

- Axis of symmetry
- Location of first dimension string
- Number of dimensions in a single orthographic view
- Principle dimensions
- Standard text height
- Rules of dimension placement
 - Over an object
 - Parallel dimension lines
- Fraction height
- Dimension line spacing.
- Dimension types
 - Location
 - Size
- Dimension line definition
- Crossing dimension lines
- Number of feature dimensions allowed
- Dimensioning rules
 - To what
 - From what
 - Use of center lines
 - Arrowheads
- Leaders
 - Start
 - Angle
- Crossing of extension and dimension lines
- Extension line definition
- Dimensions and true shape

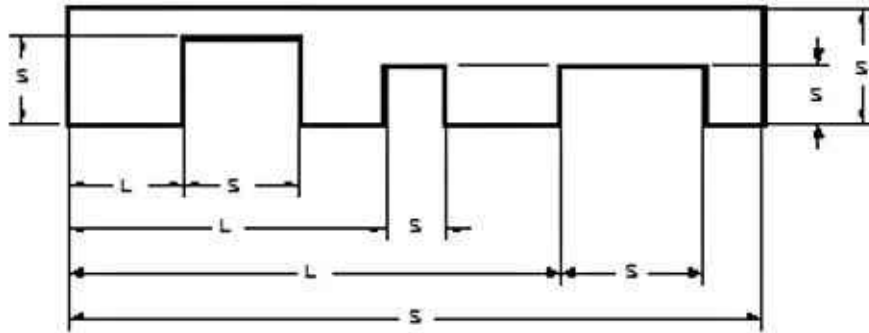
- Axis of symmetry
- Notes
- Staggered dimensions
- Reference dimension
- Extension line
- Dimension line
- Feature
- Center line
- Arrowhead
- Leader
- Dimensional tolerance
- Diameter
- Radius

4X Ø (SIZE) B' ONLY SPACED (XX)

Technical drawing of a rectangular plate with four holes. The plate has a total length of S and a width of L . The four holes are arranged in a horizontal line. The distance from the left edge to the center of the first hole is L . The distance between the centers of adjacent holes is S . The distance from the center of the last hole to the right edge is S . The holes are labeled "4X Ø (SIZE) B' ONLY SPACED (XX)".

S=size
L=location

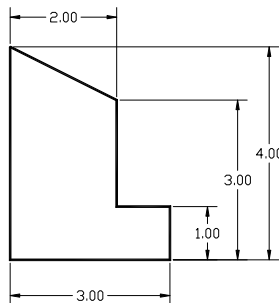
SIZE vs LOCATION DIMENSIONS



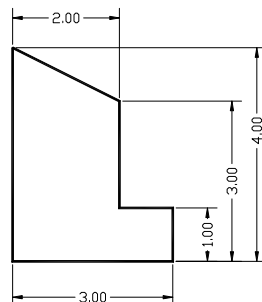
S=size L=location

Dimensioning Systems

- **Unidirectional** – All dimensions read from the bottom of the drawing sheet.



- **Aligned** – Dimensions aligned with the dimension line. Dimensions read from the bottom and right side of the drawing sheet.



Dimensioning Geometry

- Review the proper methods of dimensioning arcs, angles, chamfers, counterbores, slots etc.

Standard Dimensioning Rules

- Dimensions should be given between features, which have functional relationships.
- Dimensions should be given that control the relationship of mating parts.
- Dimension and extension lines should not cross.
- Dimension lines should not cross each other.
- Cylindrical features should be located by their centerlines.
- Cylindrical features should be located in the circular view.
- Extension lines from dimensions and centerlines should not extend between two views. (auxiliary view ex.)
- Notes should always be lettered horizontally on the drawing sheet.
- A cylindrical feature should be dimensioned with its length and diameter in the rectangular view.
- Dimensions should be given to finished surfaces if at all possible.
- Dimensions should be kept off the views of the object, if possible, to promote drawing clarity.
- Dimensions applying to adjacent views should be placed between the views.
- Dimensional figures should be .125 (3mm) tall.
- A diameter dimension should be preceded by the \varnothing symbol.
- A radius dimension should be preceded by the R symbol.
- Each dimension may appear only one time on a drawing the exception being a reference dimension.
- If possible, dimensions should be given so that the production personnel need not calculate any dimensions.
- Do not scale drawings for production purposes.

Standard Dimensioning Rules

- A dimension on a drawing that is not to scale must be underlined or denoted either NTS or NOT TO SCALE.
- The first dimension on a view should be placed at least .375" away from the view with subsequent dimensions .250" apart.
- The abbreviation TYP (typical) may be used for non-critical repeated features such as fillets or rounds.
- Dimension should be given on the view where the shape of the feature is shown.
- No line of the drawing may be used for, or coincide with, a dimension line.
- The shoulder of a leader must start at either the beginning or the end of a note with the shoulder mid height of the lettering.
- Utilize only those dimensions that are necessary to produce the part.
- Dimensioning to hidden lines is to be avoided.
- Stagger dimensional figures to avoid crowding and poor drawing legibility.
- If dimensional figures must appear in a sectioned area, a clear space should be provided.
- A local note is applied directly to a view of the drawing and supplies manufacturing information.
- A general note applies to the entire drawing.
- Longer dimensions should be placed outside shorter dimensions to avoid crossing dimension and extension lines.
- It is permissible for extension lines to cross extension lines.
- A complete chain of dimensions is to be avoided.
- Finish marks may be omitted if the part is finished all over and a general note or title block note is used.

- Circles should be dimensioned by giving a diameter dimension and arcs by a radius dimension.
- Notes for machining operations should be given in the order they are to be performed.
- All dimensions have a tolerance except those identified as reference, max, min or are commercial stock.

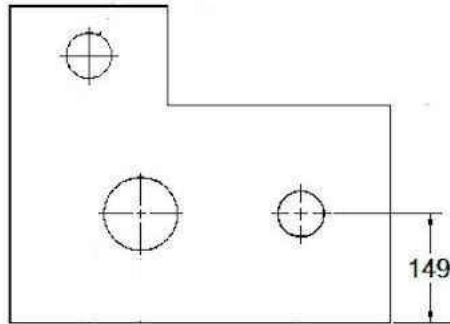
SAMPLE REVIEW QUESTIONS

1. Center lines may be used to indicate an axis of symmetry.
True
False
2. On an orthographic drawing, how many of the objects basic dimensions may be found on a single view?
2
4
3
1
3. Any object has three principle dimensions: height, width and depth.
True
False
4. The standard height of text for notes on a mechanical drawing is .125"
True
False
5. Dimensions should never be staggered.
True
False
6. The length of arrowheads in dimensioning should be equal to the text height.
True
False
7. Dimension lines are always allowed to cross.
True
False

8. Identify dimension #149

Size

Location



9. Center lines can be used as extension lines.

True

False

10. Leader shoulders should always start where, in relation to notes or text?

11. True shape best determines where dimensions are placed.

True

False

12. The point of a line on the drawing to which the dimension applies would be considered the dimension line.

True

False