DEFINITION

Dimensioning is the process of specifying part' s information by using of **figures, symbols** and **notes**.

This information are such as:

1. Sizes and locations of features
2. Number required
3. Size and geometric tolerances

DIMENSIONING COMPONENTS

- Extension lines
- Dimension lines
  (with arrowheads)
- Leader lines

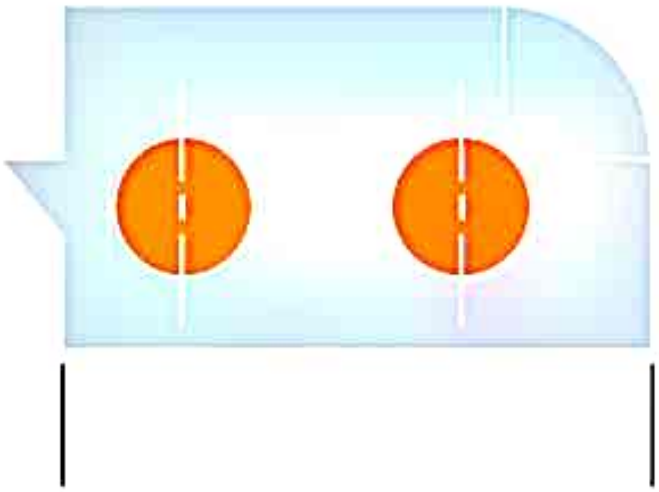
→ Drawn with 4H pencil

- Dimension figures
- Notes :
  - *local note*
  - *general note*

→ Lettered with 2H pencil.

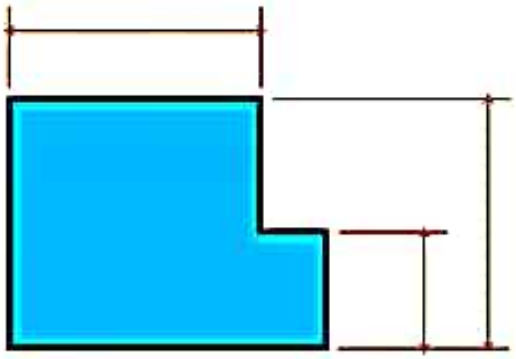
EXTENSION LINES

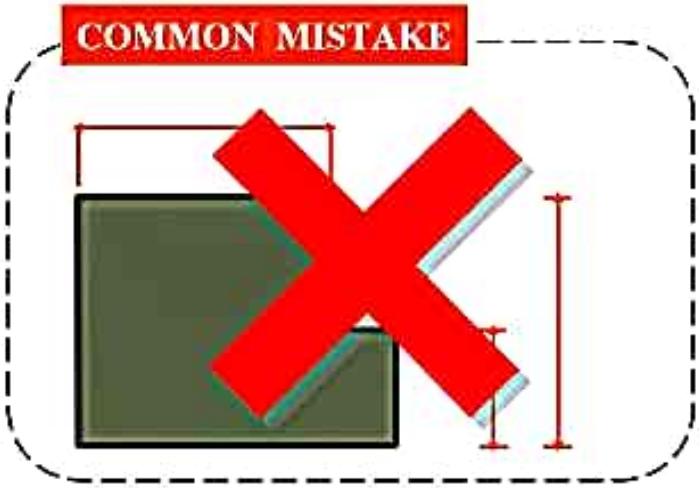
It indicate the location on the object's features that are dimensioned.



EXTENSION LINES

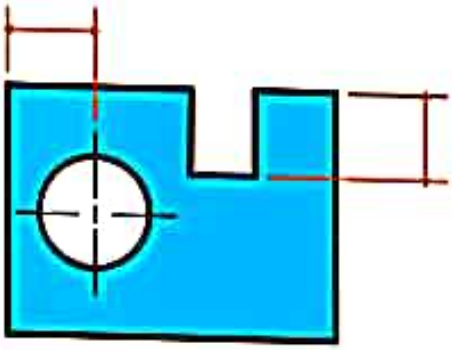
- Leave a **visible gap** (≈ 1 mm) from a view and start drawing an extension line.
- Extend the lines beyond the (last) dimension line 1-2 mm.

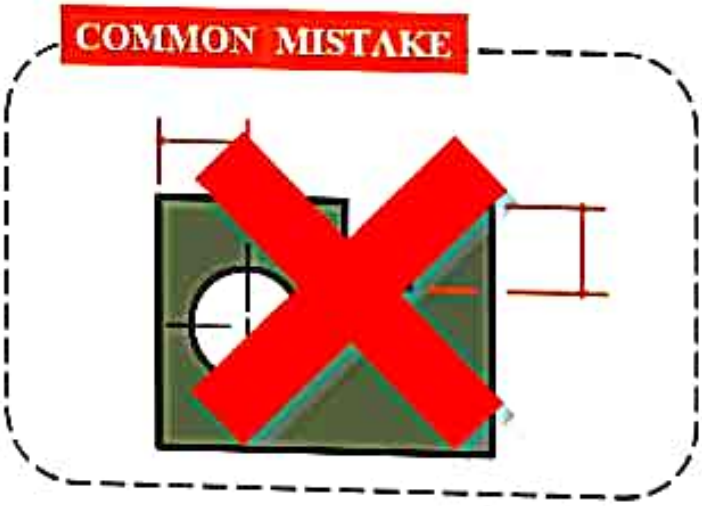




EXTENSION LINES

- **Do not break the lines as they cross object lines.**

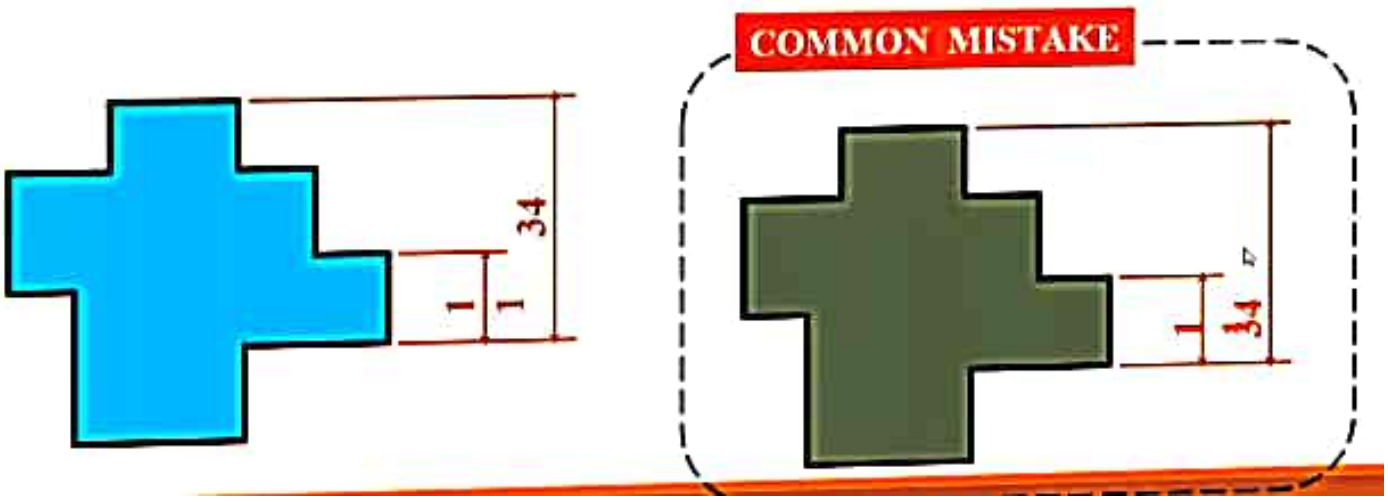




DIMENSION FIGURES

- The height of figures is suggested to be 2.5~3 mm.

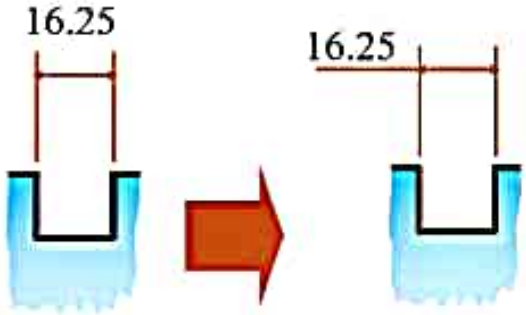
- Place the numbers at about 1 mm *above dimension line* and *between extension lines*.



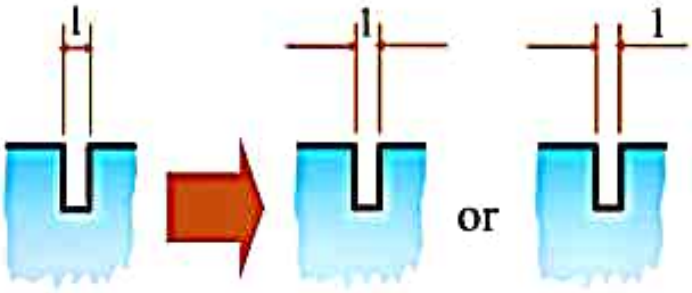
DIMENSION FIGURES

- When there is **not** enough space for figure or arrows, put it **outside** either of the extension lines.

Not enough space for ***figures***



Not enough space for ***arrows***



DIMENSION FIGURES : UNITS

The ISO standards adopt the unit of

- **Length** dimension in **millimeters without** specifying a unit symbol "mm".

- **Angular dimension in degree** with a symbol "°" place behind the figures (and if necessary **minutes** and **seconds** may be used together).

DIMENSION FIGURES : ORIENTATION

1. Aligned method

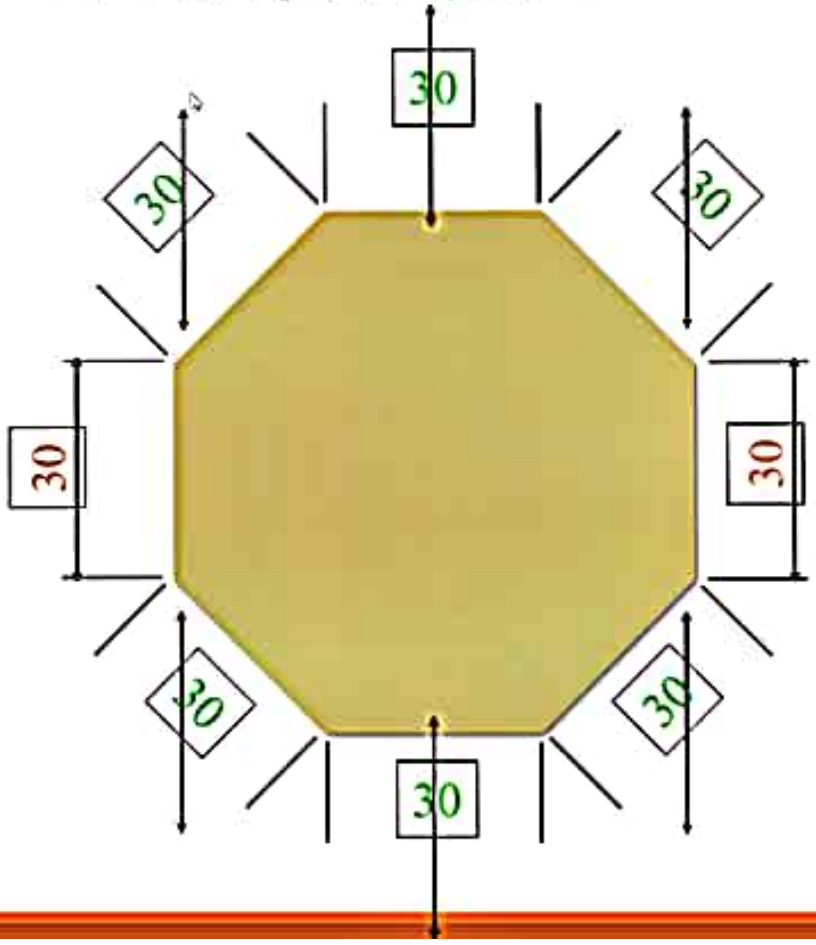
The dimension figures are placed so that they are readable from the **bottom** and **right side** of the drawing.

2. Unidirectional method

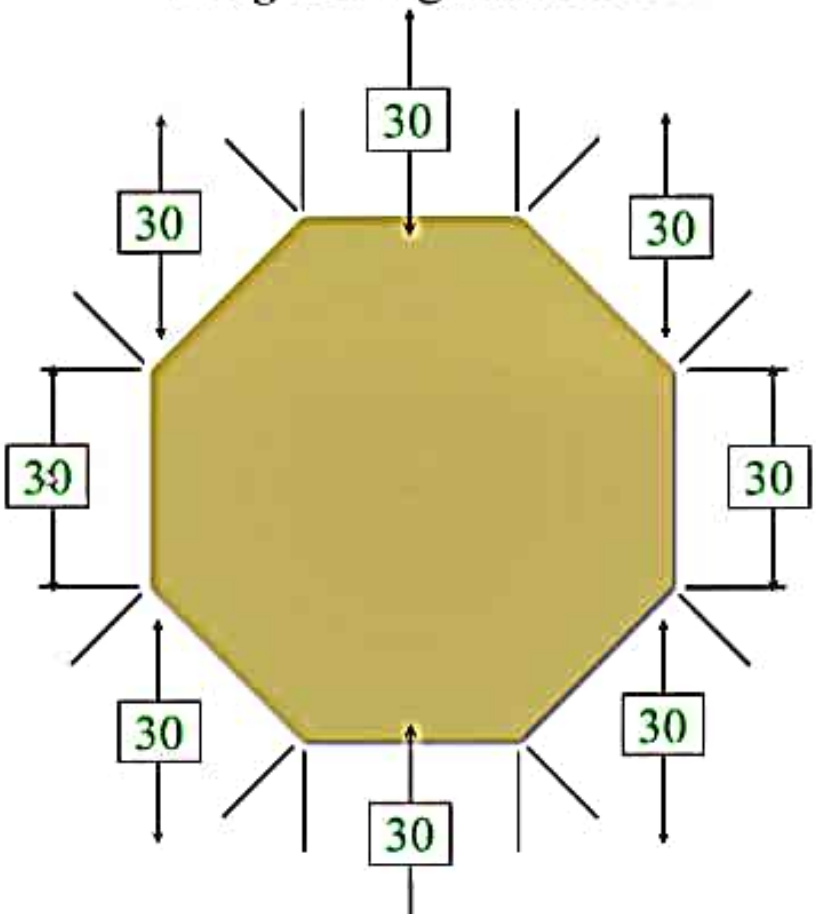
The dimension figures are placed so that they can be read from the **bottom** of the drawing.

Do not use both system on the same drawing or on the same series of drawing

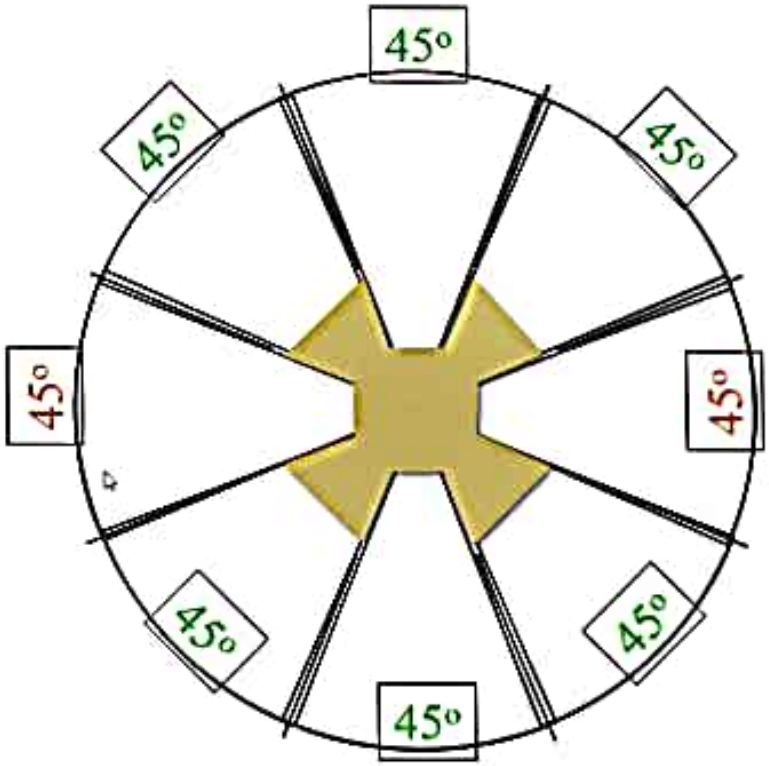
EXAMPLE : Dimension of ***length*** using ***aligned*** method.



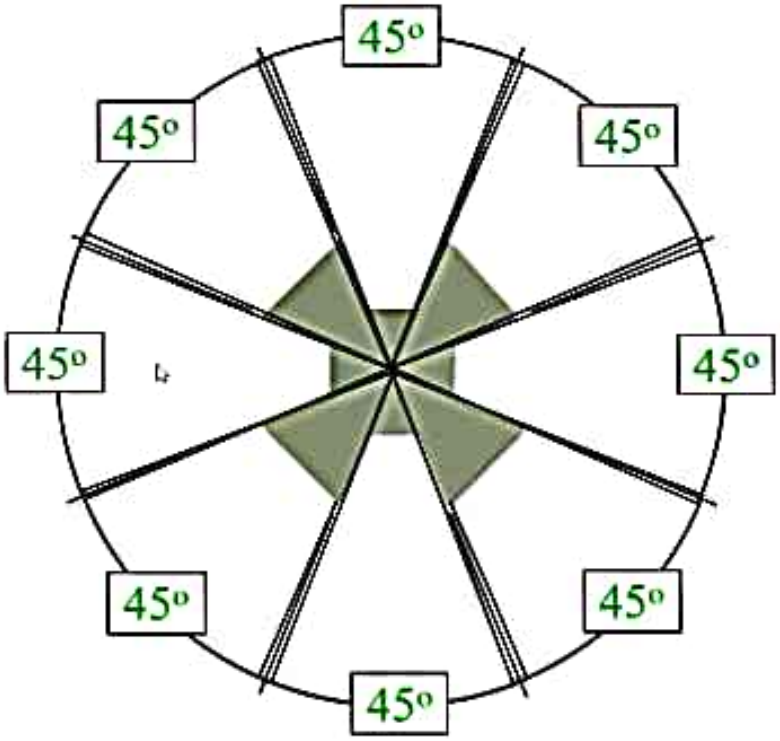
EXAMPLE : Dimension of ***length*** using ***unidirectional*** method.



EXAMPLE : Dimension of ***angle*** using ***aligned*** method.

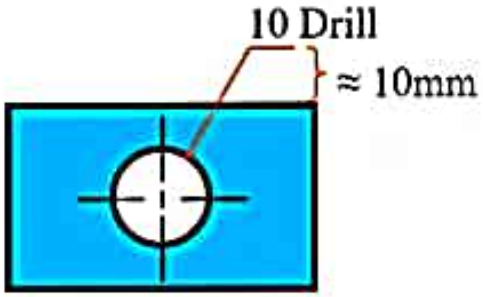


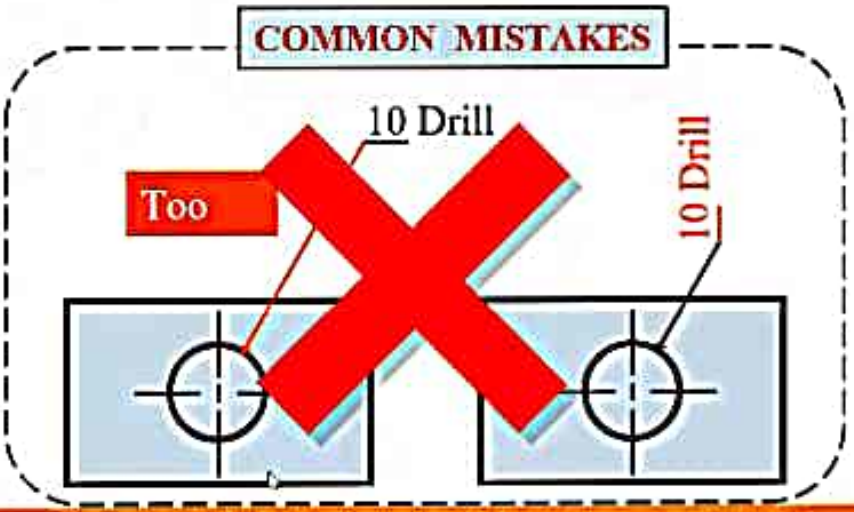
EXAMPLE : Dimension of ***angle*** using ***unidirectional*** method.



LOCAL NOTES

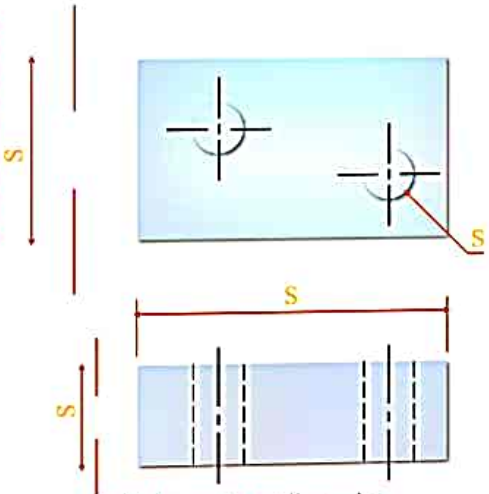
- Place the notes **near** to the feature which they apply, and should be placed outside the view.
- Always read **horizontally.**





EXAMPLE

Designed part



To manufacture this part we need to know…

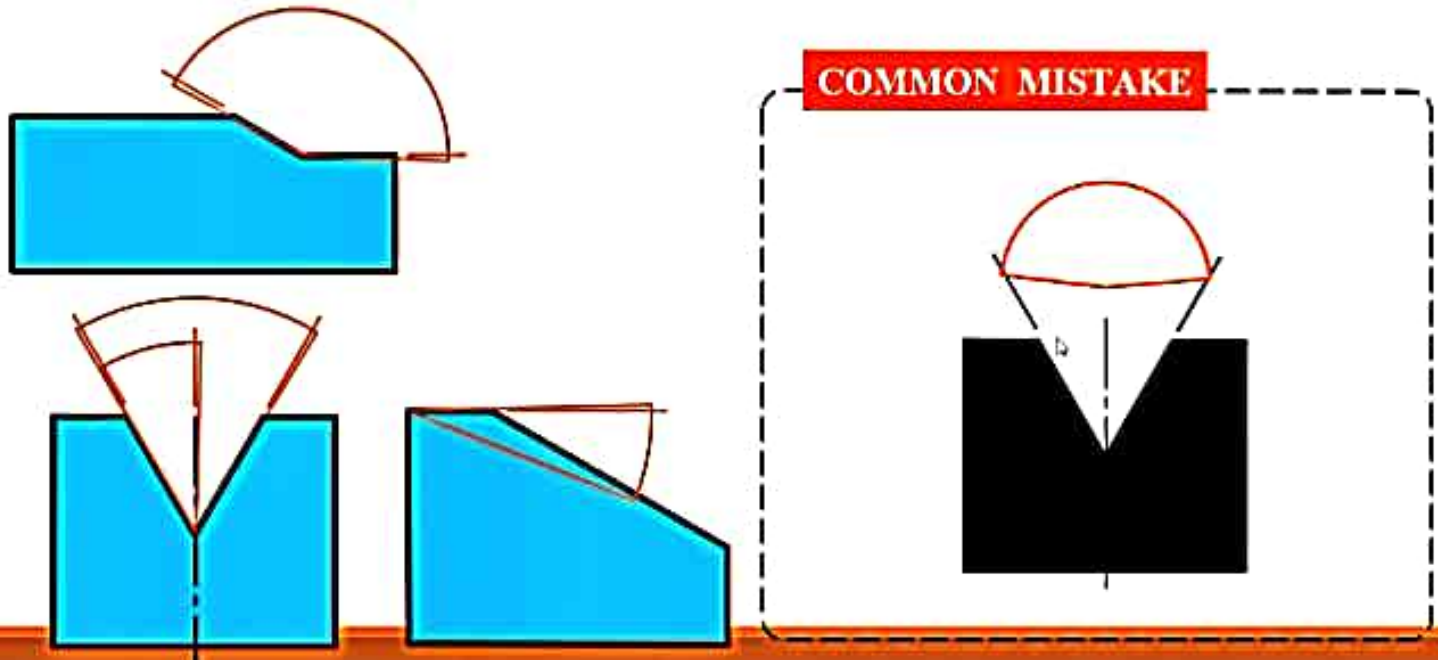
1. **Width, depth** and **thickness** of the part.
2. **Diameter** and **depth** of the hole.
3. **Location** of the holes.

"S" denotes size dimension.

"L" denotes location dimension.

ANGLE

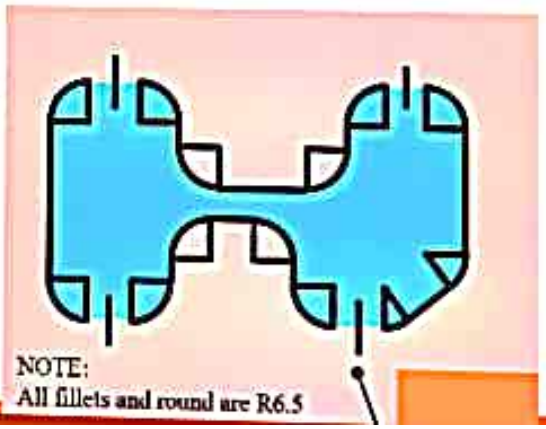
To dimension an angle use **circular dimension line** having the center at the vertex of the angle.



FILLETS AND ROUNDS

- Give the radius of a typical fillet only by using a ***local*** note.

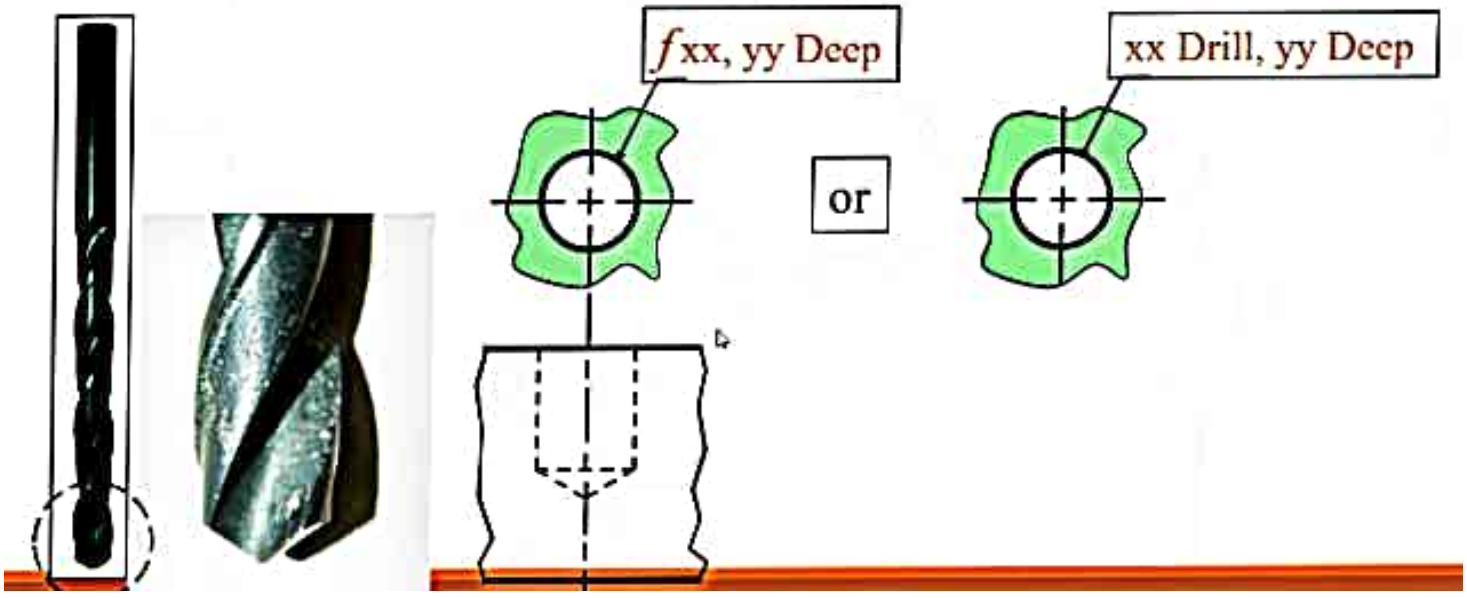
- If all fillets and rounds are uniform in size, dimension may be omitted, but it is necessary to add the note " All fillets and round are Rxx. "



HOLES : SMALL SIZE

- Use leader line and local note to specify **diameter** and **hole's depth** in the circular view.

2) Blind hole

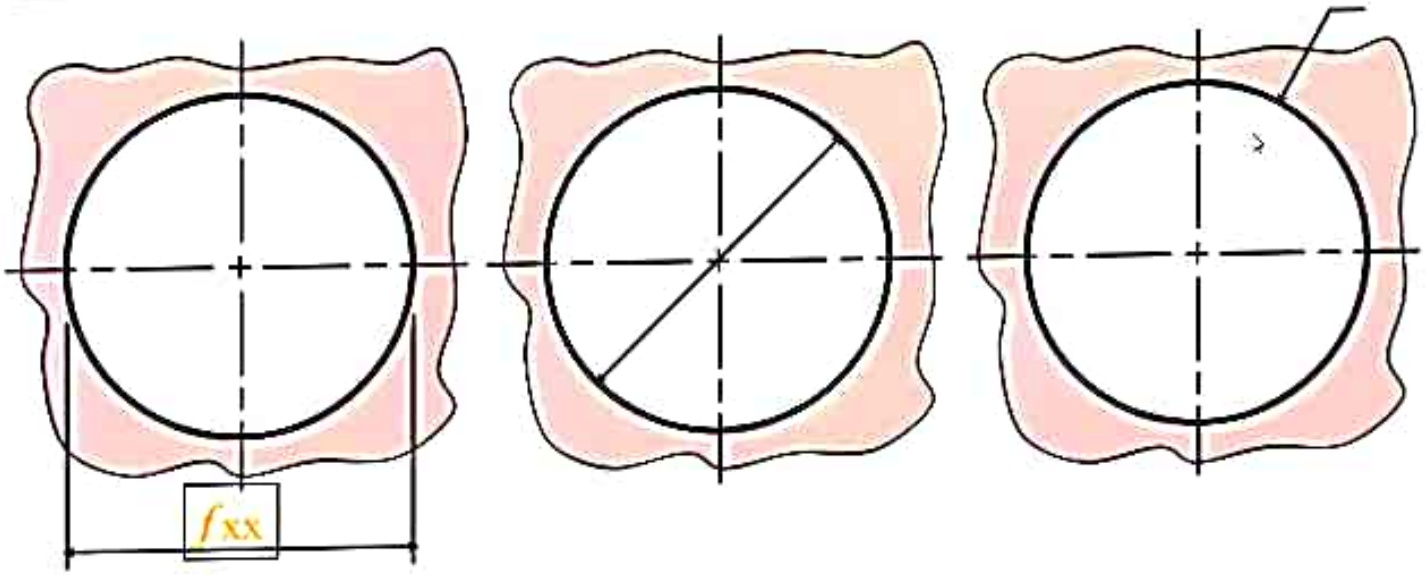


HOLES : LARGE SIZE

Use extension and dimension lines

Use diametral dimension line

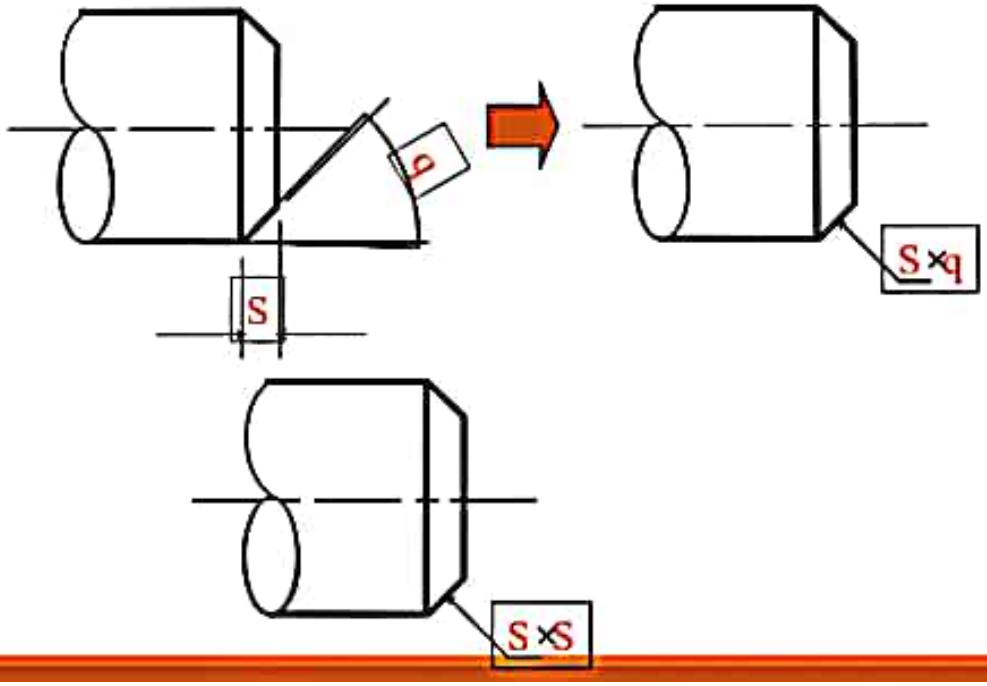
Use leader line and note



CHAMFER

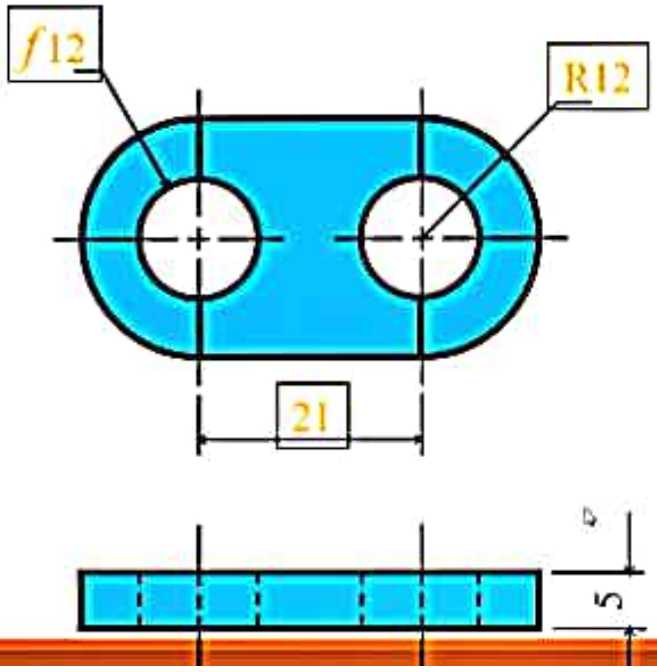
- Use leader line and note to indicate **linear distance** and **angle** of the chamfer.

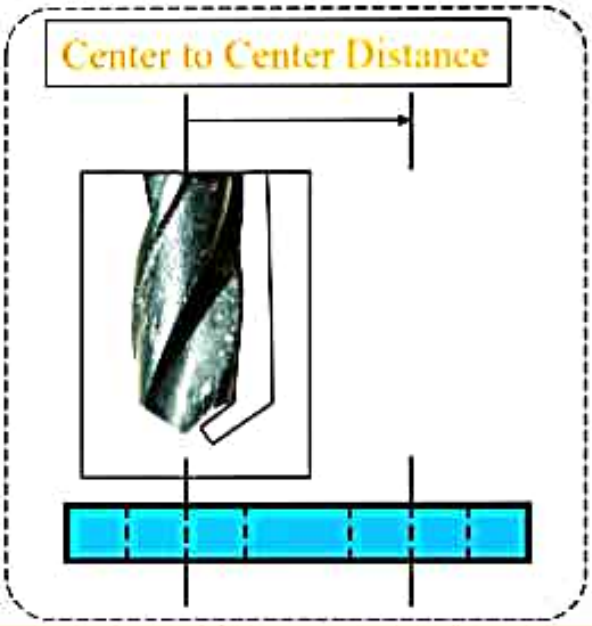
For a 45° chamfer



ROUNDED-END SHAPES

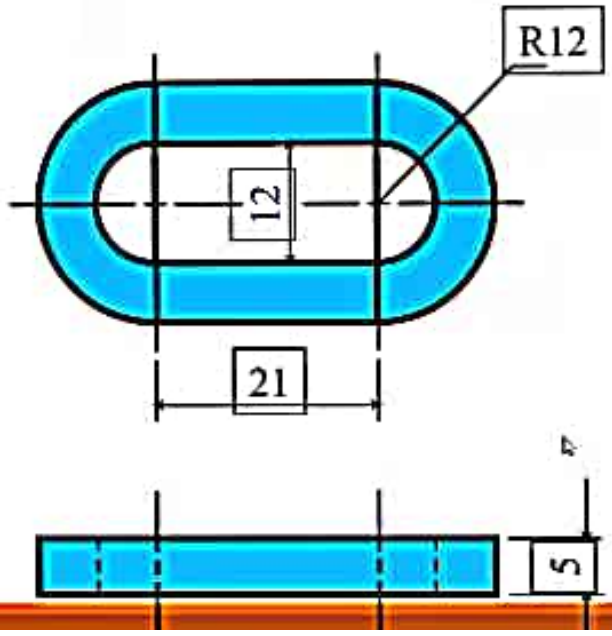
- Dimensioned according to the manufacturing method used.

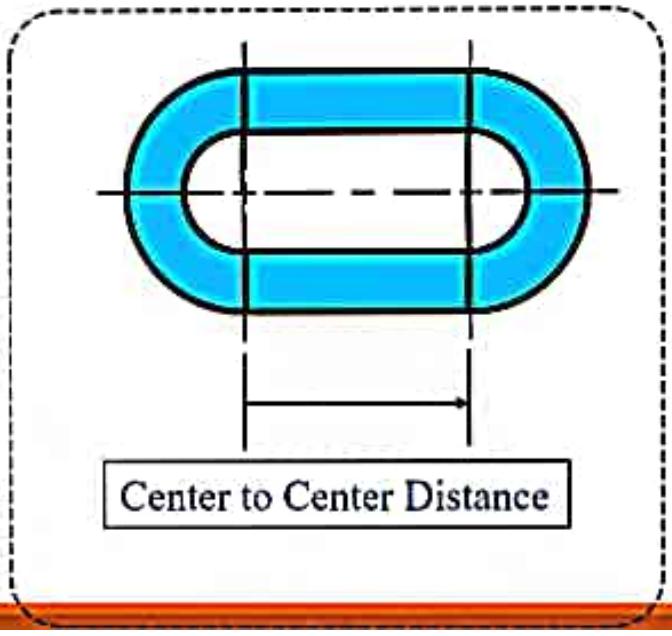




ROUNDED-END SHAPES

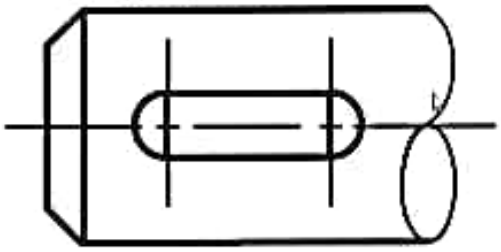
- Dimensioned according to the manufacturing method used.

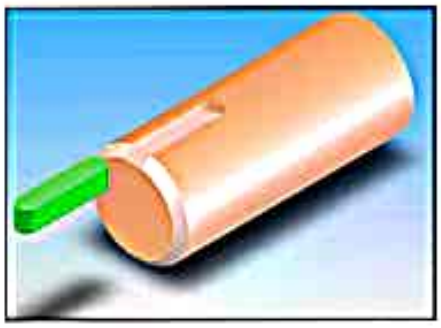


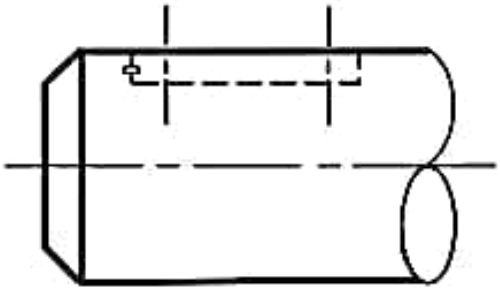


ROUNDED-END SHAPES

- Dimensioned according to the **standard sizes** of another part to be assembled or manufacturing method used.



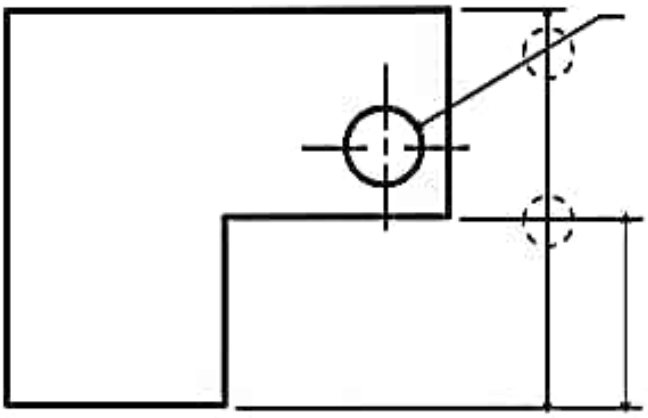




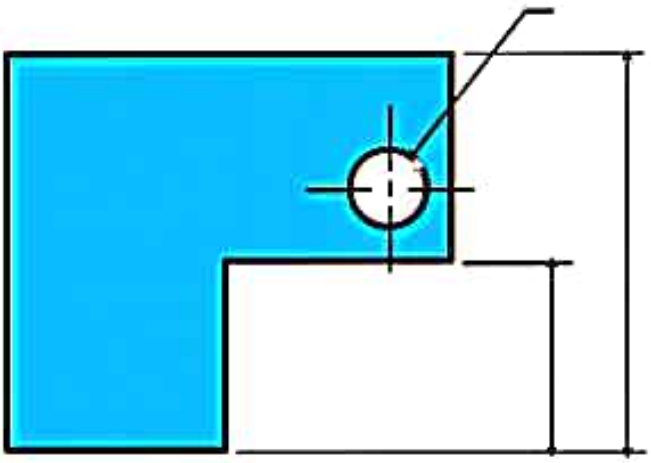
RECOMMENDED PRACTICE

1. Dimension lines, leader lines **should not** cross dimension lines.

POOR



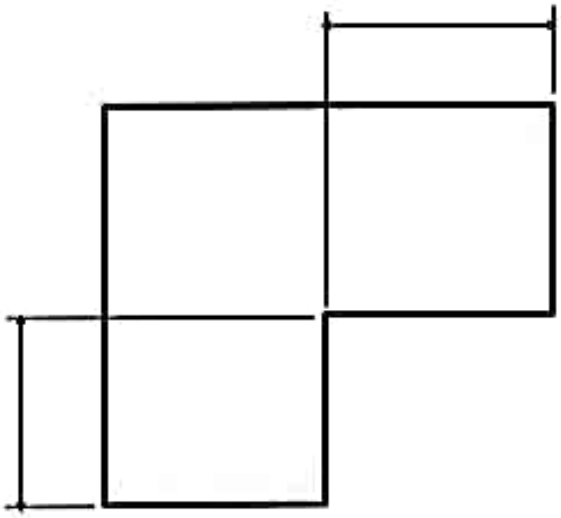
GOOD



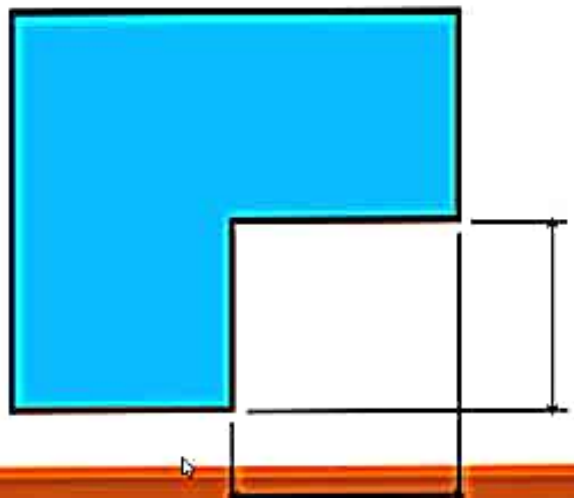
RECOMMENDED PRACTICE

2. Extension lines **should be** drawn from the nearest points to be dimensioned.

POOR



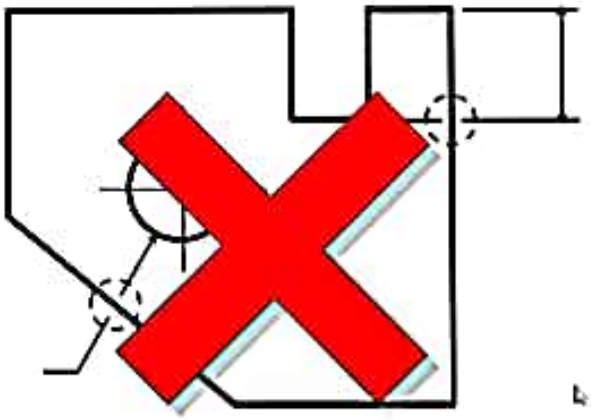
GOOD



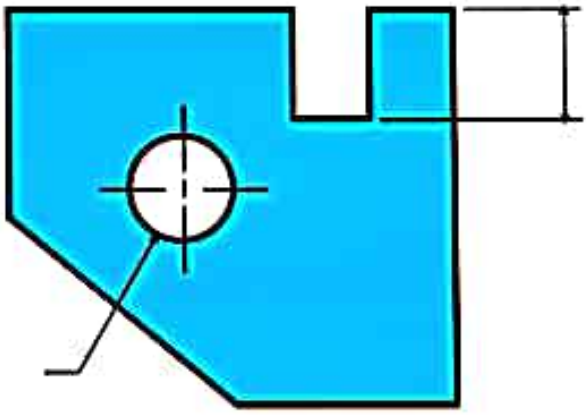
RECOMMENDED PRACTICE

3. Extension lines of internal feature **can** cross visible lines **without** leaving a gap at the intersection point.

WRONG



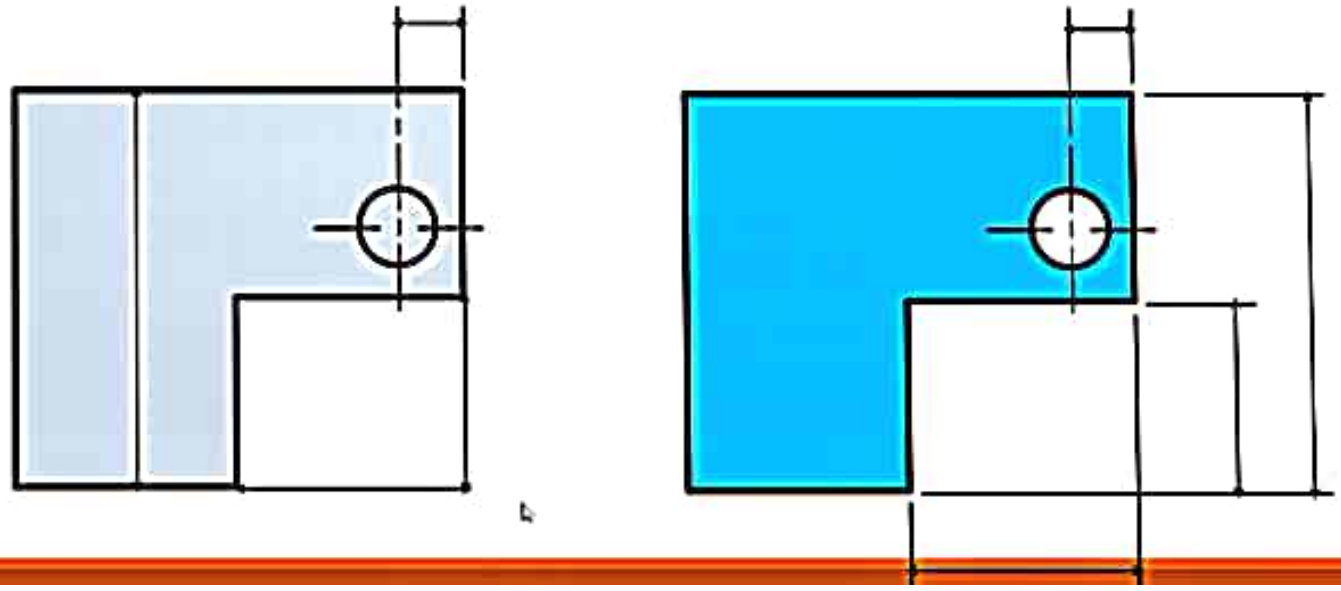
CORRECT



RECOMMENDED PRACTICE

4. **Do not** use object line, center line, and dimension line as an extension lines.

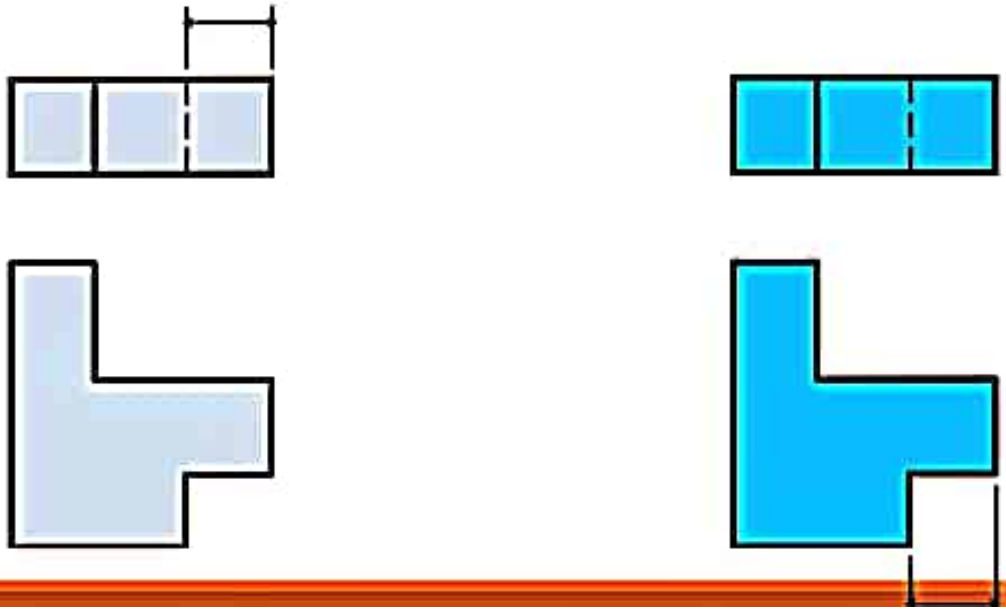
POOR



RECOMMENDED PRACTICE

*5. **Avoid** dimensioning hidden lines.*

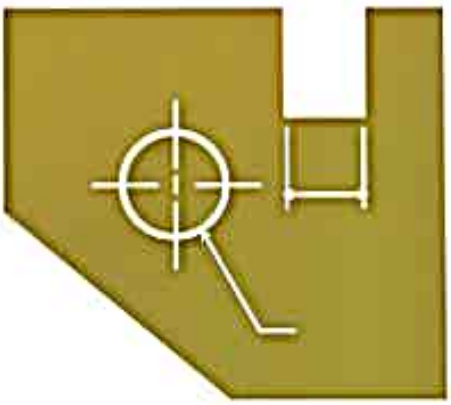
POOR



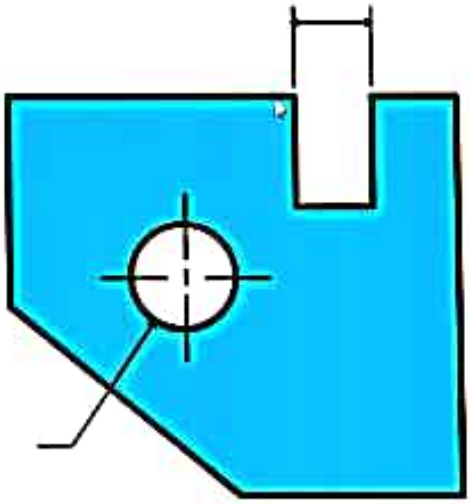
RECOMMENDED PRACTICE

6. Place dimensions **outside** the view, unless placing them inside improve the clarity.

POOR



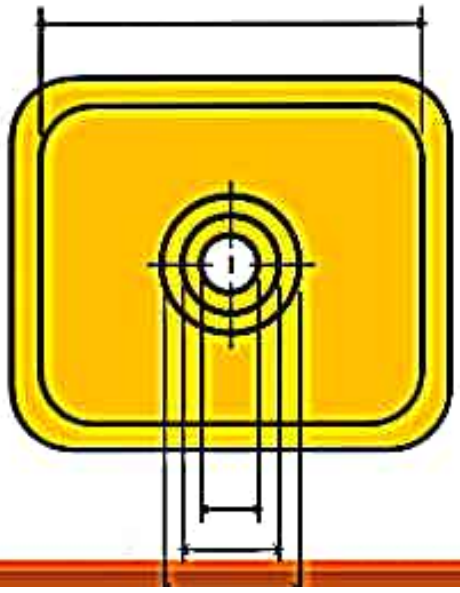
GOOD

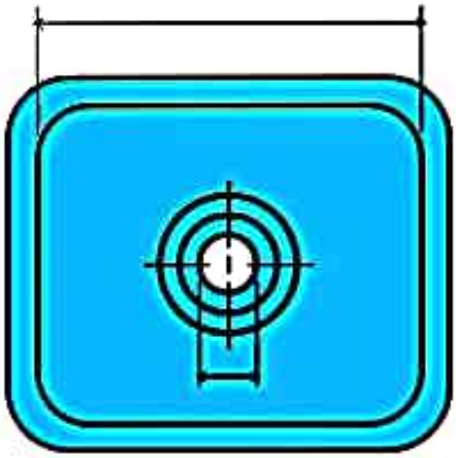


RECOMMENDED PRACTICE

6. Place dimensions **outside** the view, unless placing them inside improve the clarity.

JUST OK !!!

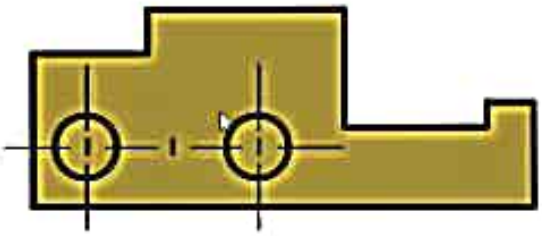




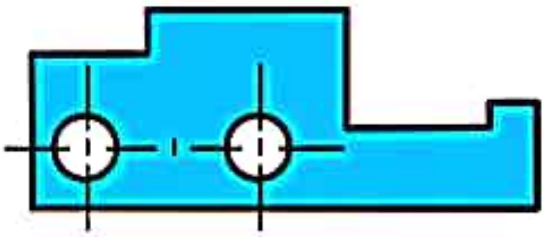
RECOMMENDED PRACTICE

7. Dimension lines should be lined up and grouped together as much as possible.

POOR



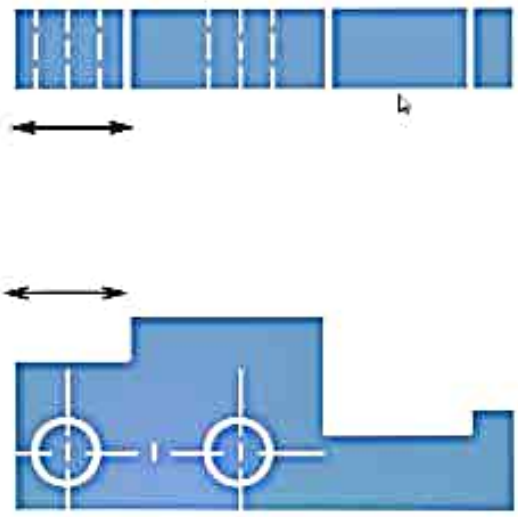
GOOD



RECOMMENDED PRACTICE

8. **Do not** repeat a dimension.

POOR



GOOD