

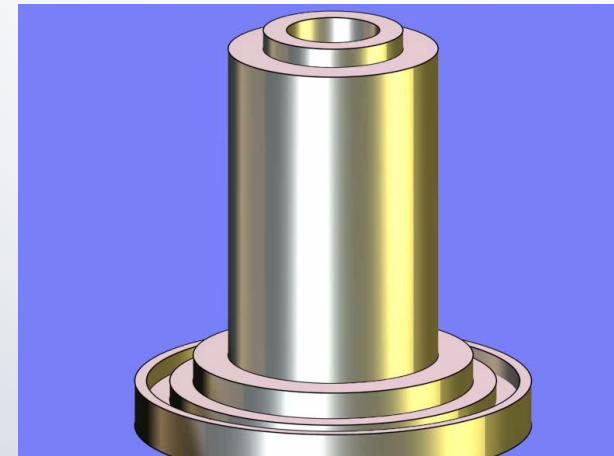
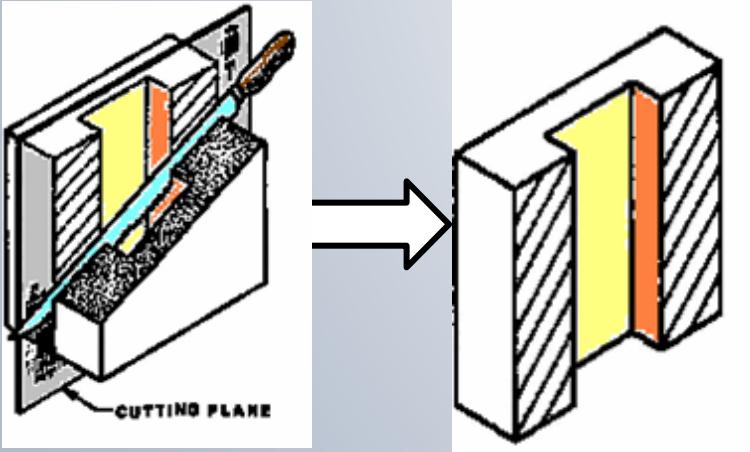
Computer-Aided Design

Section Views

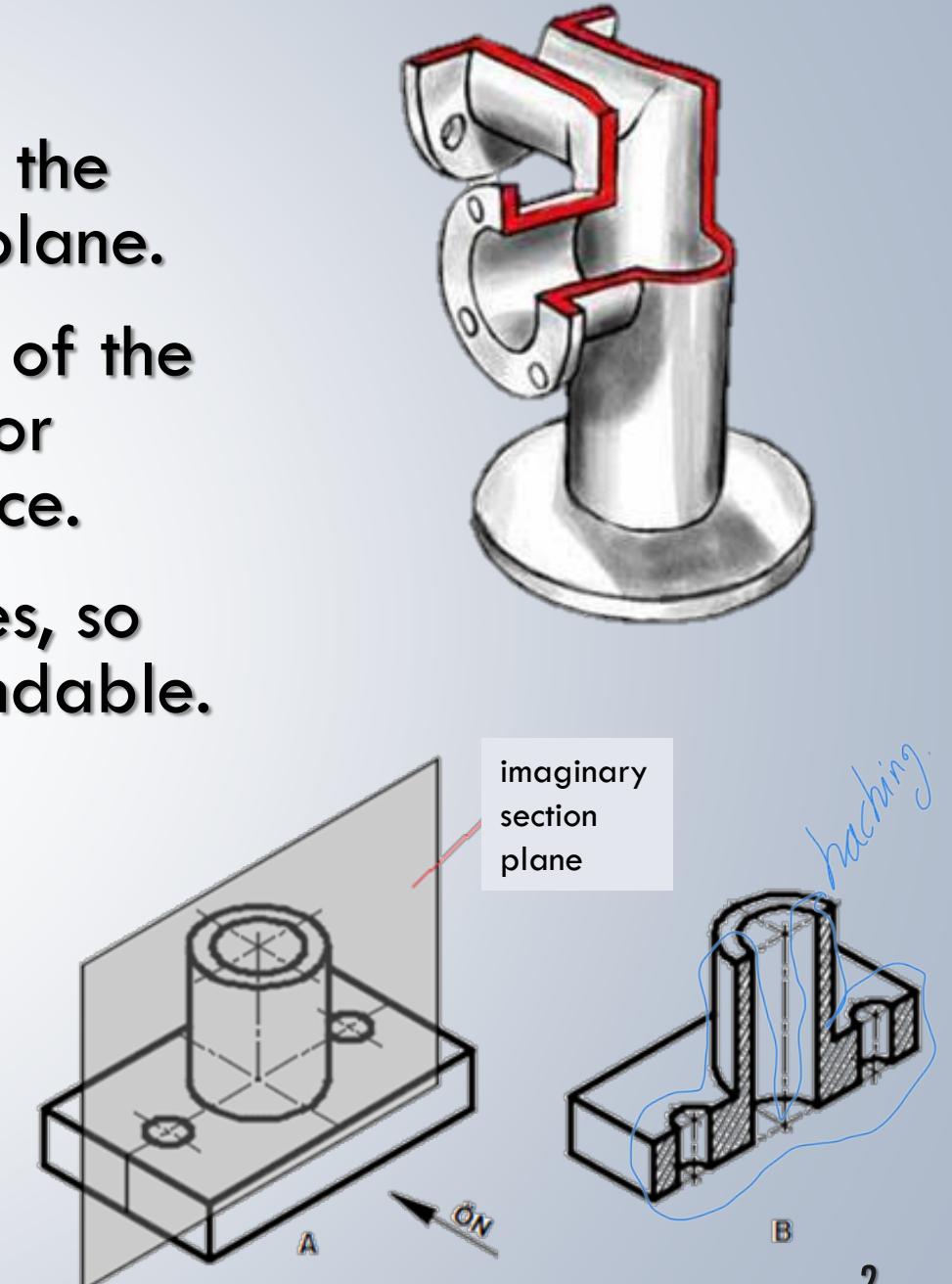
Sectioning Rules
Principles and Usage on Drawing
Types of Sections
Section of ribs and webs

PROPERTIES OF SECTIONAL VIEWS

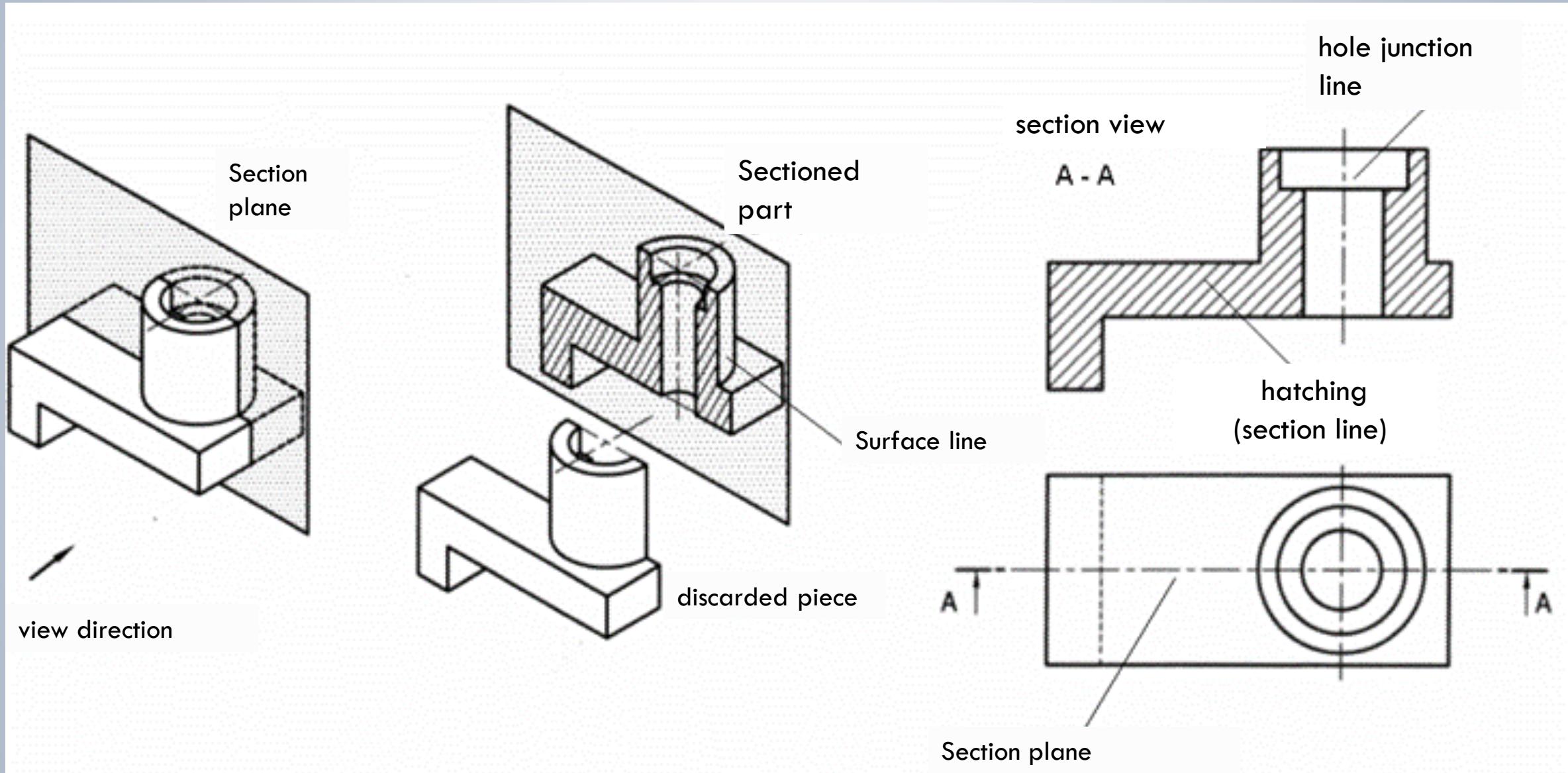
- The section view is the view of the part behind the plane when the part is cut with the imaginary plane.
- To display the holes and cavities in the interior of the part, and to provide the dimensions required for manufacturing and information about the surface.
- The dashed lines are shown with continuous lines, so that it can be dimensioned and more understandable.



(Türkdemir, K. 2008)

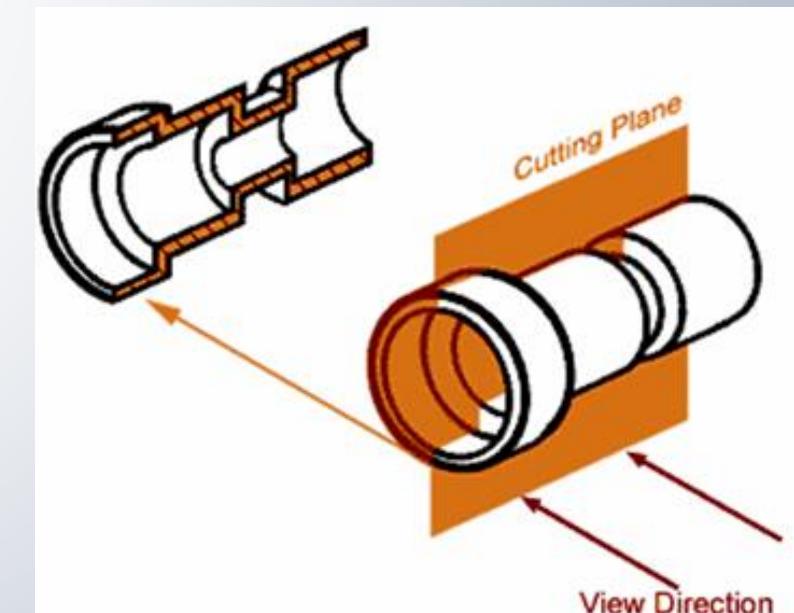
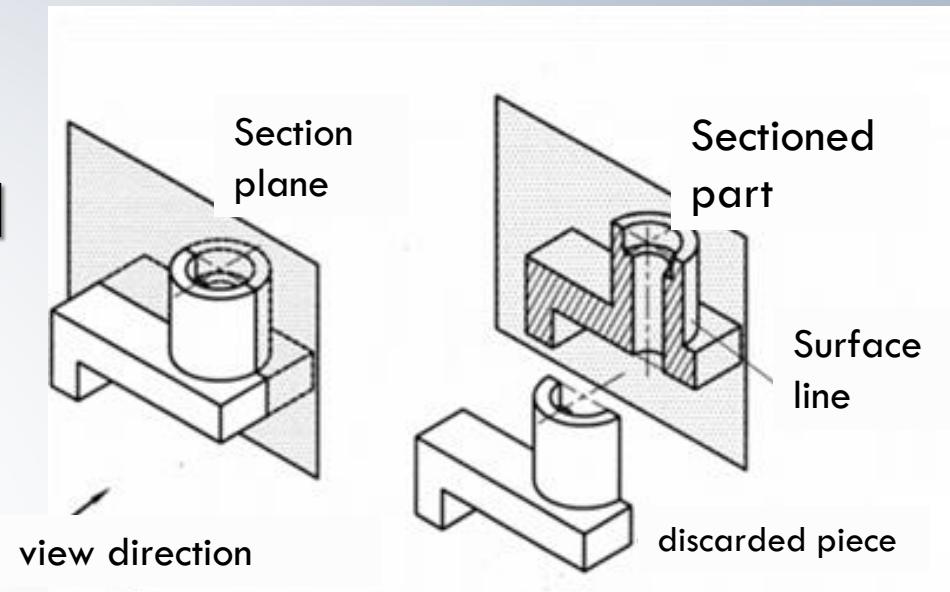


STEPS TO OBTAIN A SECTION VIEW



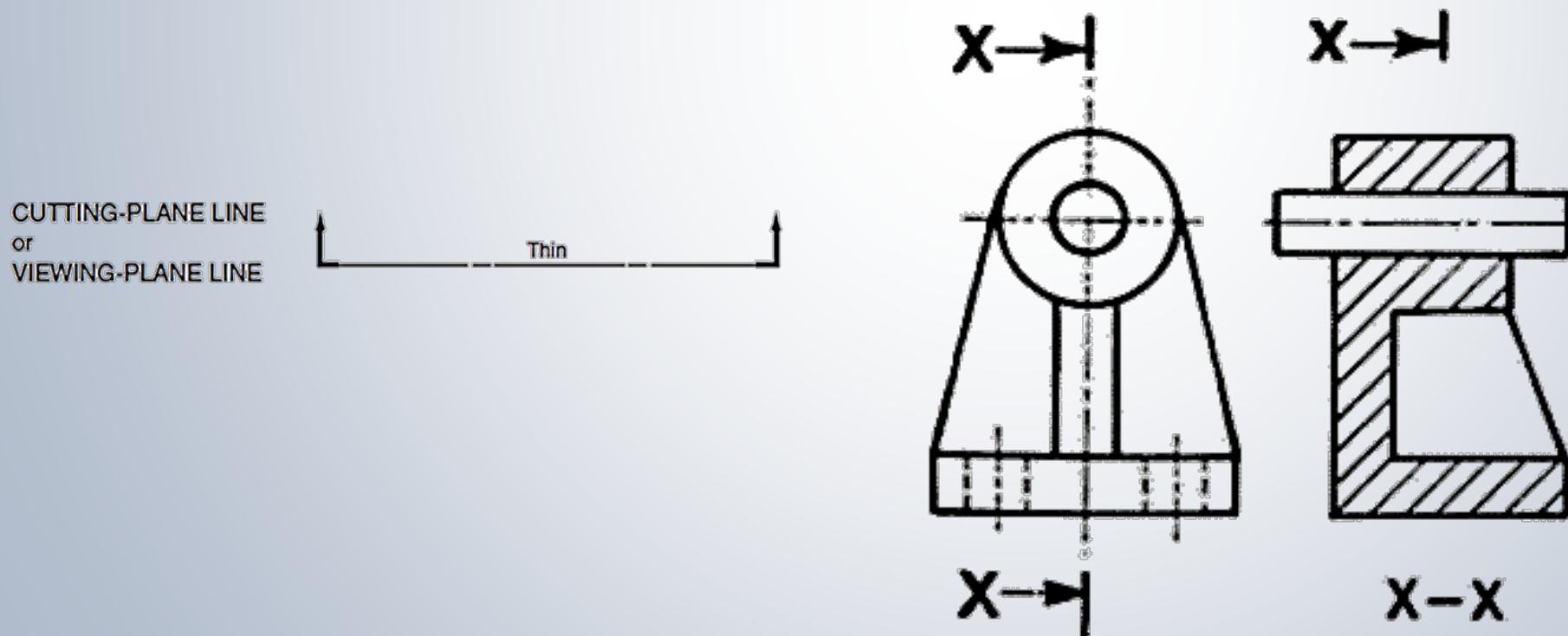
CREATING SECTIONAL VIEWS

1. Cut imaginatively by plane or planes and a part of it is discarded. The section plane usually passes through the axis of symmetry.
2. The part in front of the section plane is assumed to be removed, the rest is drawn.
3. The views are drawn by applying the projection rules together with the part's section plane.



CREATING SECTIONAL VIEWS

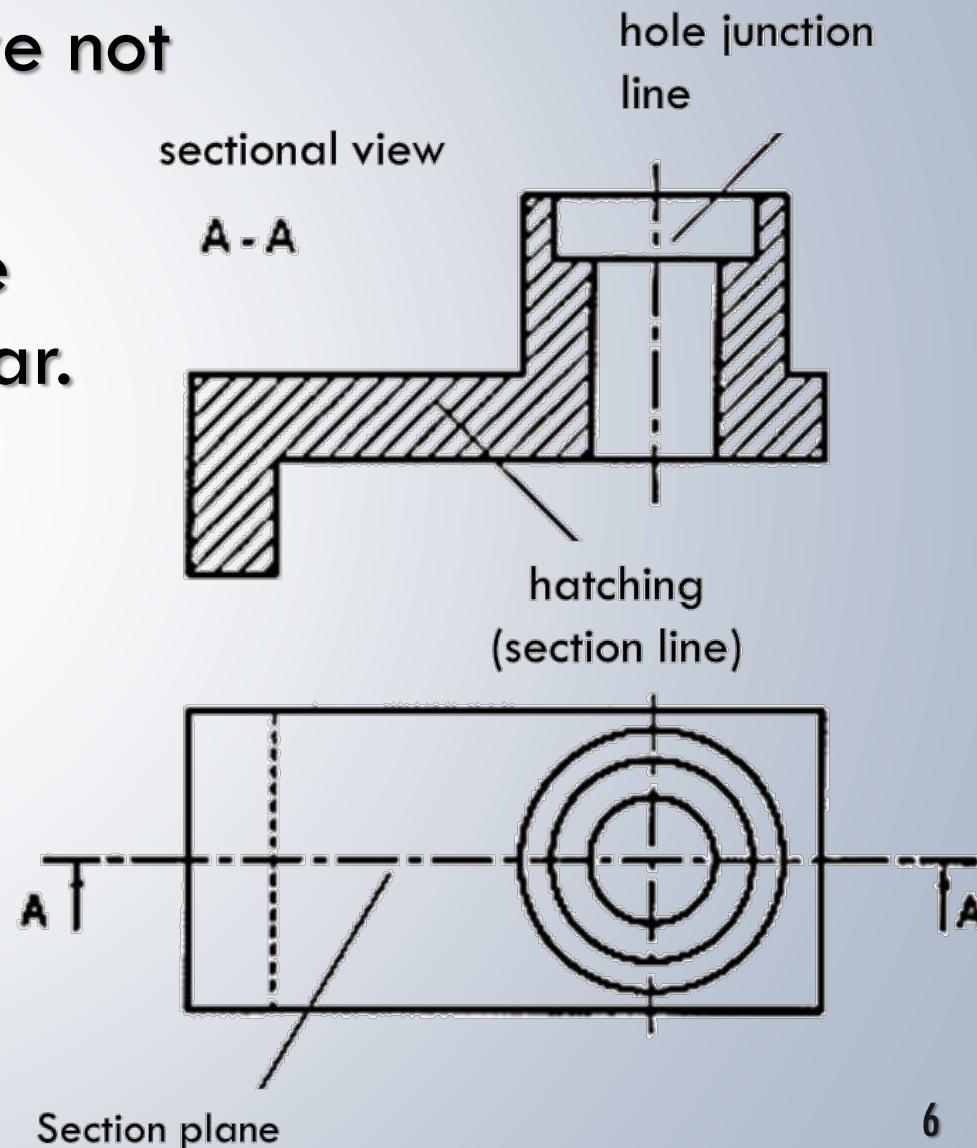
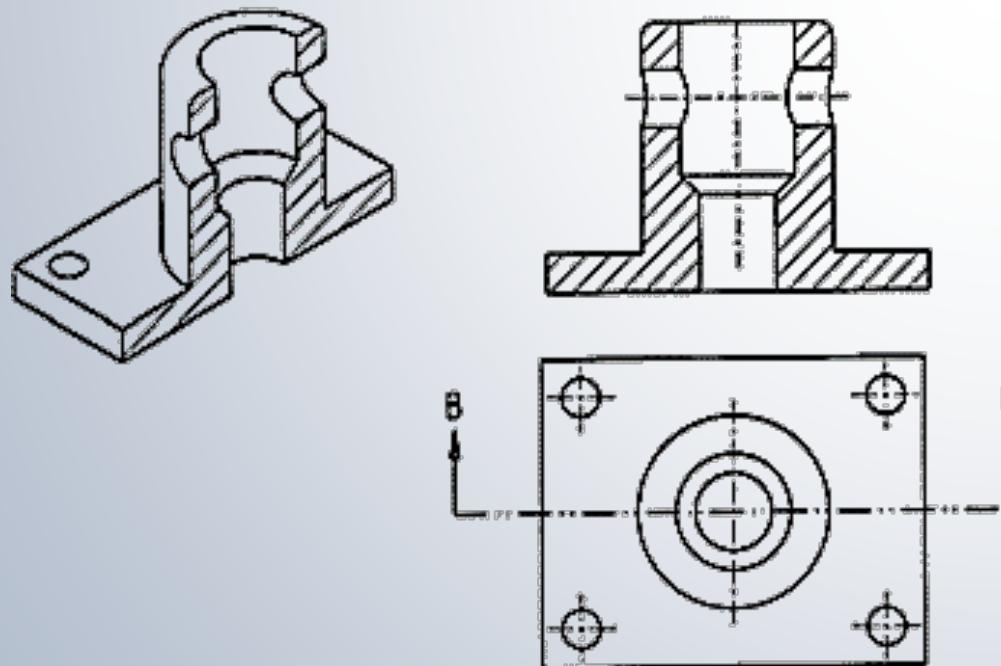
- In an other view, the section plane is indicated by the cutting-plane line and the direction of view with the arrow.
- Lines within the section plane and shown as dashed before sectioning are shown with continuous thick lines.



CREATING SECTIONAL VIEWS

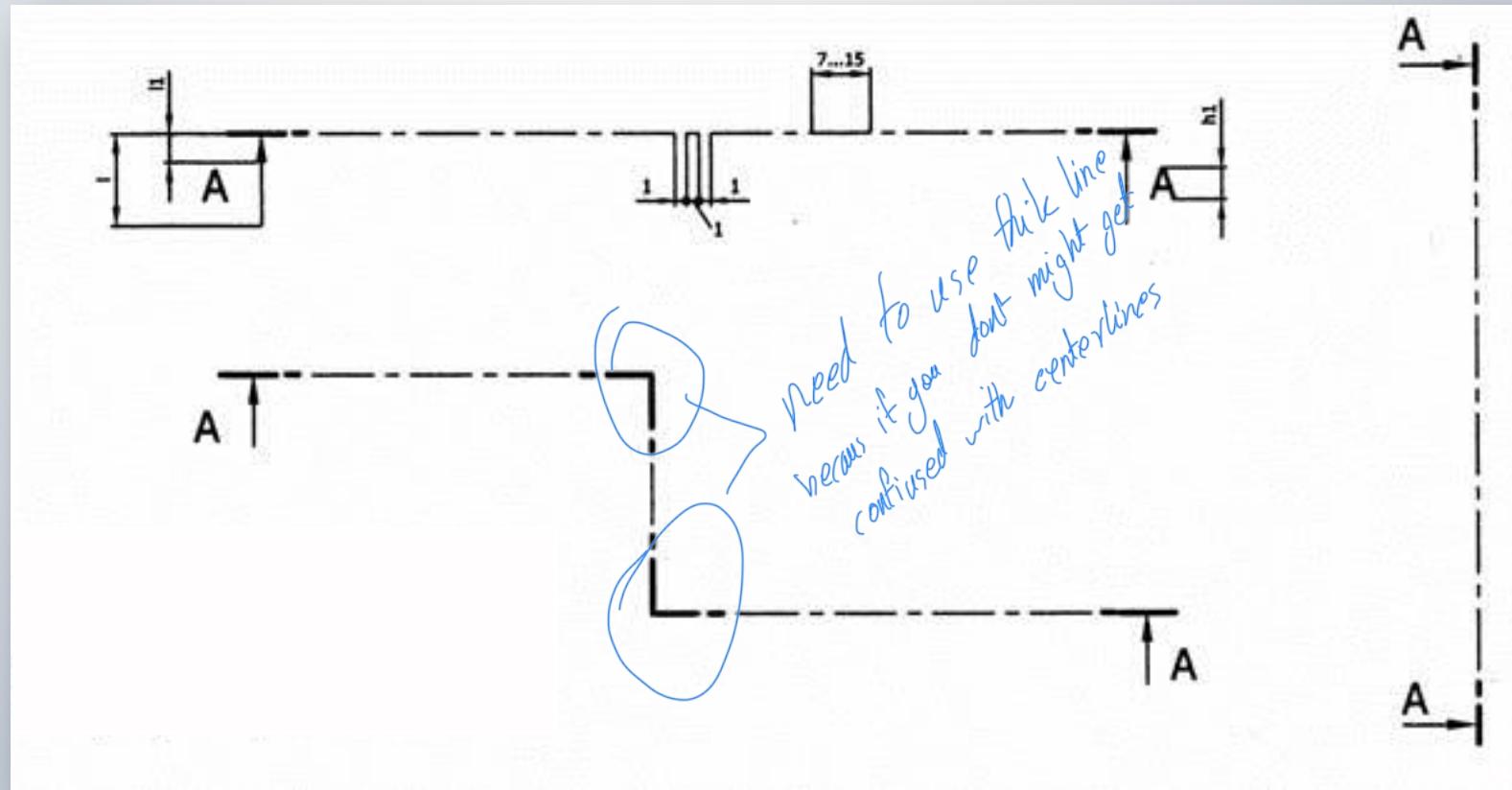
In the cut part, the material-filled parts are hatched with thin continuous lines. Holes are not hatched.

The surface lines of the sectioned part are removed, and the hole junction lines appear.

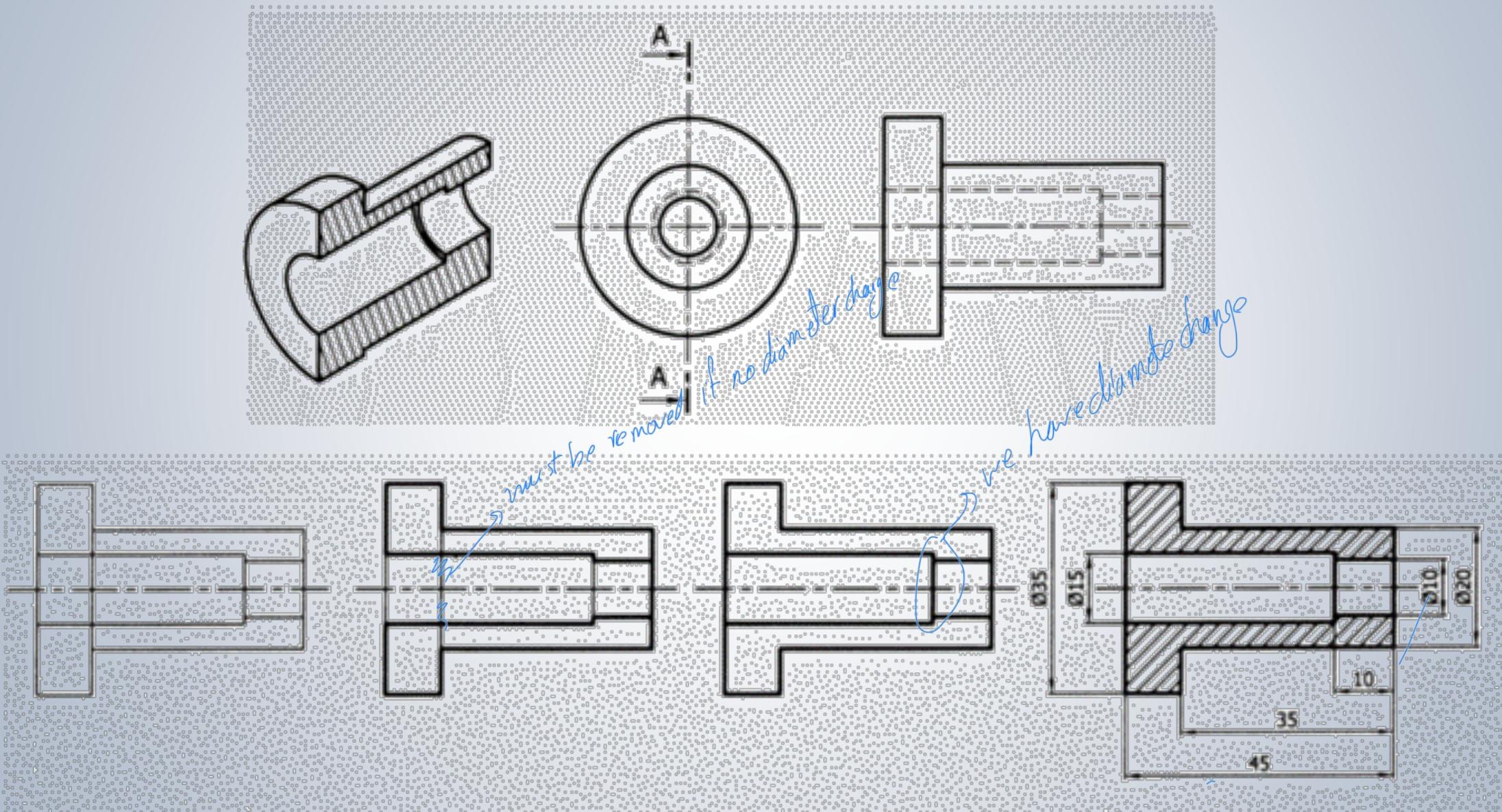


SECTION PLANE

- The section plane represents the cutting path of the section.
- The cross section is parallel to the projection plane to be drawn and is perpendicular to the other projection planes.
- In the sectional views, they are shown with the cutting plane line.

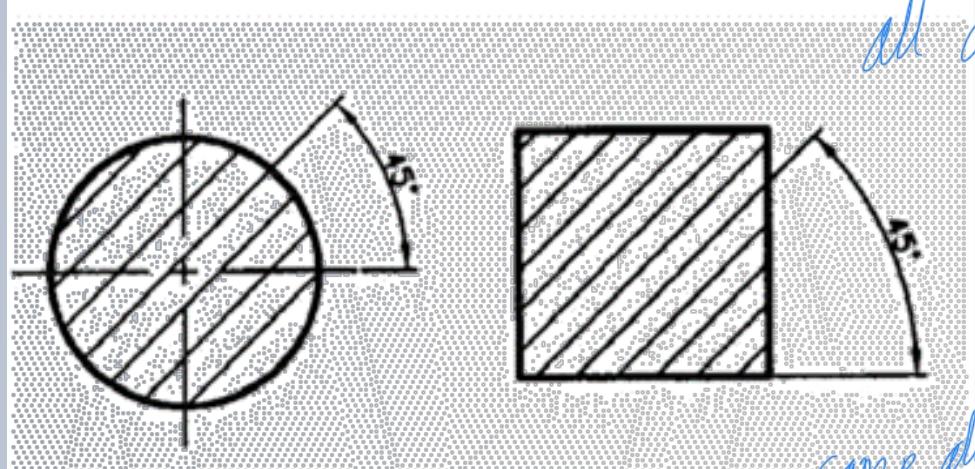


OBTAINING SECTIONAL VIEWS



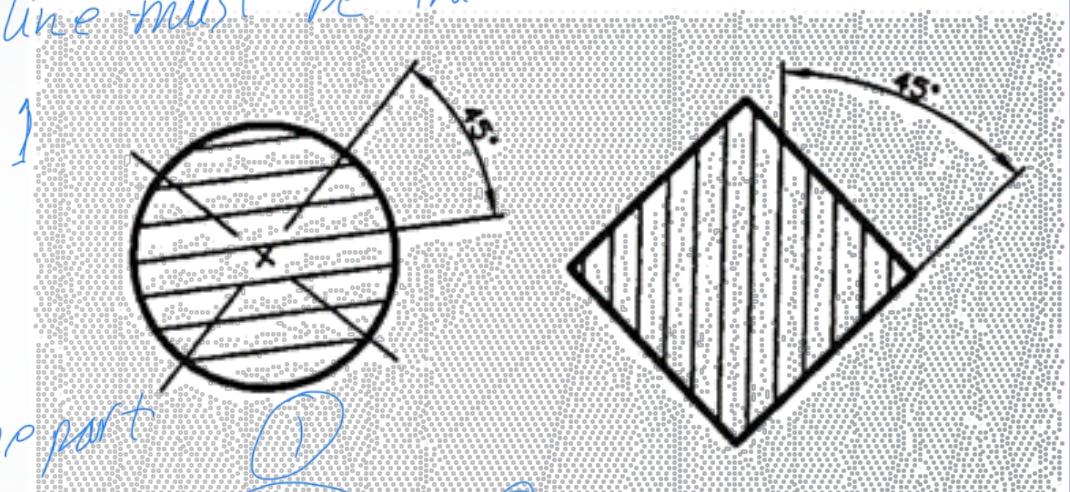
SECTION LINES AND THEIR FEATURES

- Continuous thin lines used to indicate the material-filled surfaces on the sectioned parts are called “section line”.



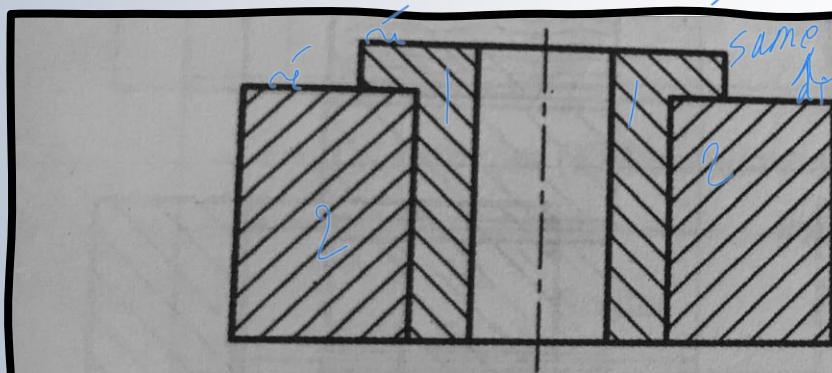
all annotation line must be thin lines

ANSI31

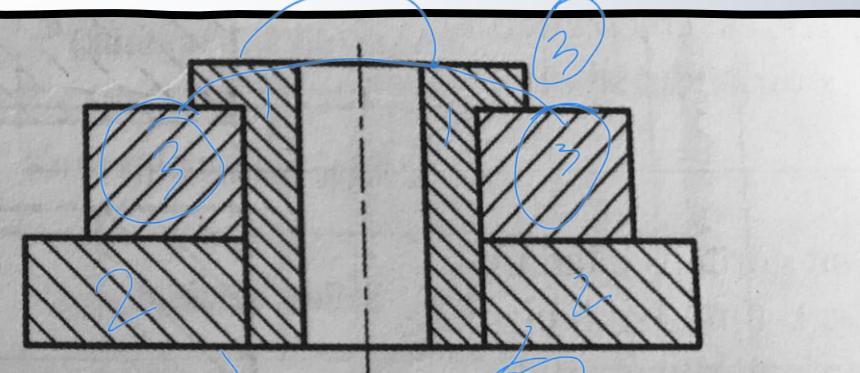


same alignment same part

same alignment
distance



(a) case of two parts



(b) case of more than two parts

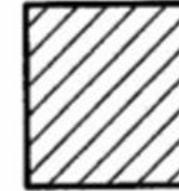
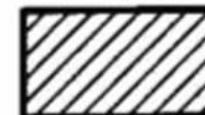
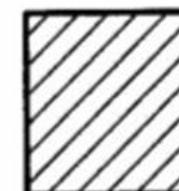
SECTION LINES AND THEIR FEATURES

- Type of material represented by different colors and line patterns.

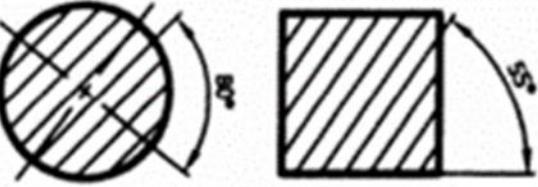
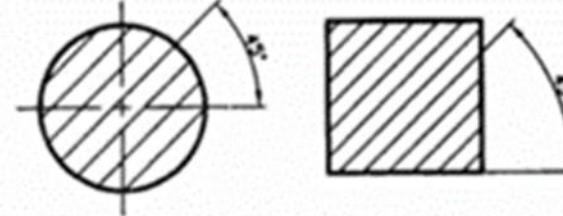
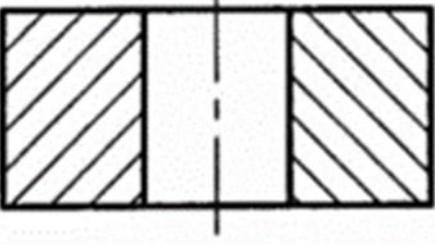
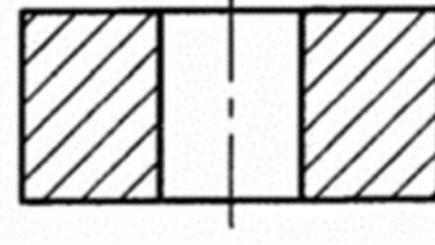
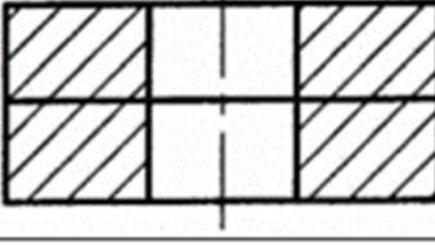
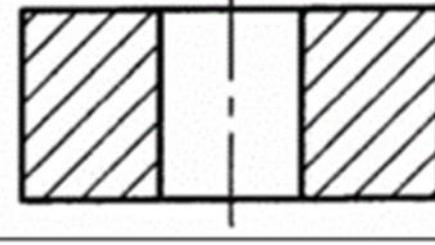
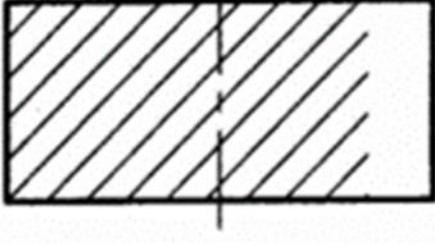
US^o always use this



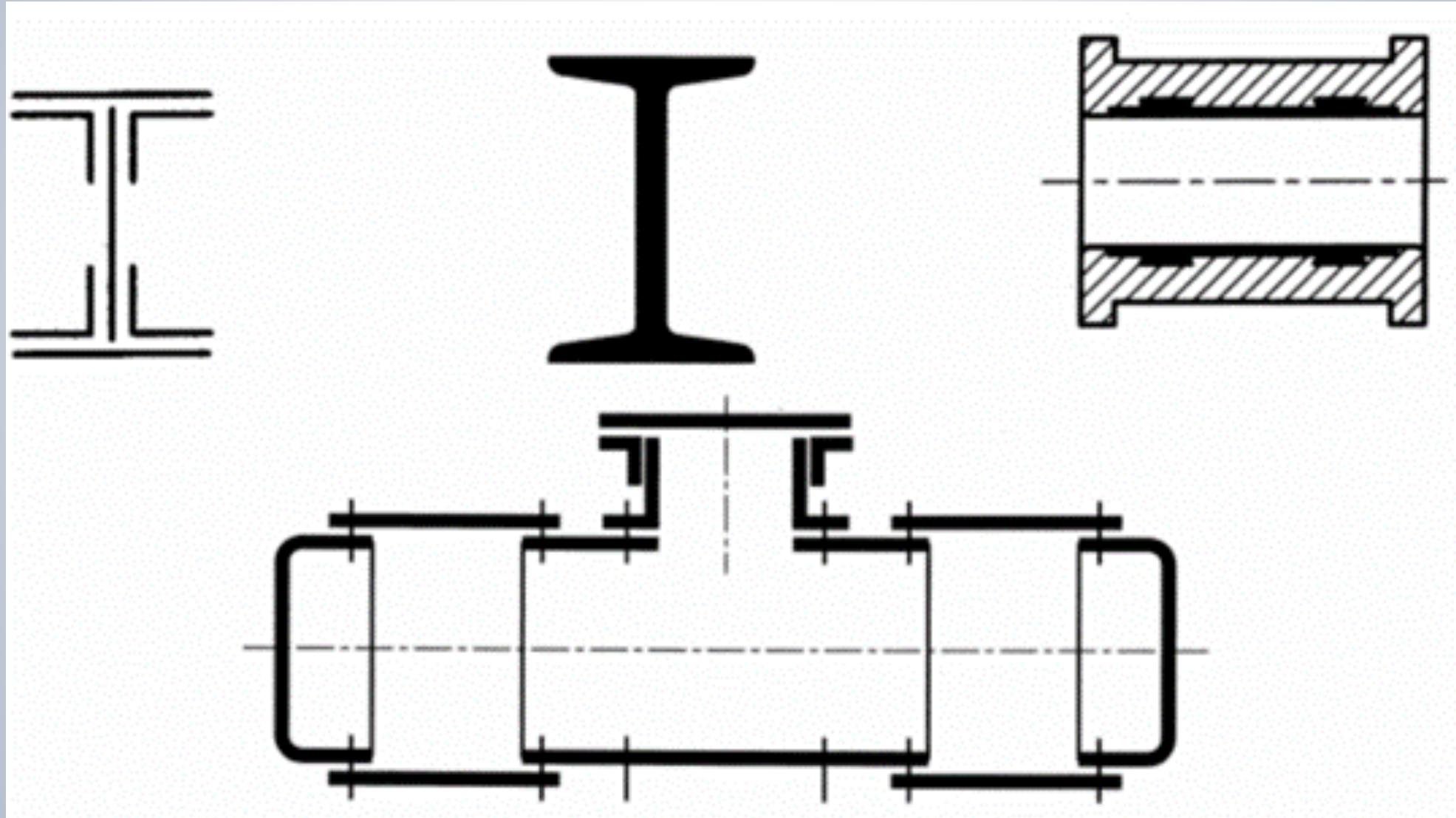
SECTION LINES AND THEIR FEATURES

Features	Incorrect	Correct
The frequency of section lines should be suitable for the size of the section taken		
Section lines should be type continuous thin lines		
The thickness of the lines should be equal everywhere and limited by thick lines (boundaries)		

SECTION LINES AND THEIR FEATURES

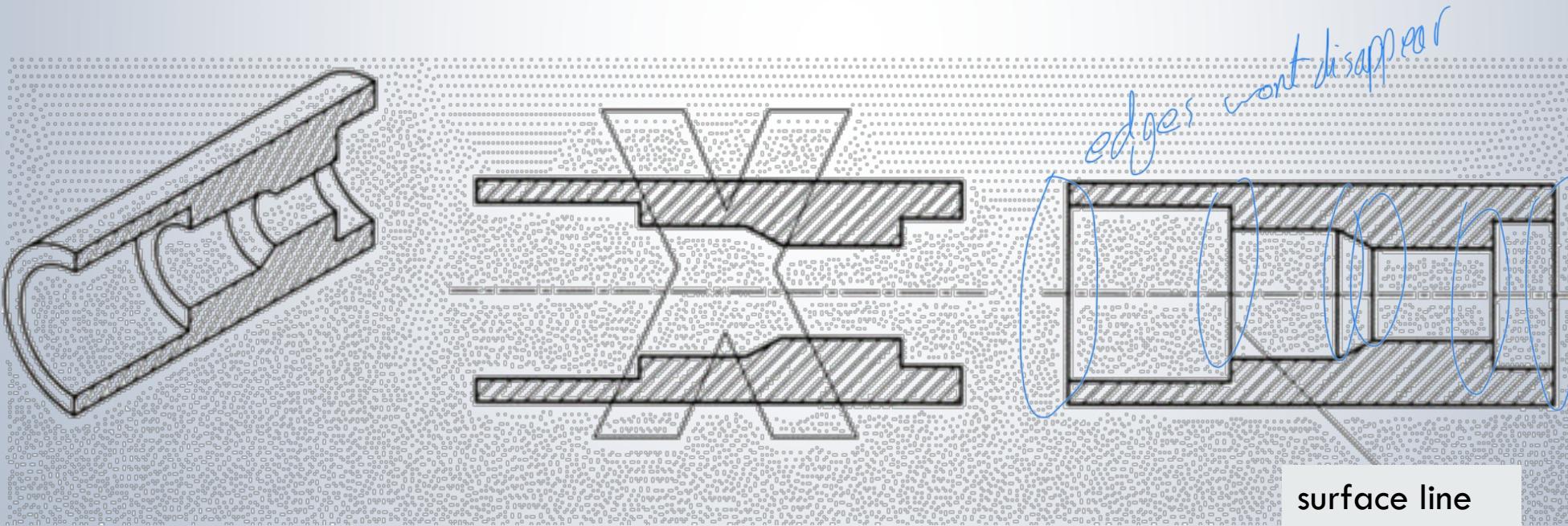
Features	Incorrect	Correct
The angle of inclination of the lines must be 45 degrees, out of necessity		
The direction of the section lines should not change throughout the section of the same part.		
Continuous thick lines should not pass through within the section lines		
section lines can be delimited by continuous lines and center-lines		

PAINTED SECTIONS INSTEAD OF HATCHING

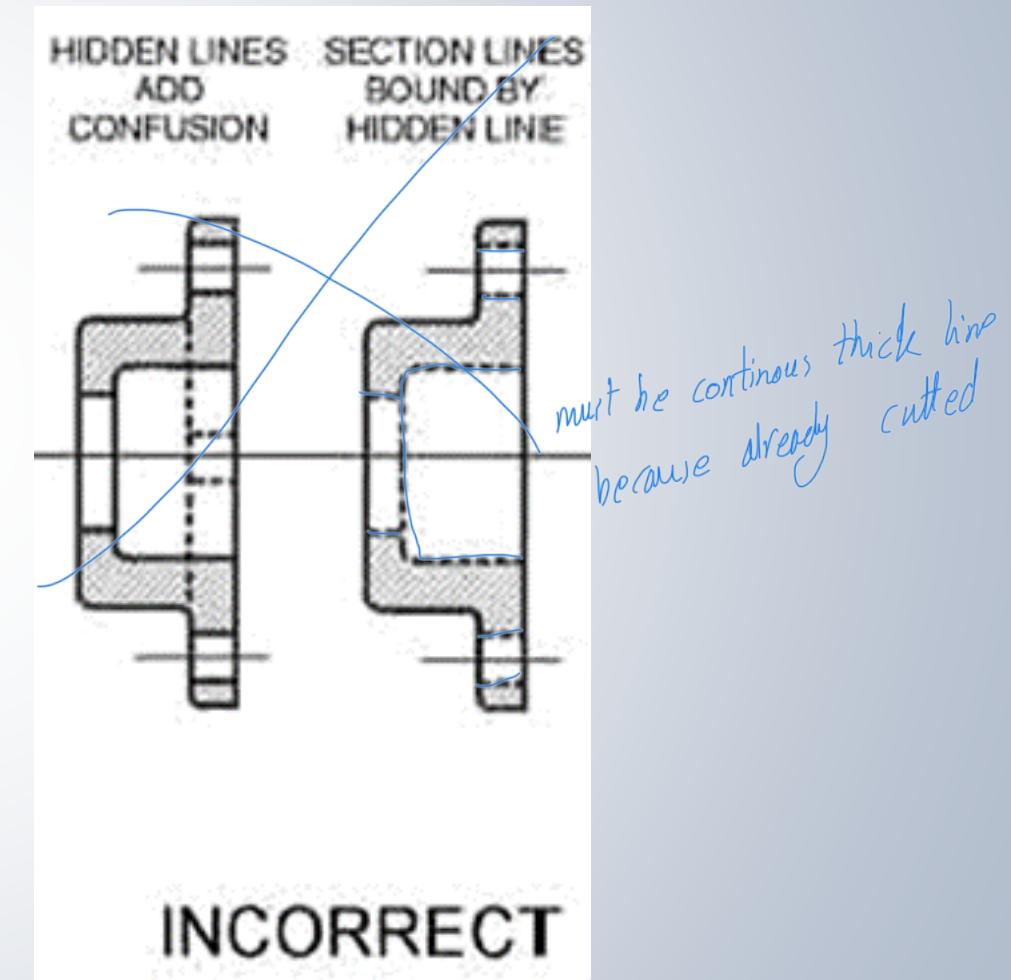
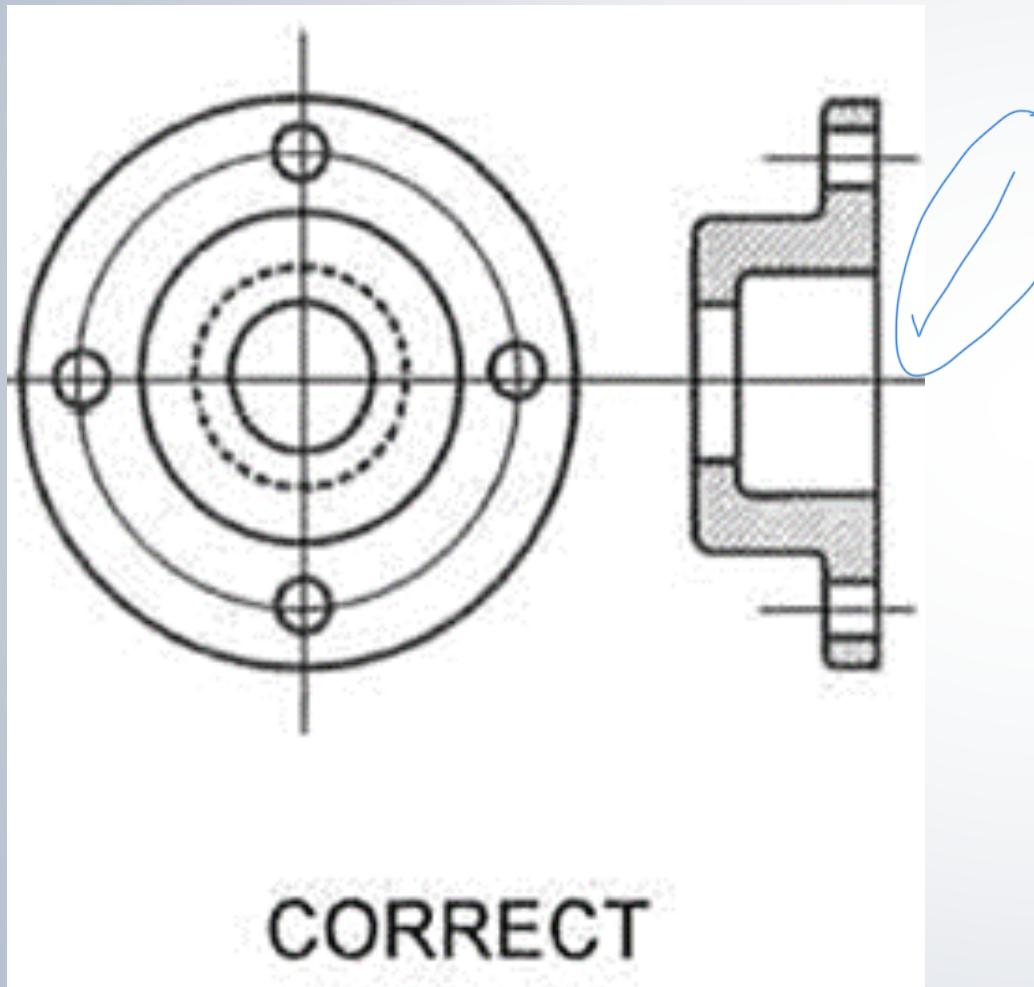


SECTIONAL VIEW OF STEPPED HOLE

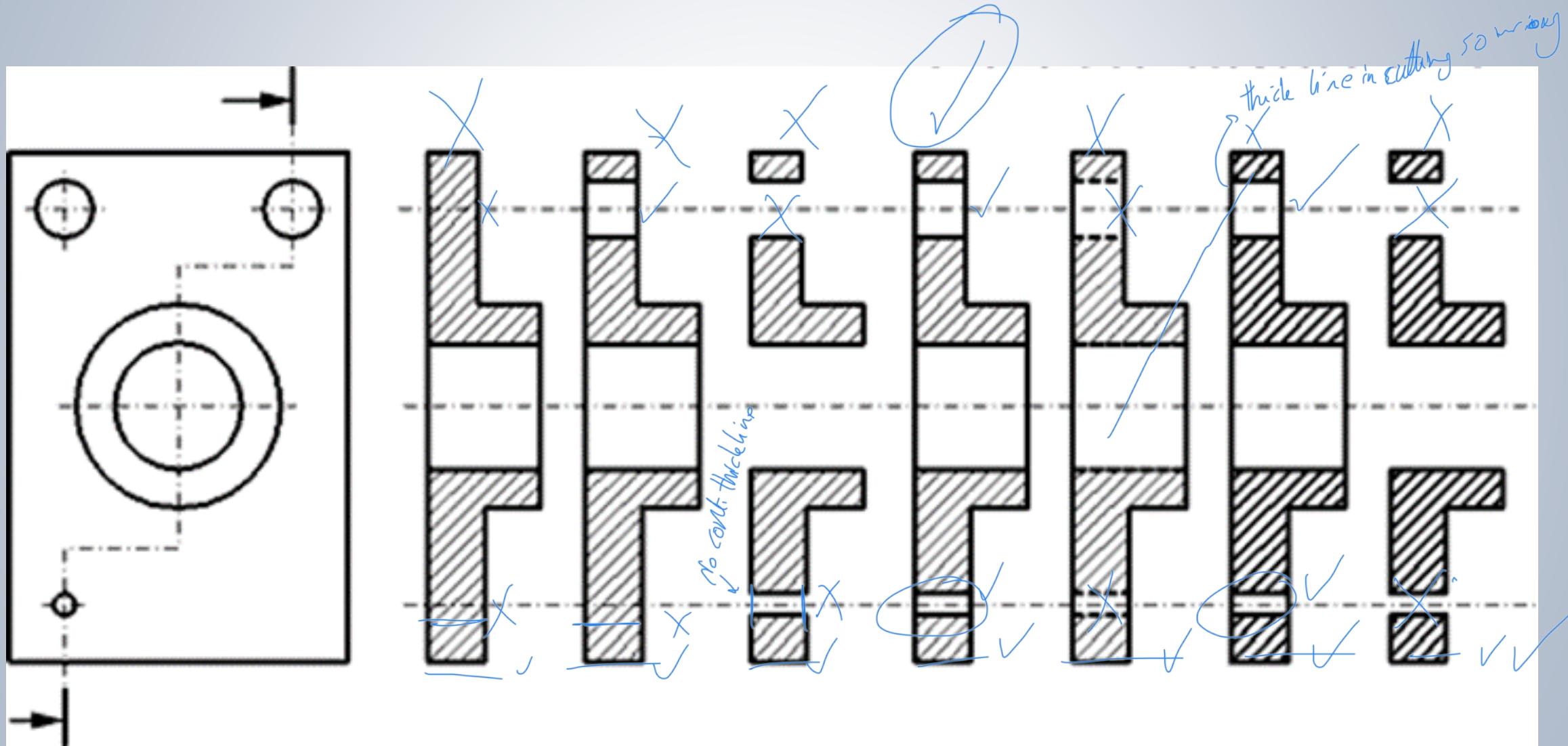
In drawing holes with different diameter dimensions in the part, the step surfaces must be specified with **thick continuous line** and the lines must be drawn completely at the end of the part.



SECTIONAL VIEW IMPLEMENTATION



SECTIONAL VIEW IMPLEMENTATION

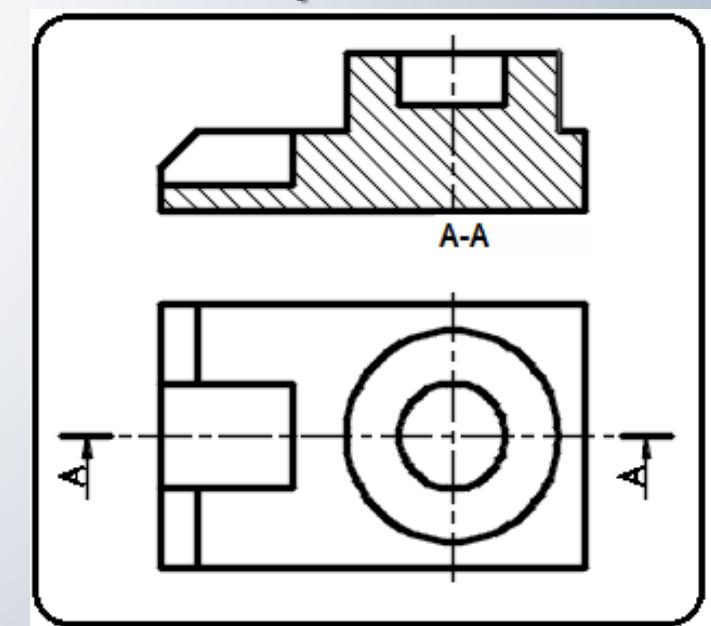
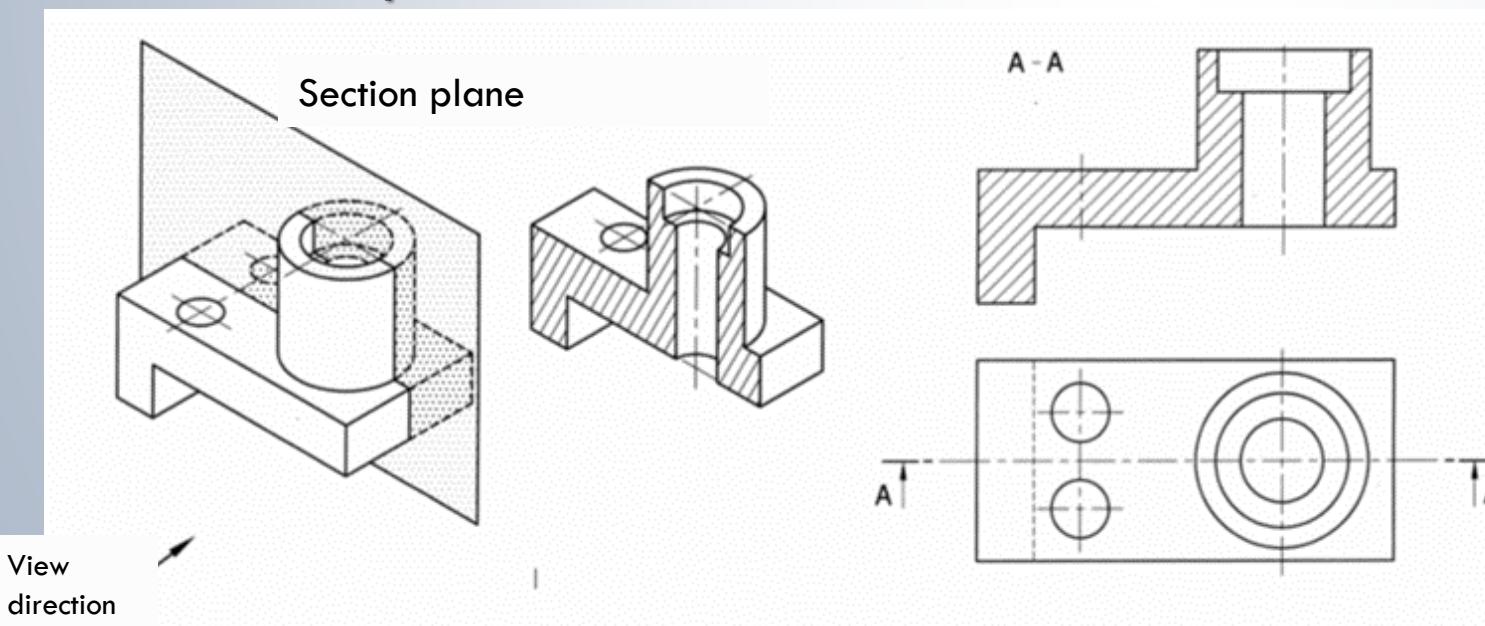


SECTIONAL VIEW TYPES

- Full sections
- Half sections
- Offset sections
- Removed sections
- Revolved sections
- Partial section views
- Detail section views

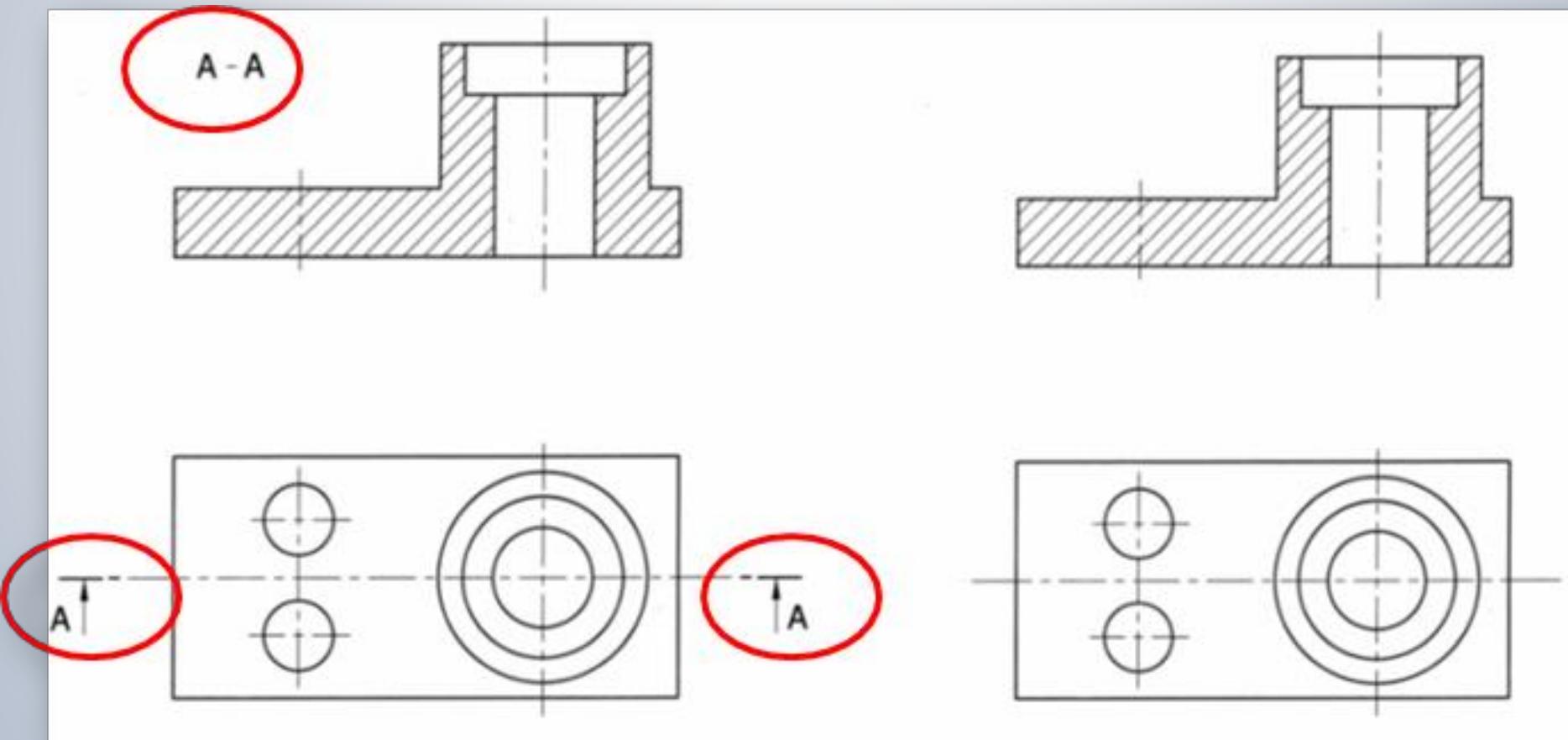
FULL SECTIONS

- Sectional views obtained by cutting the entire part with the section plane of a part
- The remaining edges **should not be drawn in dashed line types** within the hatched areas, as this will confuse the appearance.
- **All visible elements** belonging to the part **behind the section plane** are drawn.
- The section plane is chosen to best indicate the interior of the part.

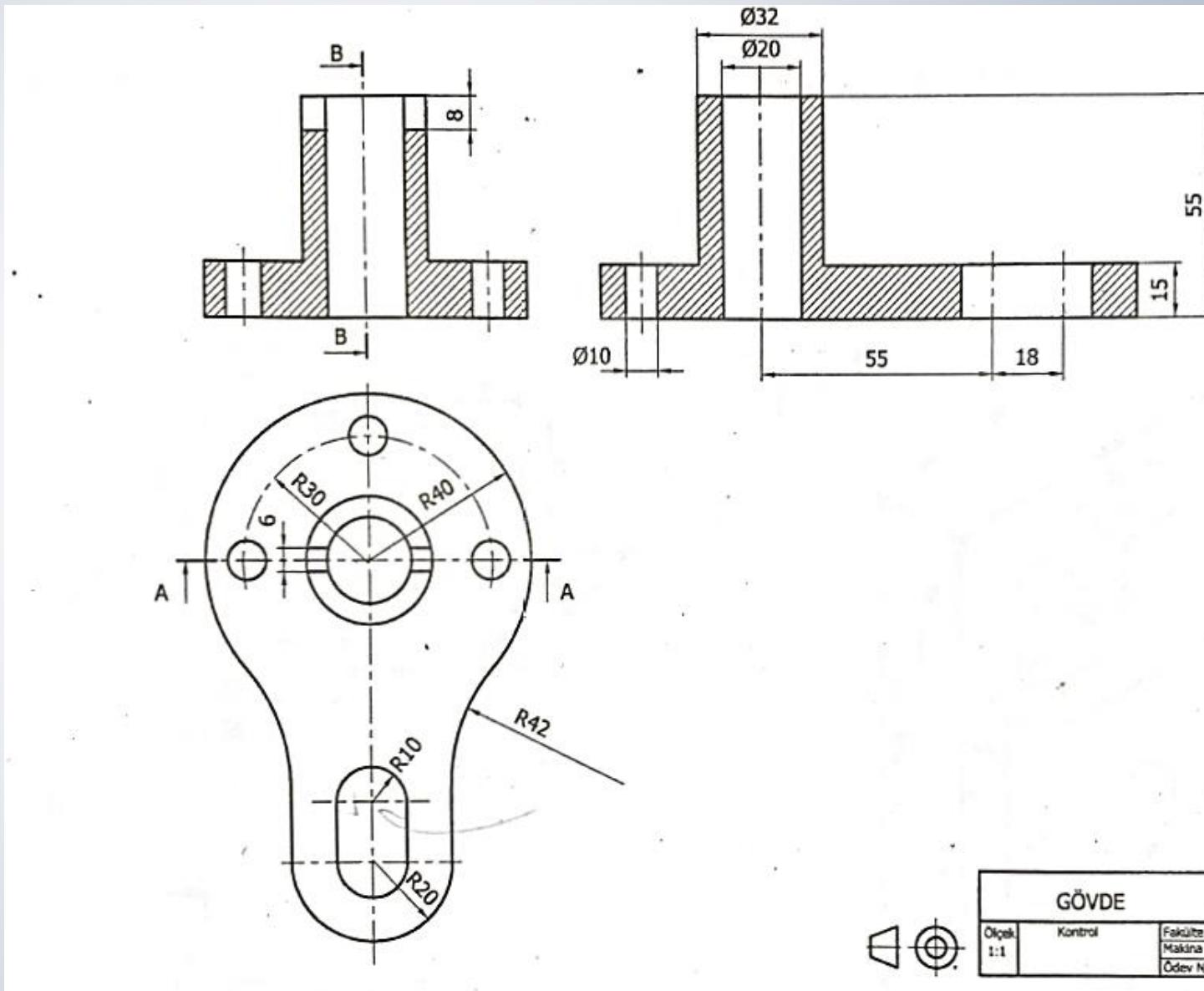
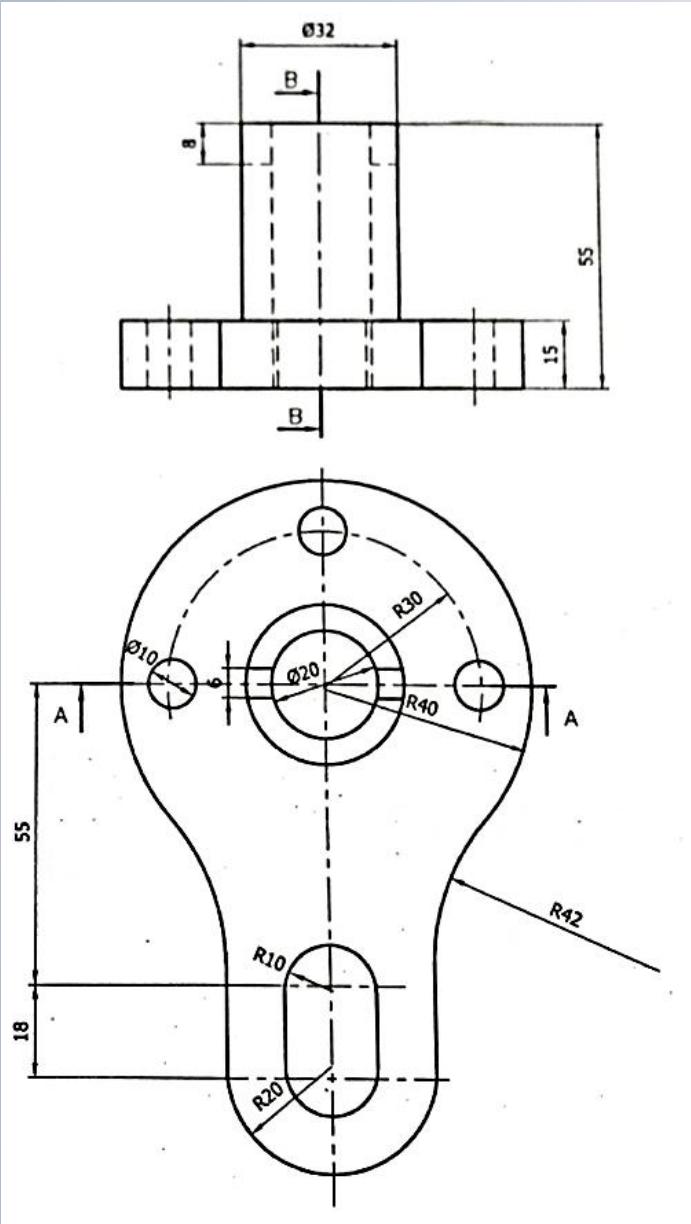


FULL SECTIONS

- It is not necessary to show the section plane if the section plane passes through the symmetry line of the part.

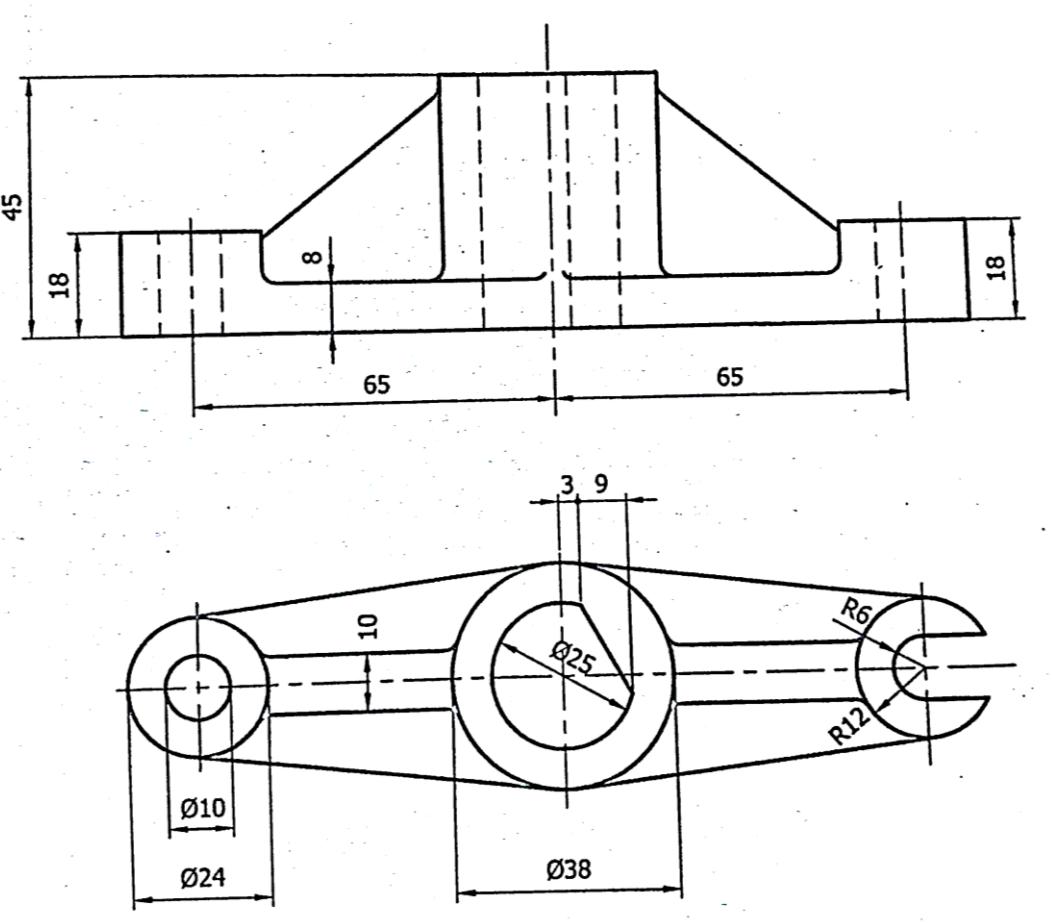


EXAMPLE

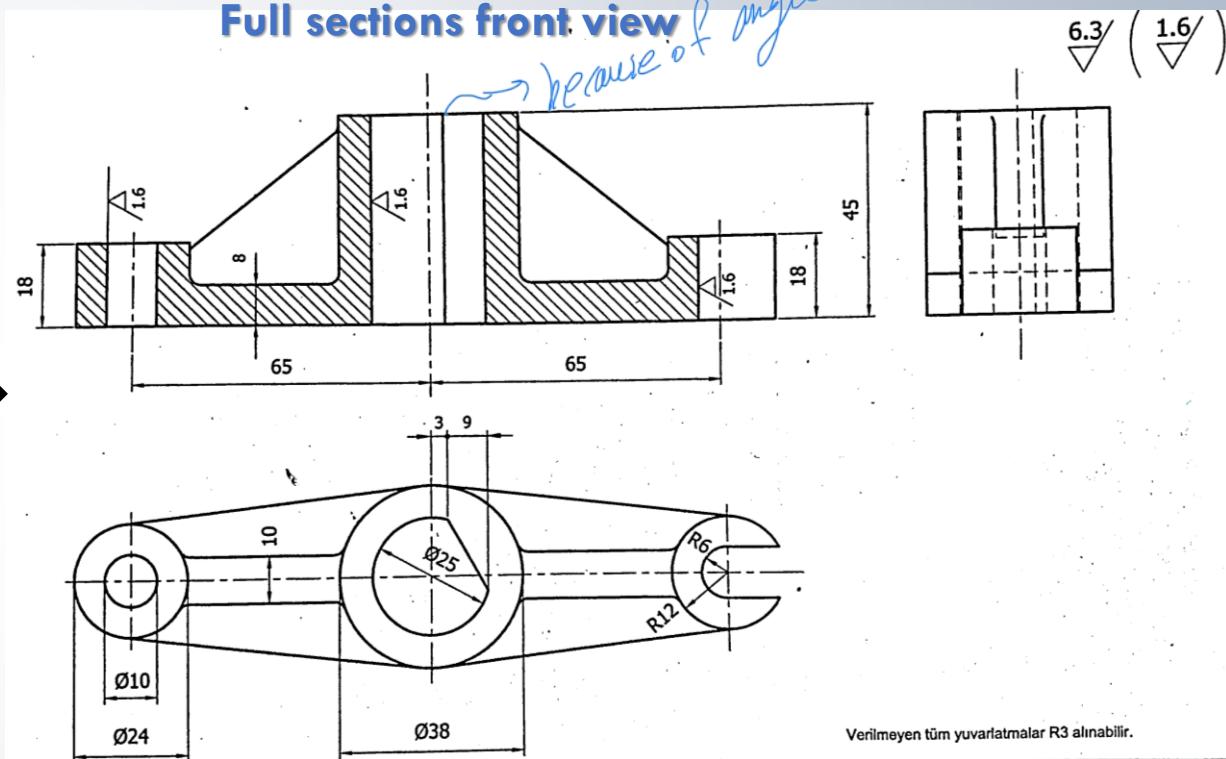


GÖVDE		İTÜ Makina Fakültesi Teknik Resim Birimi		
Ölçek: 1:1	Kontrol	Fakülte: Makina	Söm:	Adı Soyadı: _____ Numara: _____
				Ödev No: _____ Teslim Tarihi: _____

EXAMPLE

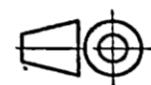
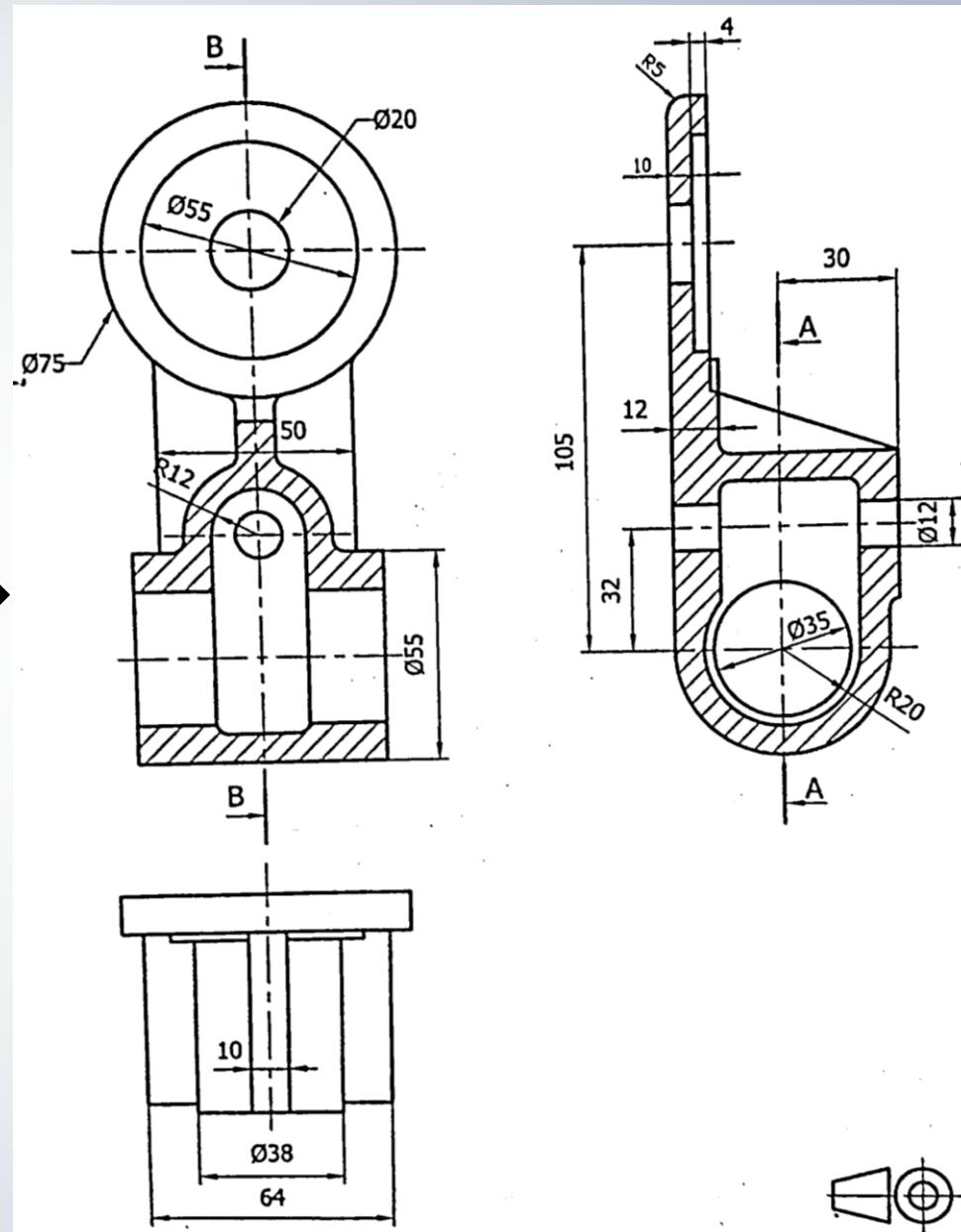
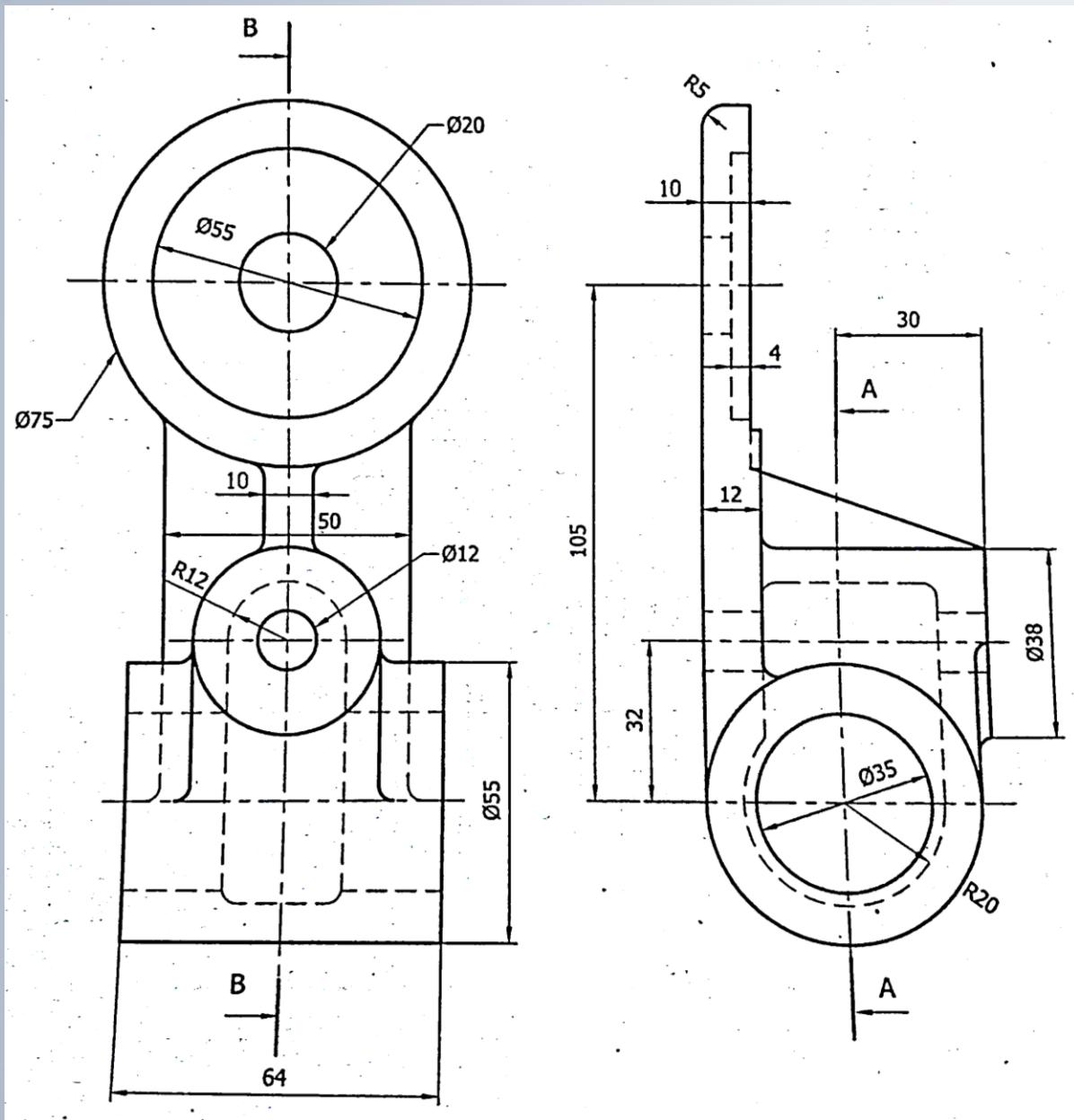


Full sections front view because of angle



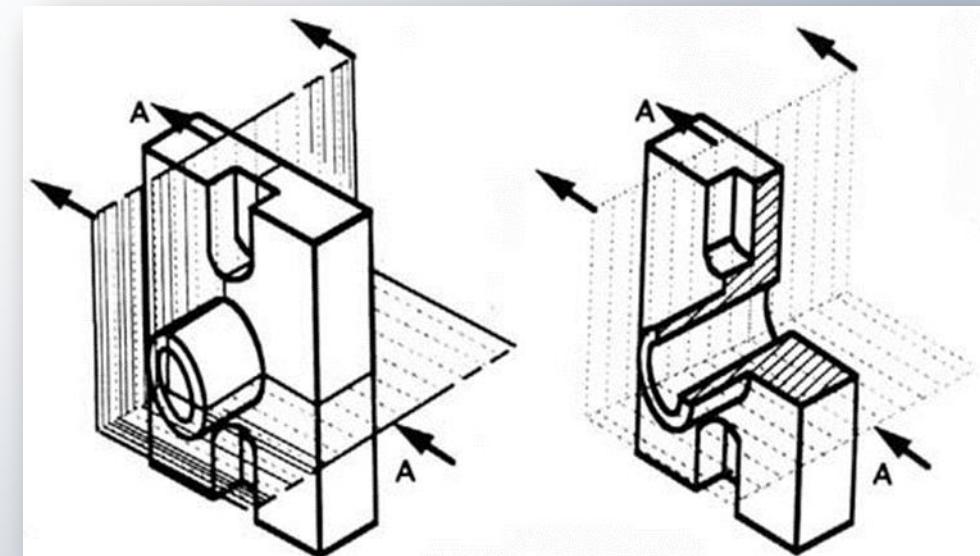
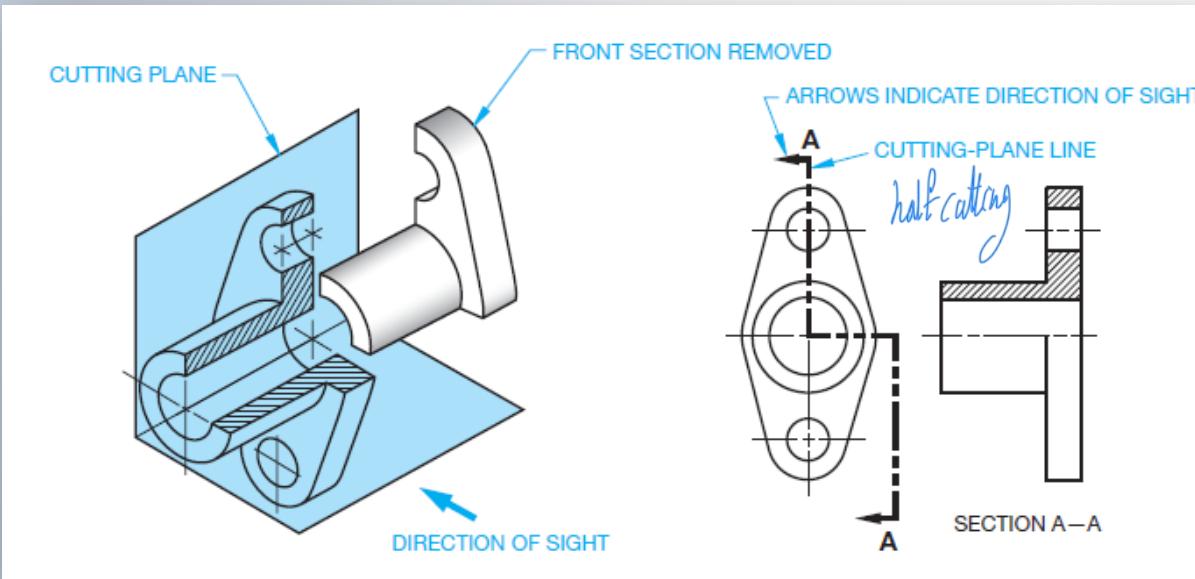
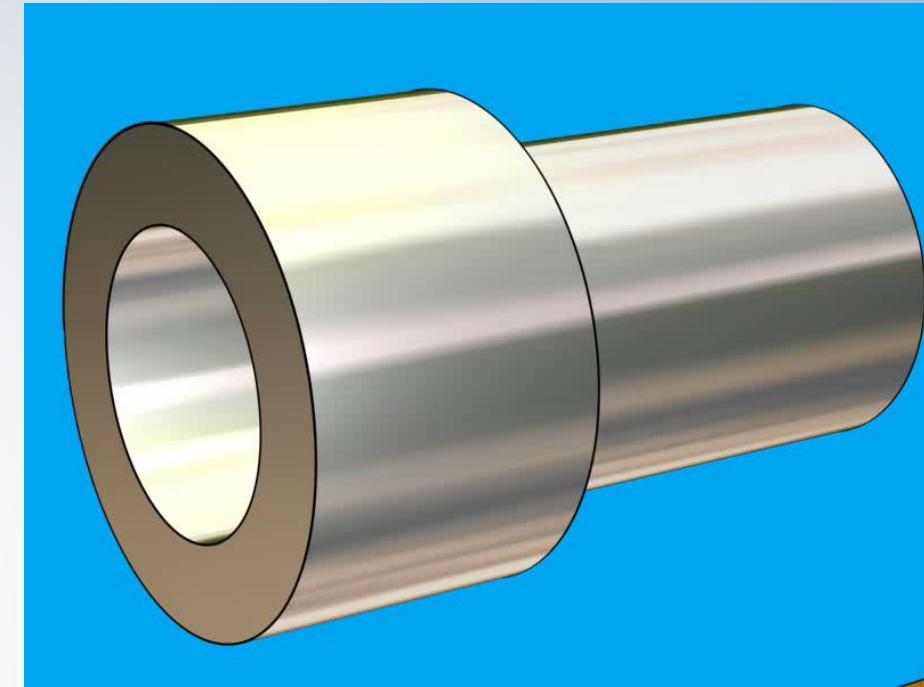
EXAMPLE

Front: A-A Left: B-B



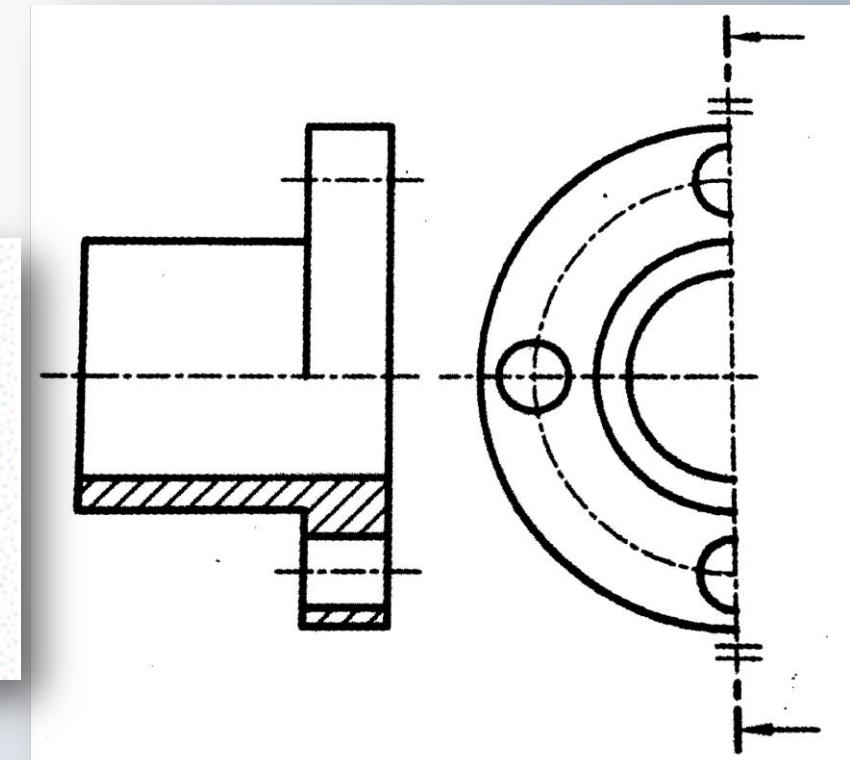
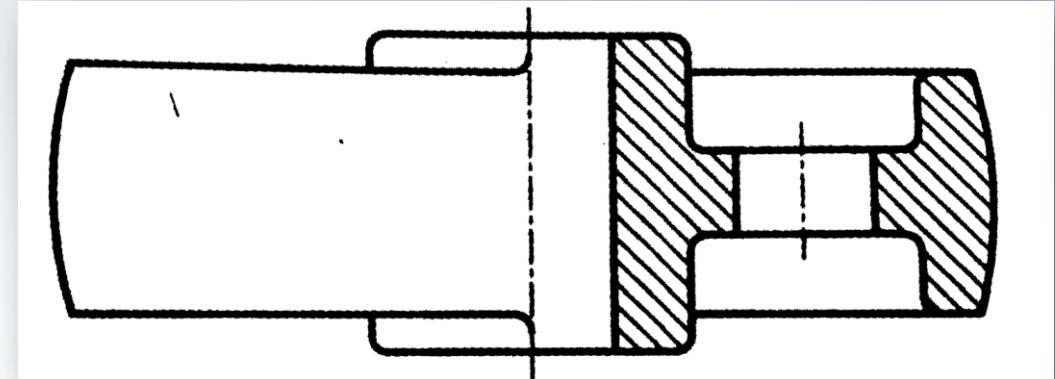
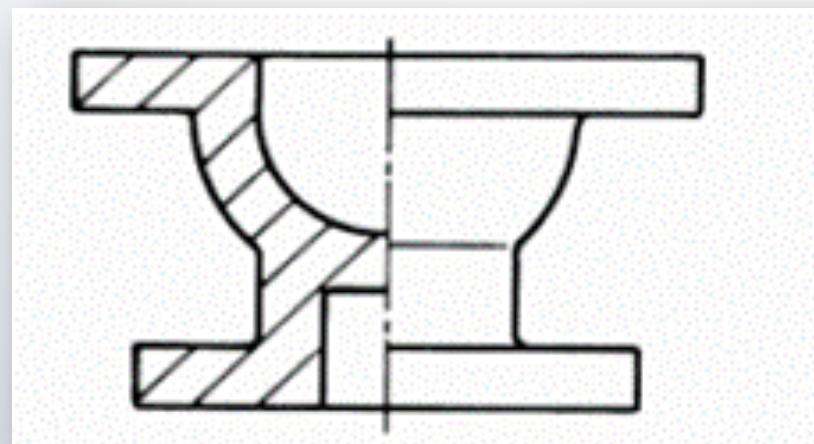
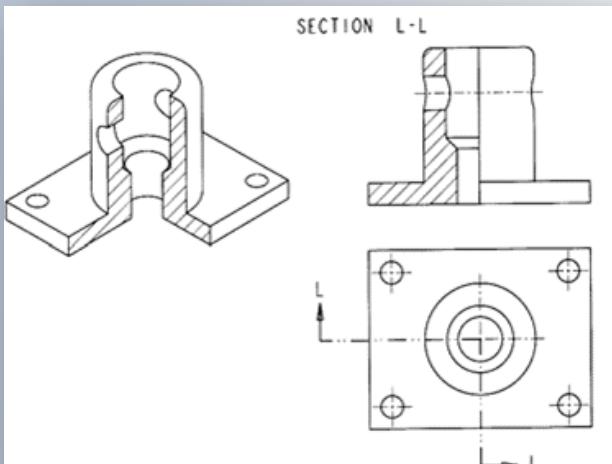
HALF SECTION

- It is a sectioning method applied to draw **symmetrical parts** according to a symmetry plane in order to draw both **external views** and **interior details**.
- One quarter of the part is removed, and the appearance of the remaining part is drawn.
- It is marked as if cut through, but **arrows and letters** are **not necessarily shown in the section plane**.

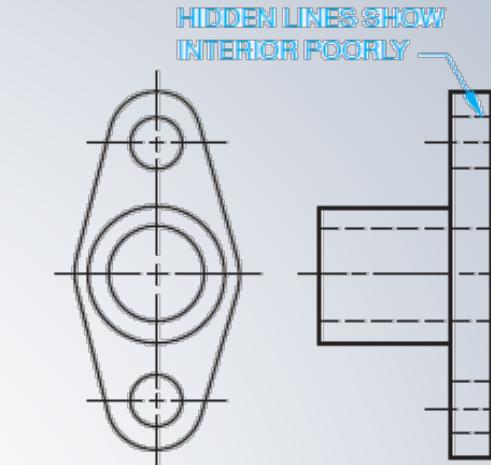
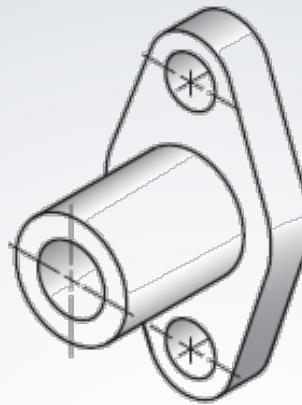


HALF SECTION

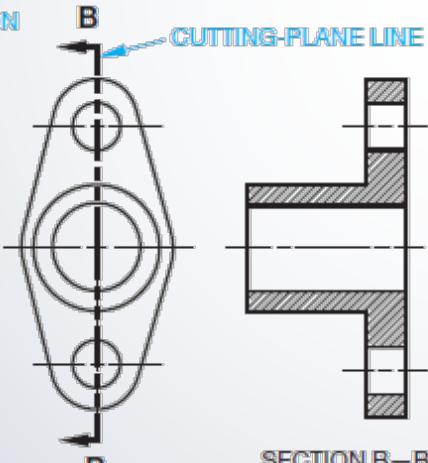
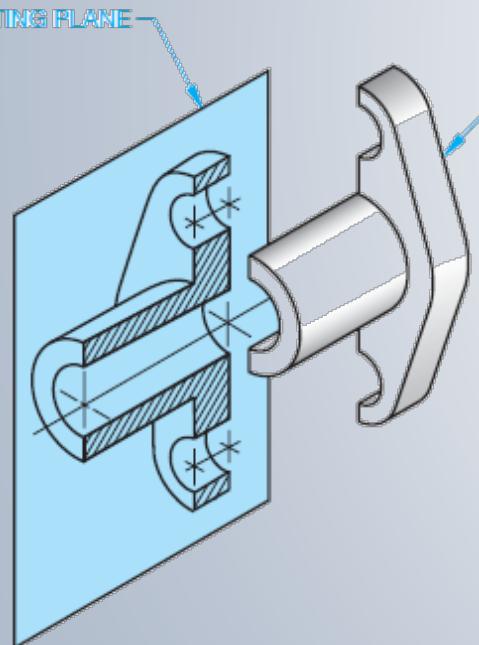
- Details are not shown with dashed lines on the sectional view.
- When symmetrical parts are drawn in half, the half closest to the section view is drawn.



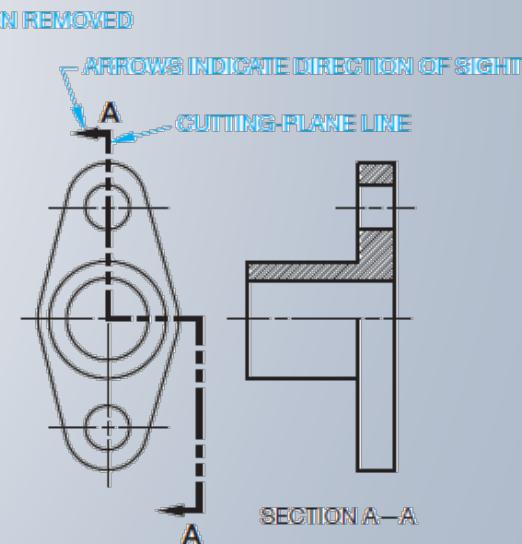
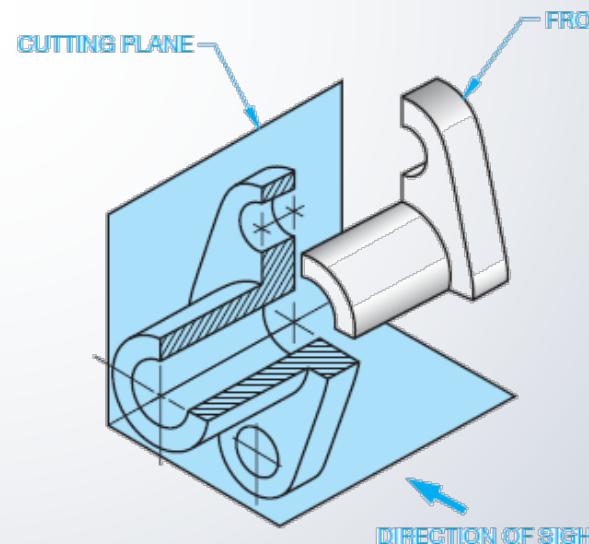
FULL SECTION ~ HALF SECTION



(A) SIDE VIEW NOT SECTIONED



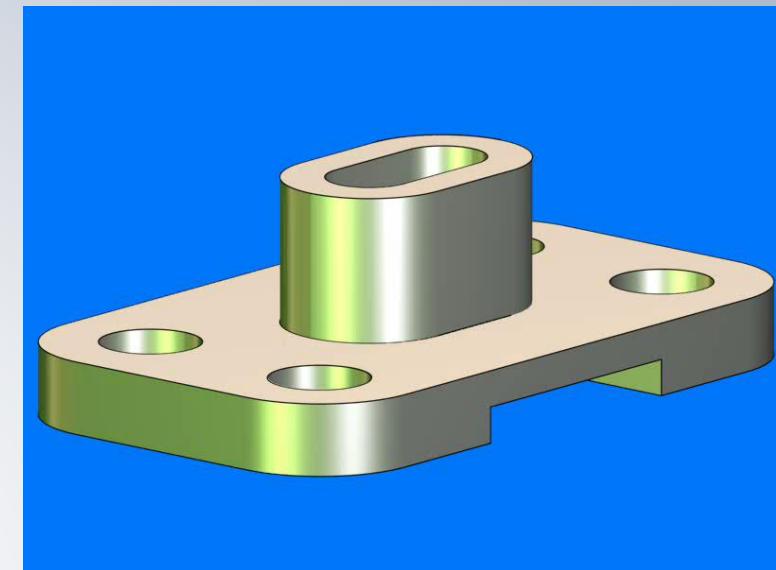
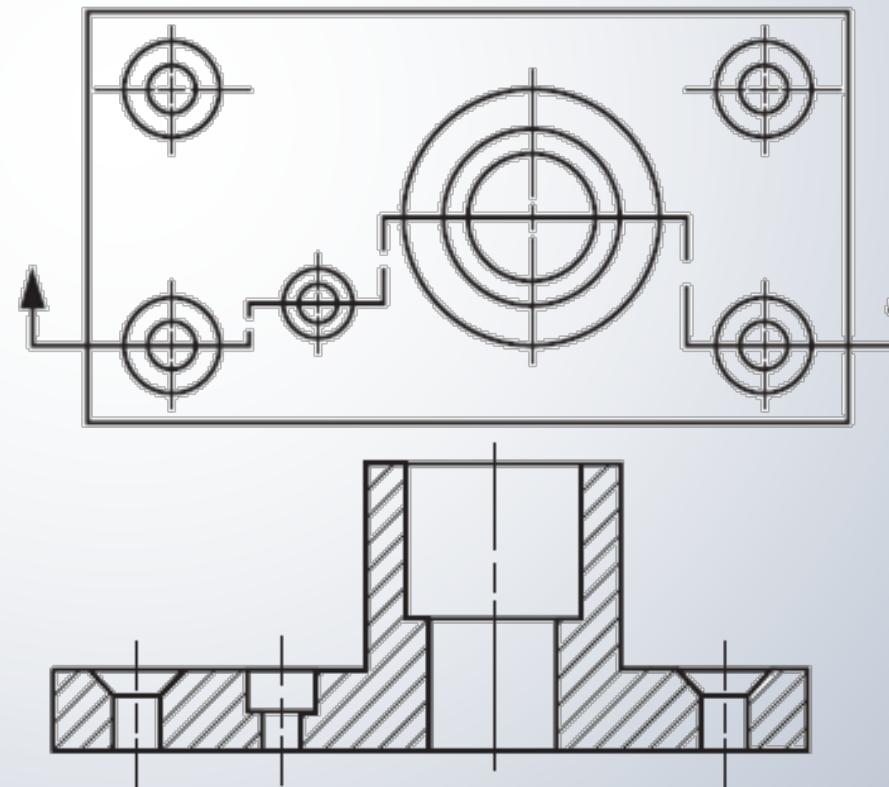
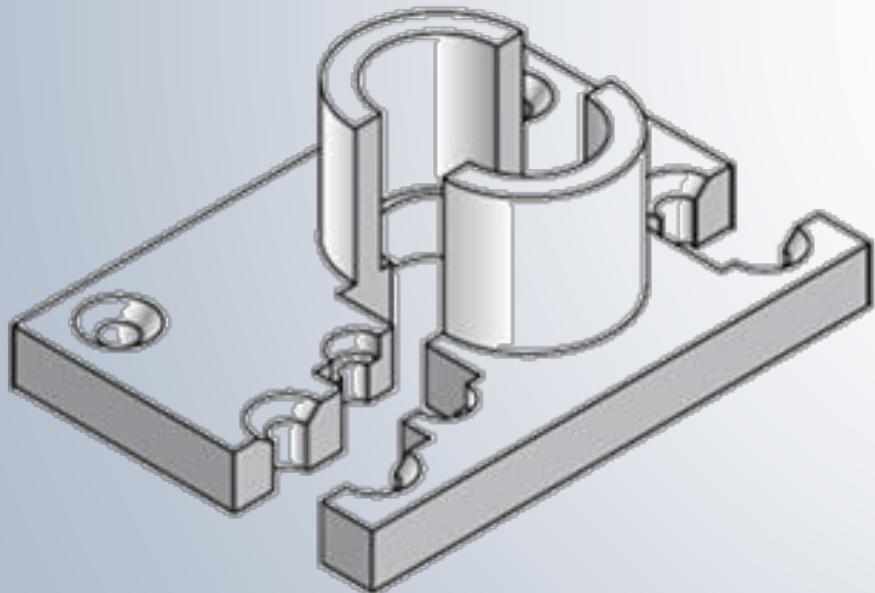
(B) SIDE VIEW IN FULL SECTION



(C) SIDE VIEW IN HALF SECTION

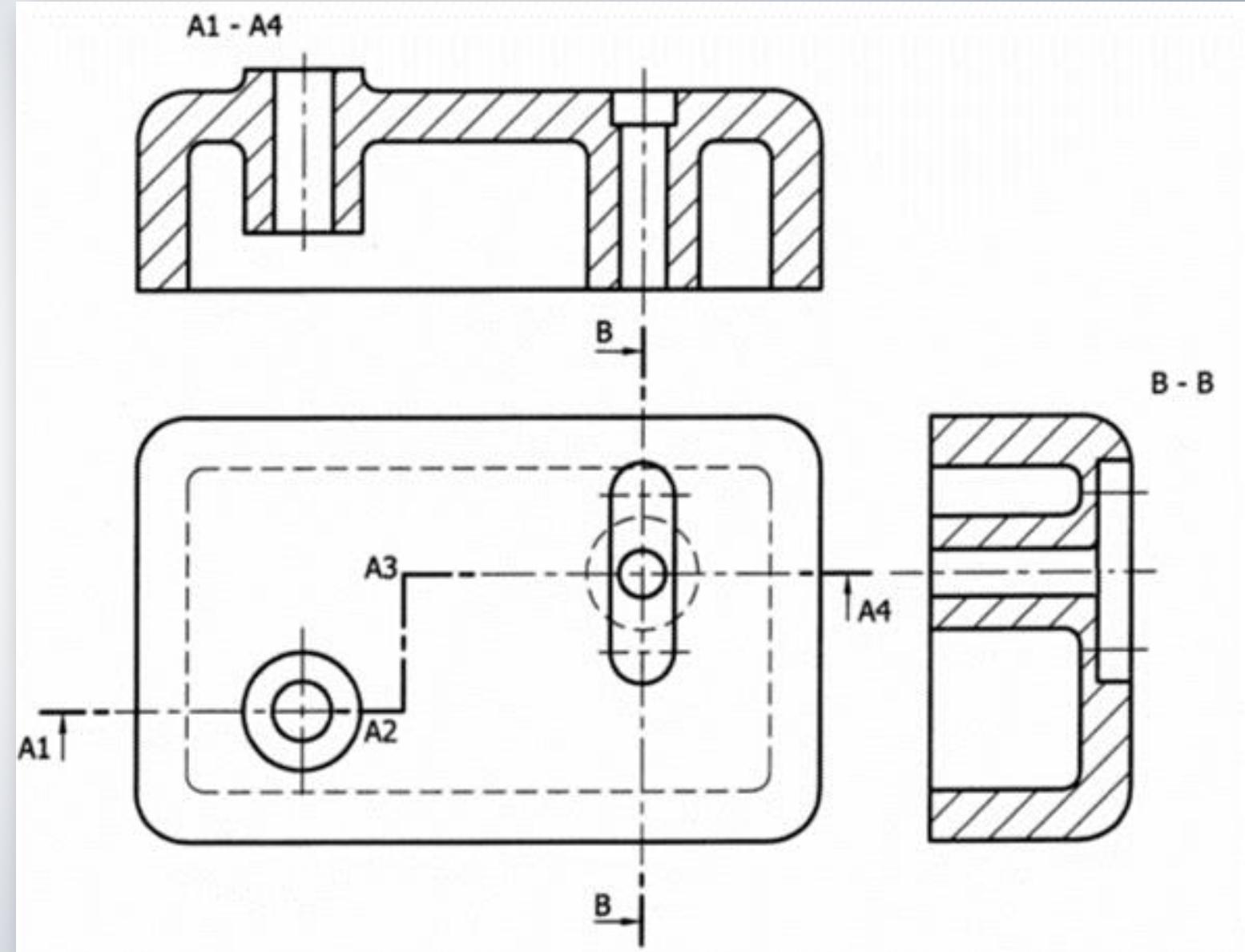
OFFSET SECTION

- In order to include features that are not in a straight line, the cutting-plane line may be offset or bent, so as to include several planes or curved surfaces.



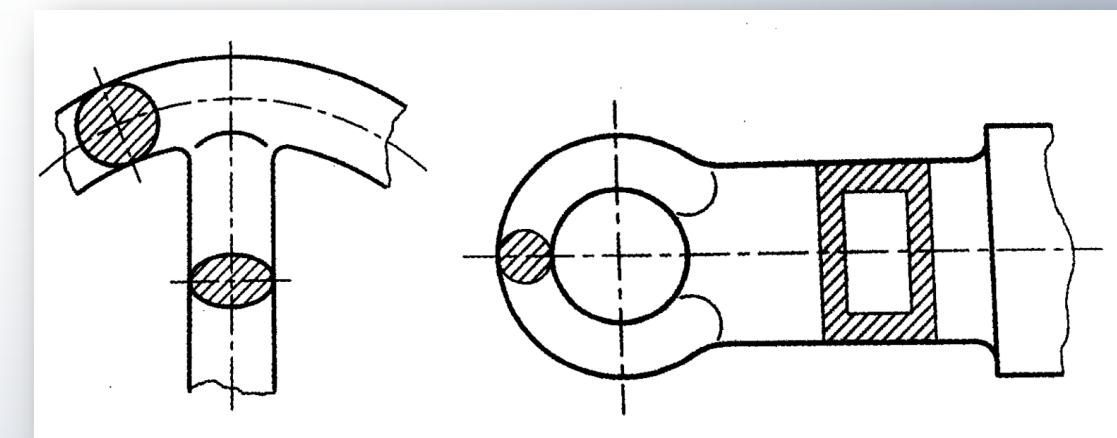
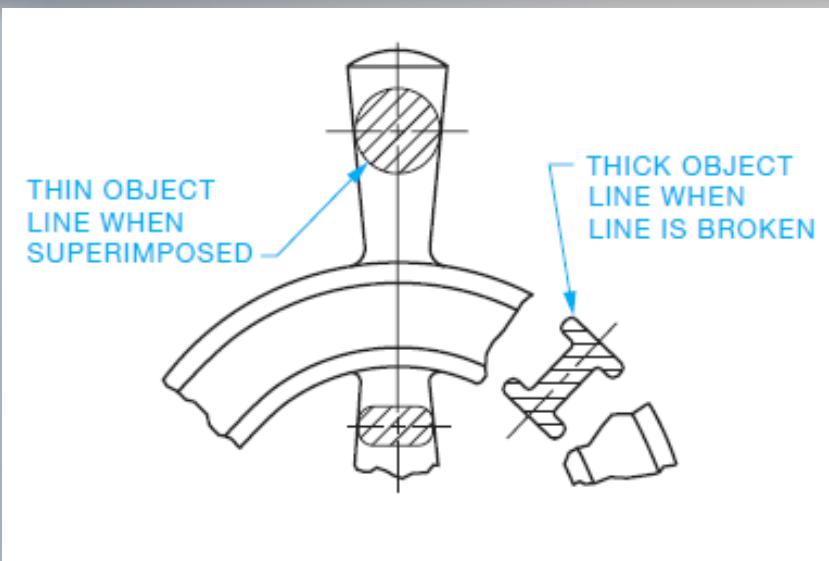
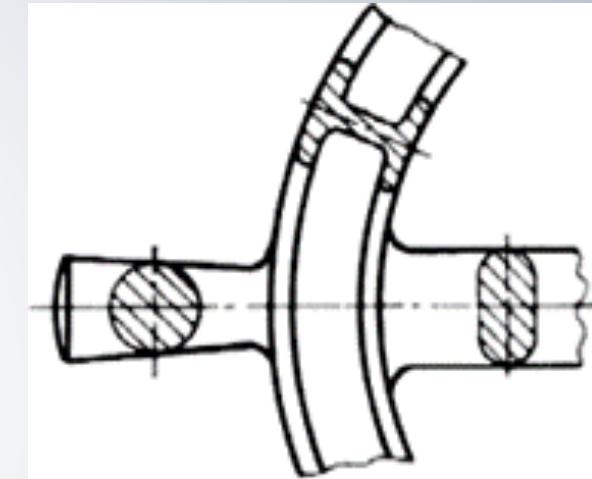
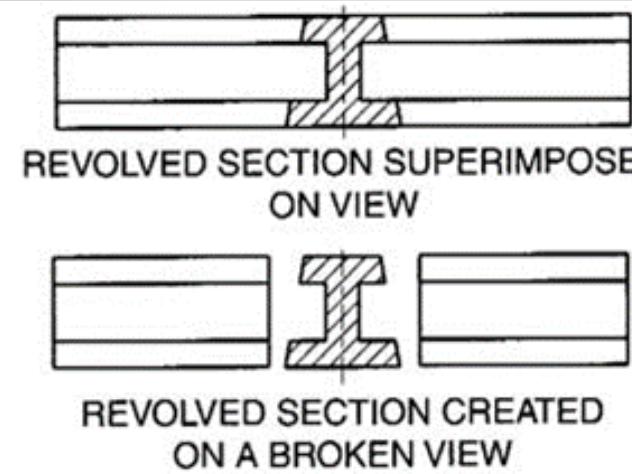
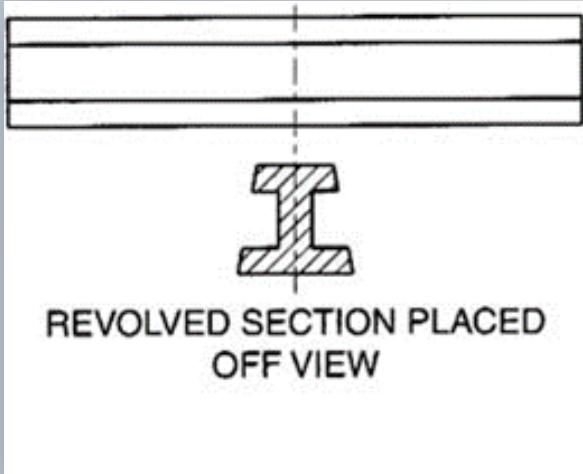
OFFSET SECTION

- If there is more than one section, the stages are also lettered.



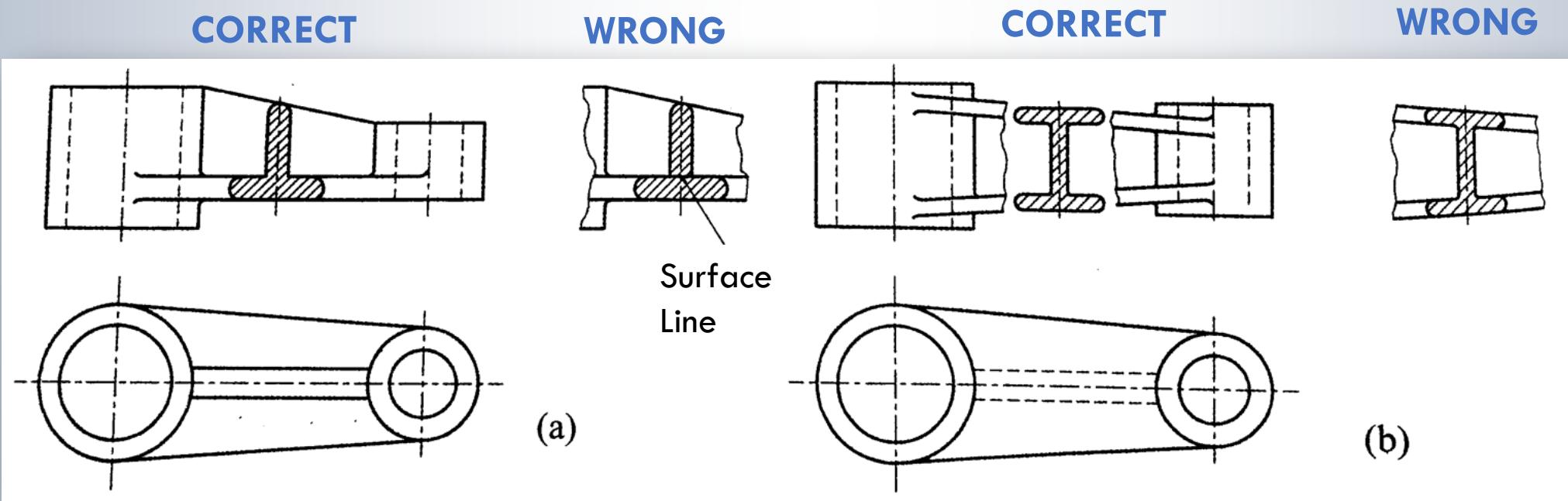
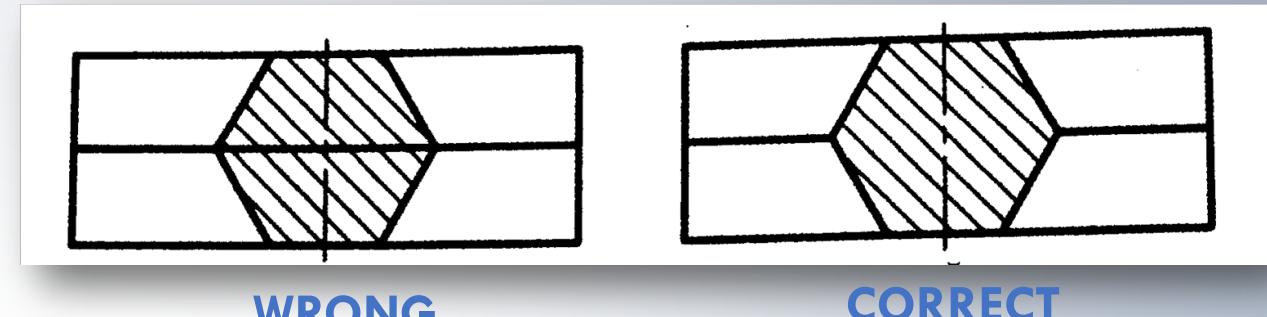
REVOLVED CROSS-SECTIONAL VIEWS

- It can be used to show cross-sectional shape of part.



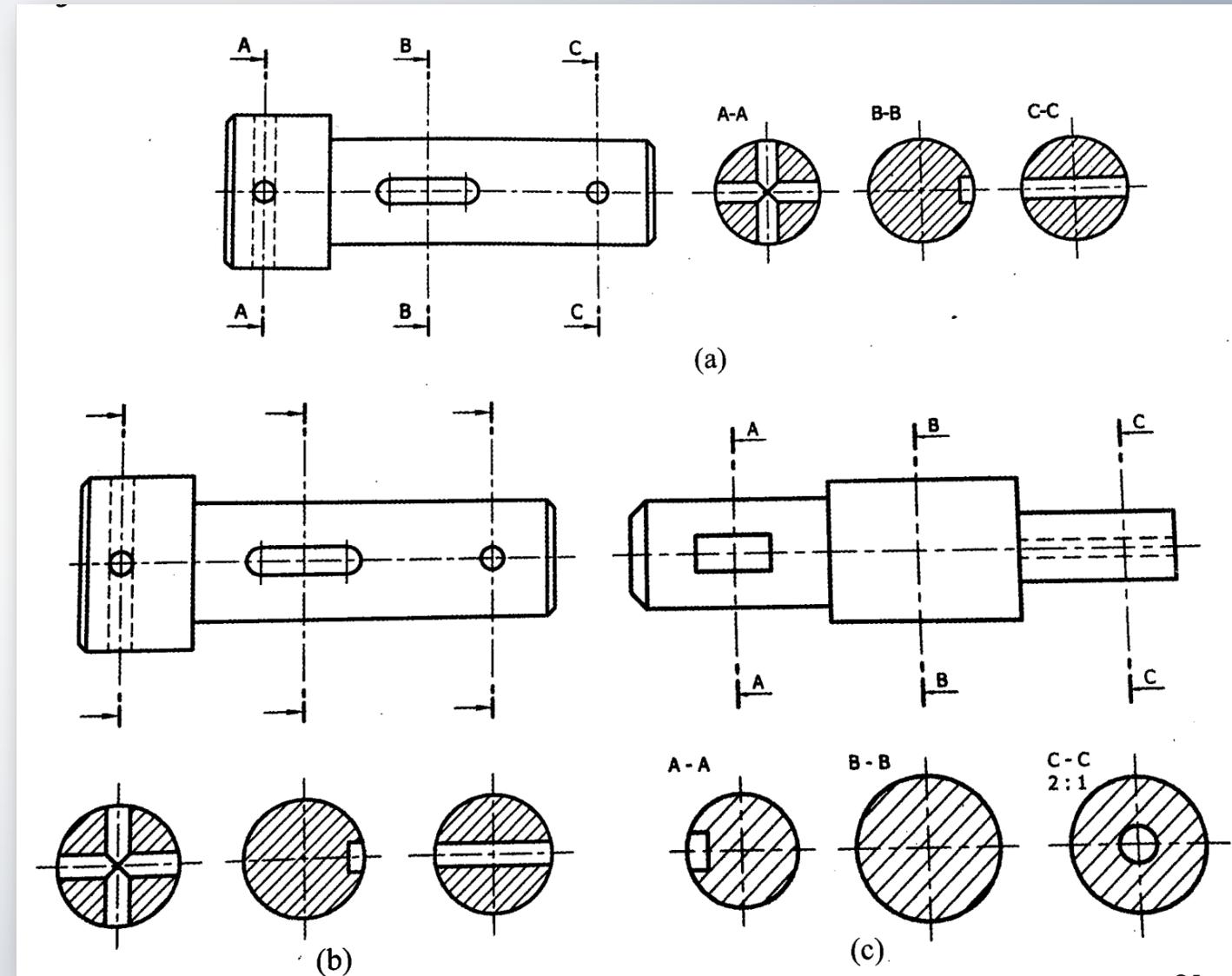
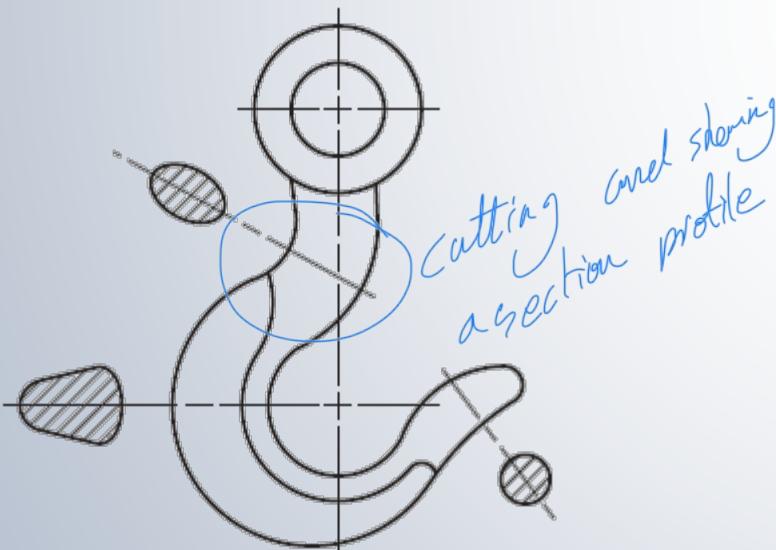
REVOLVED CROSS-SECTIONAL VIEWS

- The surface line **should not be drawn** in the cross-sectional area.



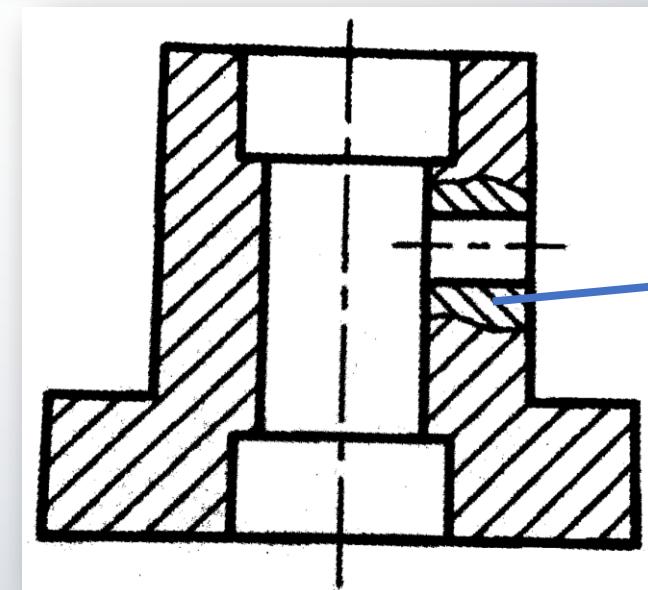
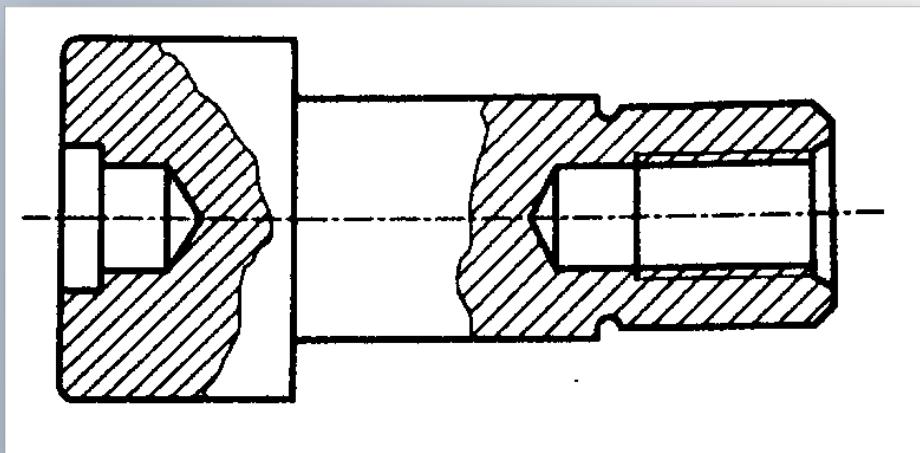
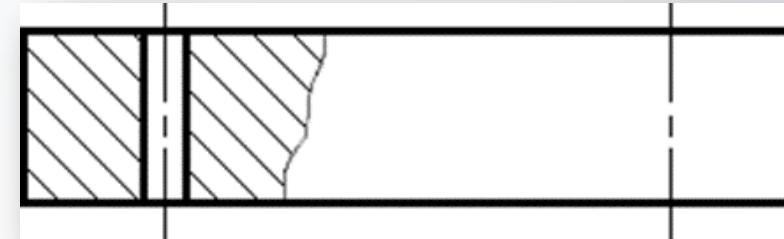
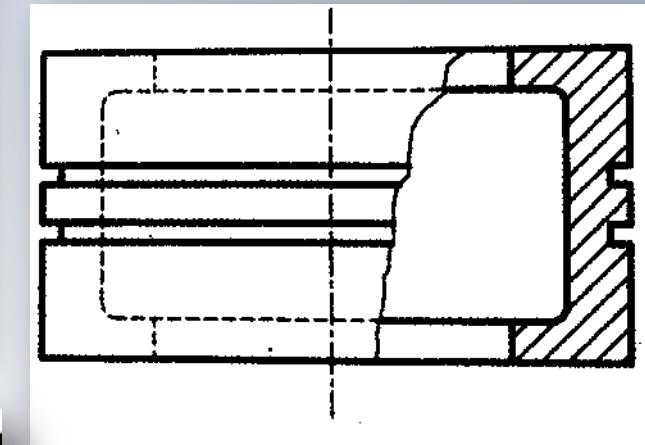
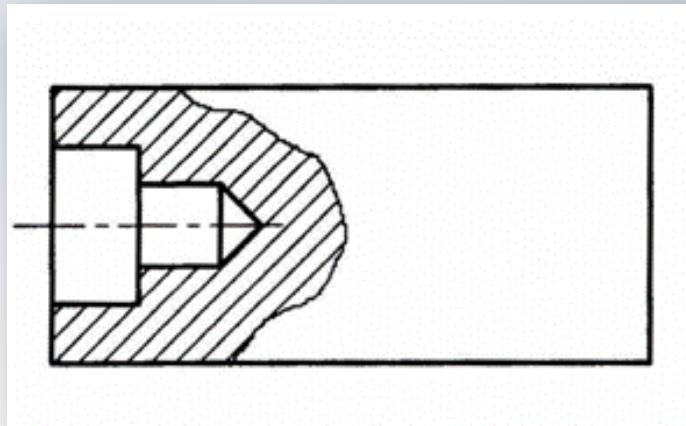
REMOVED SECTIONS

- Profile cross-sectional views can be shown in a suitable place with a continuous thick line at their boundary.



PARTIAL SECTIONS

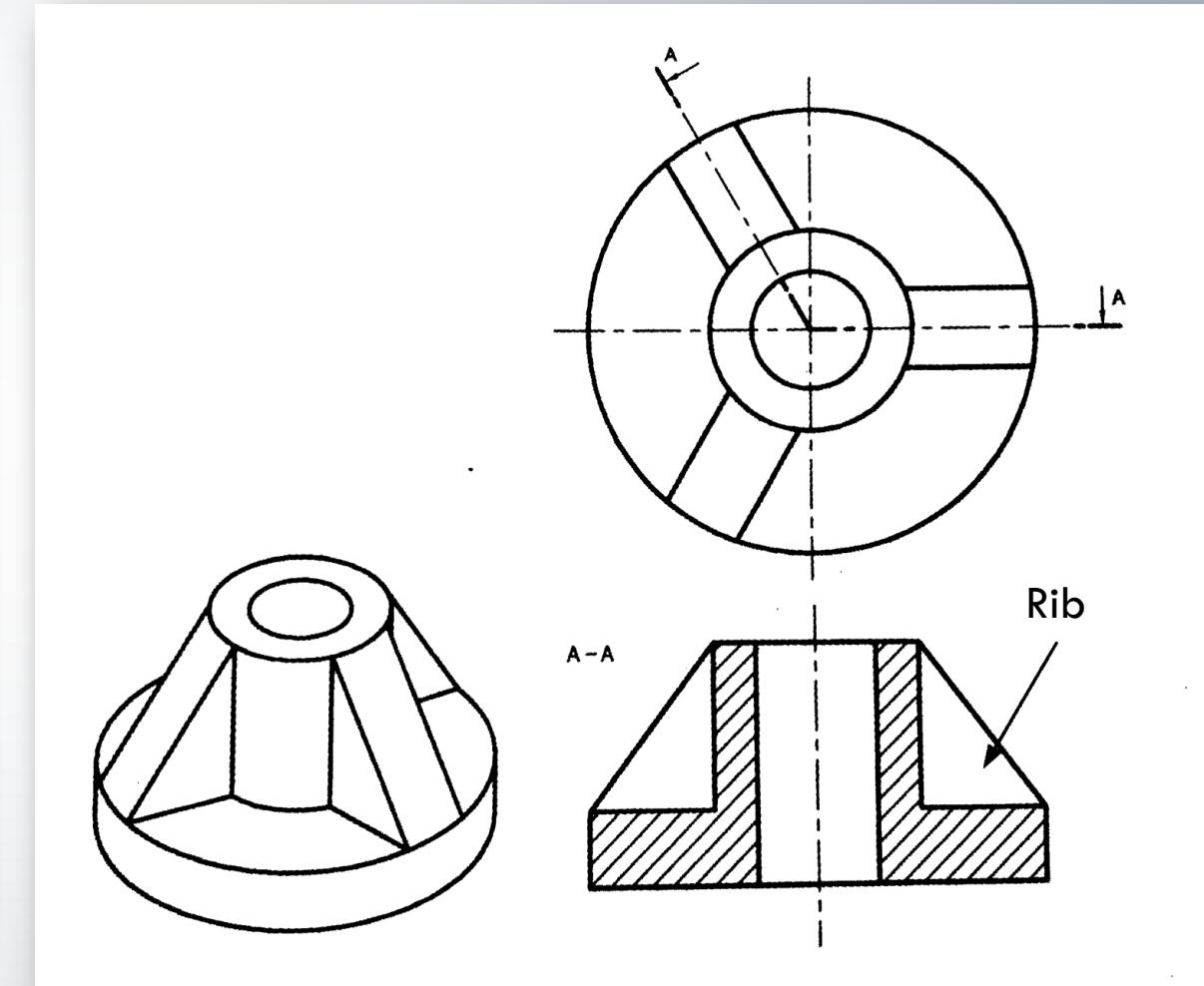
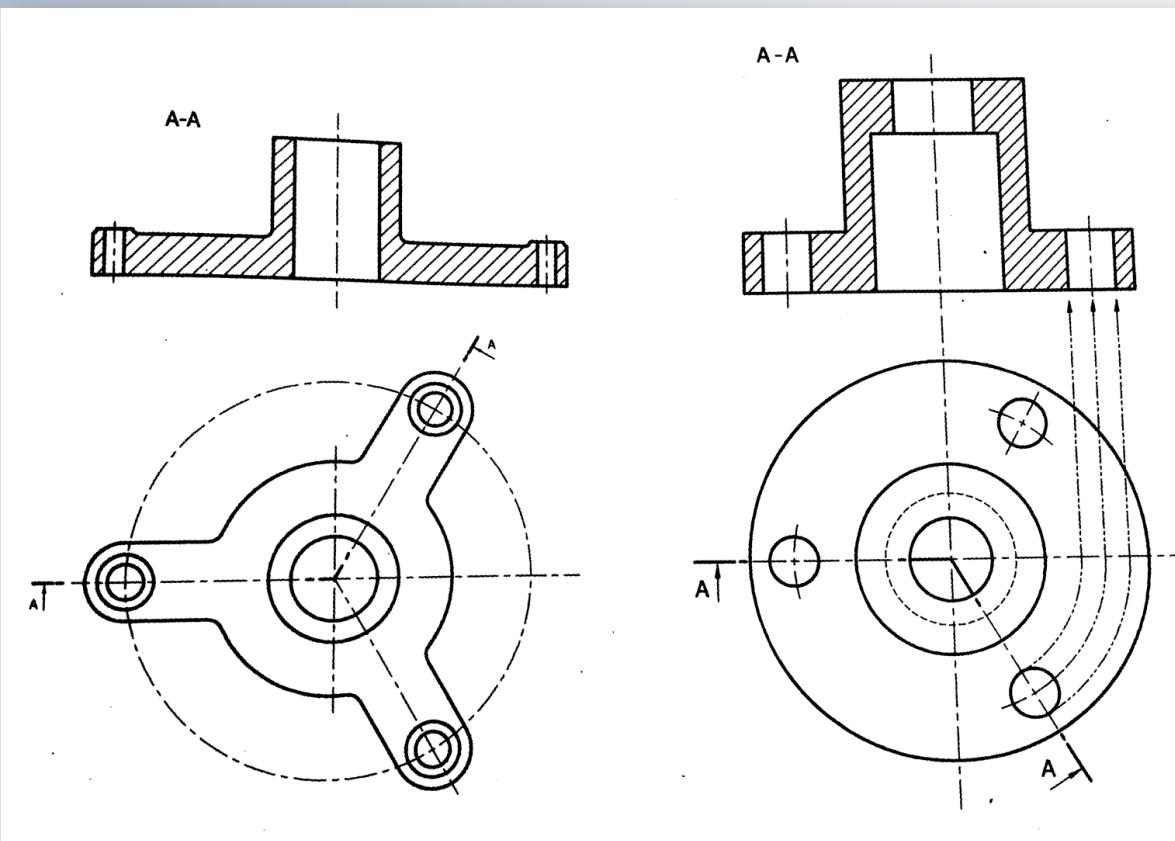
- Used to show **interior details** in a **small space** when full, half or offset sections are not required.
- Partial sections can be taken in machine elements (bolts, rivets, shafts, etc.) that cannot be cut longitudinally.



Incorrect partial
section
representation

ALIGNED SECTIONS

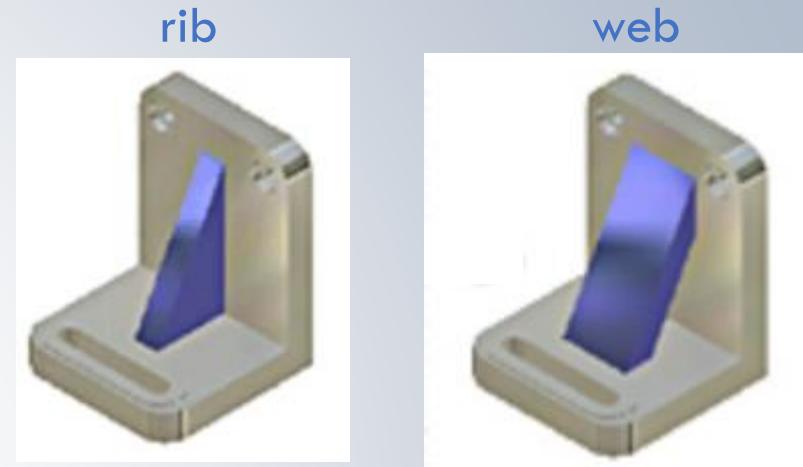
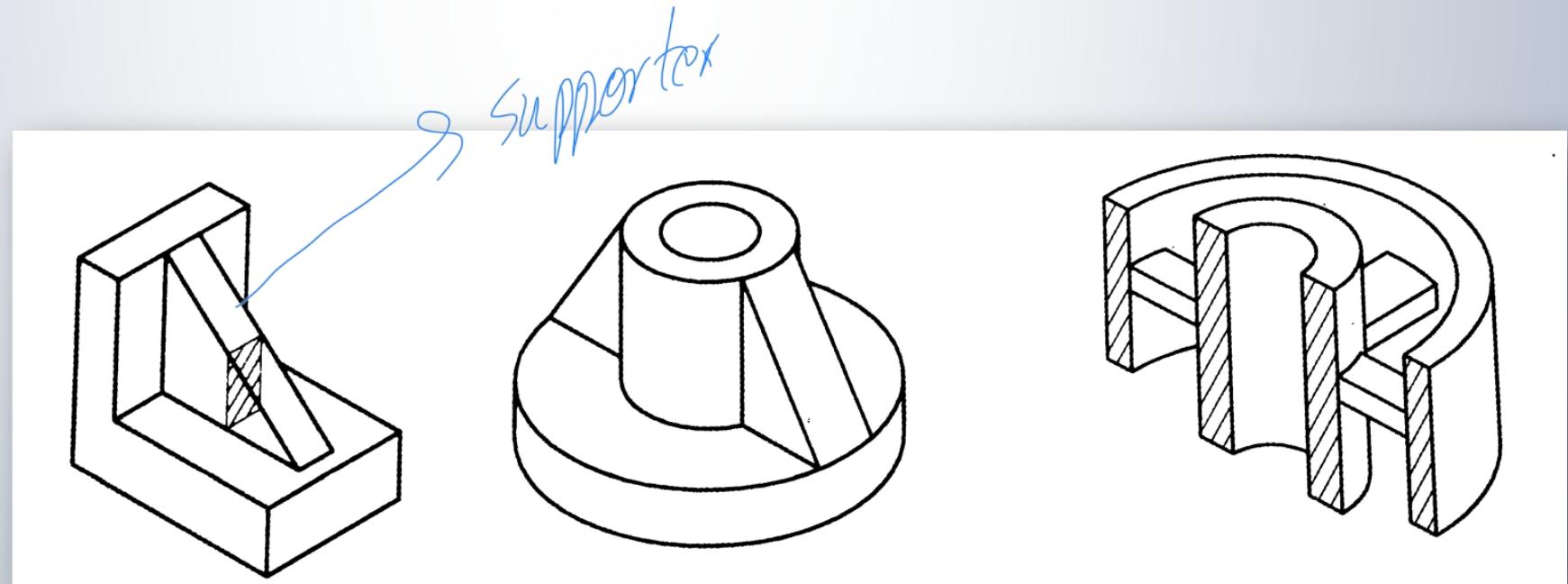
Sectioning at an angle



SECTION OF RIBS AND WEBS

- In order to strengthen or join the main parts, a thin-walled open support shapes "webs" or a thin-walled closed support shapes, generally triangular, "ribs" can be used.
- They are manufactured as joined to the part.

Support
members

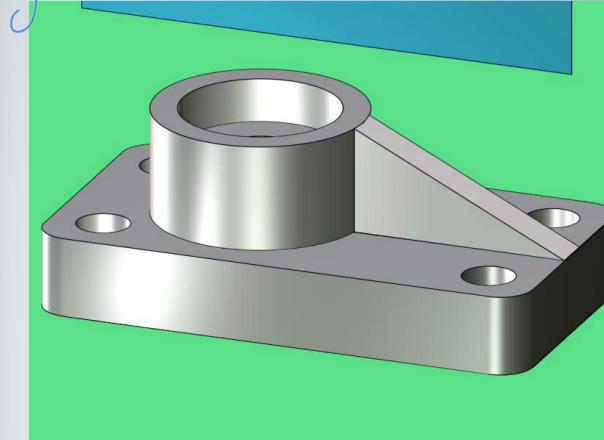
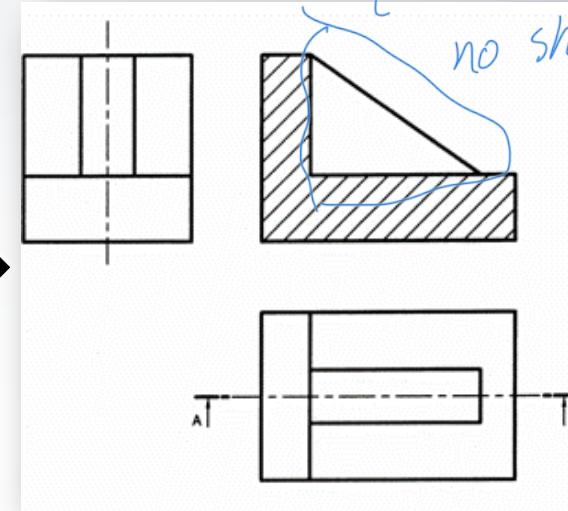
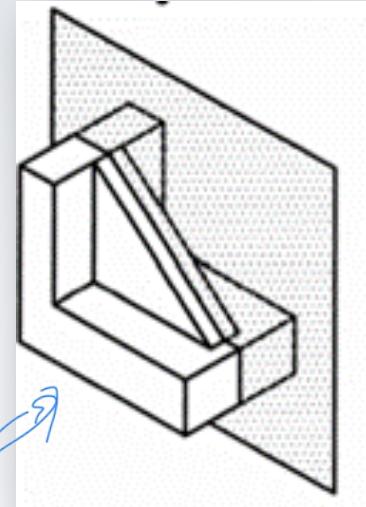


SECTION OF RIBS AND WEBS

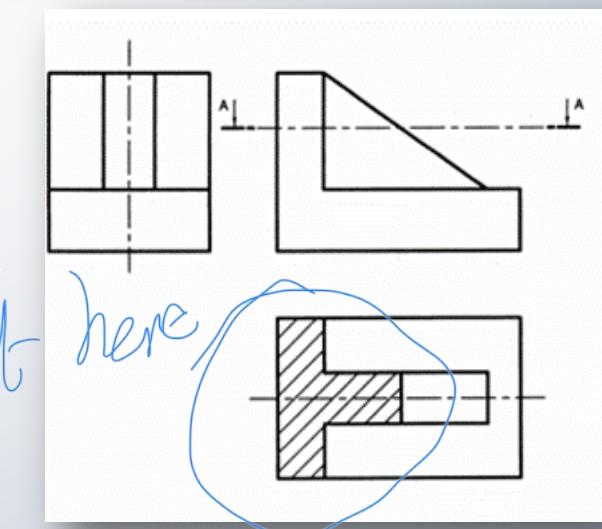
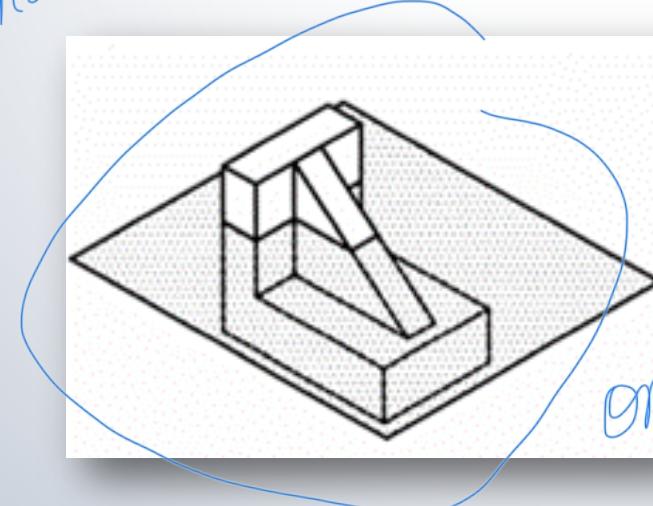
- They are not hatched when cut longitudinally.

Cutting ribs
longitudinally

common
most common



Transverse
cutting ribs



SECTION OF RIBS AND WEBS

Sectional views of the supports in the part

Destek: support shape

