Sectional Views

Unit 4

Sectional Orthographic Projections:

The projections in which the internal shape of an object is shown.

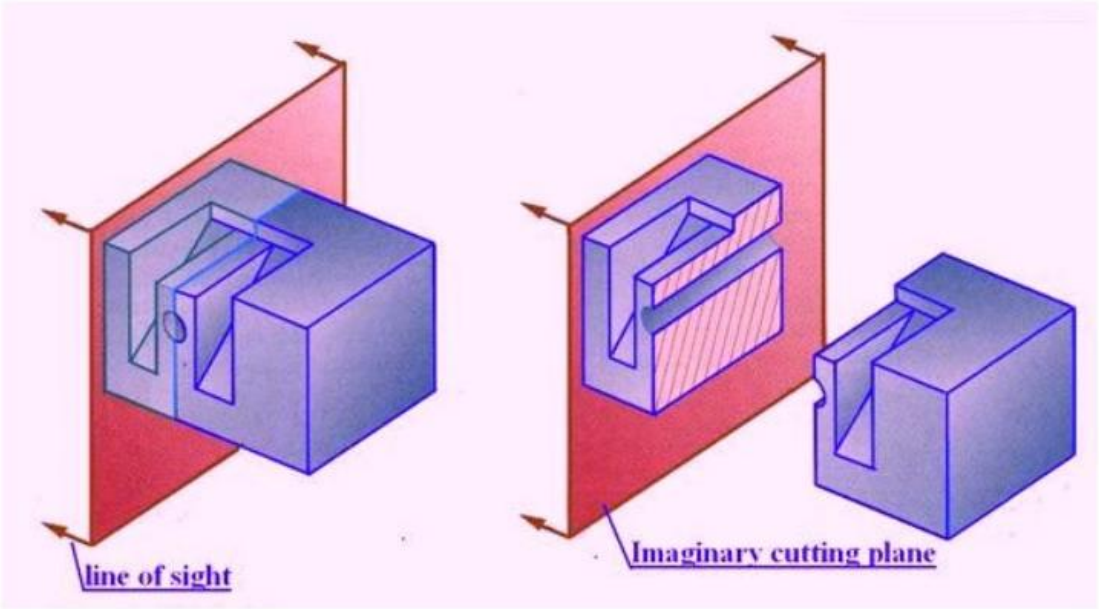


Figure 1. Illustrates a full Section view

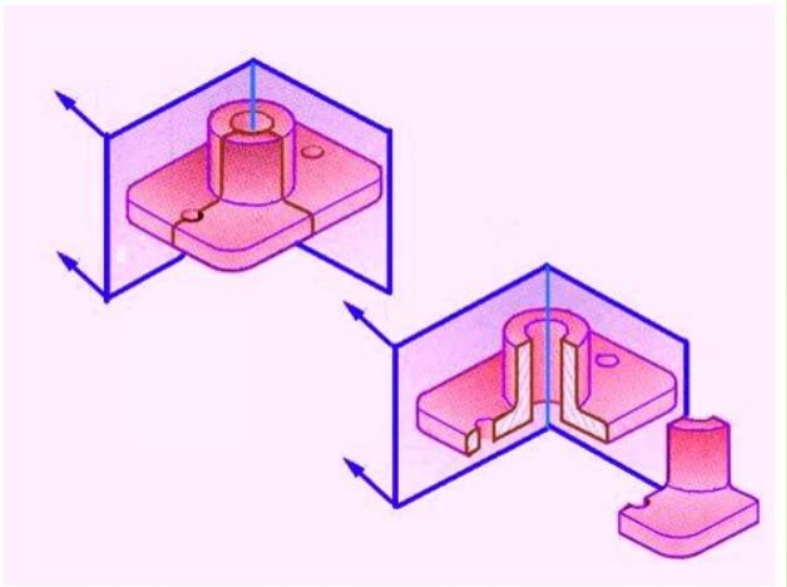


Figure 2. Illustrating a half section view

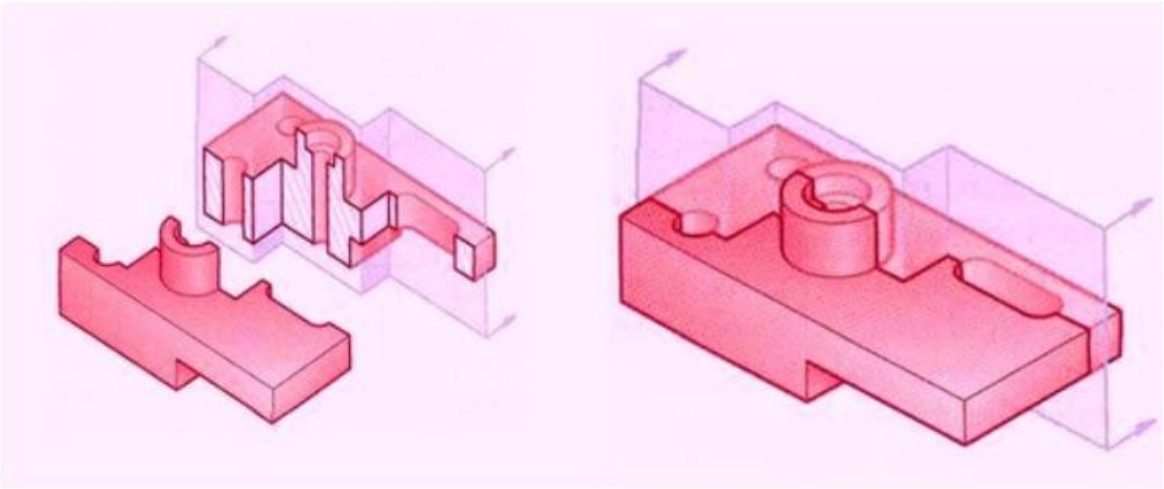


Figure 3. Illustrating an offset section

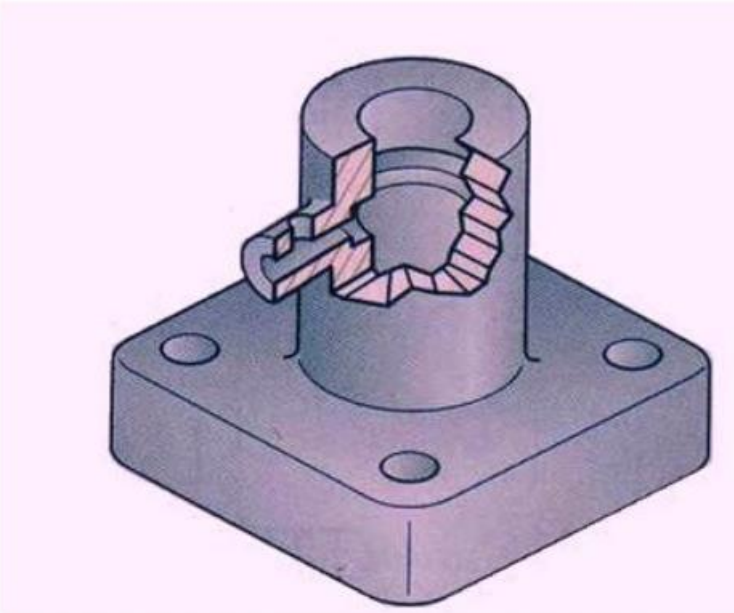


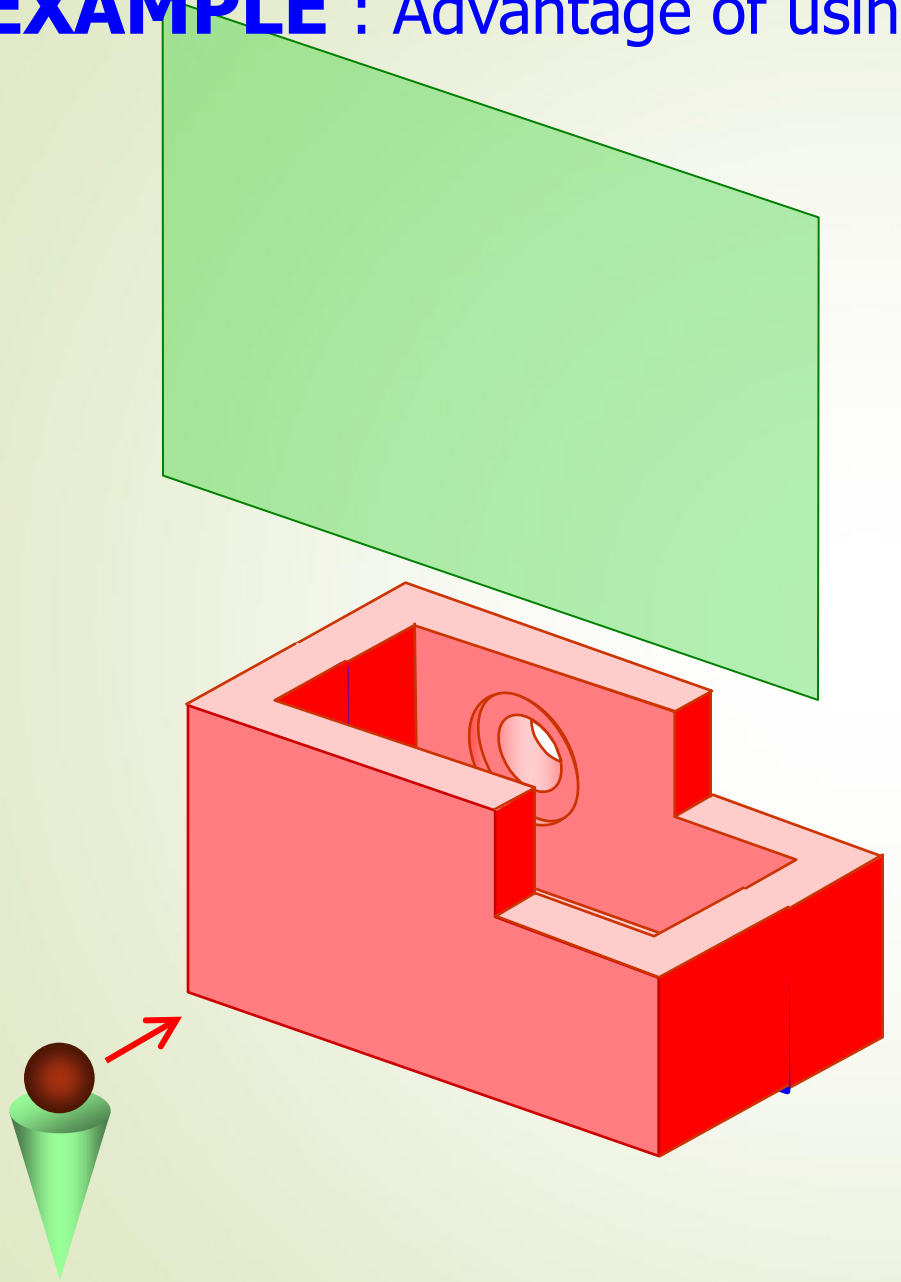
Figure 4. Illustrating a Broken-out Section

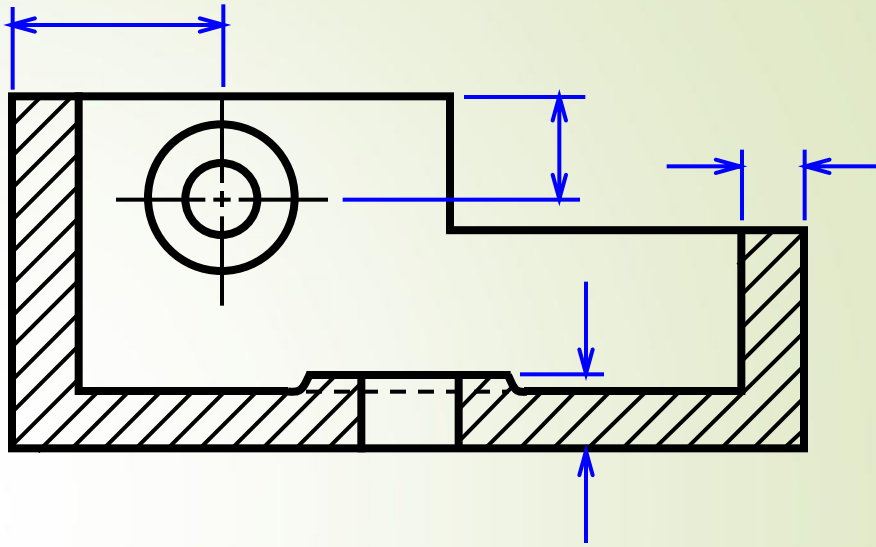
PURPOSES OF SECTION VIEWS

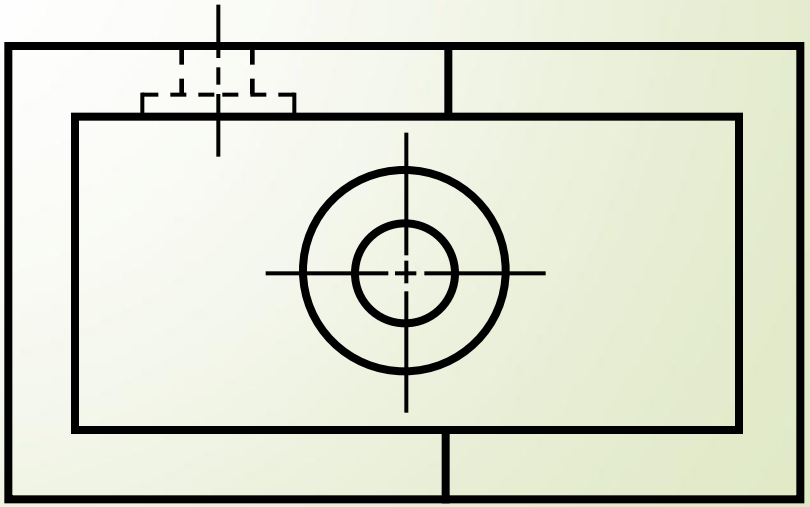
Clarify the views by:

- Reducing or eliminating the hidden lines.
- Revealing the cross sectional's shape.

EXAMPLE : Advantage of using a section view.

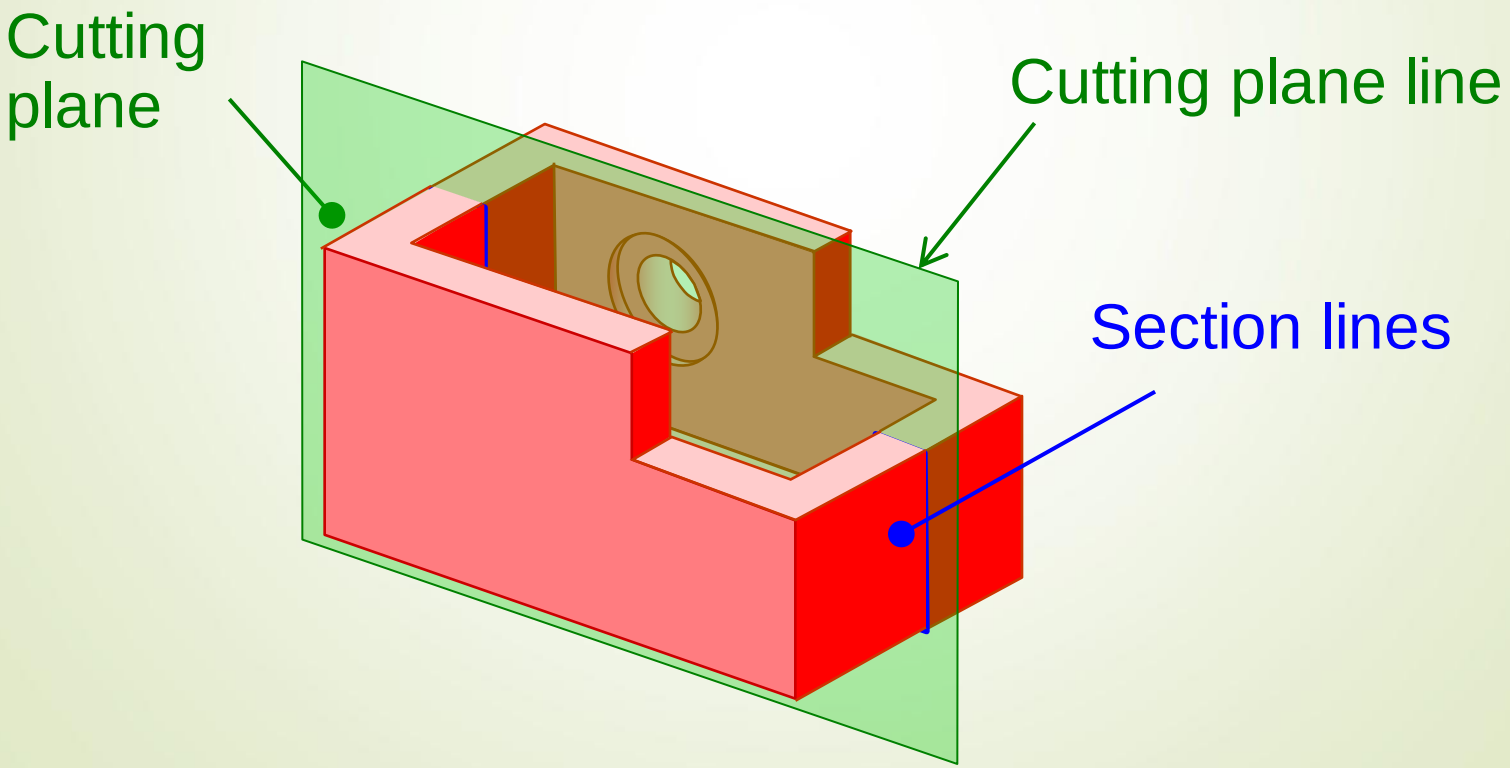






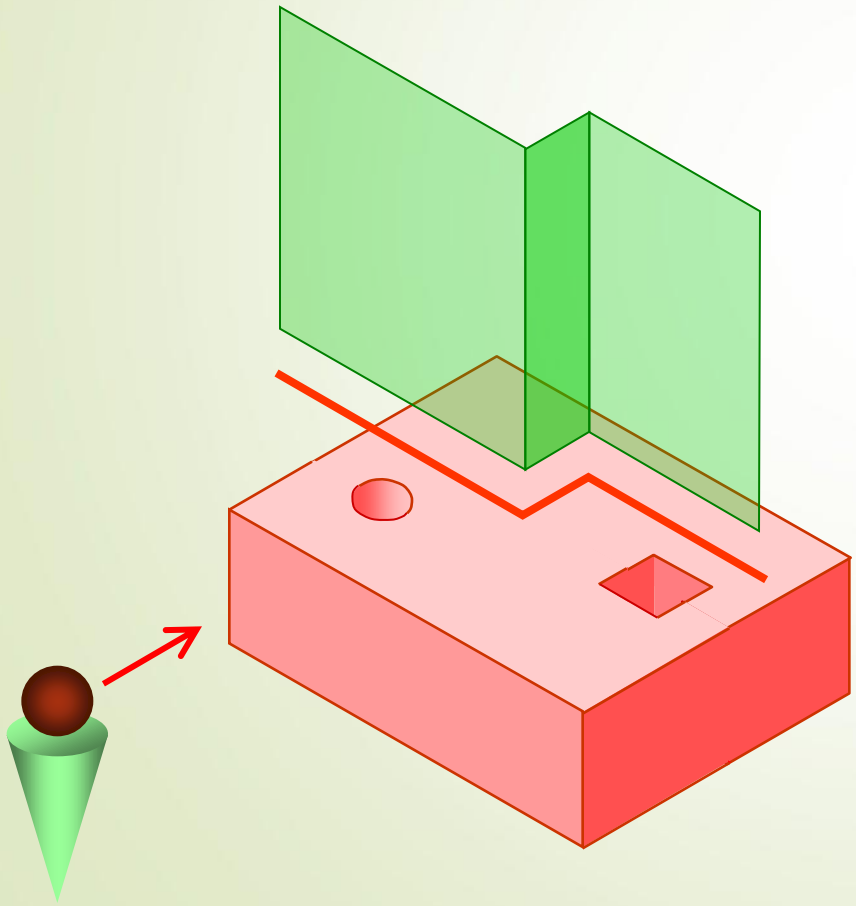
CUTTING PLANE

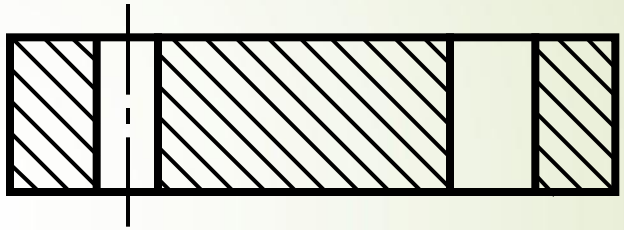
Cutting plane is a plane that ***imaginarily cuts*** the object to reveal the internal features.



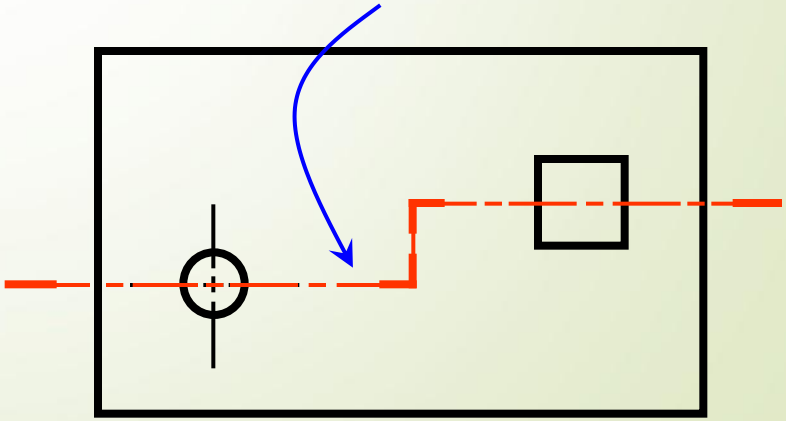
CUTTING PLANE LINE

Cutting plane line is an ***edge view*** of the cutting plane.

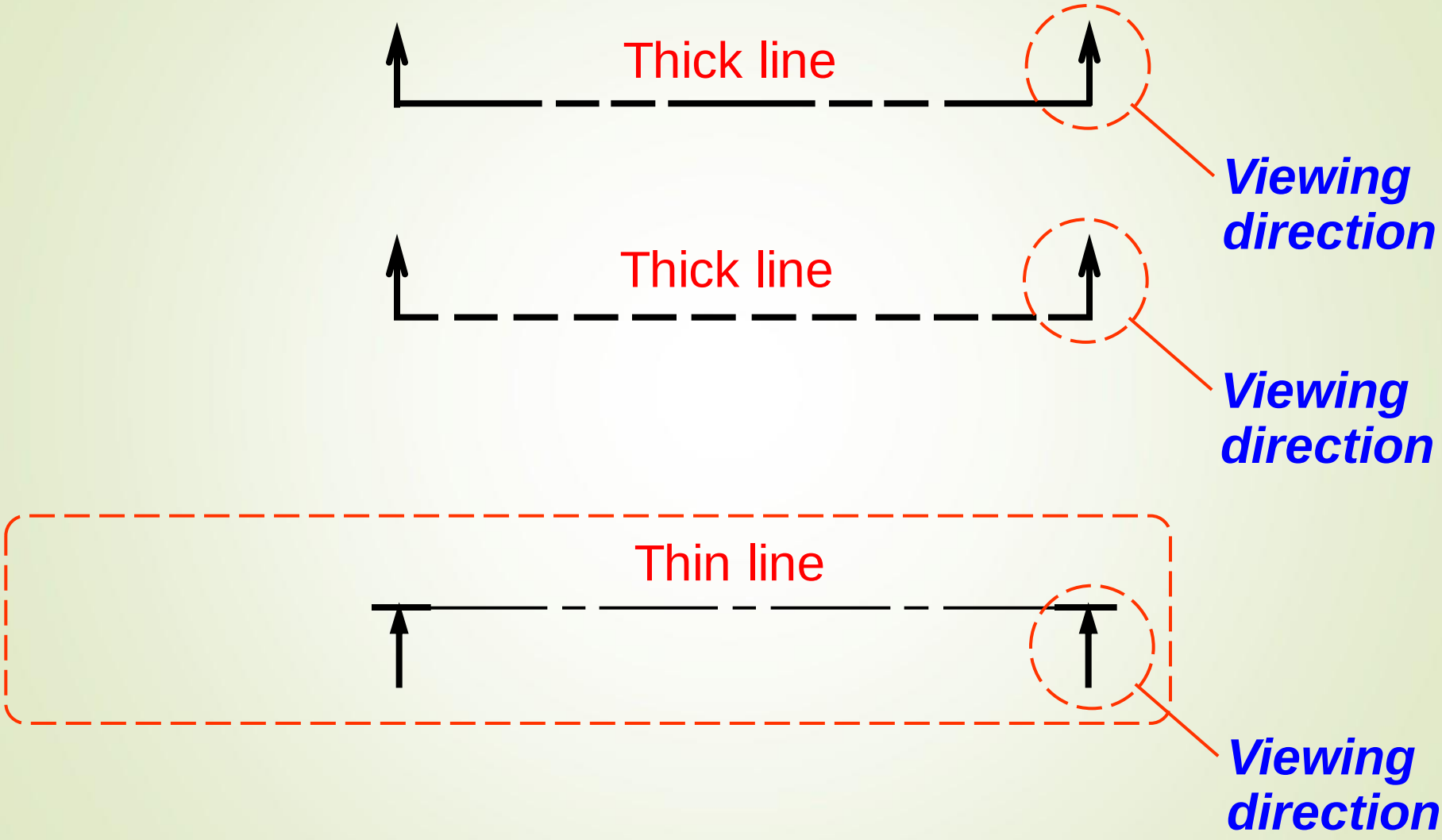




Indicate the ***path*** of cutting plane.

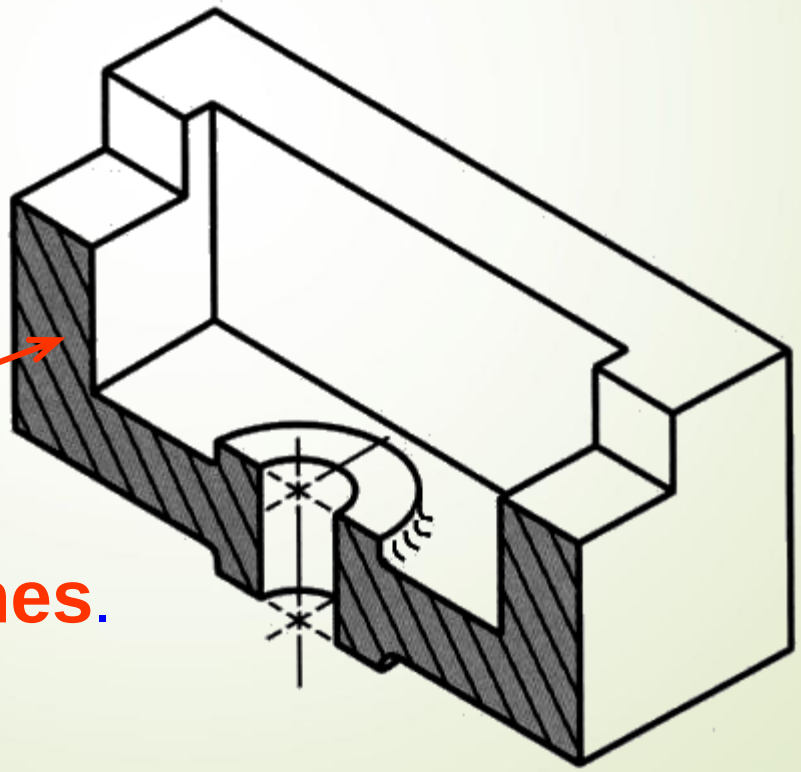


CUTTING PLANE LINESTYLES



SECTION LINING

Section lines or ***cross-hatch lines*** are used to *indicate the surfaces that are cut* by the cutting plane.



Section lines

Drawn with **thin lines**.

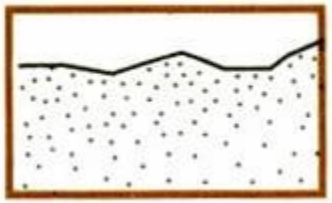
SECTION LINES SYMBOLS

- The section lines are different for each of material's type.
- For practical purpose, the cast iron symbol is used most often for any materials.

Cast iron,
Malleable iron

Steel

Concrete

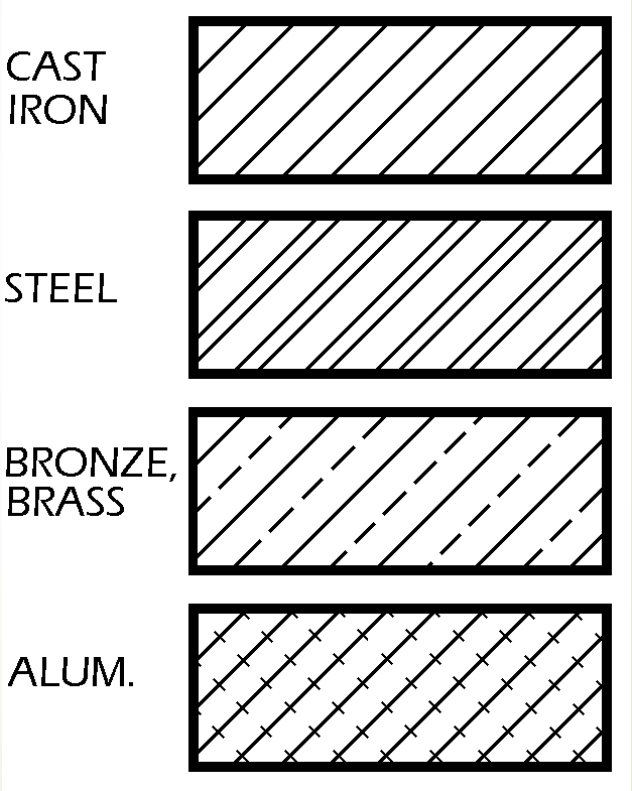


Sand

Wood

SECTION LINES SYMBOLS

- Materials – Common materials
- The symbol for cast iron can be used for most section views.
- Refer to any common drafting text for additional symbols



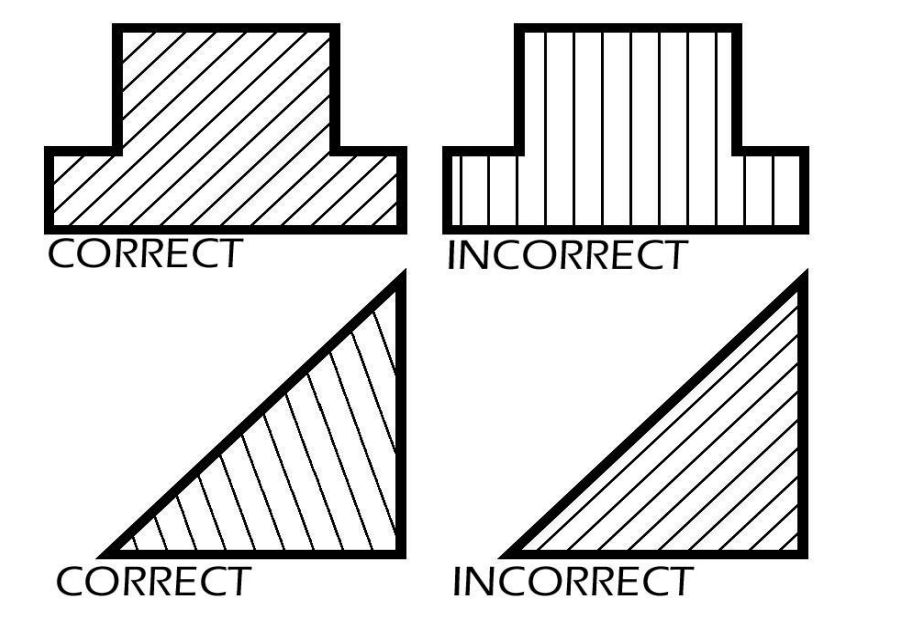
SECTION LINING

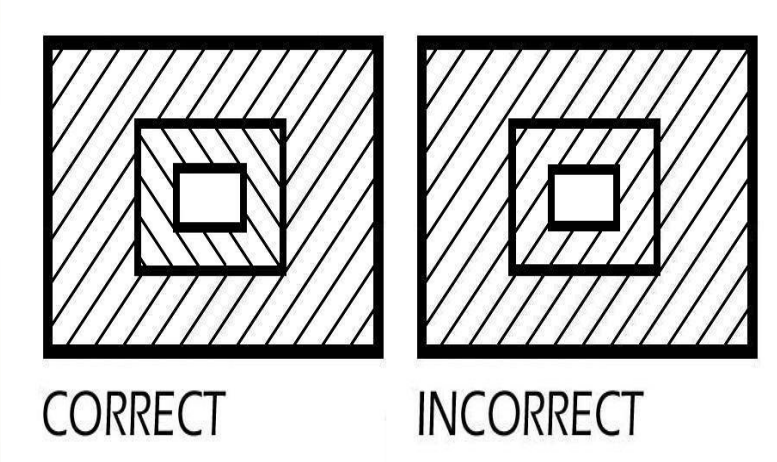
- 45 degree angle lines should be used.
- 2 to 5mm gap between lines.
- All lines should be uniformly spaced
- Thin sections may be blackened in completely

Section Lining – Line Placement

- Lines should never be parallel or perpendicular to the object lines.
- If the outline of the object has 45 degree lines, 30 or 60 degree lines should be used.
- Assemblies with several parts should be lined with varying angle section lines.

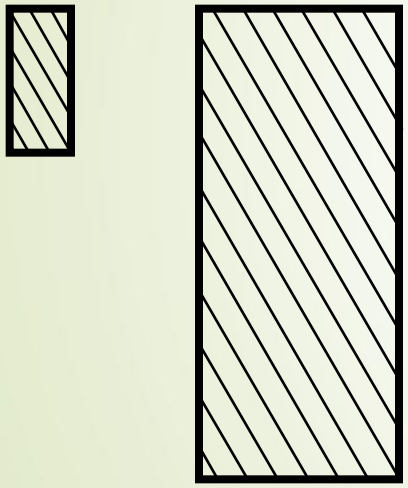
Section Lining – Line Placement

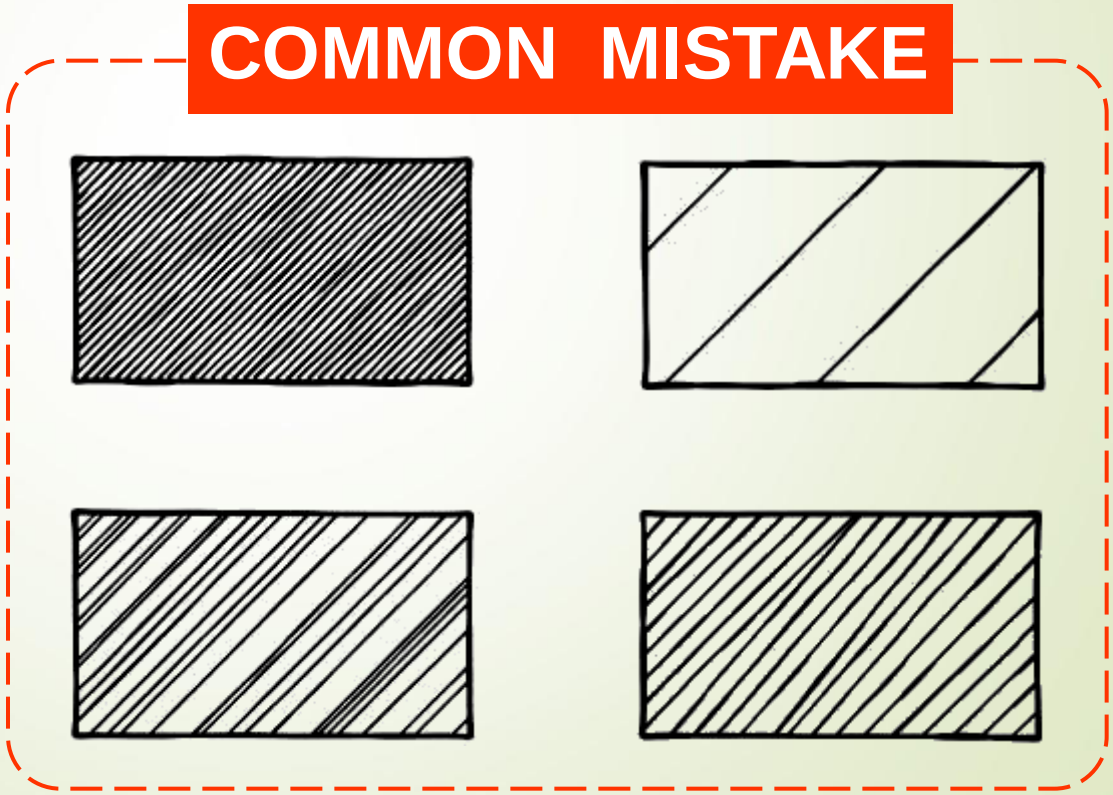




SECTION LINING PRACTICE

- The spaces between lines may vary from 2 mm for small sections to 5 mm for large sections.

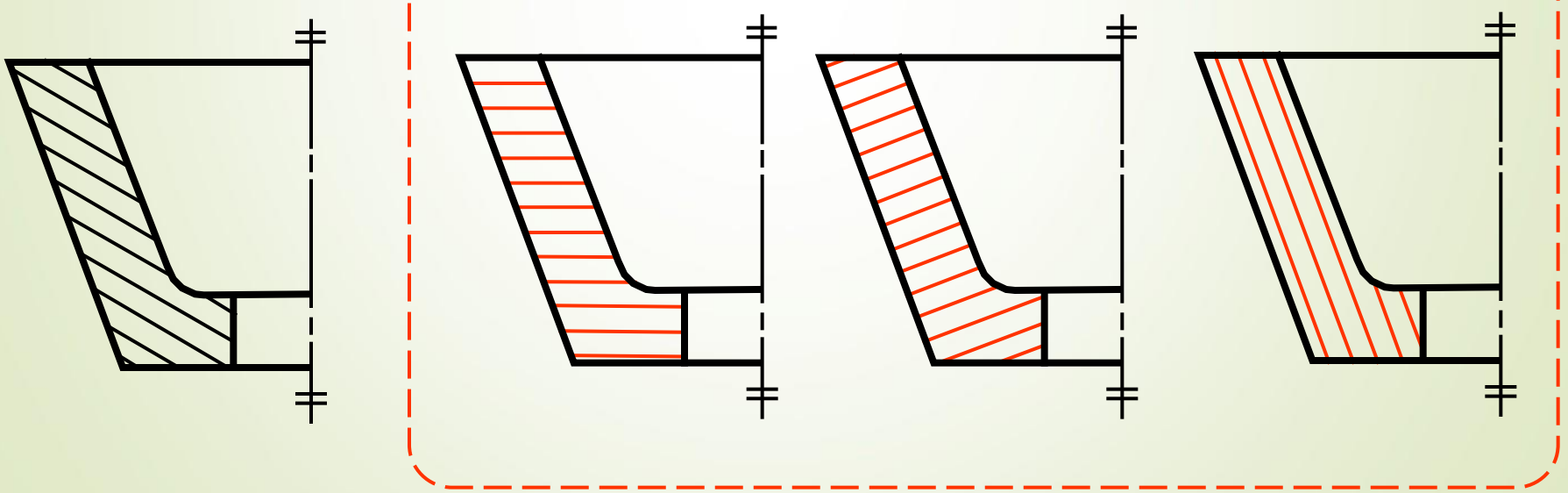




SECTION LINING PRACTICE

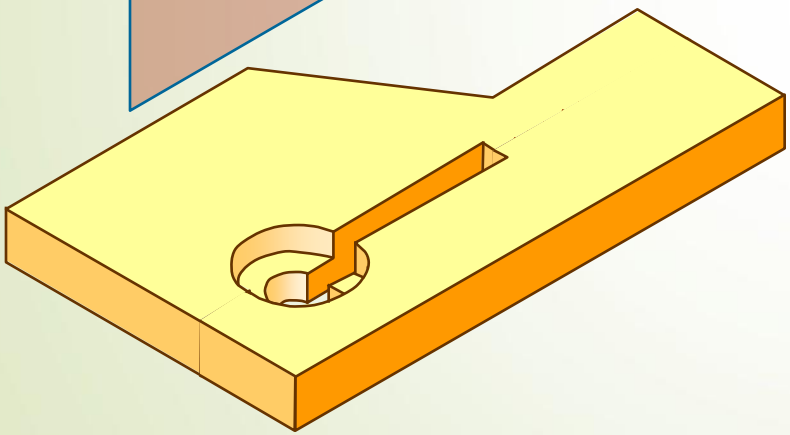
- It ***should not*** be drawn *parallel* or *perpendicular* to contour of the view.

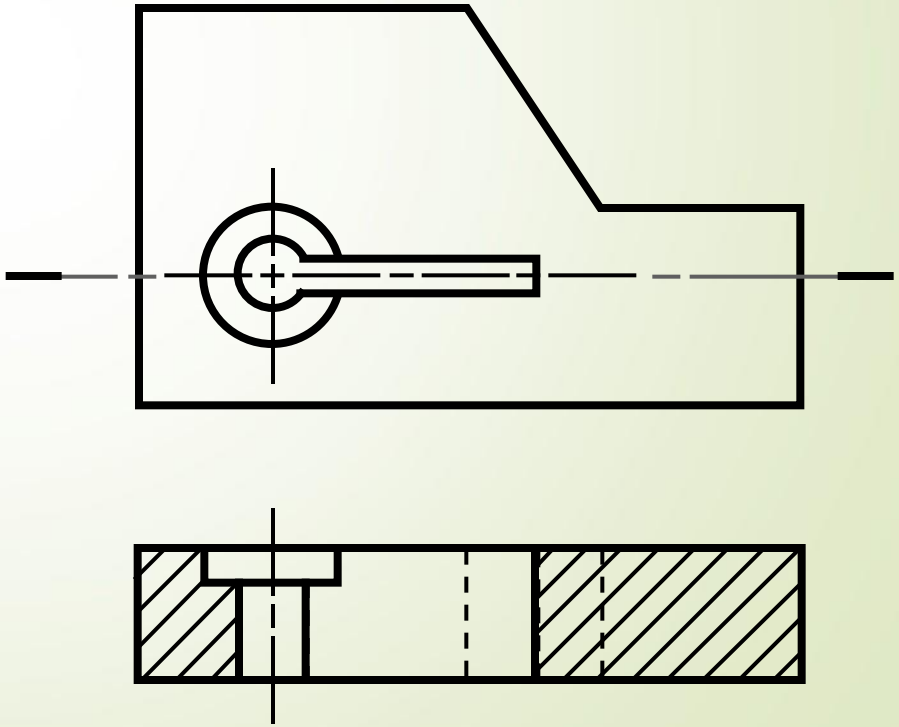
COMMON MISTAKE



TREATMENT OF HIDDEN LINES

- Hidden lines are ***normally omitted*** from section views.



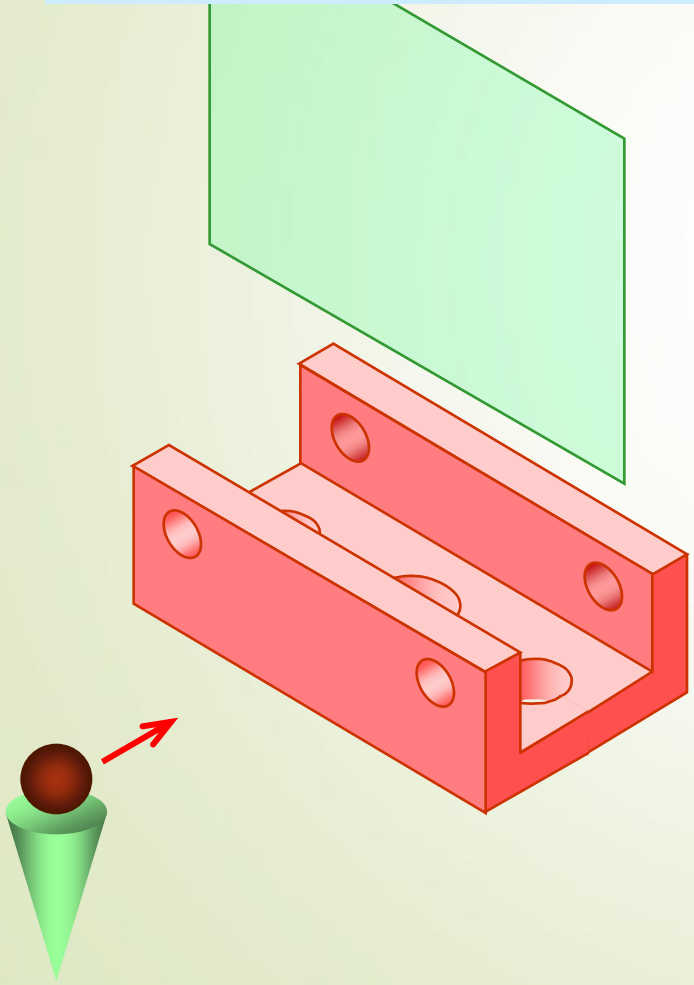


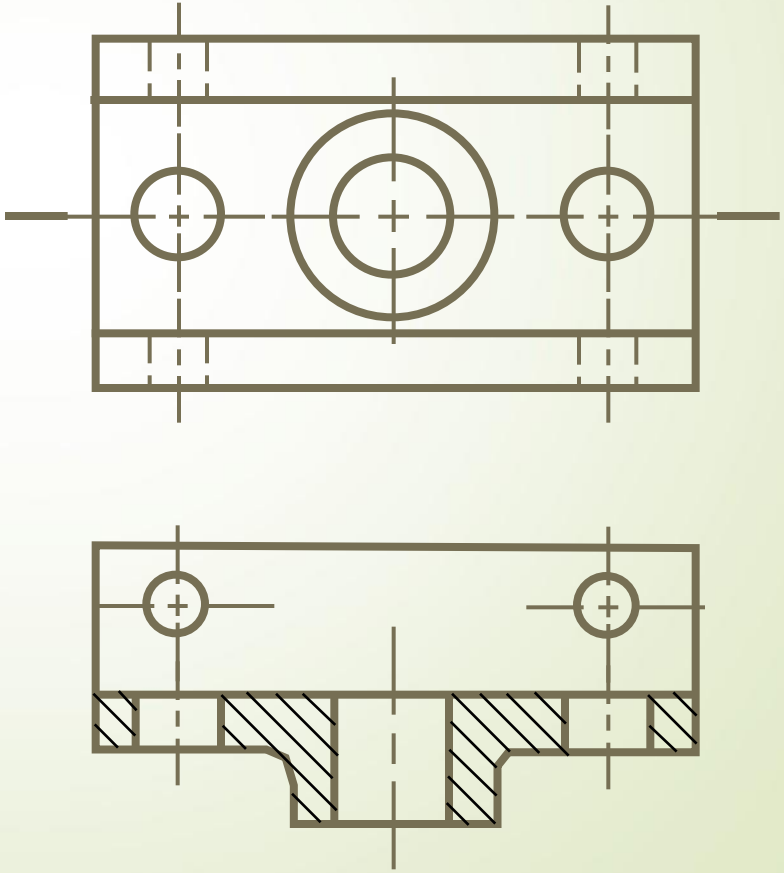
Types of Sectioning

1. Full section
2. Half section
3. Offset section

FULL SECTION VIEW

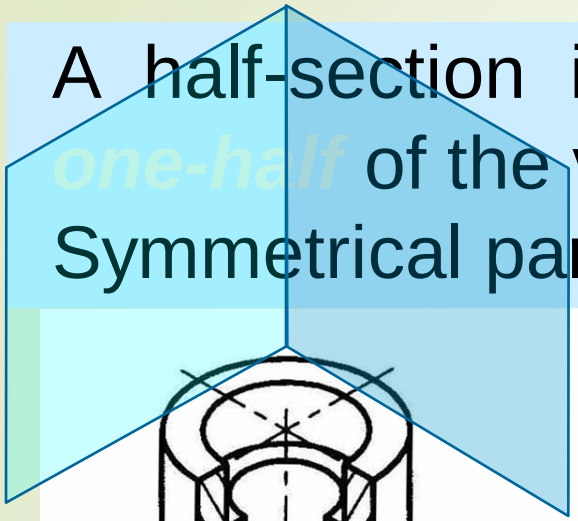
The view is made by passing the ***straight*** cutting plane ***completely through*** the part.

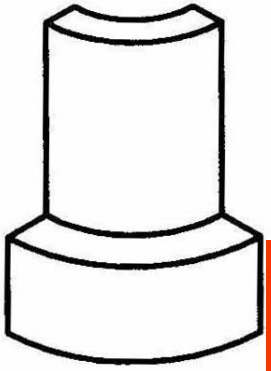


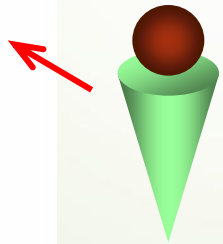


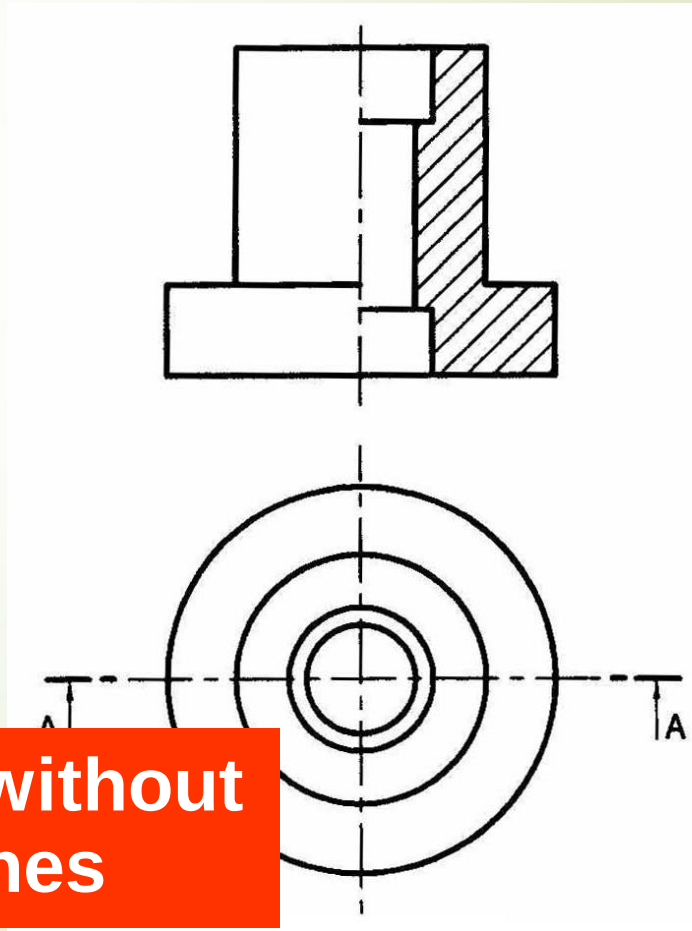
HALF SECTION VIEW

A half-section is a view of an object showing *one-half* of the view in section.
Symmetrical parts can be shown in half sections.





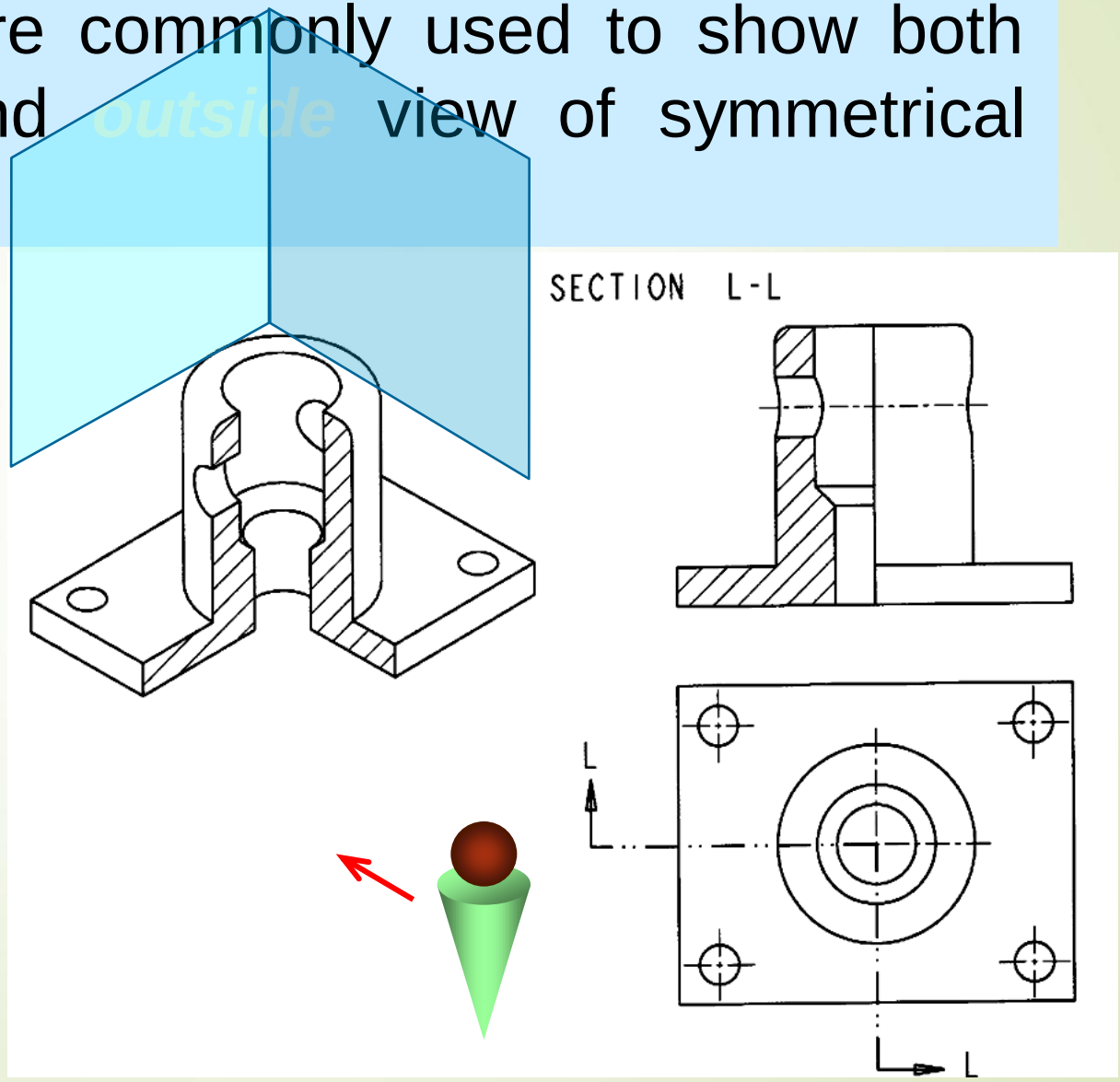




Half section without hidden lines

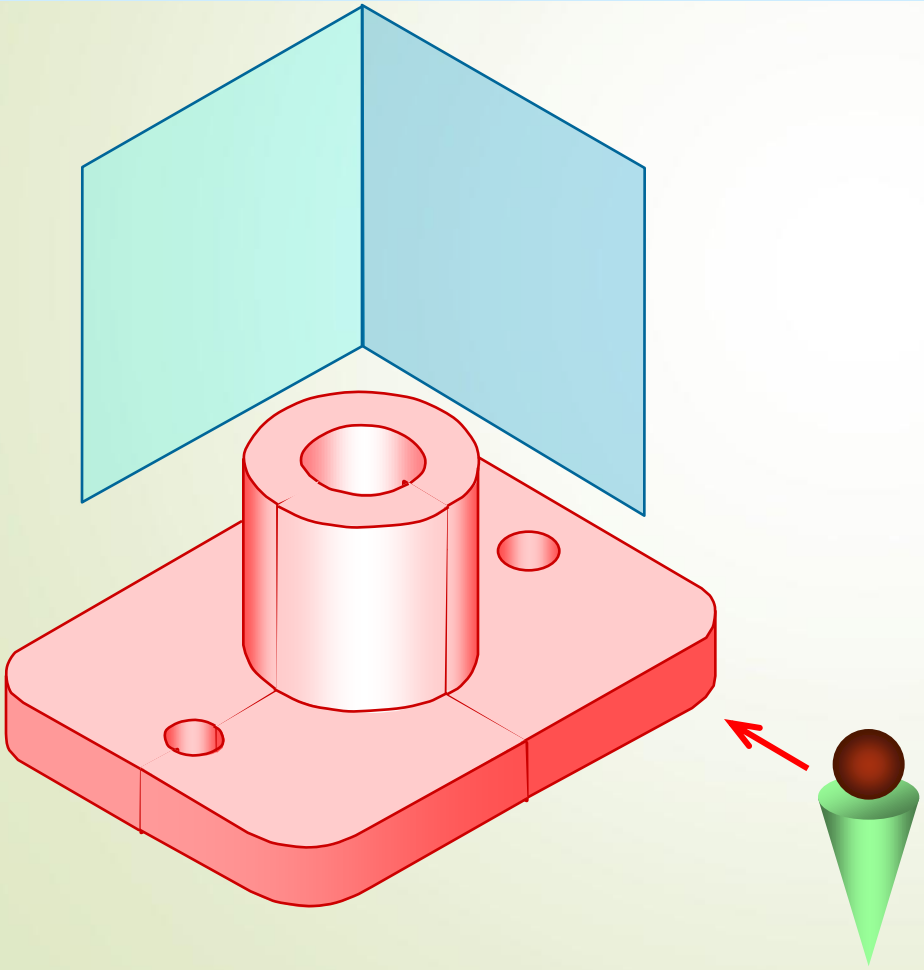
HALF SECTION VIEW

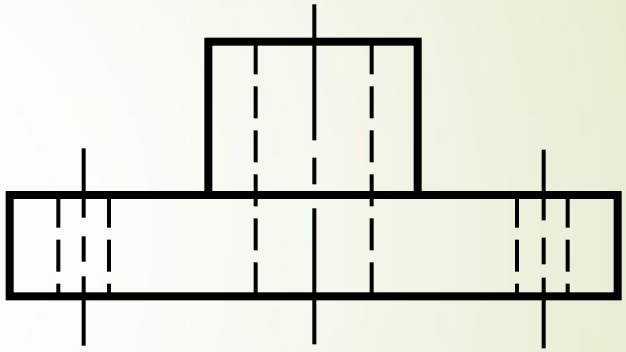
Half sections are commonly used to show both the ***internal*** and *outside* view of symmetrical objects.

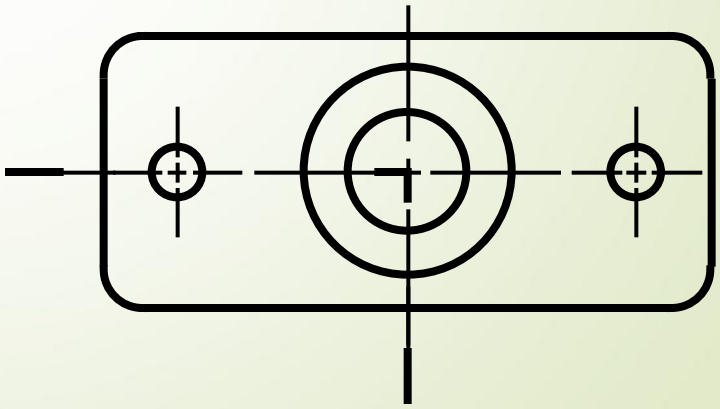


HALF SECTION VIEW

The view is made by passing the cutting plane ***halfway*** through an object and remove a ***quarter*** of it.

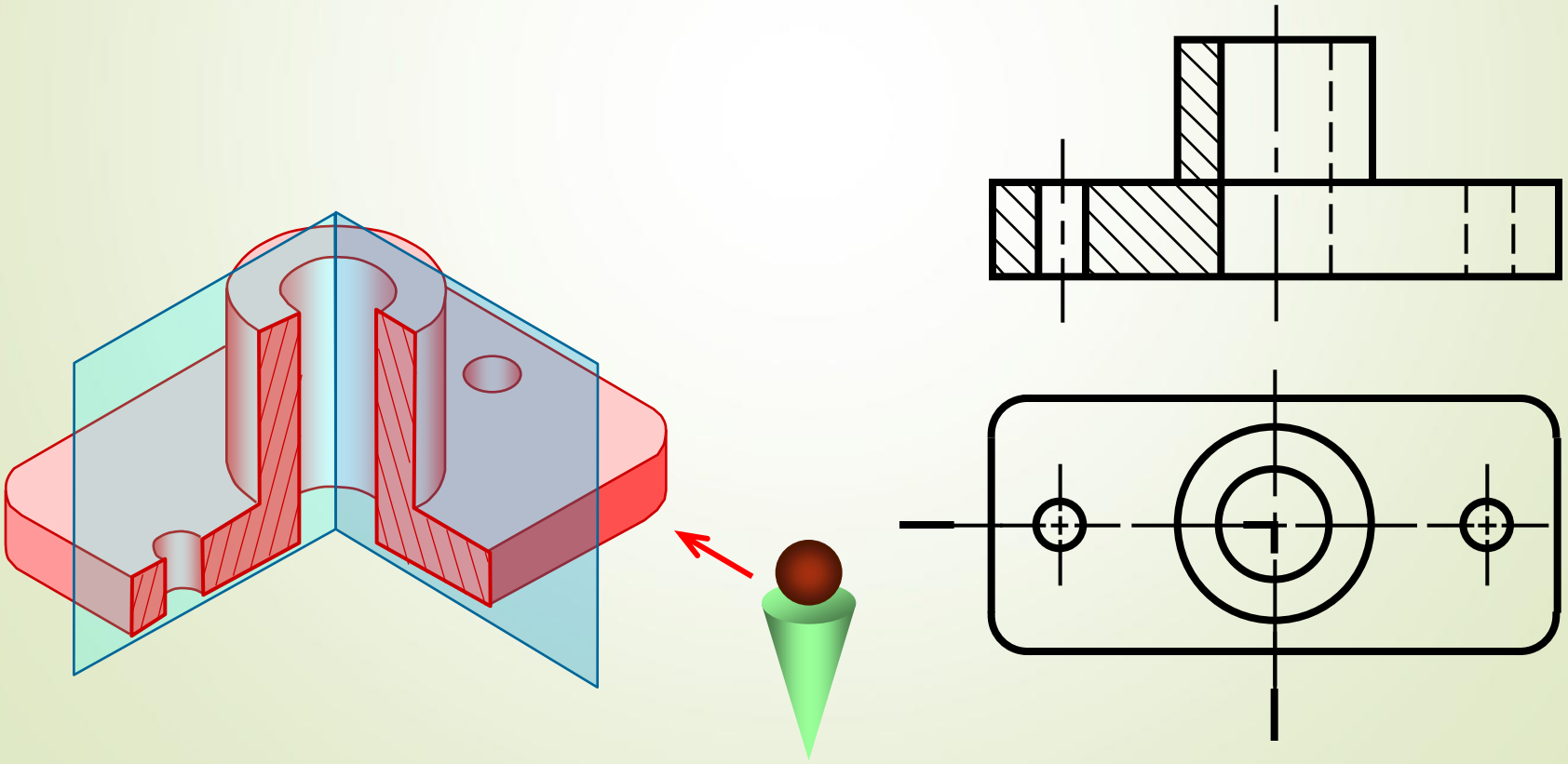






HALF SECTION VIEW

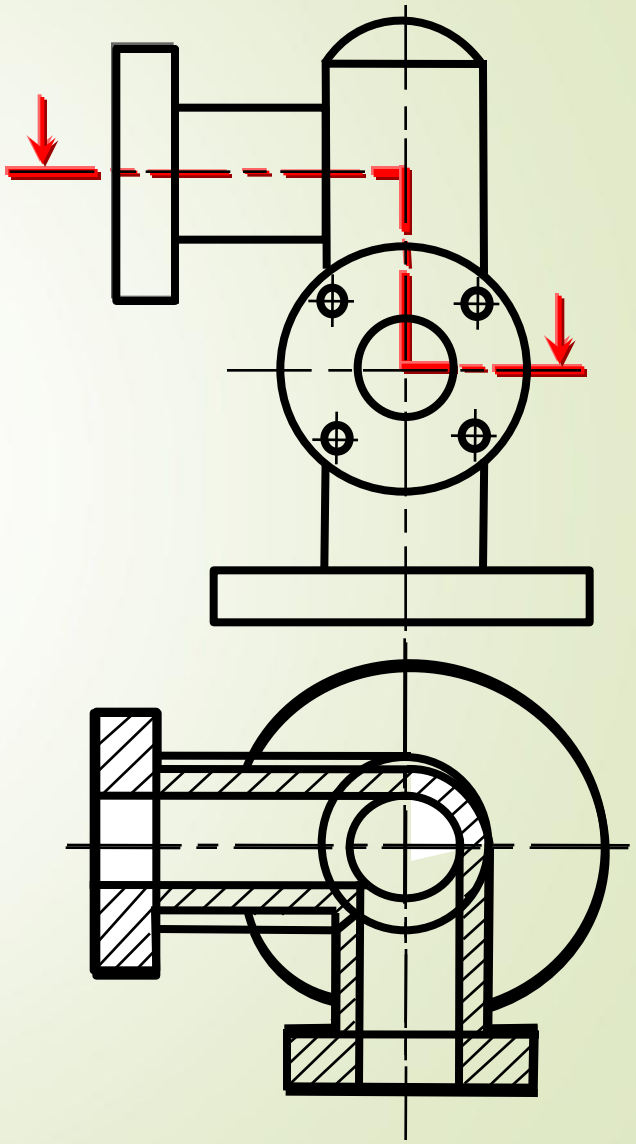
- A ***center line*** is used to separate the sectioned half from the unsectioned half of the view.
- ***Hidden line*** is omitted in unsection half of the view.



OFFSET SECTION VIEW

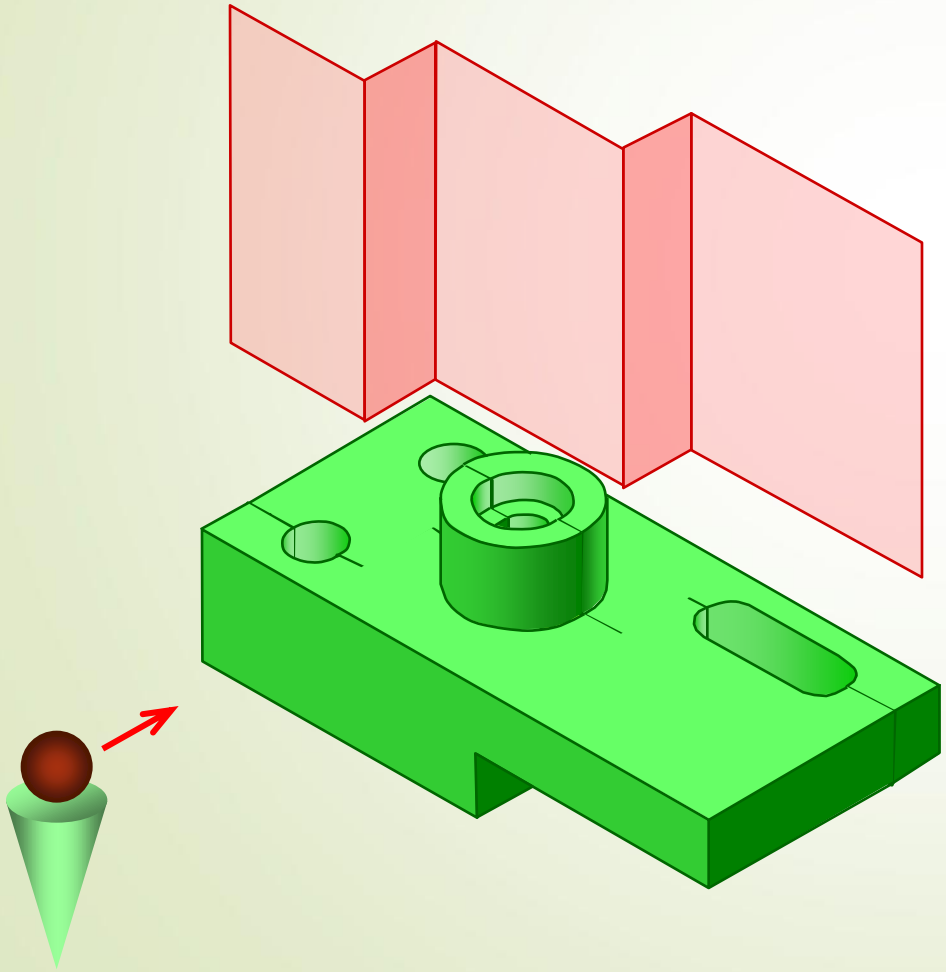
The cutting plane is ***off-set*** to include features that are not in a straight line.

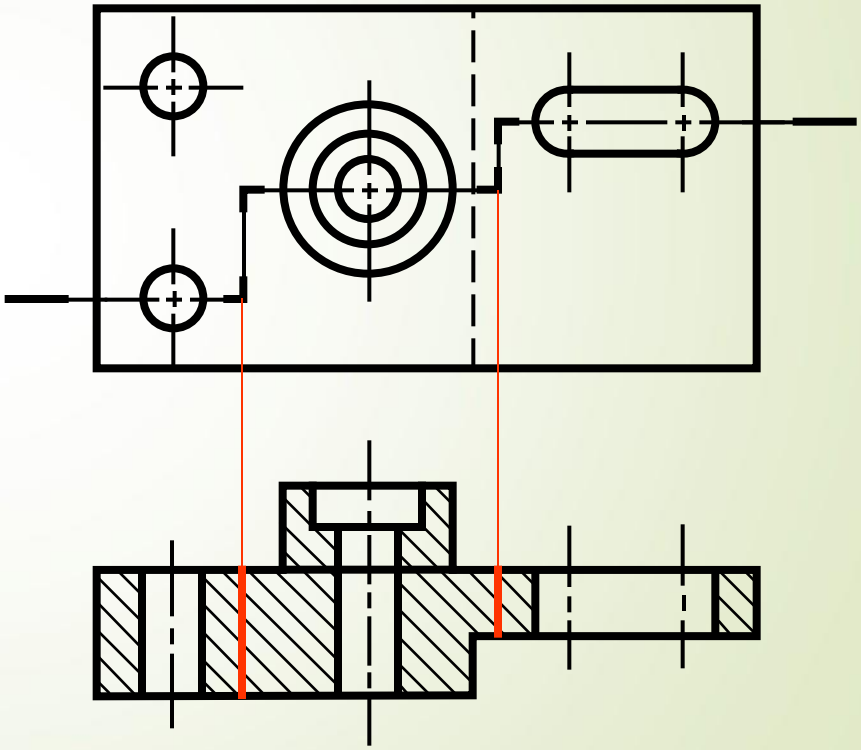
It is possible for the cutting plane to ***change directions***, to ***minimise on the number*** of sectional views required to capture the necessary details.



OFFSET SECTION VIEW

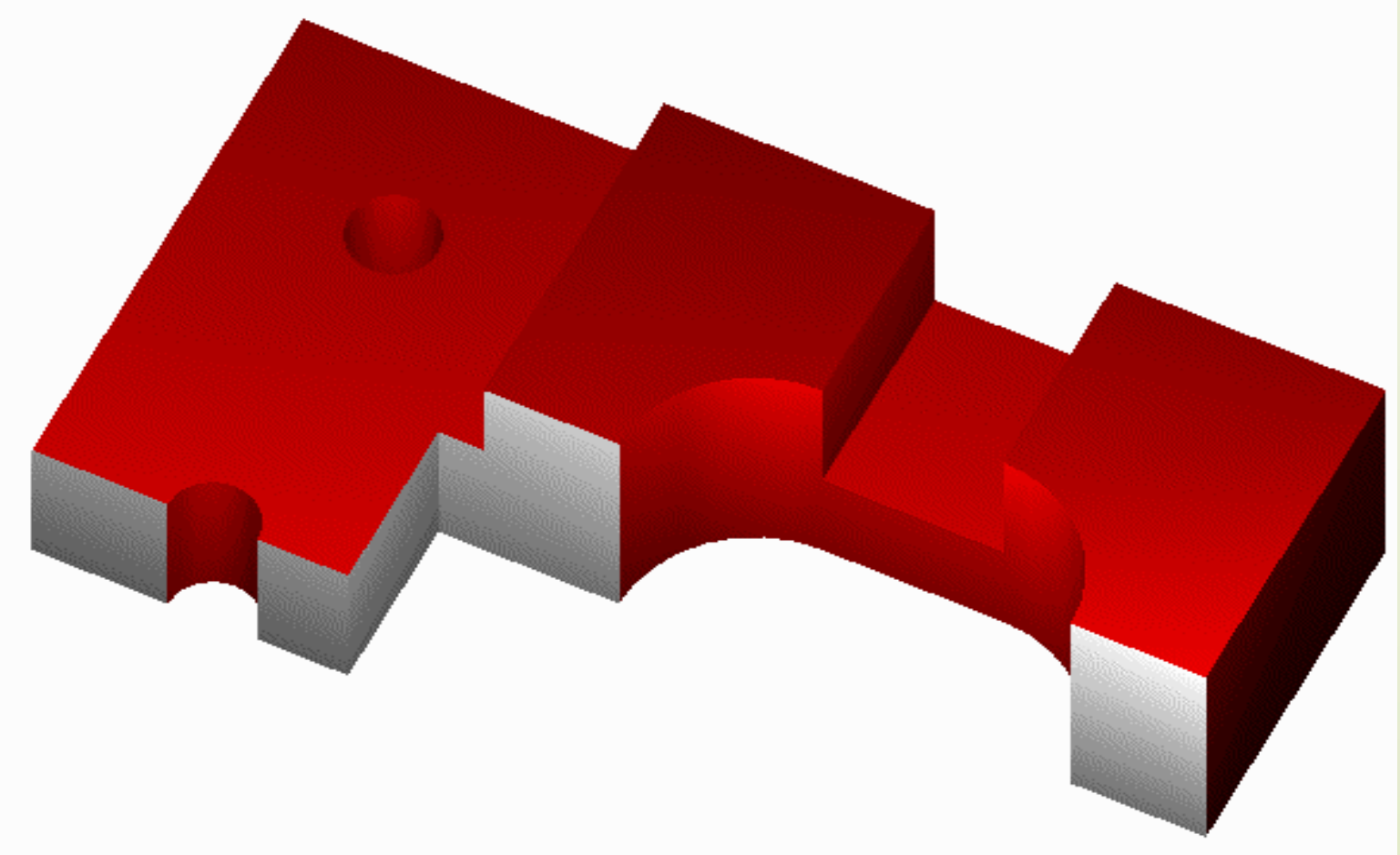
The view is made by passing the ***bended*** cutting plane ***completely through*** the part.



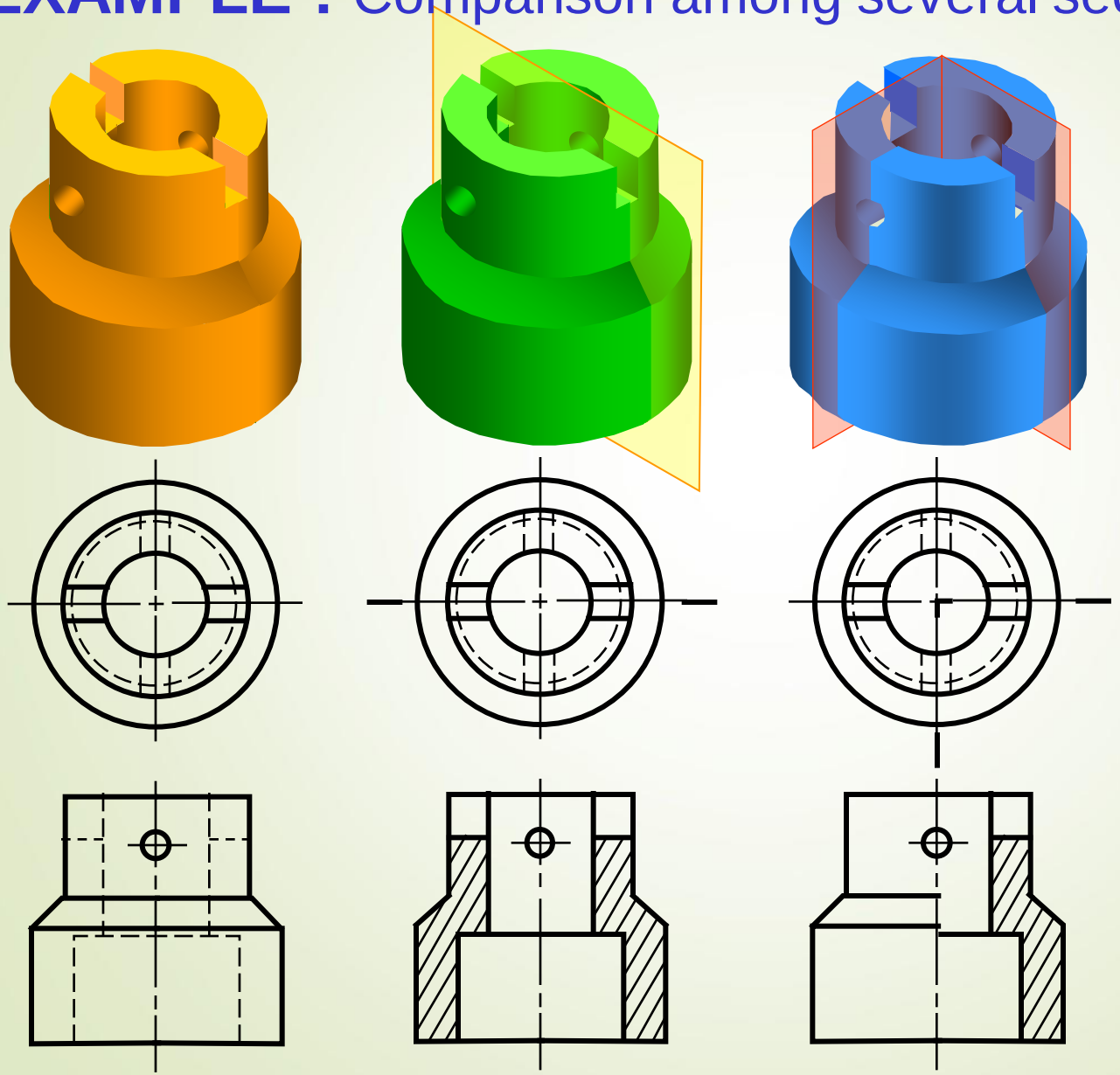


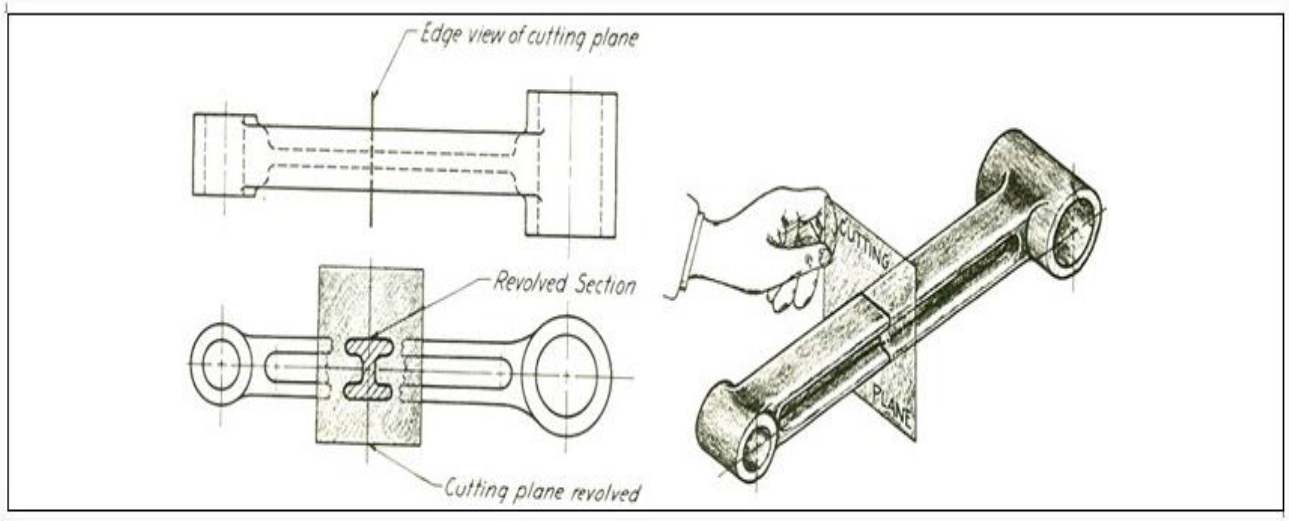
Do not show the edge views of the cutting plane.

OFFSET SECTION VIEW



EXAMPLE : Comparison among several section techniques

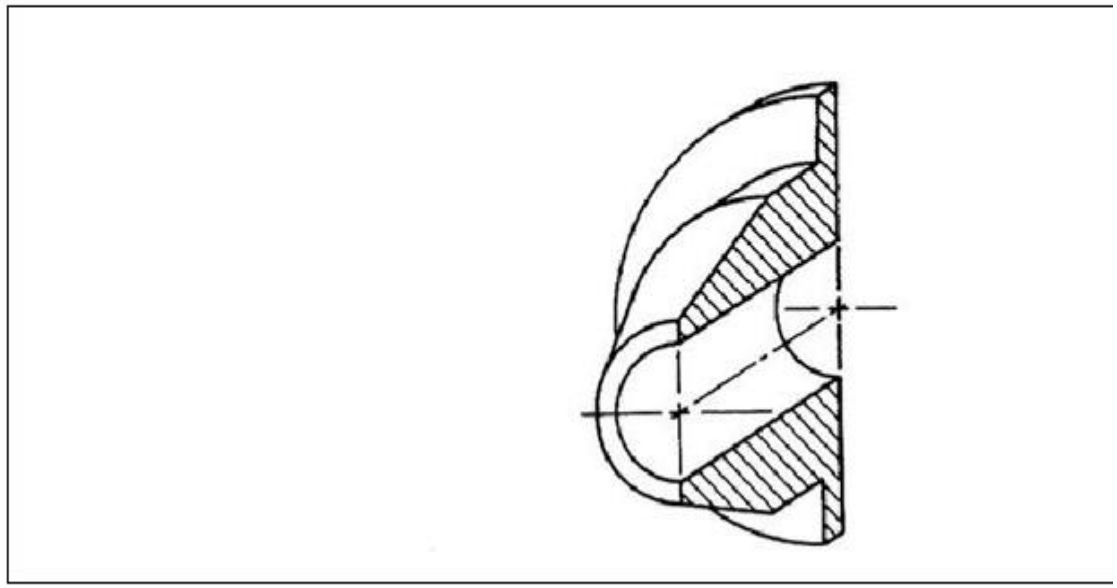


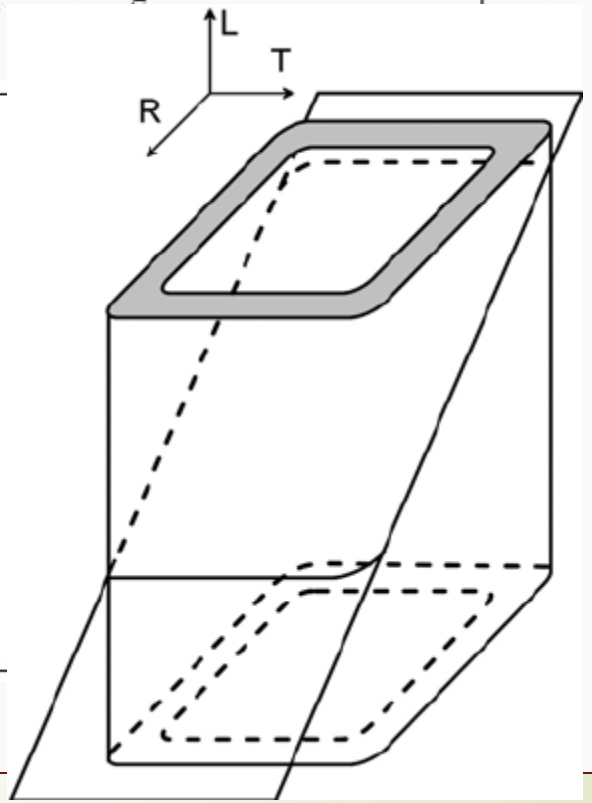


(Fig.4.2.Revolved section)

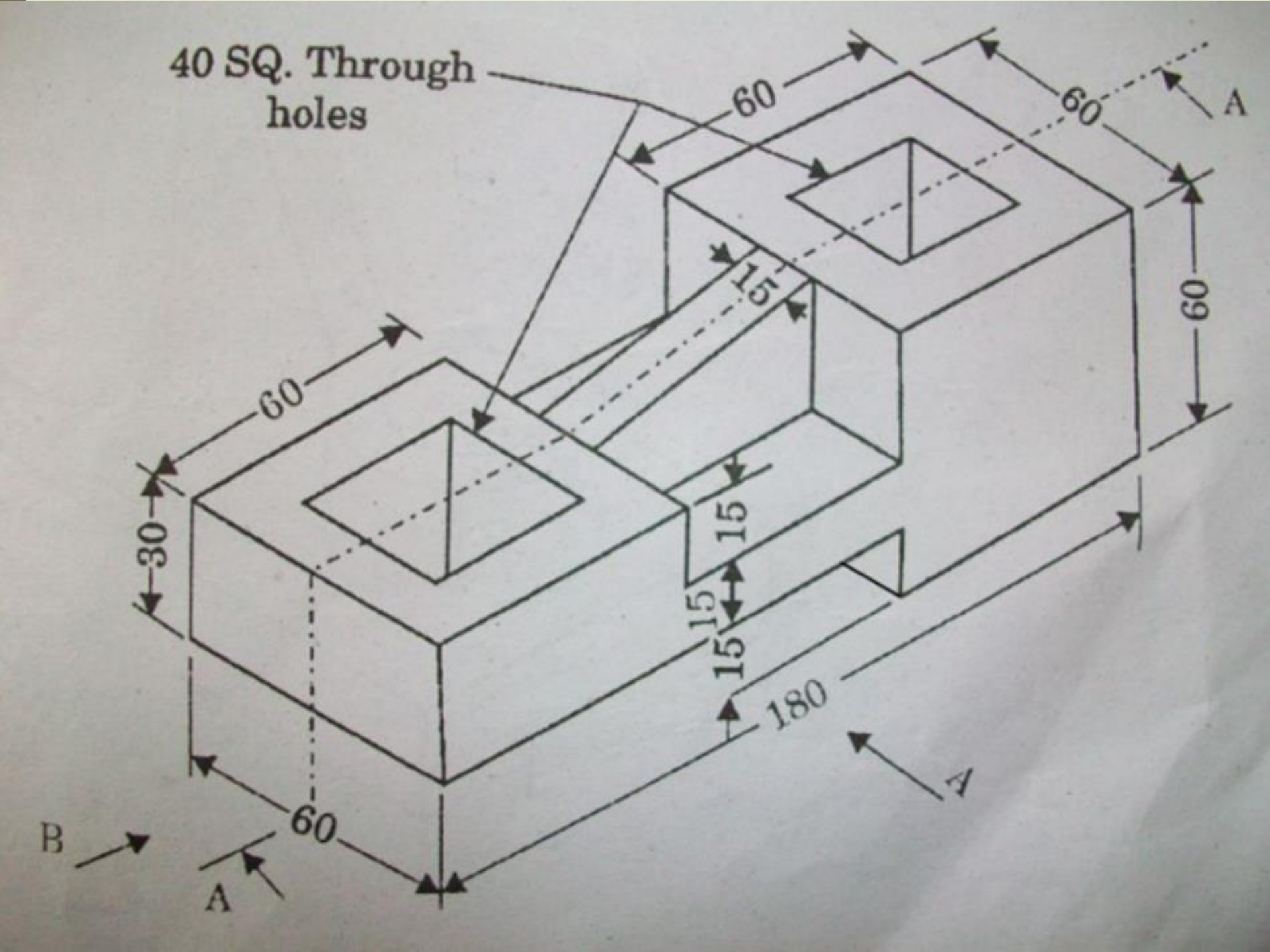
Oblique section

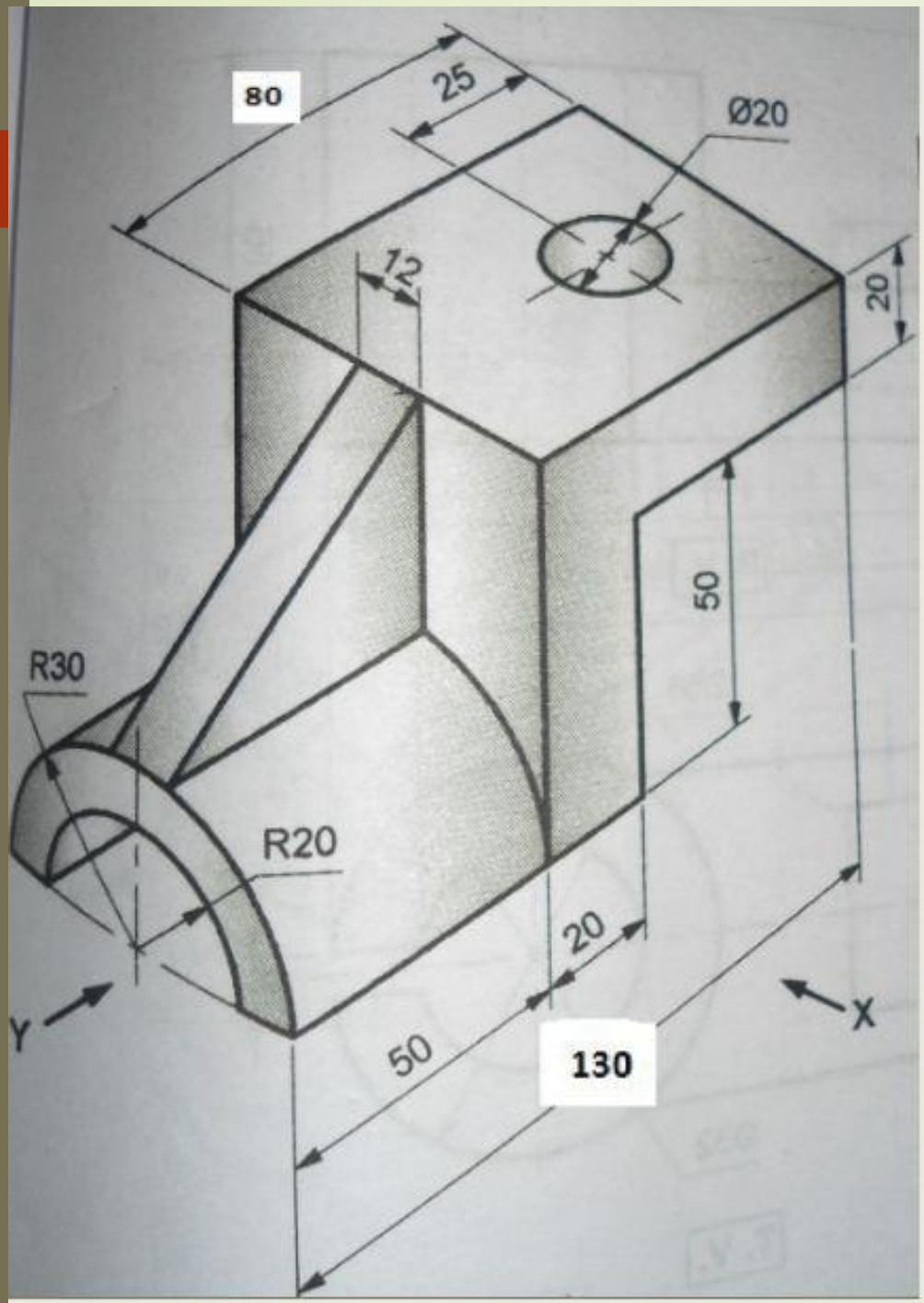
In a mechanical drawing, a section taken through an object at an angle (other than 90°) to its longest axis is known as Oblique section. in the Oblique projection is termed as oblique section as shown in the figure.



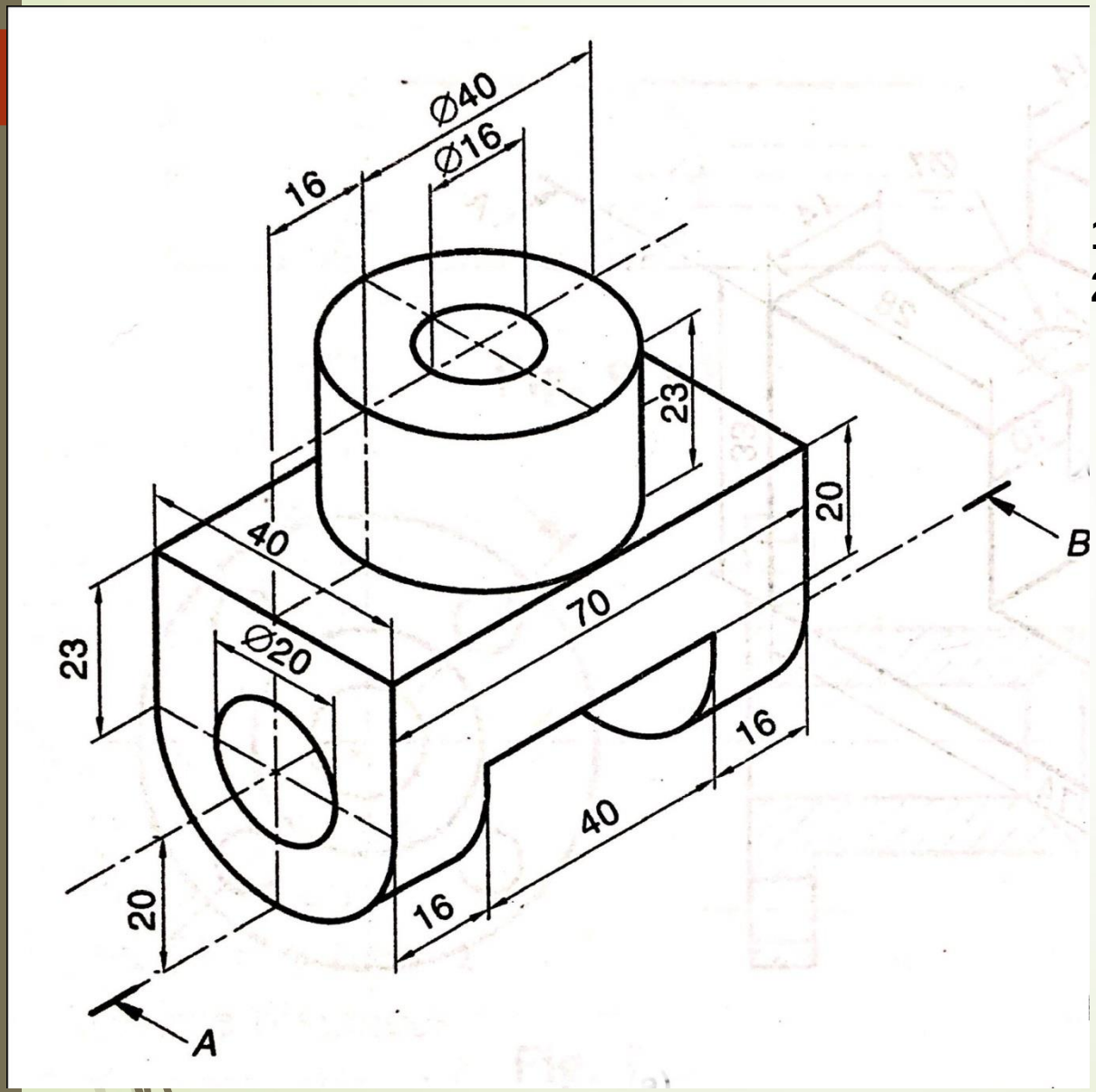


(Fig4.4. Oblique section)

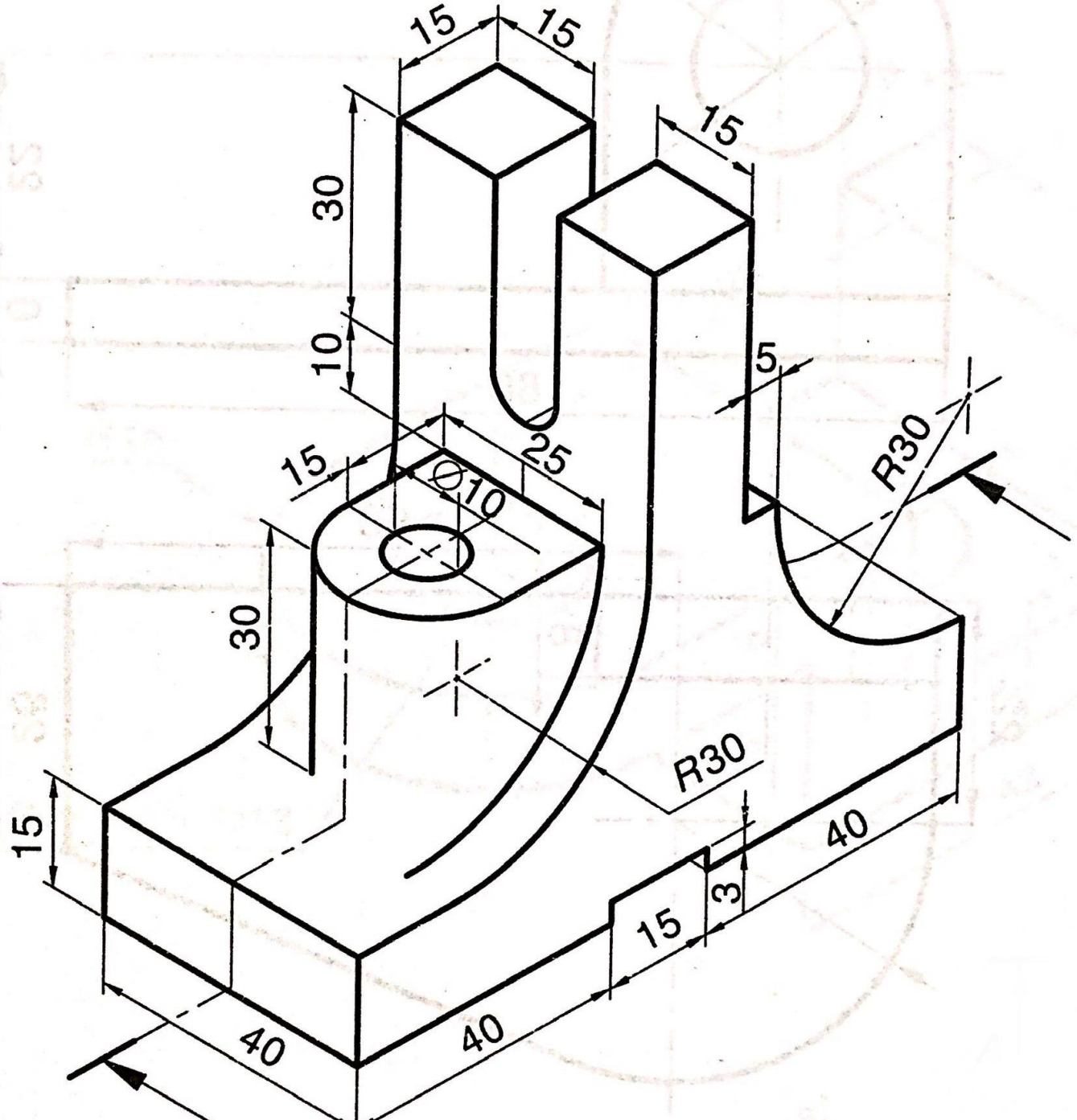

40 SQ. Through holes
60
60
A
60
15
15
60
30
15
15
15
180
A
B
60
A



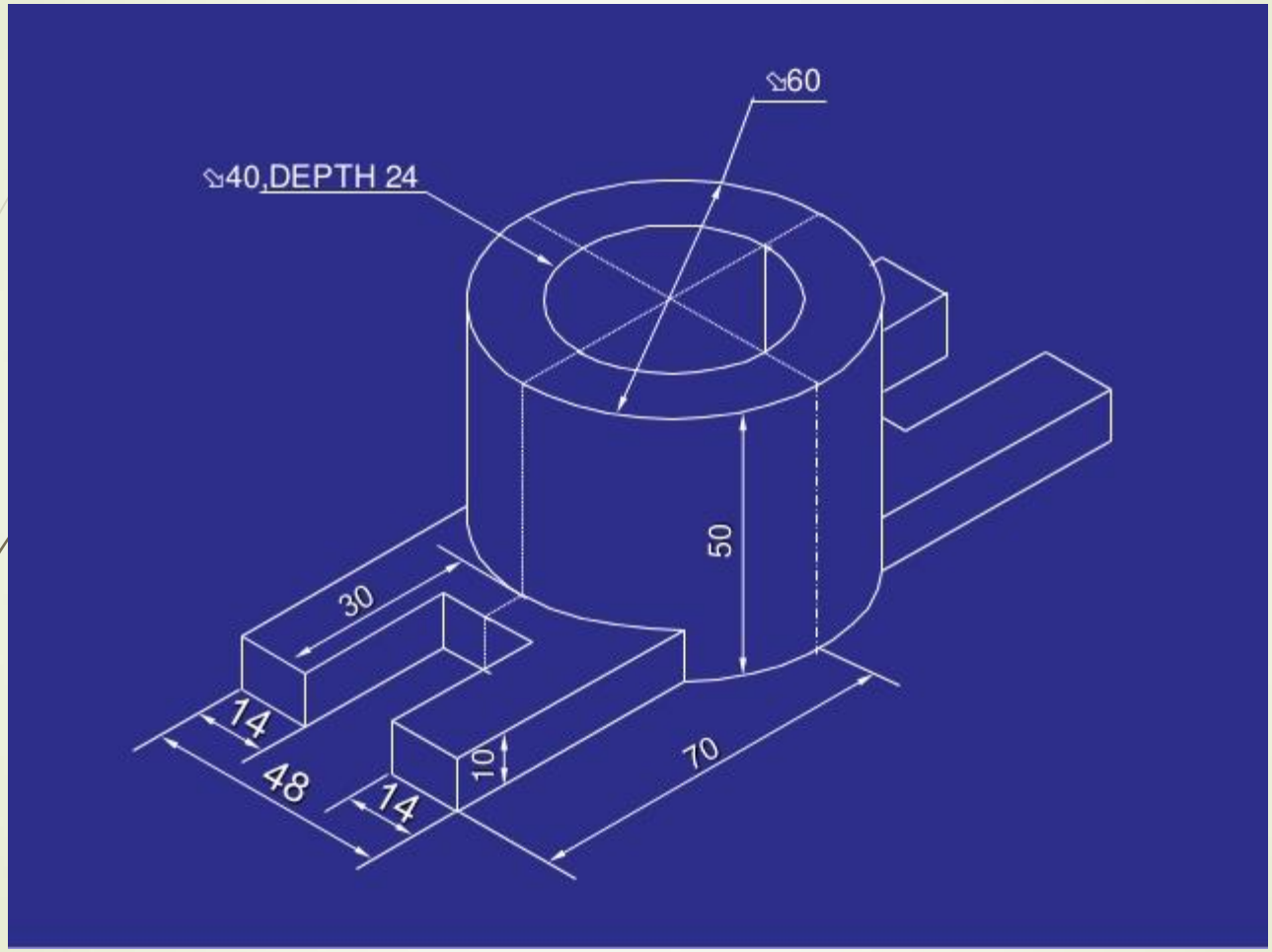
1. **Full Sectional Front View**
2. **Top View**

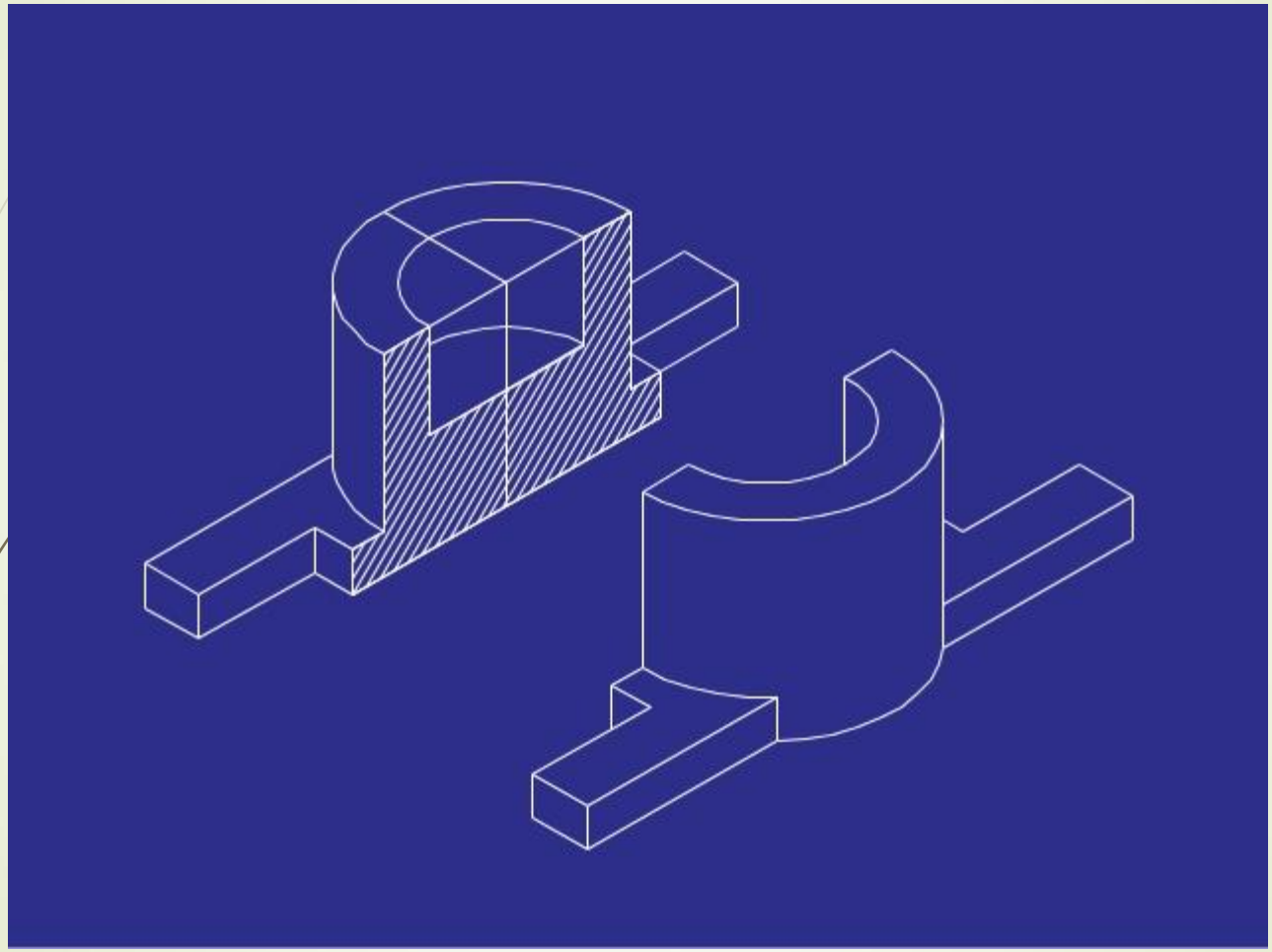


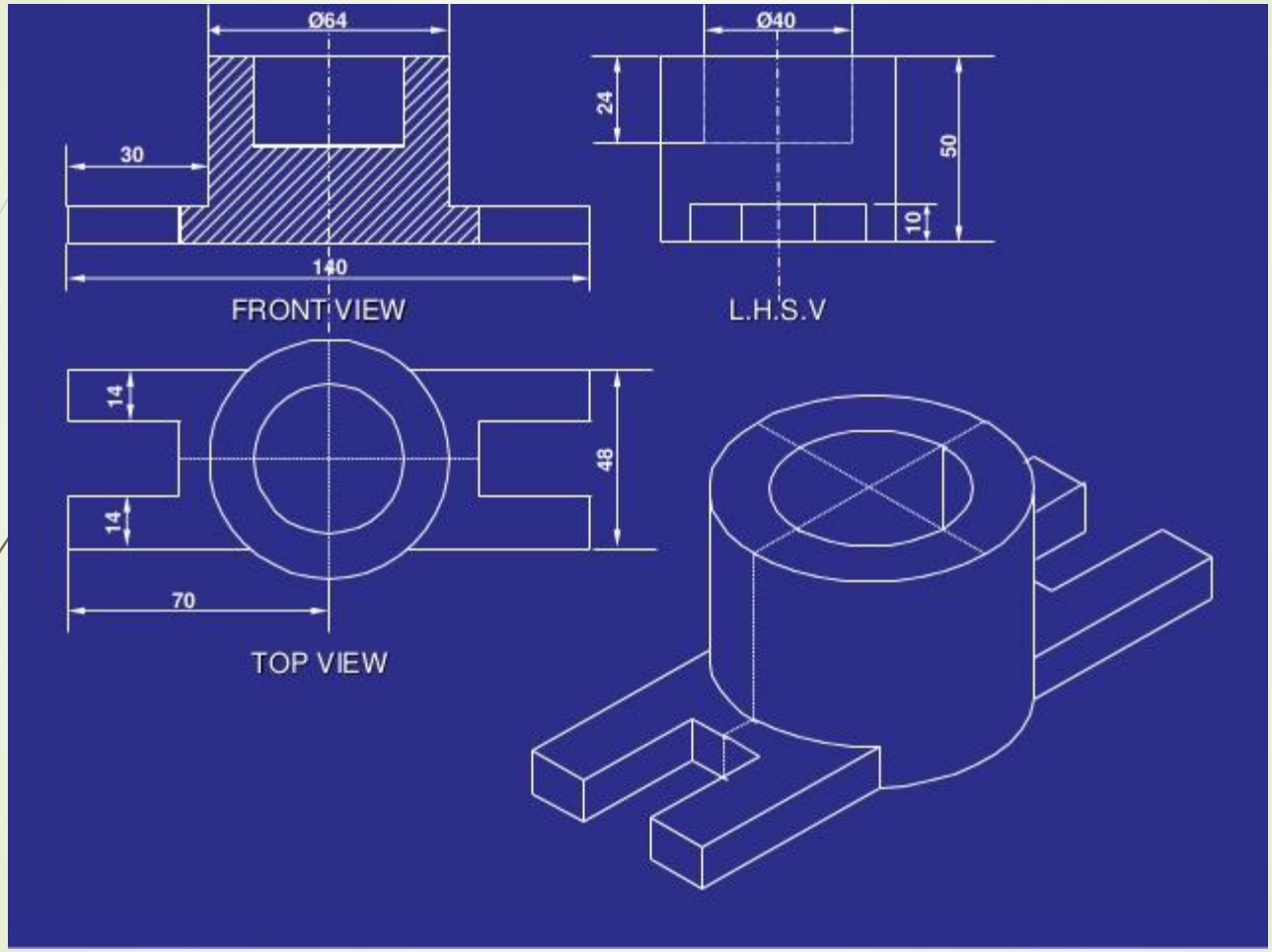
1. **Full Sectional Front View**
2. **Top View**



1. **Full Sectional Front View**
2. **Top View**


⌀60
⌀40,DEPTH 24
50
30
14
48
14
10
70




Ø64
30
140
FRONT VIEW
Ø40
24
50
10
L.H.S.V
14
14
48
70
TOP VIEW