

Lecture 02

Types Of Lines And Usage, Dimensioning & Lettering.

By

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Types of Lines used in Engineering Drawing:

a) Visible Outline

For showing visible edges of an object

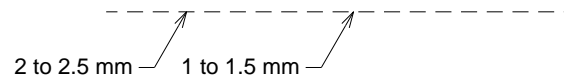
0.35 mm to 0.5 mm thick



b) Hidden Outline

For showing hidden edges of an object

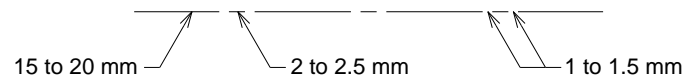
0.25 mm to 0.35 mm thick



c) Center Line

For locating center of circles, arc and ellipses relative to the object.

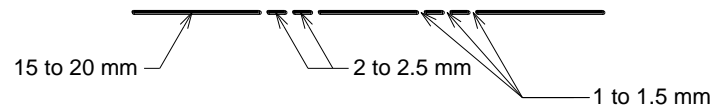
0.13 mm to 0.2 mm thick



d) Cutting Plane Line

To show the location of the imaginary section plane in the reference view.

0.5 mm to 0.7 mm thick

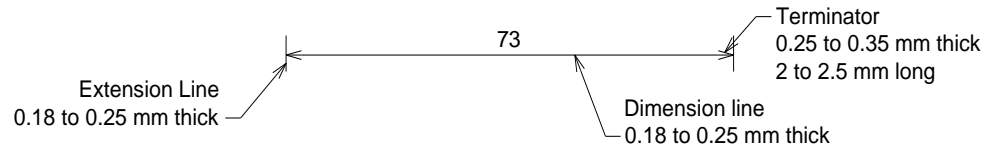




Types of Lines used in Engineering Drawing:

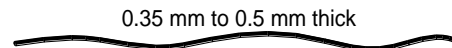
f) Extension Lines, Dimension Lines and Terminators

For extension of edges and placement of dimensions.



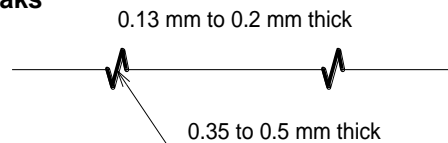
g) Short Break Line

For showing short breaks



h) Long Break Line

To show long breaks

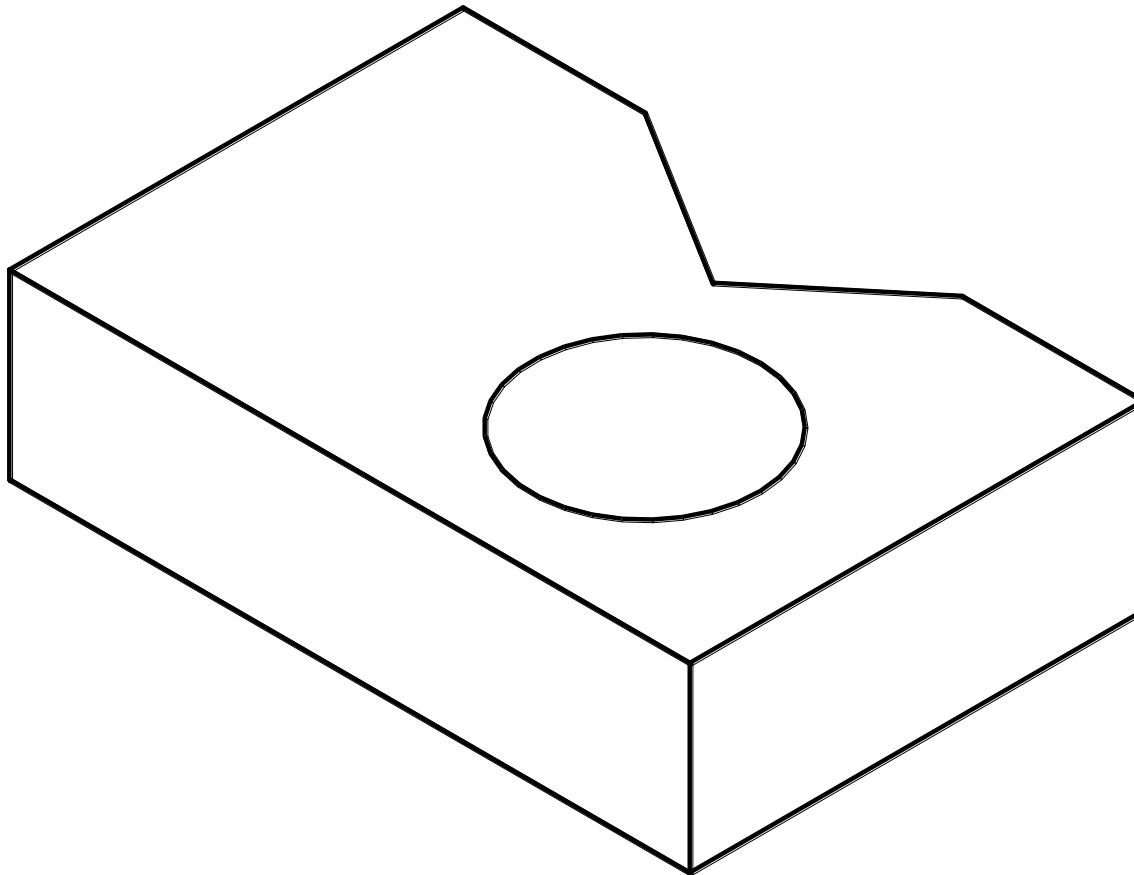


i) Section Lines

A pattern of thin lines 0.2 to 0.25 mm thick. The pattern and thickness is dependent on the material.

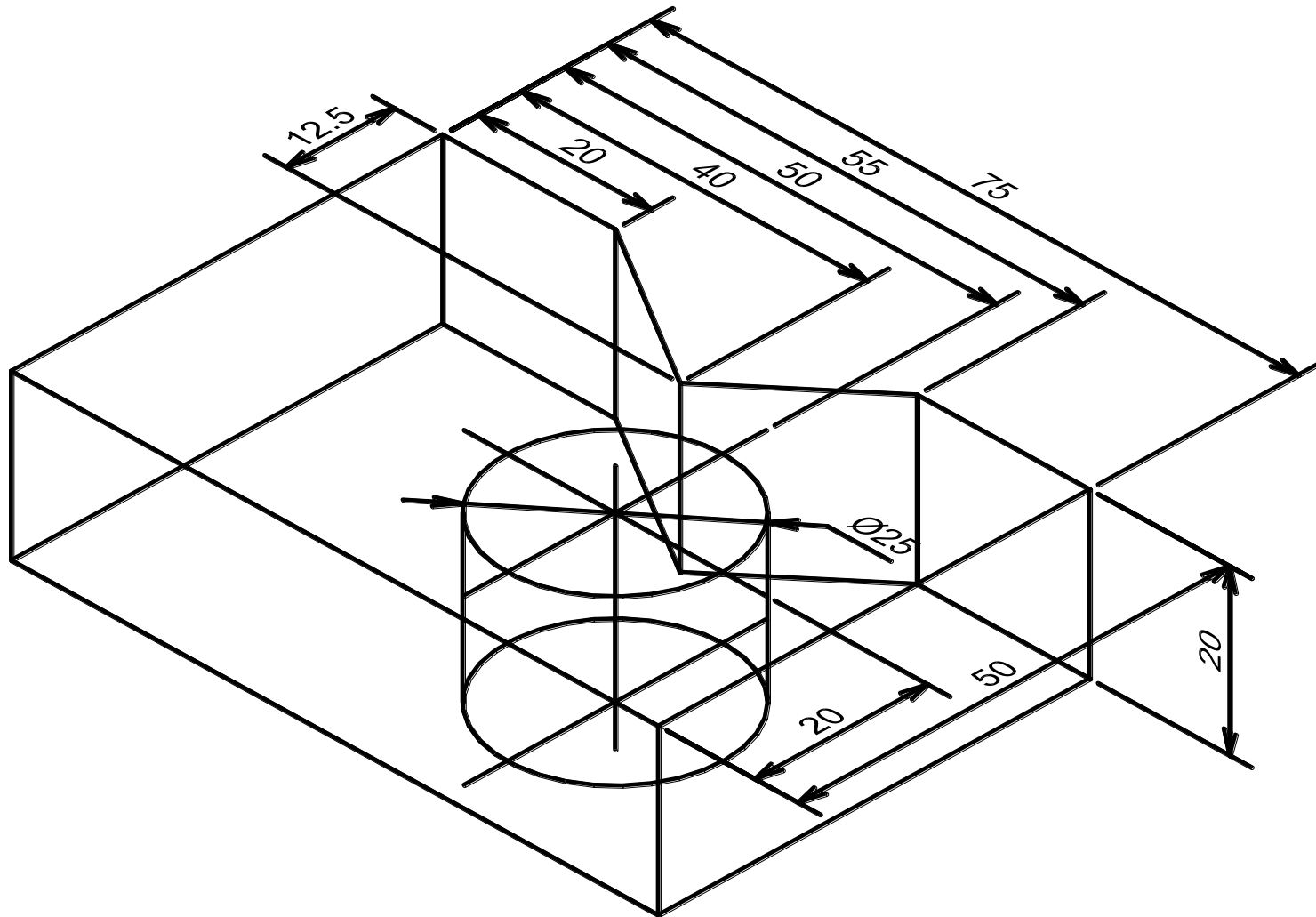


Types of Lines used in Engineering Drawing:



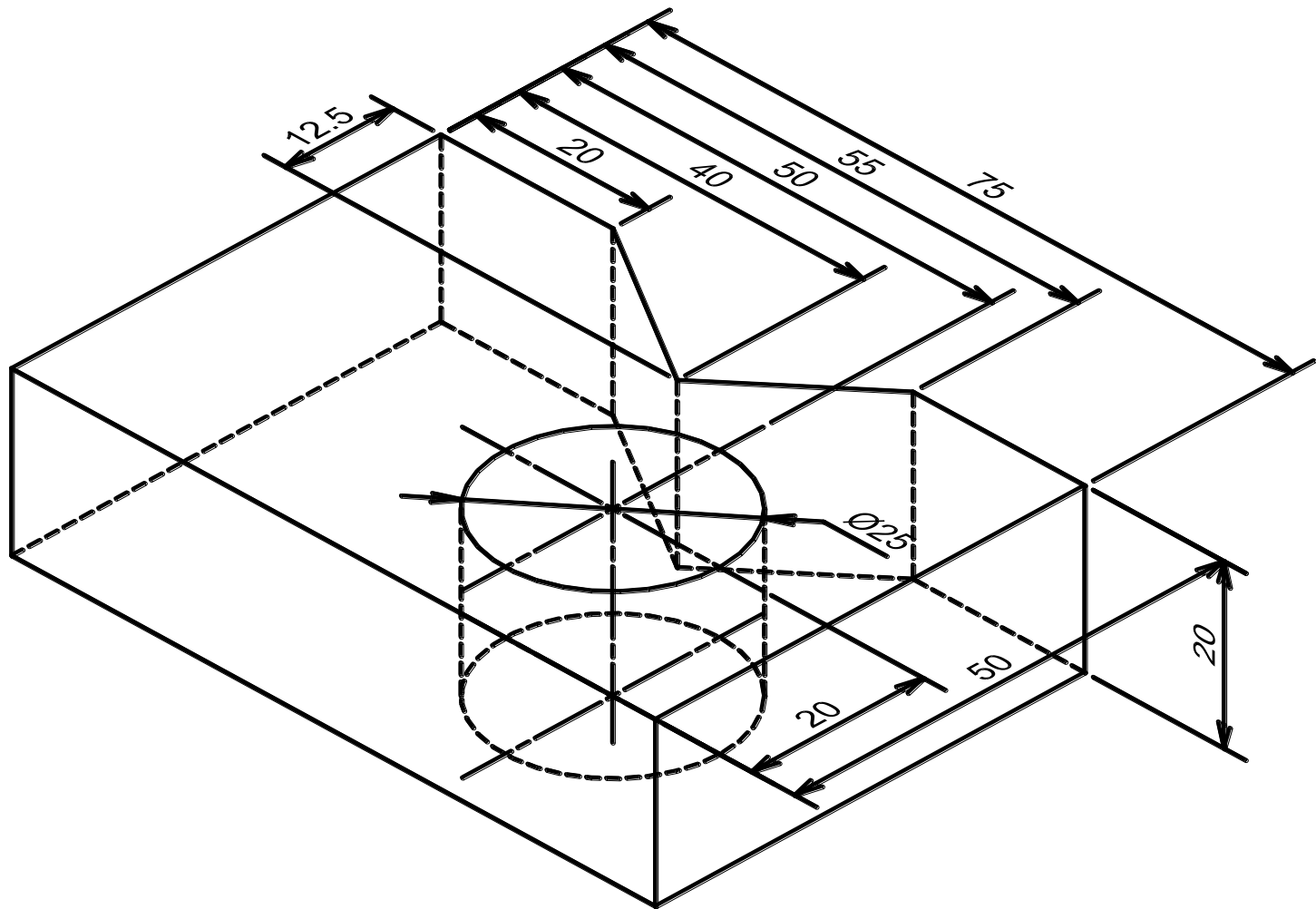


Types of Lines used in Engineering Drawing:



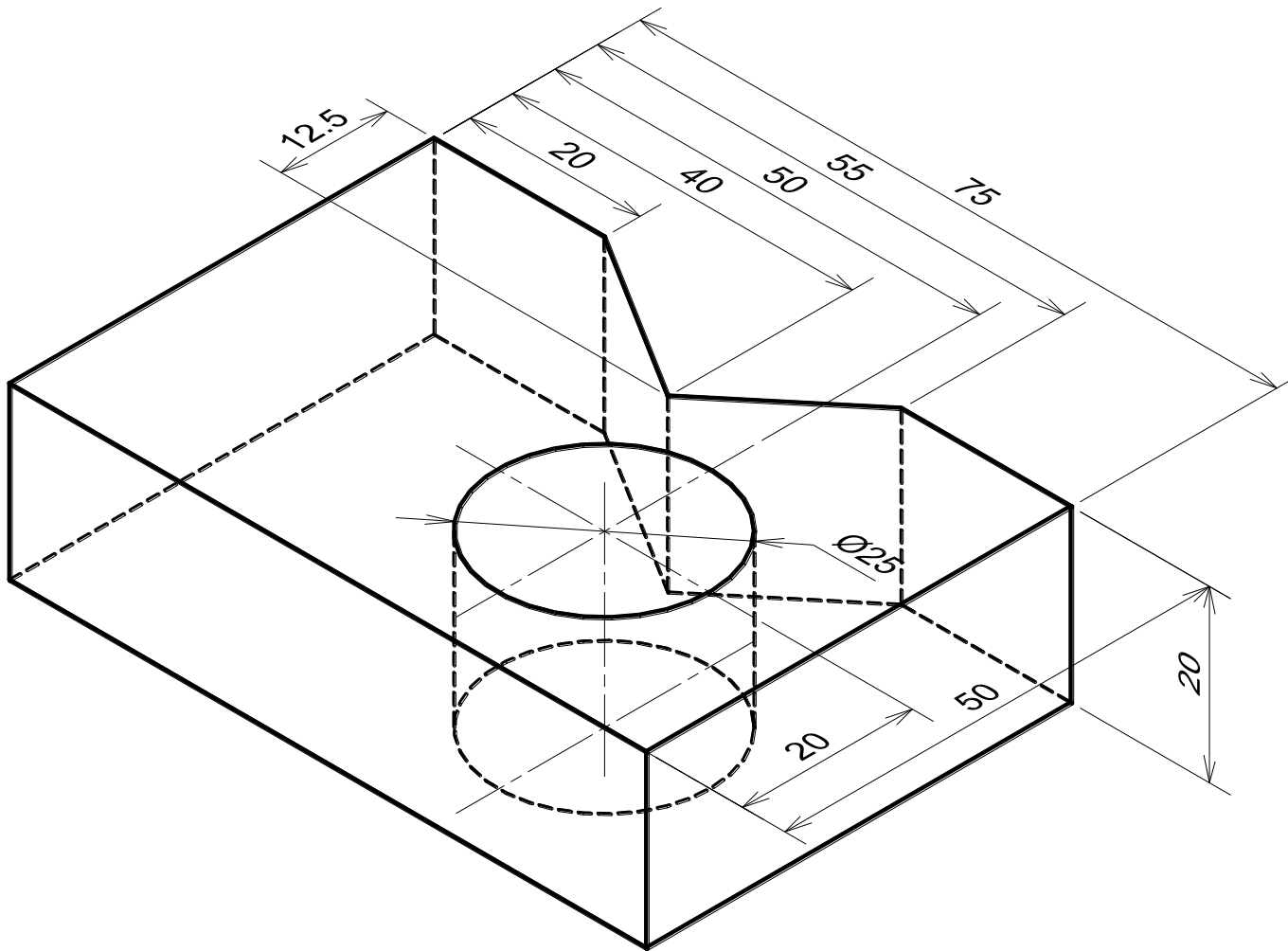


Types of Lines used in Engineering Drawing:





Types of Lines used in Engineering Drawing:



BASICS OF LETTERING

1. NEED FOR LETTERING

Lettering is needed for

- **Dimensions of parts**
- **Notes relating to the manufacture of parts**
- **Descriptive titles.**

Shall be

- **Highly legible**
- **Uniform**
- **Capable of being done rapidly**

2. CONSIDERATIONS FOR GOOD LETTERING

A. General Proportions

- No specific standard for the proportions of letters
- Proportion of width to the height of letters varies.

B. The Rule of Stability

- In order to give the appearance of stability, letters as B, E, K, S, X, and Z and the digits 3 and 8 must be drawn smaller at the top than at the bottom.

C. Guide Lines

- Always draw light guide lines for both tops and bottoms of letters. A very sharp pencil shall be used for the purpose.

D. Styles of Lettering

- No specific standard for the style of lettering
- Styles shall be simple and clear to facilitate the reading of a drawing.
- TIME-CONSUMING LETTERING STYLE should be avoided.
- AN EFFICIENT LETTERING STYLE
- **A LIMITED-USE LETTERING STYLE**

E. Size of Lettering

- Shall be at least 0.125 in (3.00 mm) high

F. Aspect Ratio

- The width/height ratio
- No specific standard

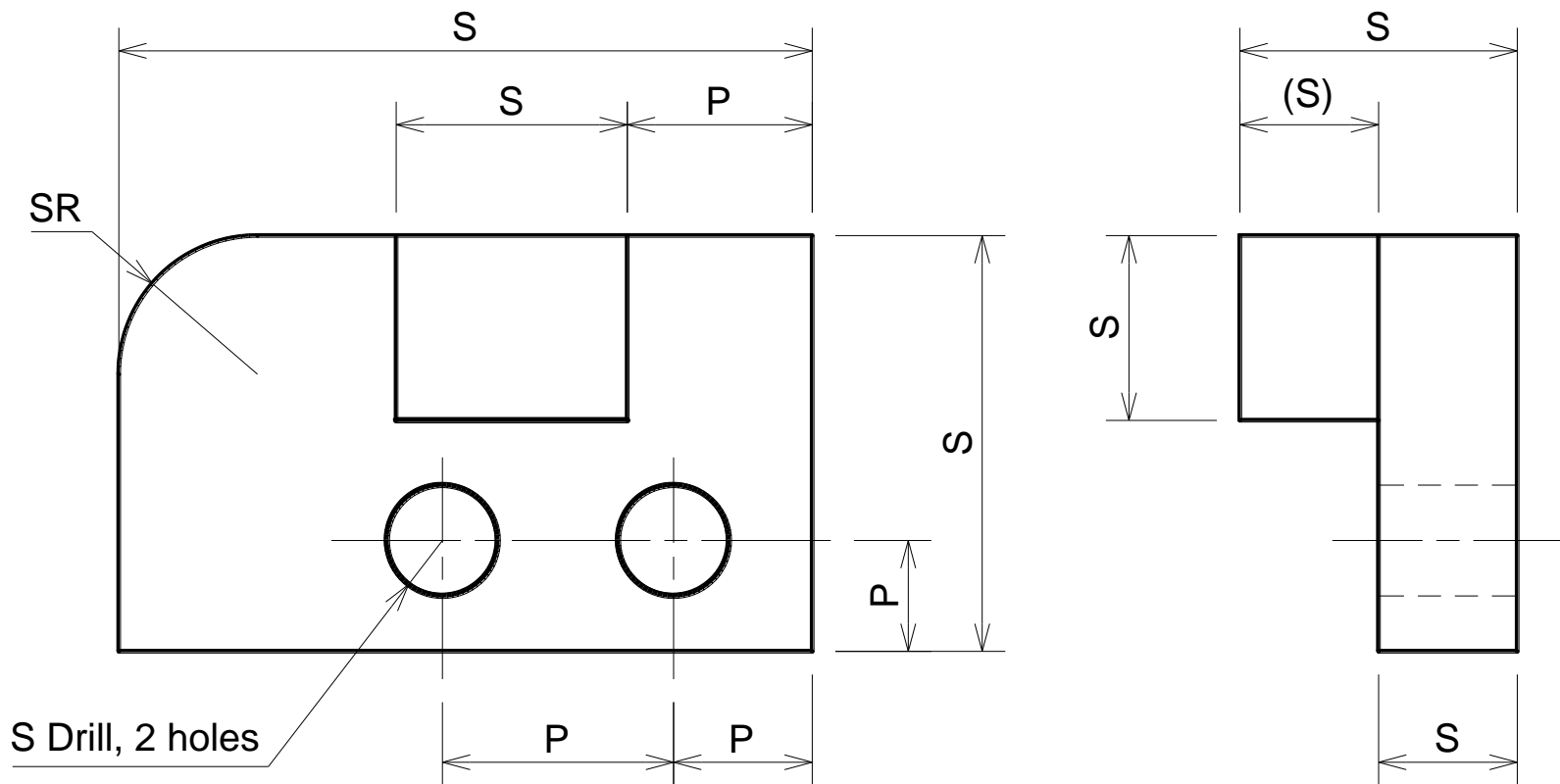
THEORY OF DEMINSIONING

1. PURPOSE OF DIMENSIONING

- To provide exact information on the size and position of each feature of the part for production purposes.

2. SIZE VS. POSITION DIMENSIONS

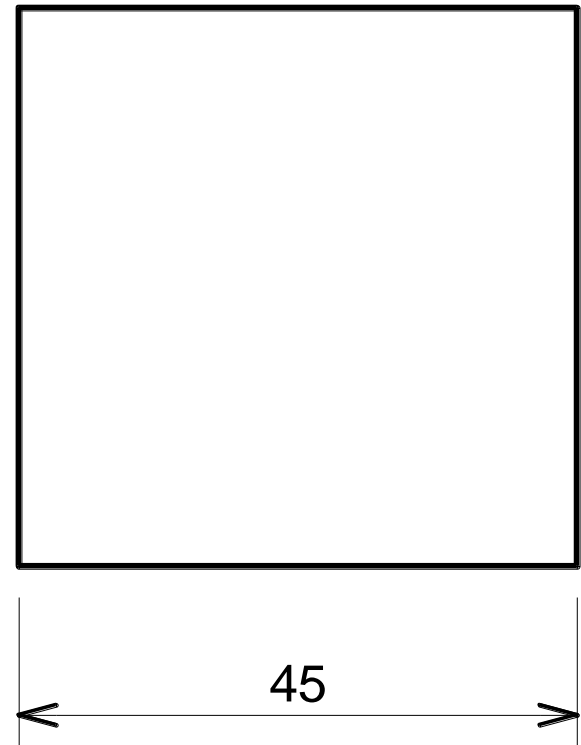
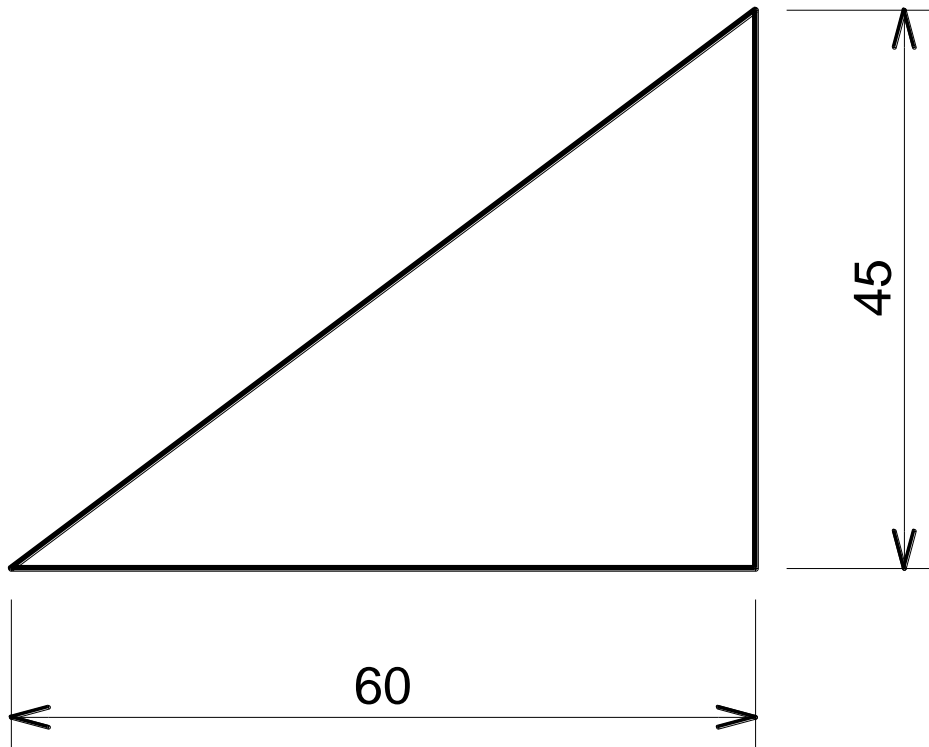
- Dimensions can be classified as those for size or position.
- Each feature shall be dimensioned and positioned only once.
- Each feature shall be dimensioned and positioned where its shape is shown.



Dimensions of size and position. S indicates size, P position

3. BASIC EXAMPLES OF DIMENSIONS OF SIZE AND POSITION

Each of the geometric shapes making up the object must have its height, width, and depth indicated in the dimensioning.



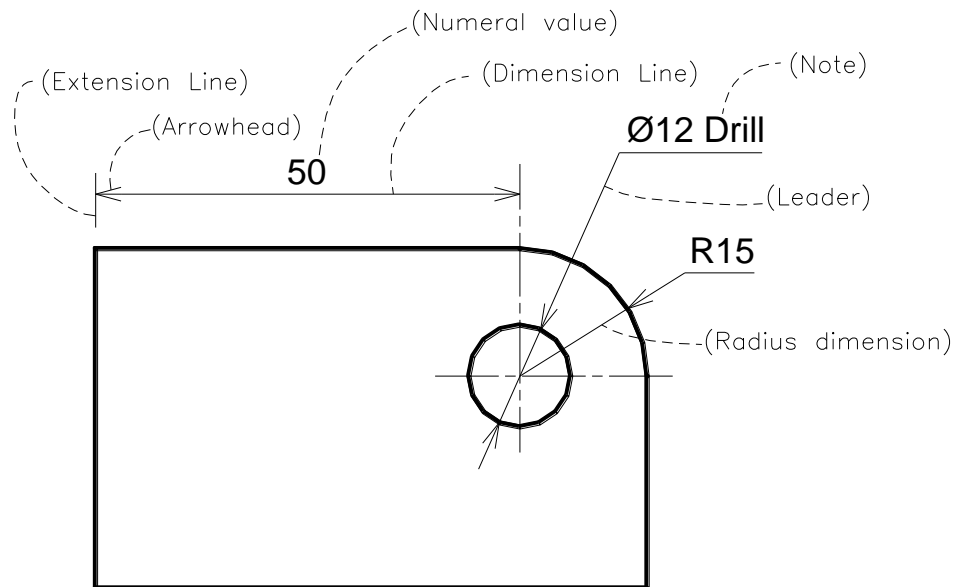
DIMENSIONING TECHNIQUES AND CONVENTIONS

1. USE OF SCALE

- A part may be drawn to any convenient scale.
- The scale must be indicated in an easily seen area of the working drawing, often in the title block. If a sheet of drawing has more than one scale used, then the scale shall be mentioned next to the relevant view.
- The dimensions placed on the part are always actual size dimensions.

2. DIMENSIONS AND NOTES

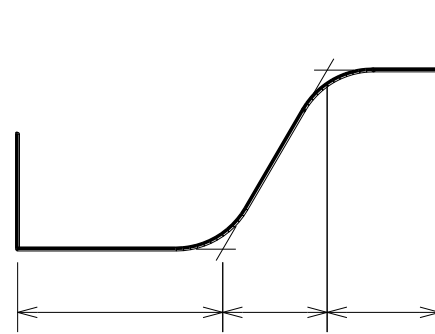
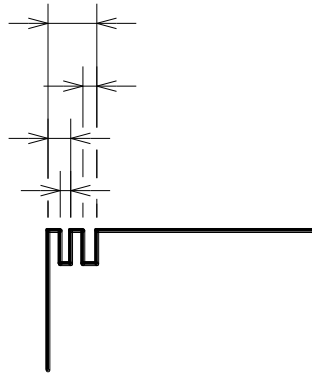
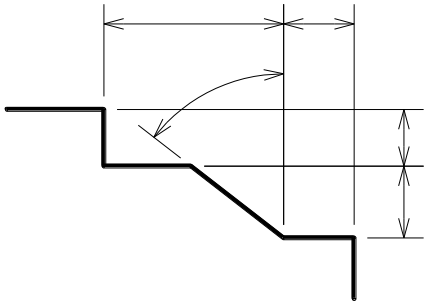
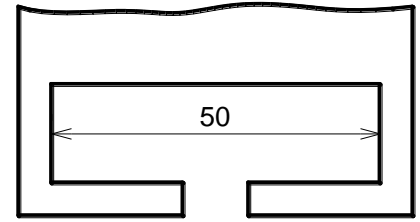
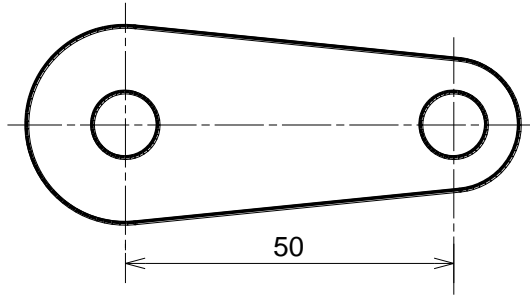
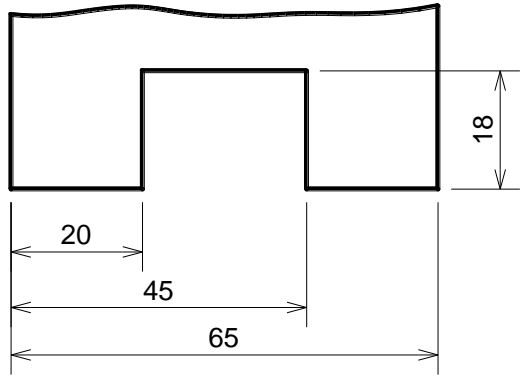
- Distances can be given as either dimensions or notes.
- Specific notes have a leader and shall be placed close to the feature to which they apply.
- General notes do not require a leader and should be grouped together above the title block.



3. EXTENSION LINES AND LEADERS

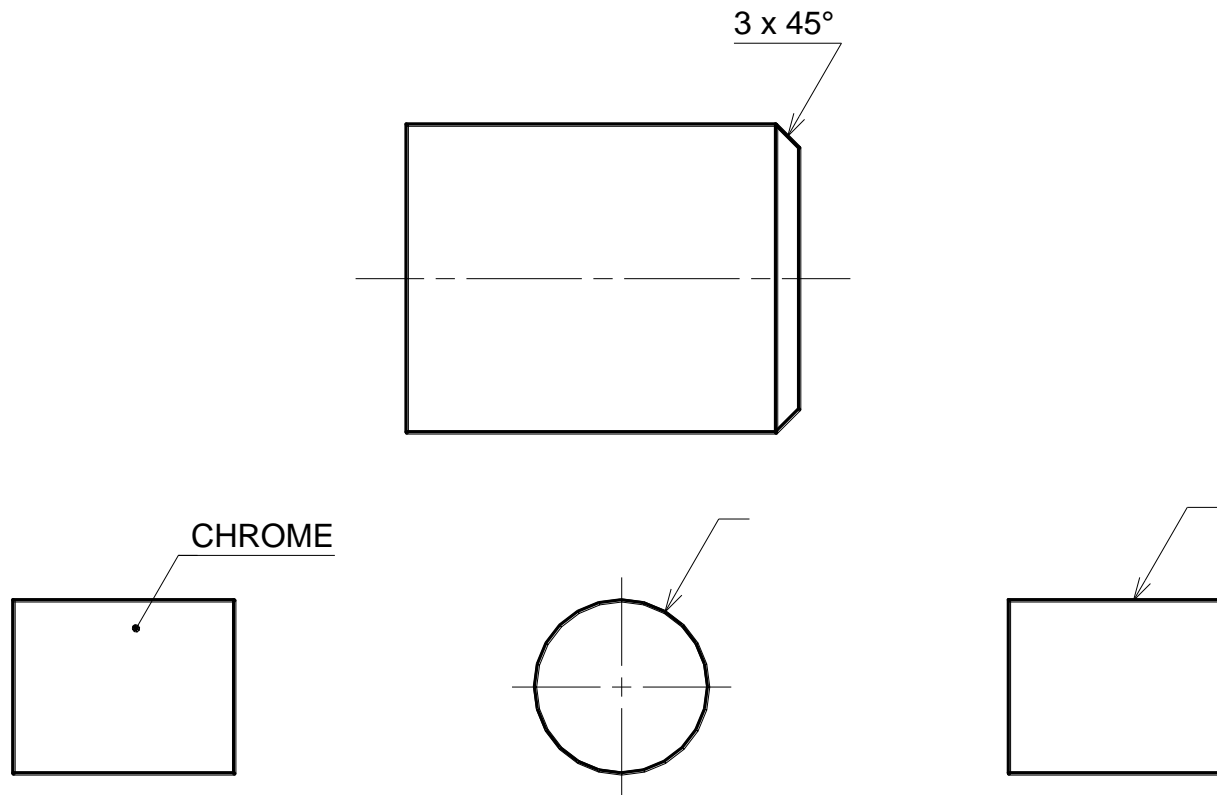
A. Extension Lines

- Shall not touch the outline of the view. There shall be an offset of about 1.5 to 2 mm from the origin.
- Shall extend 2.5 to 3 mm beyond the last dimension line.
- Dimensions may also terminate at center lines or visible outlines of the view.
- Center lines are extended to serve as extension lines where the distance between centers is to be shown.
- Extension lines for an angular dimension can be used to place linear dimensions.
- Extension shall not be broken where they cross each other or an outline of a view. When space is restricted and extension lines come close to arrowheads, the extension lines may be broken for clarity.
- Where a point is located by extension lines alone, the extension lines should pass through the point.



A. Leaders

- Leaders are straight (not curved) lines leading from a dimension value or an explanatory note to the feature on the drawing to which the note applies.
- Arrowhead is used at the pointing end of the leader.
- Shall be drawn at an angle to the principal lines of the drawing.



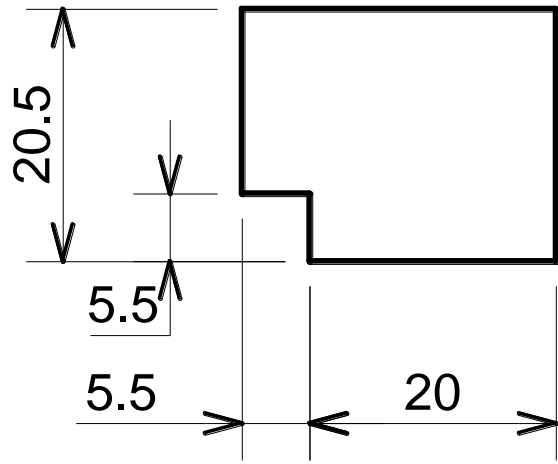
4. LINE WEIGHTS AND ARROWHEADS

- Line weights for the dimension lines and extension lines shall be 0.2 mm to 0.25 mm.
- Arrowheads shall be darker in appearance than the extension lines and dimension lines. Both open 30° and closed filled can be used.
- Arrowheads shall be about 3 mm long and shall have a consistent size and appearance throughout the drawing.

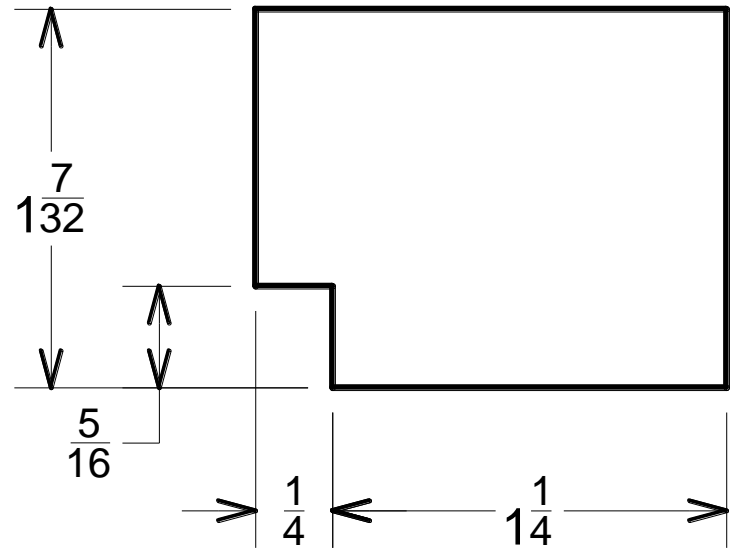
5. DIMENSION TEXT

- Dimension text shall be about 3 mm high.
- In the BSI and ANSI methods the text is placed horizontal between the dimension line.
- In the ISO methods the text is always placed above the dimension line. The text must be aligned to the dimension line if it is written between the extension lines. If however, it is written outside, then it shall be horizontal.
- In the BSI and ANSI methods, if arrows are placed outside, then dimension line shall not be drawn between the extension lines.
- In the ISO methods, the dimension line shall always be drawn.

ISO



ANSI



**These topics can also be covered from Engg.
Drawing book, Chapter 3.**