

Technical Drawing

Chapter III

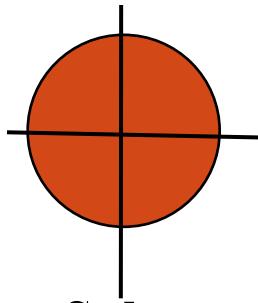
PROJECTION OF SOLIDS

III-1. Descriptive Geometry

II-1-1. Principe

The principle is to represent solids using planar figures (2D).

Examples of object projection:



Sphere



Cube

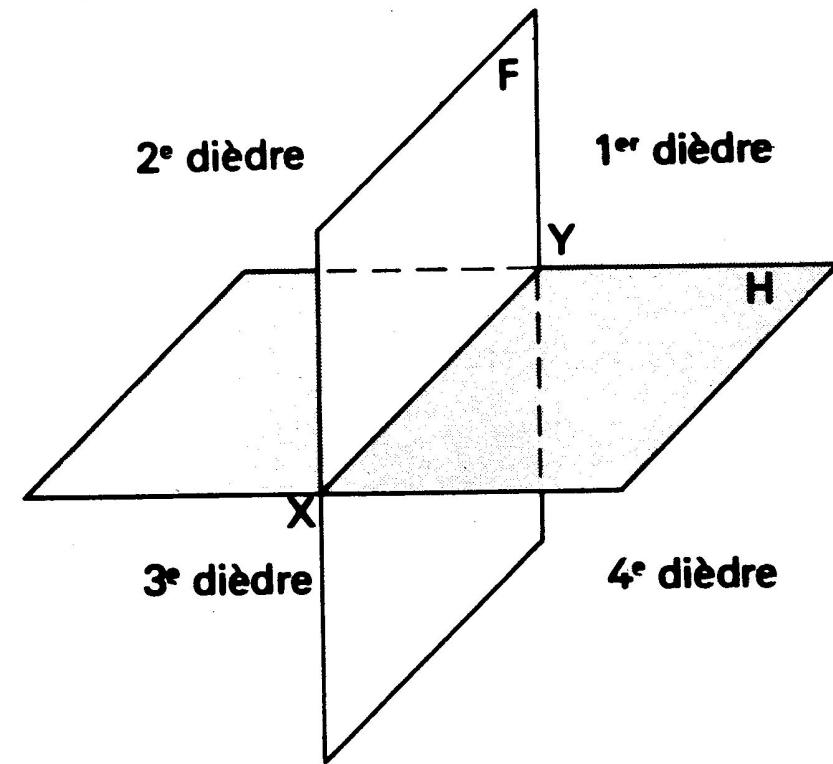
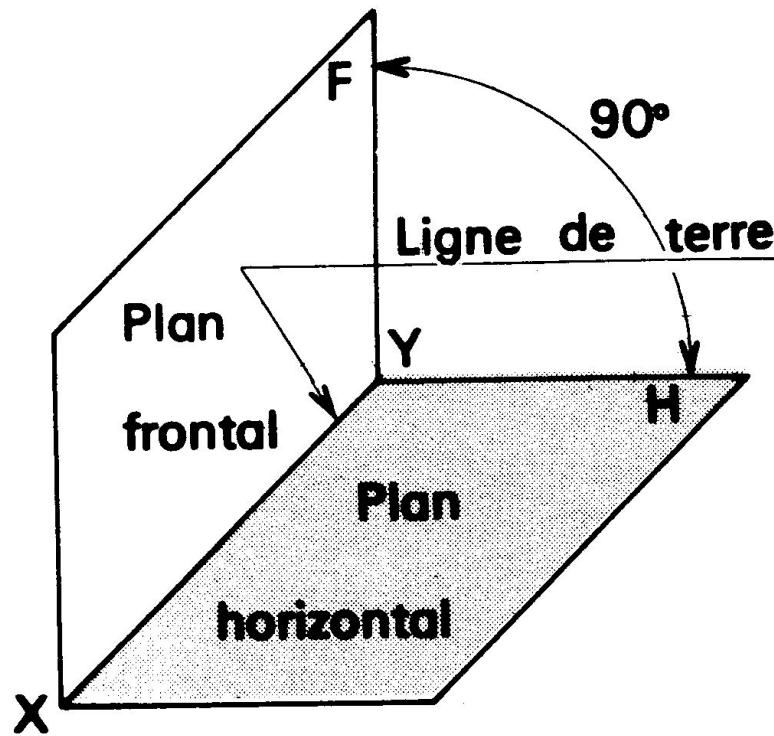


Cylindrical axis

- Therefore, it is necessary to know beforehand how to:
- Choose the projection planes
- Project a point, a line, and a plane
- Present these projections

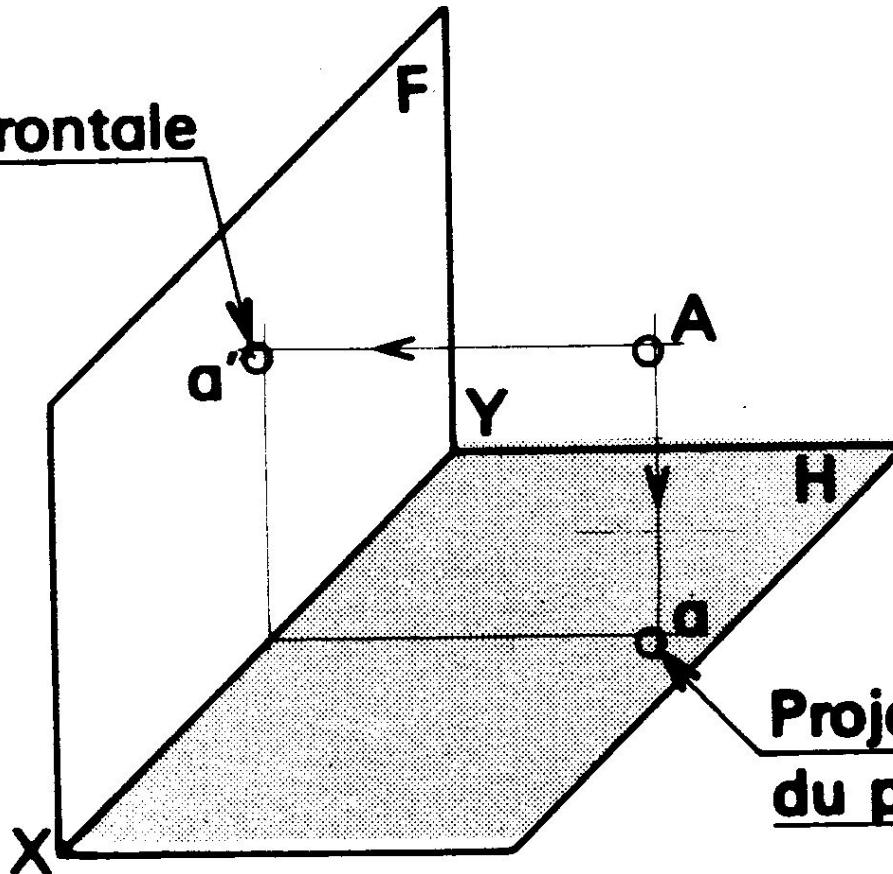
III-1-2. Projection Plans

We choose two planes: one horizontal (H) and the other frontal (F).



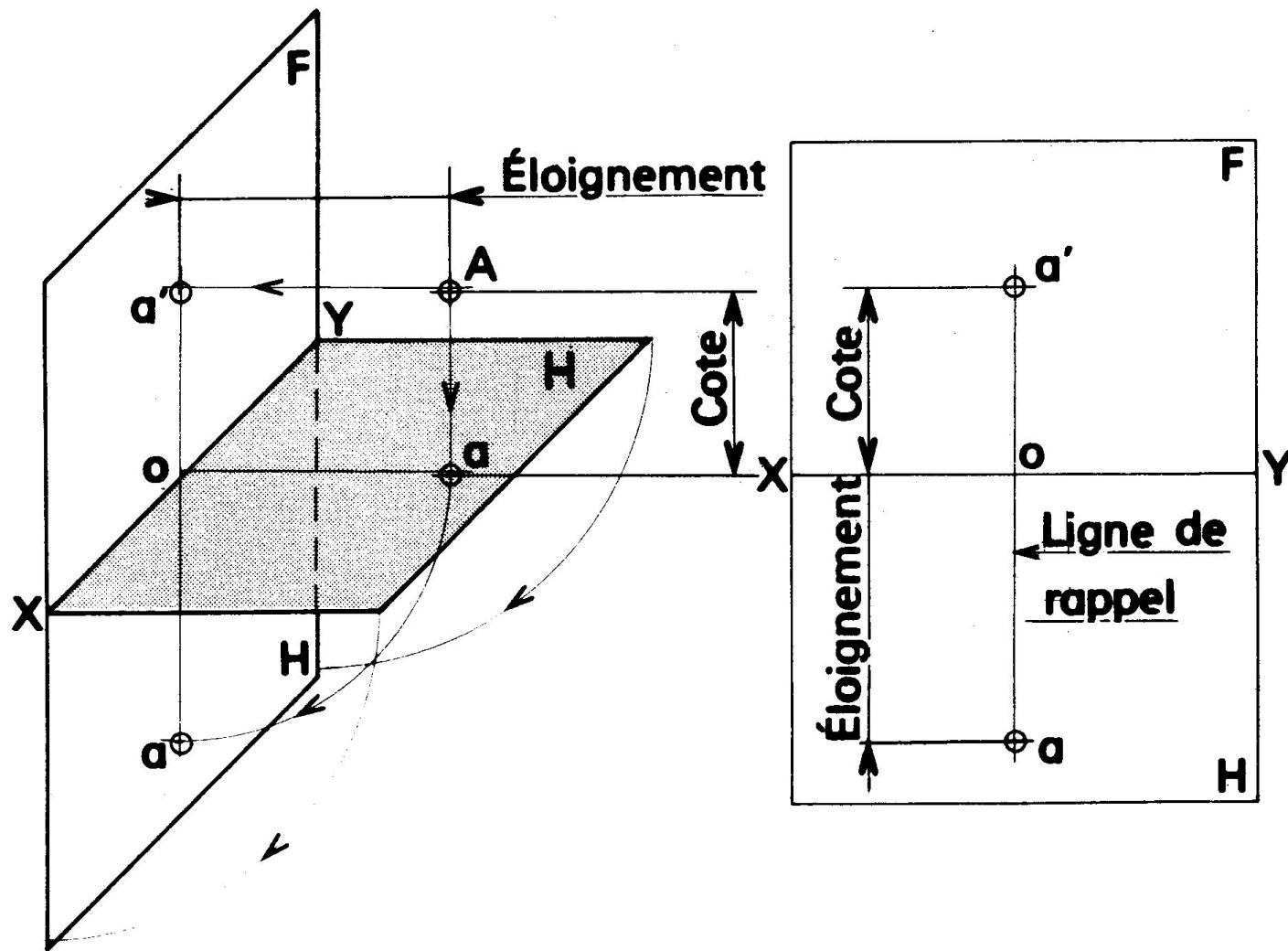
II-1-3 Orthogonal Projections of a Point

Projection frontale
du point A

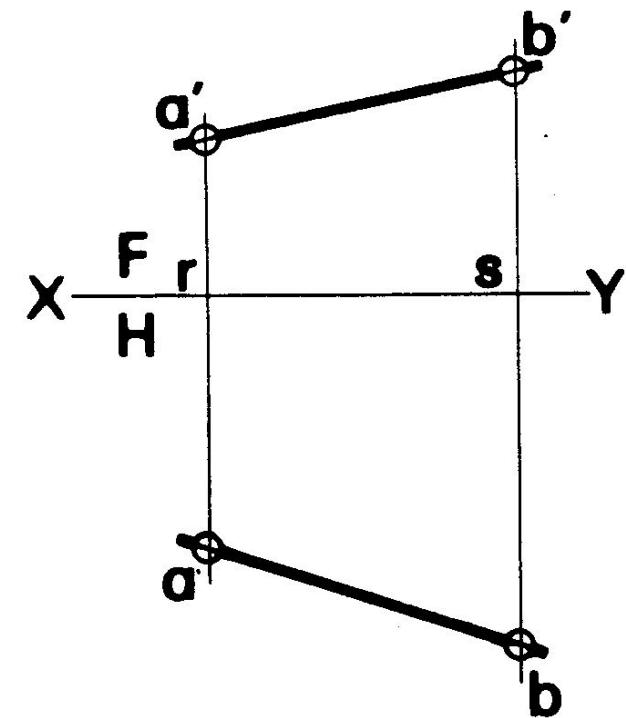
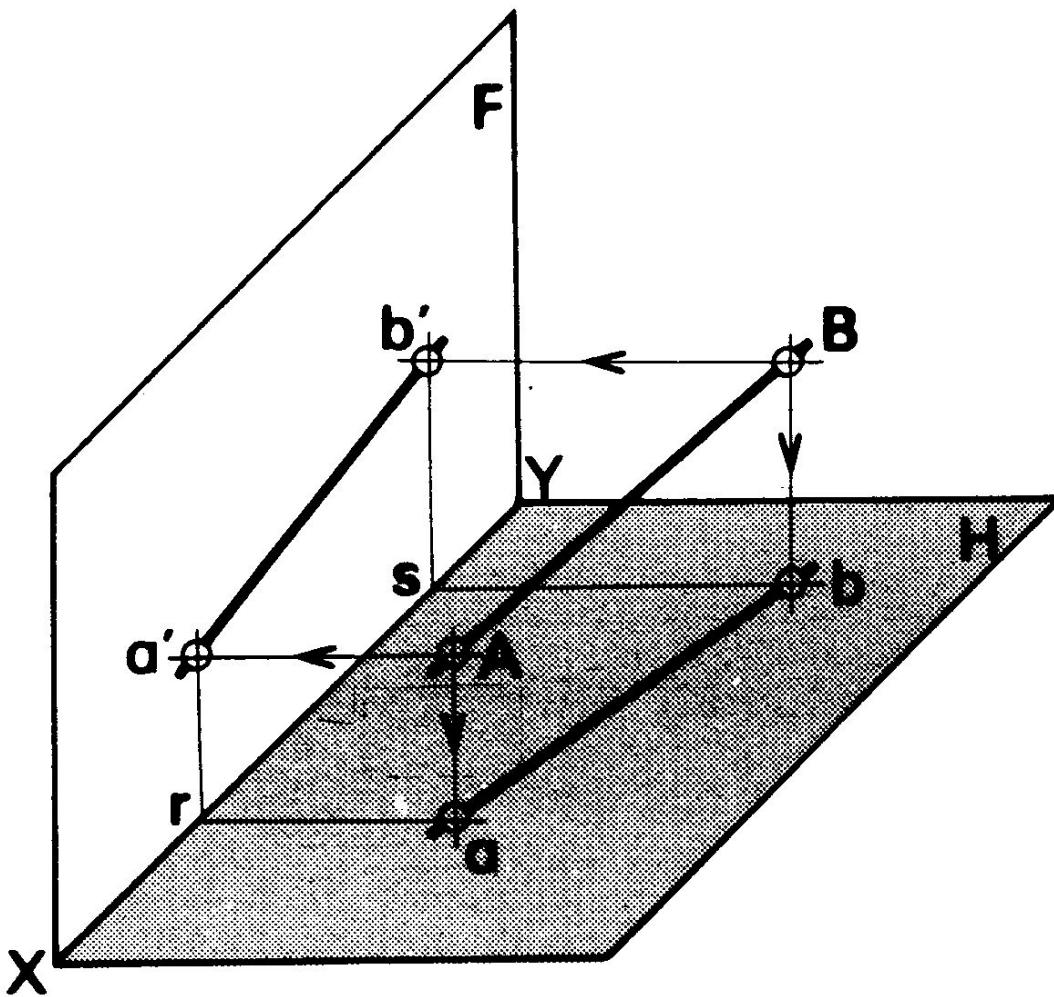


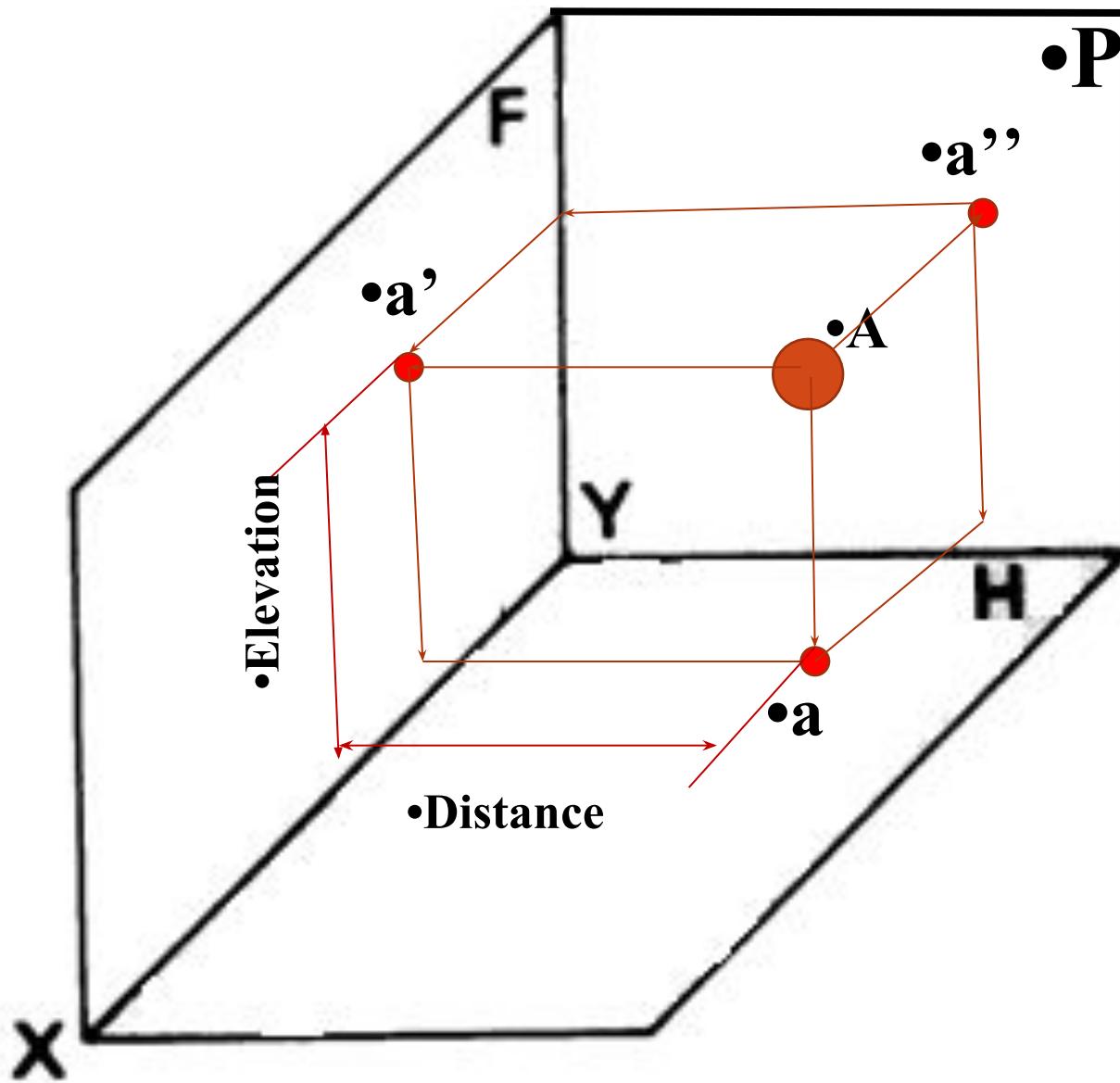
Projection horizontale
du point A

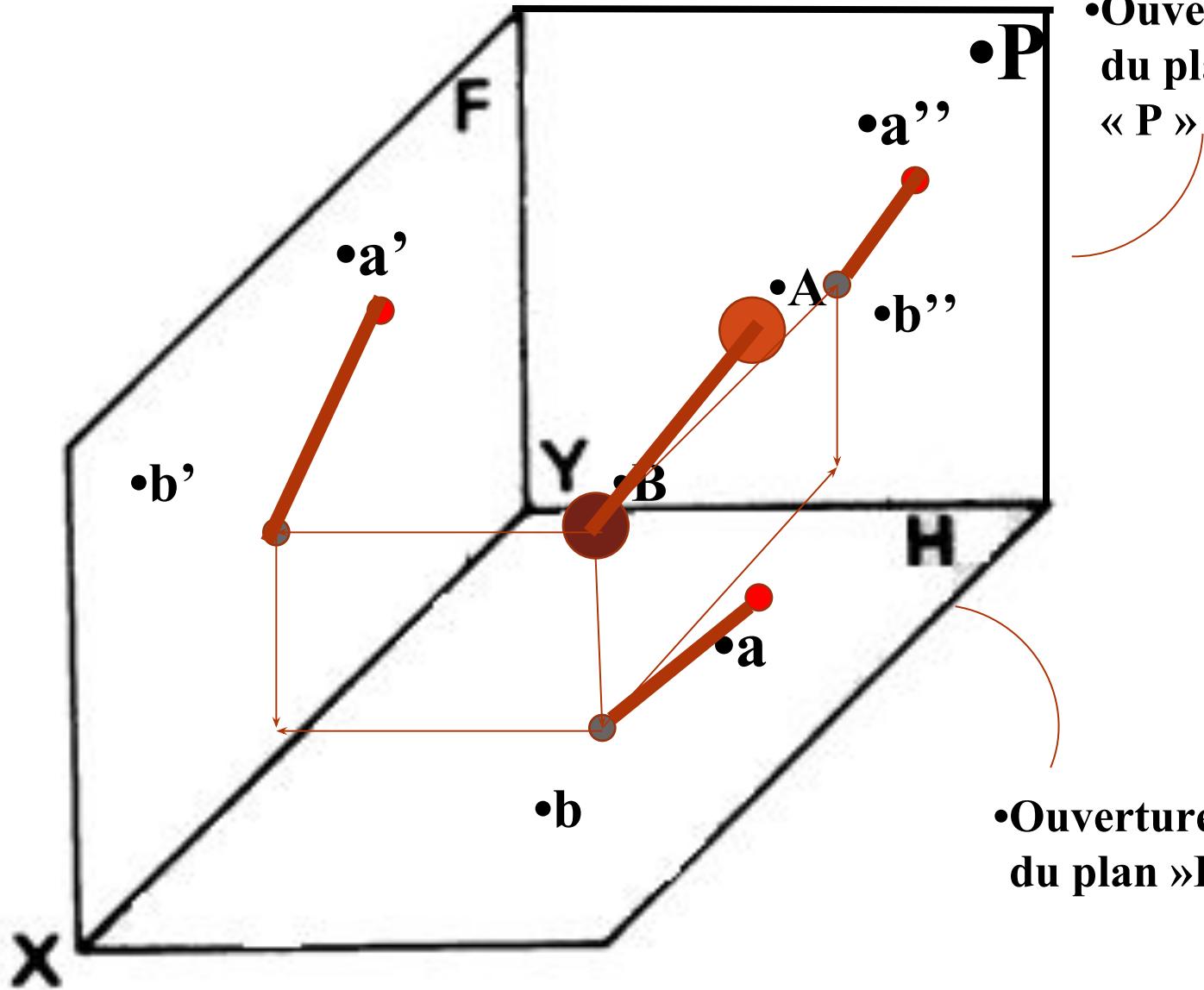
II-1-4. Plot of point A



II-1-5. Orthogonal Projections of a Line

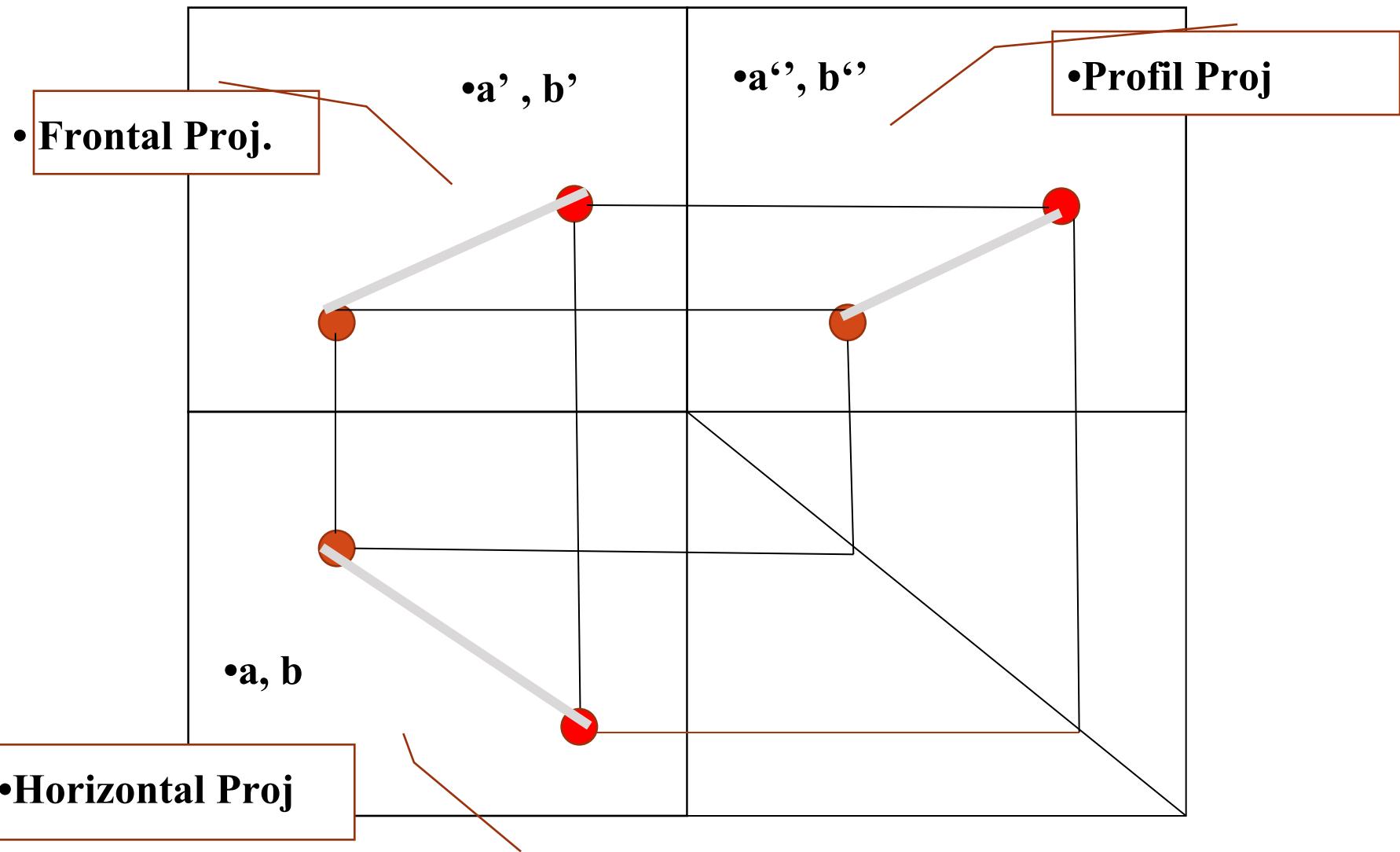






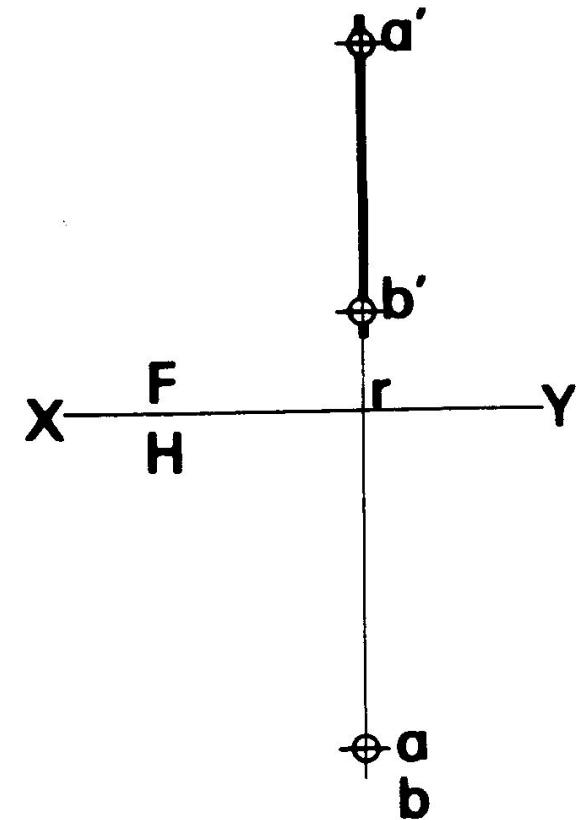
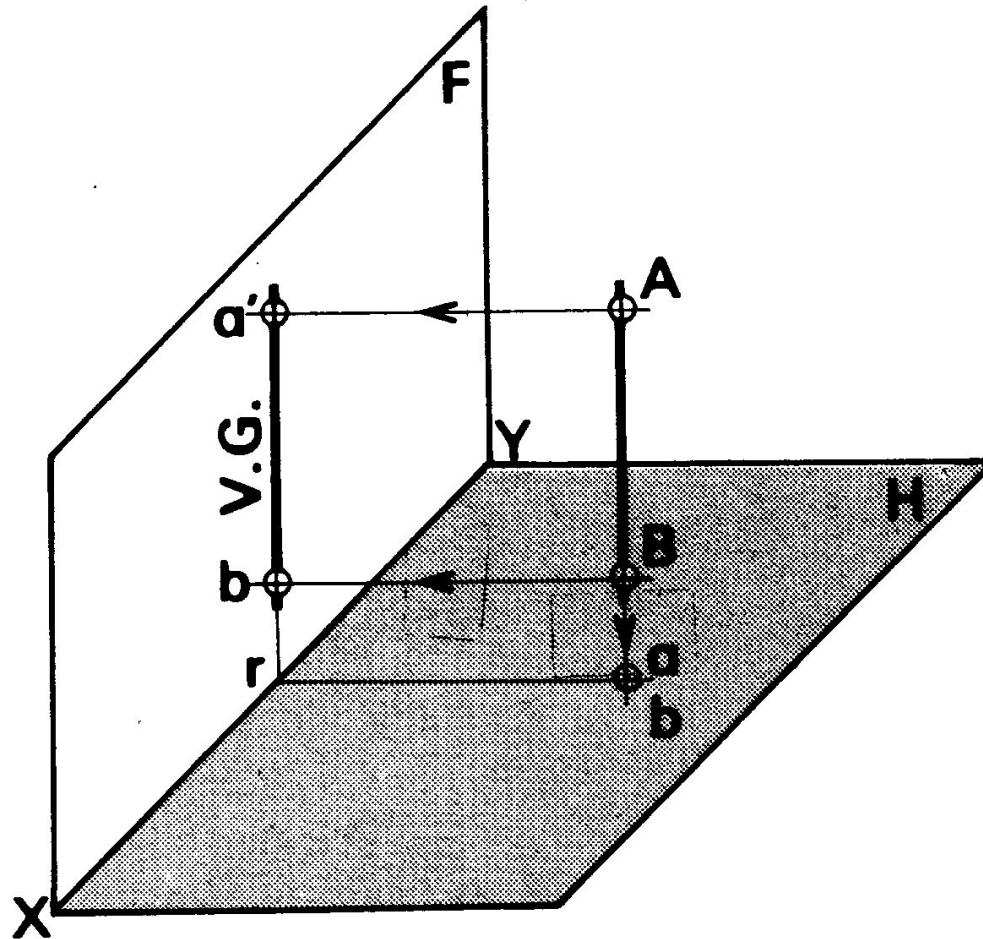
•Ouverture
du plan
« P »

•Ouverture
du plan »H»

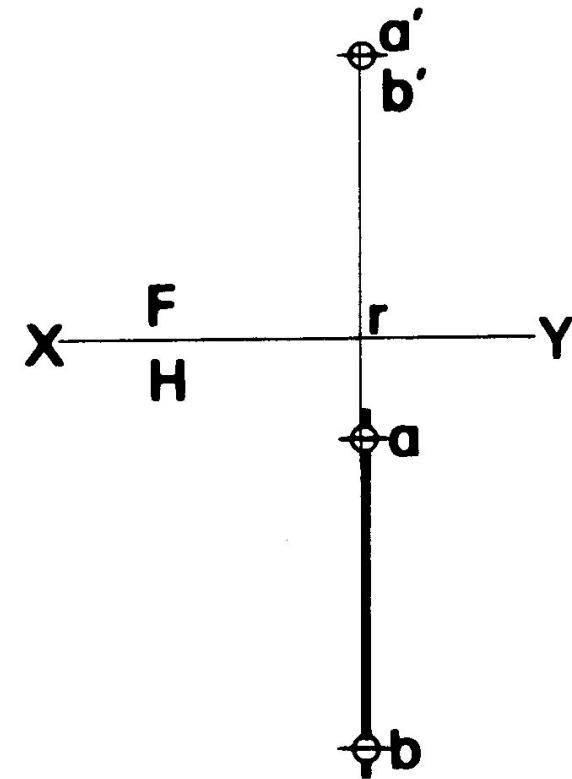
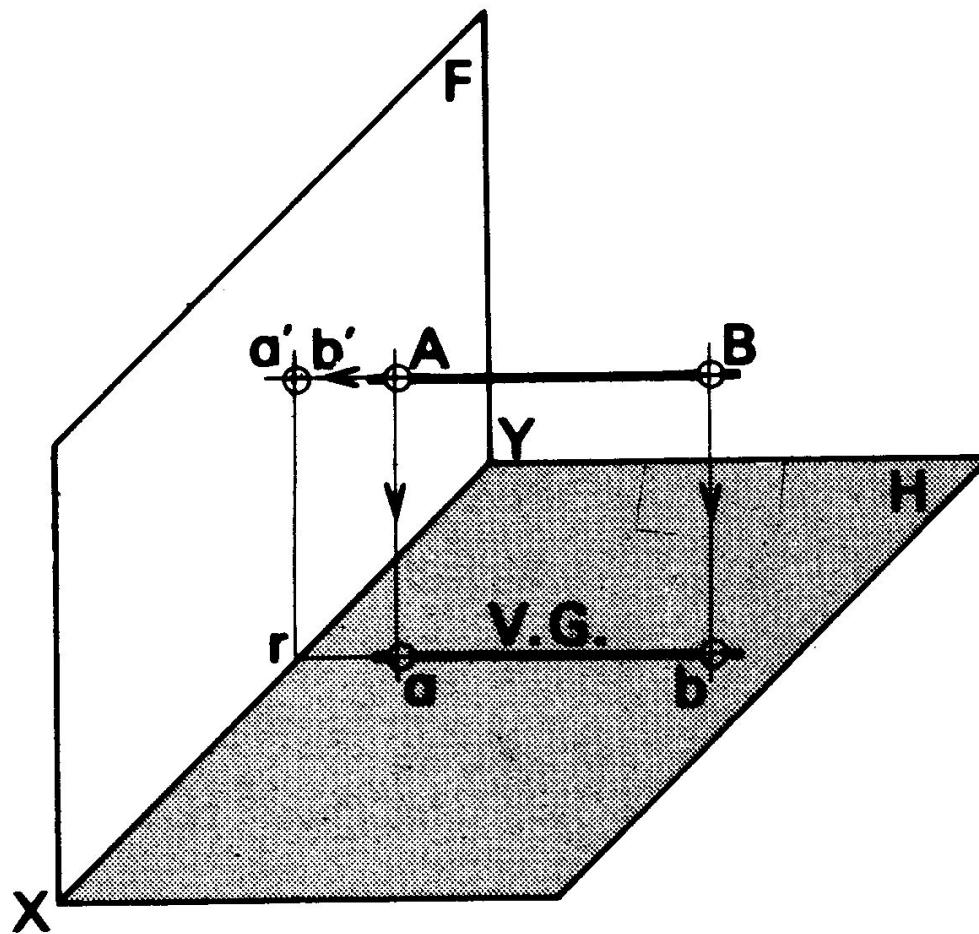


II-1-6. Positions of a Line

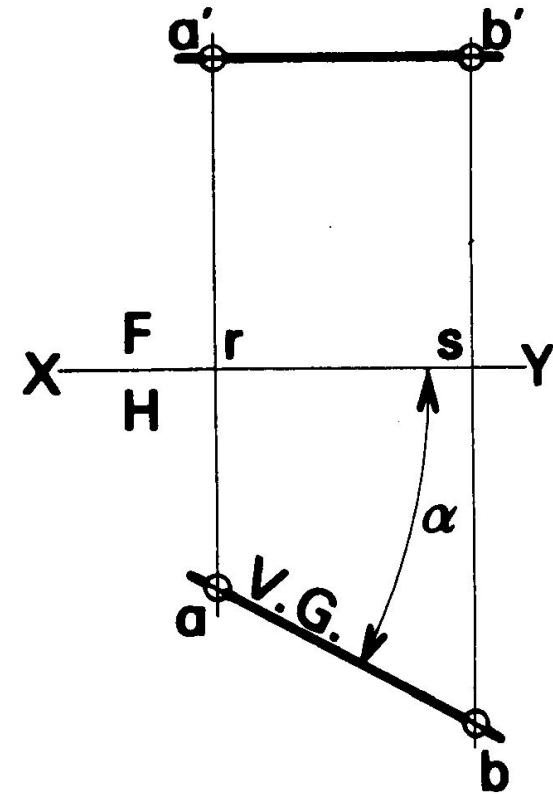
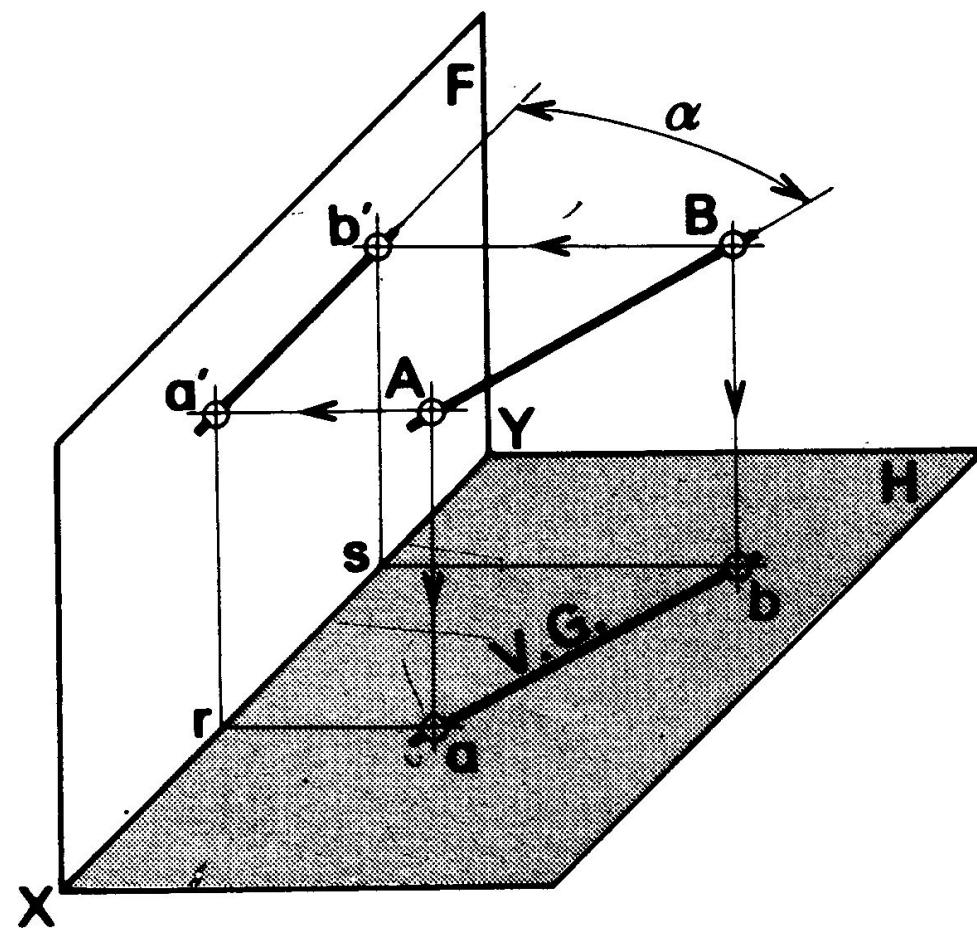
•1. Vertical line



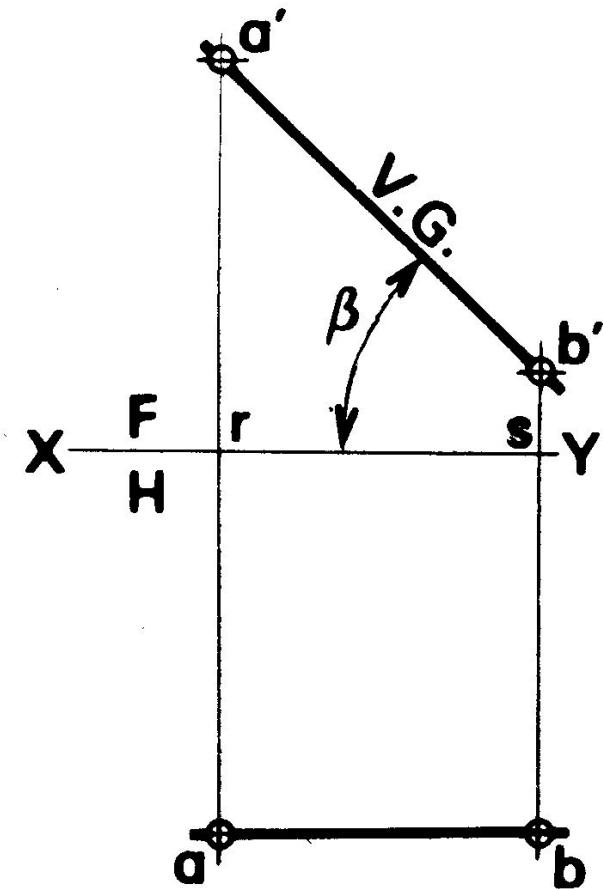
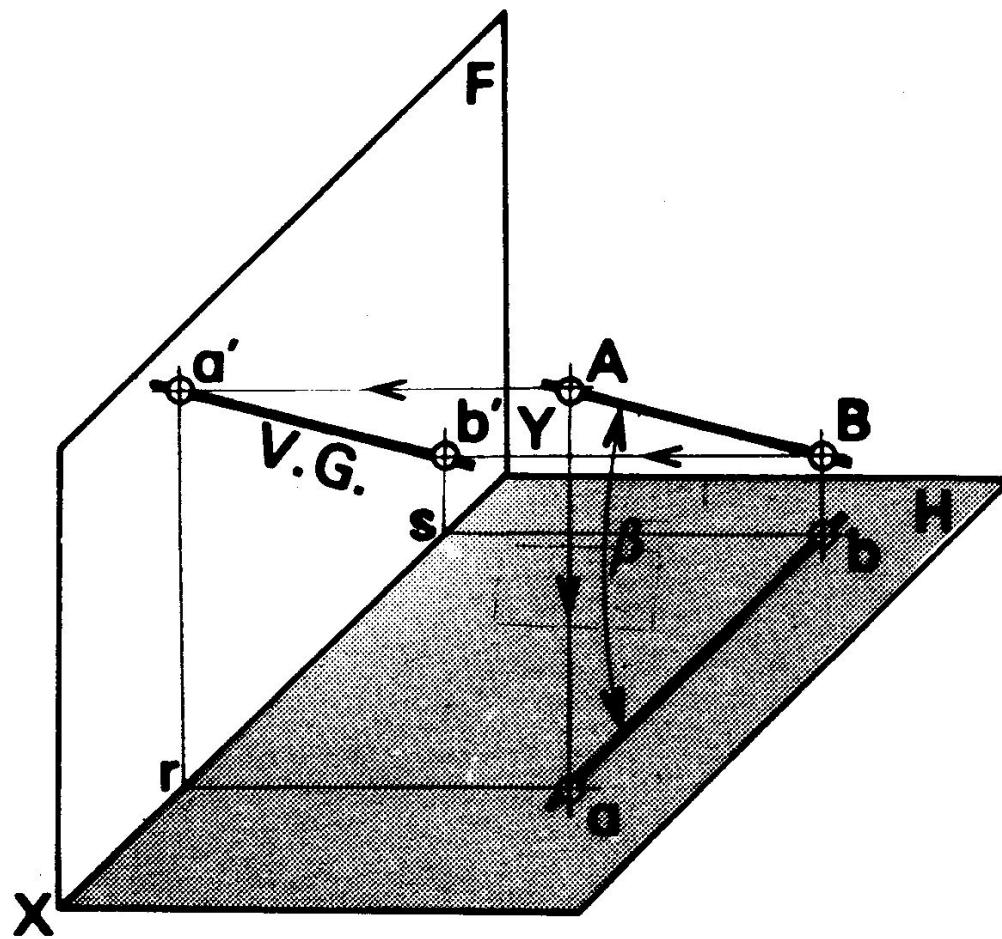
2. Frontal-perpendicular line



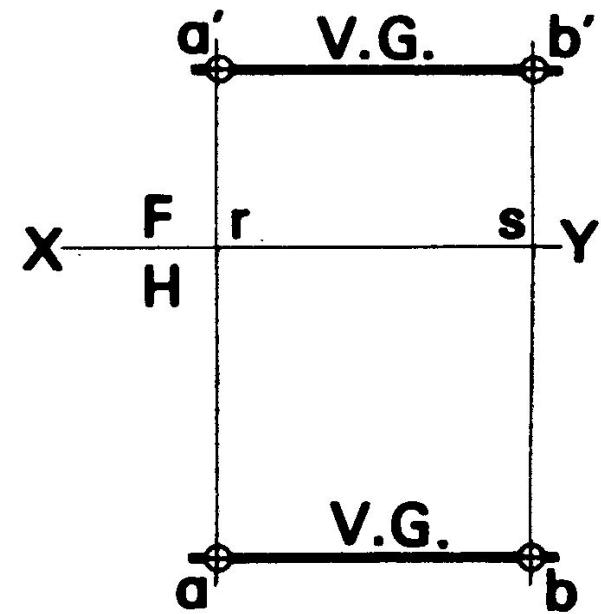
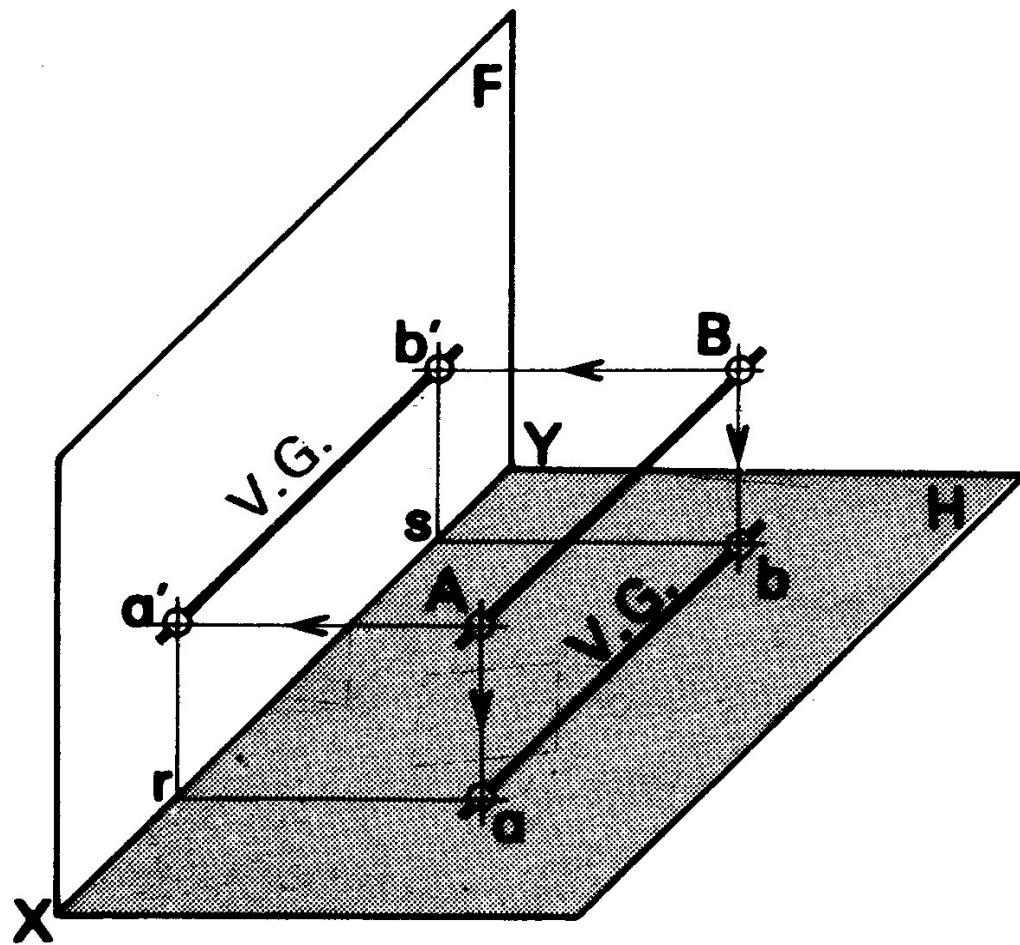
3. Horizontal Line



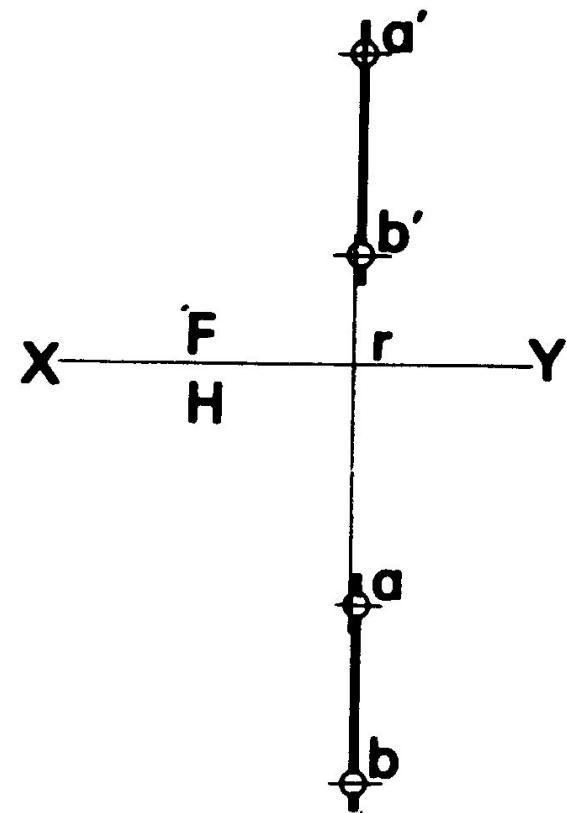
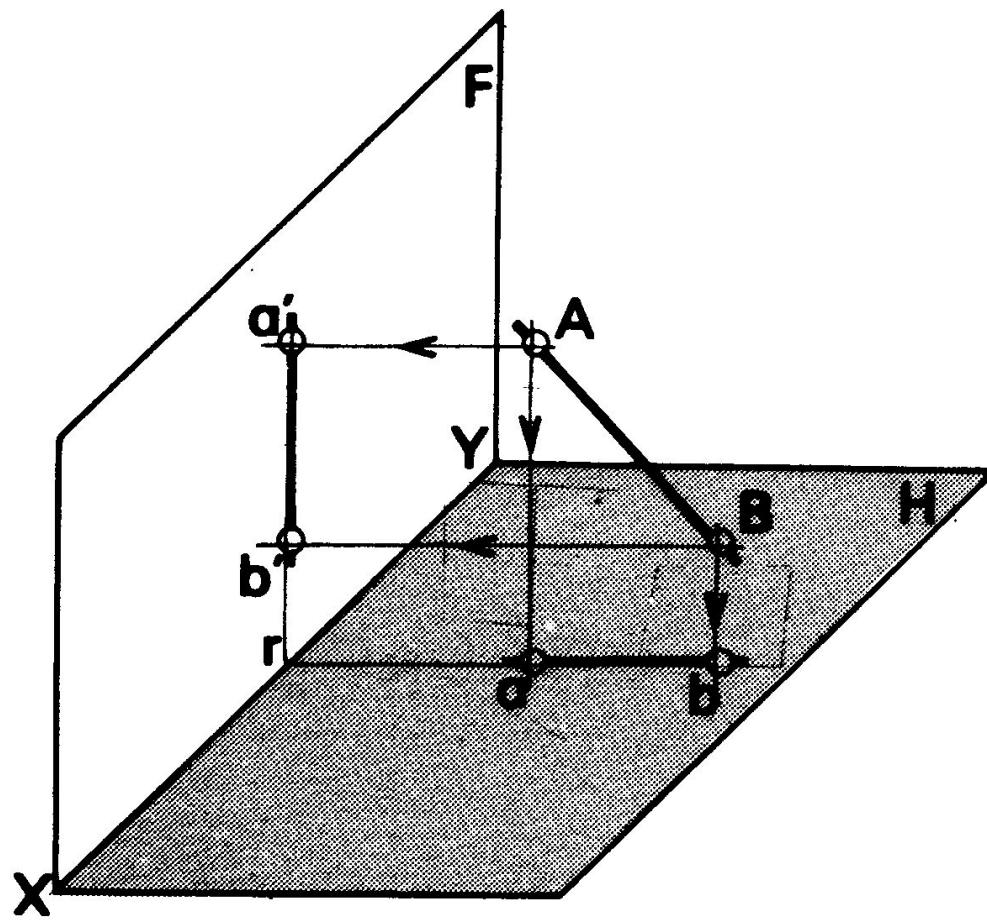
4. Frontal Line



5. Fronto-horizontal Line

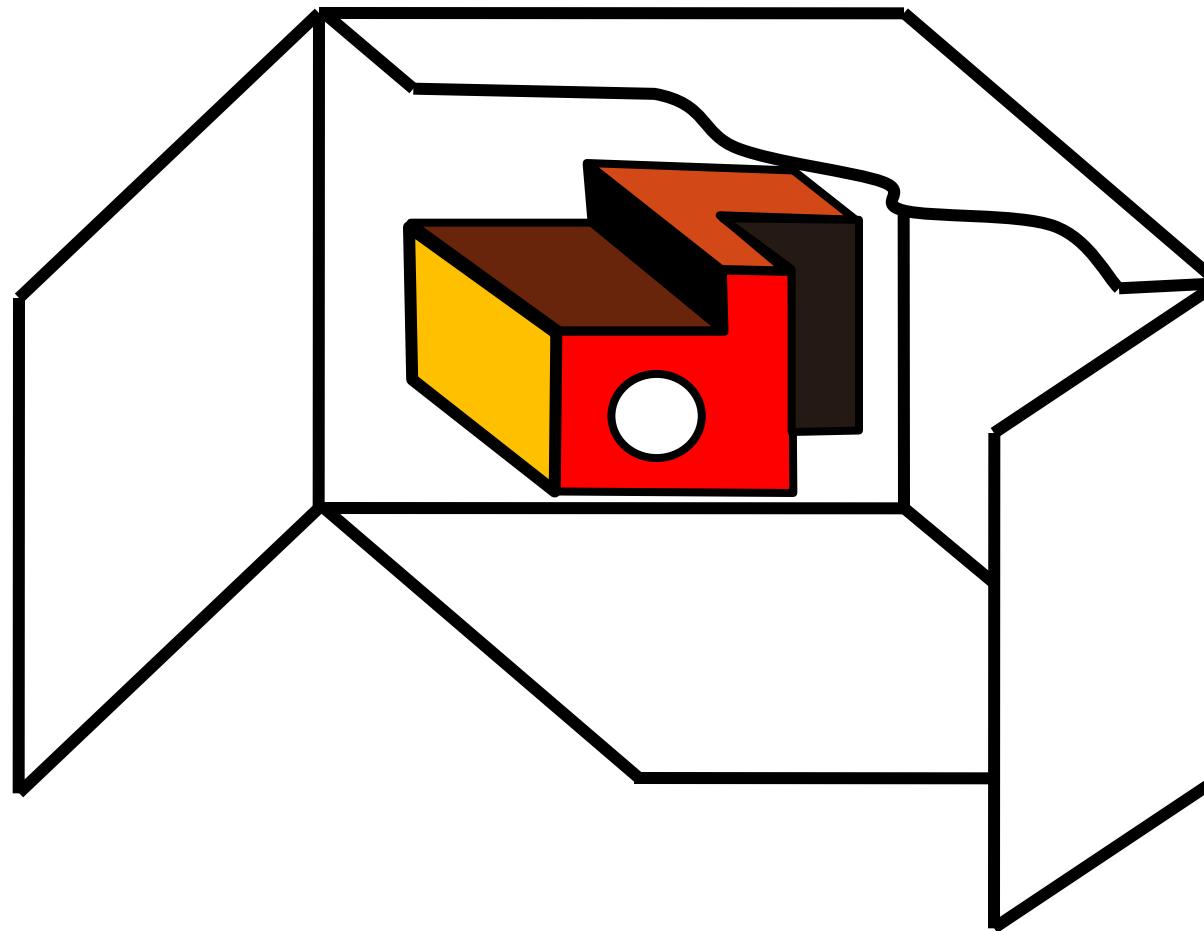


6. Profil Line

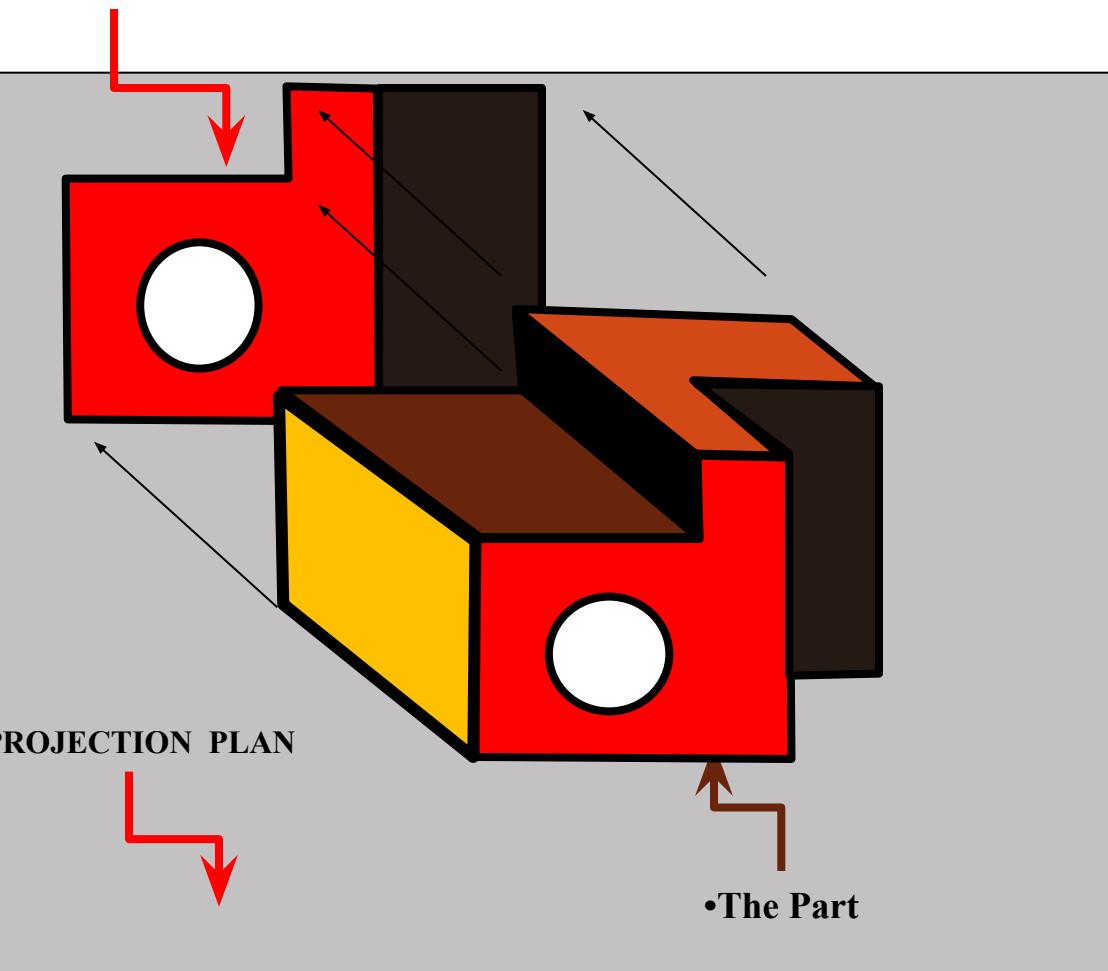


III-2. ORTHOGRAPHIC PROJECTION OF SOLIDS

PRINCIPE

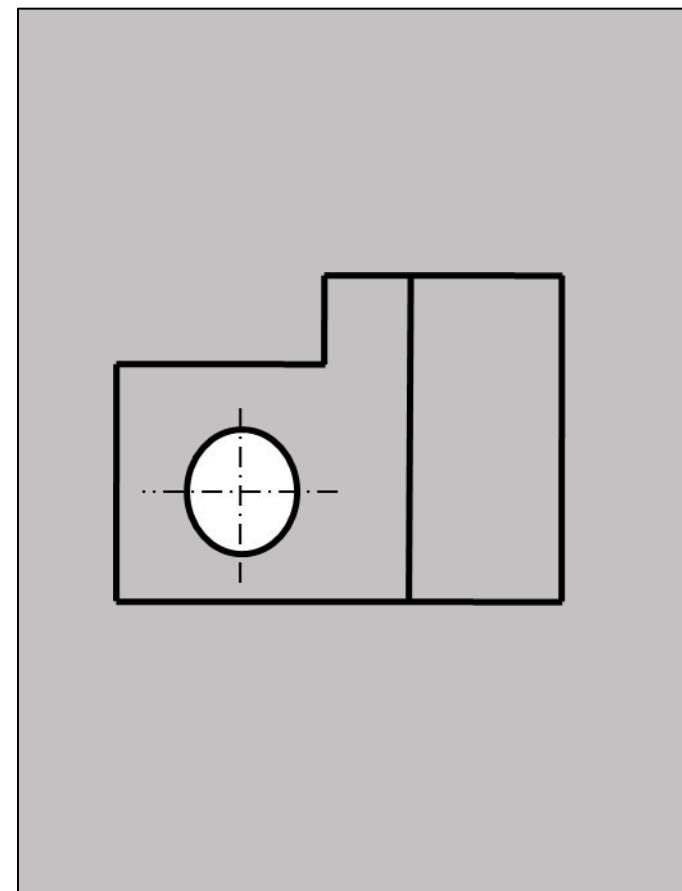


•Front view



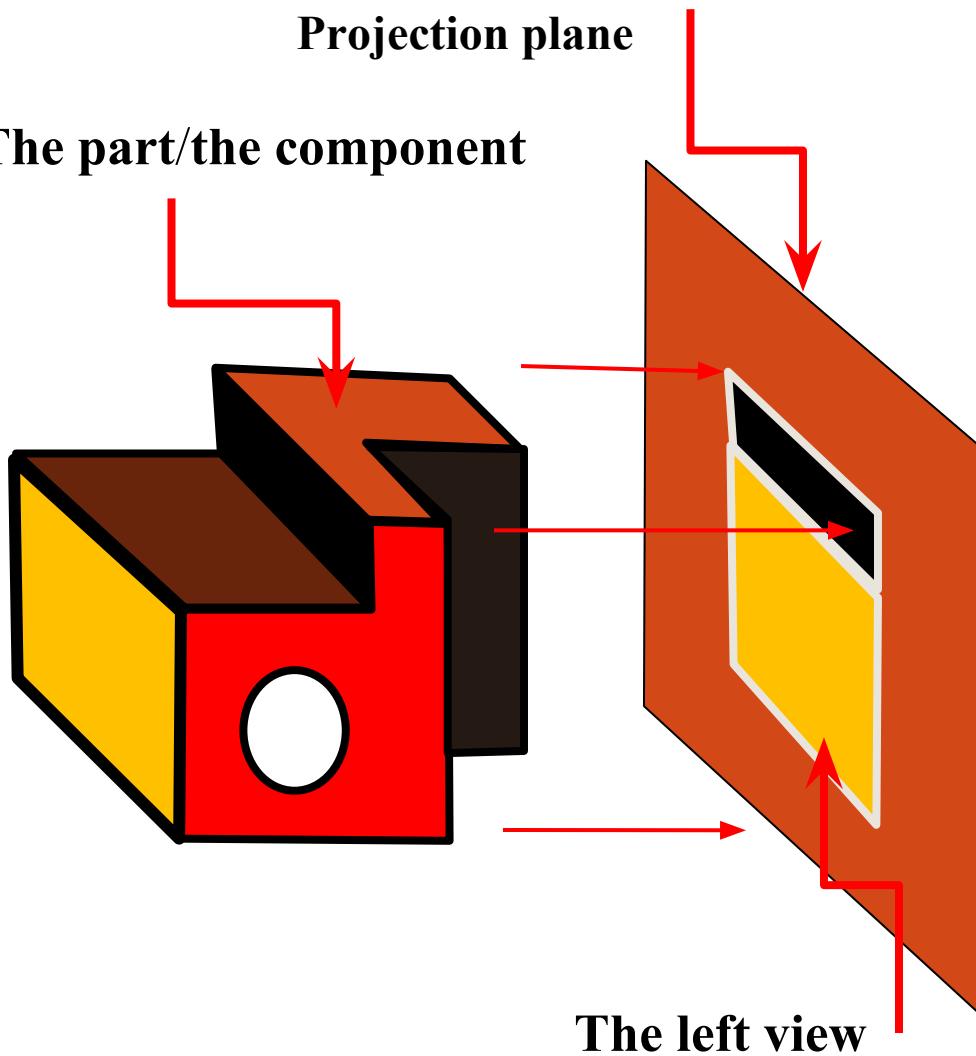
•Standard Drawing

•Front view



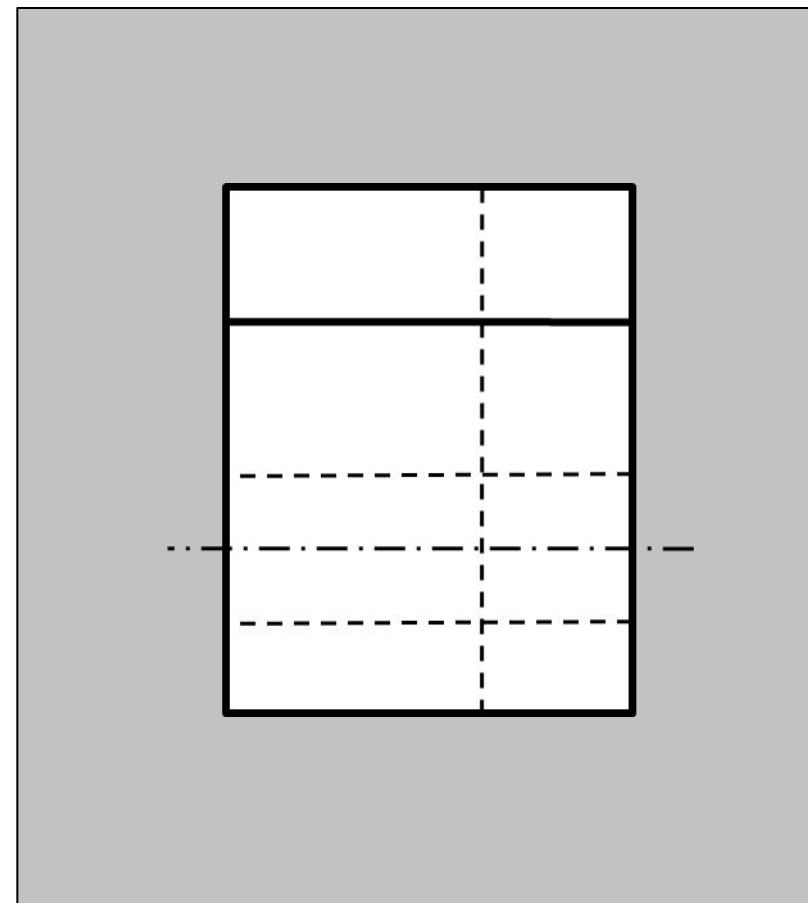
Projection plane

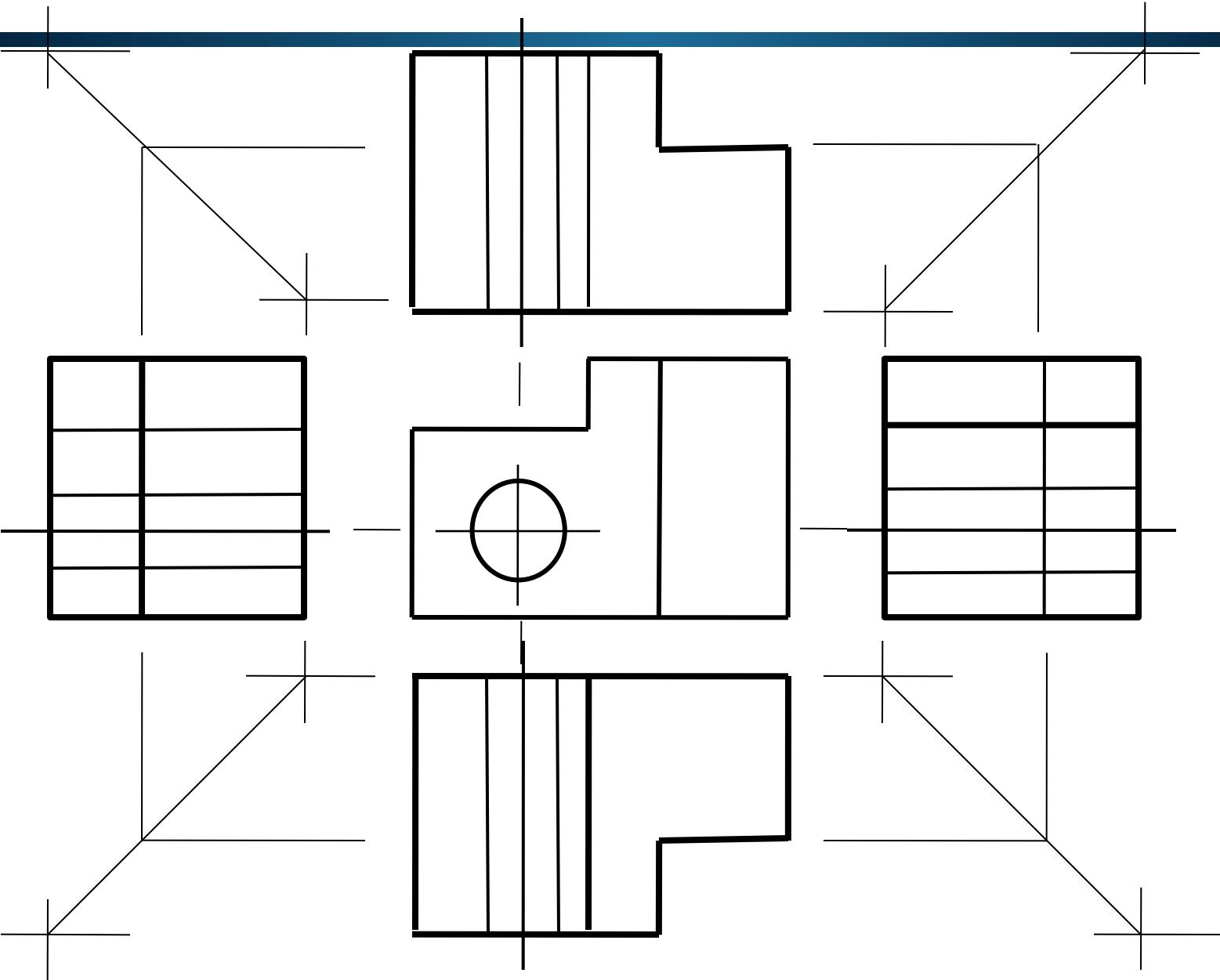
•The part/the component

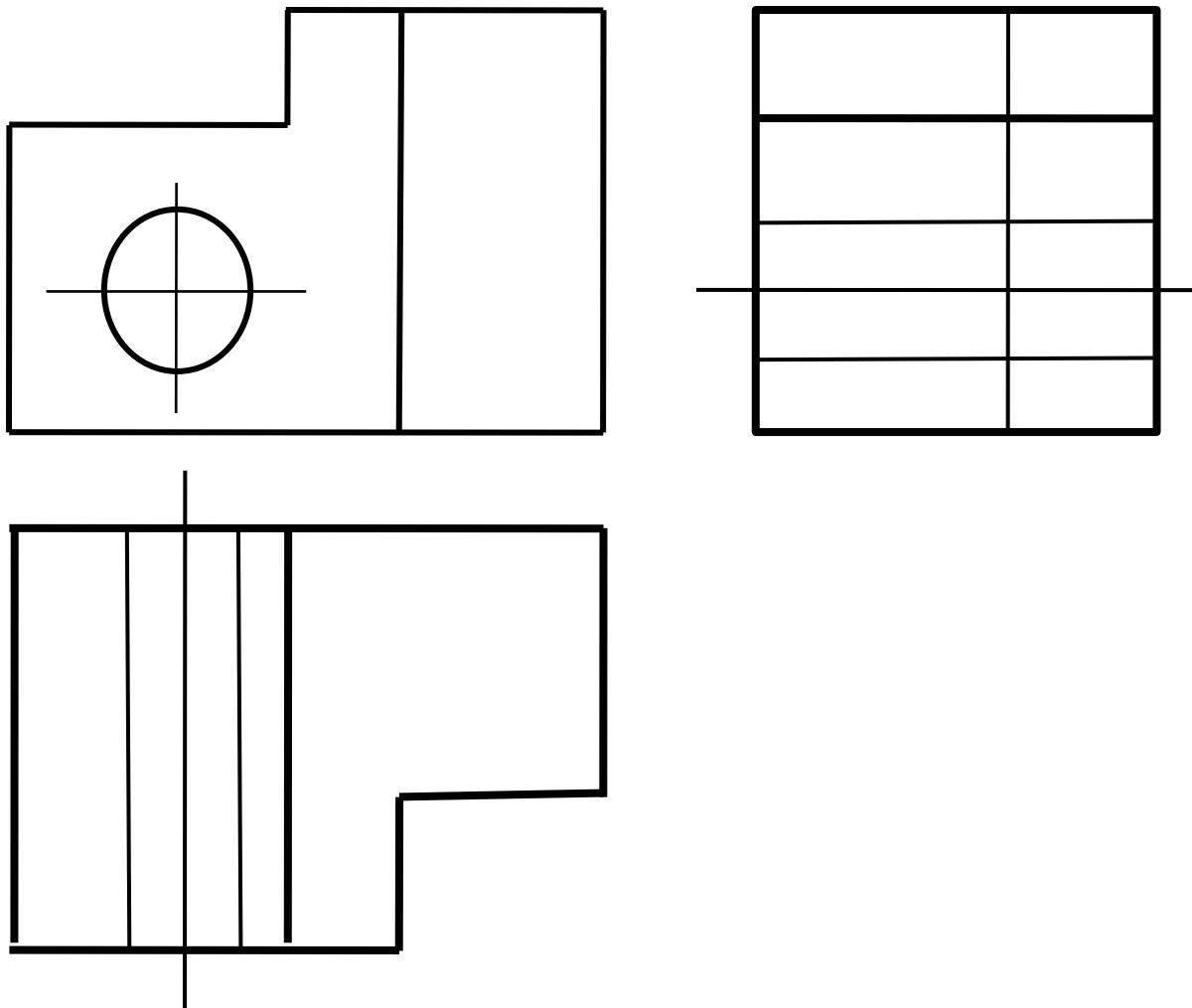


The left view

•Standard Drawing
•The left view

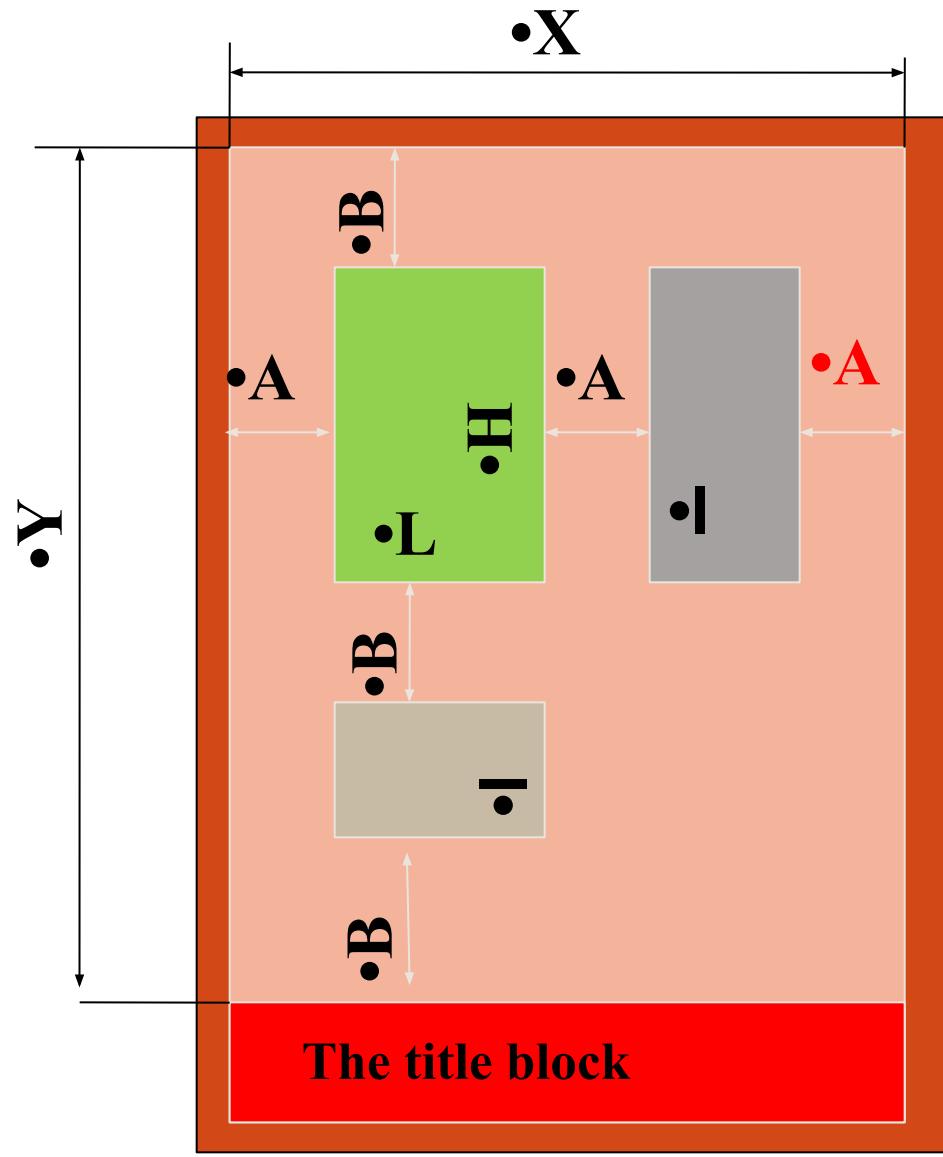






Notes

- Never write the name of the views on the drawing; their placement indicates it.
- The front view is the view that shows the most apparent details.
- The placement of the views follows two standards:
- American standard: Symbolized by (A).
 - European standard: Symbolized by (E).
- In our case, we opt for the European method, which consists of placing the right view to the left of the front view and the top view below the main view (Front).
- If a rear view is required, its placement will be either completely to the right or completely to the left.



Drawing Layout

$$\bullet A = [X - (L+I)] / 3$$

$$\bullet B = [Y - (H+I)] / 3$$

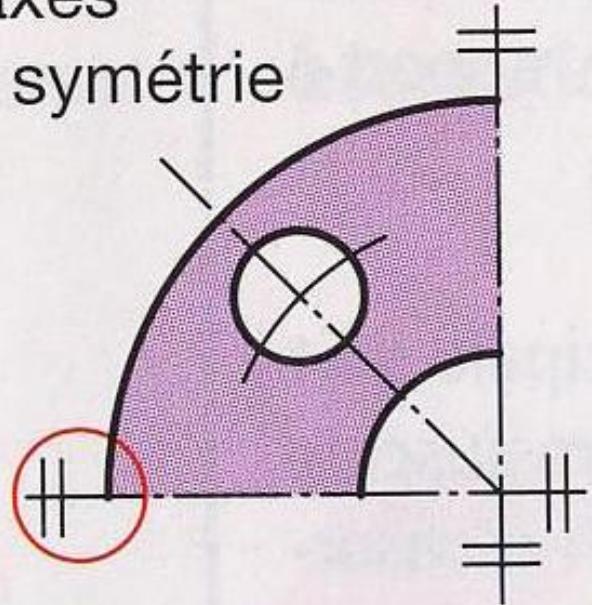
Avec

X=190 et Y=247

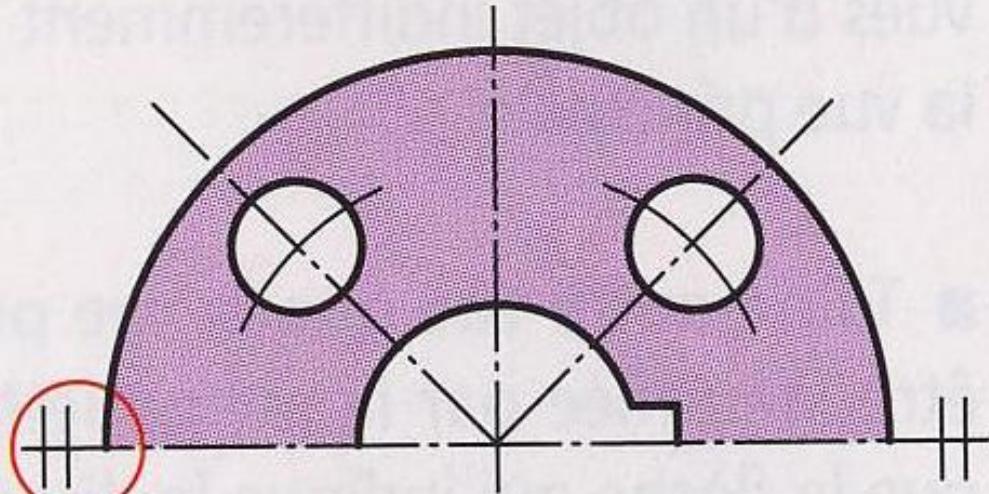
Symmetrical parts

- For the sake of simplicity, a view that has axes of symmetry can be represented by only a half-view or a quarter-view. In this case, mark the ends of the symmetry axes with two small, fine lines perpendicular to these axes.

2 axes
de symétrie

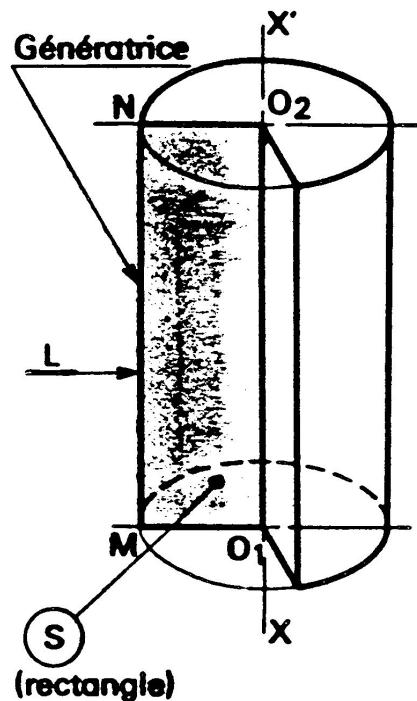


1 axe de symétrie

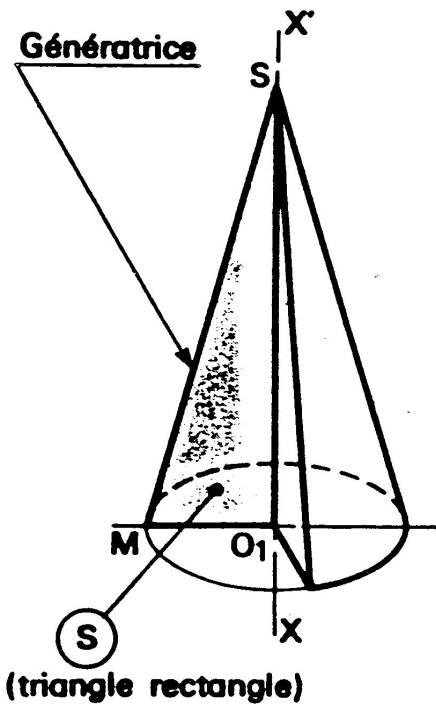


Representation of Solids of Revolution

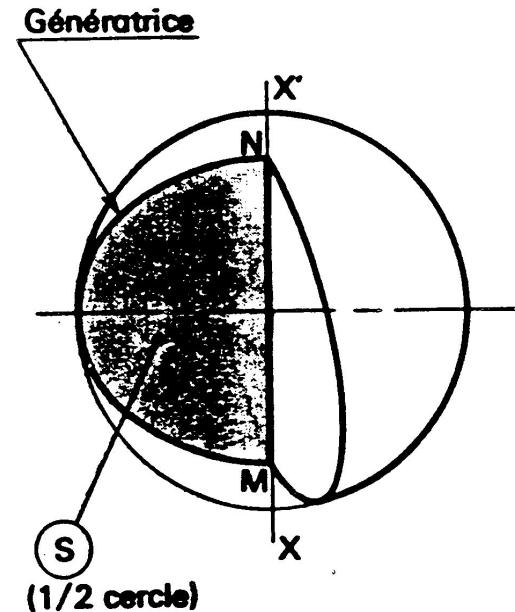
- A solid of revolution is generated by a plane surface S, bounded by a line L, rotating around an axis XX' in its plane that does not intersect L.
- S generates a volume and is called the "generating surface".
- L generates a surface and is called the "generatrix".



•CYLINDER



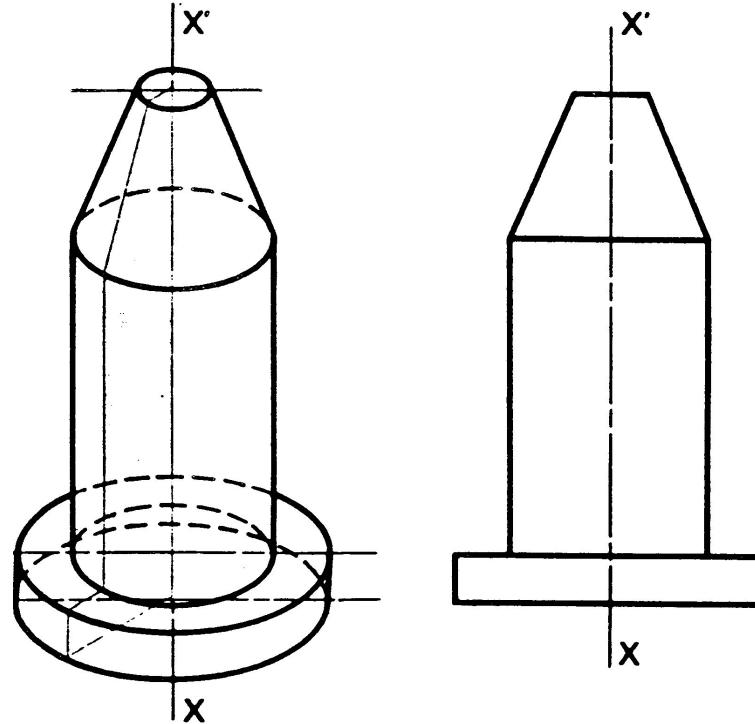
•CONE



•SPHERE

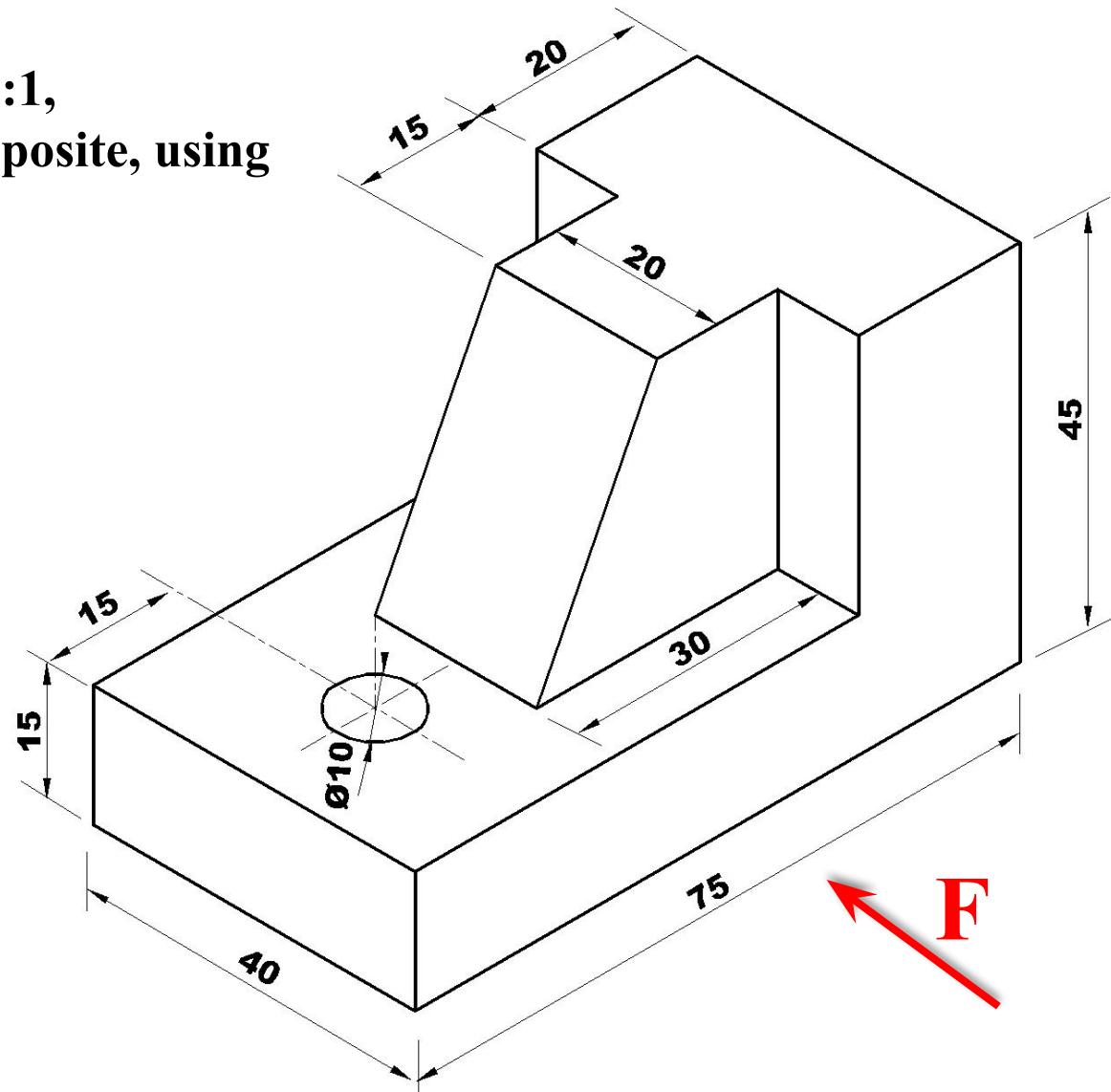
Representation of Solids of Revolution

- To fully represent and define a solid of revolution, a single projection is sufficient, provided that the projection plane is parallel to the axis XX'.
- It is necessary to draw the axis XX' and, when dimensioning, to prefix diameter dimensions with the symbol Ø.



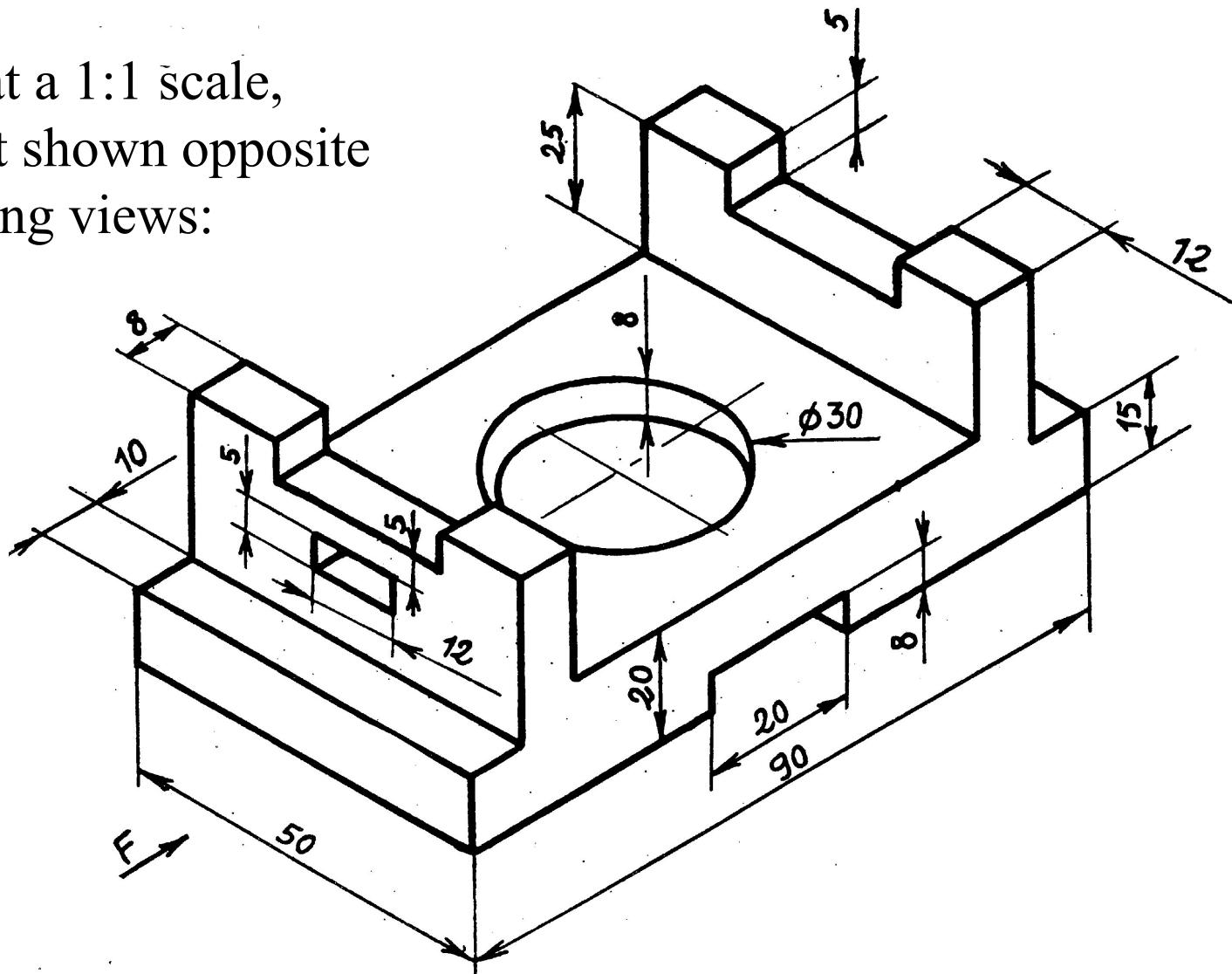
Exercise N° 1:

- On A4 format and at scale 1:1,
represent the part shown opposite, using
the following views:
- Front view,
- Left view,
- Top view.



Exercise N°2: (Homework)

- On an A4 sheet at a 1:1 scale, represent the part shown opposite using the following views:
 - Front view
 - Right view
 - Top view



You're welcome.