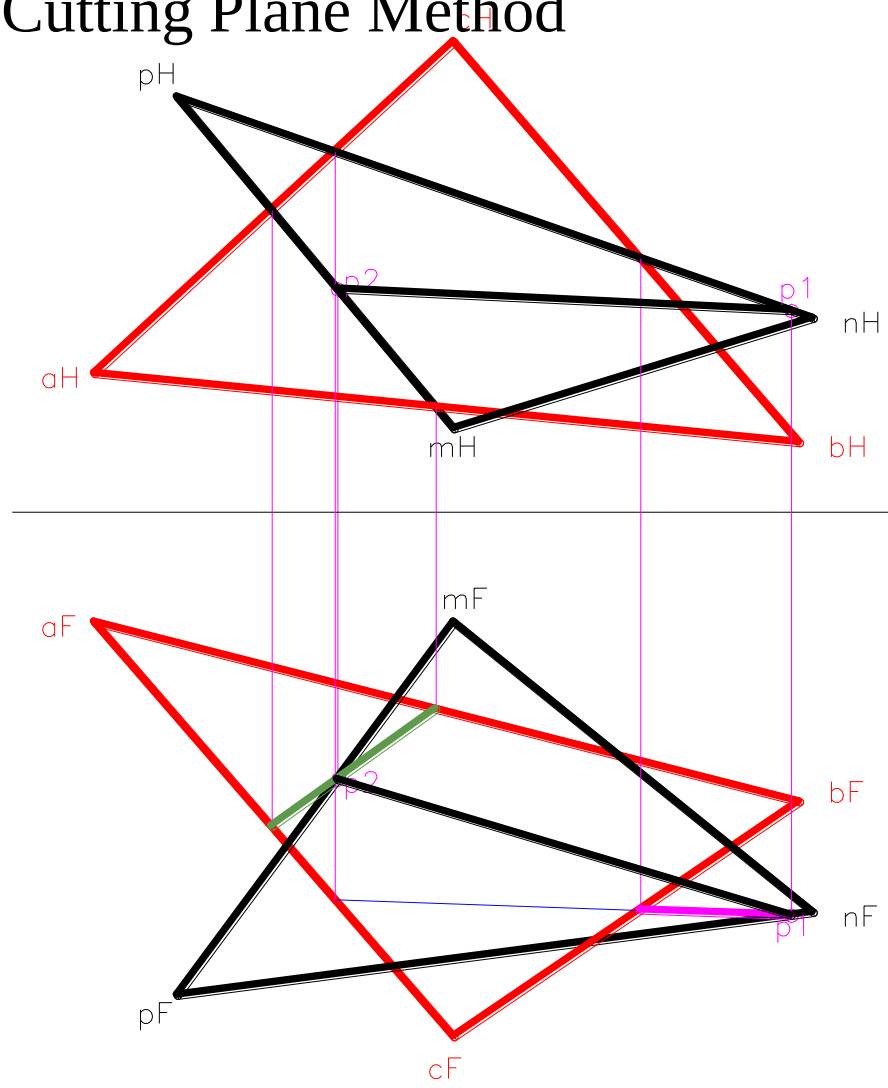
Intersection of two planes – CP

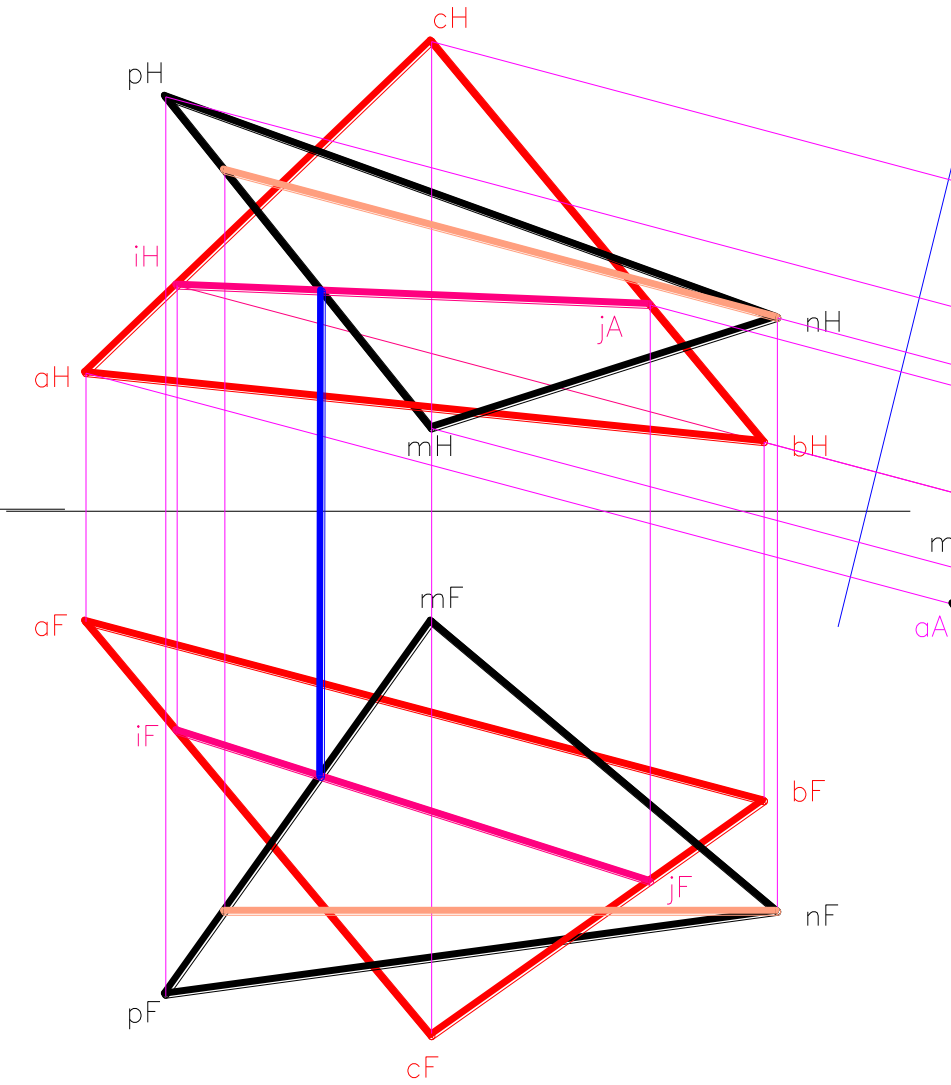
Cutting Plane Method



Intersection of two planes – CP

Cutting Plane Method





MECHANICAL ENGINEERING GRAPHICS

MECH 211

LECTURE #7

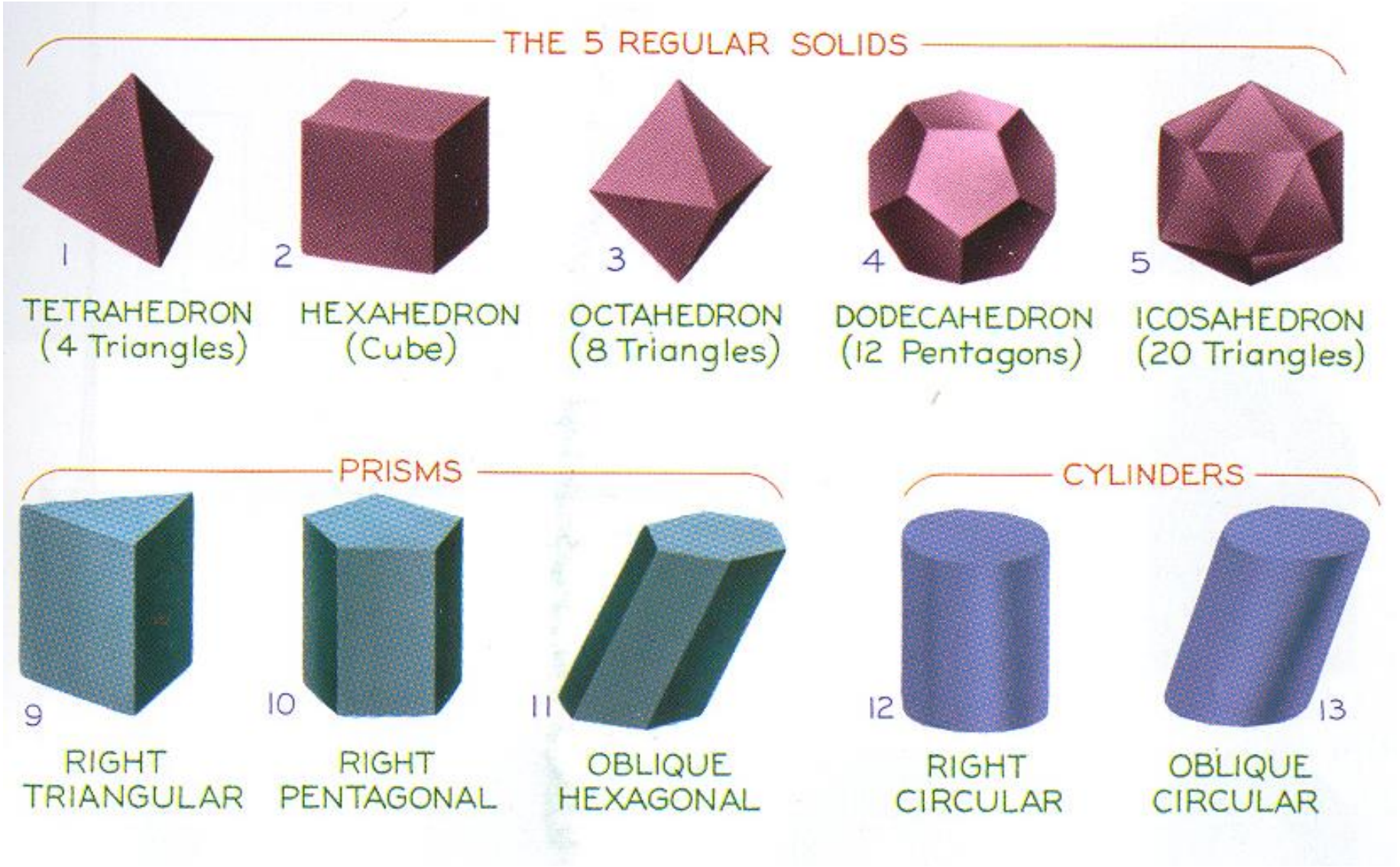
Content of the Lecture

- Polyhedrons and curved surfaces – discussion
- Intersection of a plane with a polyhedron – visibility
- Intersection of a line with a polyhedron – visibility
- Location of a plane perpendicular to a line through a point
- Projection of a point to a plane
- Intersection of a line with a cone
- Intersection of a cylinder with a plane
- Intersection of two prisms
- Intersection of two cylinders

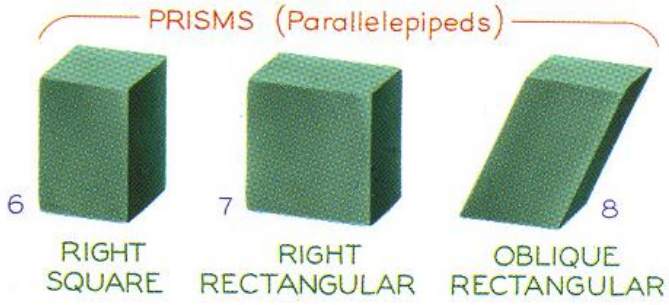
Polyhedrons and curved surfaces

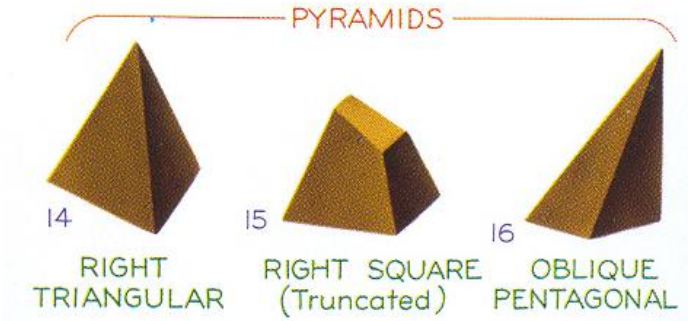
- **Surface** is 2D. It has area, no volume
  - Surface is generated by moving a line (straight or curved). This is called generatrix
  - Every position of this generatrix is called the element of the surface
- **Divided as Ruled and Double Curved Surfaces**
  - Ruled Surface – Generated by moving straight lines
    - Plane Surfaces – Polyhedrons
    - Single Curved surfaces – Cylinders or Cones
    - Warped Surfaces – adjacent lines are skewed lines (Hyperboloid)
  - Double curved surface - generated by moving curved lines (Sphere, Torus, ellipsoid)

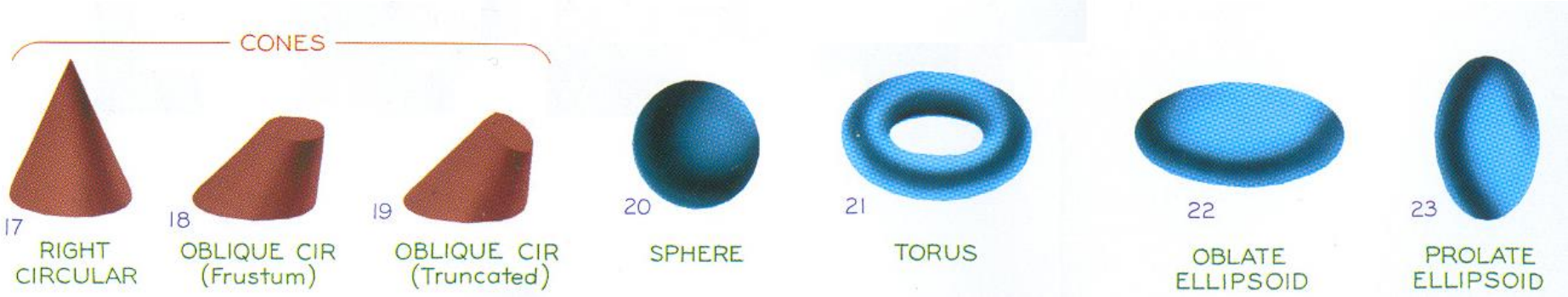
Polyhedrons and curved surfaces



Polyhedrons and curved surfaces

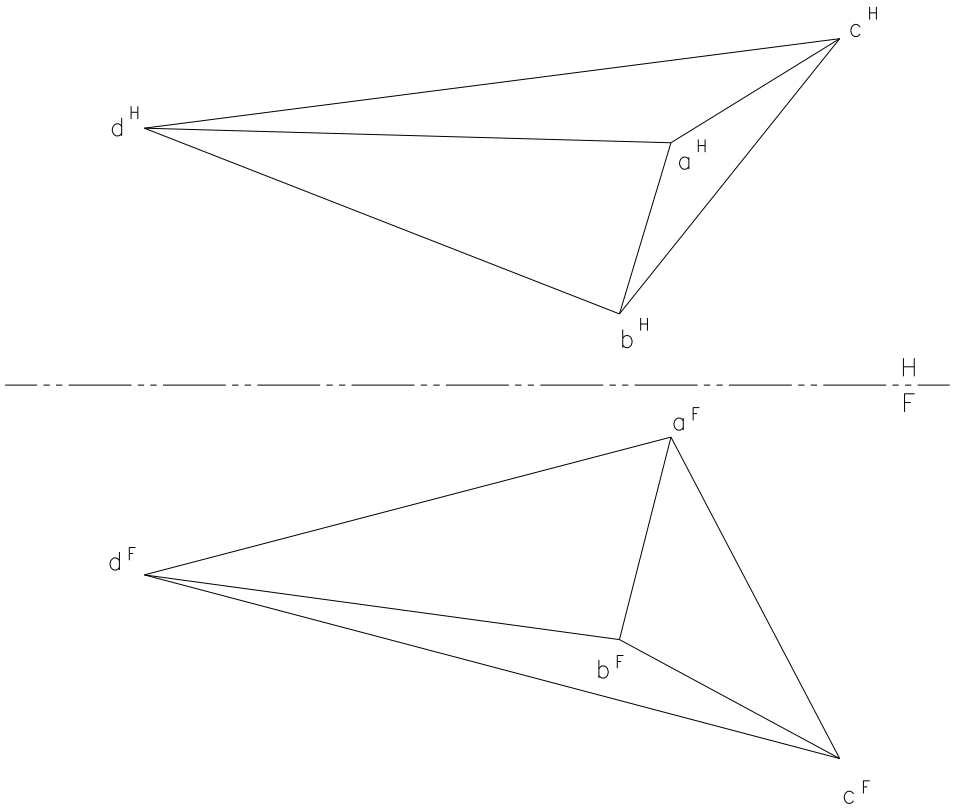






Intersection of plane and polyhedron

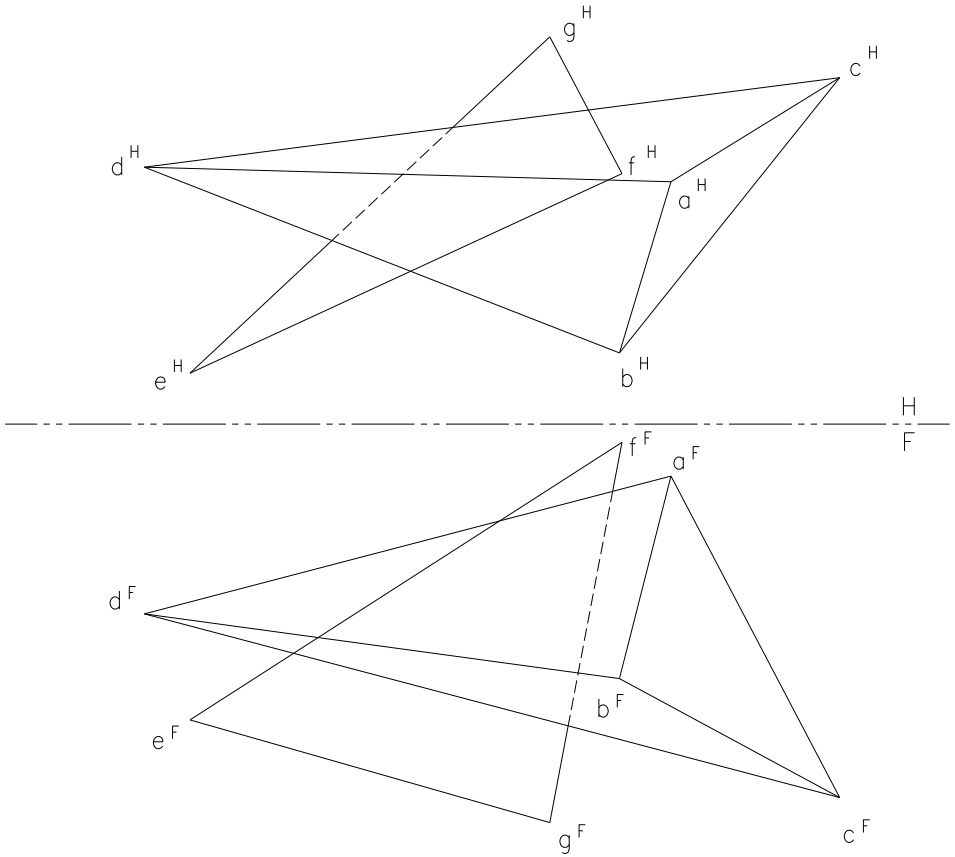
(A) INTERSECTION OF A PLANE AND A POLYHEDRON.
CUTTING PLANE METHOD.



abcd is the polyhedron

Intersection of plane and polyhedron

(A) INTERSECTION OF A PLANE AND A POLYHEDRON.
CUTTING PLANE METHOD.

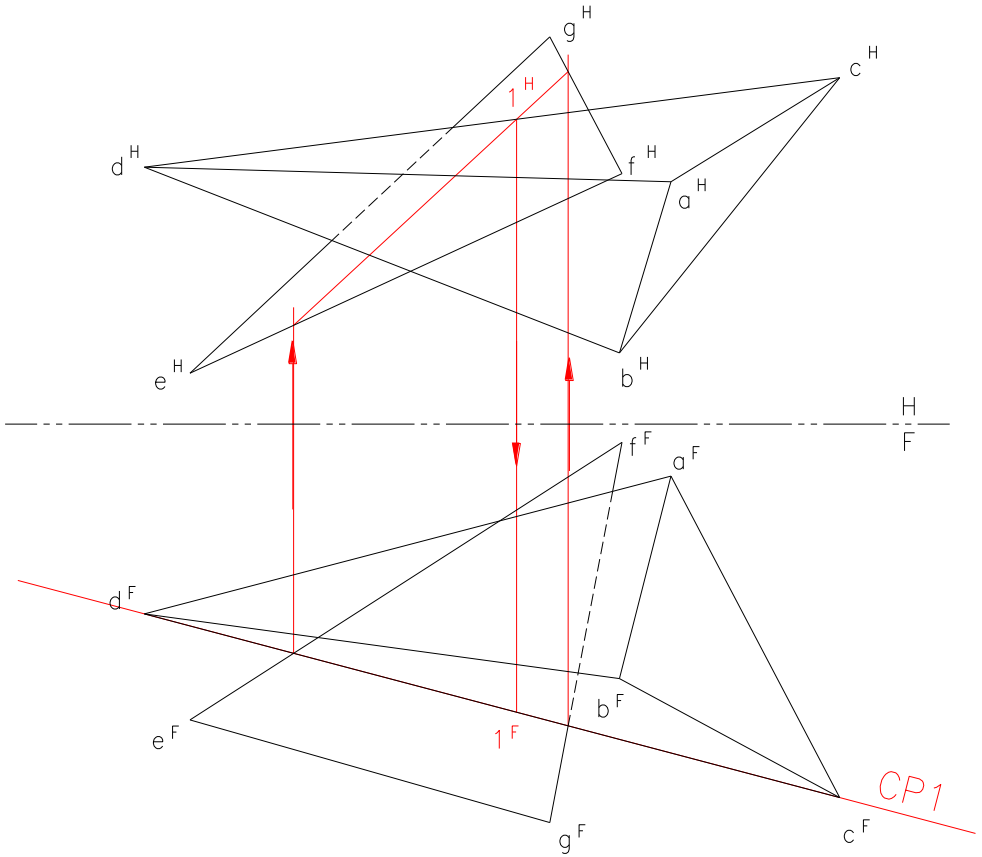


abcd is the polyhedron

efg is the plane that intersects the polyhedron abc

Intersection of plane and polyhedron

(A) INTERSECTION OF A PLANE AND A POLYHEDRON.
CUTTING PLANE METHOD.



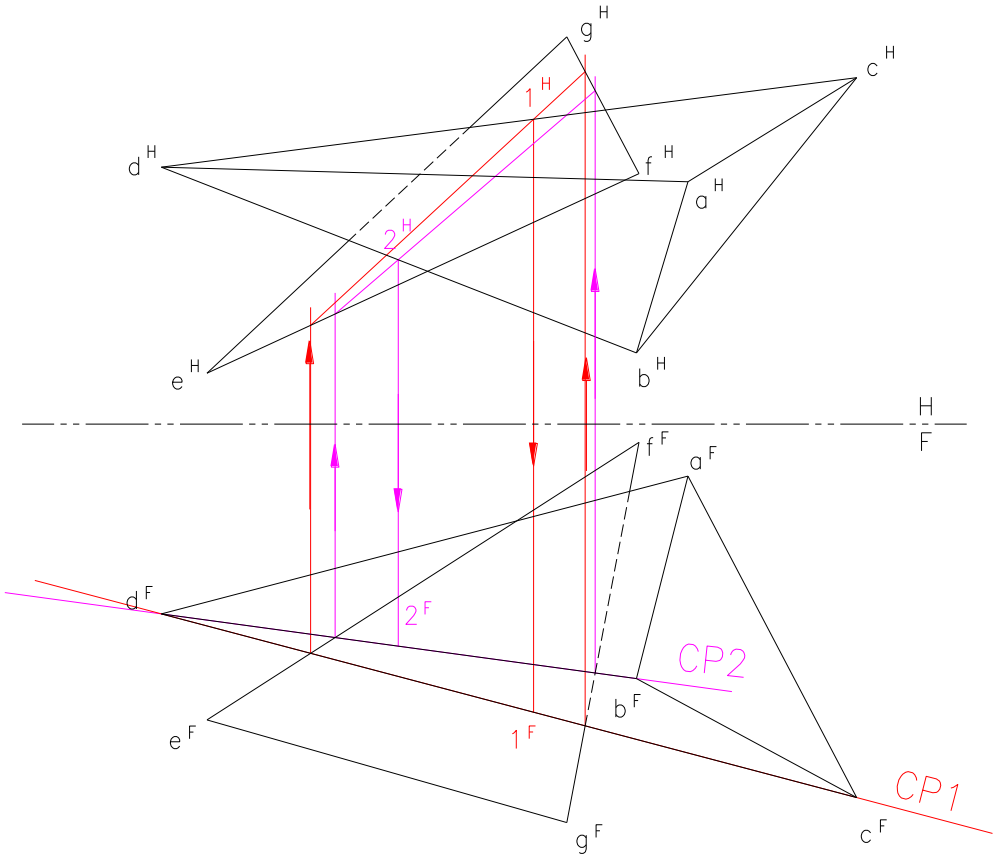
abcd is the polyhedron

efg is the plane that intersects the polyhedron abc

CP1 is the cutting plane whose EV coincides with line cd of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 1

Intersection of plane and polyhedron

A INTERSECTION OF A PLANE AND A POLYHEDRON.
CUTTING PLANE METHOD.



abcd is the polyhedron

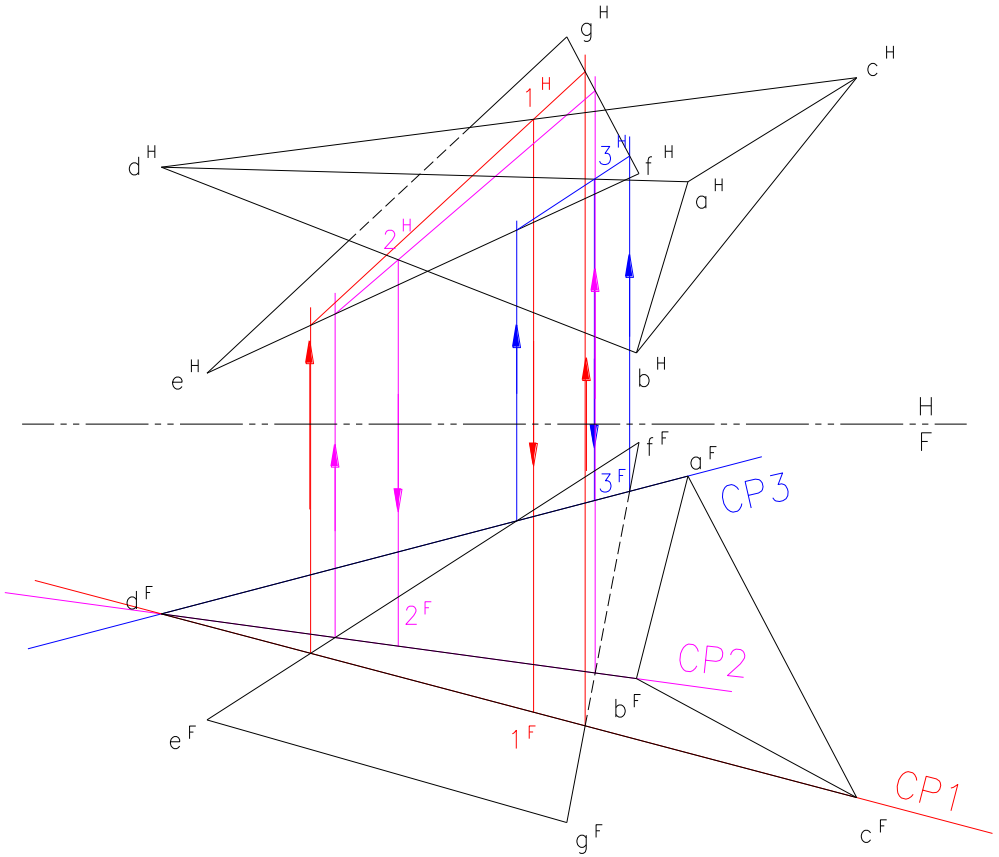
efg is the plane that intersects the polyhedron abc

CP1 is the cutting plane whose EV coincides with line cd of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 1

CP2 is the cutting plane whose EV coincides with line db of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 2

Intersection of plane and polyhedron

A INTERSECTION OF A PLANE AND A POLYHEDRON.
CUTTING PLANE METHOD.



abcd is the polyhedron

efg is the plane that intersects the polyhedron abc

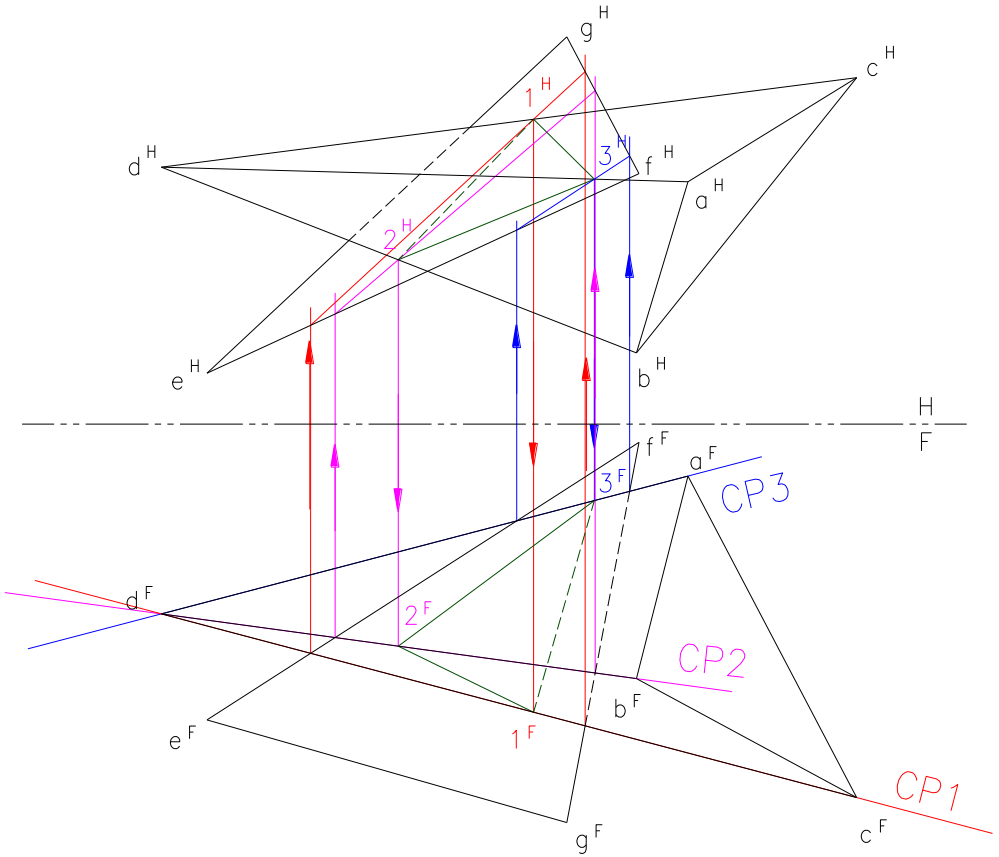
CP1 is the cutting plane whose EV coincides with line cd of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 1

CP2 is the cutting plane whose EV coincides with line db of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 2

CP3 is the cutting plane whose EV coincides with line da of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 3

Intersection of plane and polyhedron

A INTERSECTION OF A PLANE AND A POLYHEDRON.
CUTTING PLANE METHOD.



abcd is the polyhedron

efg is the plane that intersects the polyhedron abc

CP1 is the cutting plane whose EV coincides with line cd of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 1

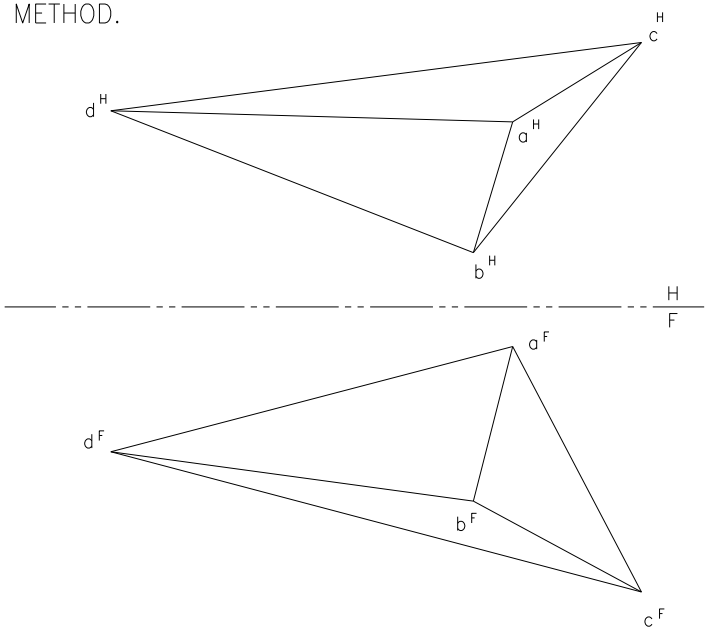
CP2 is the cutting plane whose EV coincides with line db of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 2

CP3 is the cutting plane whose EV coincides with line da of the polyhedron in the FV.
project the points of intersctions on to the TV and find the piercing point 3

Connect points 1, 2, 3 to get the intersection between the plane efg and the polyhedron abcd

Intersection of plane and polyhedron

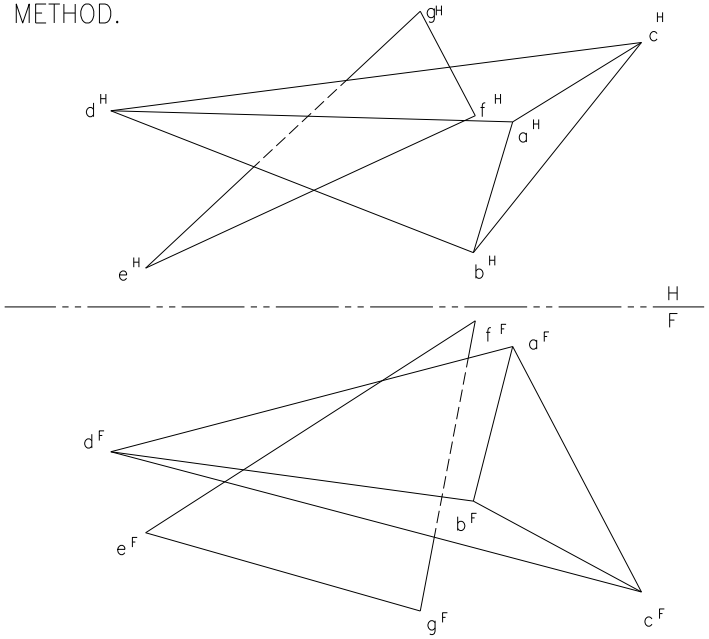
B INTERSECTION OF A PLANE AND A POLYHEDRON.
EDGE VIEW METHOD.



abcd is the polyhedron

Intersection of plane and polyhedron

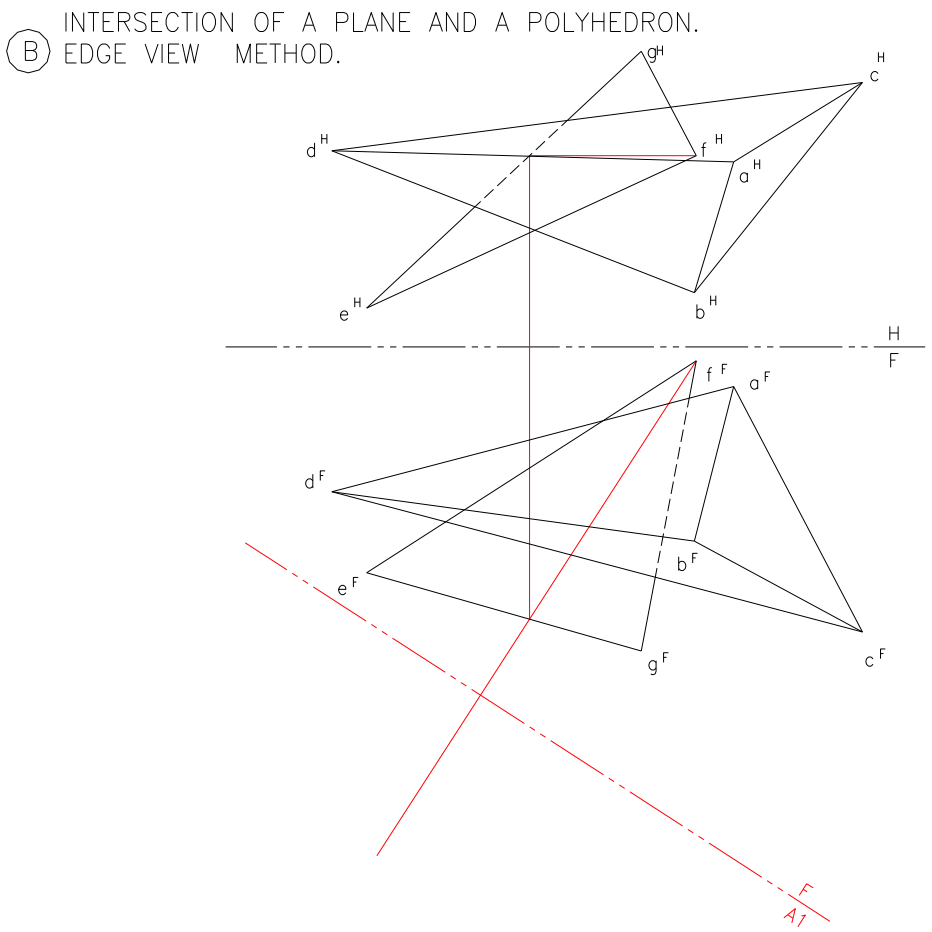
(B) INTERSECTION OF A PLANE AND A POLYHEDRON.
EDGE VIEW METHOD.



abcd is the polyhedron

efg is the plane that intersects the polyhedrong abcd

Intersection of plane and polyhedron

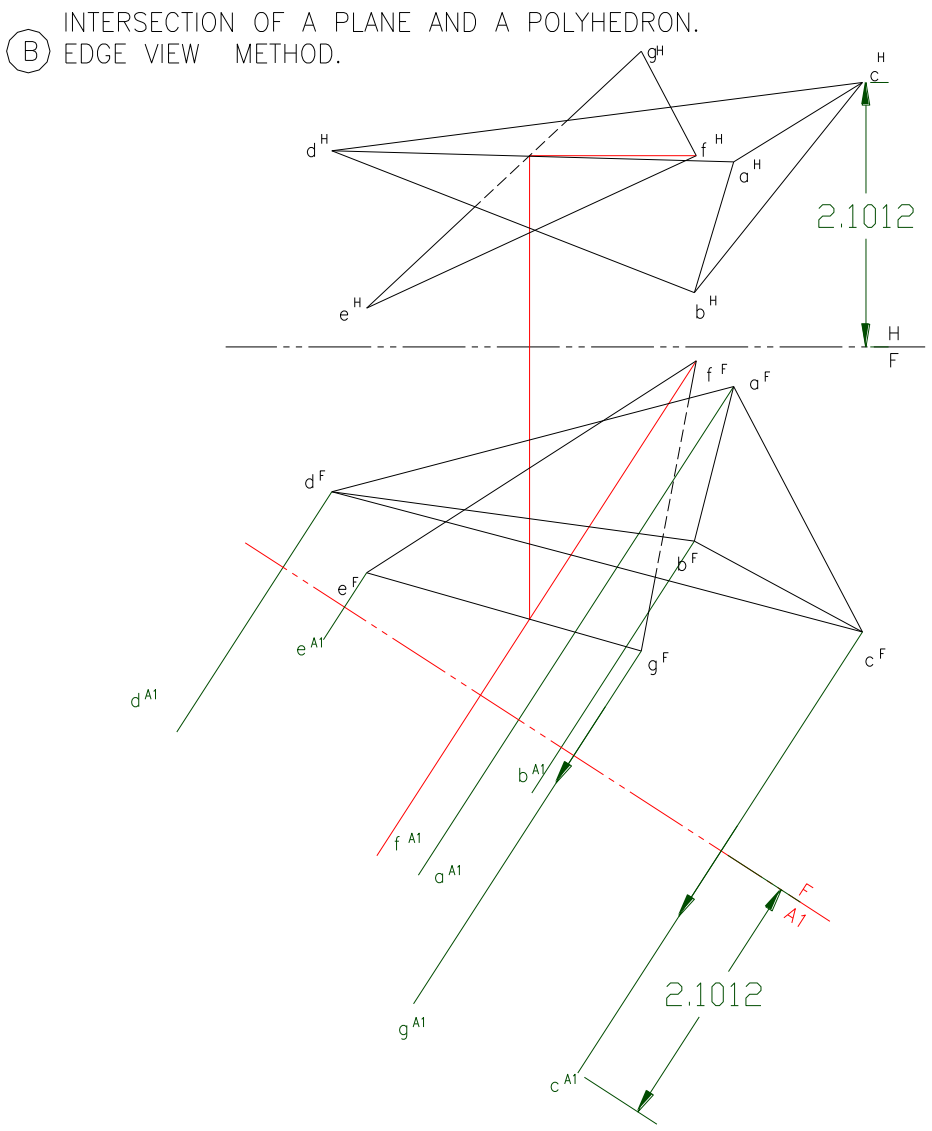


abcd is the polyhedron

efg is the plane that intersects the polyhedrong abcd

In the EV method, draw the EV of the plane

Intersection of plane and polyhedron



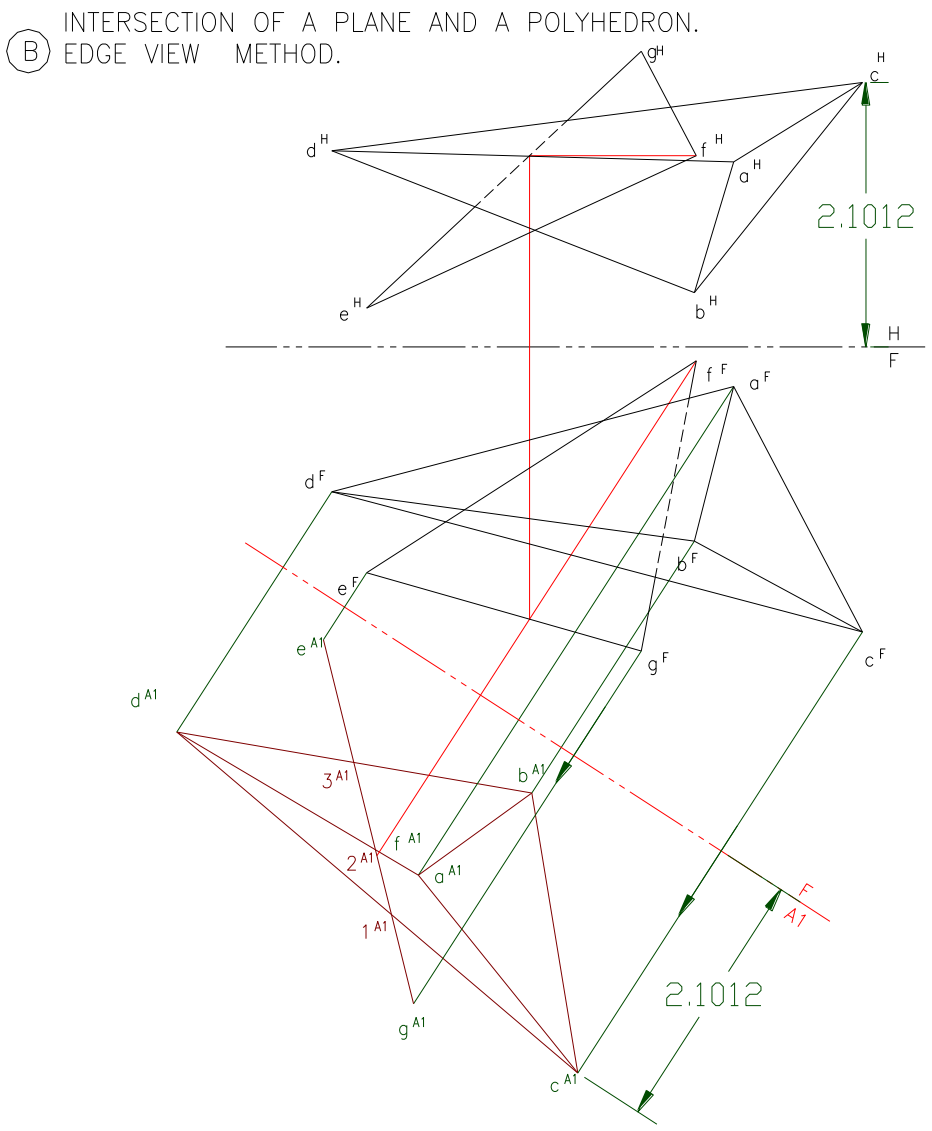
abcd is the polyhedron

efg is the plane that intersects the polyhedrong abcd

In the EV method, draw the EV of the plane

Project the points abcdefg, parallel to the TL line in the plane

Intersection of plane and polyhedron



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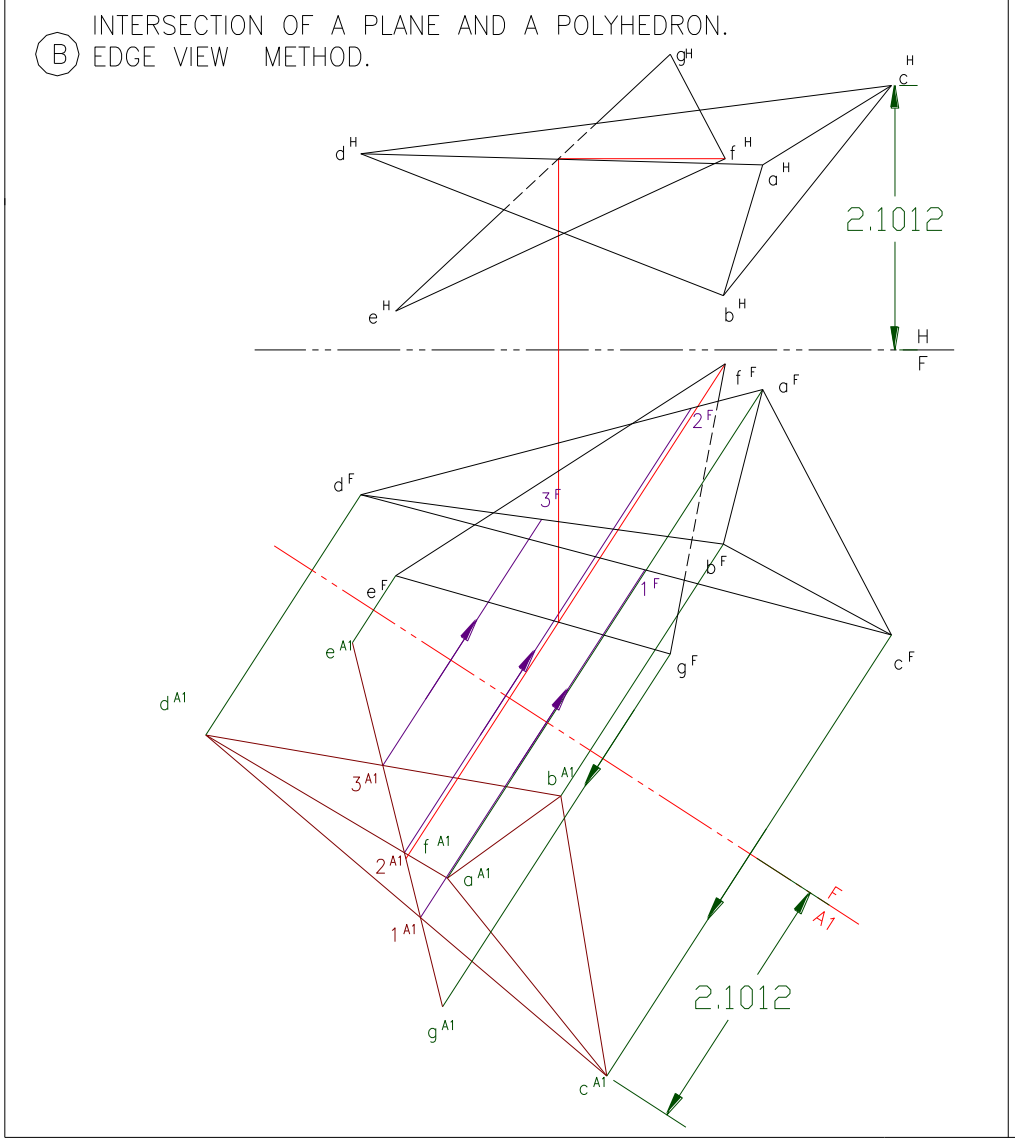
In the EV method, draw the EV of the plane

Project the points abcdefg, parallel to the TL line in the plane

Complete the polyhedron in that view and the EV of the plane efg. Here you can find the piercing points 1 2 and 3

Intersection of plane and polyhedron



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In the EV method, draw the EV of the plane

Project the points abcdefg, parallel to the TL line in the plane

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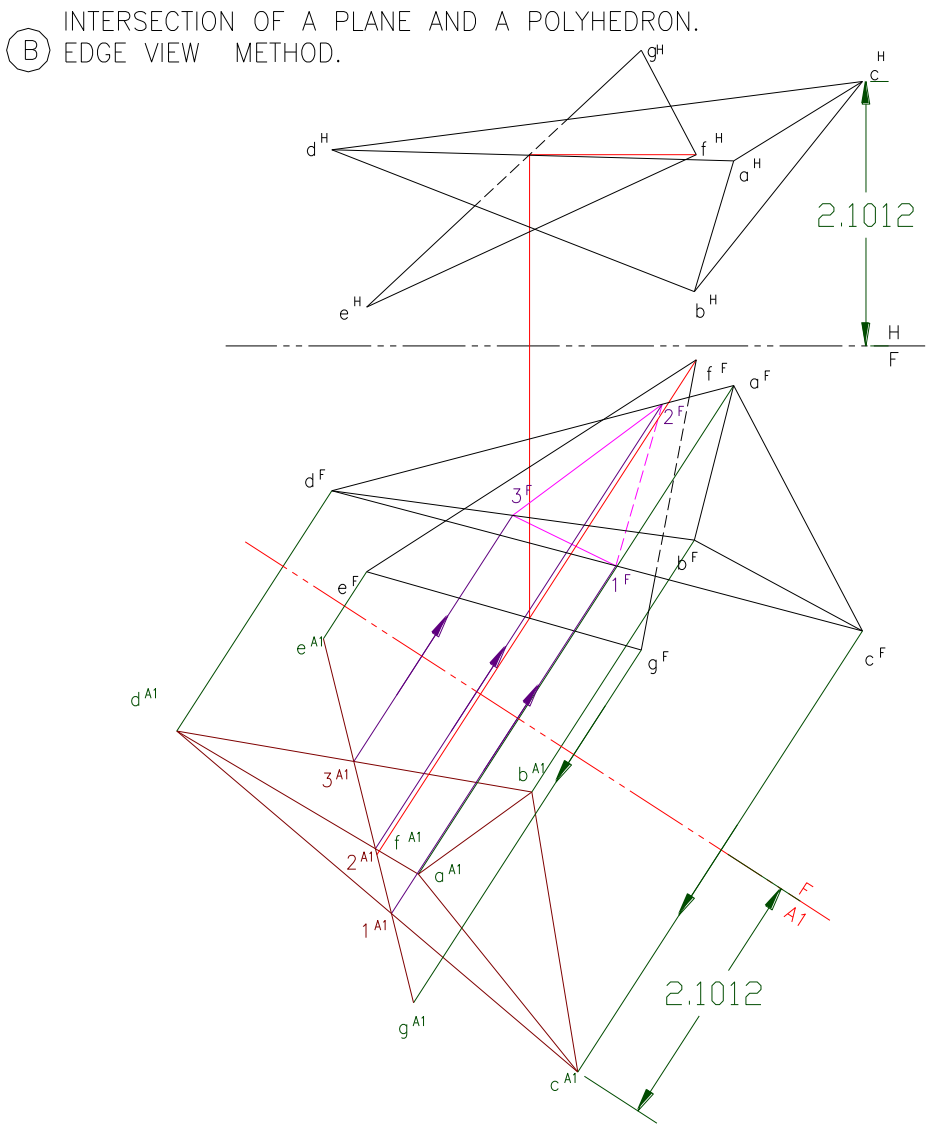
Project the piercing points 1, 2, 3 back to the FV from the aux view based on the edges in the polyhedron

Intersection of plane and polyhedron



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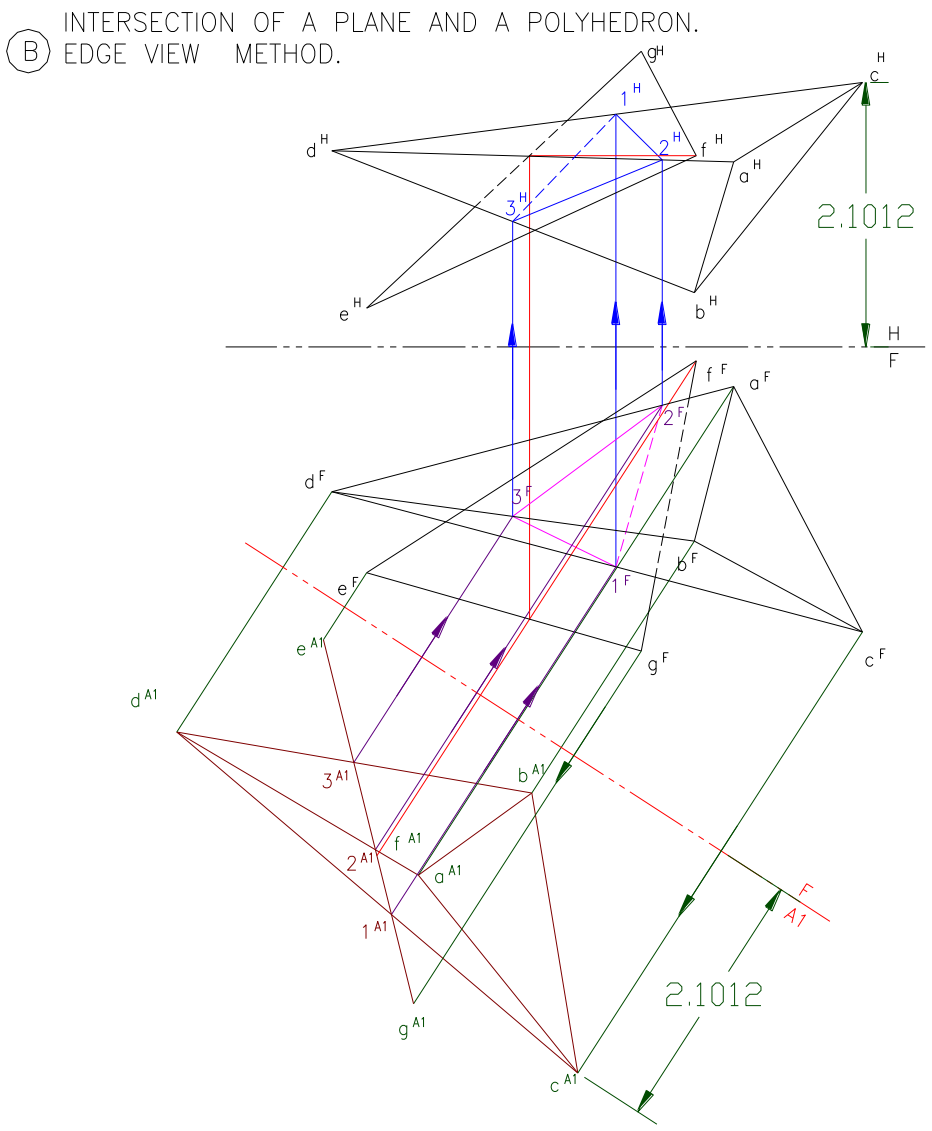
Join the points 1, 2, 3 in propoer order to get the plane of intersection in the FV

Intersection of plane and polyhedron



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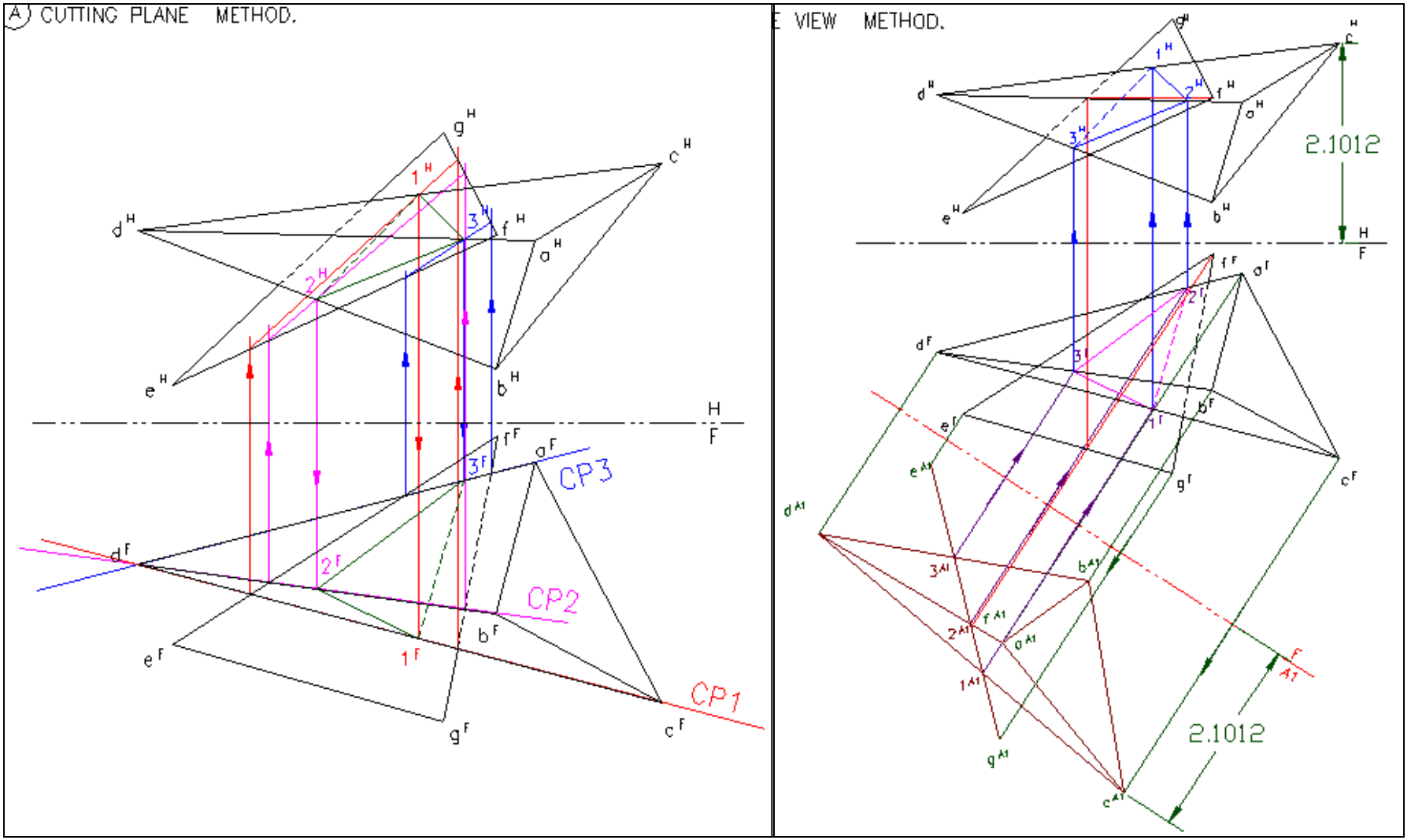
Complete the polyhedron in that view and the EV of the plane efg. Here you can find the piercing points 1 2 and 3

Project the piercing points 1, 2, 3 back to the FV from the aux view based on the edges in the polyhedron

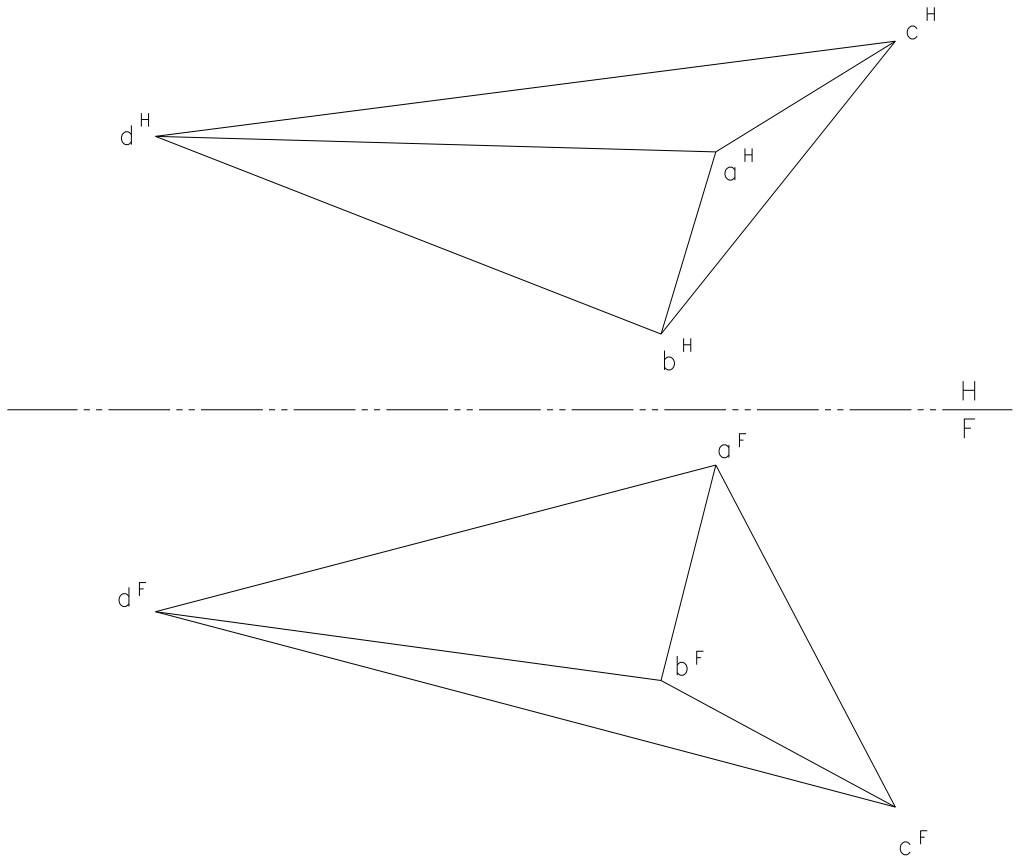
Join the points 1, 2, 3 in propoer order to get the plane of intersection in the FV

Project the points from the FV to the TV and complete the plane in the TV as well

Intersection of plane and polyhedron



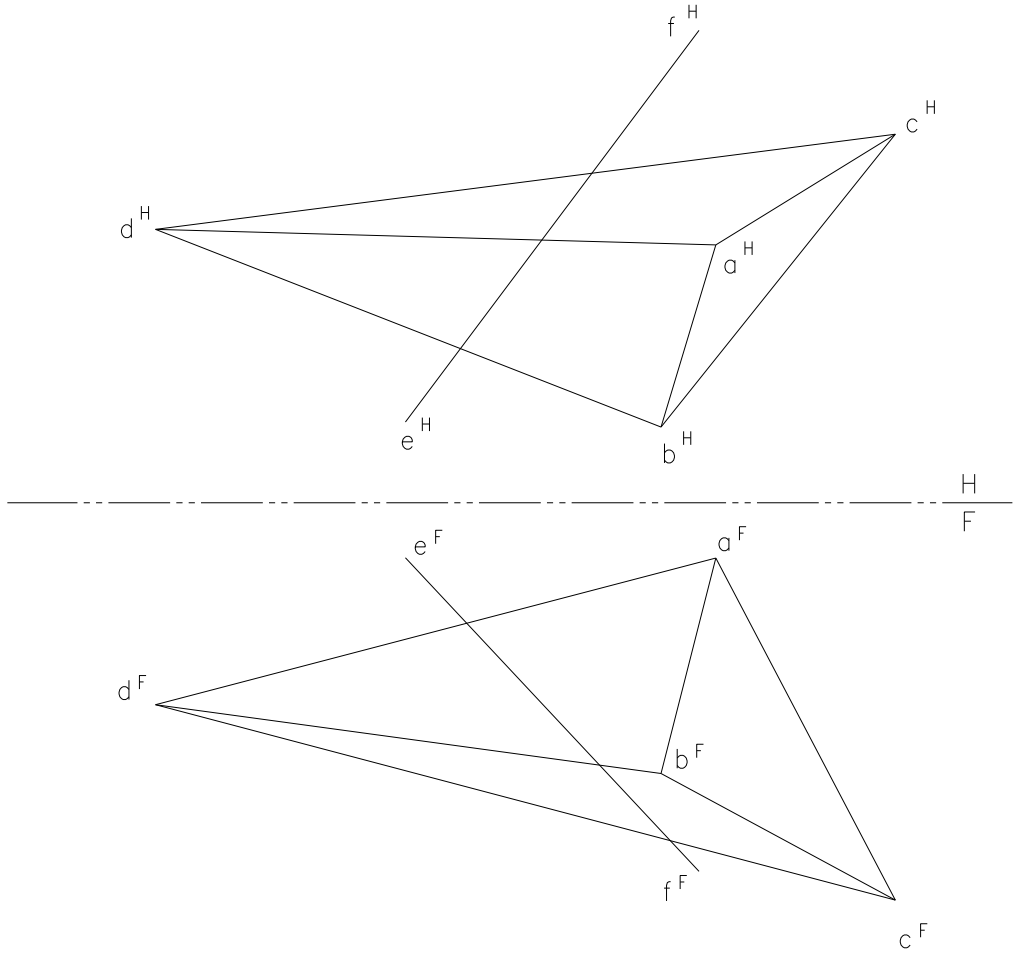
Intersection of line with polyhedron



abcd is the polyhedron

Intersection of line with polyhedron

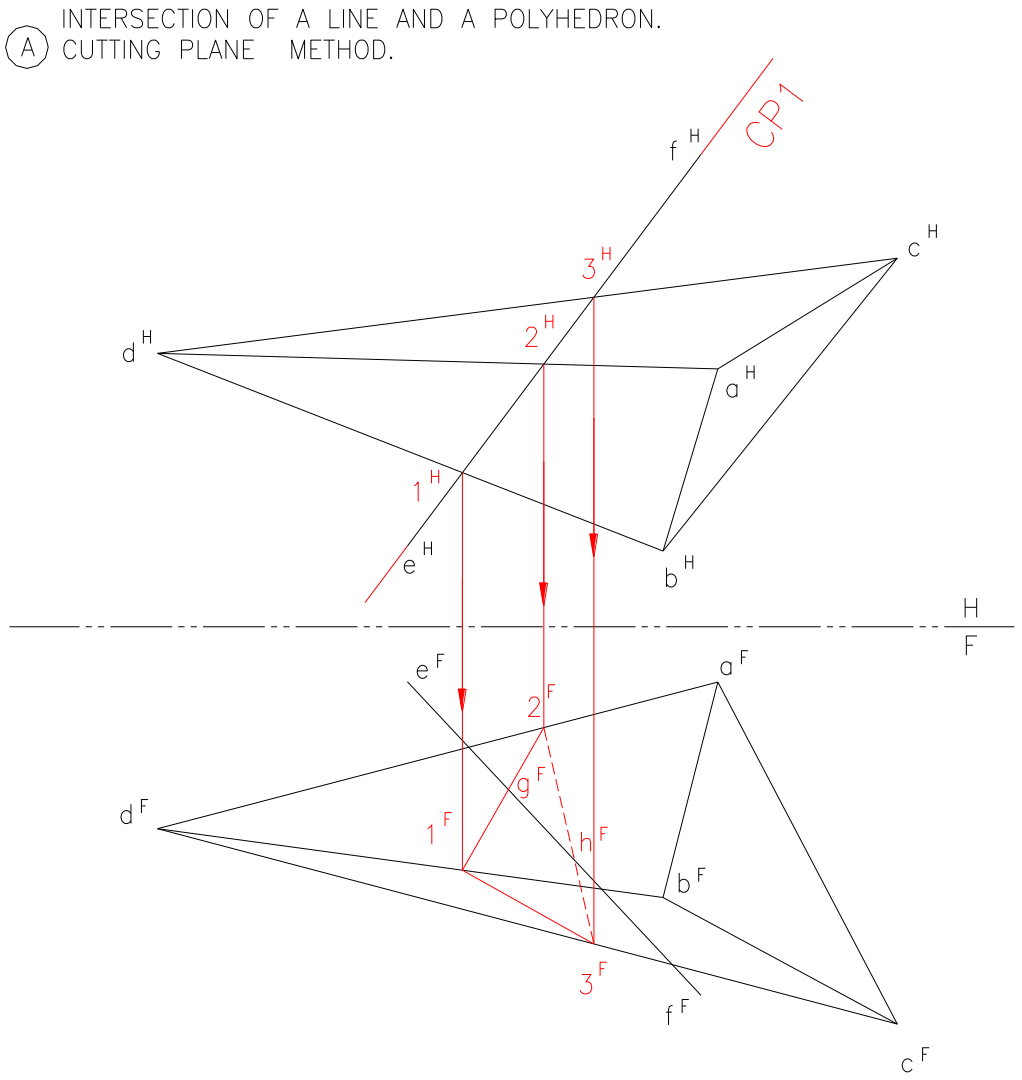
(A) INTERSECTION OF A LINE AND A POLYHEDRON.
CUTTING PLANE METHOD.



abcd is the polyhedron

ef is the line intersecting the polyhedron abcd. A line must intersect the surface of a polyhedron at two points.
An plane containing the given line will help us determine the two points of intersection.

Intersection of line with polyhedron



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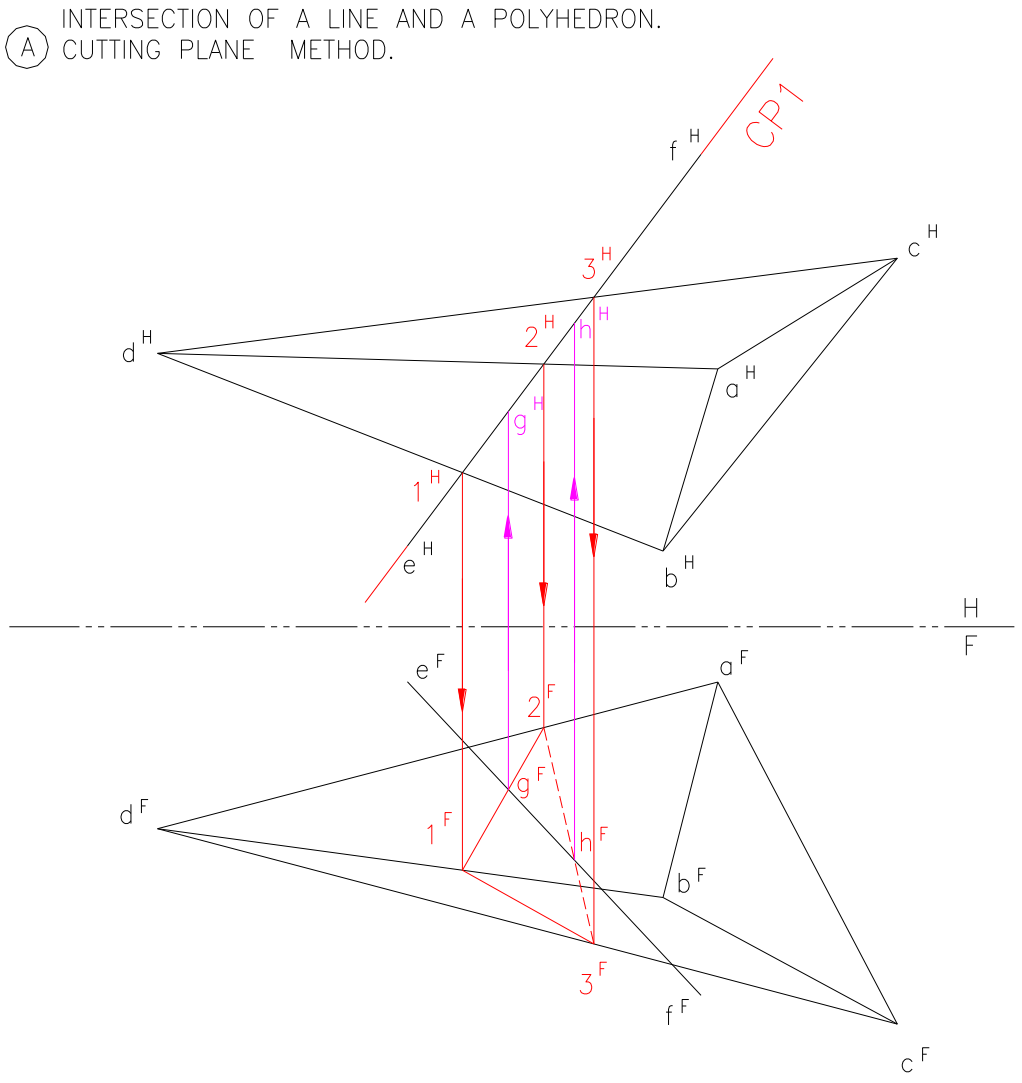
To simplify the solution we will use a plane that appears as an edge in one of the views (CP1). Project the points where line intersects the edges of the polyhedron to the TV. This will give the plane of intersection 123

Intersection of line with polyhedron



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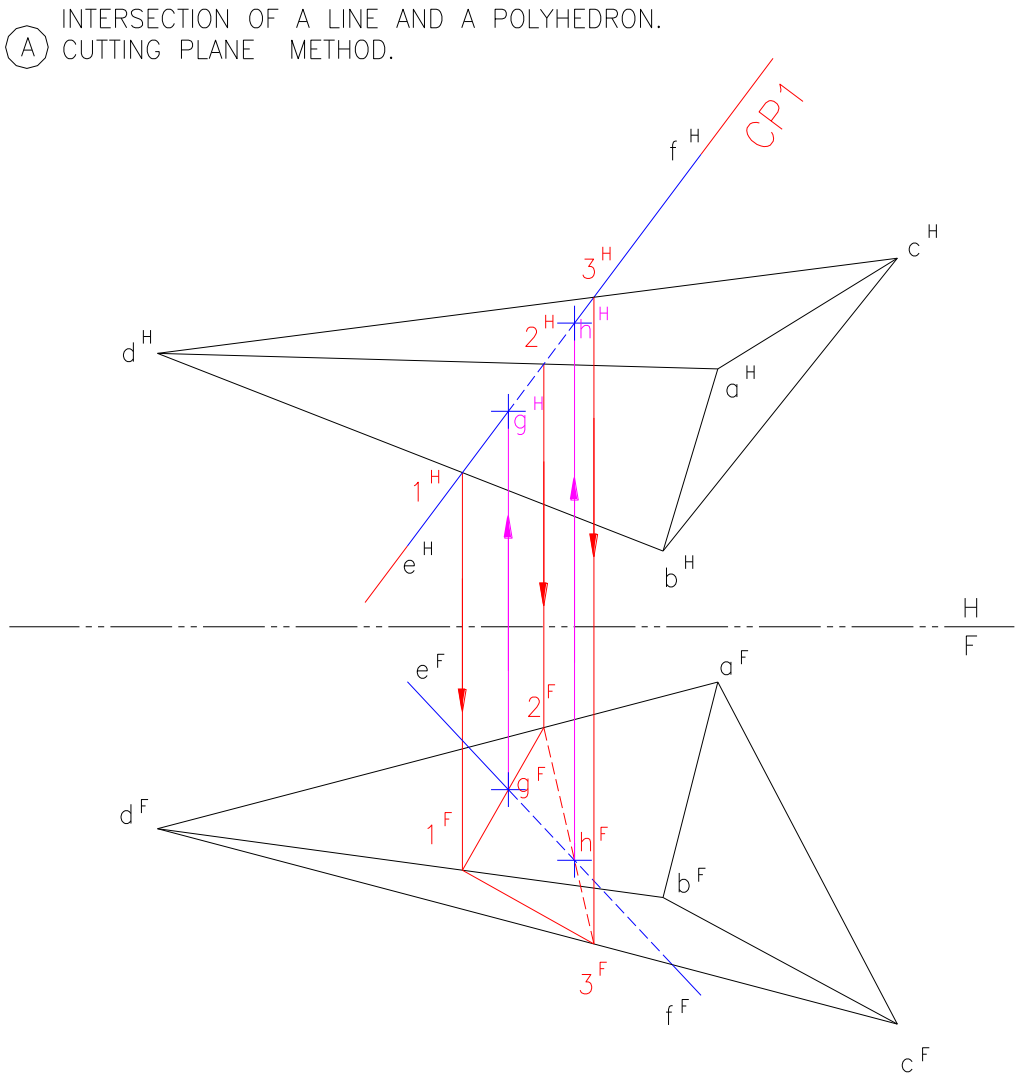
The line of intersection should be within this plane. So mark the piercing poings g and h where the line intersects the plane 123.

Project the points to the TV. This will give the line of intersection between polygon abcd and line ef.

Intersection of line with polyhedron



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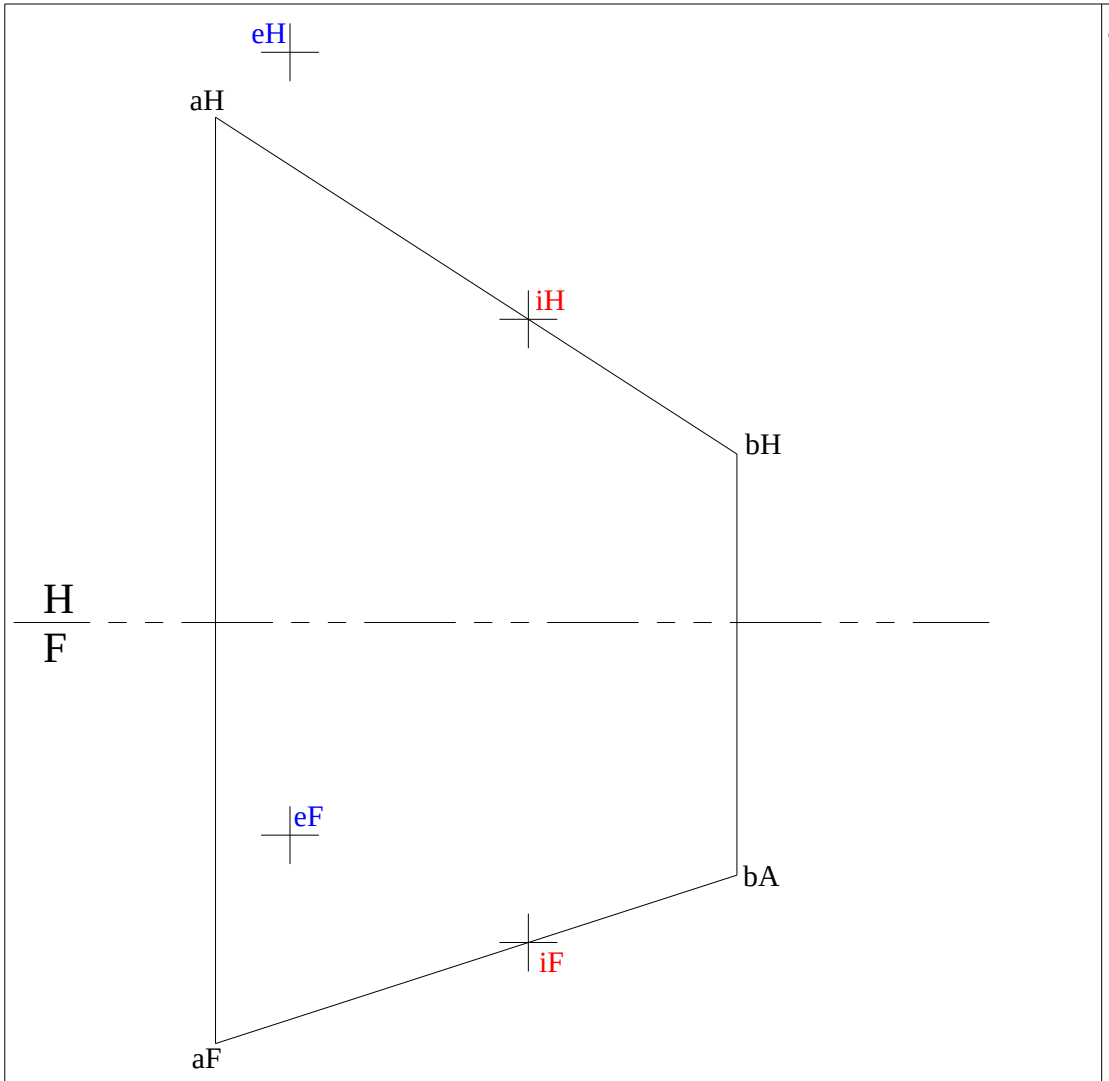
The line of intersection should be within this plane. So mark the piercing poings g and h where the line intersects the plane 123.

Project the points to the TV. This will give the line of intersection between polygon abcd and line ef.

To see the line in the correct visibility with the points of intersection with the polyhedron marked by crosses turn off layer A1OFF and turn on layer A4.

Location of a Plane

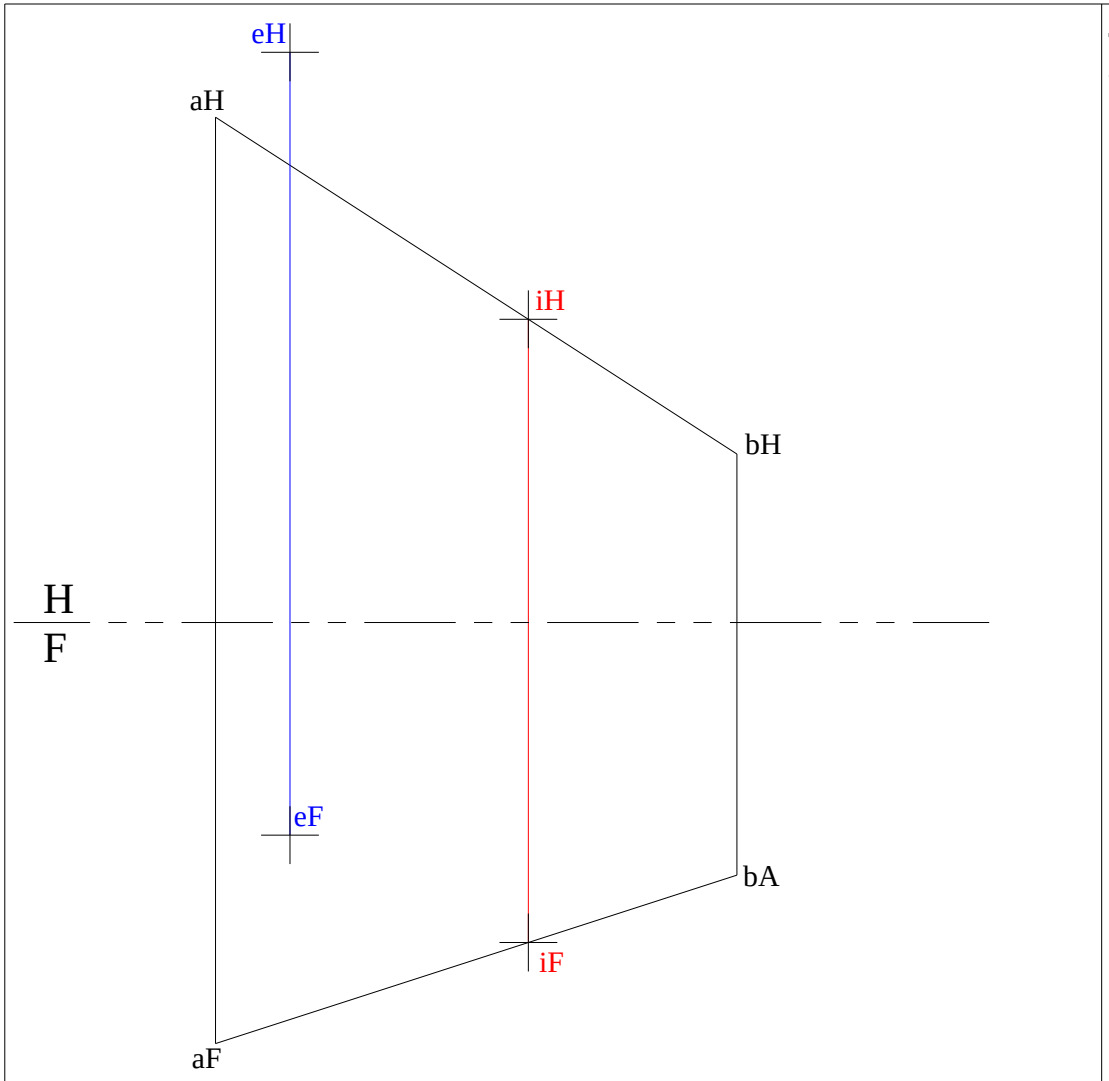
perpendicular to a line through a point



Through the points I and E respectively draw planes that are perpendicular to line AB

Location of a Plane

perpendicular to a line through a point



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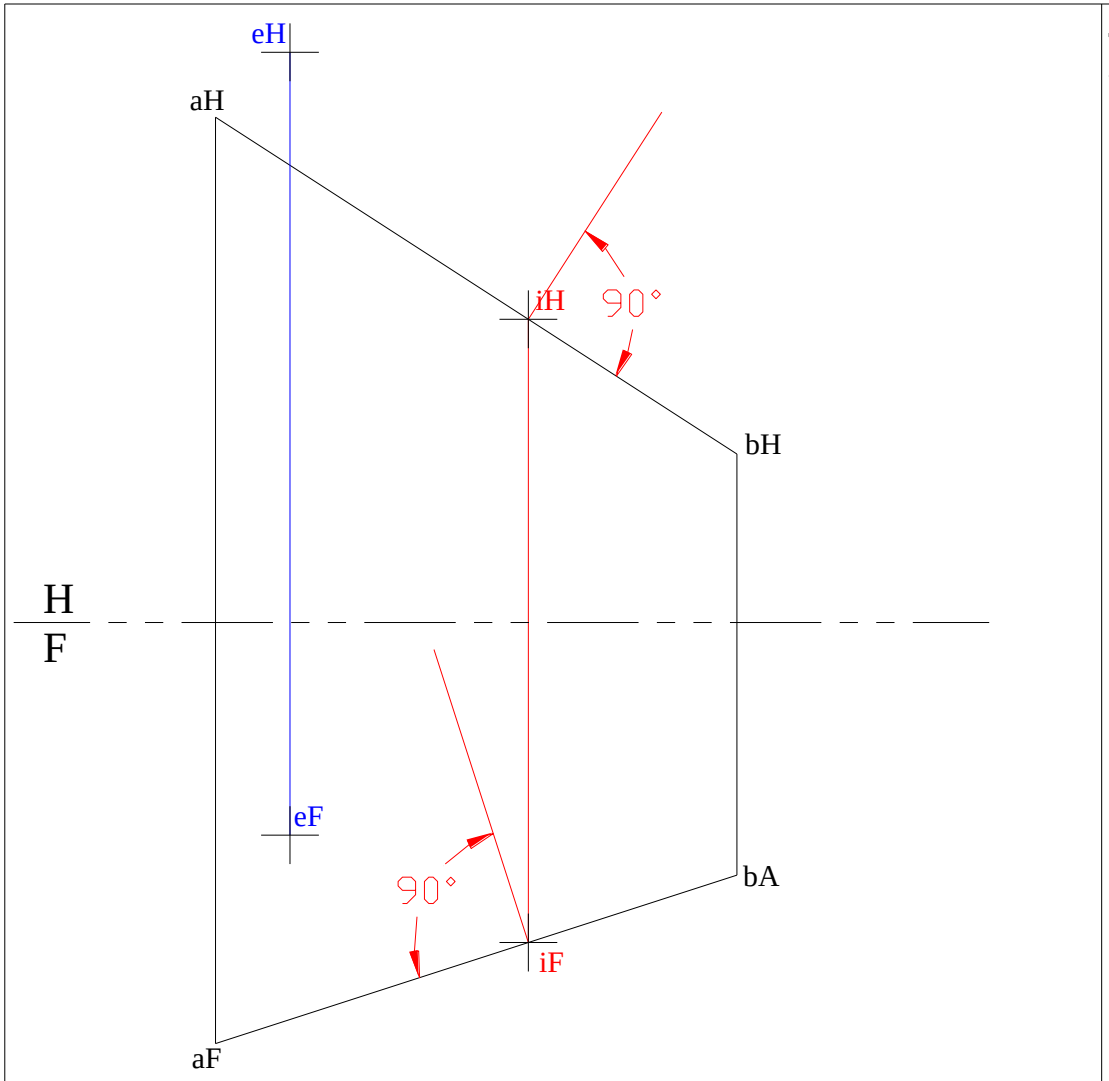
I belongs AB, E does not belong AB

Location of a Plane

perpendicular to a line through a point



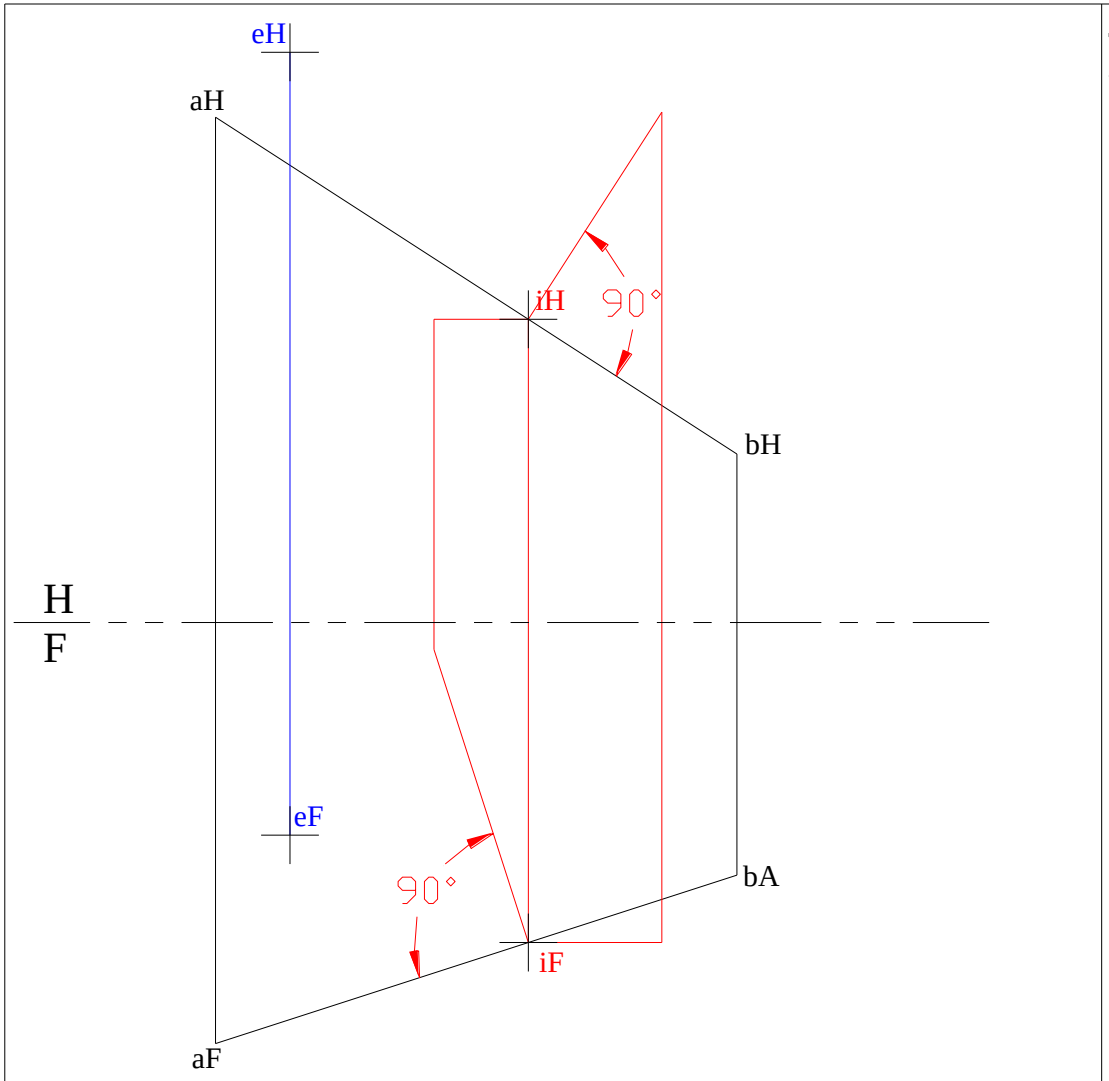
Through the points I and E respectively draw planes that are perpendicular to line AB

I belongs AB, E does not belong AB

Draw lines perpendicular to line ab from point I in both FV and TV

Location of a Plane

perpendicular to a line through a point



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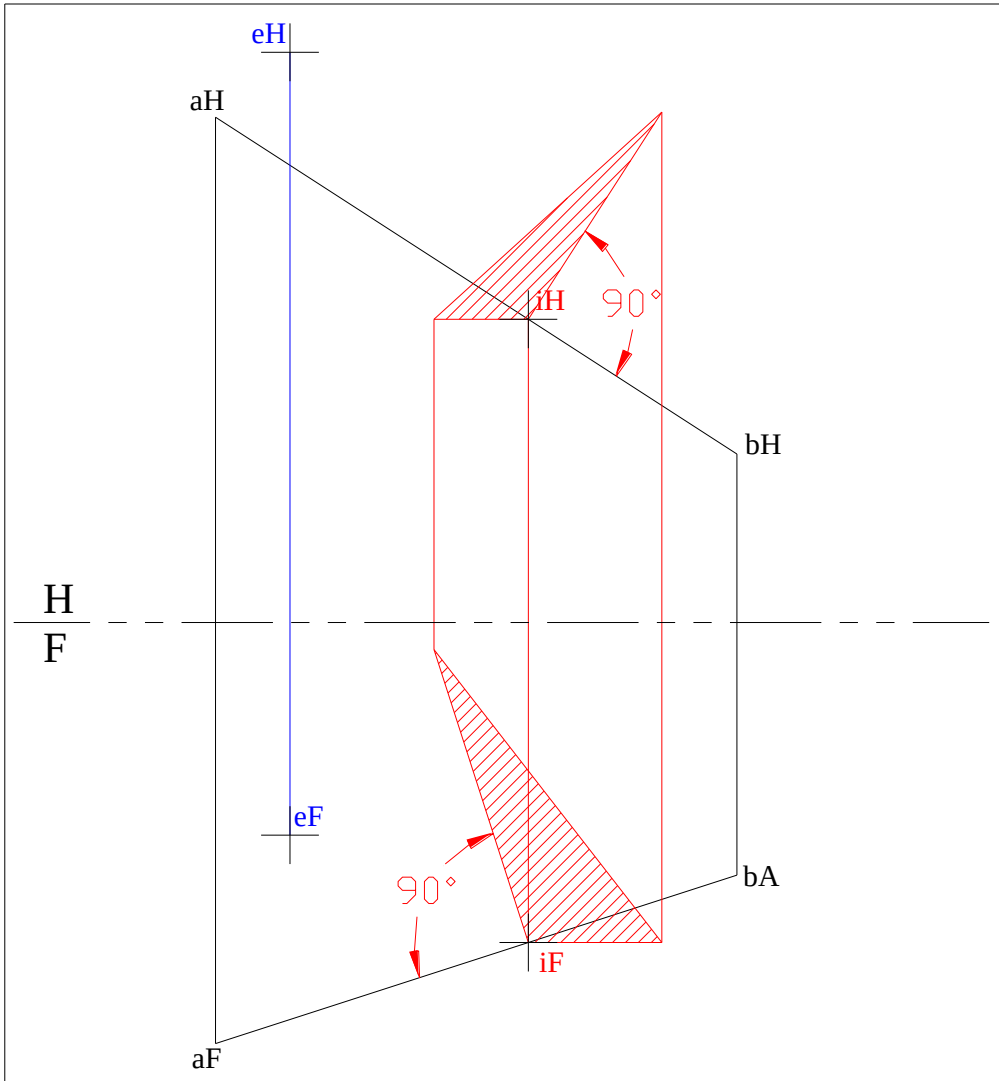
Draw lines perpendicular to line ab from point I in both FV and TV

Perpendicular line must be a TL line. so to make it true length the projection in the adjacent view needs to be parallel to the folding line.

Location of a Plane

perpendicular to a line through a point



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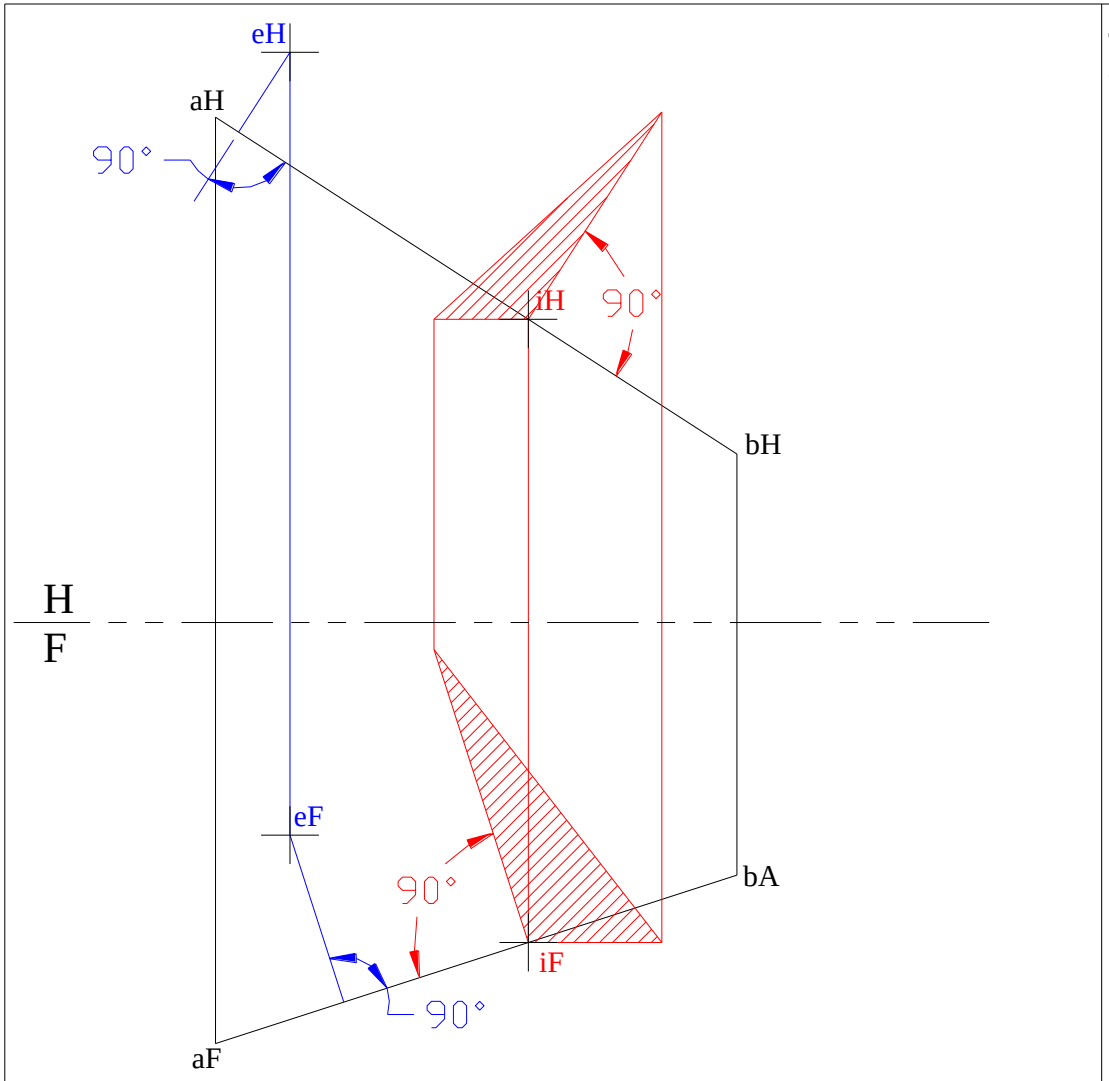
Draw lines perpendicular to line ab from point I in both FV and TV

Perpendicular line must be a TL line. so to make it true length the projection in the adjacent view needs to be parallel to the folding line.

Complete the plane based on the points obtained

Location of a Plane

perpendicular to a line through a point



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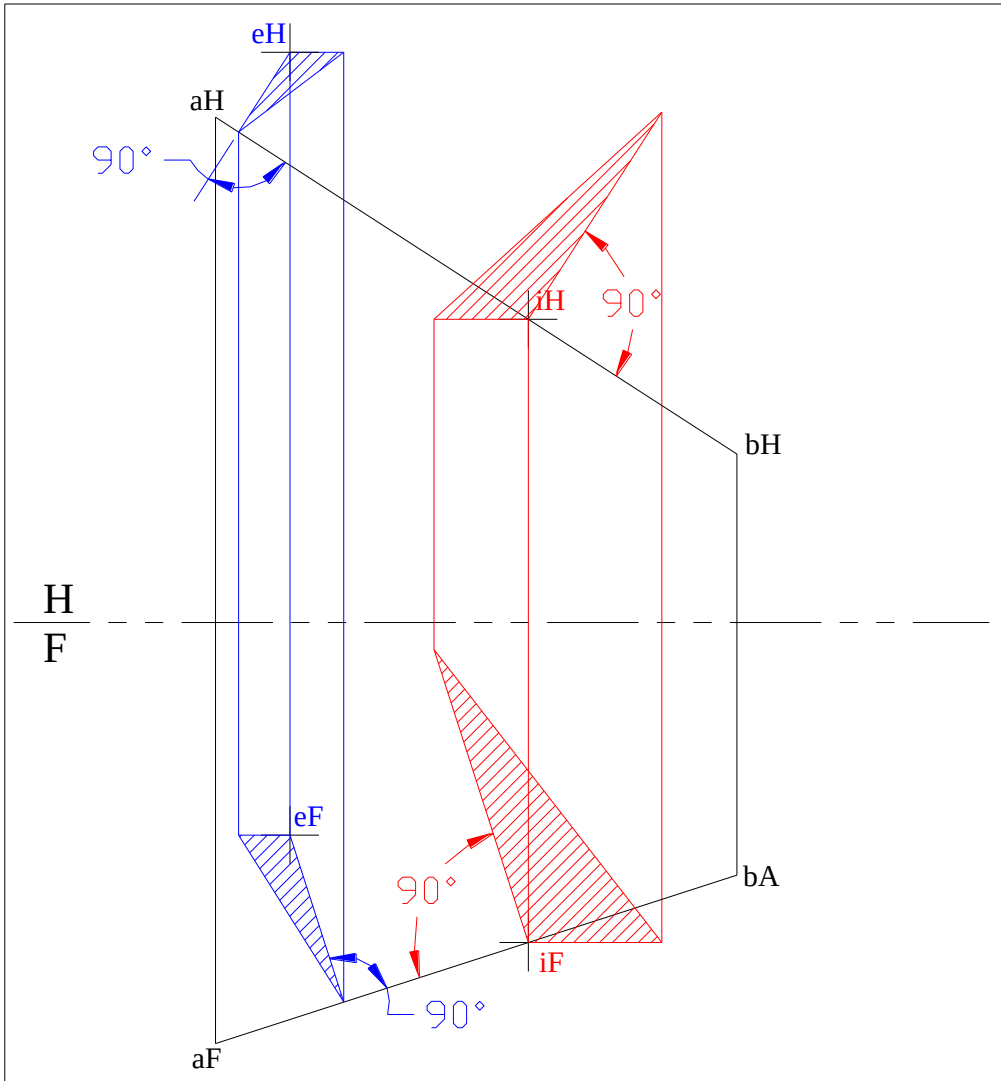
perpendicular to a line through a point



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Perpendicular line must be a TL line. so to make it true length the projection in the adjacent view needs to be parallel to the folding line.

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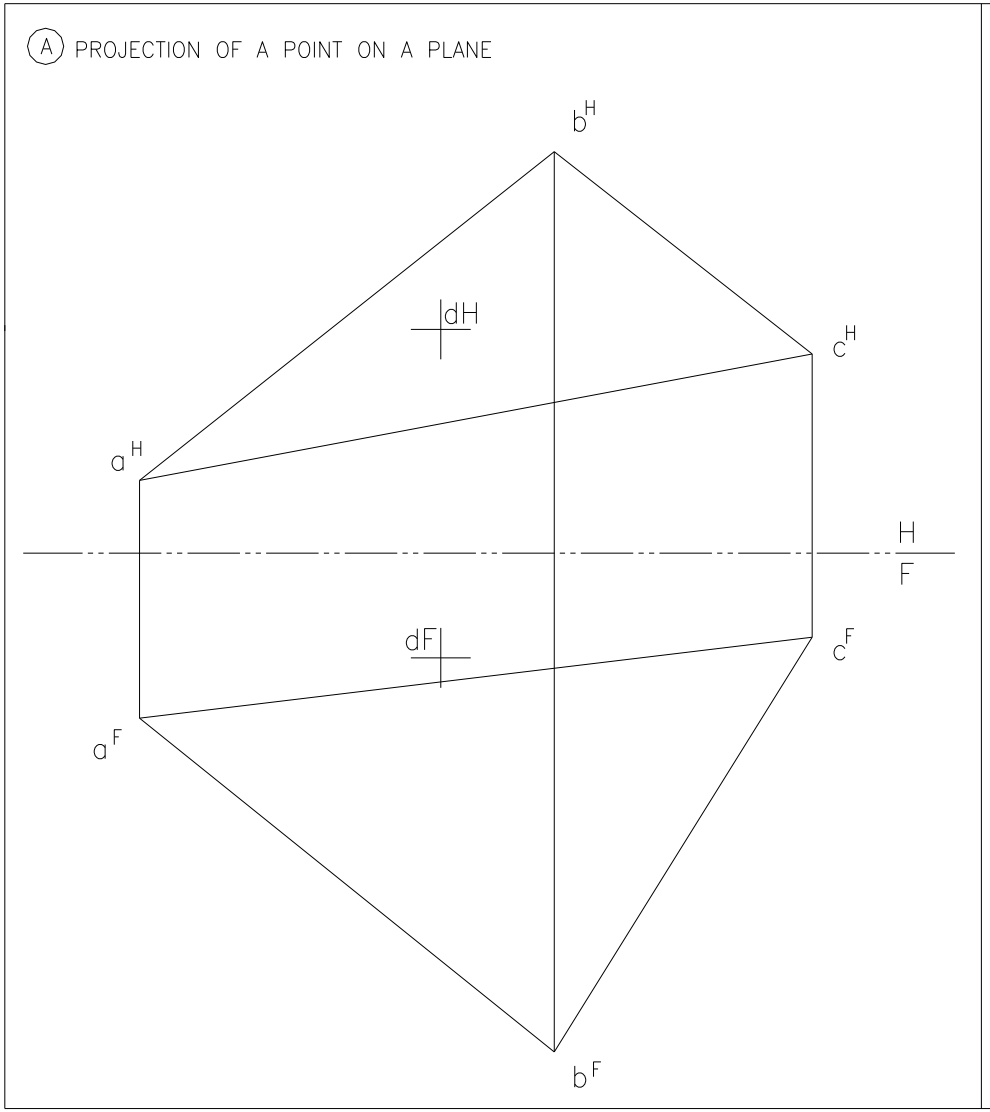
Perpendicular line must be a TL line. so to make it true length the projection in the adjacent view needs to be parallel to the folding line.

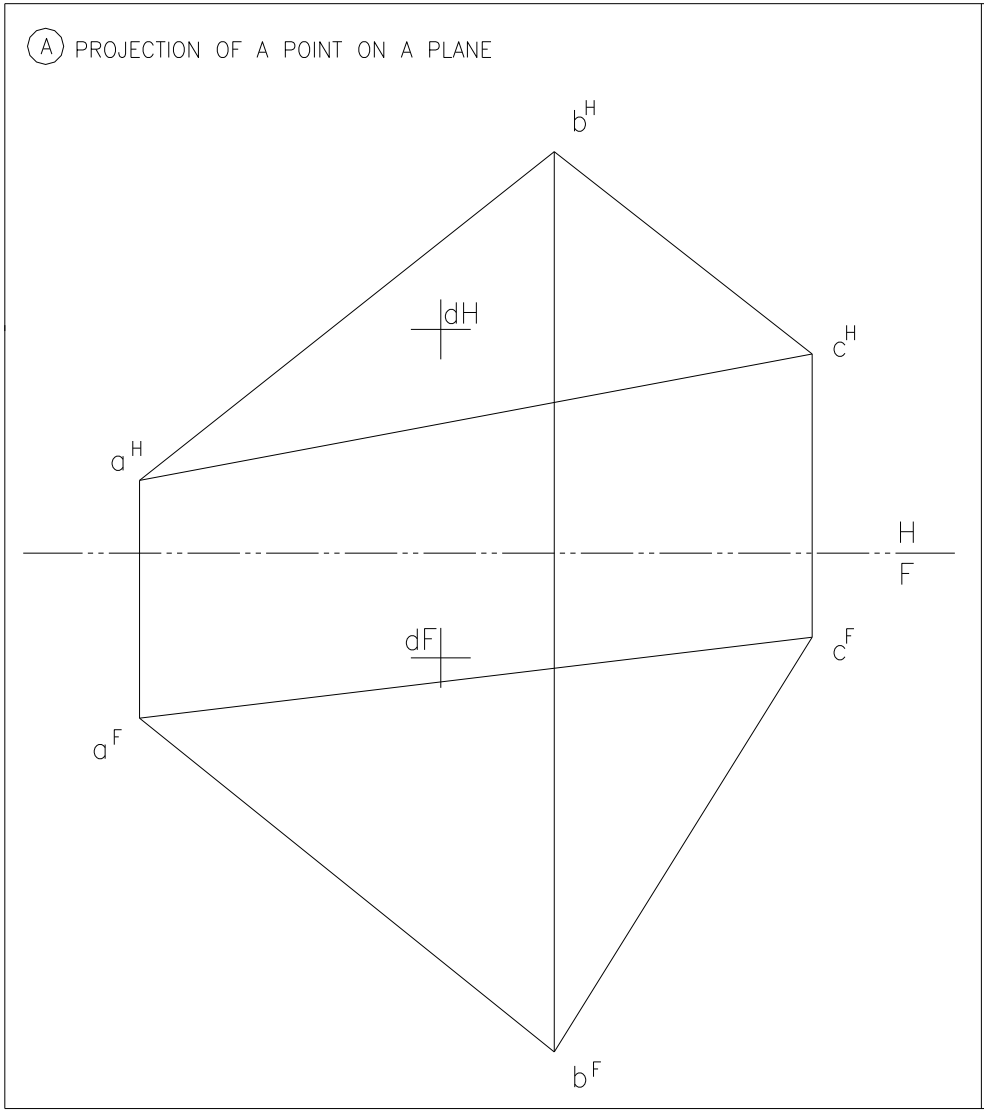
Complete the plane based on the points obtained

Projection of a Point to a Plane



Projection of a point on a plane is like a shadow of point on the plane due to light shining perpedicular to the plane

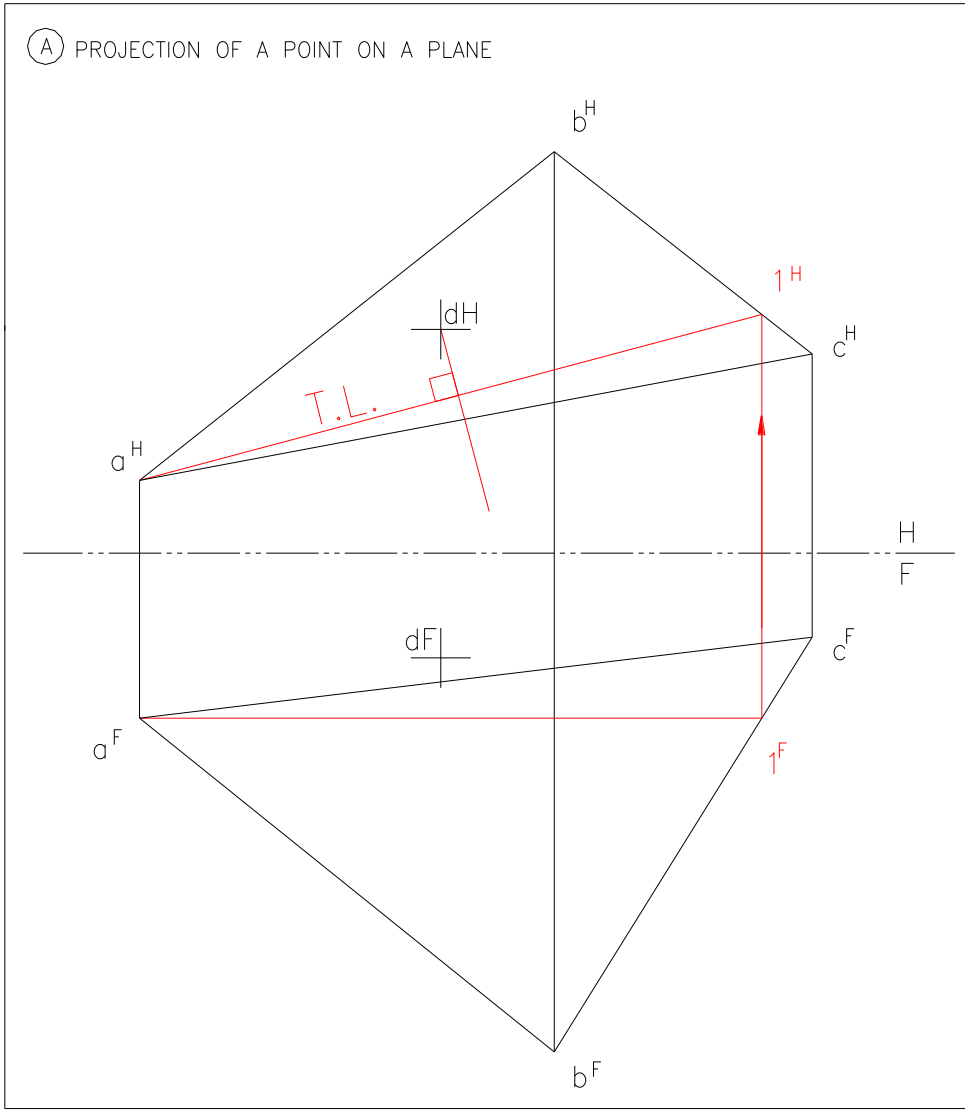
Projection of a Point to a Plane



Projection of a point on a plane is like a shadow of point on the plane due to light shining perpedicular to the plane

This problem may be conviniently subdivided into two:
1. Construction of a perpendicular from a geven point (D) to the plane (ABC).
2. Location of the point of intersection of the perpendicular with the plane.

Projection of a Point to a Plane



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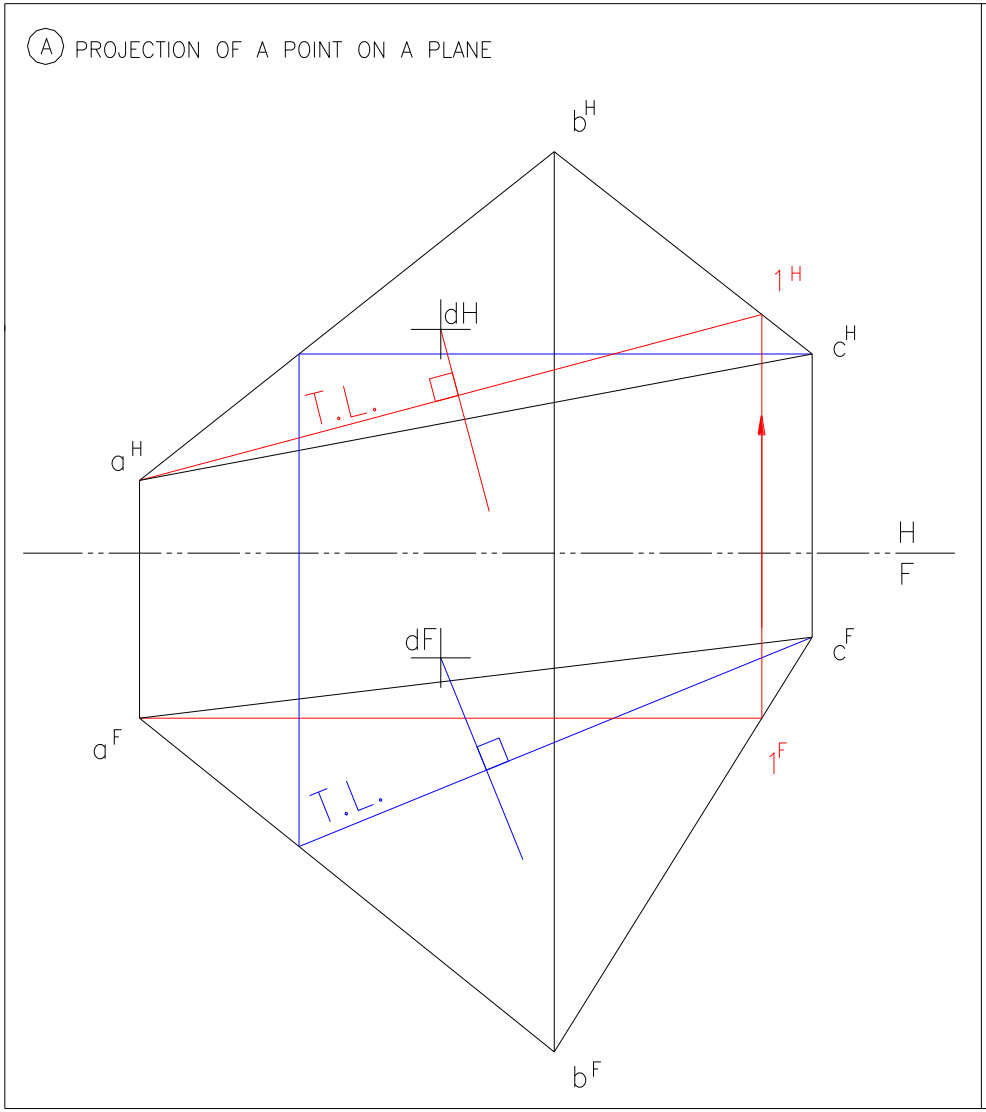
1. A perpendicular to a plane must be perpendicular to any two lines in that plane.
A right angle is seen as such if one of the lines forming it is a True Length.
The horizontal projection of the perpendicular from D to ABC is located.

Projection of a Point to a Plane



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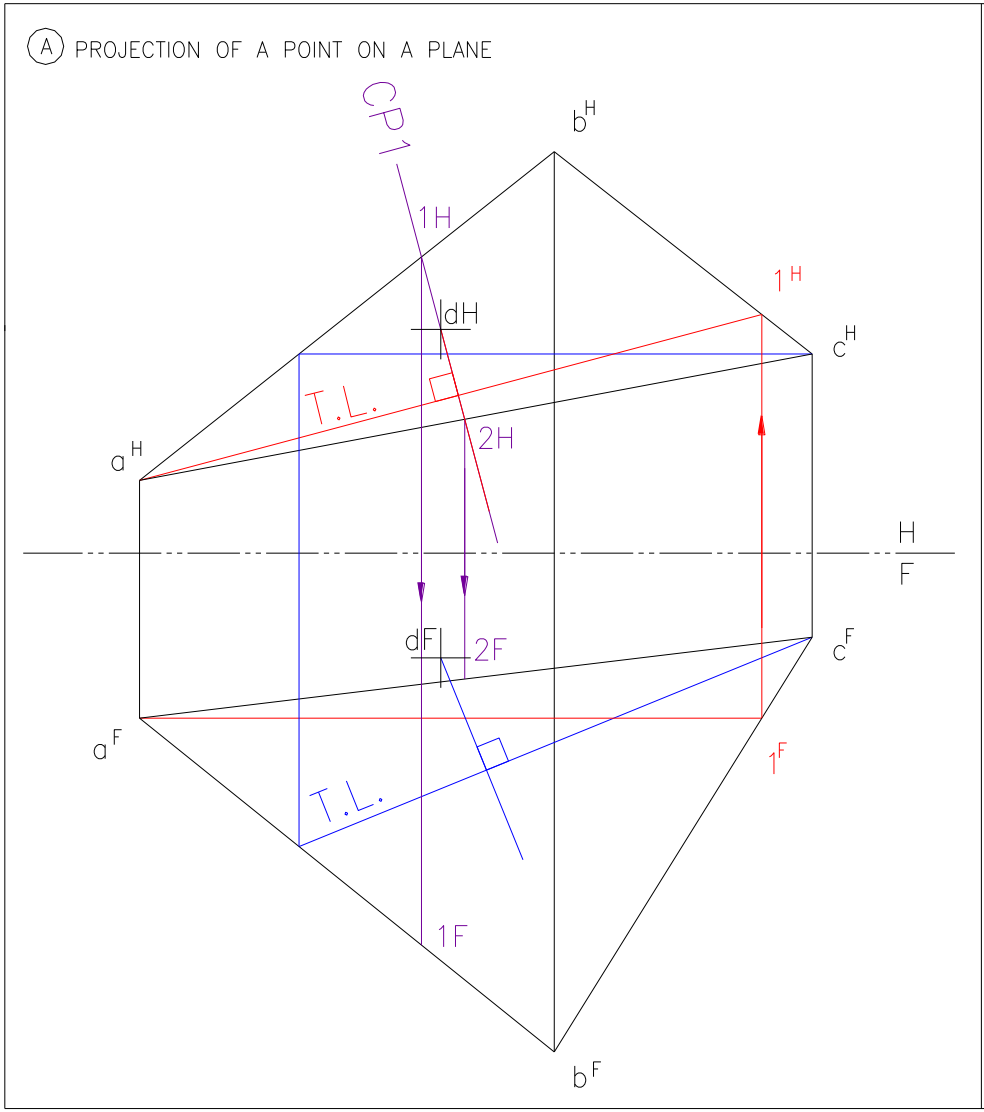
Similarly the frontal projection of the perpendicular is located.

Projection of a Point to a Plane



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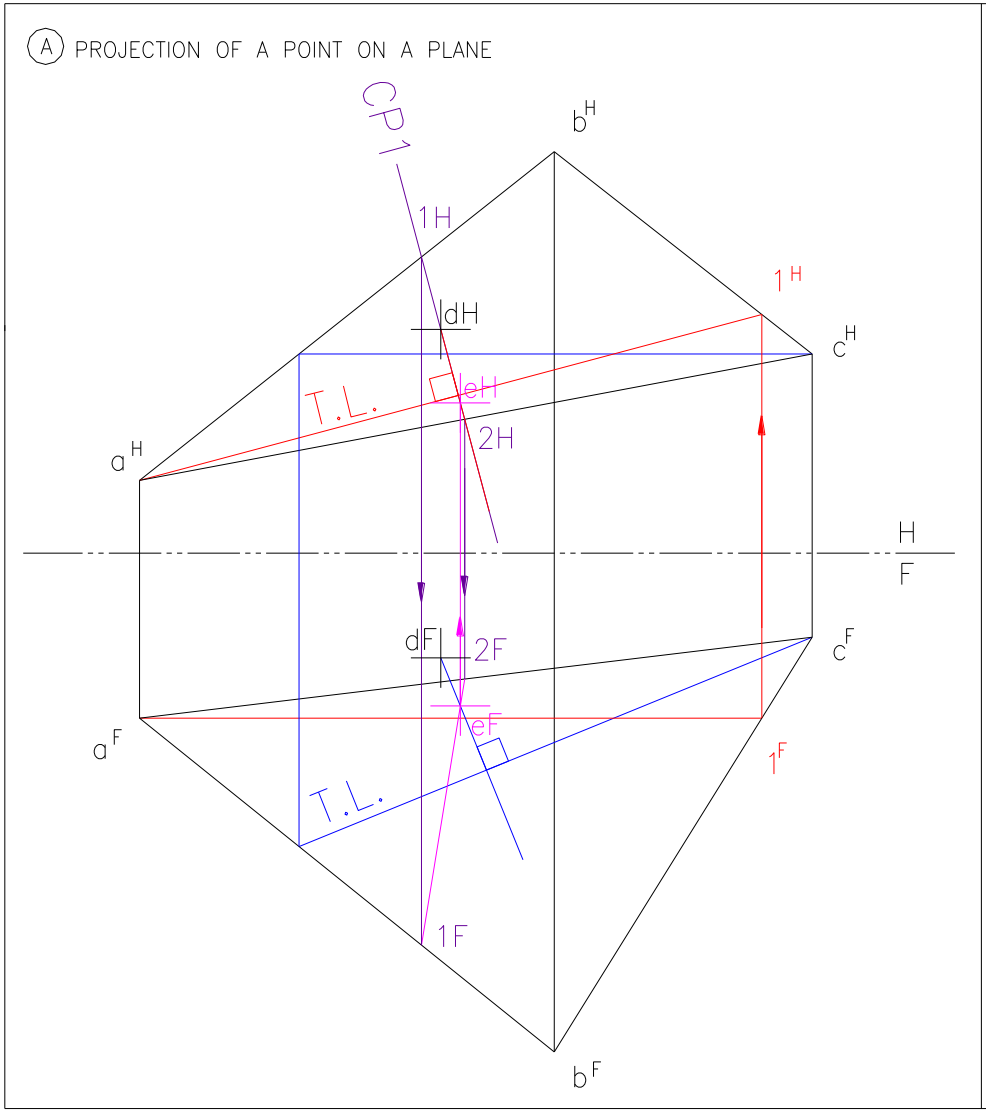
2. The intersection (E) of the perpendicular with the plane is located with the help of cutting plane CP1 passing through horizontal projection of the perpendicular.

Projection of a Point to a Plane



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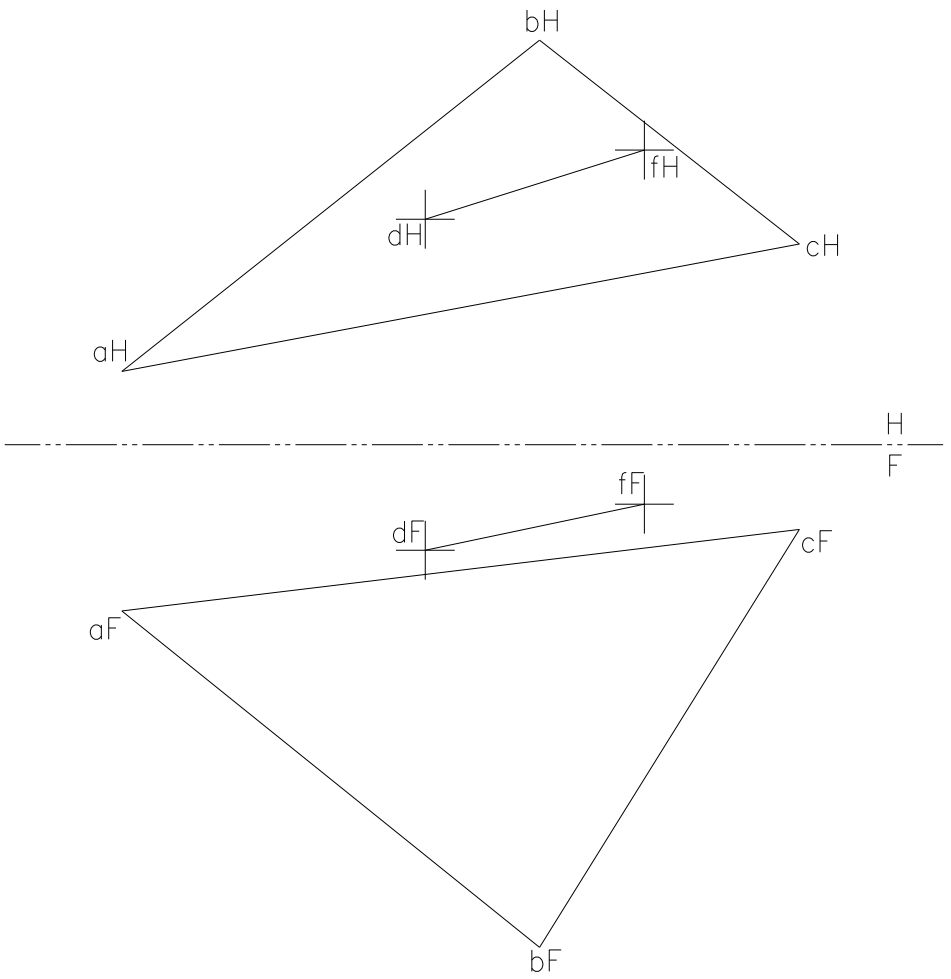
The point of intersection with the plane is found on the intersection of the perpendicular and the trace (12) of the cutting plane on ABC in the frontal view and projected back to the horizontal view.

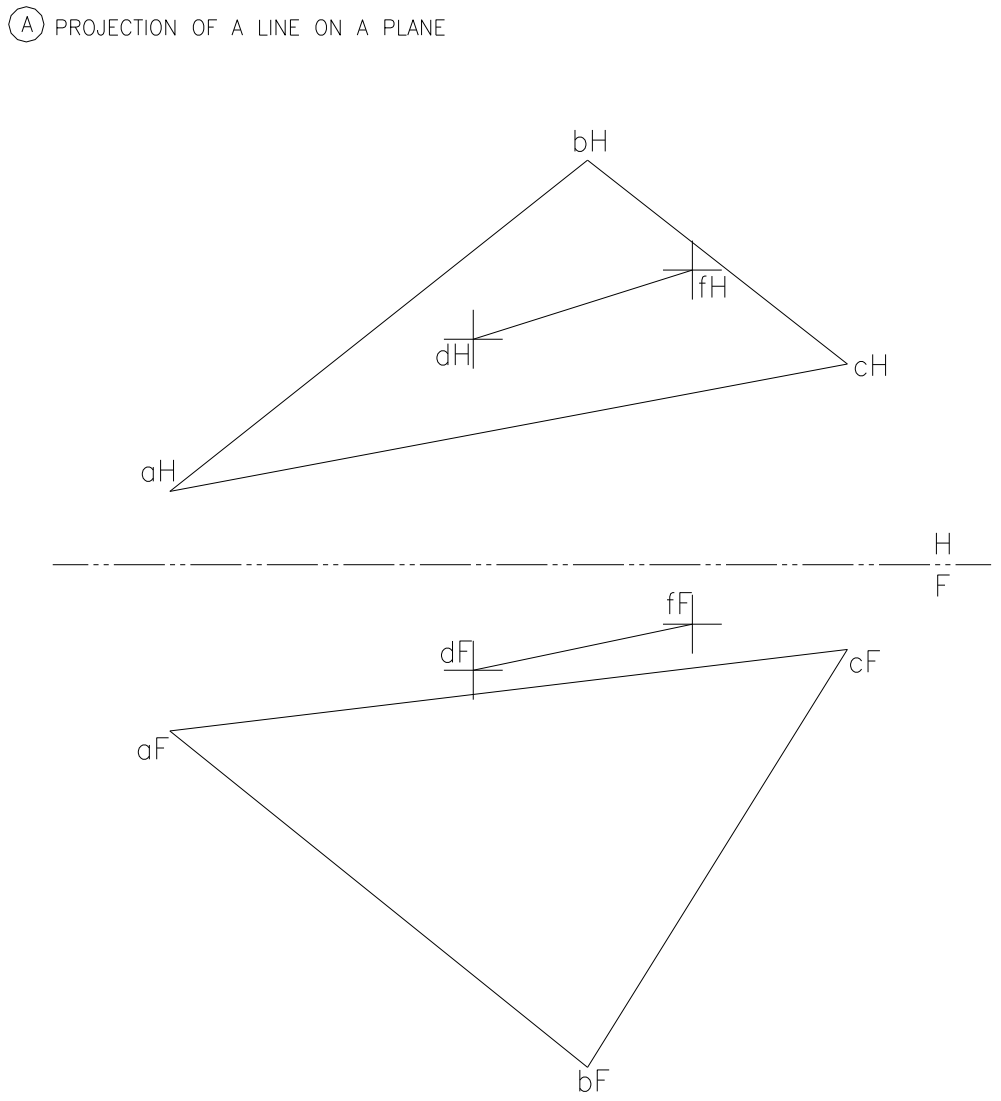
Projection of a Line on a Plane

Ⓐ PROJECTION OF A LINE ON A PLANE



Project line DF onto plane ABC.
A line can be located by determining the position of two points of that line.
Therefore a projection of the line can be obtained by projecting any two points of that line. (See L05T05 for details on construction of projection of a point on a line).

Projection of a Line on a Plane



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Projections of points:
1. Construction of a perpendicular from given points (D, F) to the plane (ABC).
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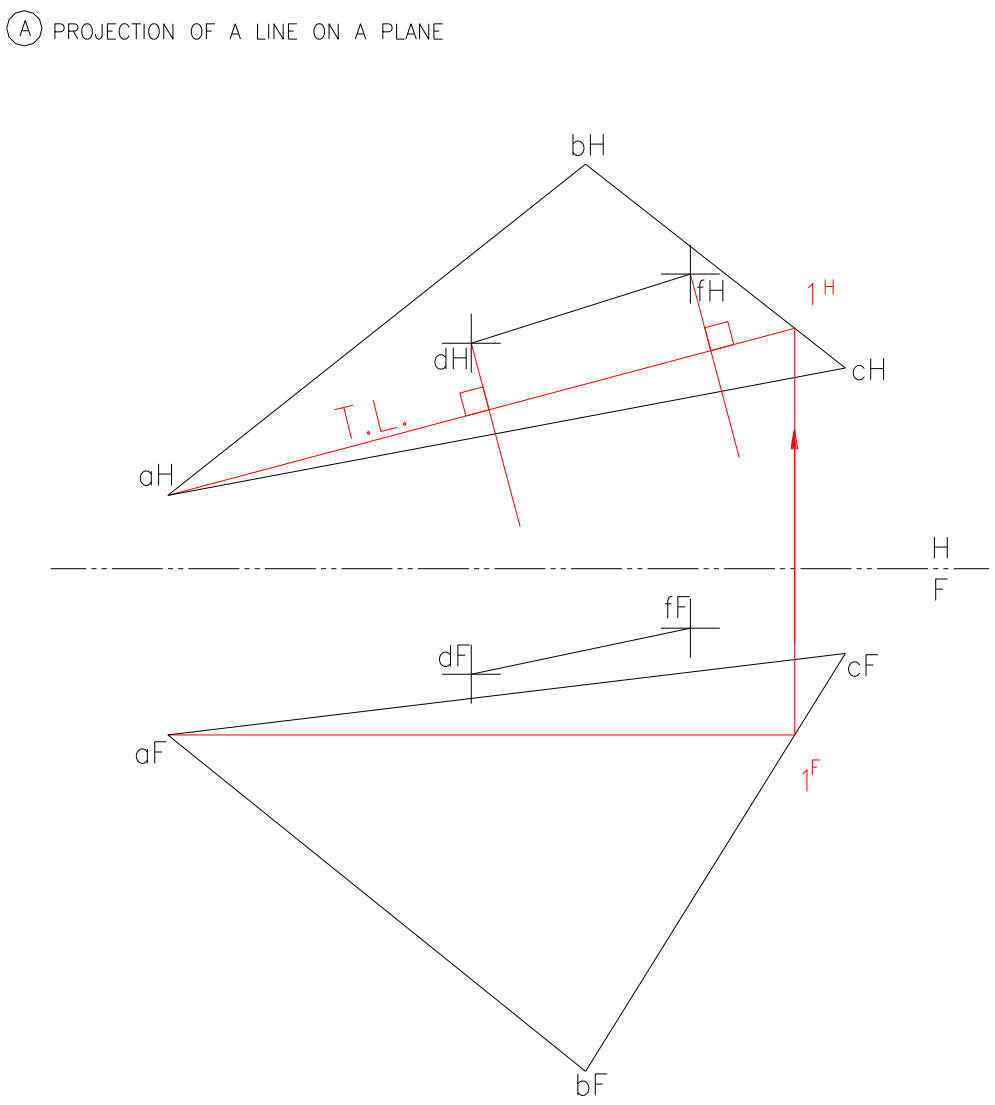
Projection of a Line on a Plane



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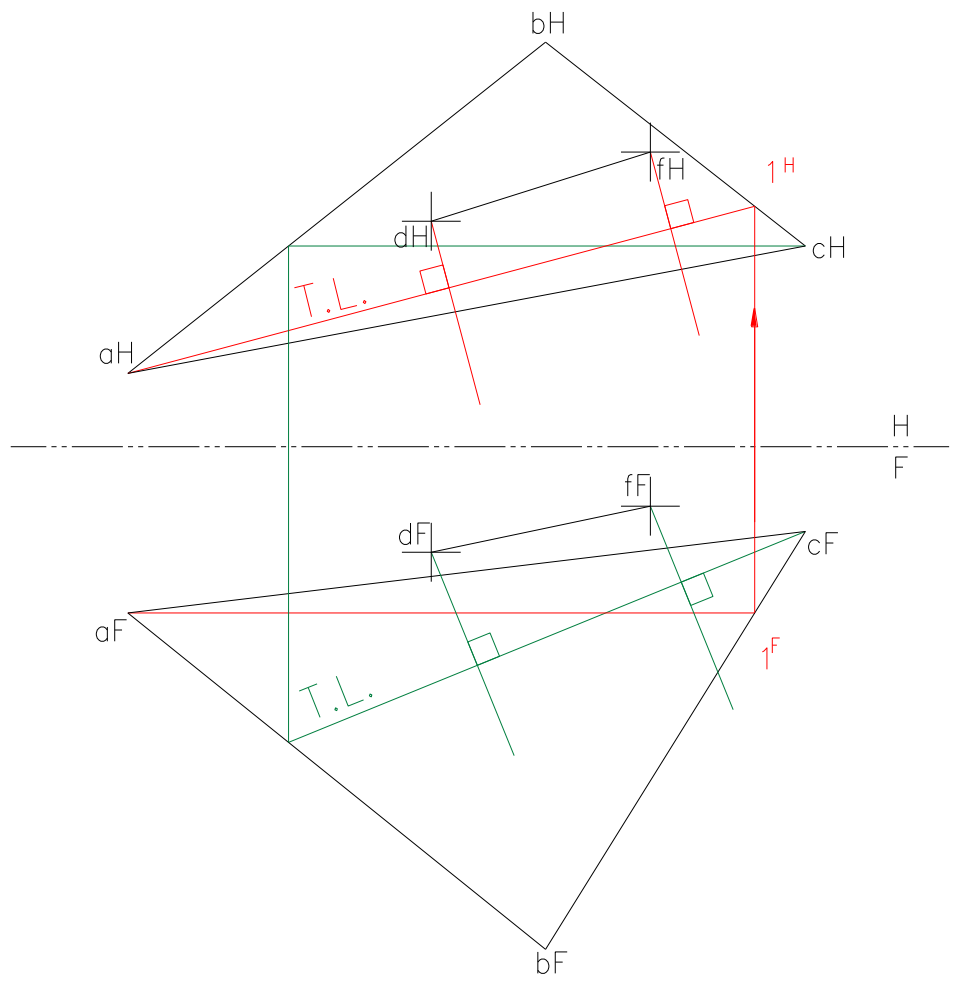
The horizontal projections of the perpendiculars from D and F to ABC are located.

Projection of a Line on a Plane



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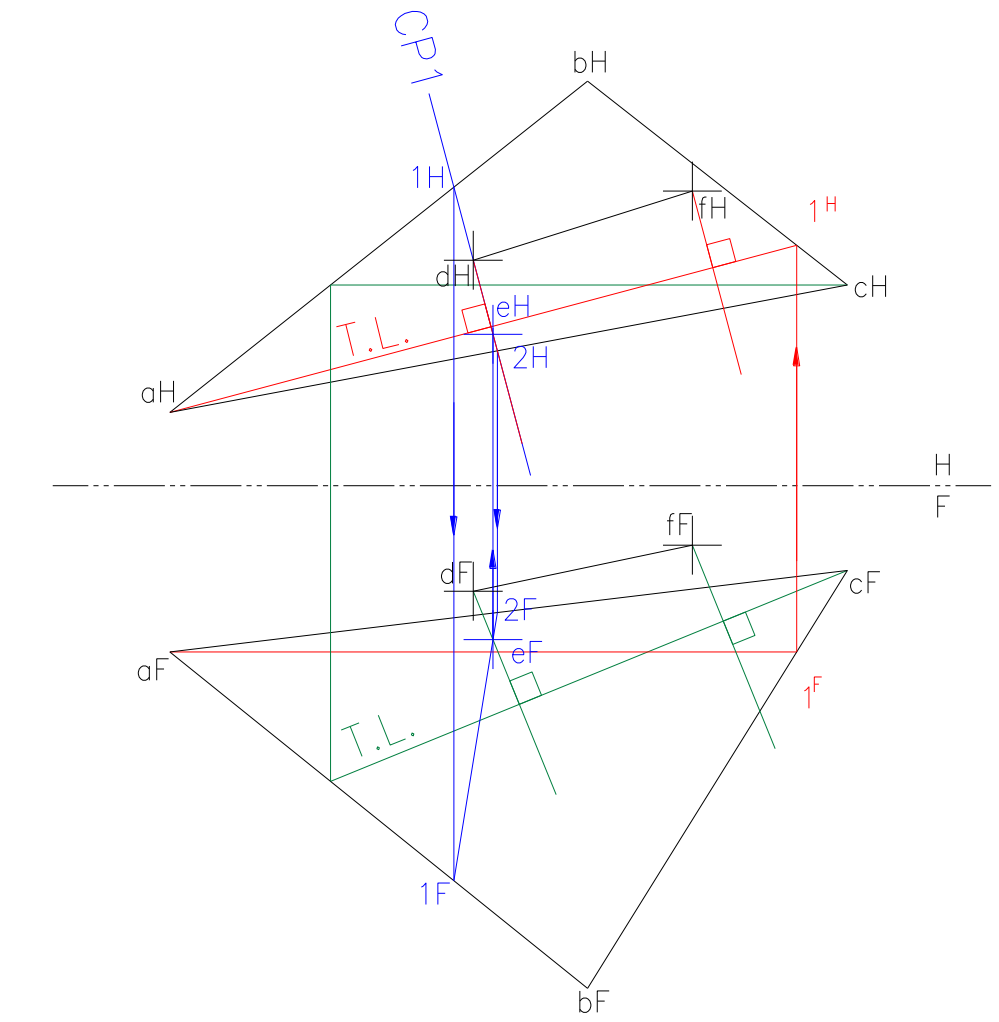

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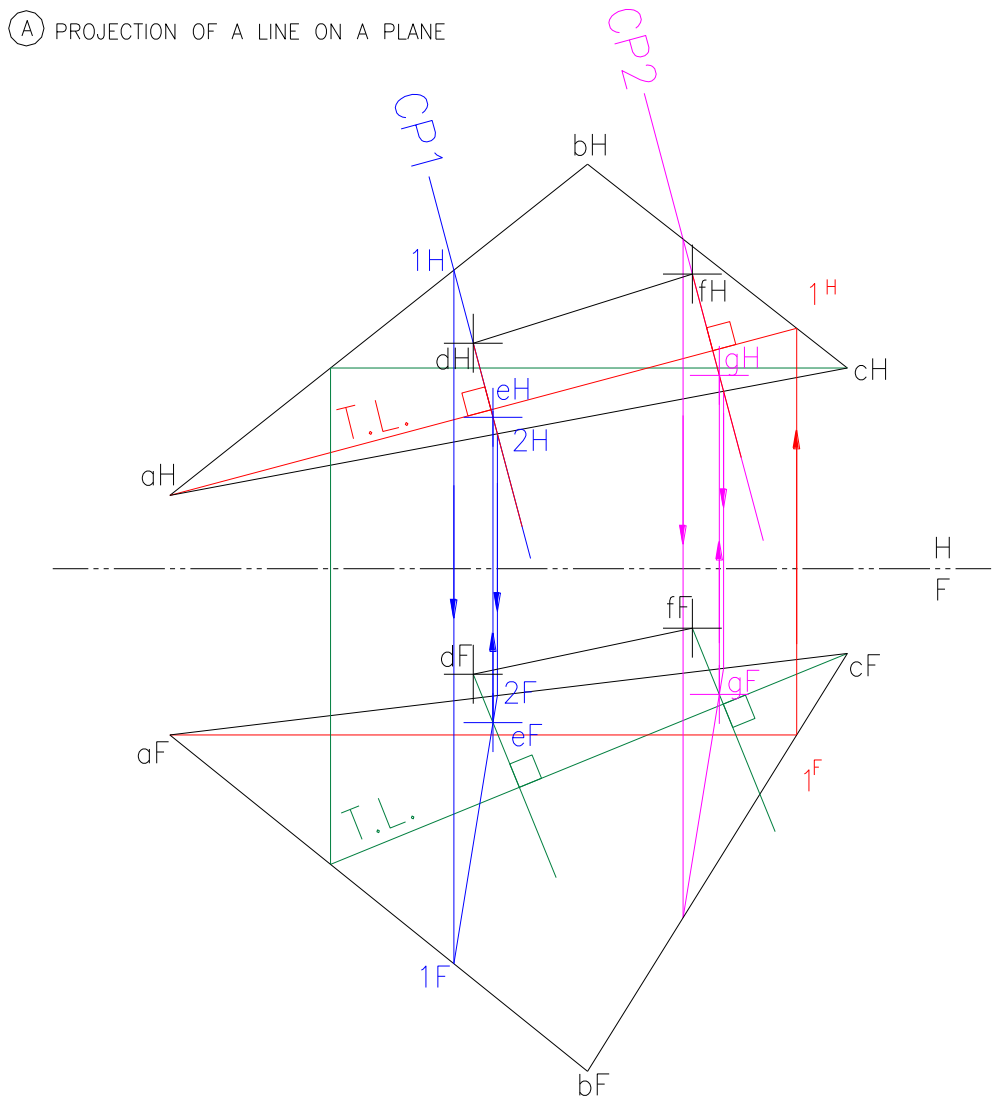
The frontal projections of the perpendiculars are located.

2. The intersection of the perpendiculars from E and F with the plane are located with the help of cutting planes CP1 and CP2 respectively.

Projection of a Line on a Plane



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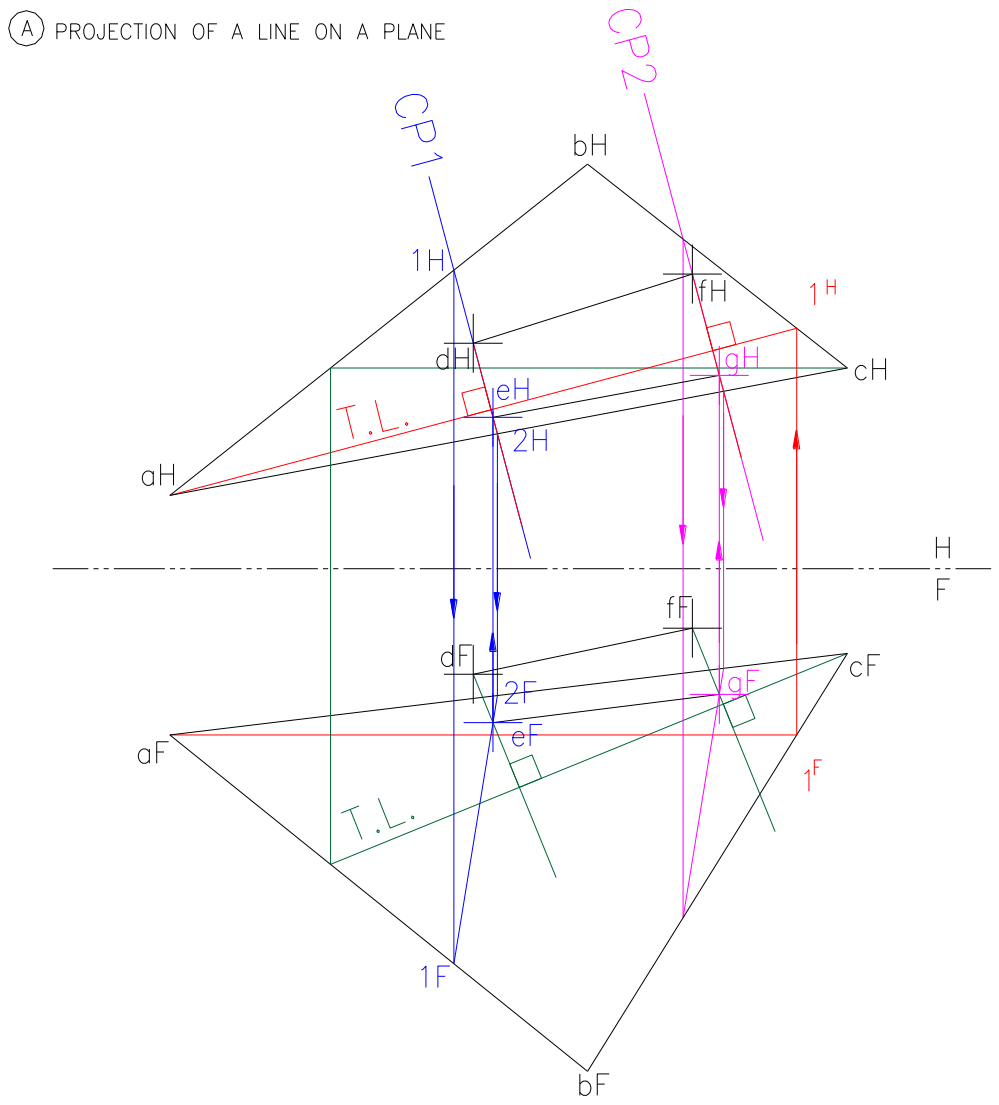
Projection of a Line on a Plane



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2. The intersection of the perpendiculars from E and F with the plane are located with the help of cutting planes CP1 and CP2 respectively.

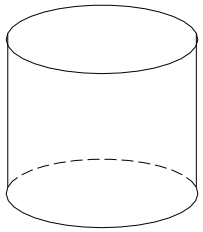
The projection of the line is drawn through the projected points.

Single curved surfaces

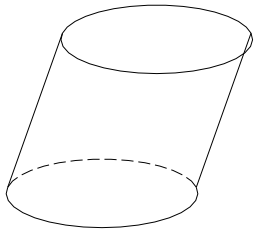
Location of a point on a Cone/Cylinder

(A) SINGLE CURVED SURFACES

are such ruled surfaces that may be generated by moving a straight line along a curve so that any next position of the line is either parallel to its previous position



right cylinder



oblique cylinder

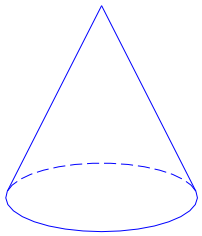
Single curved surfaces

Location of a point on a Cone/Cylinder

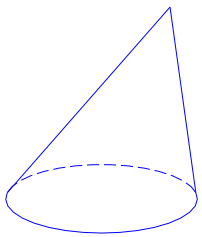
(A) SINGLE CURVED SURFACES

are such ruled surfaces that may be generated by moving a straight line along a curve so that any next position of the line is either parallel to its previous position

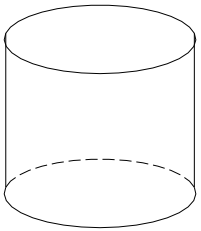
or intersecting its previous position.



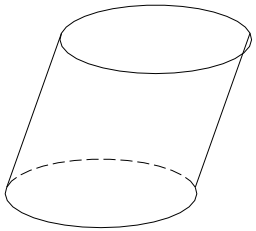
right cone



oblique cone



right cylinder



oblique cylinder

Single curved surfaces

Location of a point on a Cone/Cylinder

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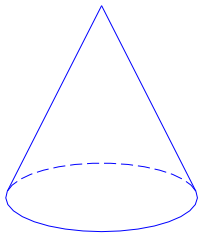
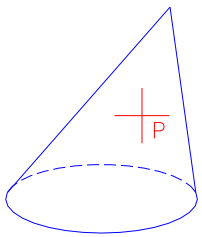
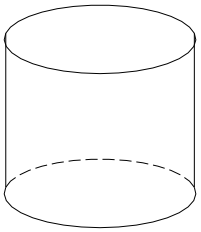


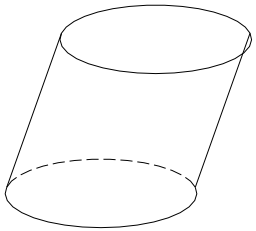
right cone



oblique cone



right cylinder



oblique cylinder

(B) LOCATION OF A POINT ON A CONE/CYLINDER

How to locate point P which is on the surface of the oblique cone in the views?

Single curved surfaces

Location of a point on a Cone/Cylinder

(A) SINGLE CURVED SURFACES

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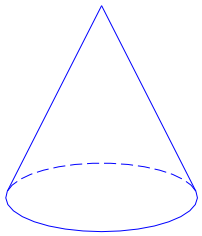
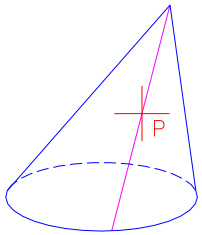
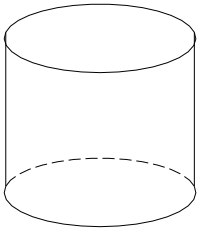


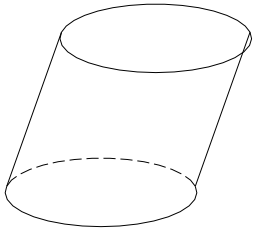
right cone



oblique cone



right cylinder

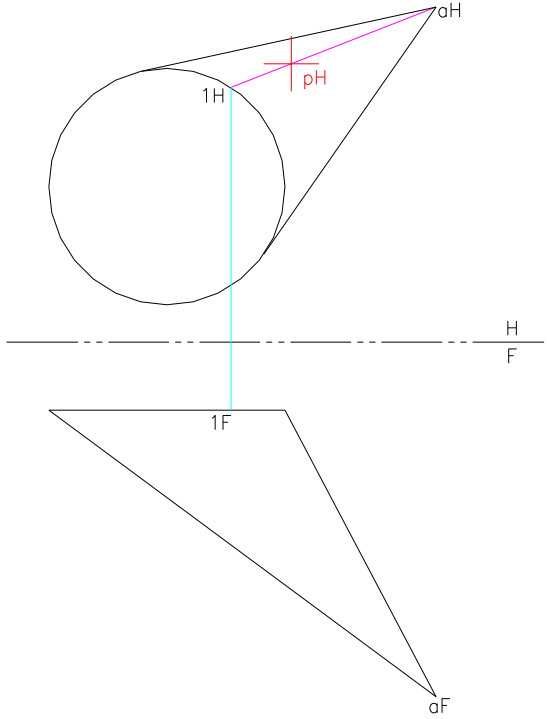


oblique cylinder

(B) LOCATION OF A POINT ON A CONE/CYLINDER

How to locate point P which is on the surface of the oblique cone in the views?

A point on the surface must belong to some surface element, 1A in this case.



Single curved surfaces

Location of a point on a Cone/Cylinder

(A) SINGLE CURVED SURFACES

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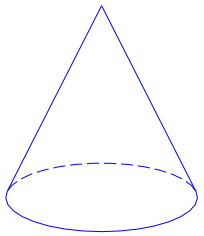
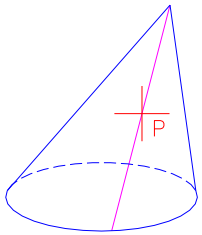
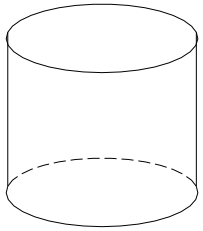


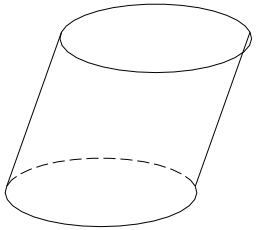
right cone



oblique cone



right cylinder



oblique cylinder

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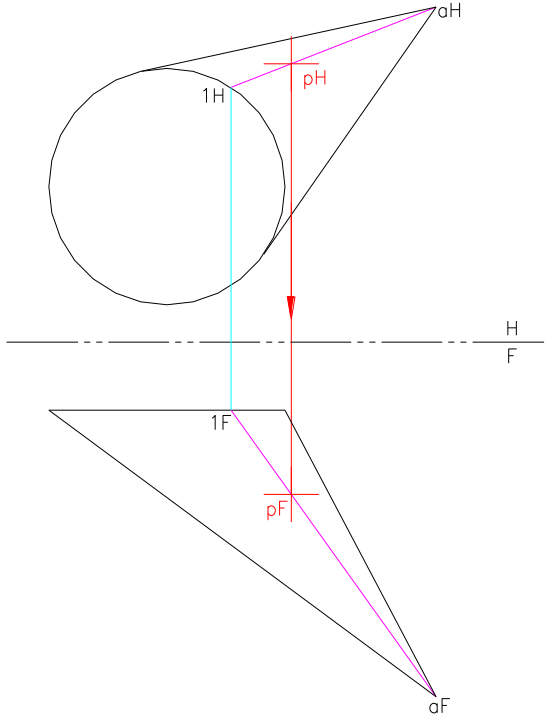
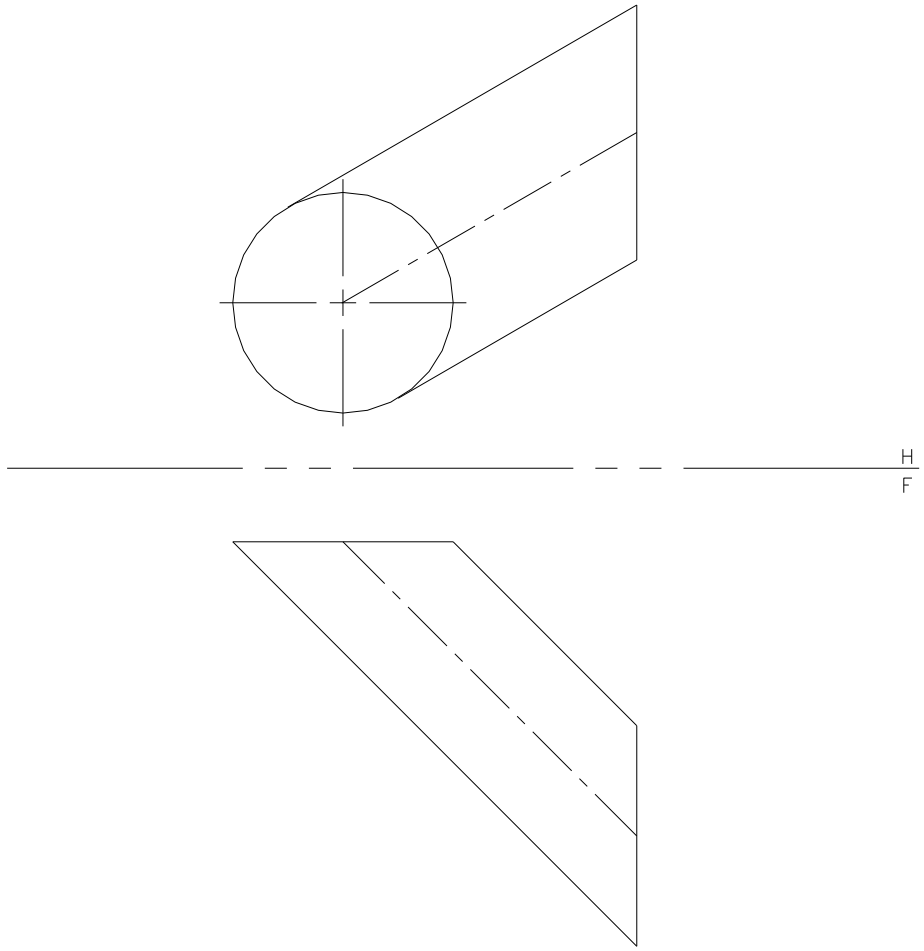


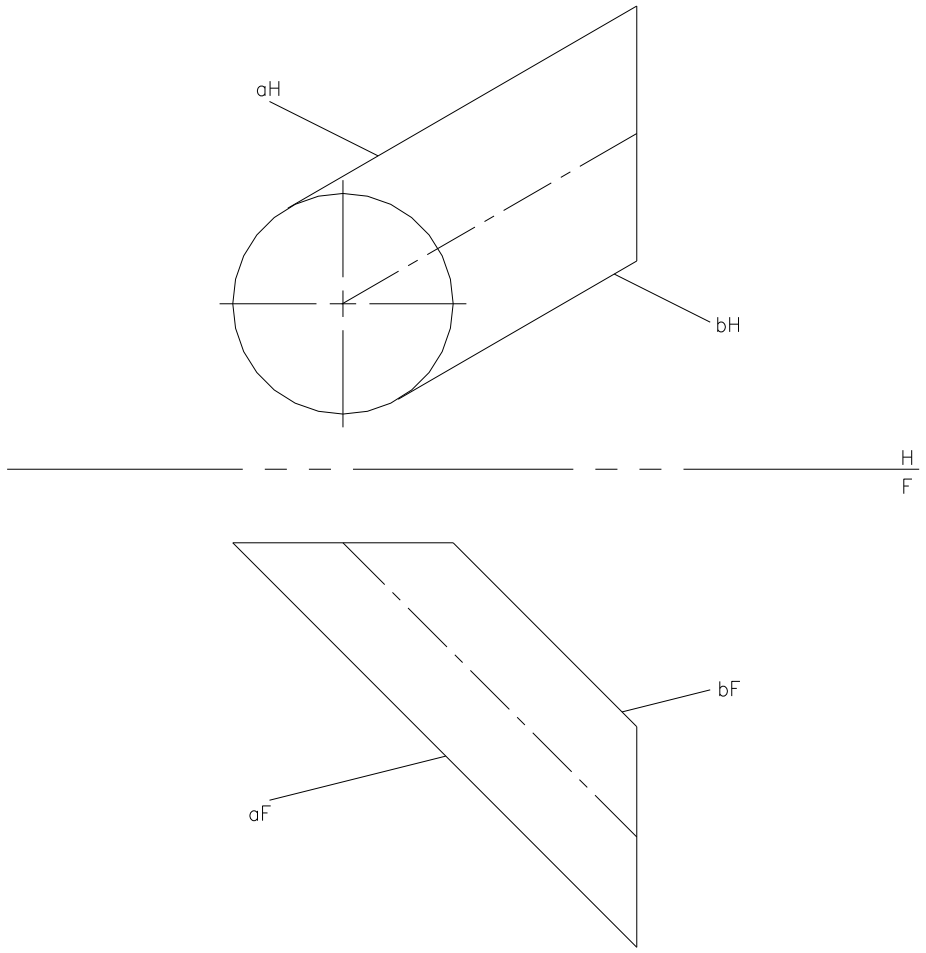
Position of the point in other views is located on the same element by projection.

Intersection of Line with Cylinder



Front and top views of an Oblique cylinder is seen

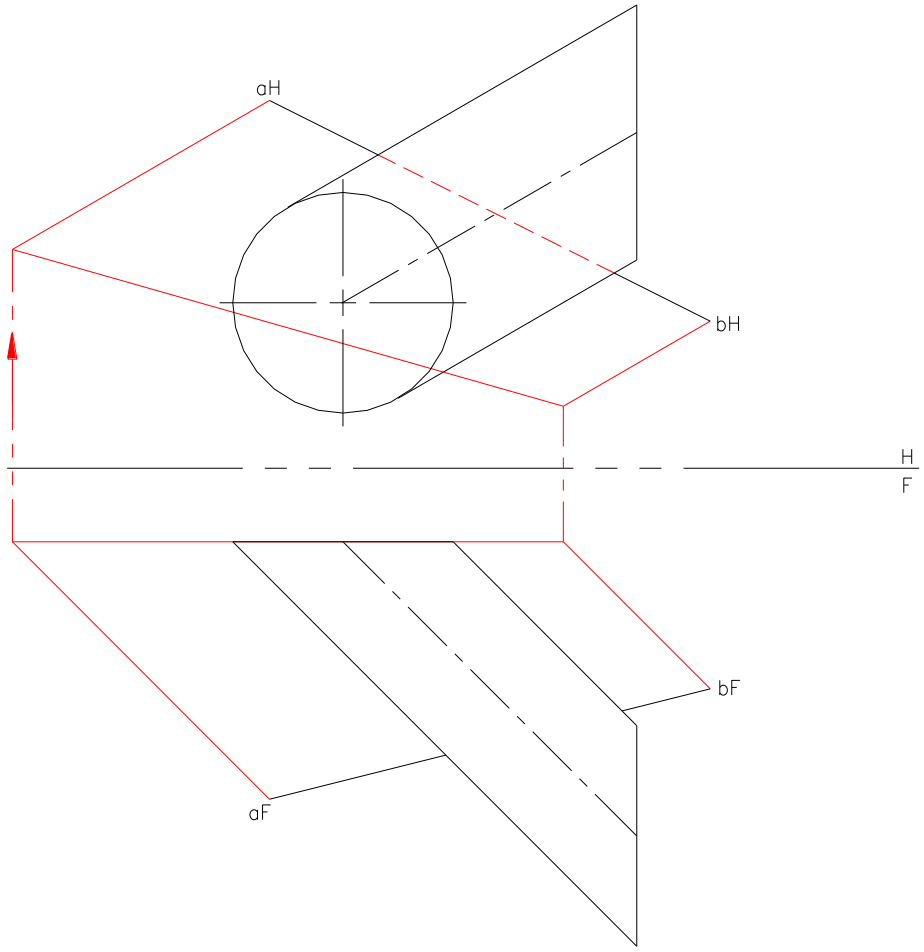
Intersection of Line with Cylinder



Front and top views of an Oblique cylinder is seen

a b is the line that passes through the cylinder and we have to locate the piercing points to find the line of intersection

Intersection of Line with Cylinder

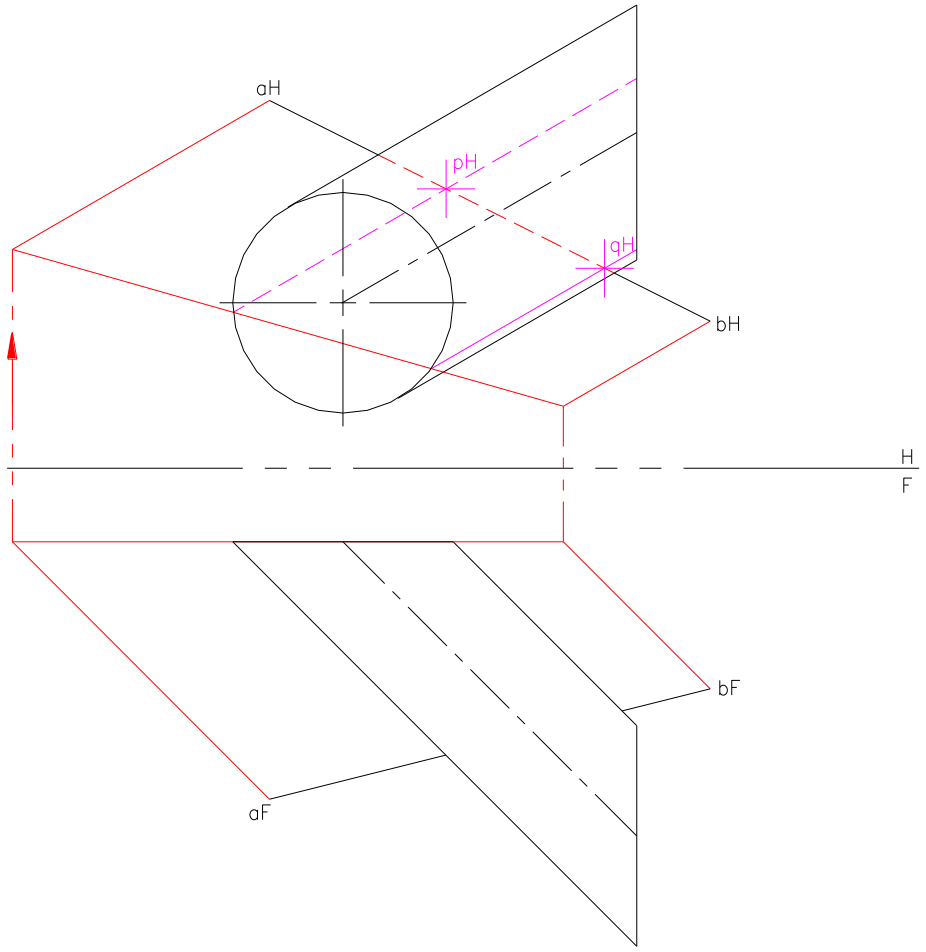


Front and top views of an Oblique cylinder is seen

a b is the line that passes through the cylinder and we have to locate the piercing points to find the line of intersection

Construct a plane through AB || to the cylinder;

Intersection of Line with Cylinder



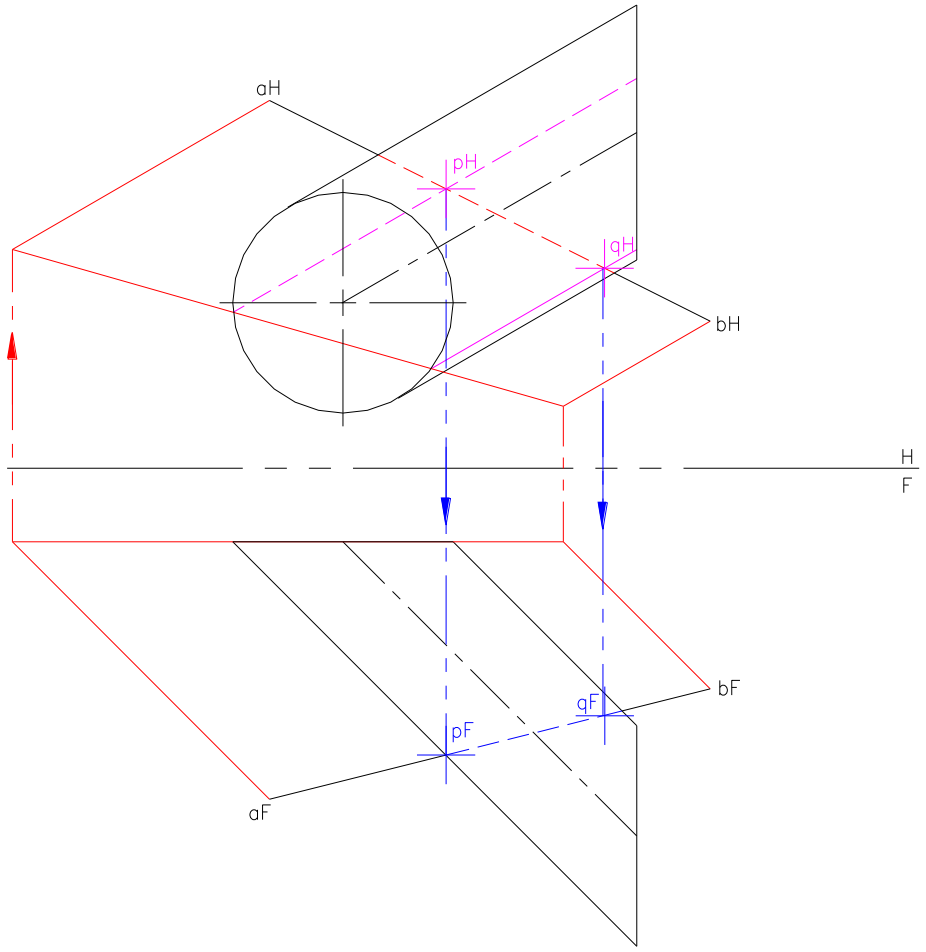
Front and top views of an Oblique cylinder is seen

a b is the line that passes through the cylinder and we have to locate the piercing points to find the line of intersection

Construct a plane through AB || to the cylinder;

Draw the cylinder elements ∈ to the plane.

Intersection of Line with Cylinder



Front and top views of an Oblique cylinder is seen

a b is the line that passes through the cylinder and we have to locate the piercing points to find the line of intersection

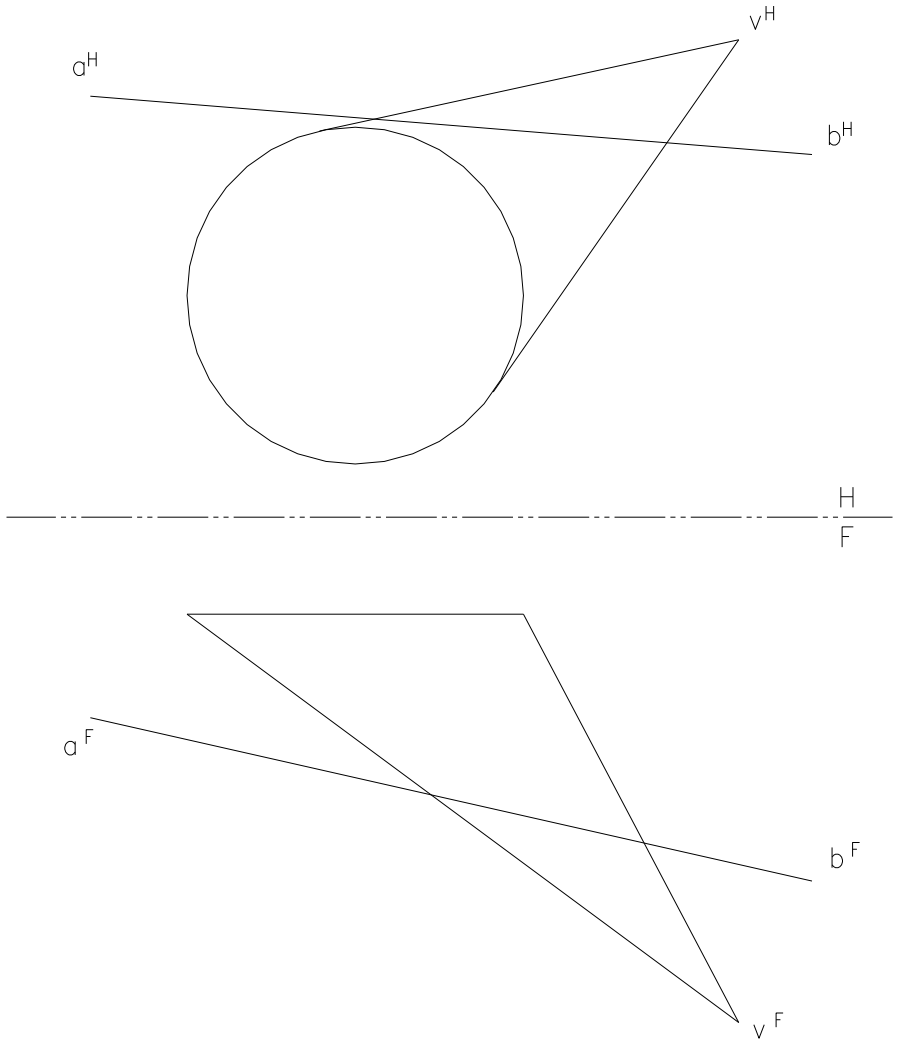
Construct a plane through AB || to the cylinder;

Draw the cylinder elements ∈ to the plane.

Trace P and Q to Front view and mark lines according to visibility

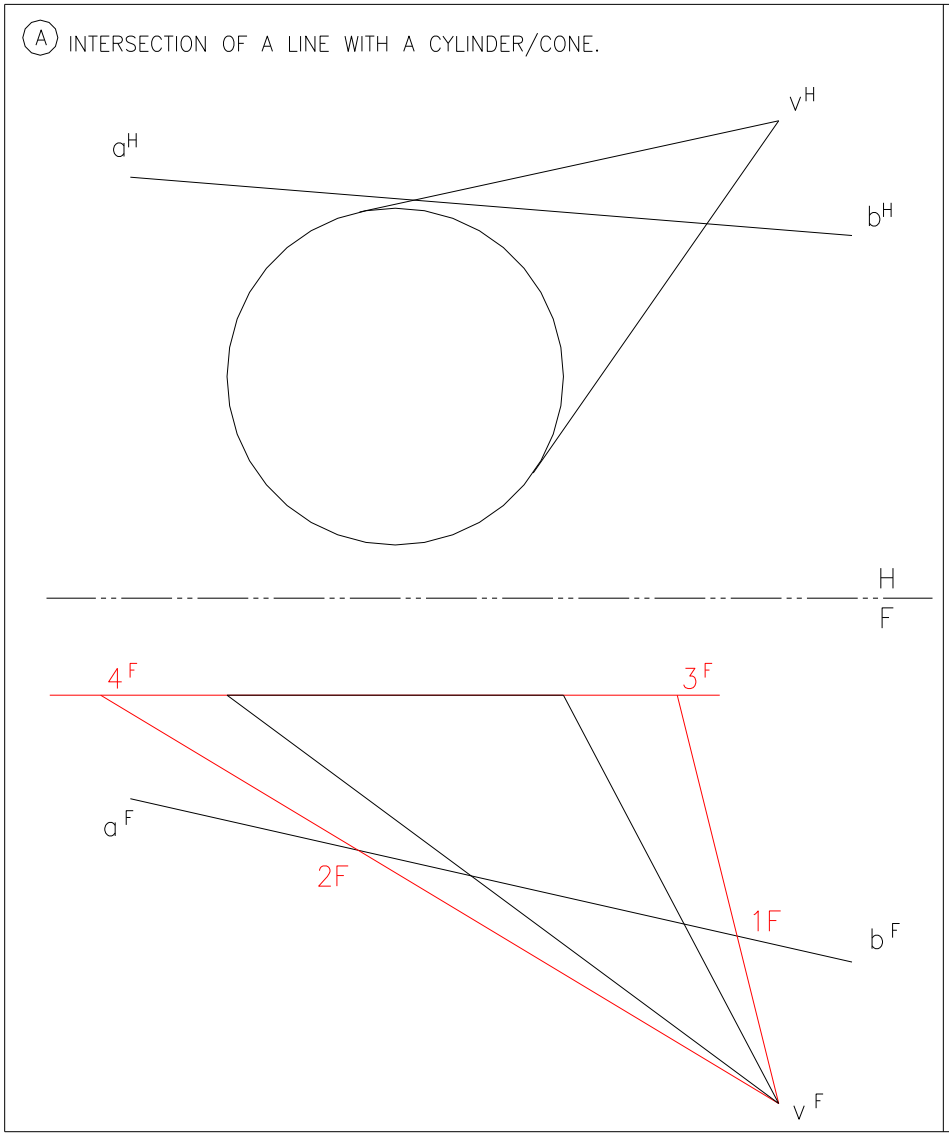
Intersection of Line with Cone

(A) INTERSECTION OF A LINE WITH A CYLINDER/CONE.



a b is the line that intersects the oblique cone with vertex at V. to find the intersection of the line with the cone, we must find the piercing points and join them.

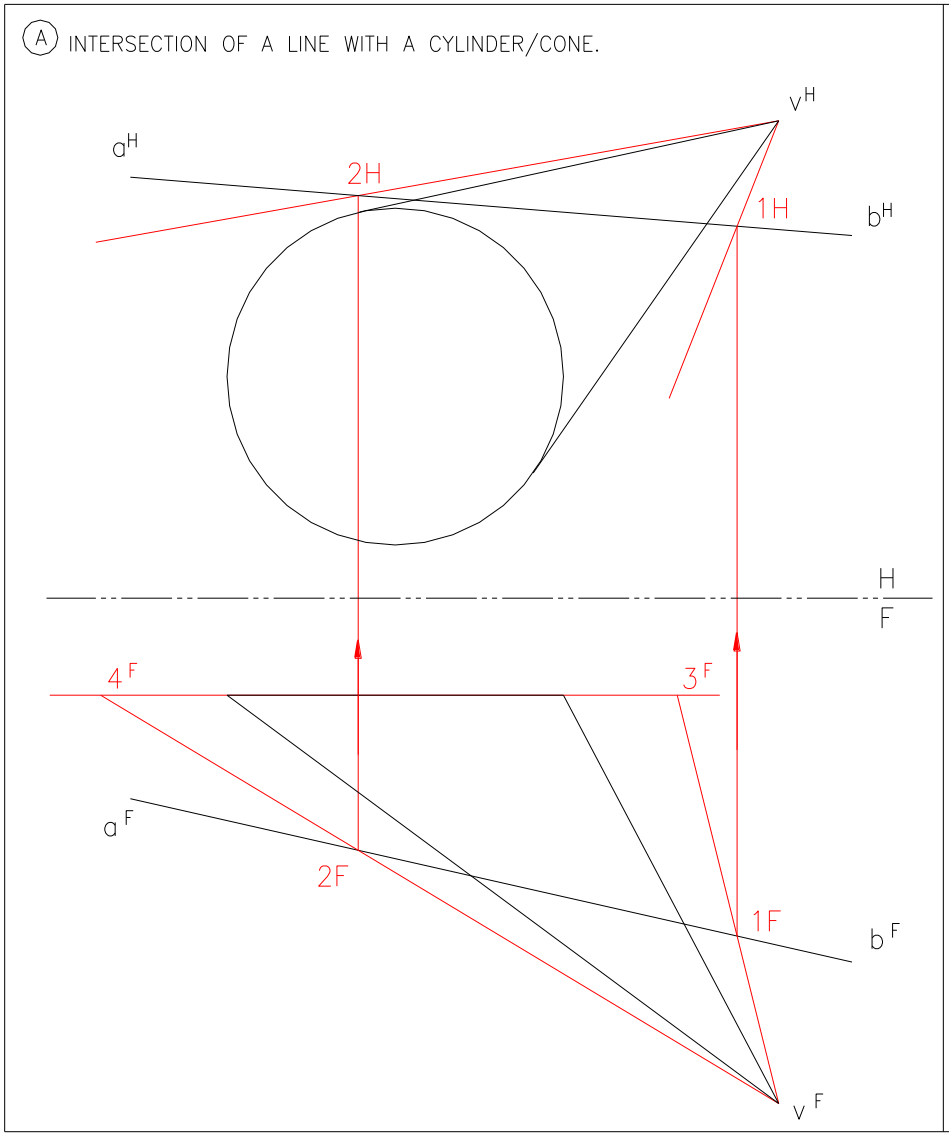
Intersection of Line with Cone



a b is the line that intersects the oblique cone with vertex at V. to find the intersection of the line with the cone, we must find the piercing points and join them.

Imagine a cutting plane that passes through the line and vertex of the cone; two lines of that plane will intesect AB and the base plane at points 1, 2, 3, 4.

Intersection of Line with Cone



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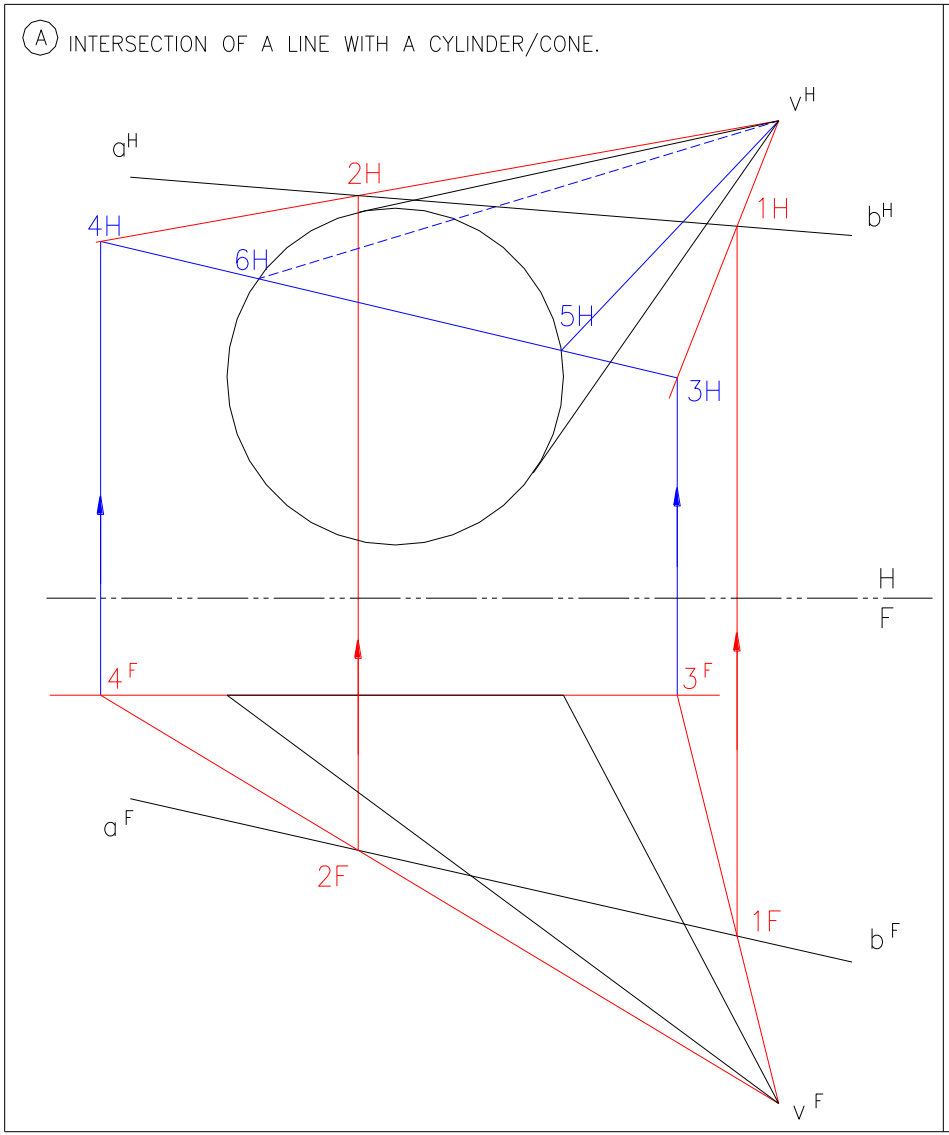
Imagine a cutting plane that passes through the line and vertex of the cone; two lines of that plane will intesect AB and the base plane at points 1, 2, 3, 4.

Determine the position of the lines in the Horizontal view by locating points 1 and 2.

Intersection of Line with Cone



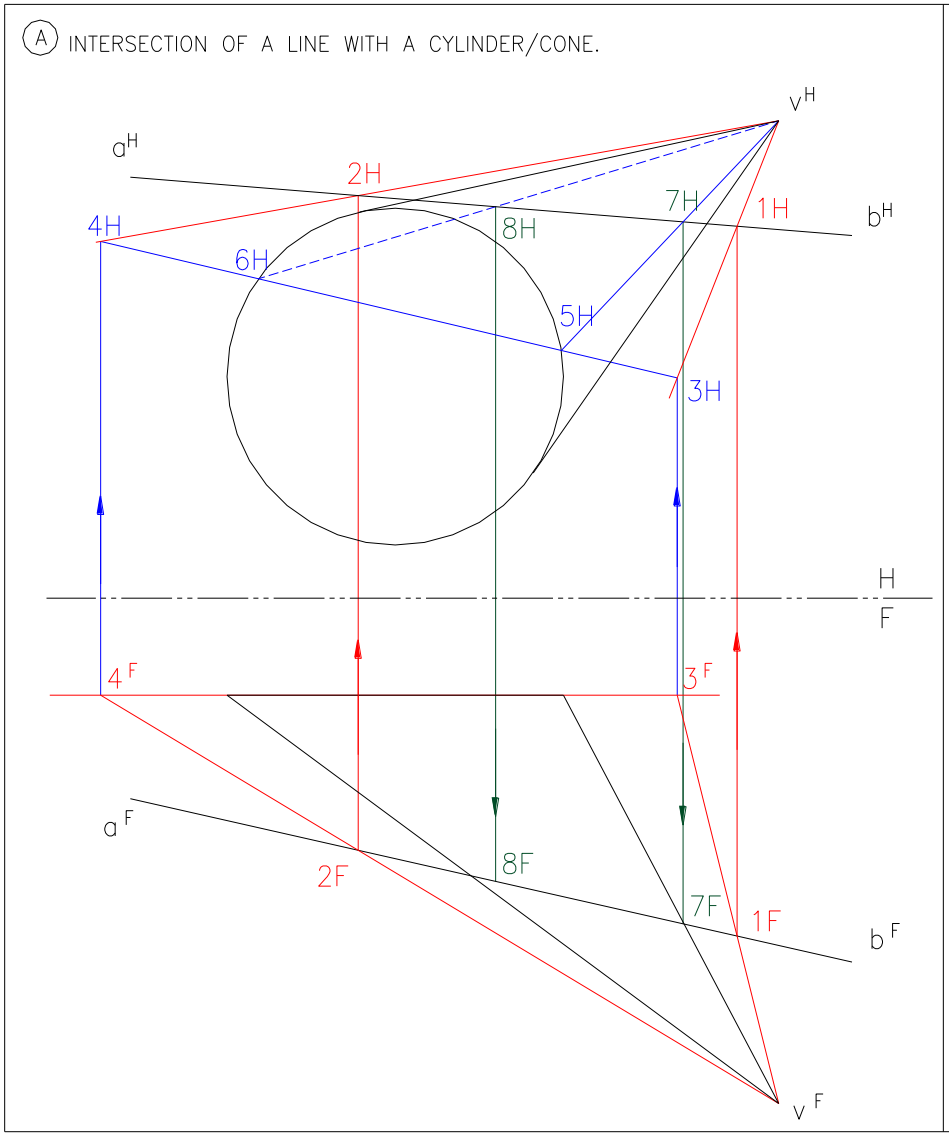
a b is the line that intersects the oblique cone with vertex at V. to find the intersection of the line with the cone, we must find the piercing points and join them.

Imagine a cutting plane that passes through the line and vertex of the cone; two lines of that plane will intesect AB and the base plane at points 1, 2, 3, 4.

Determine the position of the lines in the Horizontal view by locating points 1 and 2.

Find the intersection of the forementioned cutting plane and the base plane of the cone. Points 5 and 6 define the elements of the cone through which the cutting plane passes;

Intersection of Line with Cone



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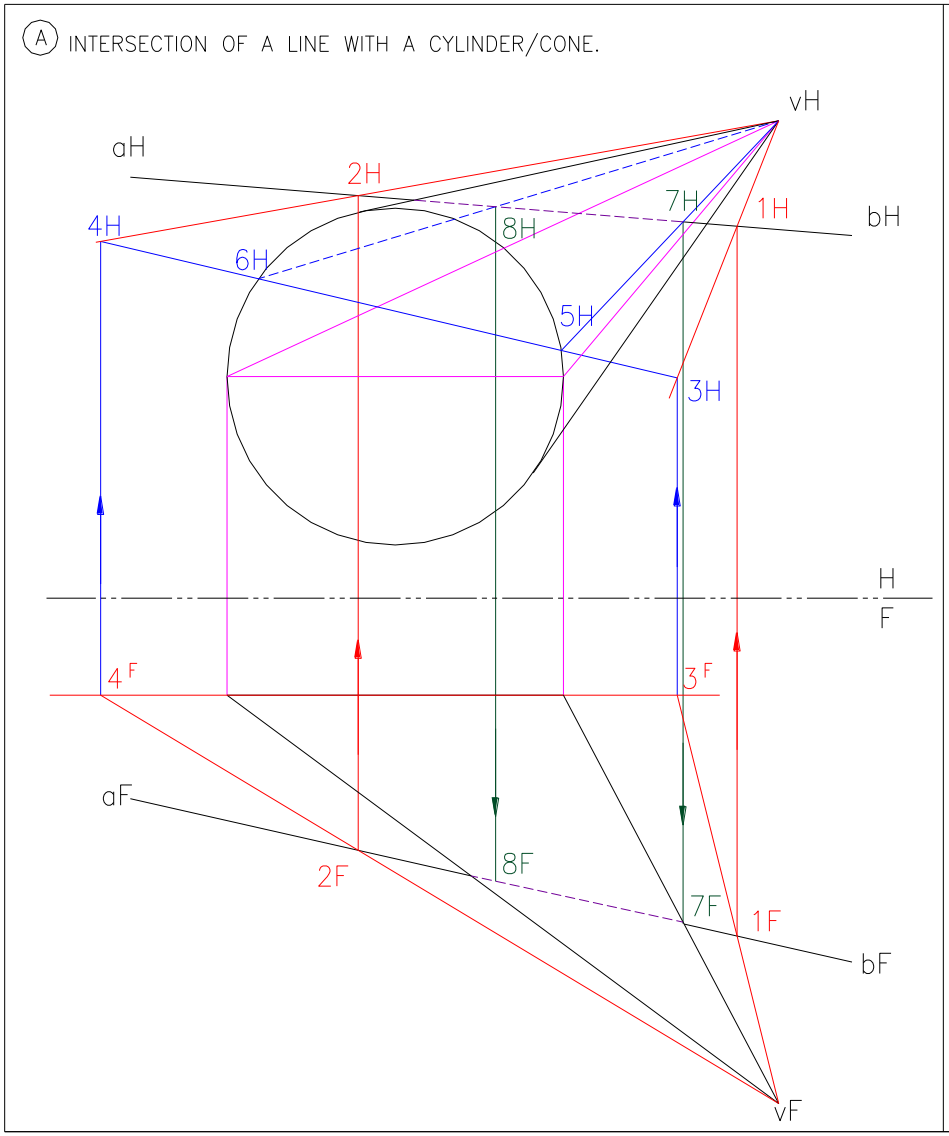
Find the intersection of the forementioned cutting plane and the base plane of the cone. Points 5 and 6 define the elements of the cone through which the cutting plane passes;

7 and 8 are the points of intersection between line AB and the cone since they belong both to the cone and the line AB.

Intersection of Line with Cone



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Imagine a cutting plane that passes through the line and vertex of the cone; two lines of that plane will intesect AB and the base plane at points 1, 2, 3, 4.

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Find the intersection of the forementioned cutting plane and the base plane of the cone. Points 5 and 6 define the elements of the cone through which the cutting plane passes;

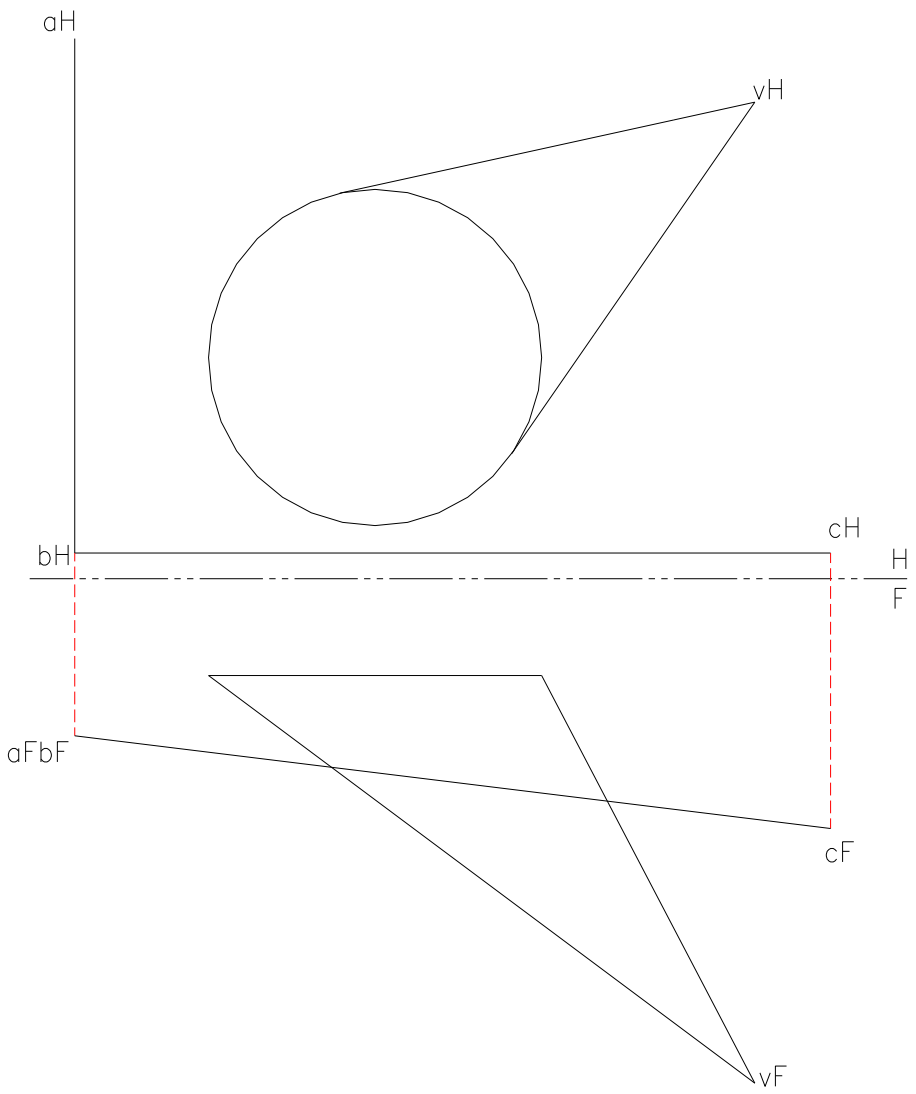
7 and 8 are the points of intersection between line AB and the cone since they belong both to the cone and the line AB.

Visibility of the lines are shown in 'this color

Magenta lines show the extreme elements of the cone beyond which we cannot see on the Frontal view.

Intersection of Plane with Cone/Cylinder

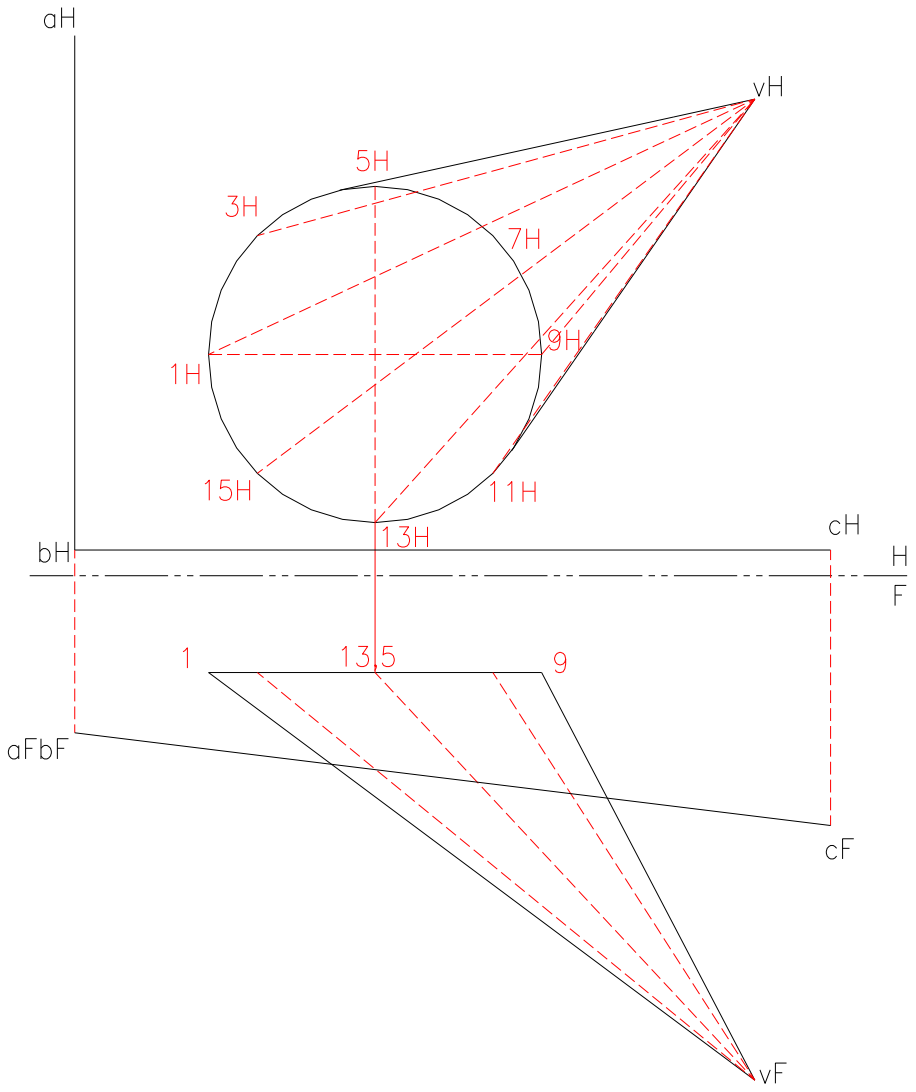
INTERSECTION OF A PLANE WITH A CYLINDER/CONE.



abc is the plane that intersects the oblique cone with vertex in V. For this multiple points are needed to get the curved surface accurately

Intersection of Plane with Cone/Cylinder

INTERSECTION OF A PLANE WITH A CYLINDER/CONE.

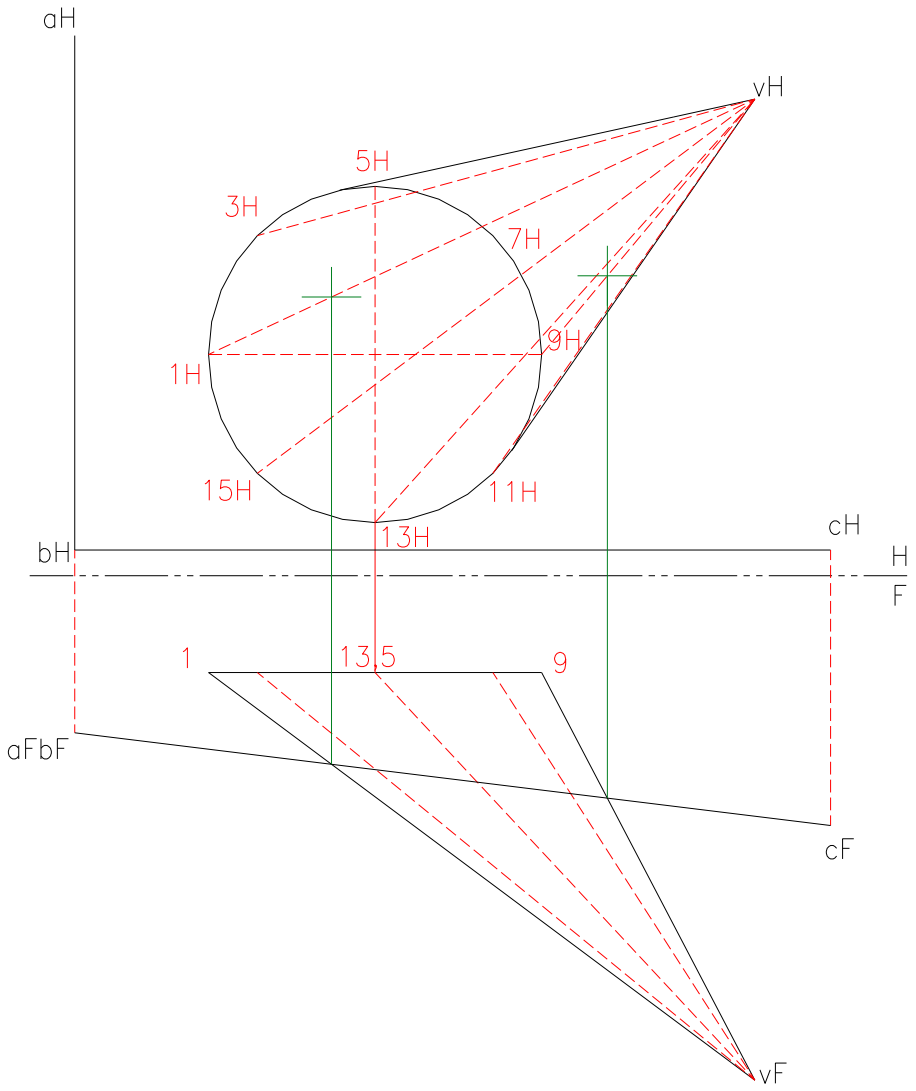


abc is the plane that intersects the oblique cone with vertex in V. For this multiple points are needed to get the curved surface accurately

the points are done on the circle and projected to the FV where the line elements are drawn to the vertex

Intersection of Plane with Cone/Cylinder

INTERSECTION OF A PLANE WITH A CYLINDER/CONE.

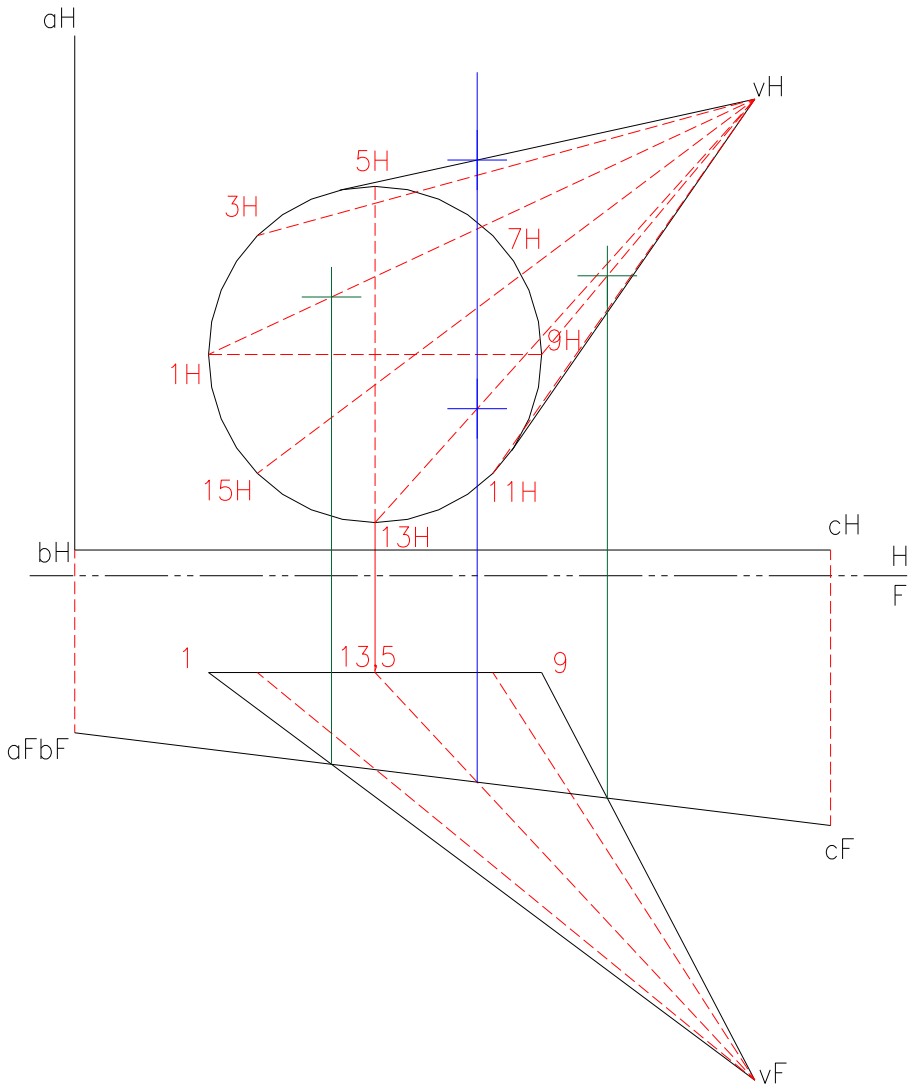


abc is the plane that intersects the oblique cone with vertex in V. For this multiple points are needed to get the curved surface accurately

the points are done on the circle and projected to the FV where the line elements are drawn to the vertex

project the piercing point of EV of plane on the cone in extreme line 1V and 9V in the FV back to same lines in TV

Intersection of Plane with Cone/Cylinder



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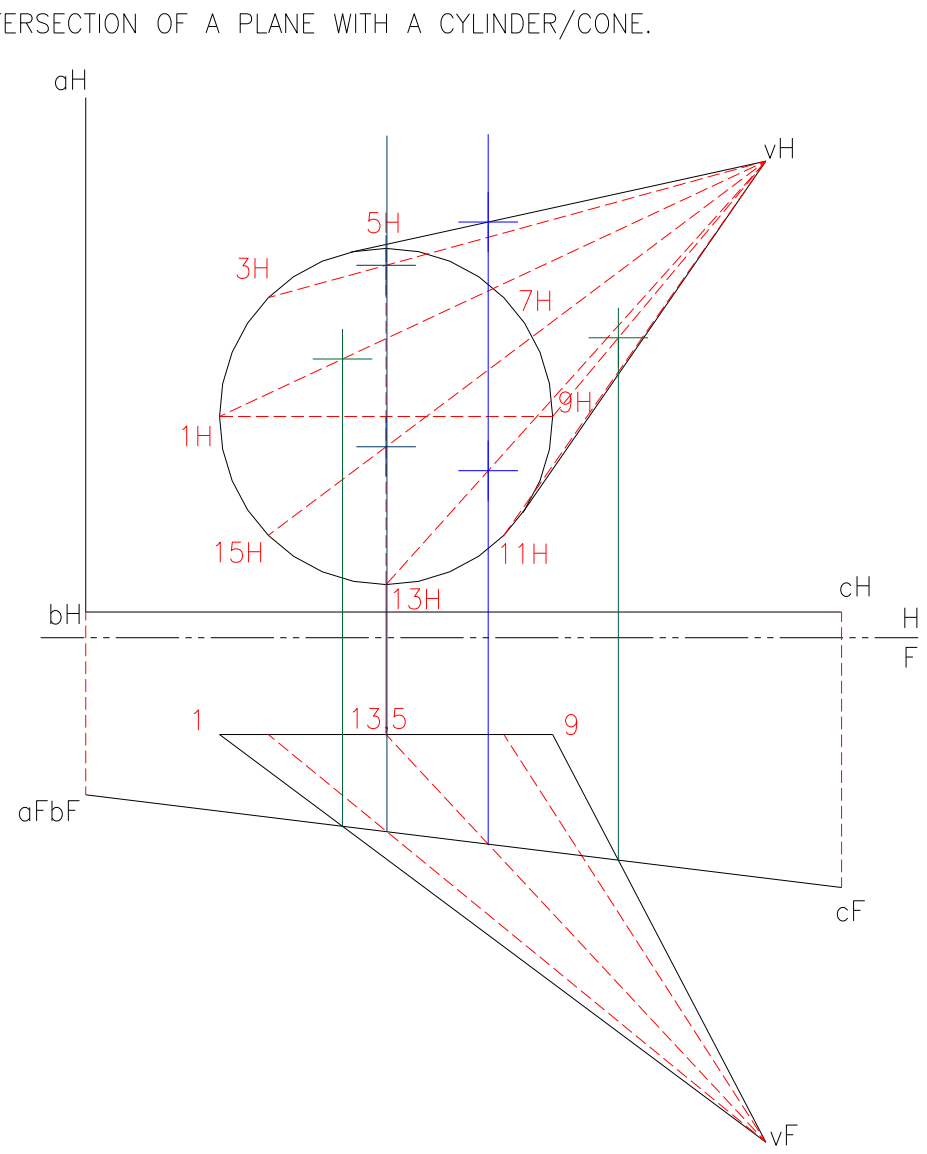
the points are done on the circle and projected to the FV where the line elements are drawn to the vertex

project the piercing point of EV of plane on the cone in extreme line 1V and 9V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 13V and 5V in the FV back to same lines in TV

Intersection of Plane with Cone/Cylinder



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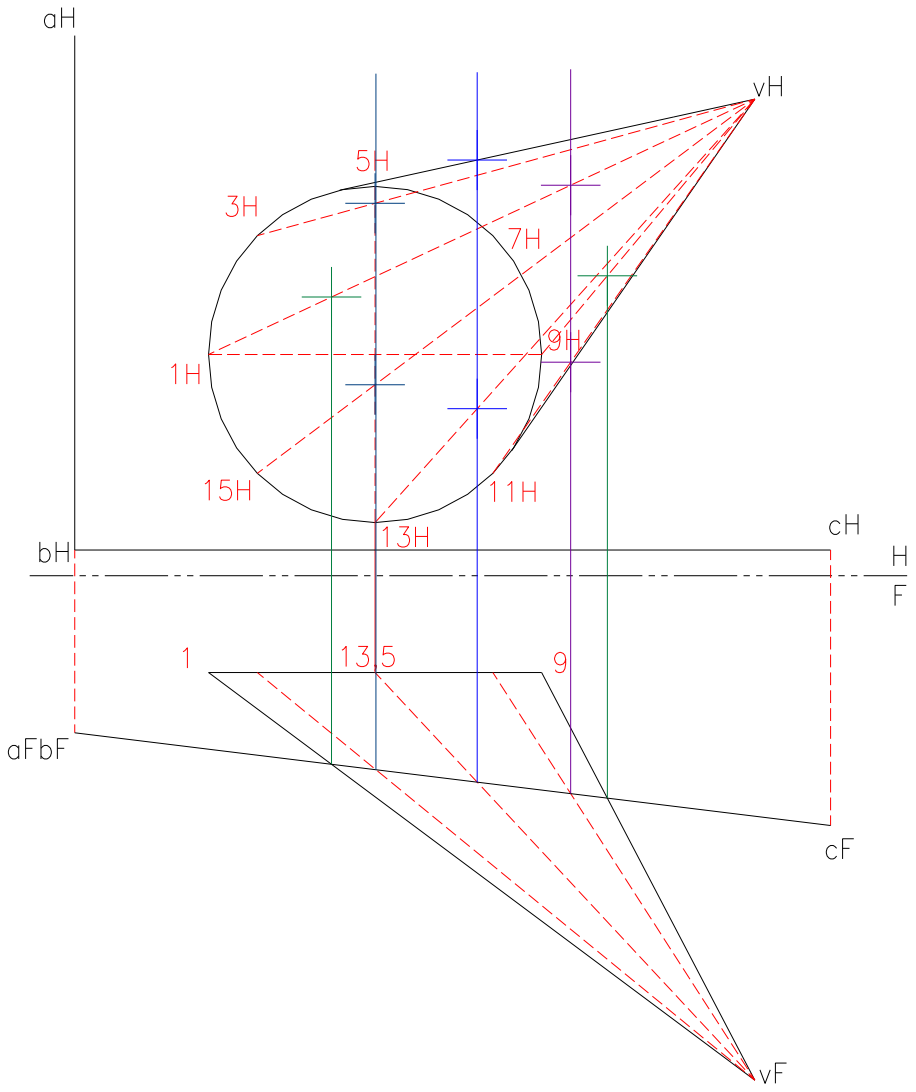
the points are done on the circle and projected to the FV where the line elements are drawn to the vertex

project the piercing point of EV of plane on the cone in extreme line 1V and 9V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 13V and 5V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 3V and 15V in the FV back to same lines in TV

Intersection of Plane with Cone/Cylinder



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the points are done on the circle and projected to the FV where the line elements are drawn to the vertex

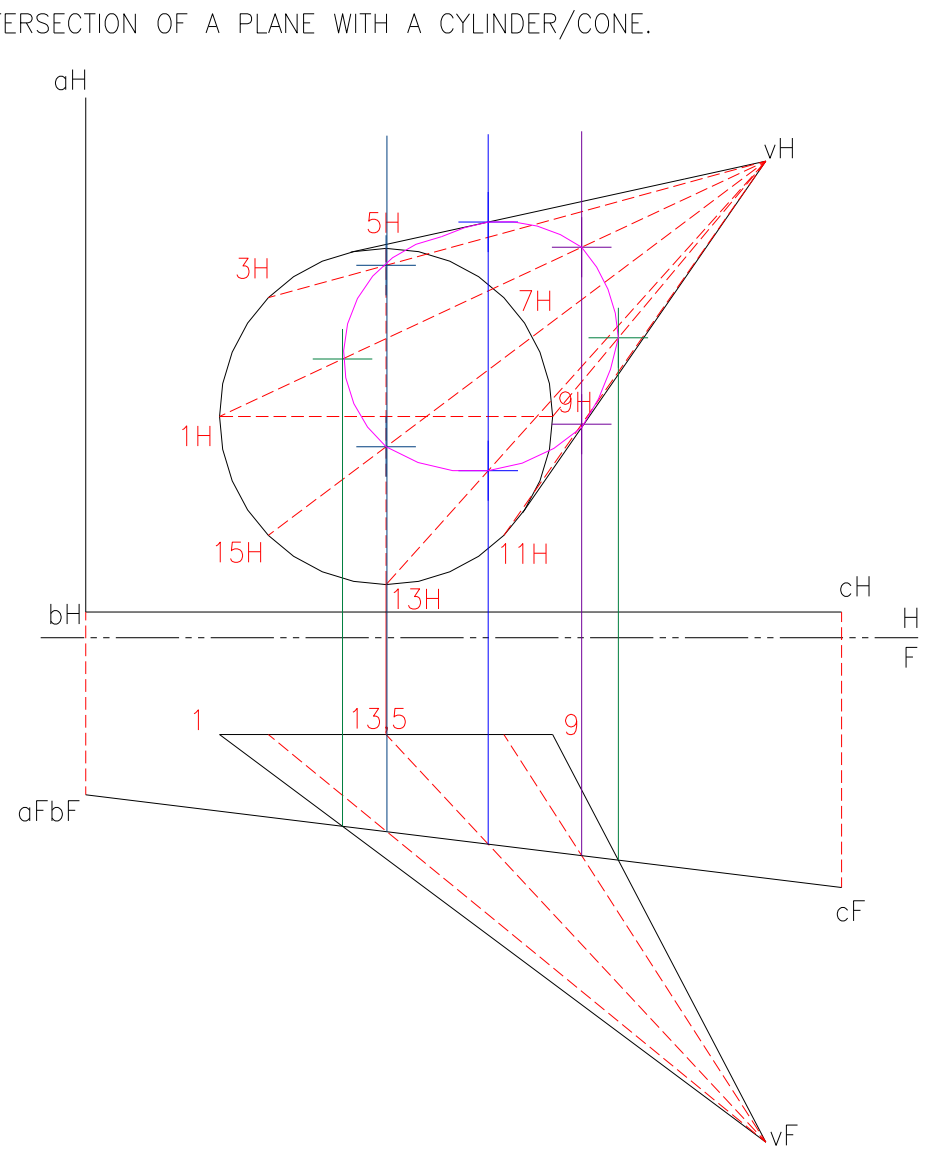
project the piercing point of EV of plane on the cone in extreme line 1V and 9V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 13V and 5V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 3V and 15V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 7V and 11V in the FV back to same lines in TV

Intersection of Plane with Cone/Cylinder



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project the piercing point of EV of plane on the cone in line 13V and 5V in the FV back to same lines in TV

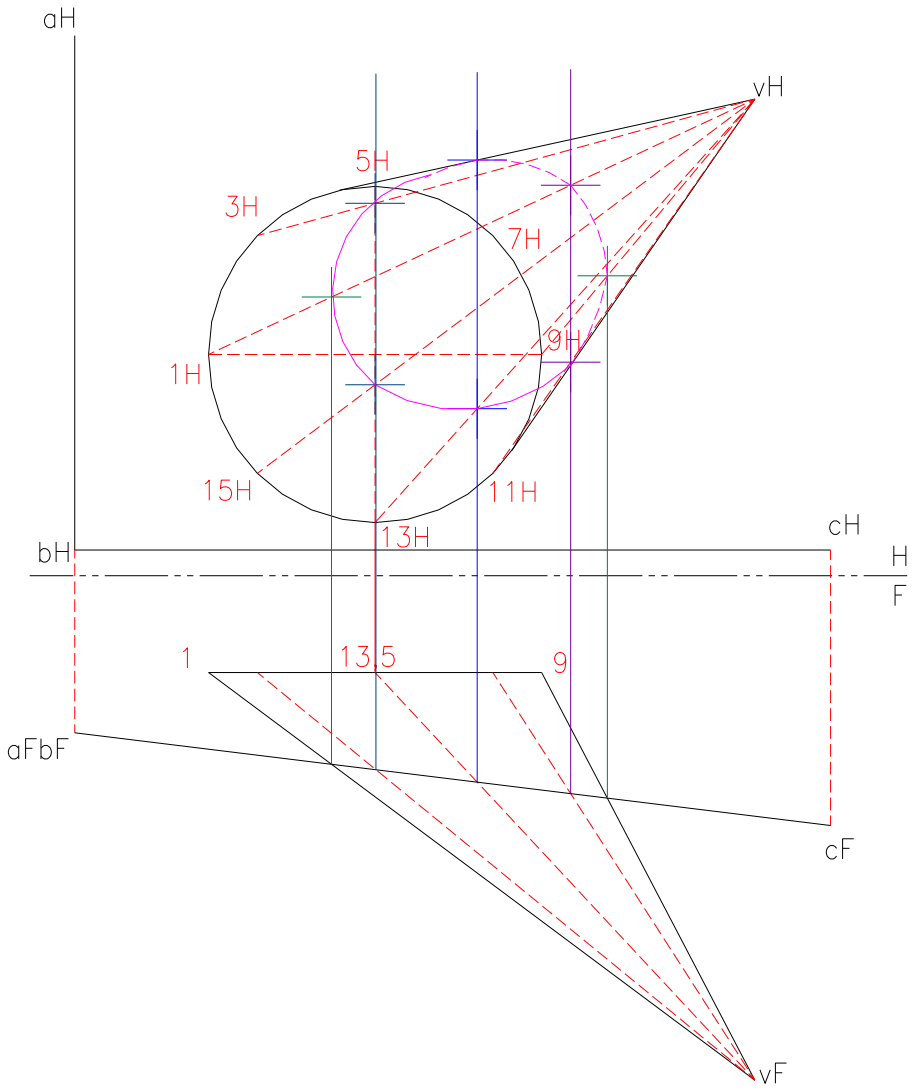
project the piercing point of EV of plane on the cone in line 3V and 15V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 7V and 11V in the FV back to same lines in TV

with available points, draw a curve with irregular curves. the more no. of points, the smooth the curve is.

Intersection of Plane with Cone/Cylinder

INTERSECTION OF A PLANE WITH A CYLINDER/CONE.



abc is the plane that intersects the oblique cone with vertex in V. For this multiple points are needed to get the curved surface accurately

the points are done on the circle and projected to the FV where the line elements are drawn to the vertex

project the piercing point of EV of plane on the cone in extreme line 1V and 9V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 13V and 5V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 3V and 15V in the FV back to same lines in TV

project the piercing point of EV of plane on the cone in line 7V and 11V in the FV back to same lines in TV

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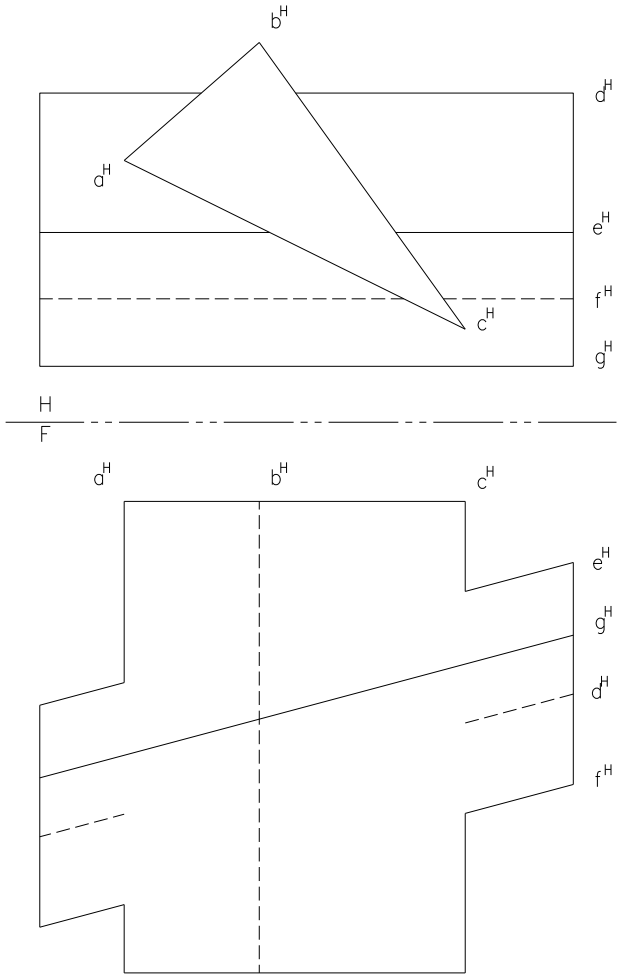
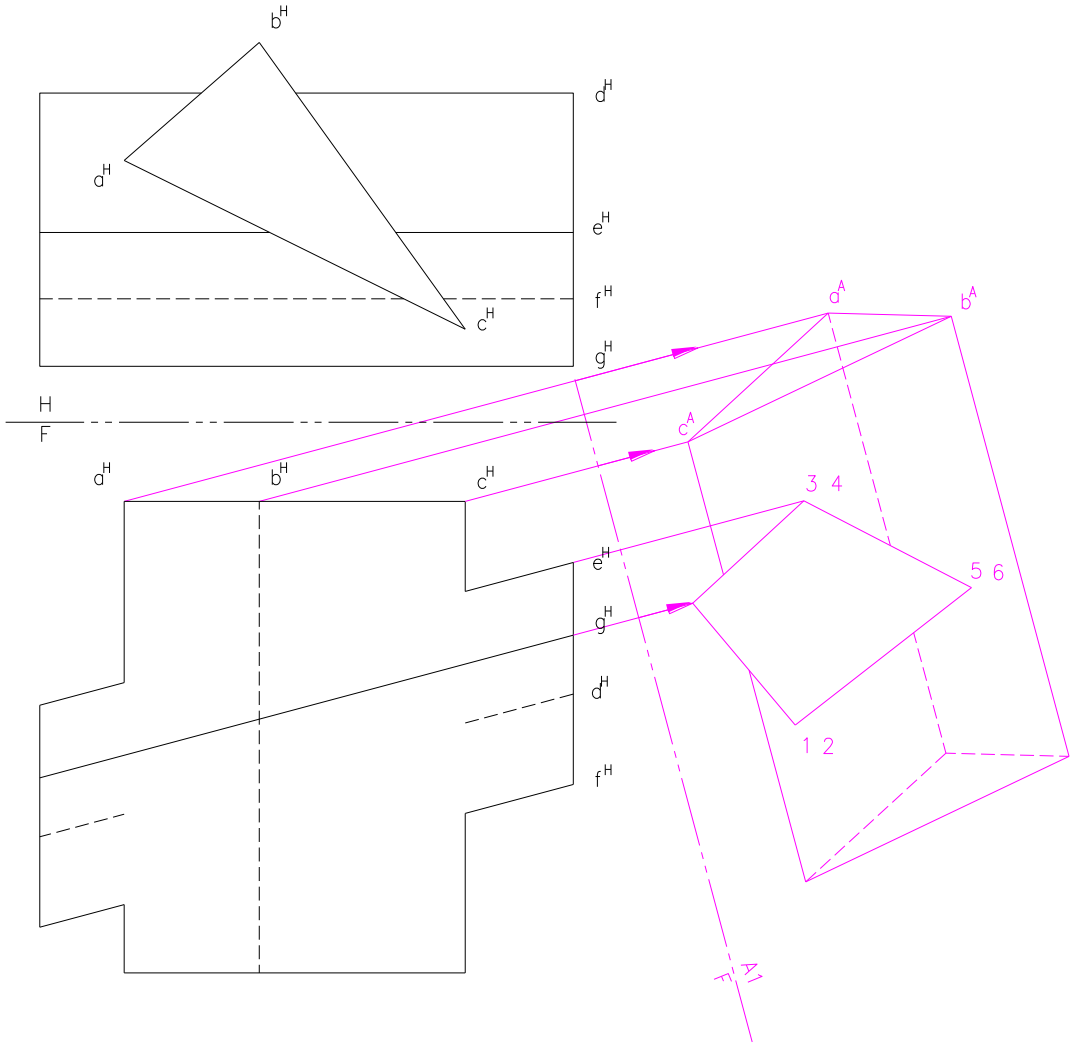
Look for Visibility

Intersection of two Prisms



A vertical prism is intersected by a inclined prism. how will the intersection lines be

Intersection of two Prisms



A vertical prism is intersected by a inclined prism. how will the intersection lines be

The lateral edge of the veritcal prism is seen as EV in the front view. To see the lateral surface of the inclined prism, an aux view is drawn

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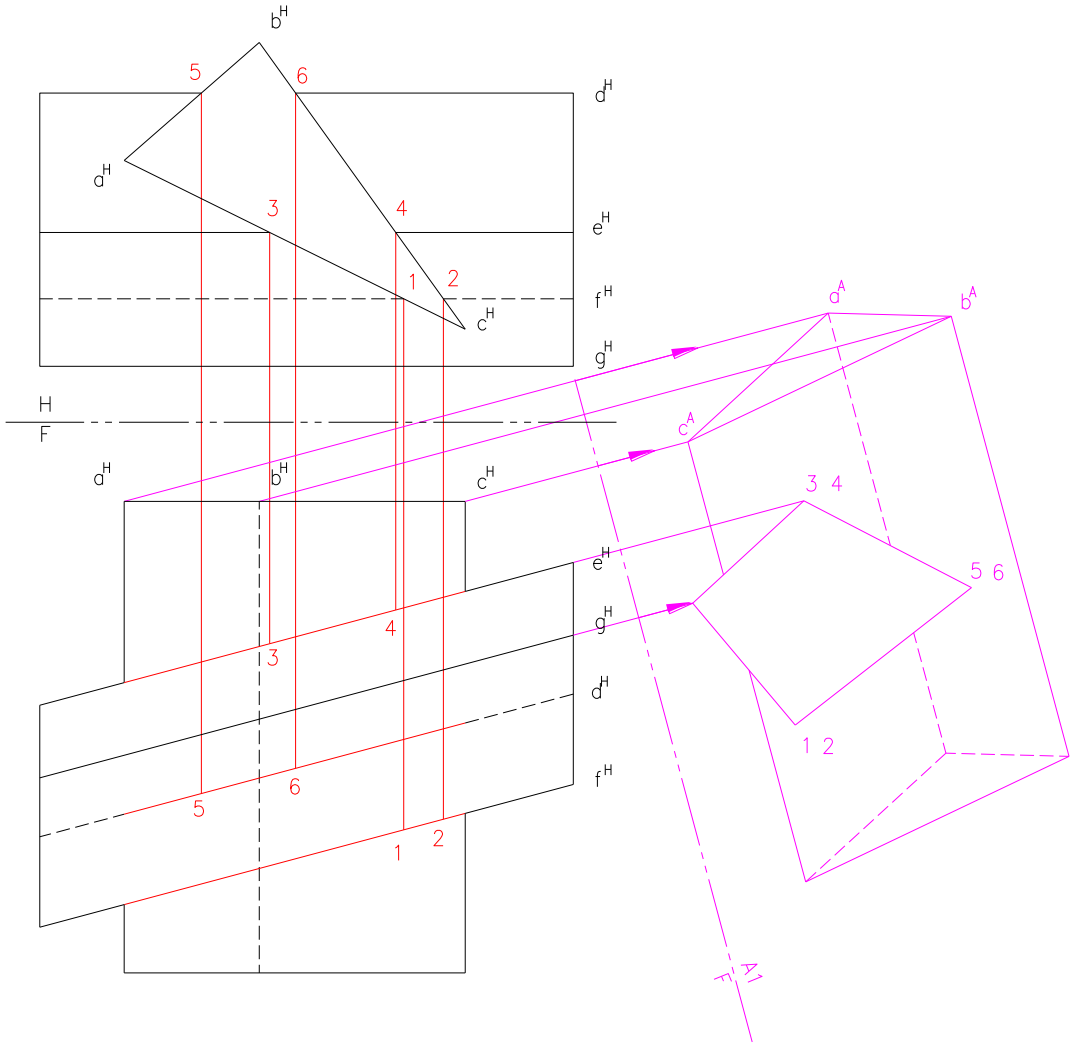

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The number of the edges in aux view come from the points of intersection of the vertical prism with the edges of the inclined prism in the top view

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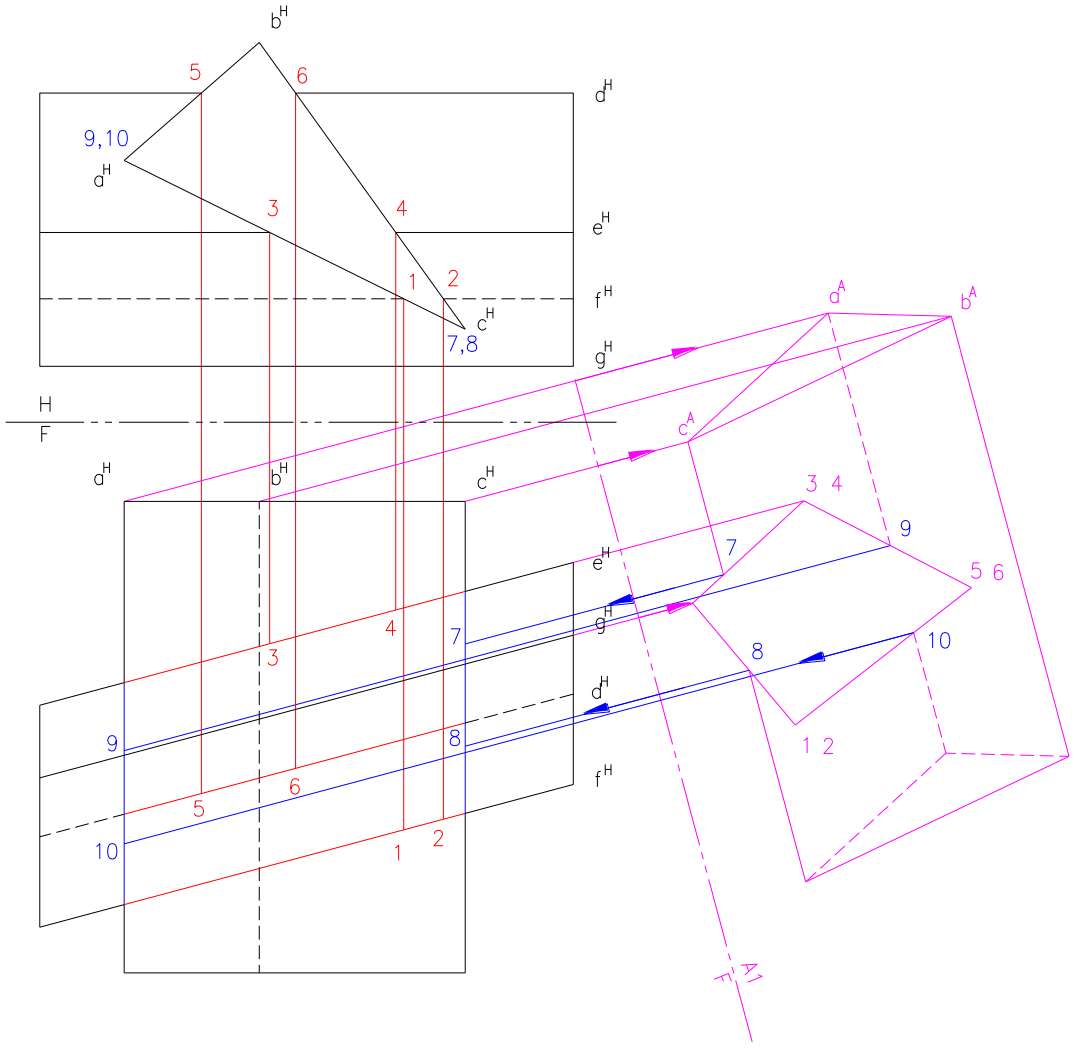

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Trace the points 7, 8, 9, 10 which show the face of the inclined prism intersecting the edges of the vertical prism, back to the front view.

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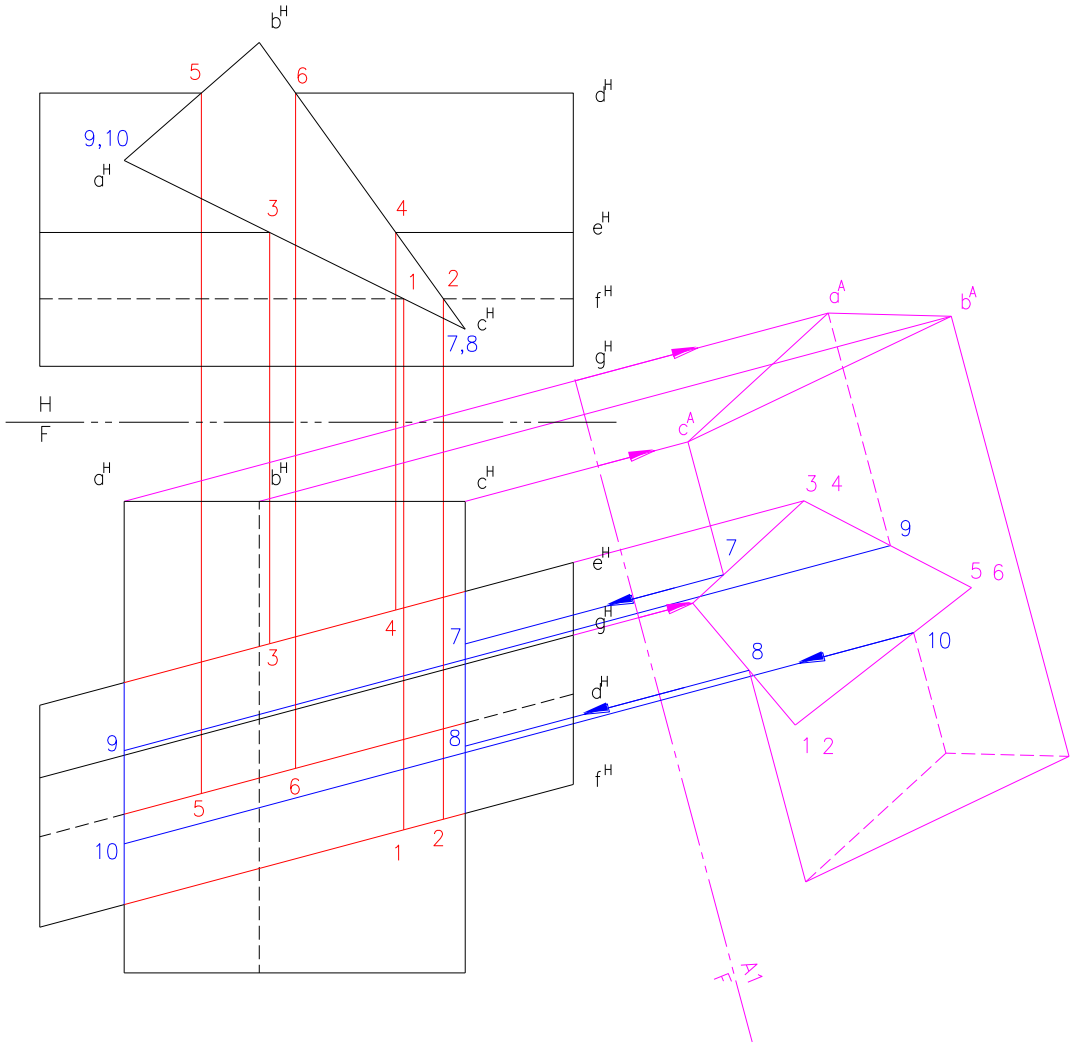

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For example pt.1 is visible and pt.4 is hidden.
1, 3, 7, 8 visible

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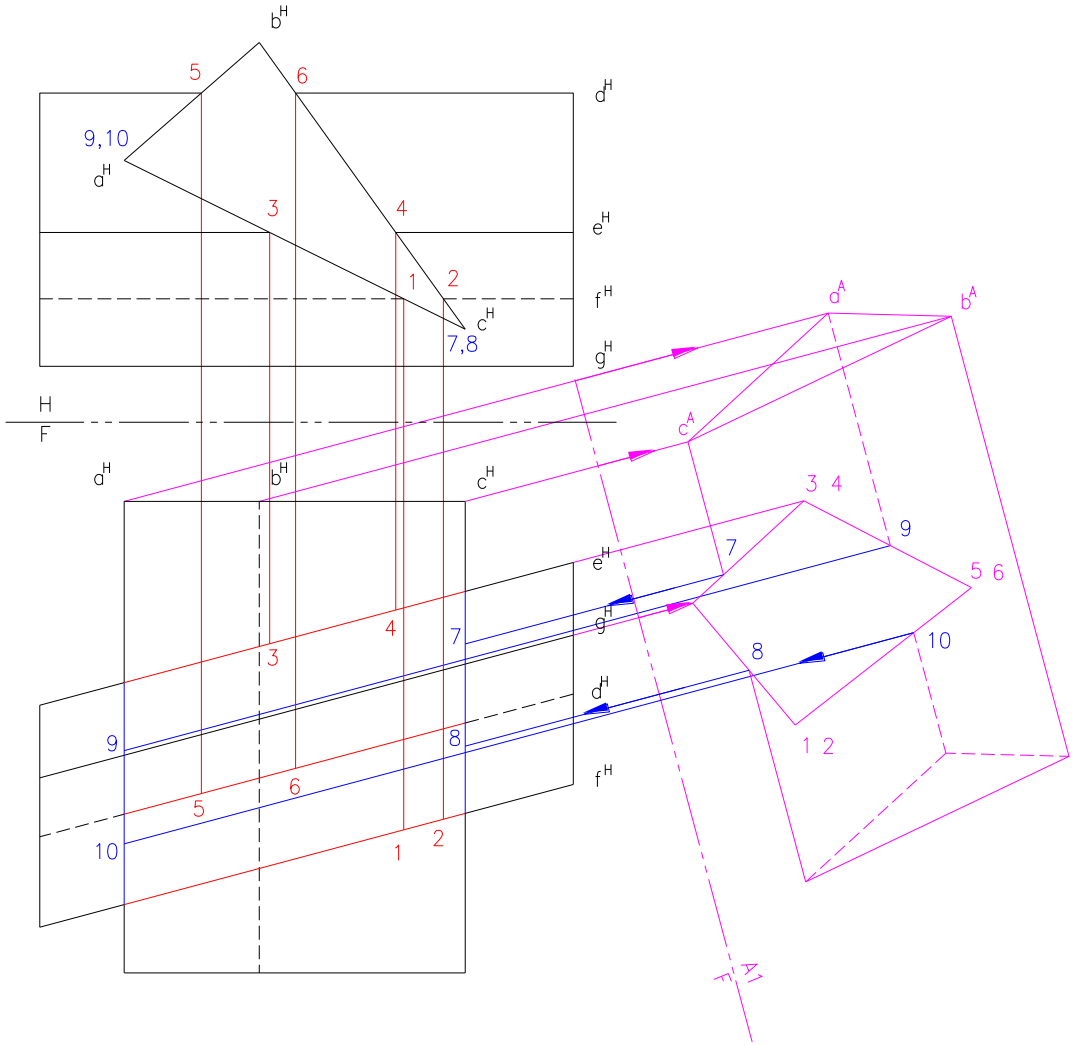

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Connecting the lines in proper sequence is the key to completion. The line should be traced around each prism in all views. like when you see in aux view there is a line from 3,4 to 9, but tin TV there is no line from 4 to 9.

So a line is drawn between 3 and 9 in front view

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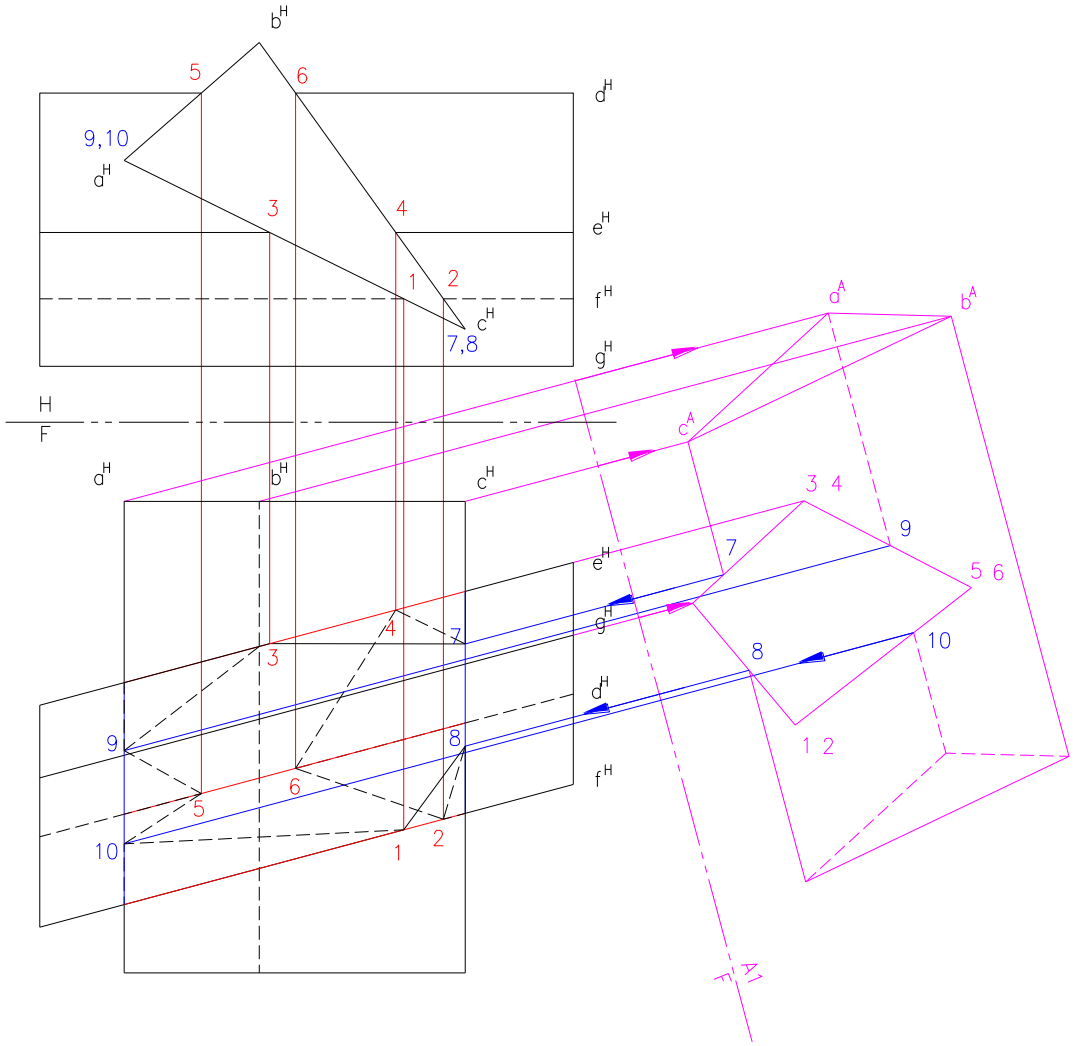

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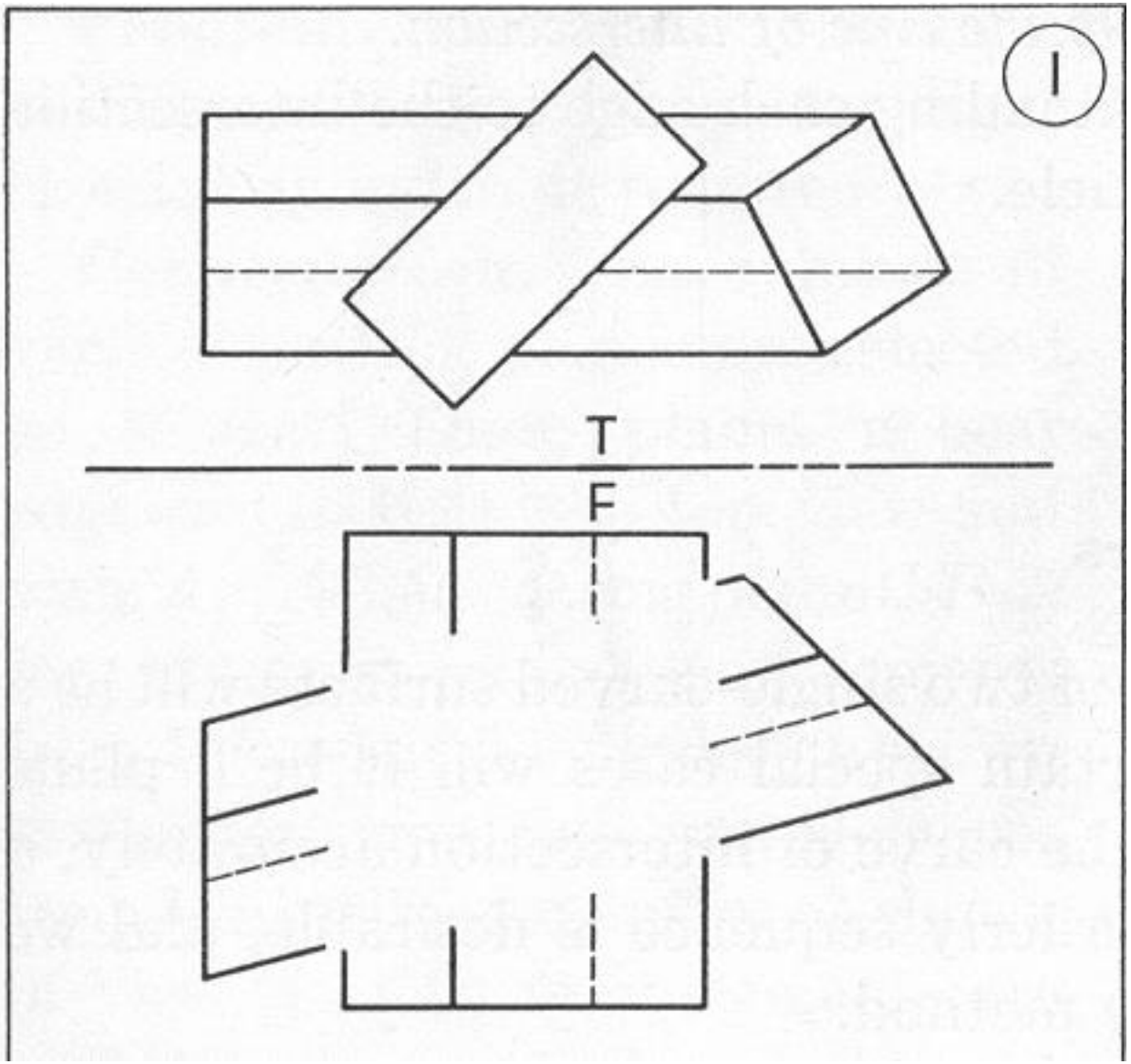

Cutting plane method

The problem shows one vertical and one inclined prism, we must find the intersection figures

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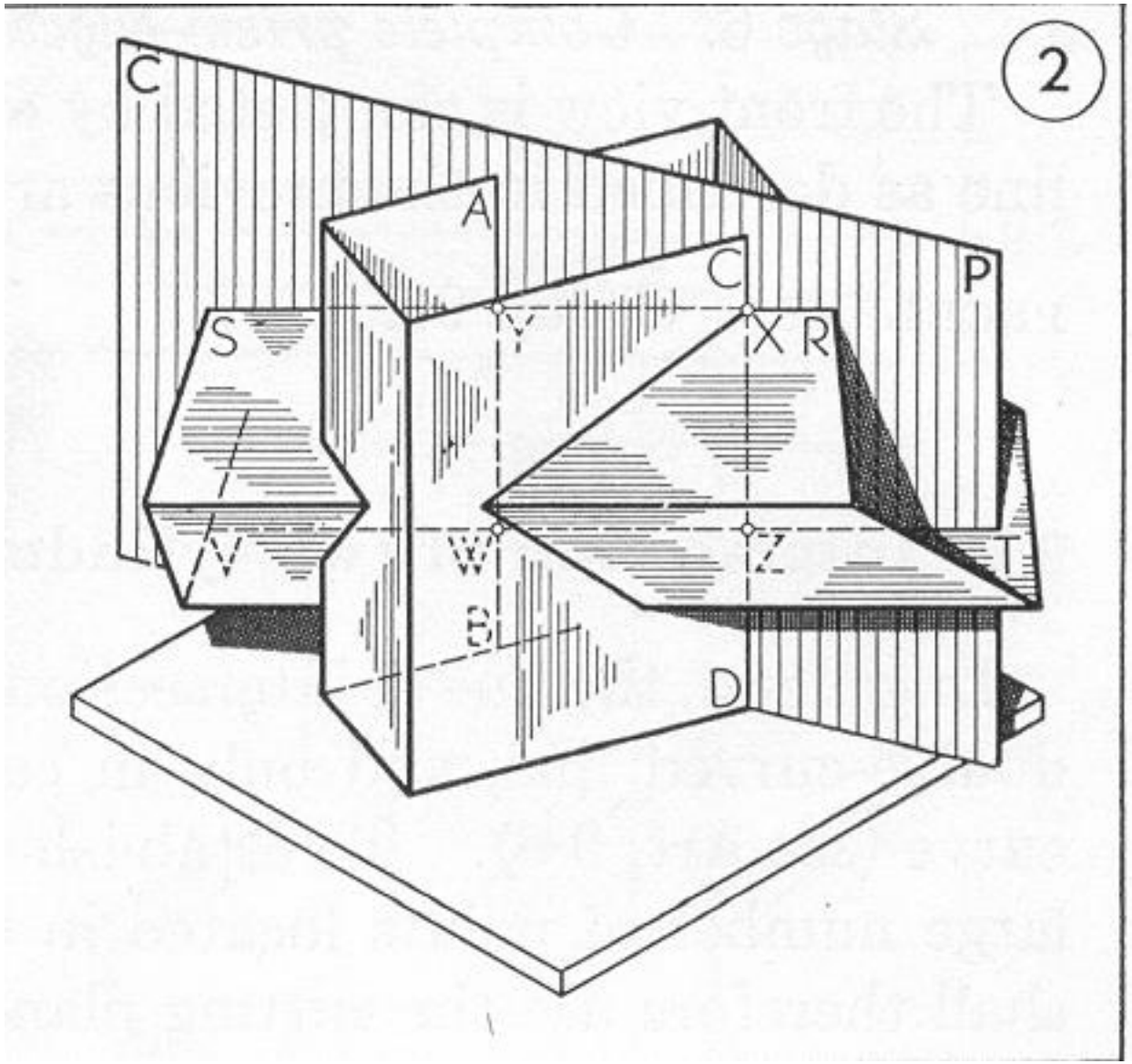

The CP is chosen across one edge RS of the prism

This plane cuts the lower surface at VT, and the other prism at AB and CD

The 4 points WZYX line in both the prisms and also on the cutting plane

These are the points of intersection required

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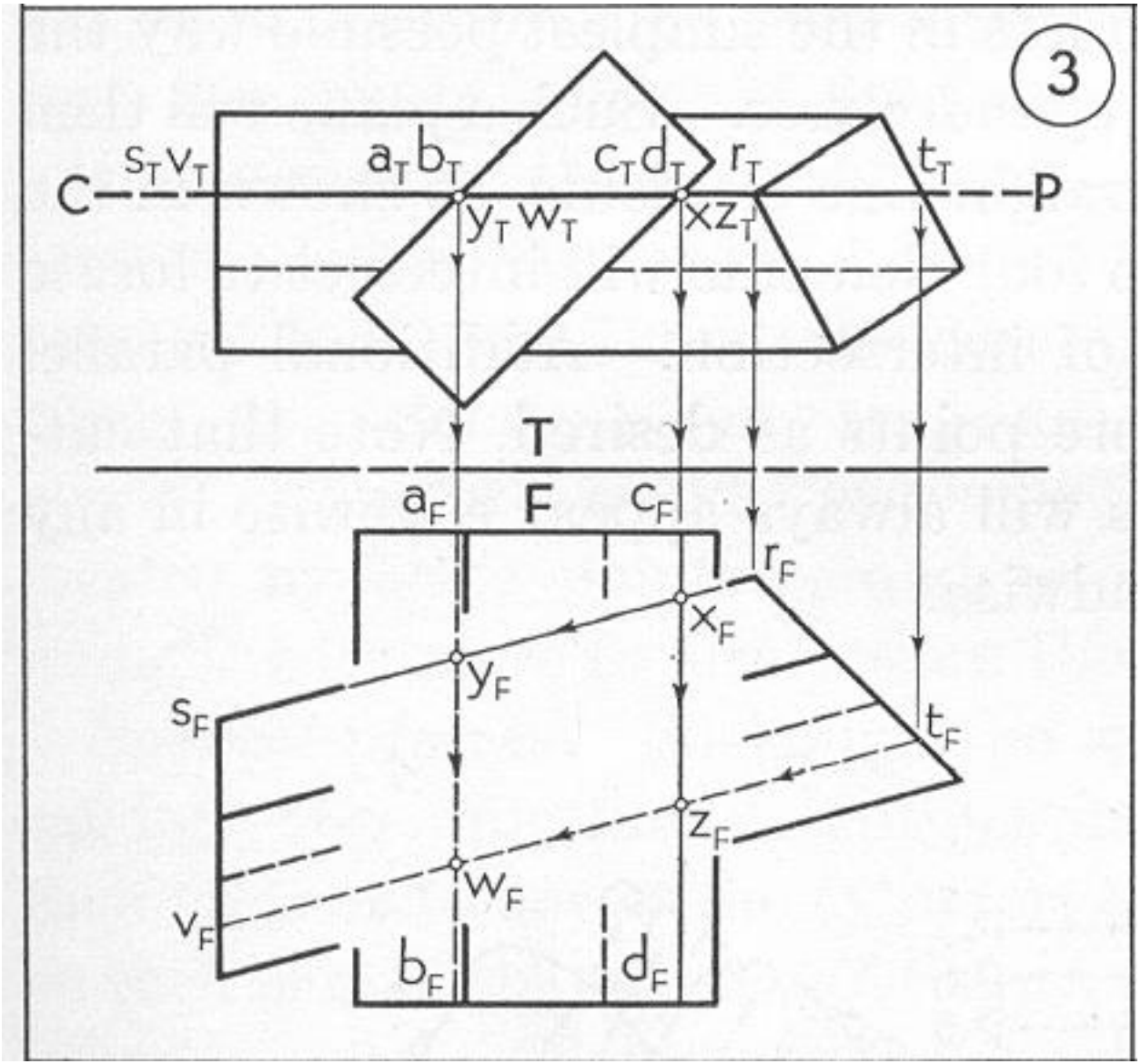

The cutting plane shown in multi view projection.

The visibility of the points are seen in the 3D

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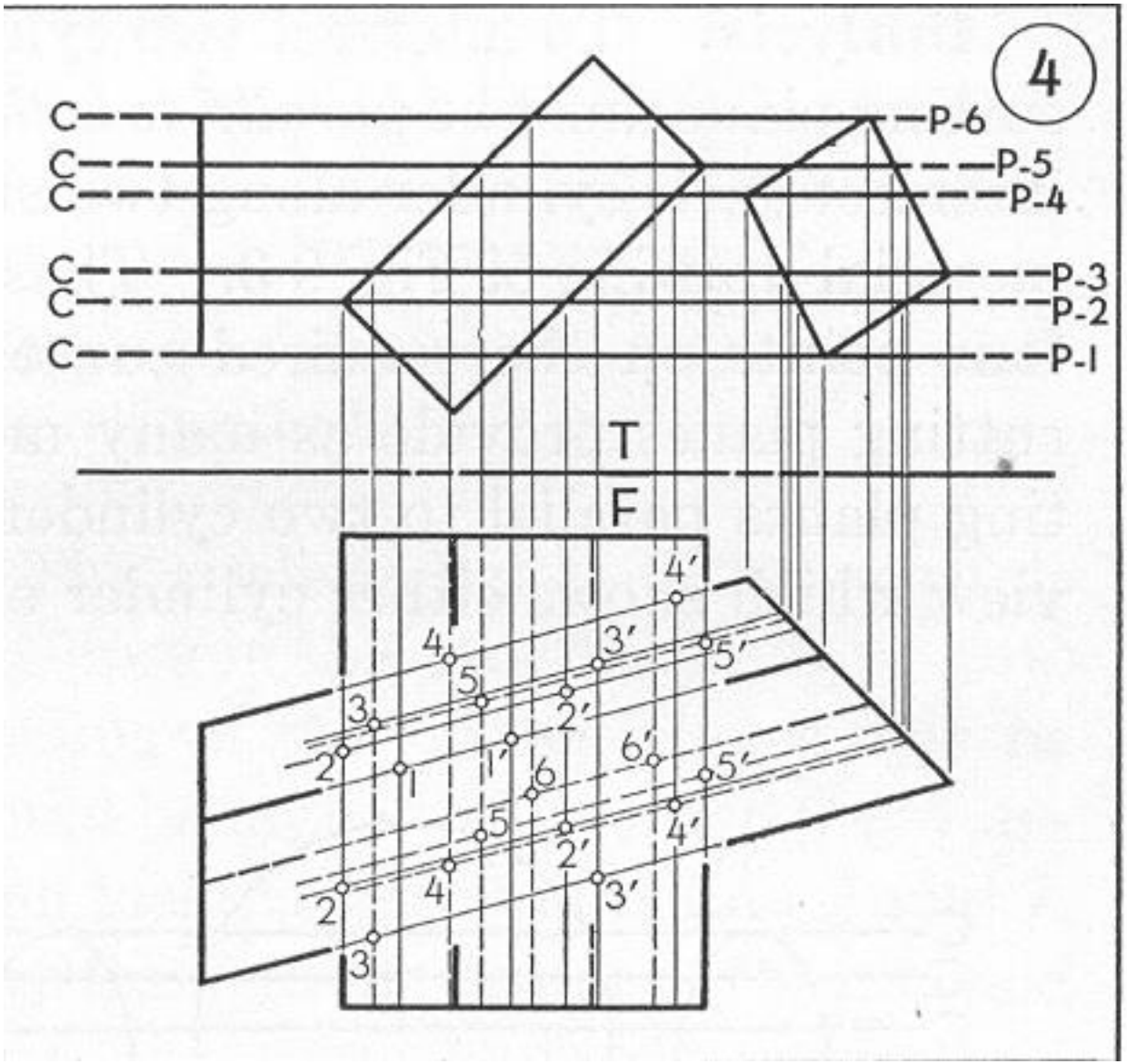

Total number of cutting planes required is 6 and locate the intersection points from the cutting planes and locate the points in the front view

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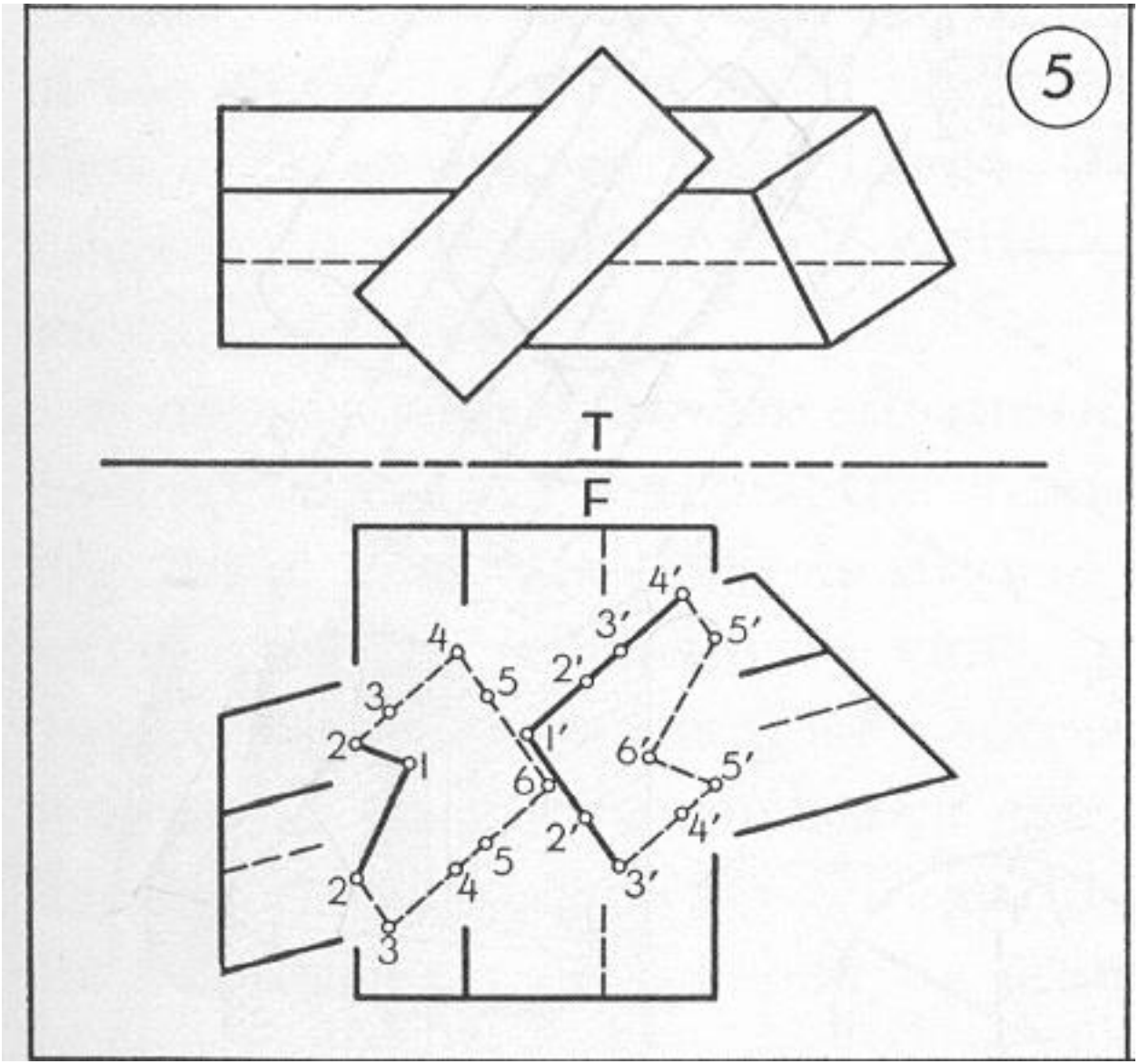

The points are connected in the front view based on the visibility and sequence

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