Dimensioning
A *dimension* is a numerical value that defines the:

- Size and shape
- Position
- Surface texture or
- Geometric characteristic

of a feature
Units

Default dimensional units in most CAD systems:

- Millimeters (mm) in metric system
  - Typically expressed as whole numbers
- Inches in English system
  - Typically expressed to two decimal places
Terminology

- Angular dimension
- A36 steel
- Center line
- Radius symbol
- Visible gap
- Arrow
- Dimension line
- Dimension value
- Leader line
- Diameter symbol
- Extension line
- Reference dimension

60°

30

75

100
Dimensioning Styles

A. Unidirectional

B. Aligned

NOTE: Dimension text heights are typically 3 mm, and are uniform throughout the drawing
Dimension Spacing

6 min
10 min

50
100
15
50

R10
Grouping & Alignment of Dimensions

Uniform grouping and alignment of like dimensions (width, depth, height)
Staggering of Dimensions
Dimension Text (& Arrow) Placement
Multiple Leaders

Multiple leader lines should be parallel
Radial Leader Position

Radial leaders should pass through center of feature, when extended.
Dimensions – Sizing of Features

Dimensions that determine feature size
Dimensions – Positioning of Features

Dimensions that determine the position of features
# Dimensional Symbols

<table>
<thead>
<tr>
<th>Symbol Name</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterbore</td>
<td>□□</td>
</tr>
<tr>
<td>Countersink</td>
<td>▽▽</td>
</tr>
<tr>
<td>Deep</td>
<td>▼▼</td>
</tr>
<tr>
<td>Diameter</td>
<td>Ø</td>
</tr>
<tr>
<td>Square</td>
<td>□□</td>
</tr>
<tr>
<td>Places, Times</td>
<td>×</td>
</tr>
<tr>
<td>Radius</td>
<td>R</td>
</tr>
<tr>
<td>Spherical Radius</td>
<td>SR</td>
</tr>
<tr>
<td>Spherical Diameter</td>
<td>SØ</td>
</tr>
</tbody>
</table>
Dimensioning Guidelines for Prisms-1

- Do not repeat dimensions
- Dimension most descriptive view of feature being dimensioned
- Dimension between views
- Omit one intermediate dimension
- Smaller dimensions inside of larger dimensions
Dimensioning Guidelines for Prisms-2

- Dimension to visible object lines, not to hidden lines.
- Avoid dimensioning inside an object.
- Extension lines may cross object lines and other extension lines.
Dimensioning Rules/Guidelines for Cylinders and Arcs

- Dimension diameter ($\phi$) of cylindrical parts in their rectangular views
- Dimension diameter of cylindrical holes in their circular views
- Dimension radius (R) of fillets and rounds (180 degrees or less)
- Locate center of holes
Finished Surfaces

- Parts formed in molds (i.e., castings) have rough external surfaces
  - Difficult to mate w/ other parts
- Machine surfaces to obtain good mating surfaces
- Finish marks (√) used to indicate a machined surface
  - Apply to every edge view of the surface
- Finished surface makes good datum for dimensioning
C’est tout!