ADDIS ABABA SCIENCE AND TECHNOLOGY UNIVERSITY

Collage of Electrical and Mechanical Engineering

Department of Mechanical Engineering

COURSE :ENGINEERING DRAWING [Meng1011]

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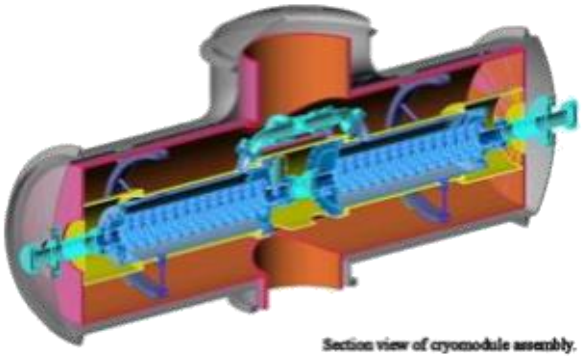
Office : BLDG :64

Room No.: 306

CHAPTER 6

SECTION VIEWS





Section view of cryomodule assembly.



TOPICS

- Introduction
- Terminology & common practices
- Kind of sections
- Dimensioning

Introduction

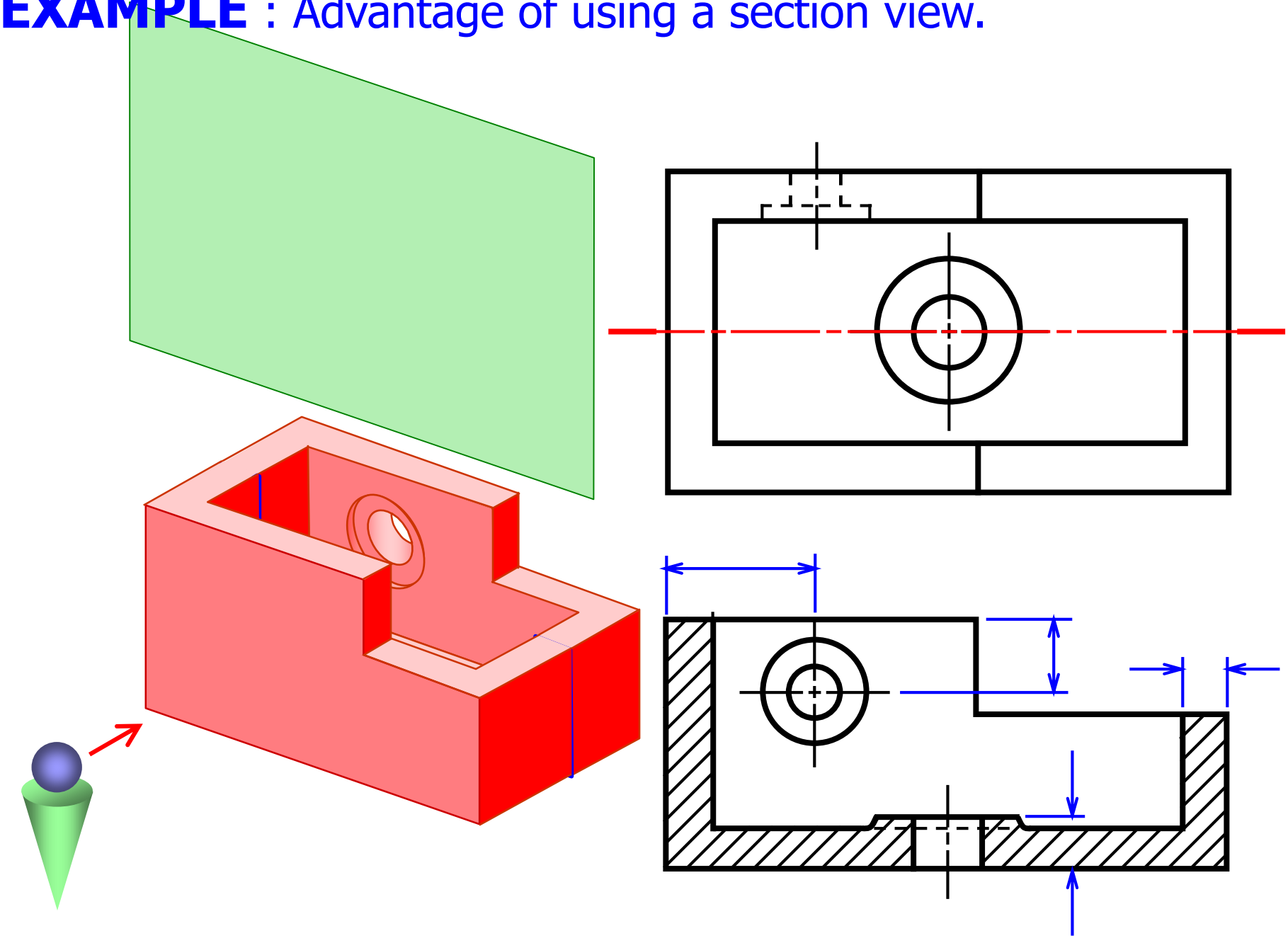


PURPOSES OF SECTION VIEWS

- Clarify the views by
  - reducing or eliminating the hidden lines.
  - revealing the cross sectional's shape.
- Facilitate the dimensioning.

Let See the example

EXAMPLE : Advantage of using a section view.

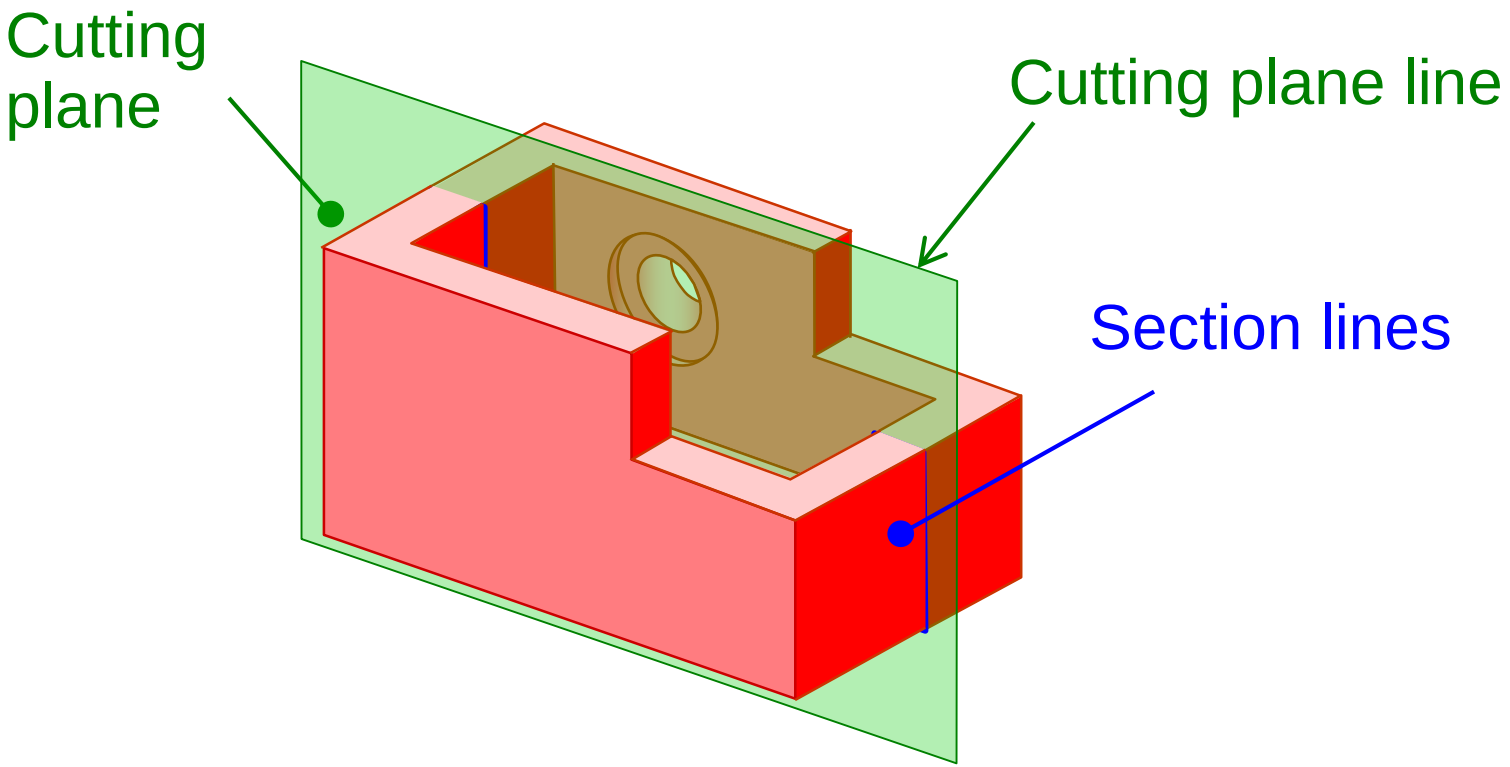


Terminology and common practices



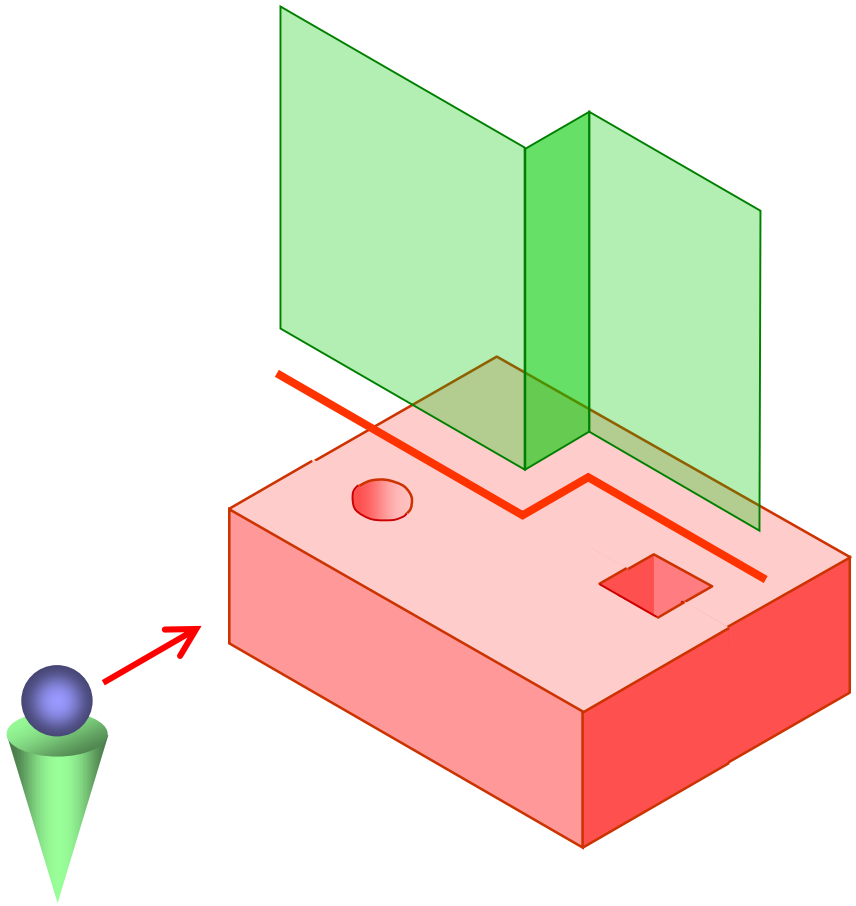
CUTTING PLANE

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

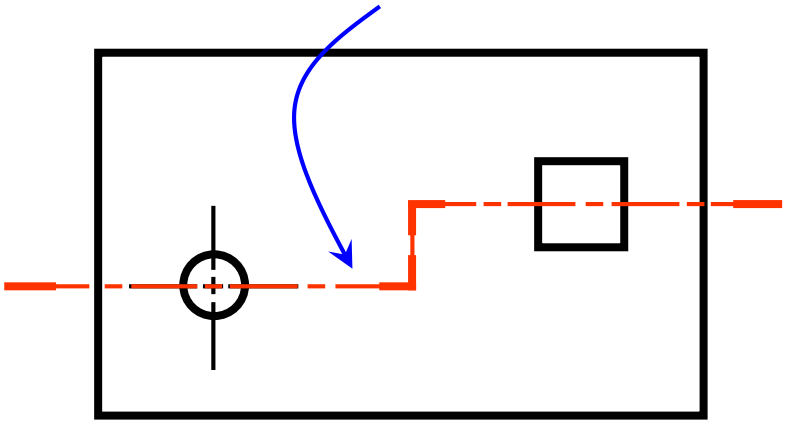


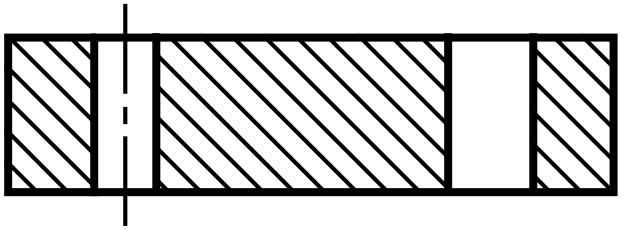
CUTTING PLANE LINE

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

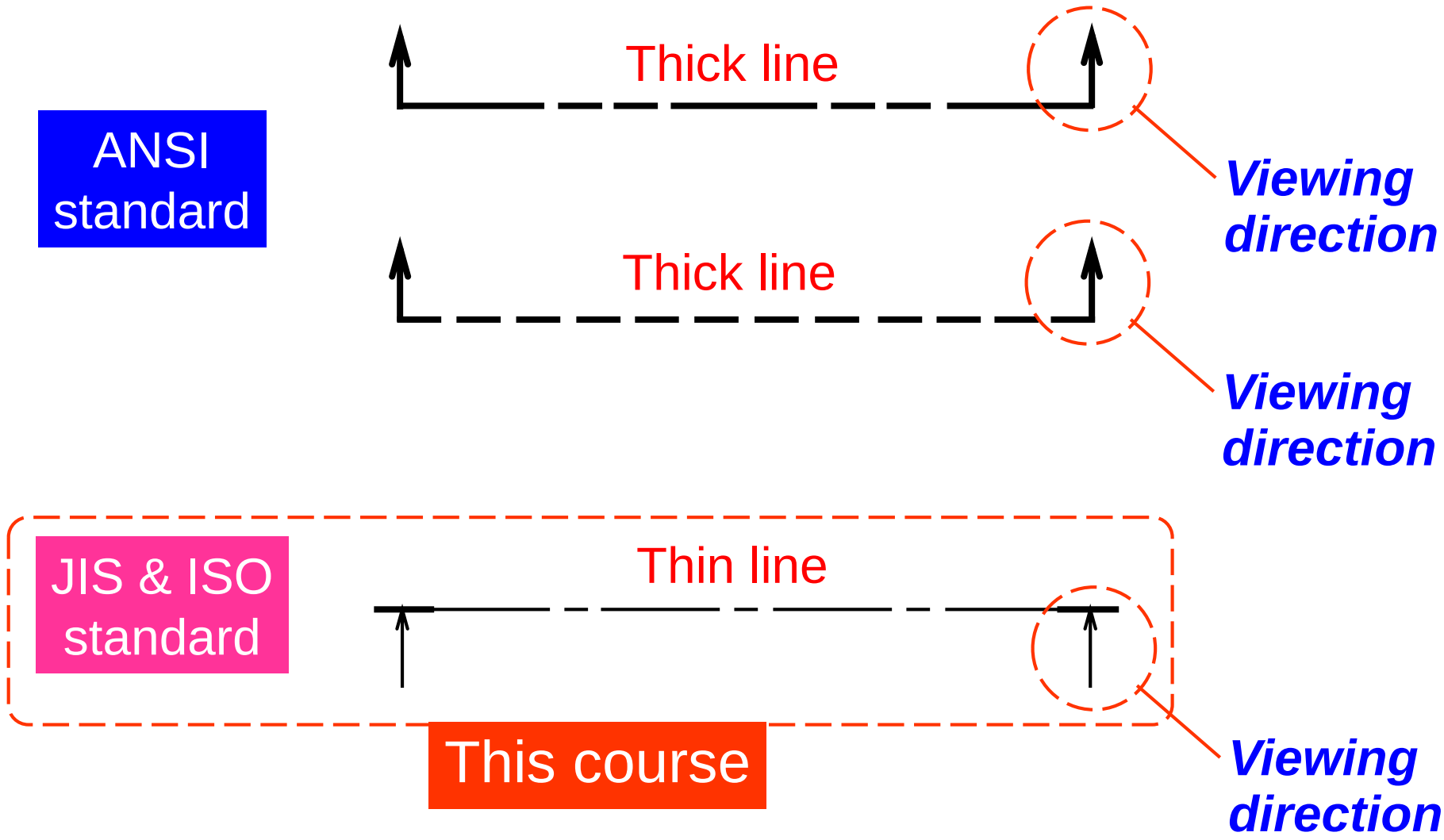


Indicate the ***path*** of cutting plane.



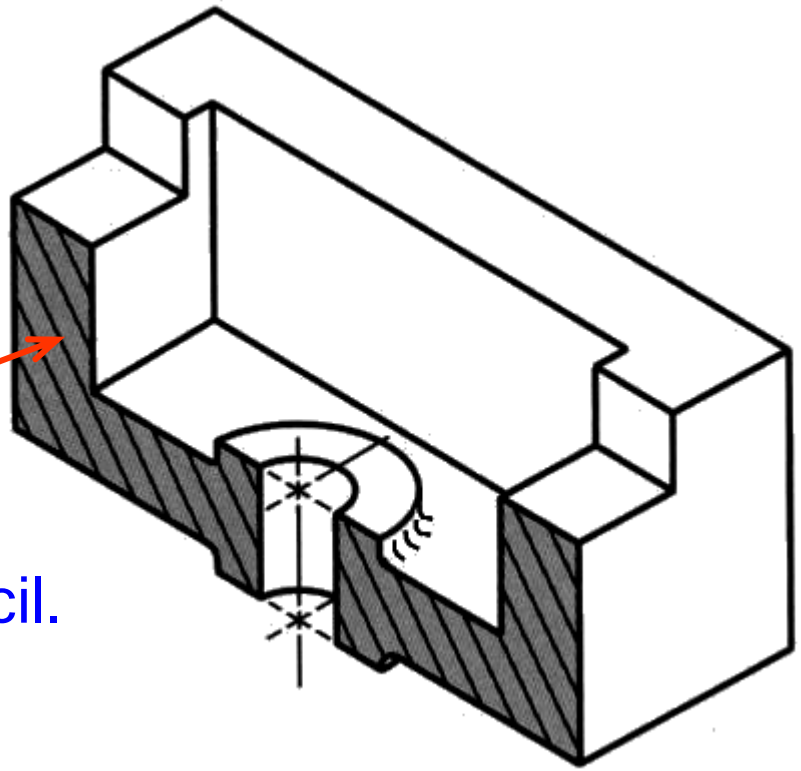


CUTTING PLANE LINESTYLES



SECTION LINING

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

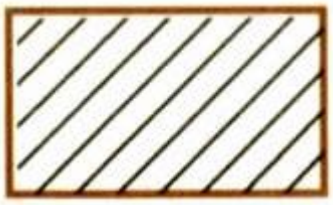


Section lines

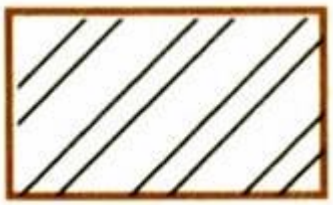
Drawn with **4H** pencil.

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.



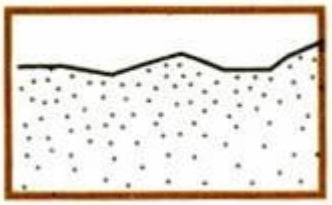
Cast iron,
Malleable iron



Steel



Concrete



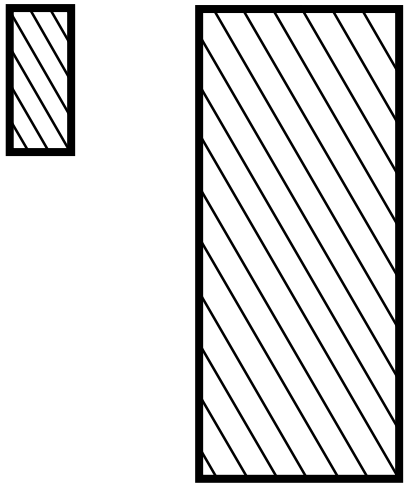
Sand

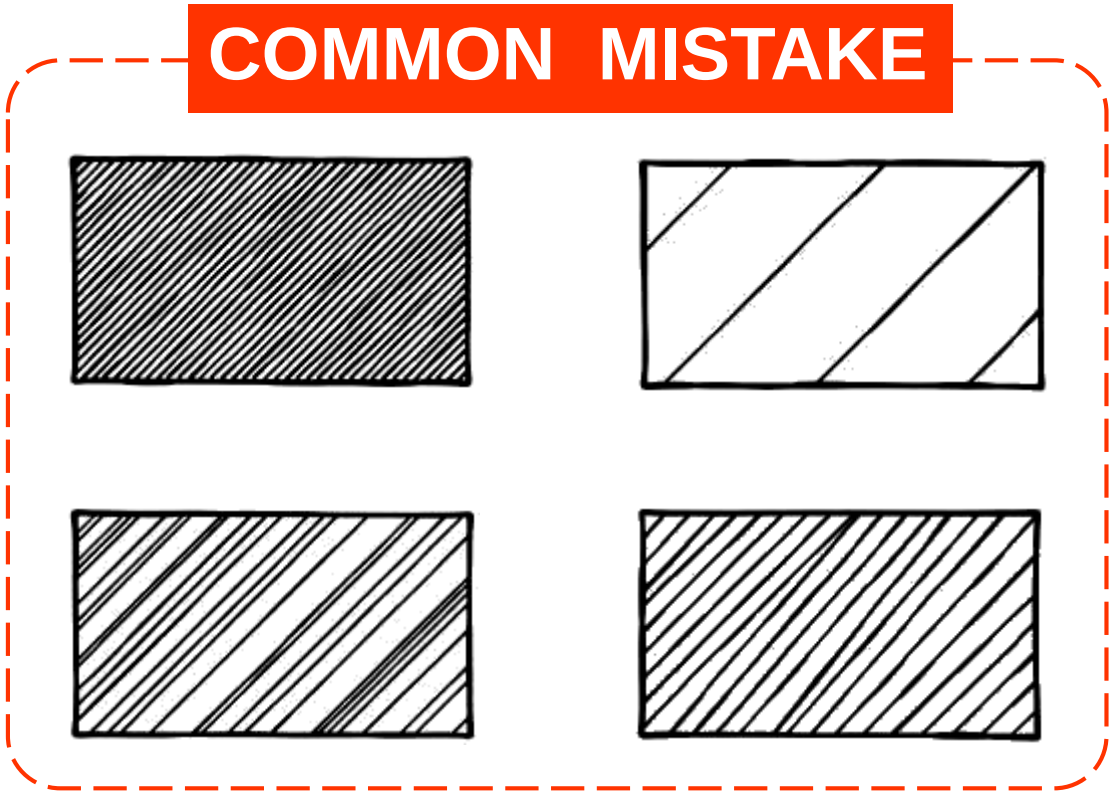


Wood

SECTION LINING PRACTICE

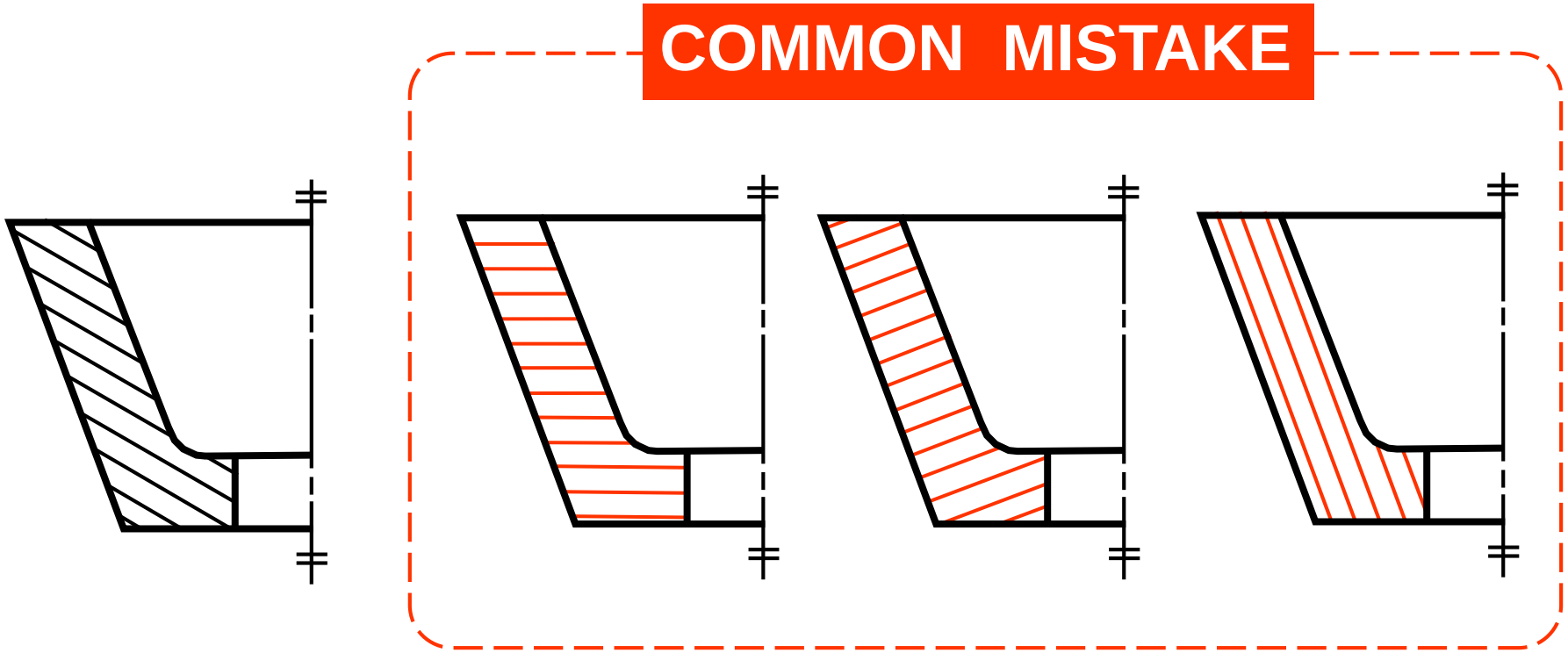
- The spaces between lines may vary from 1.5 mm for small sections to 3 mm for large sections.





SECTION LINING PRACTICE

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



Kinds of Sections

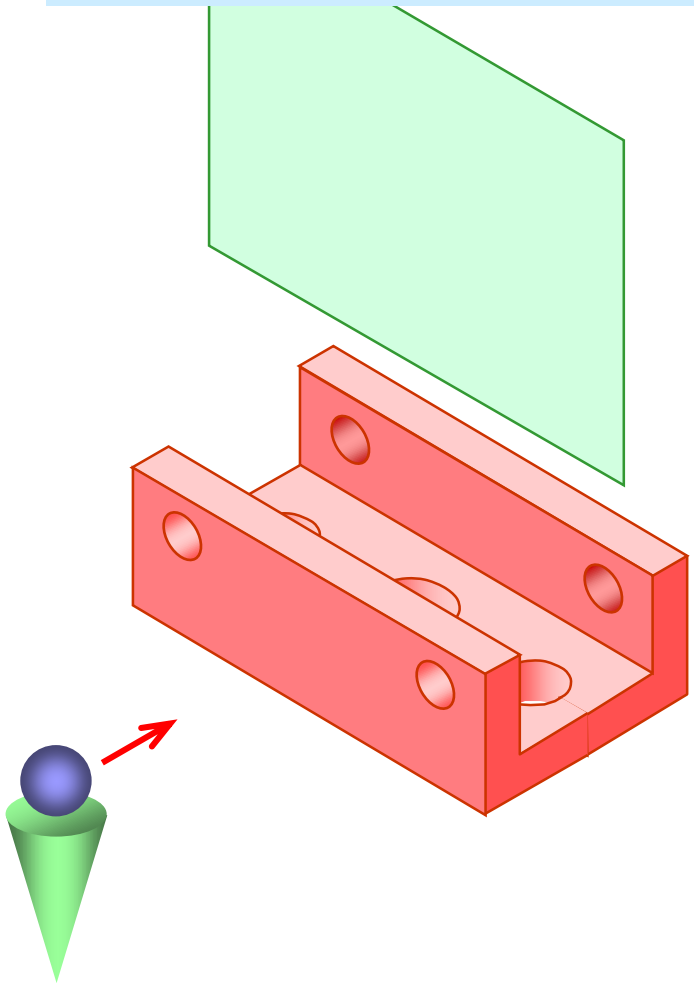


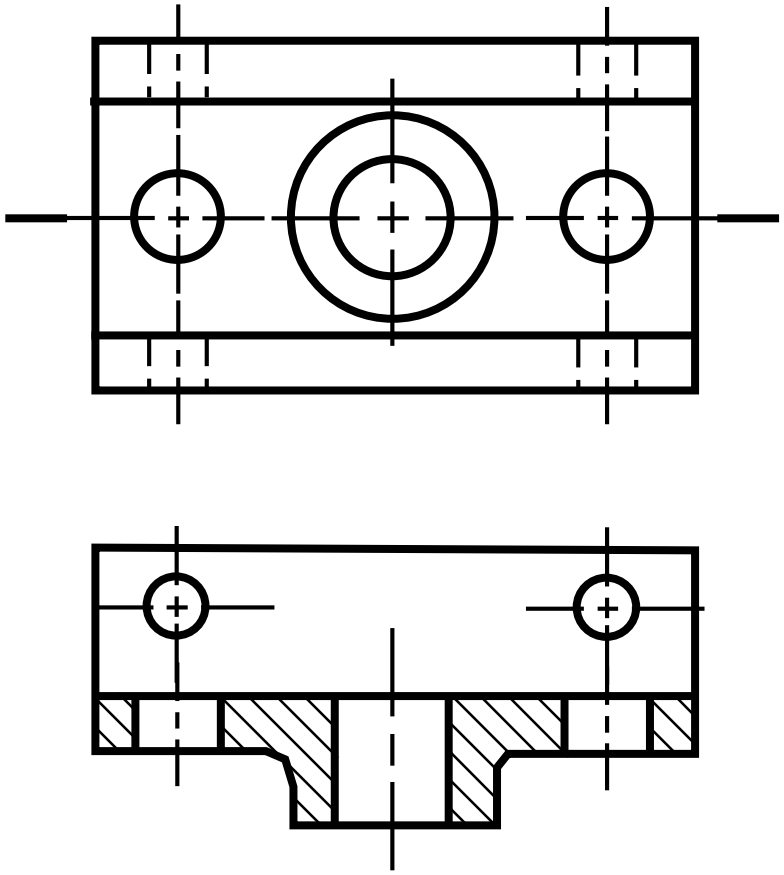
KIND OF SECTIONS

1. Full section
2. Offset section
3. Half section
4. Broken-out section
5. Revolved section (aligned section)
6. Removed section (detailed section)

FULL SECTION VIEW

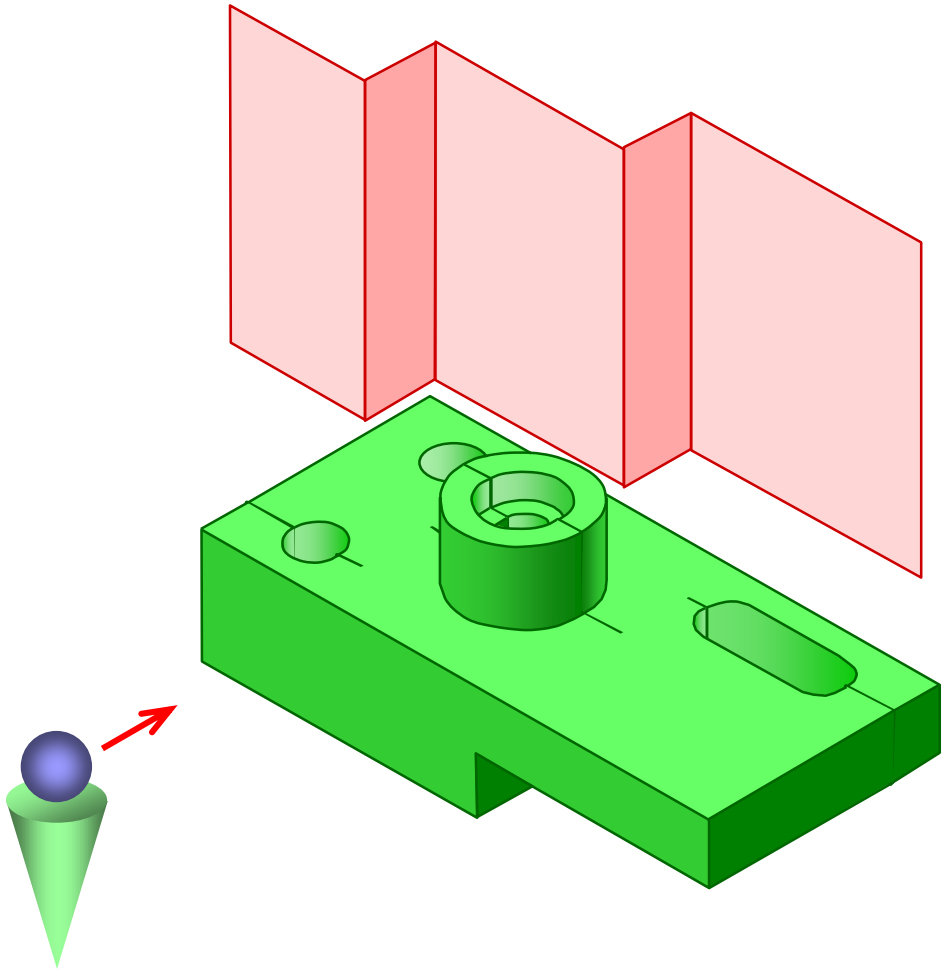
The view is made by passing the ***straight*** cutting plane ***completely through*** the part.

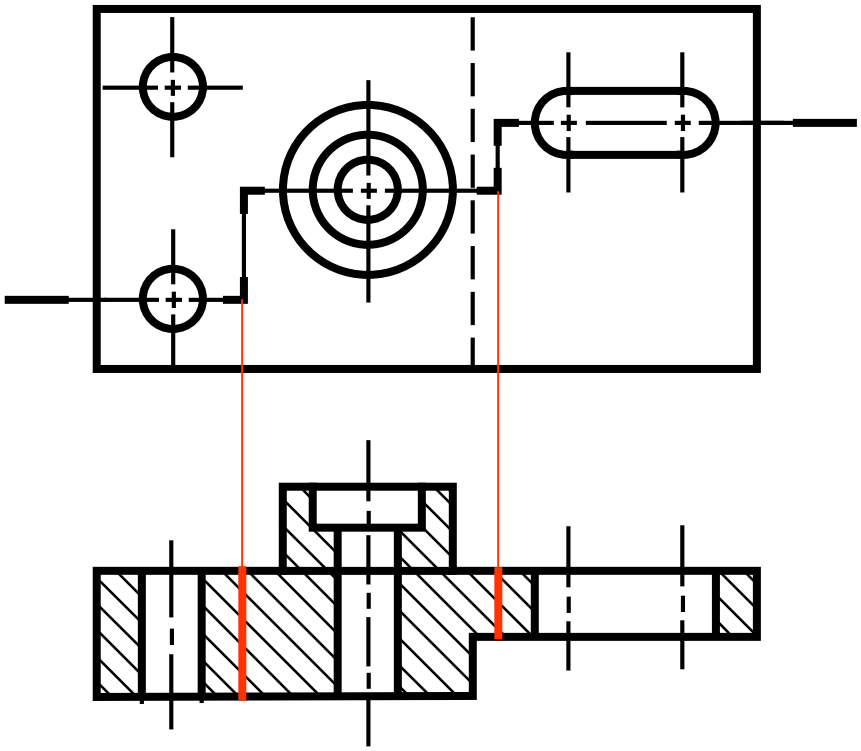




OFFSET SECTION VIEW

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

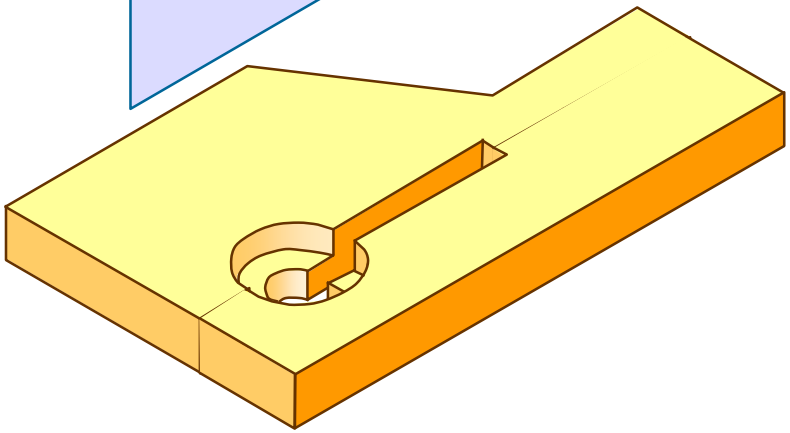


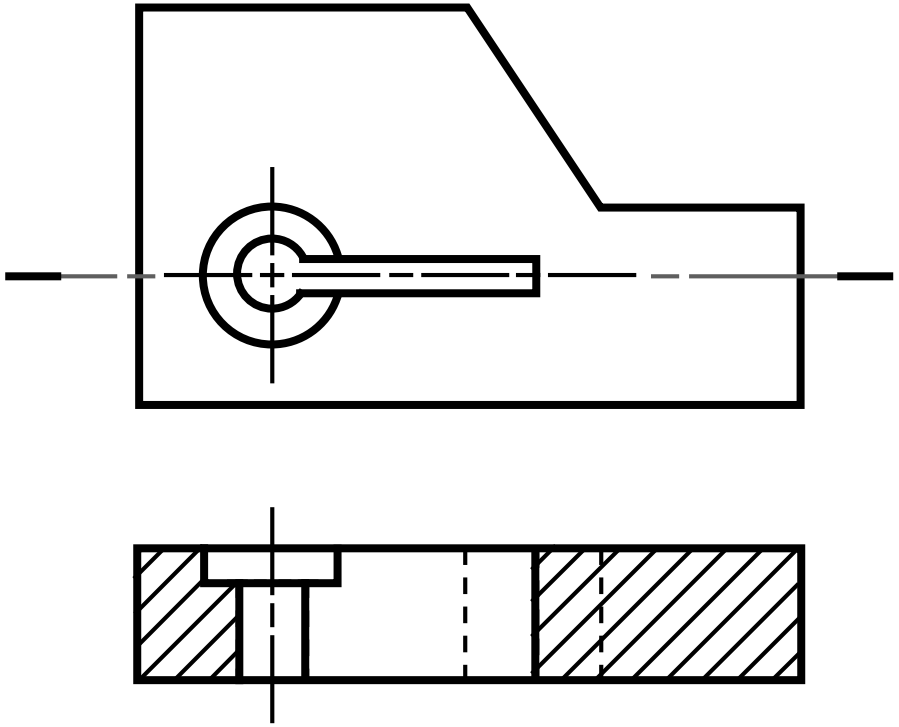


Do not show the edge views of the cutting plane.

TREATMENT OF HIDDEN LINES

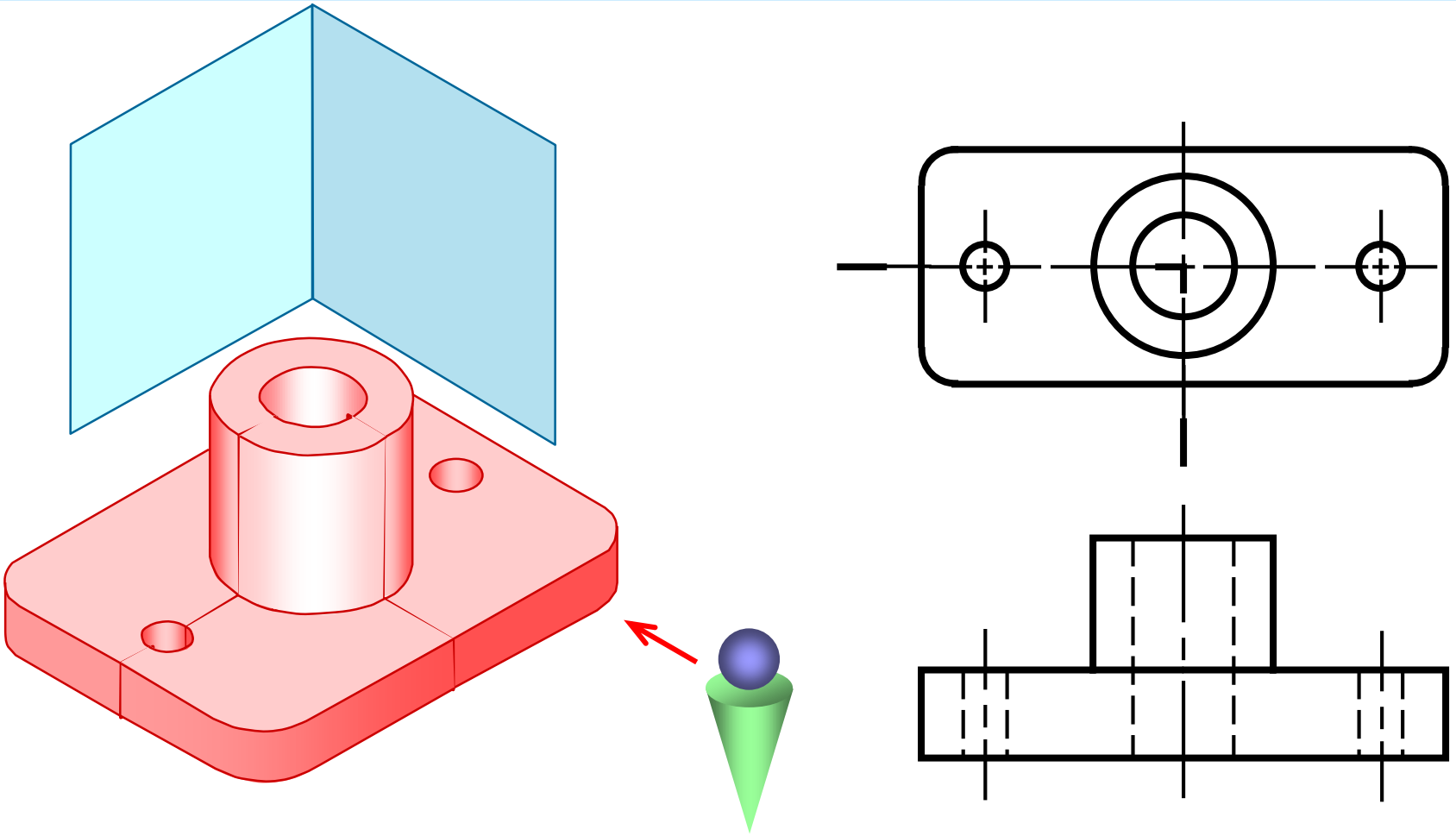
- Hidden lines are ***normally omitted*** from section views.





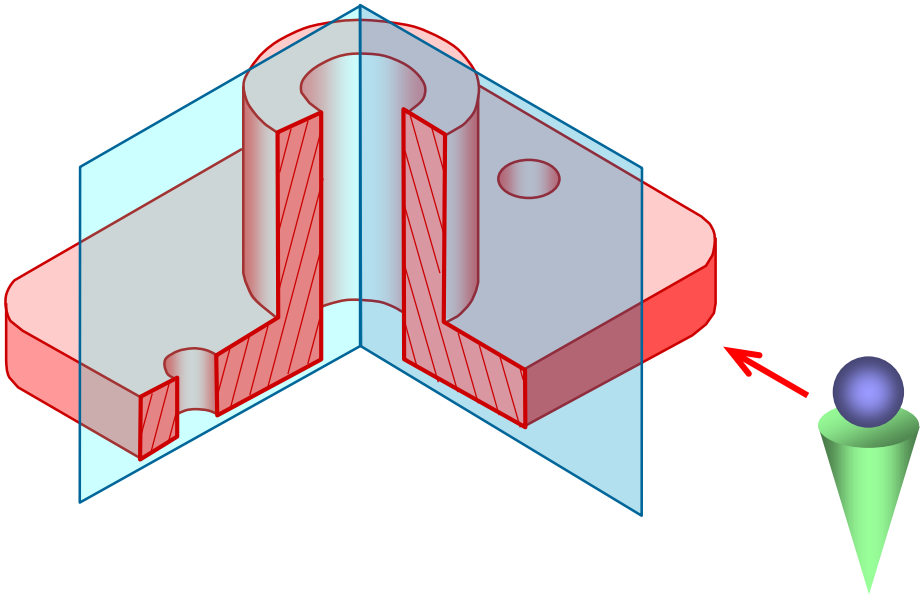
HALF SECTION VIEW

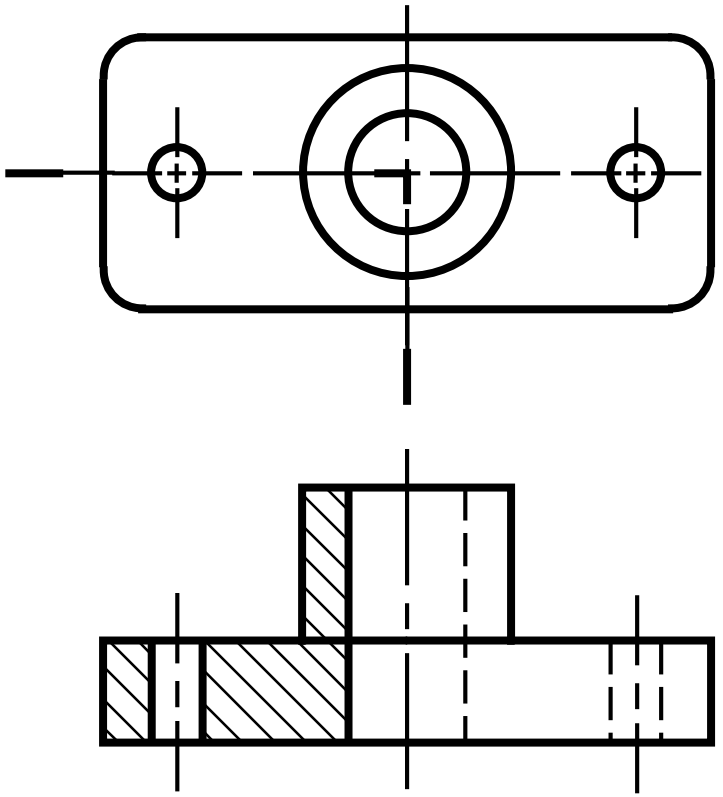
The view is made by passing the cutting plane ***halfway*** through an object and remove a ***quarter*** of it.



HALF SECTION VIEW

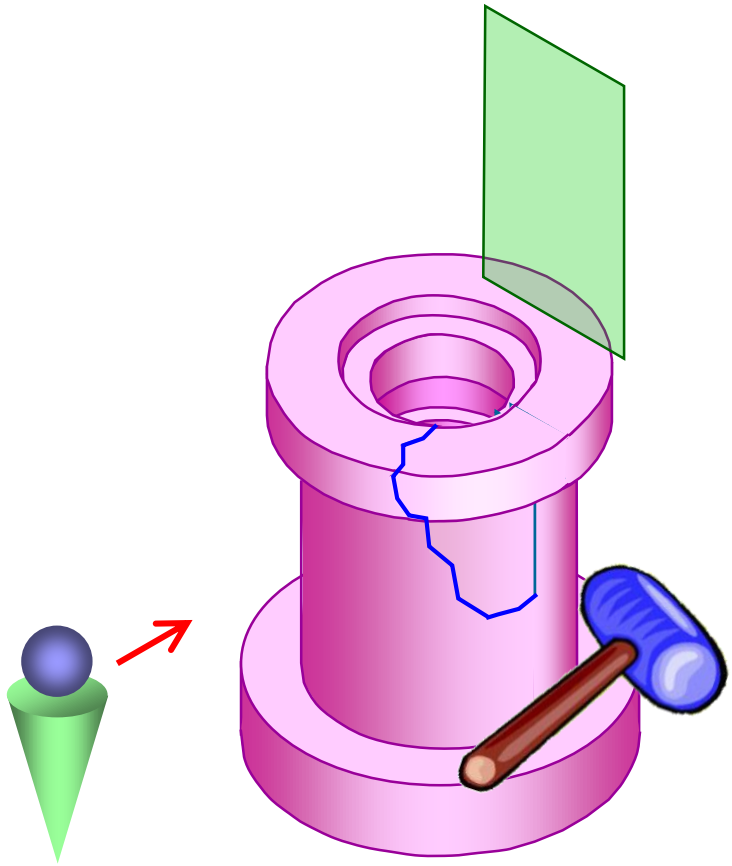
- A ***center line*** is used to separate the sectioned half from the unsectioned half of the view.
- ***Hidden line*** is omitted in unsection half of the view.

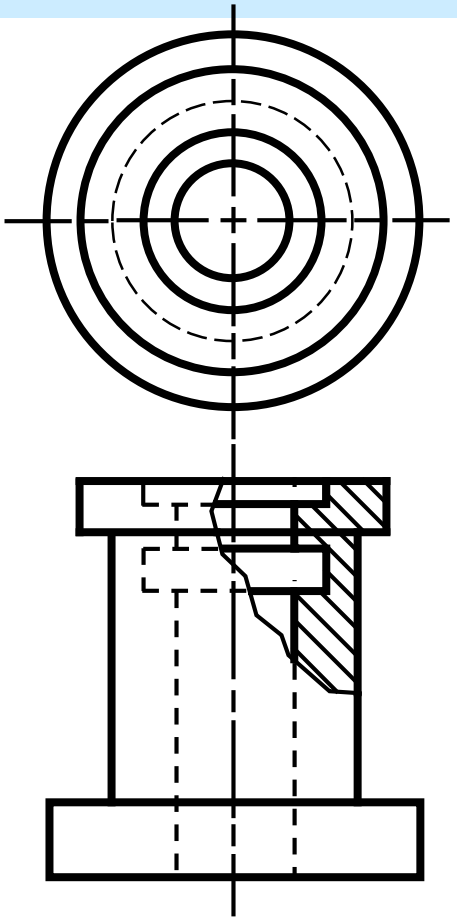




BROKEN-OUT SECTION VIEW

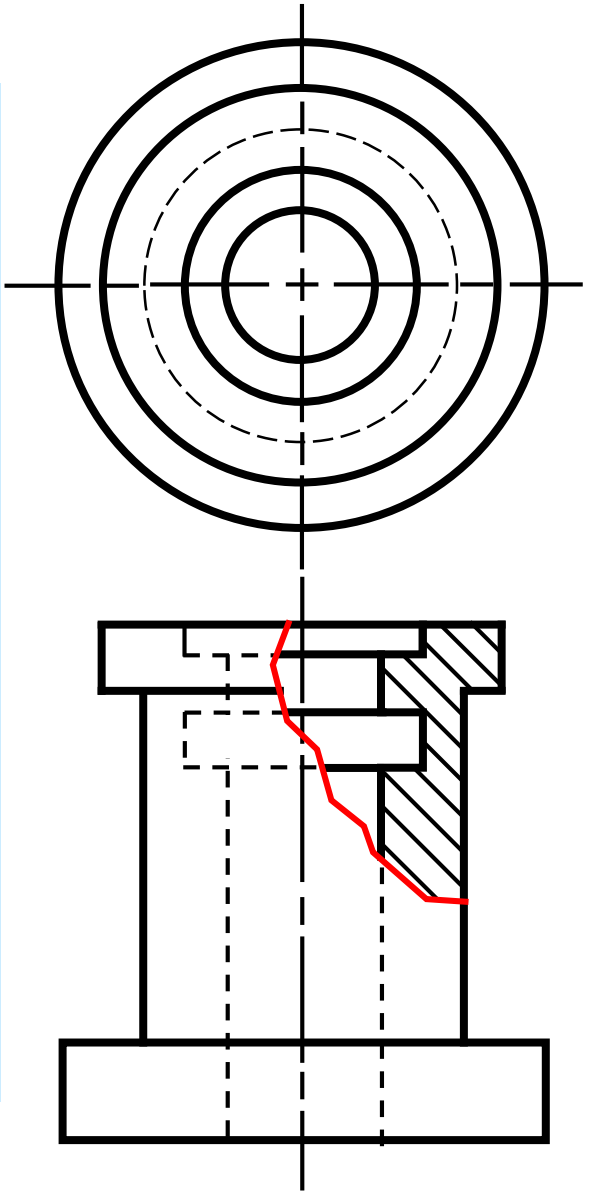
The view is made by passing the cutting plane normal to the viewing direction and removing the portion of an object in front of it.



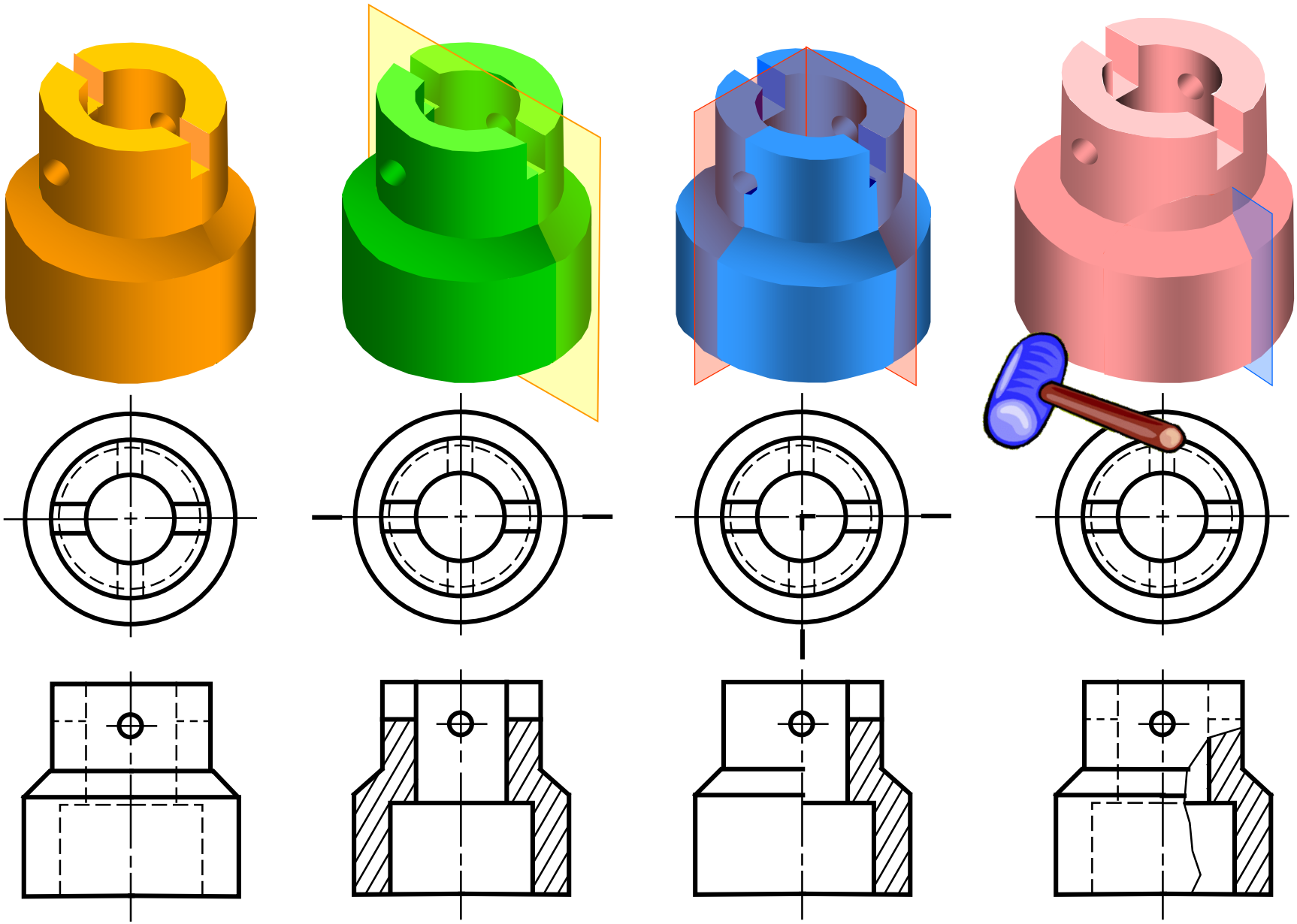


BROKEN-OUT SECTION VIEW

- A ***break line*** is used to separate the sectioned portion from the unsectioned portion of the view.
- Break line is a thin continuous line (**4H**) and is drawn freehand.
- There is ***no*** cutting plane line.



EXAMPLE : Comparison among several section techniques

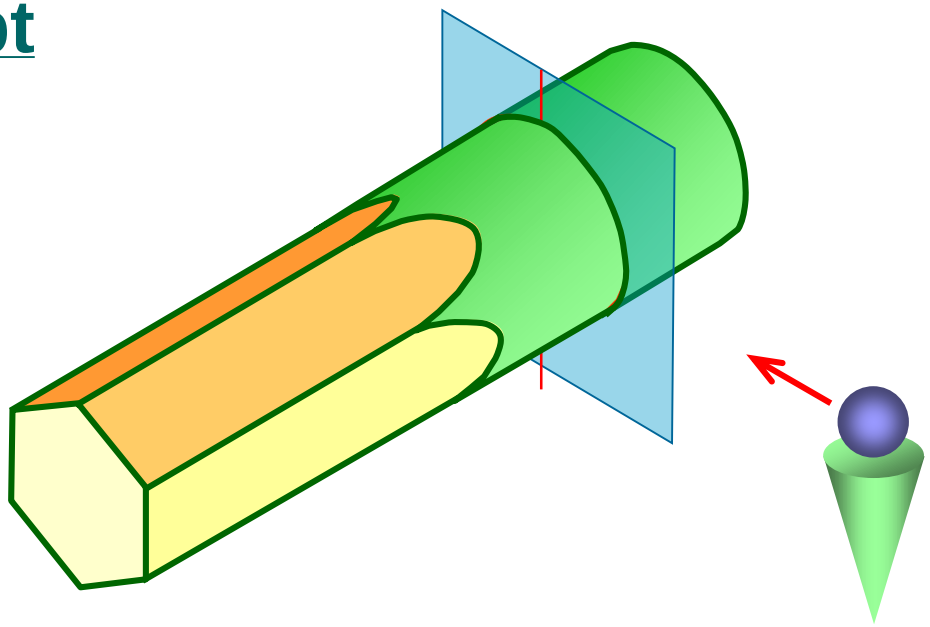


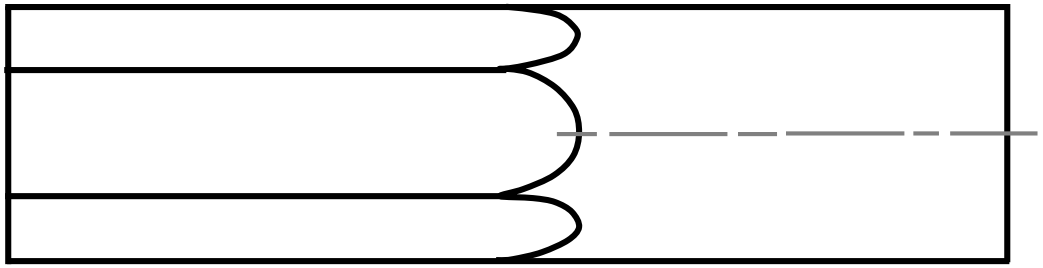
REVOLVED SECTION VIEW

- Revolved sections *show cross-sectional features* of a part.
- No need for additional orthographic views.
- This section is especially helpful when a cross-section varies.

REVOLVED SECTION VIEW

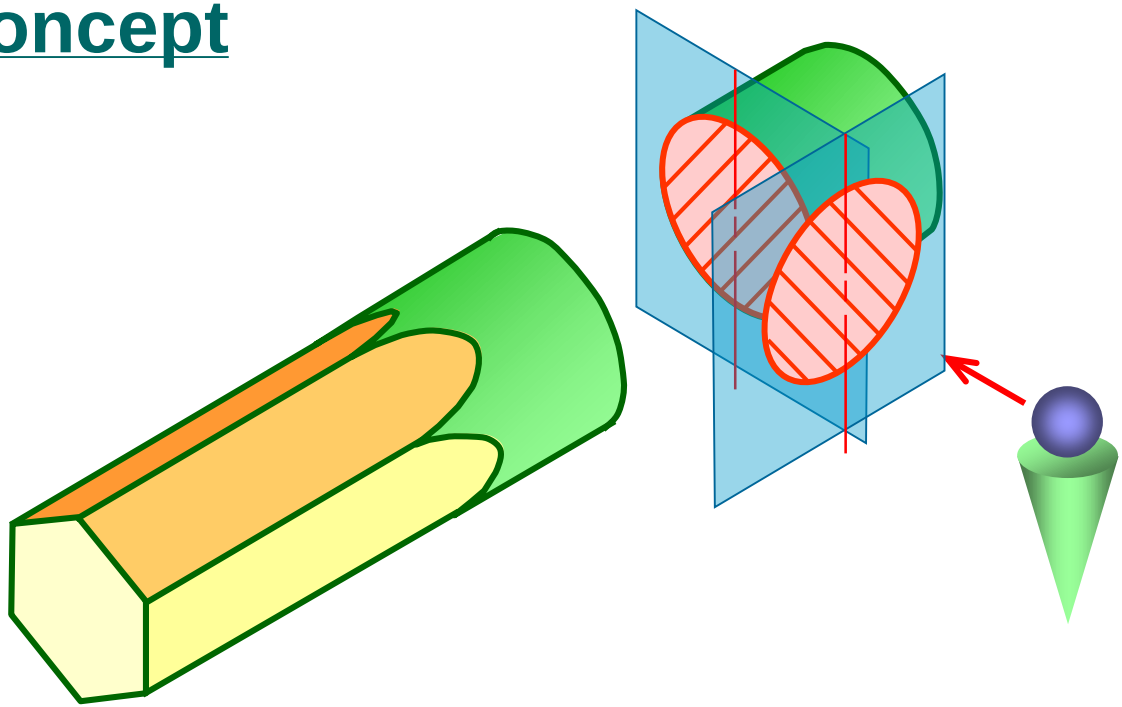
Basic concept

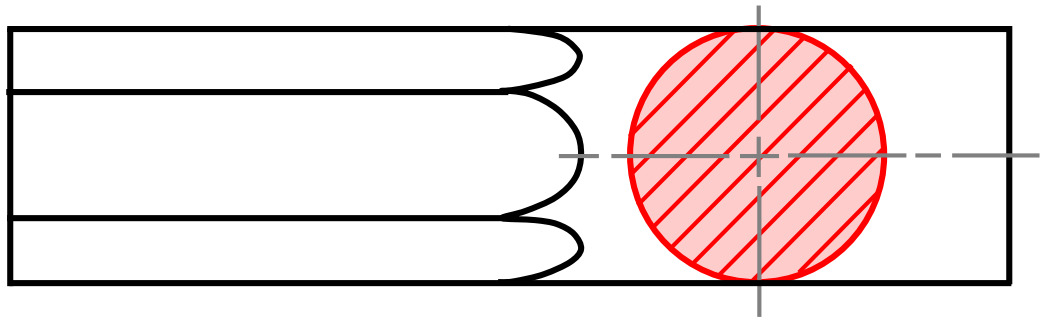




REVOLVED SECTION VIEW

Basic concept

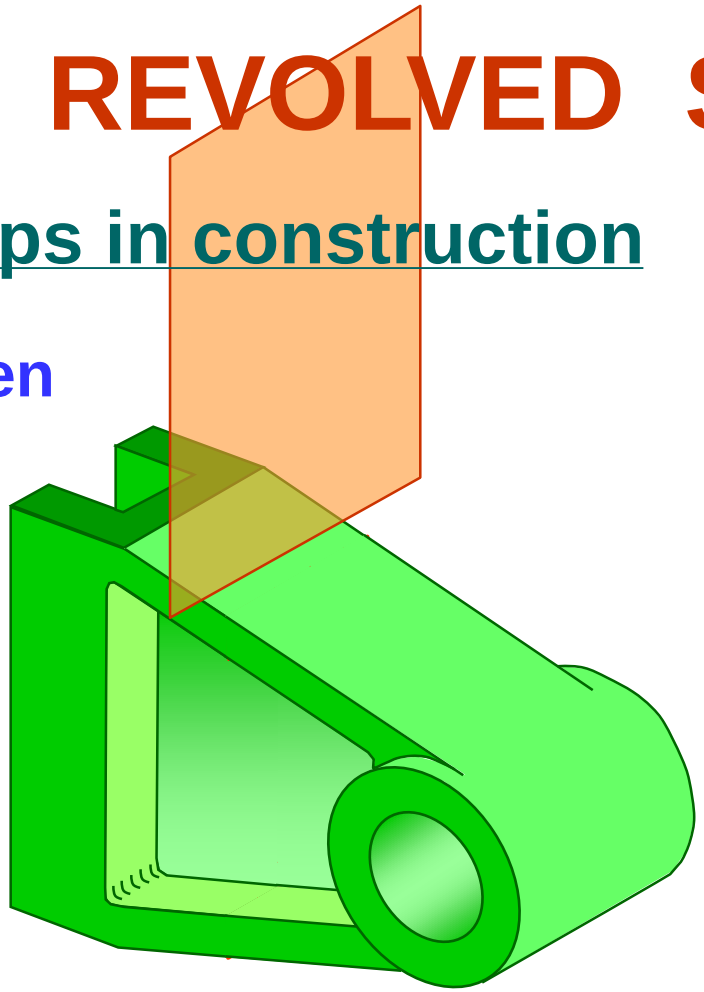


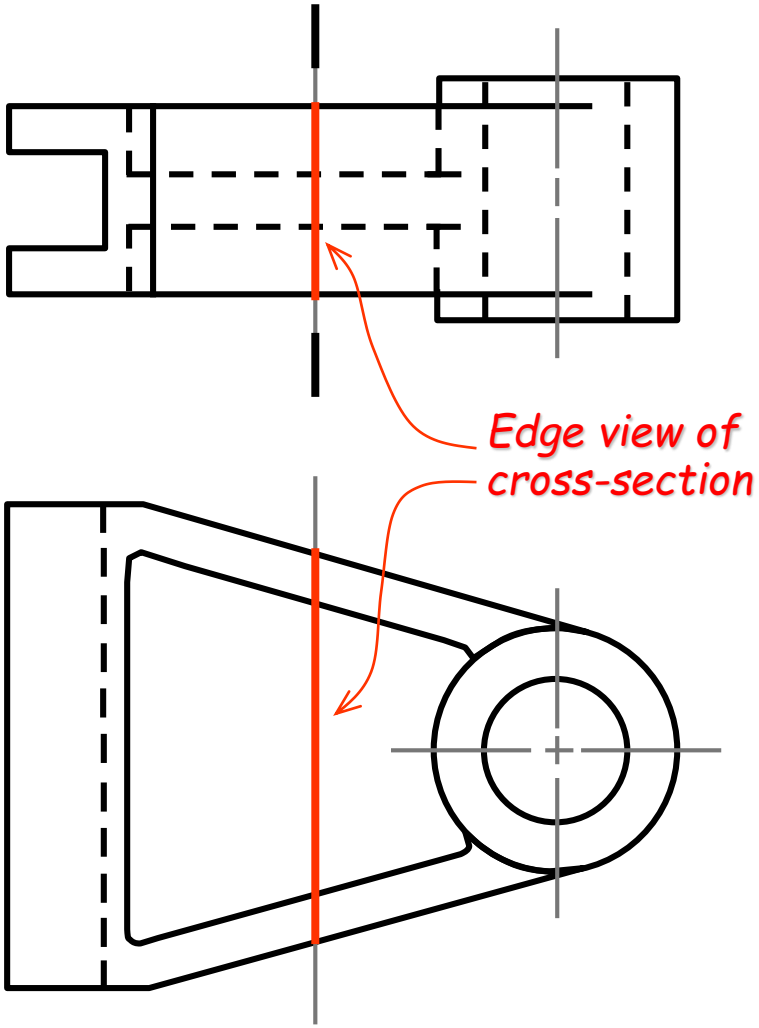


REVOLVED SECTION VIEW

Steps in construction

Given





Step 1

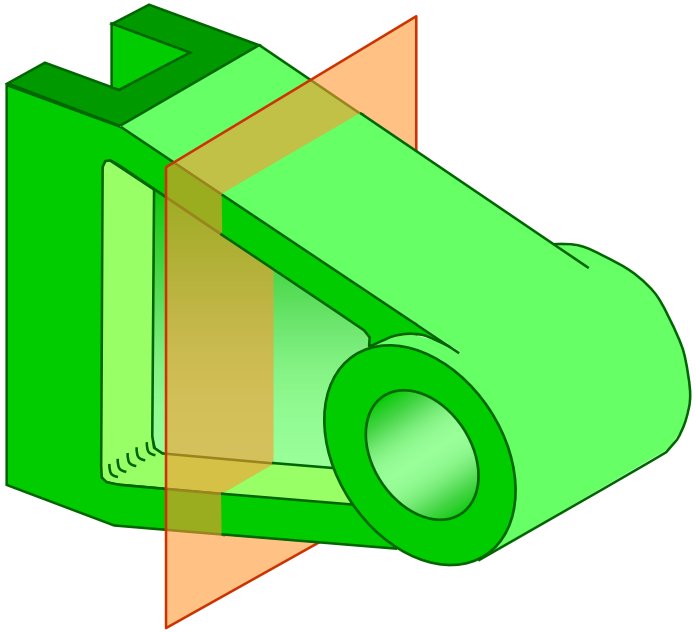
a. Assign position of cutting plane.

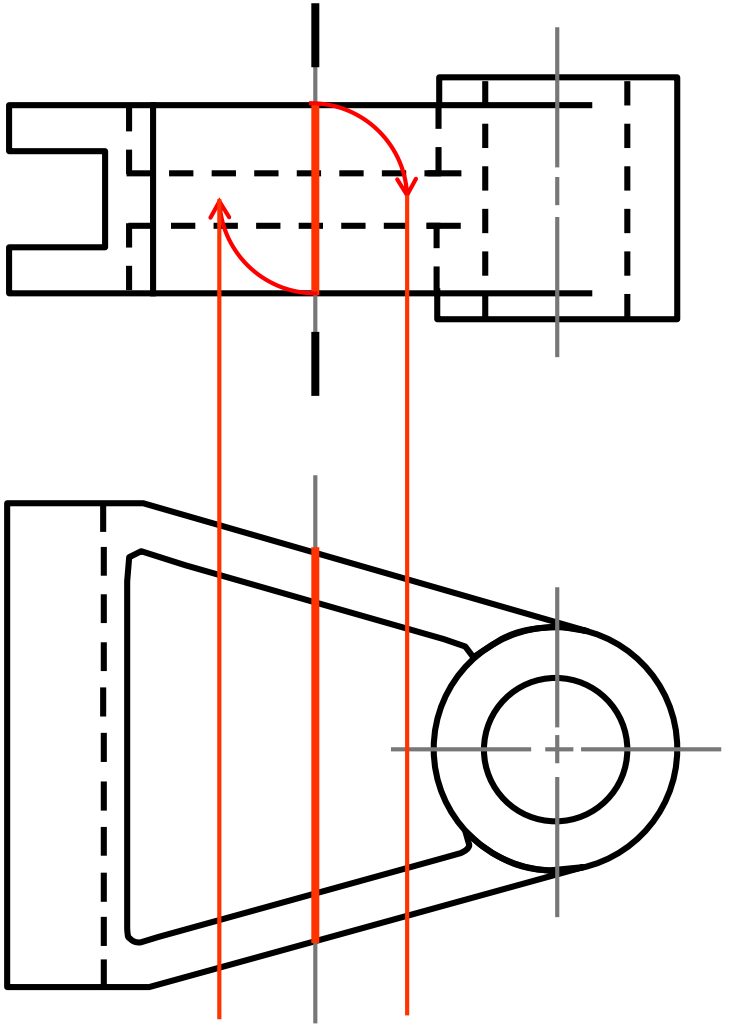
b. Draw axis of rotation in front view.

REVOLVED SECTION VIEW

Steps in construction

Given





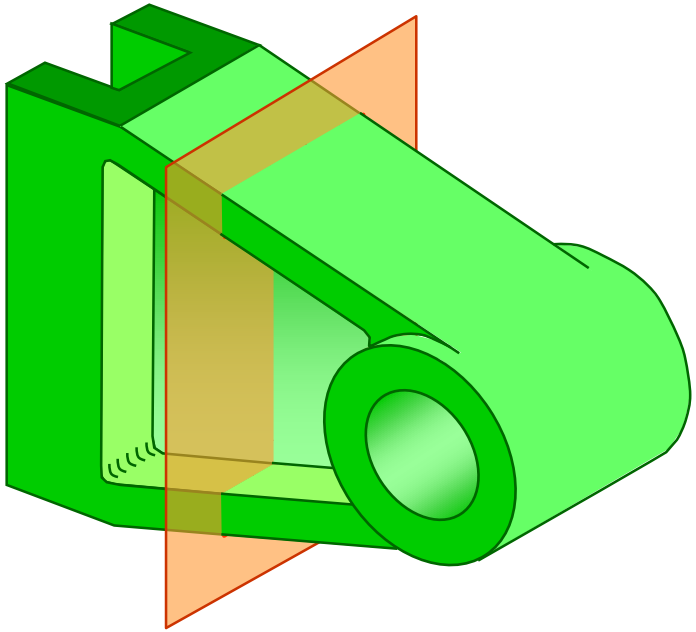
Step 2

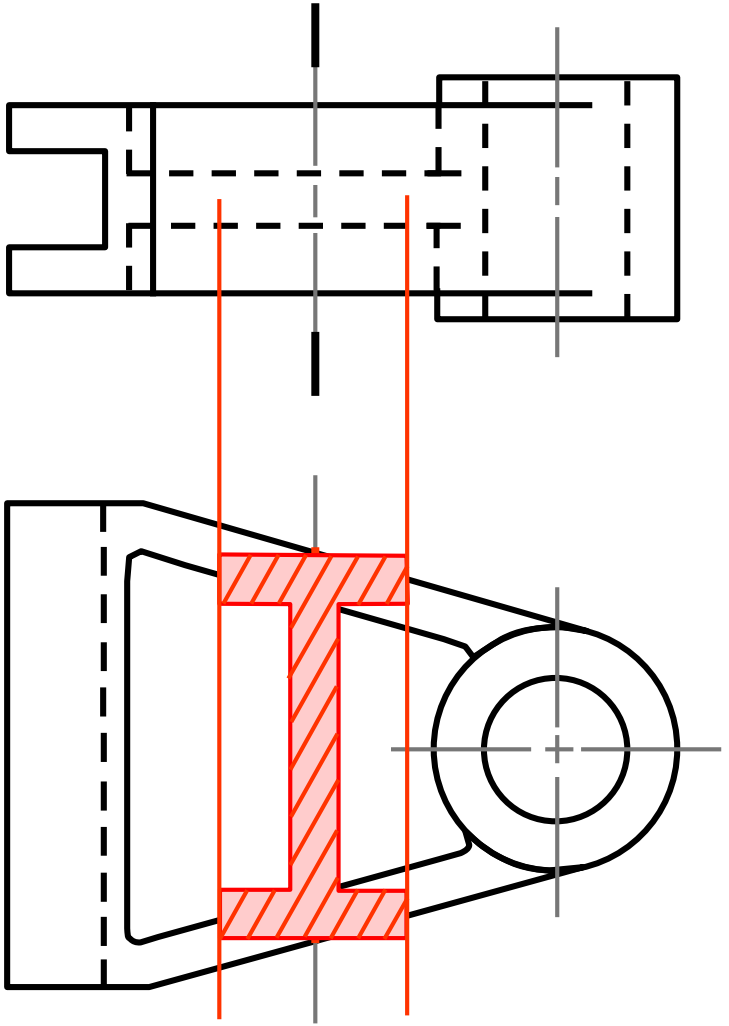
a. **Transfer the depth dimension to the front view.**

REVOLVED SECTION VIEW

Steps in construction

Given





Step 3

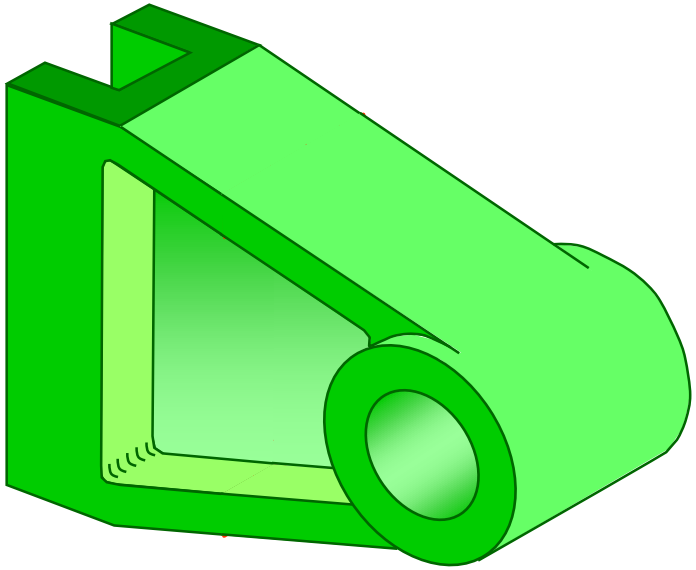
a. Draw the revolved section.

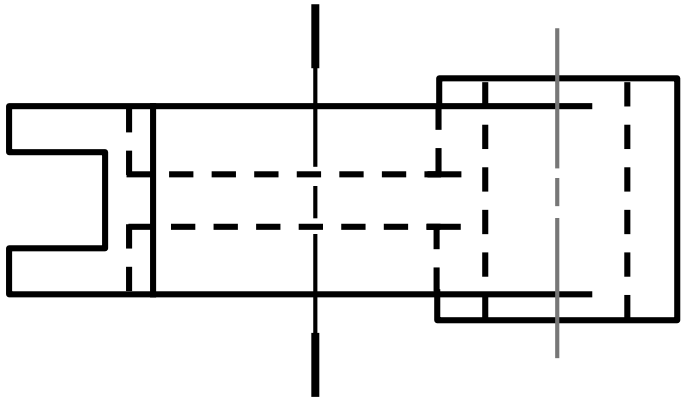
b. Add section lines.

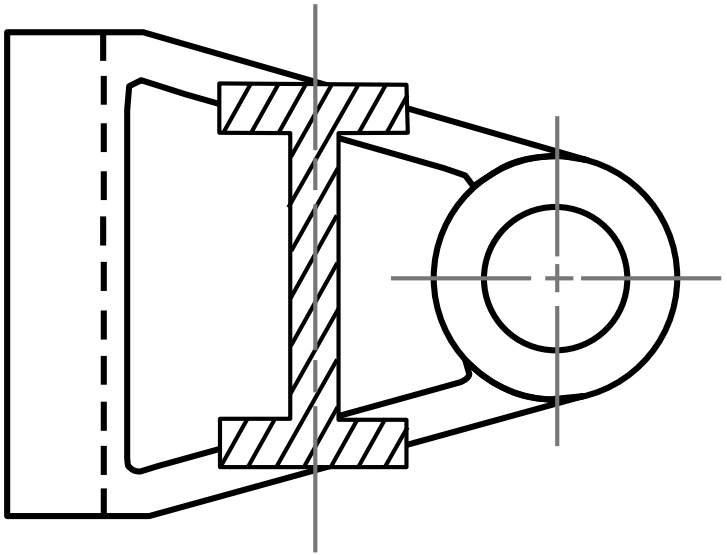
REVOLVED SECTION VIEW

Steps in construction

Given







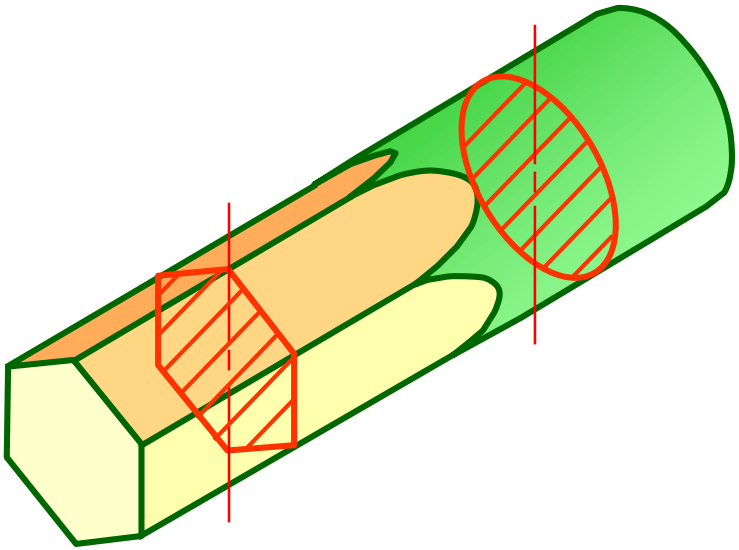
FINAL PICTURE

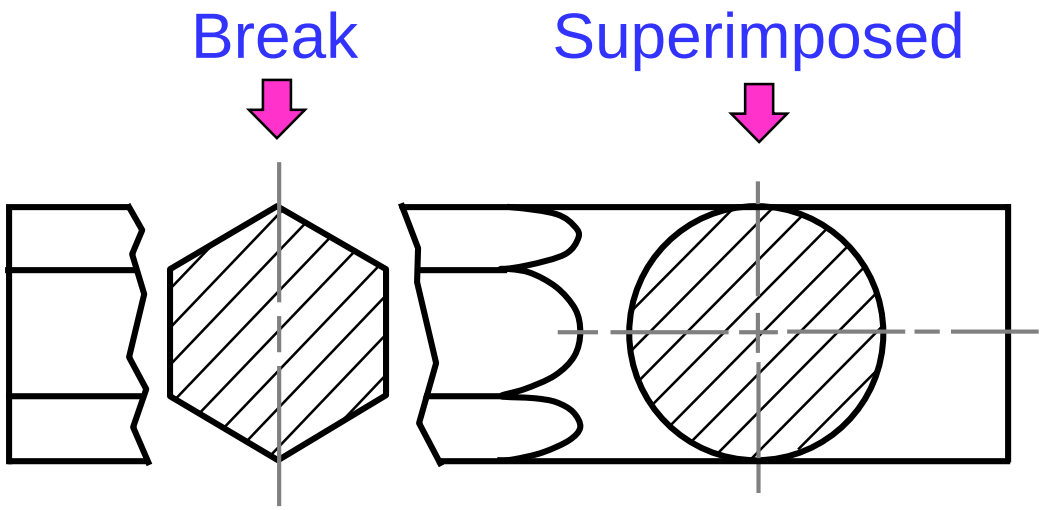
REVOLVED SECTION VIEW

Placement of revolved section

1. Superimposed to orthographic view.

2. Break from orthographic view.



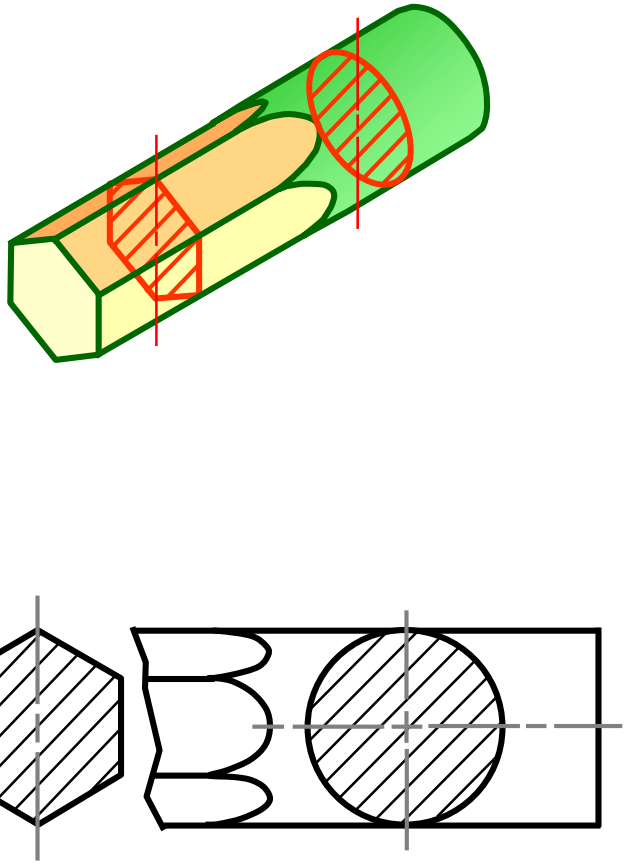


REMOVED SECTION VIEW

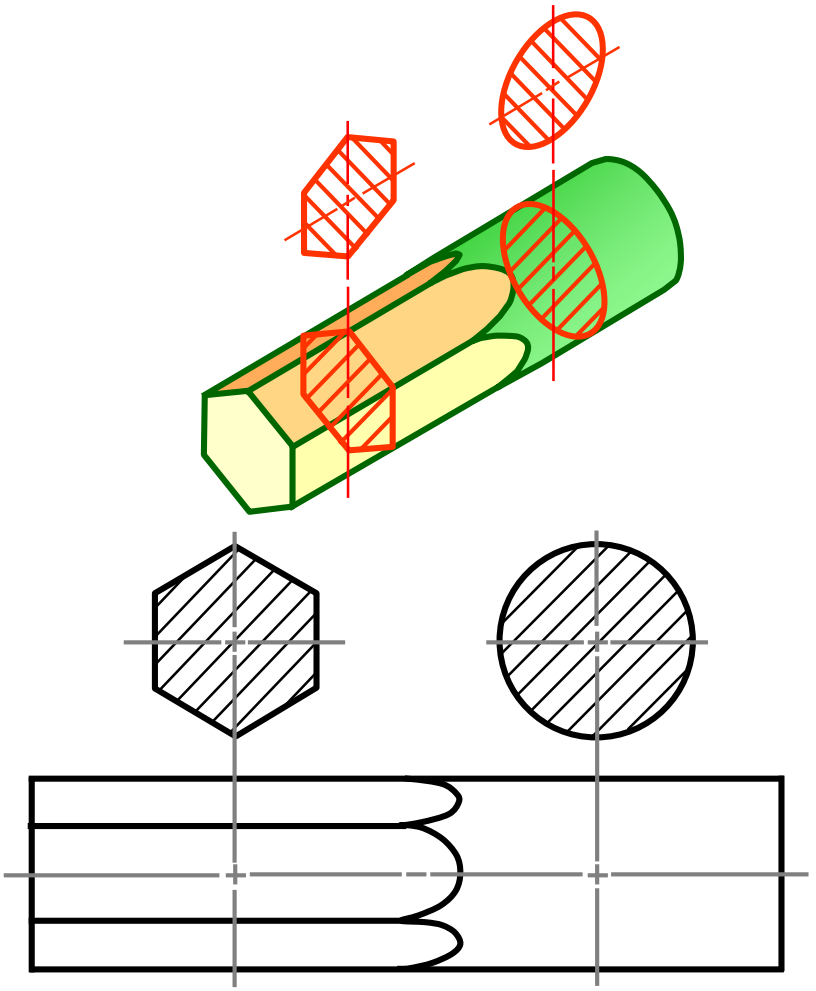
- Removed section is revolved section.
- Section view is shown outside the view.
- Used where space does not enough for revolved section
- Can be located elsewhere on a drawing with *properly labeled*

REMOVED SECTION VIEW

Revolved section

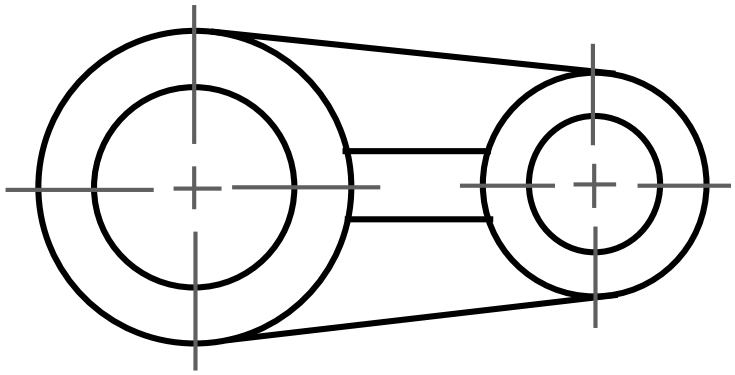


Removed section

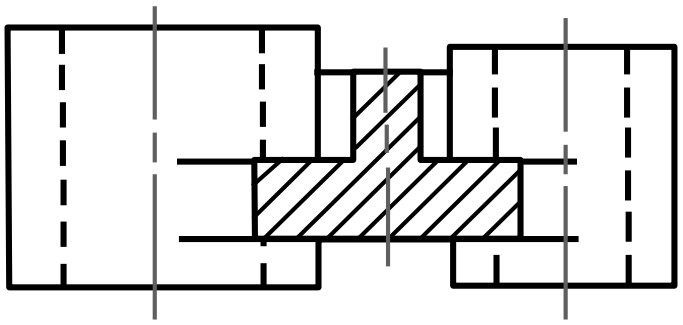


REMOVED SECTION VIEW

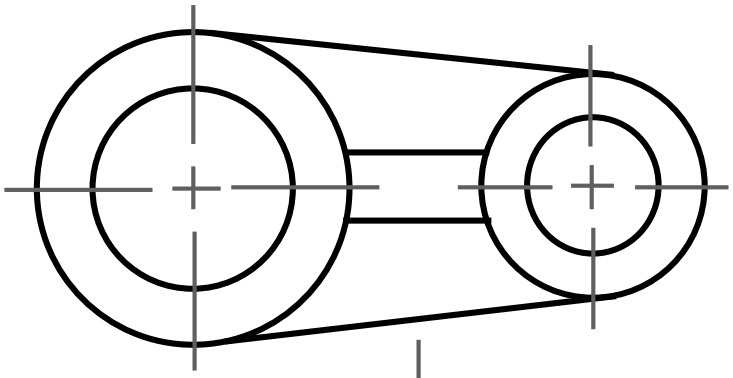
Poor

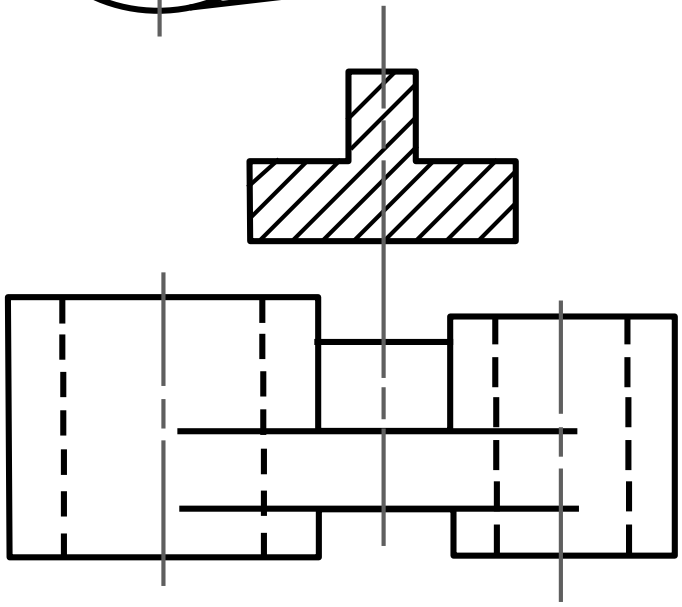


Too messy !!

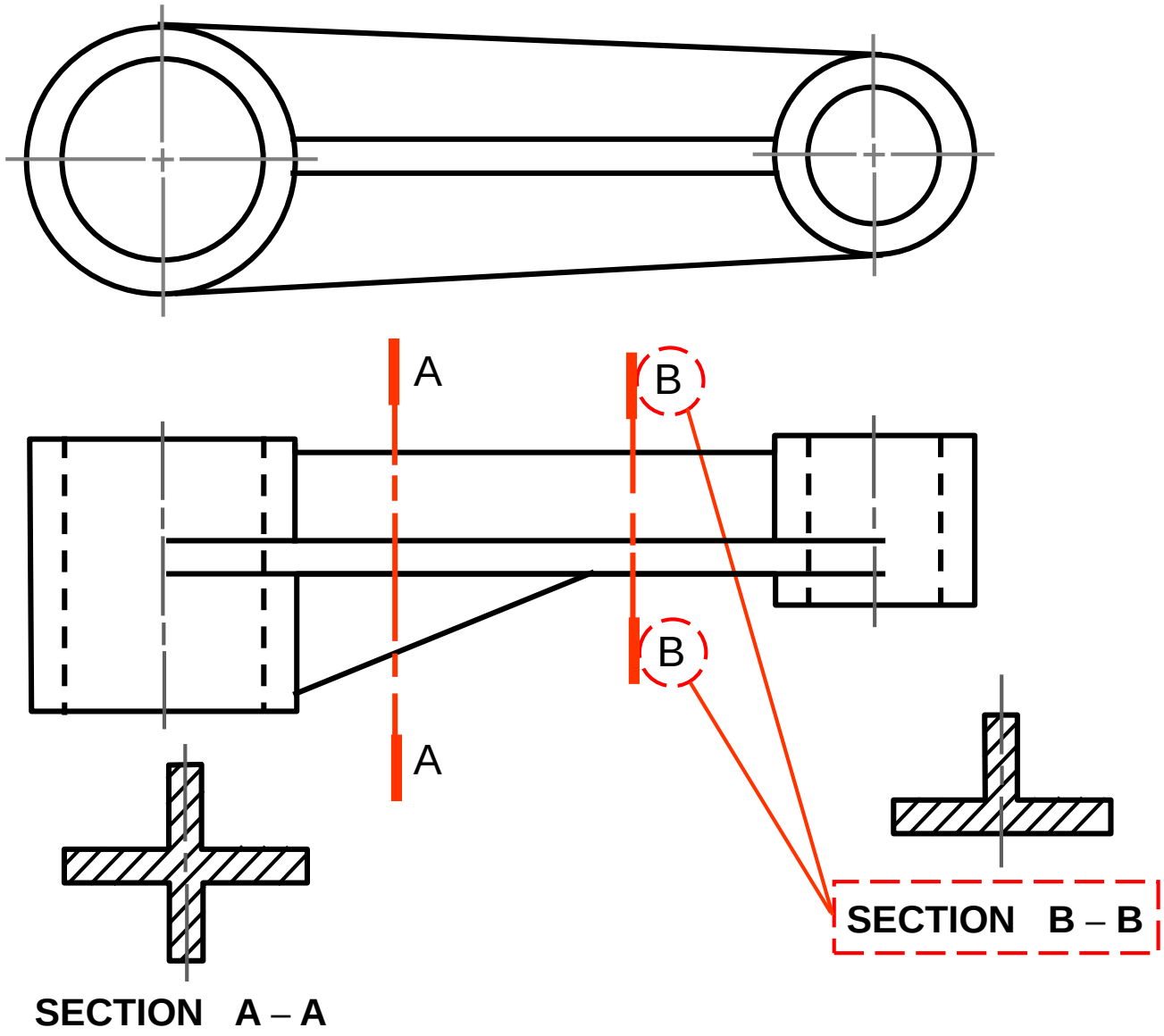


Preferred





REMOVED SECTION VIEW

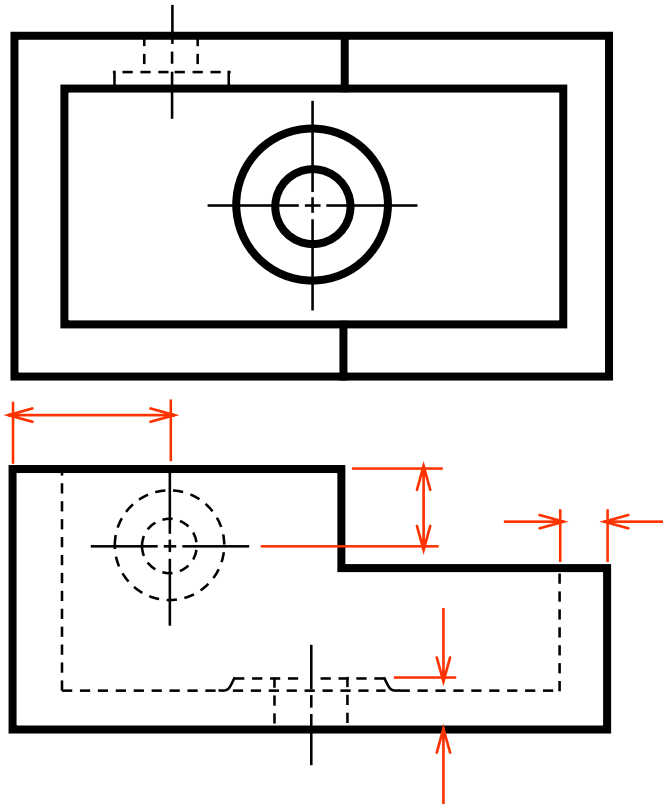


Dimensioning in Section View

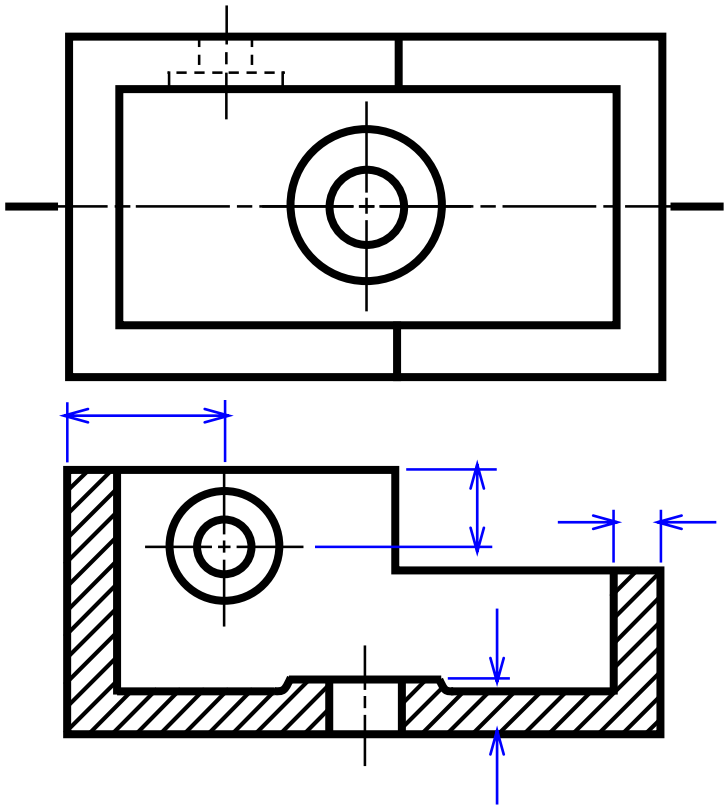


- In most cases, dimensioning of the section views follows the typical rules of dimensioning.

POOR

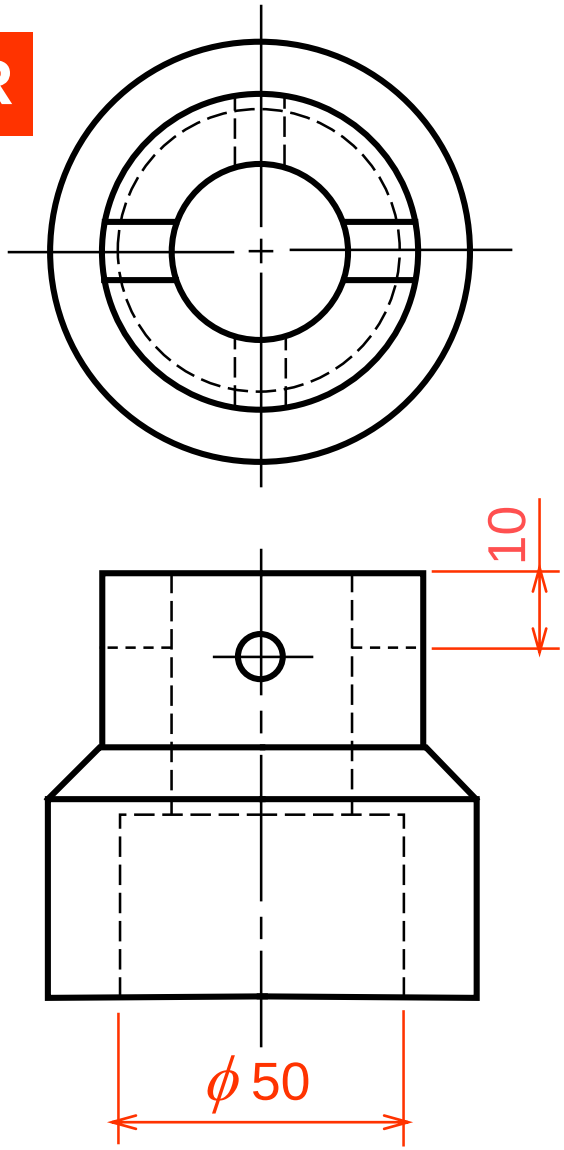


GOOD

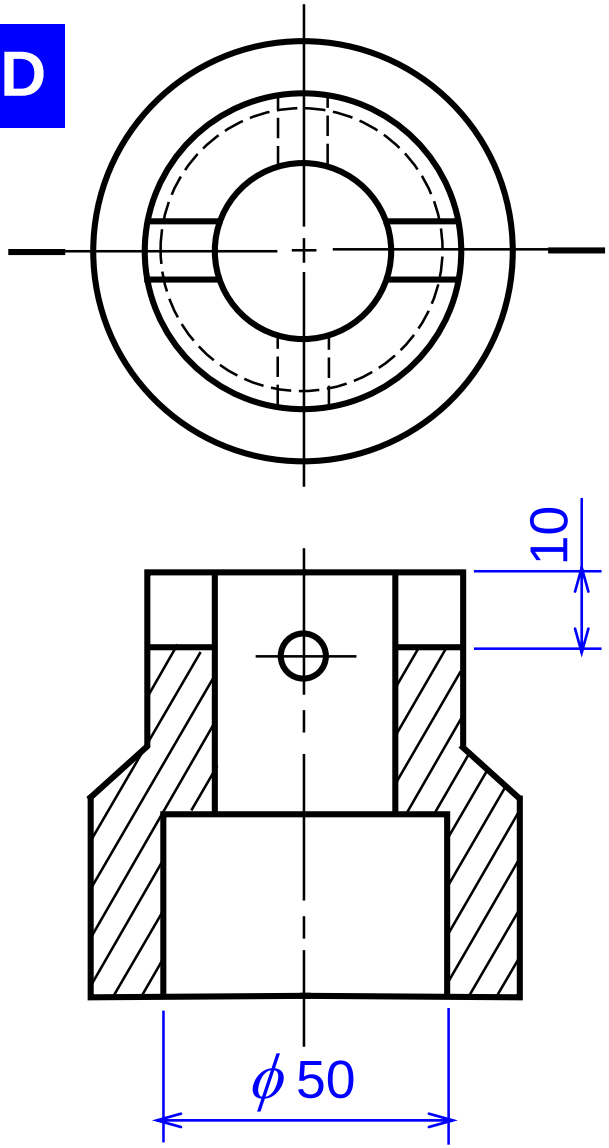


DIMENSIONING

POOR

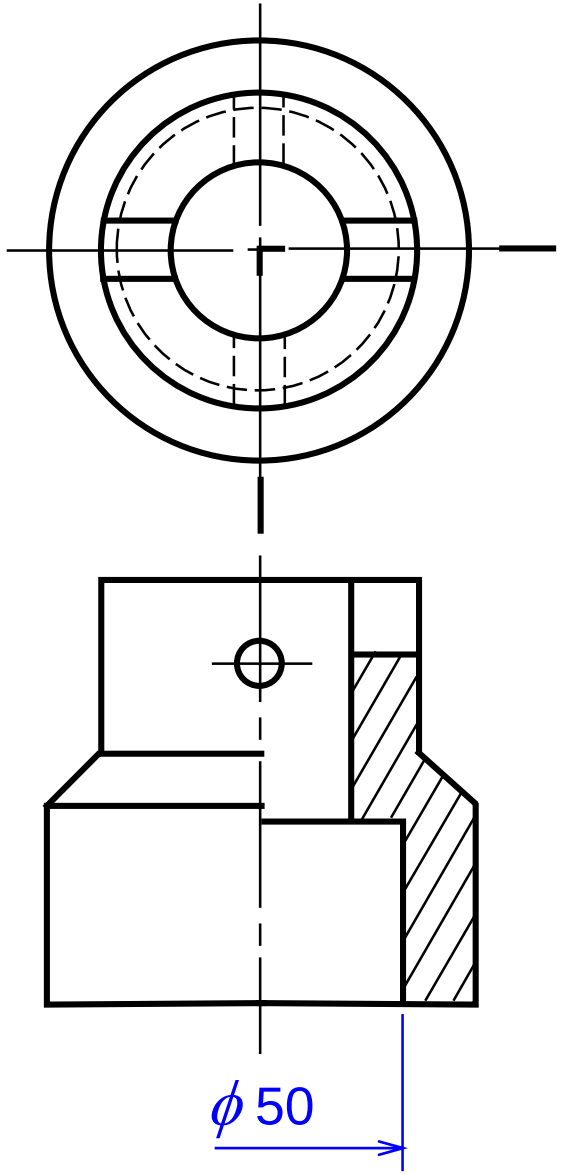


GOOD

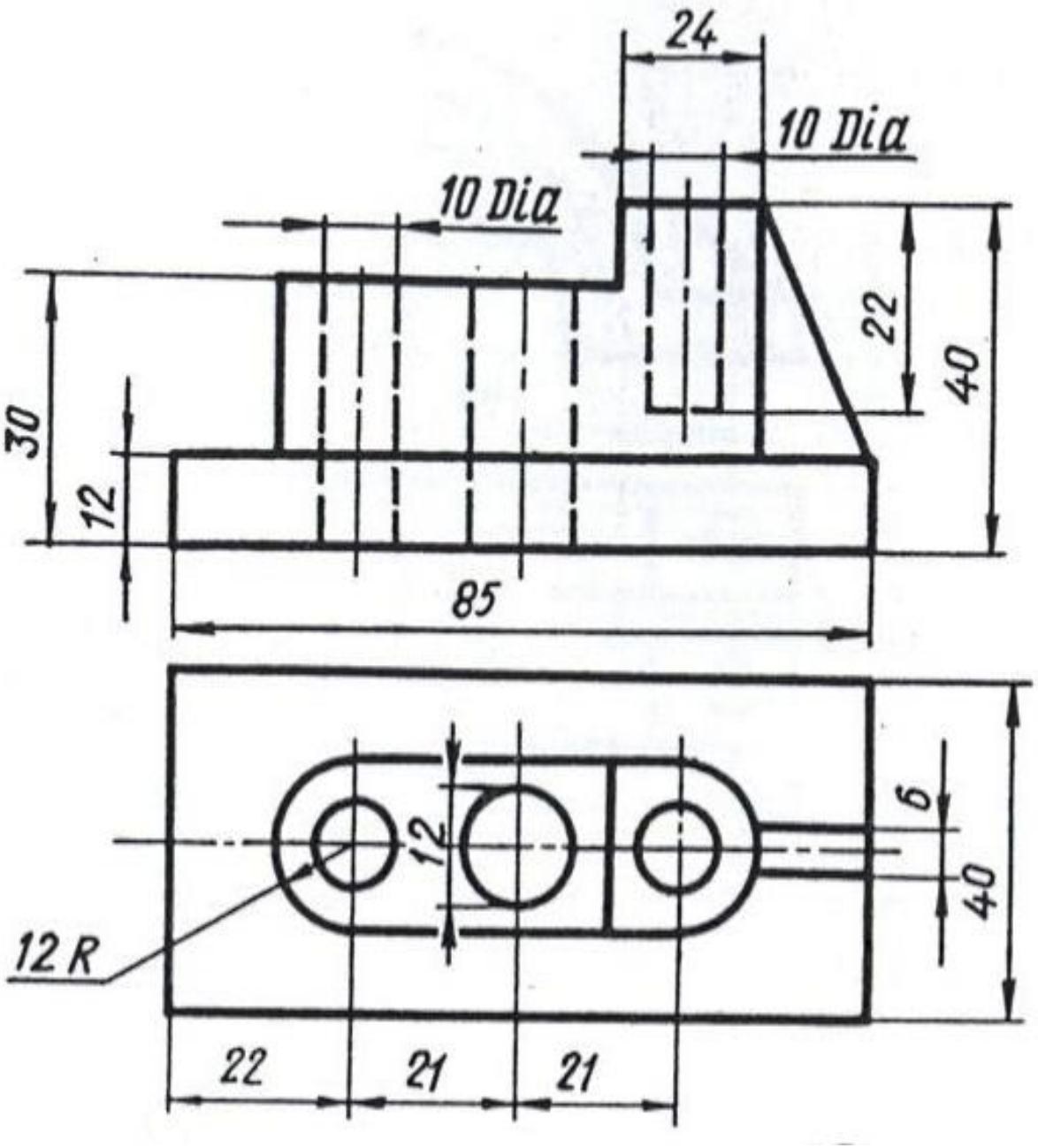


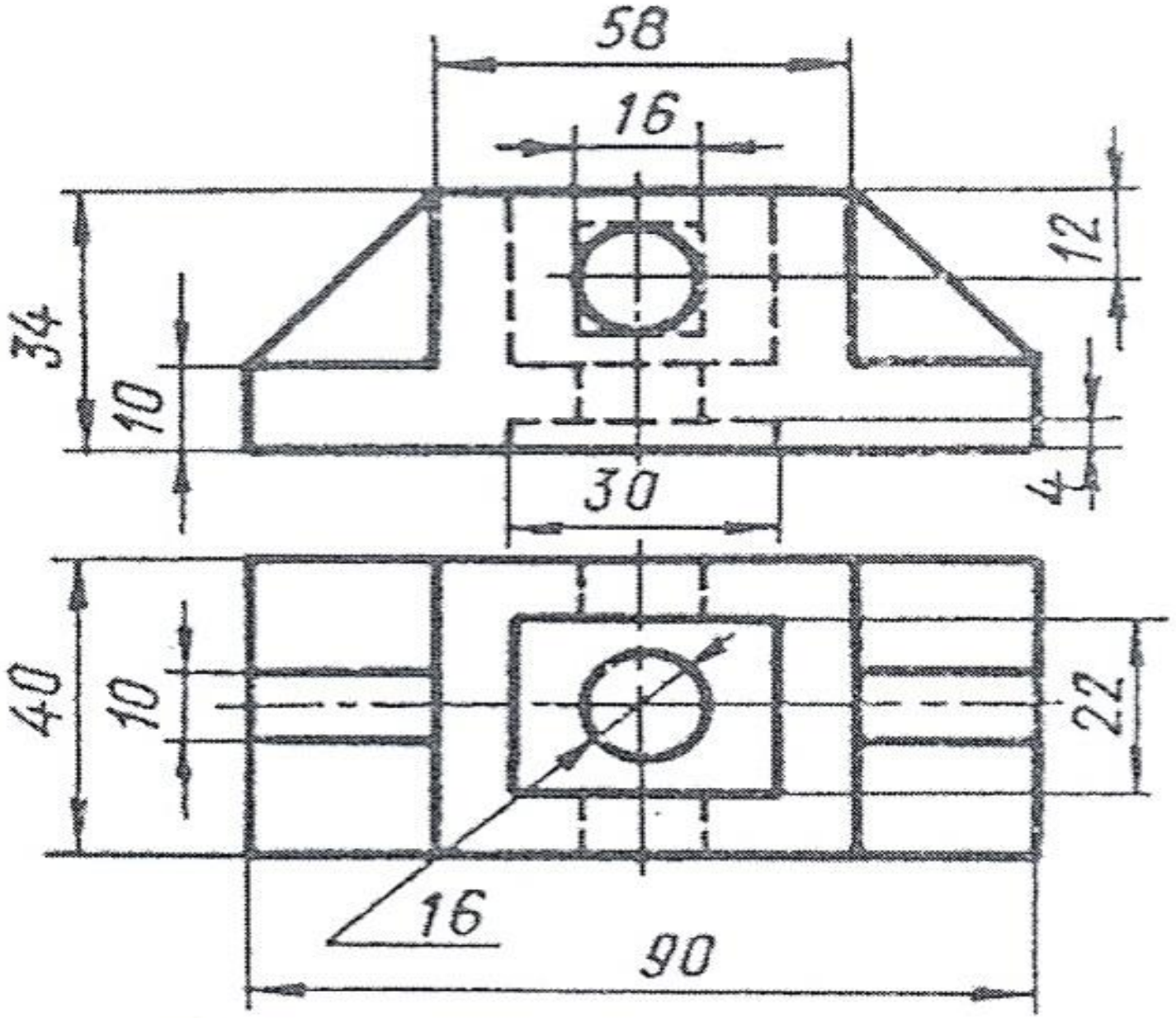
DIMENSIONING

- For a half-section view, use dimension line with only one arrowhead that points to the position inside the sectioned portion.



EXAMPLE




58
16
34
10
12
30
4
40
10
22
16
90