

ME 1110 - Engineering Practice 1

Engineering Drawing and Design - Lecture 5

Drawing Procedure and Dimensioning

Prof Ahmed Kovacevic

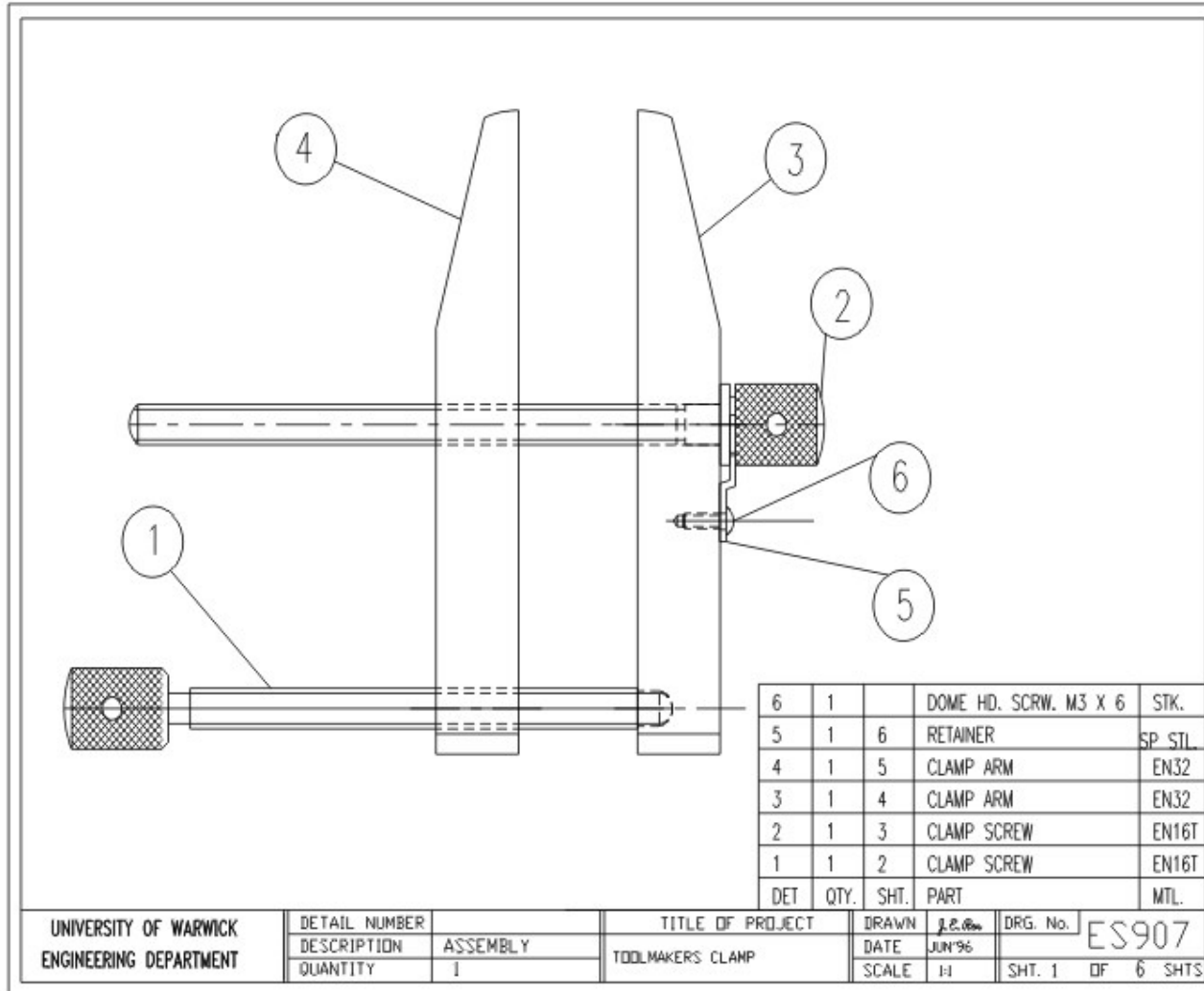
School of Engineering and Mathematical Sciences
Room C130, Phone: 8780, E-Mail: a.kovacevic@city.ac.uk

www.staff.city.ac.uk/~ra600/intro.htm

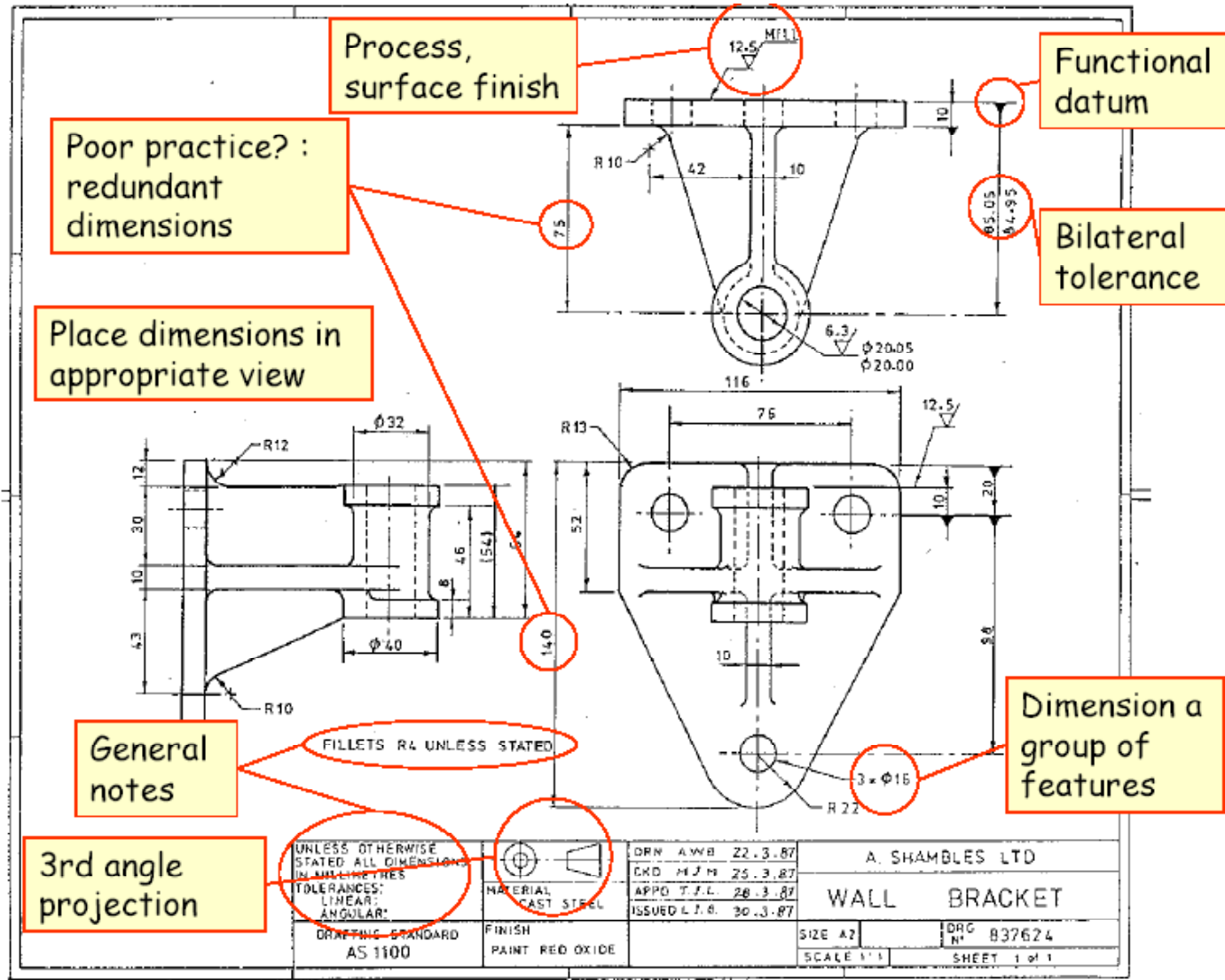
Objectives for today

- To learn about differences between assembly and detailed drawings
- o understand steps and order of drawing procedure
- To learn general rules of dimensioning and specific dimensioning of drawing features

Assembly drawing



Detailed drawing

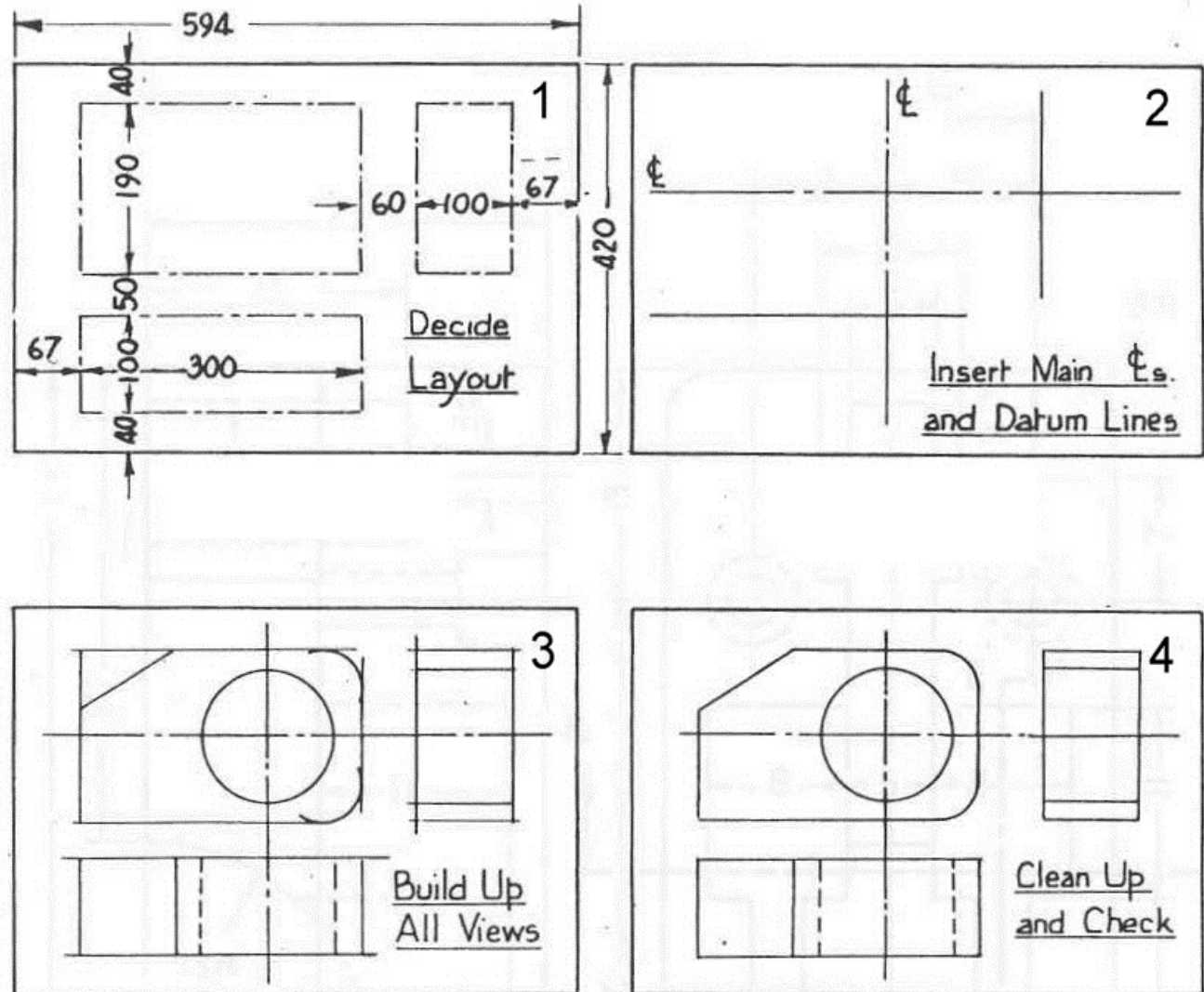


Drawing Scales

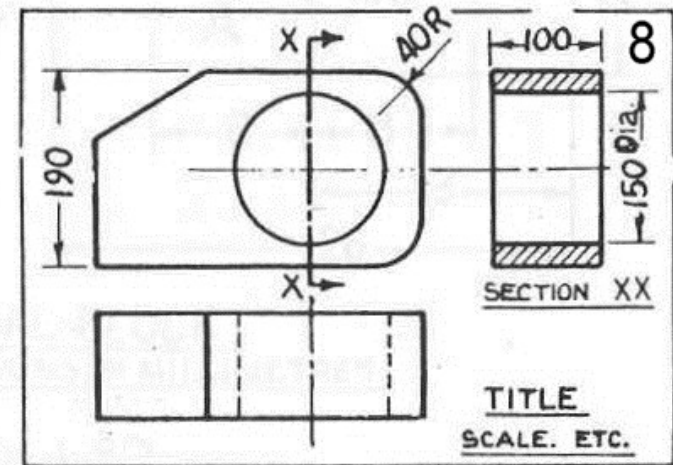
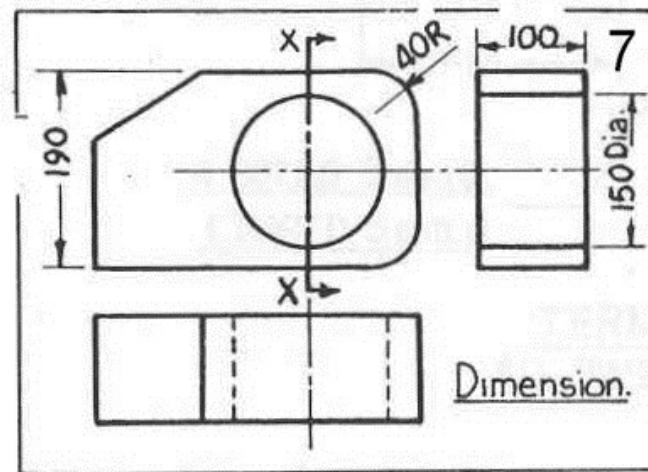
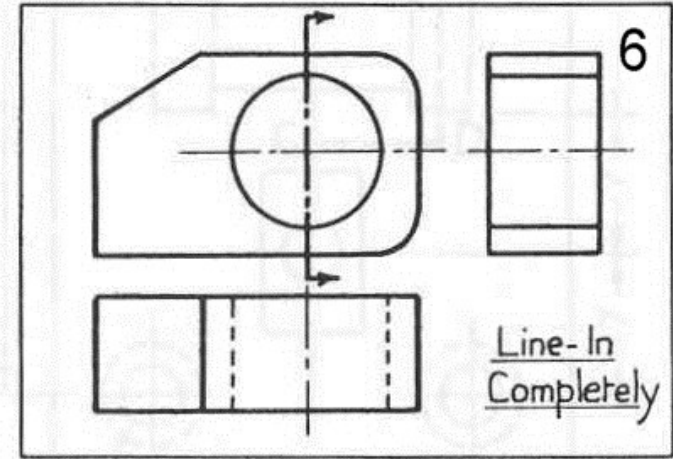
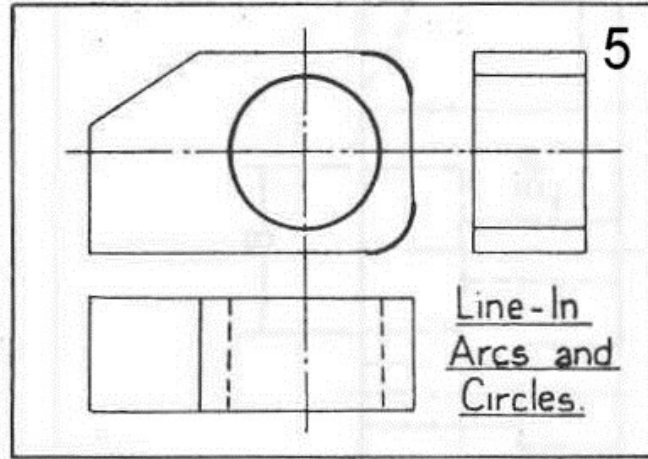
- Scale is the linear ratio of the size of the object and the size of its drawing view
 - » It consist of the word SCALE and the ratio
 - » SCALE 1:1 for full size
 - » SCALE **X**:1 for **enlargement** ($X > 1$)
 - » SCALE 1:**X** for **reduction** ($X > 1$)
- **BS8888**
- Dimension values in drawing refer to the full size of the object.

Drawing procedure

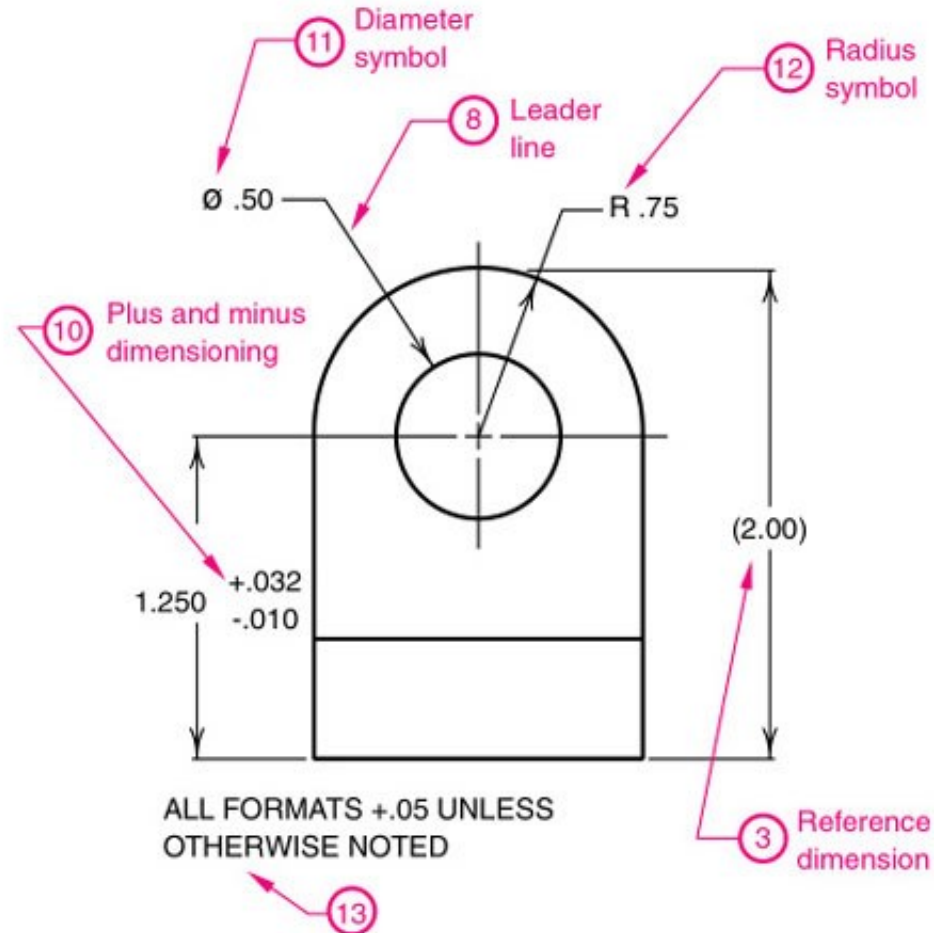
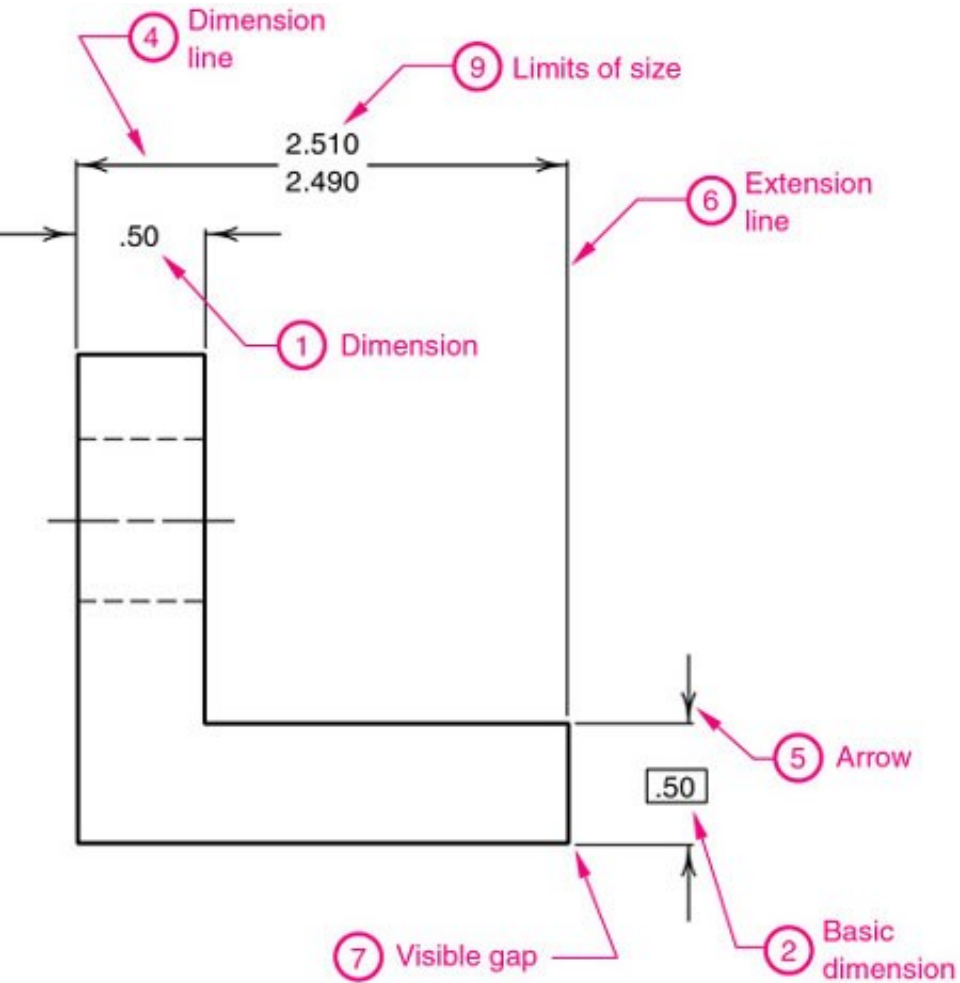
- Accurate drawings
- Methodical approach
- Neat and clean



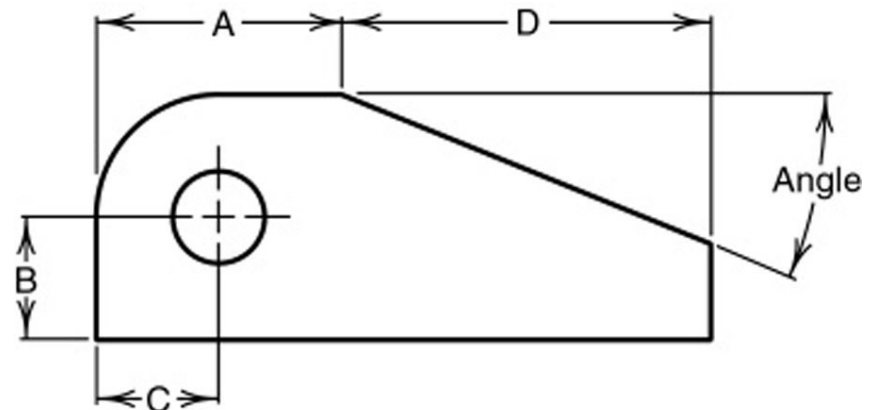
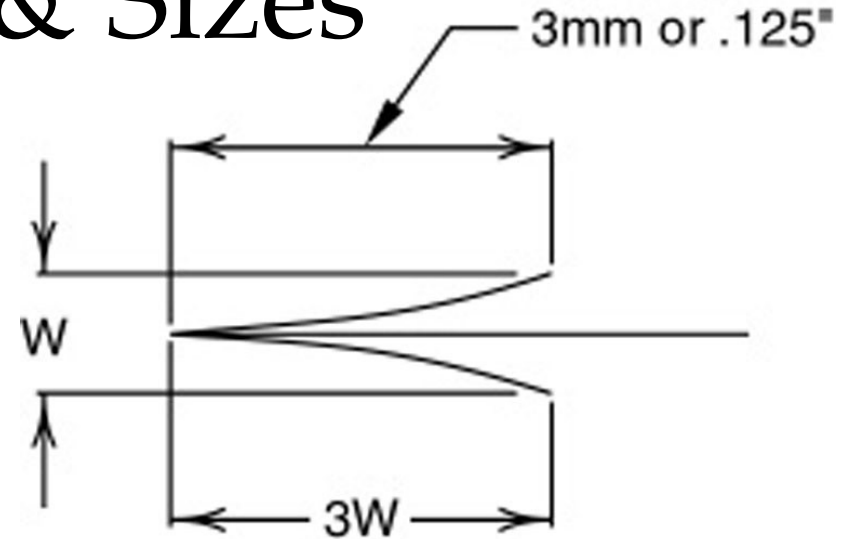
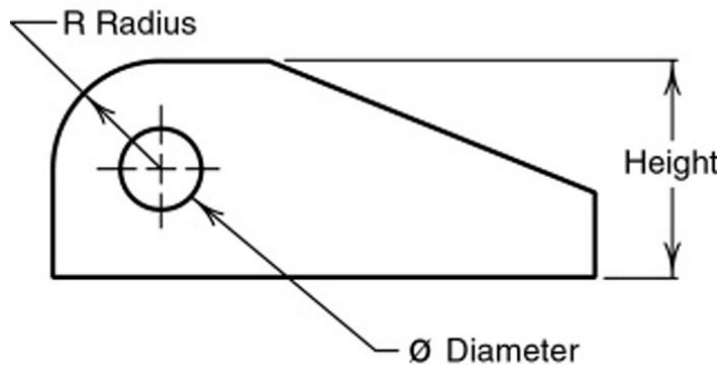
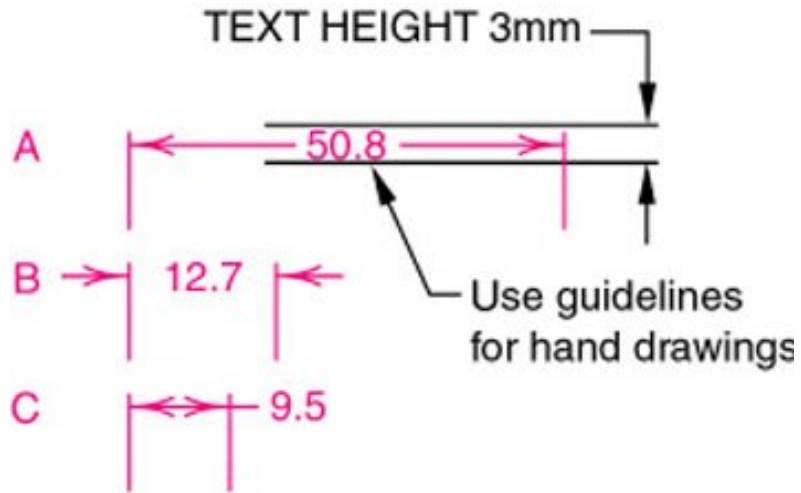
Drawing procedure 2



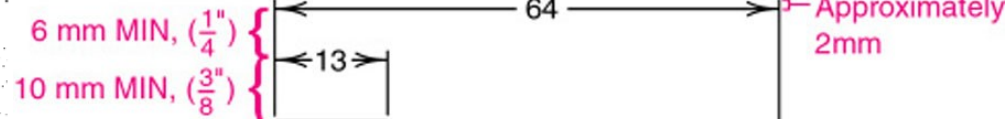
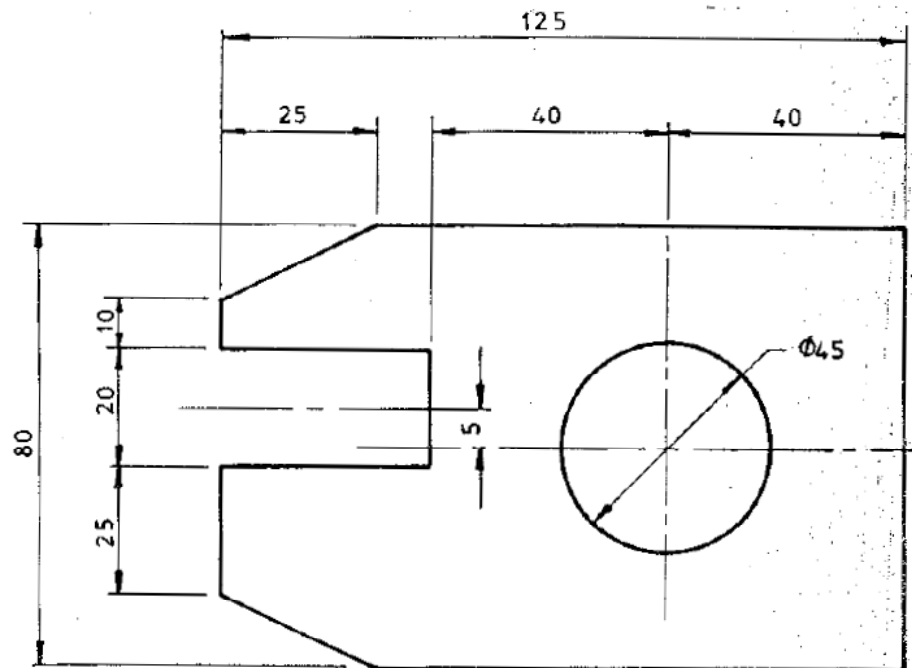
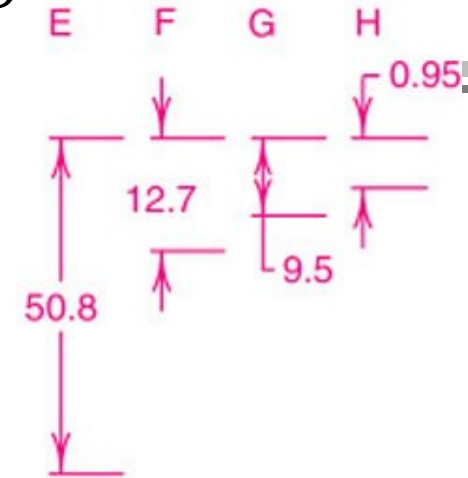
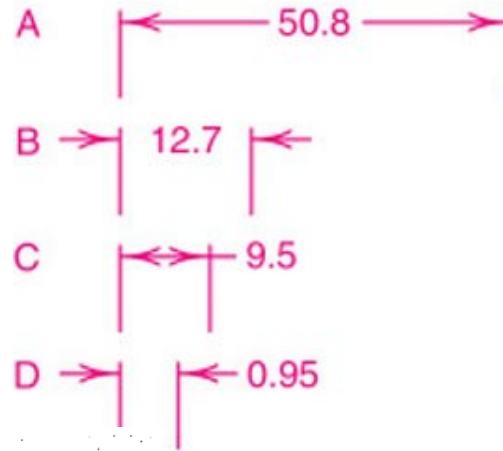
Dimension elements



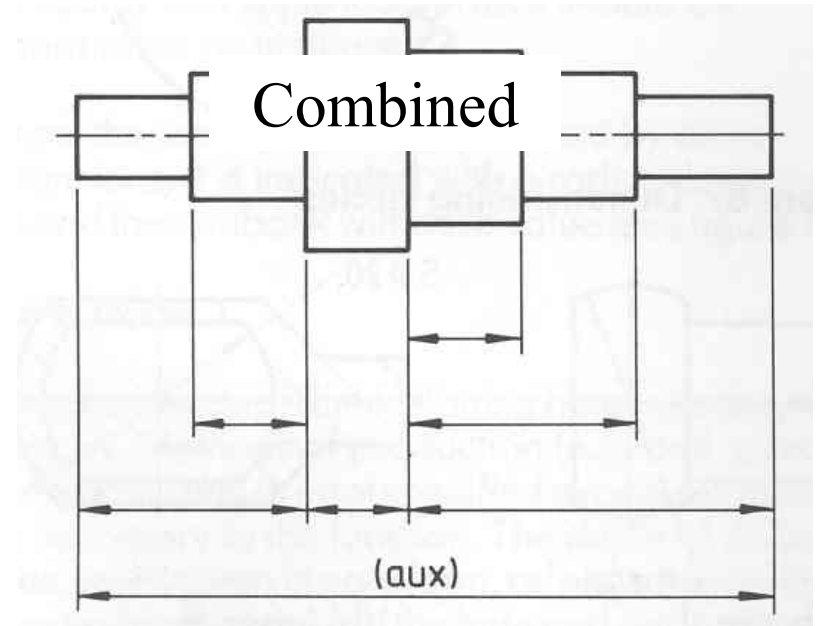
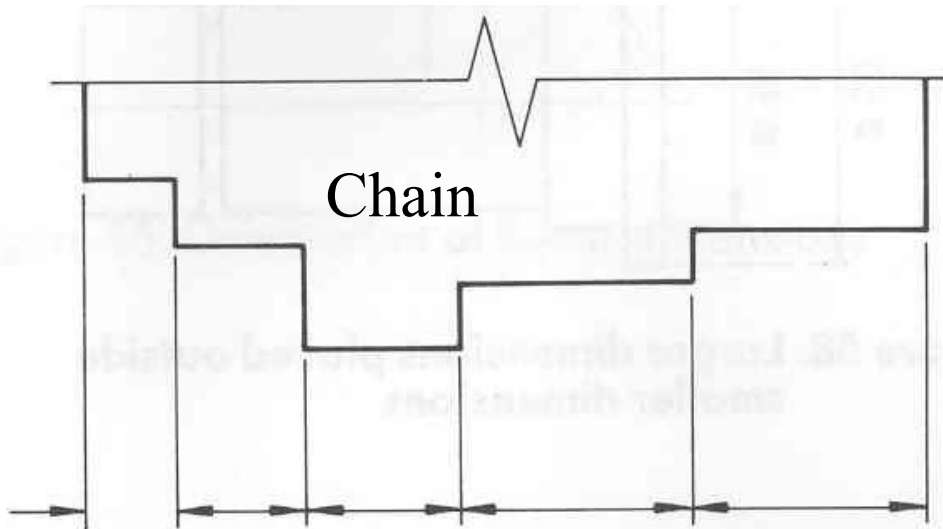
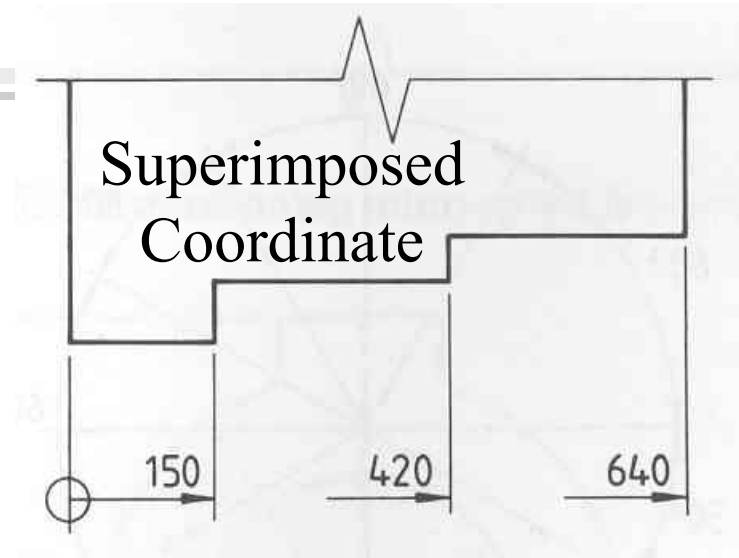
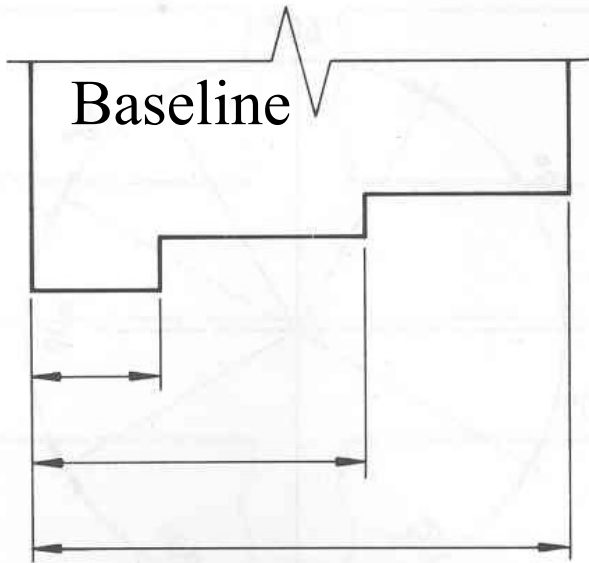
Symbols & Sizes



Positioning of dimensions

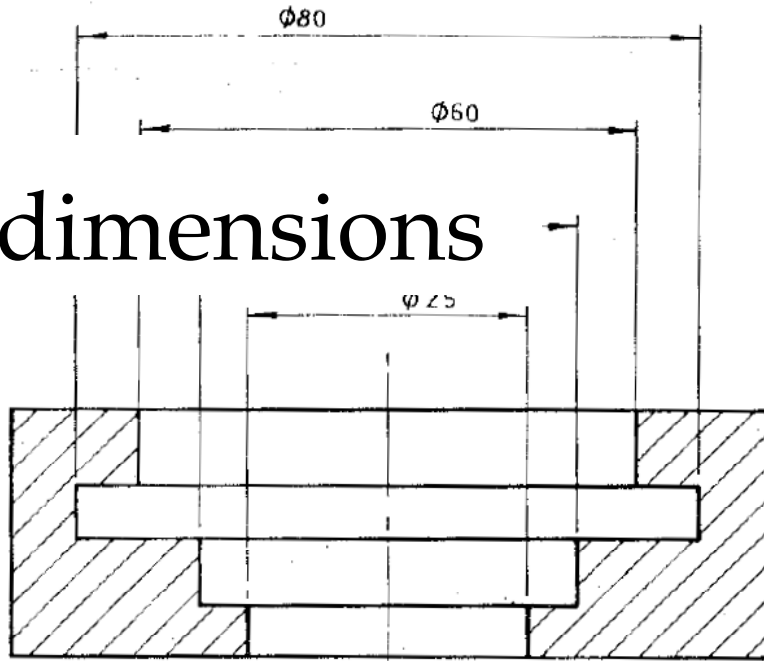


Positioning of dimensions

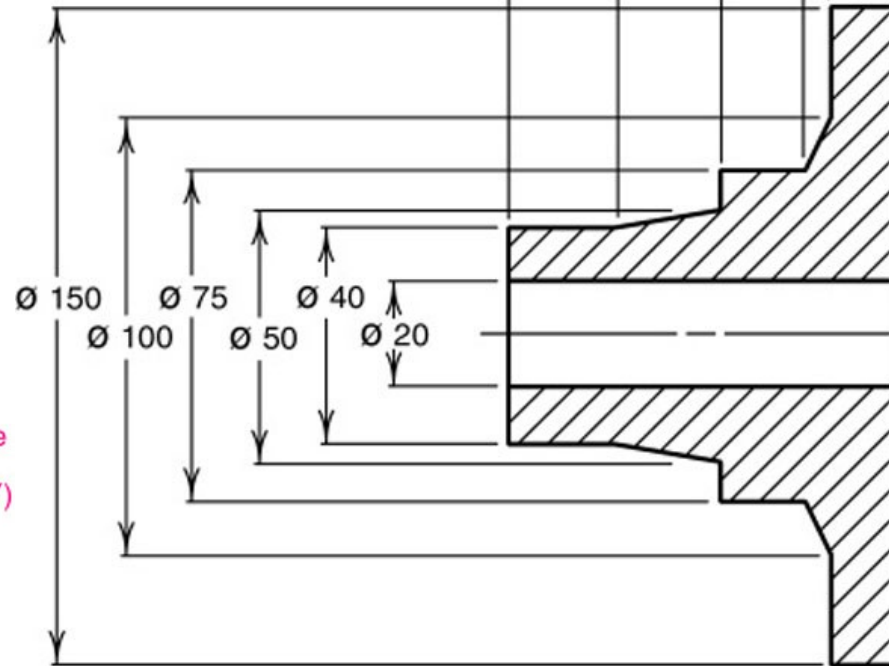
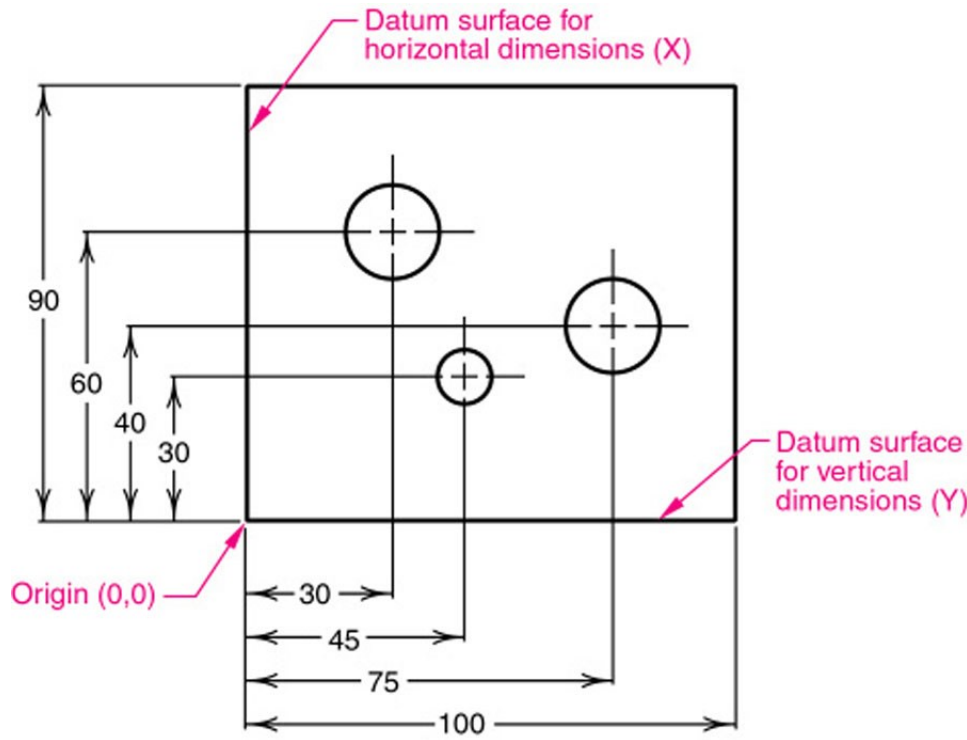
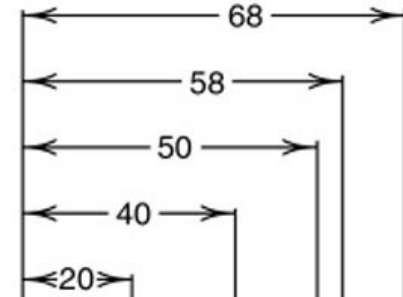


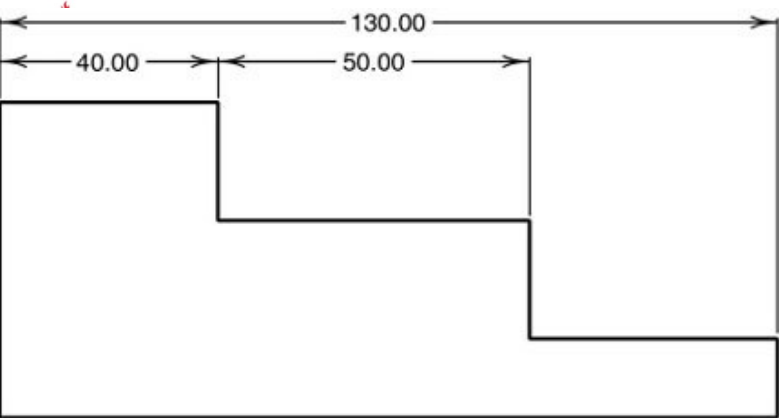
Positioning of dimensions

Baseline or Datum Dimensions

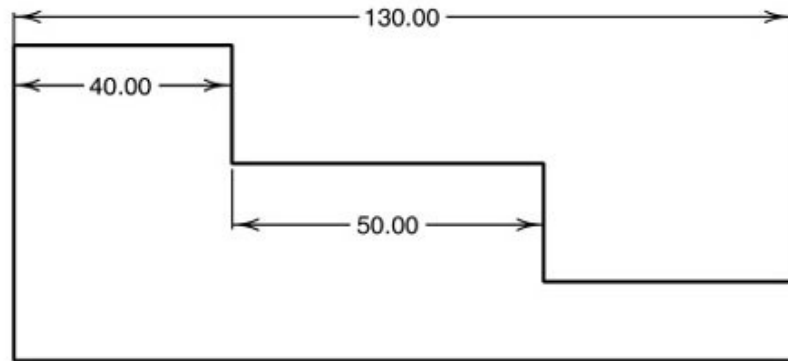


Staggered dimensions



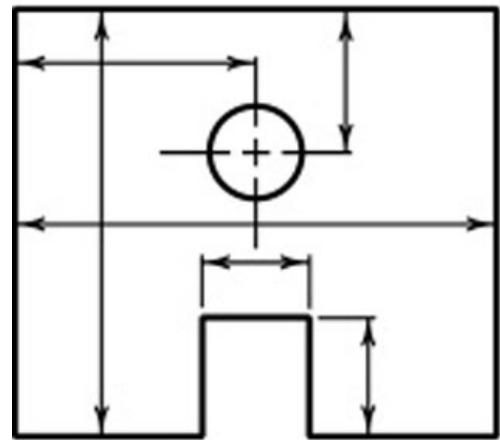


(A) Yes

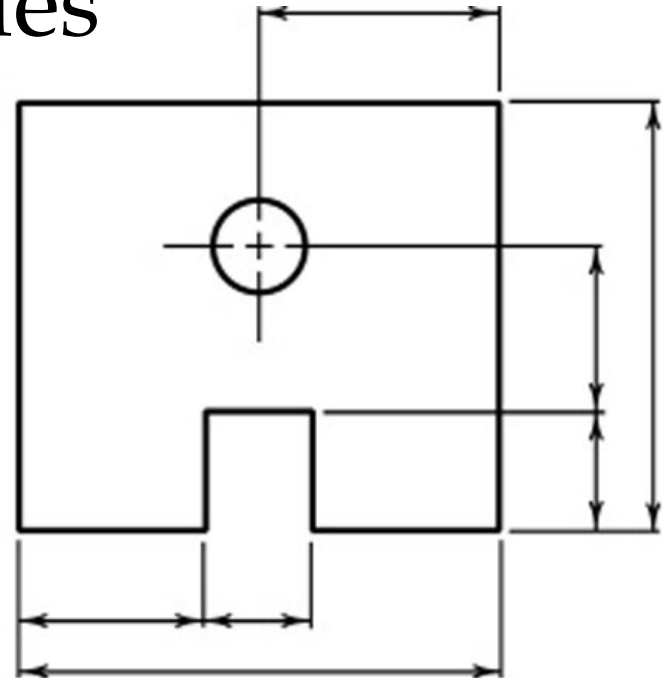


(B) No!

Some dimensioning rules

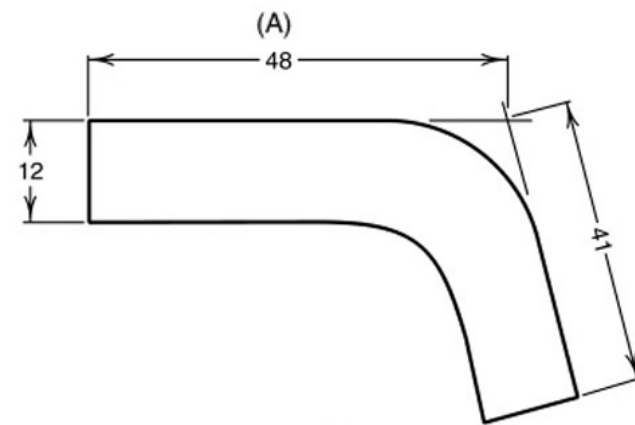
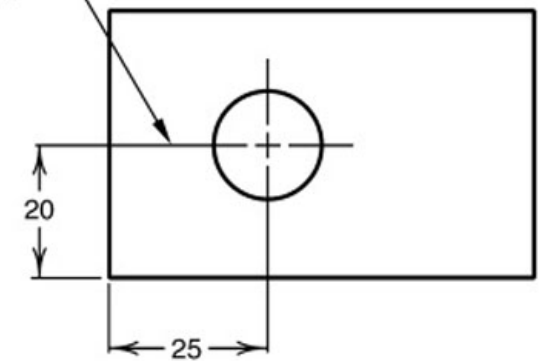


(A) No!



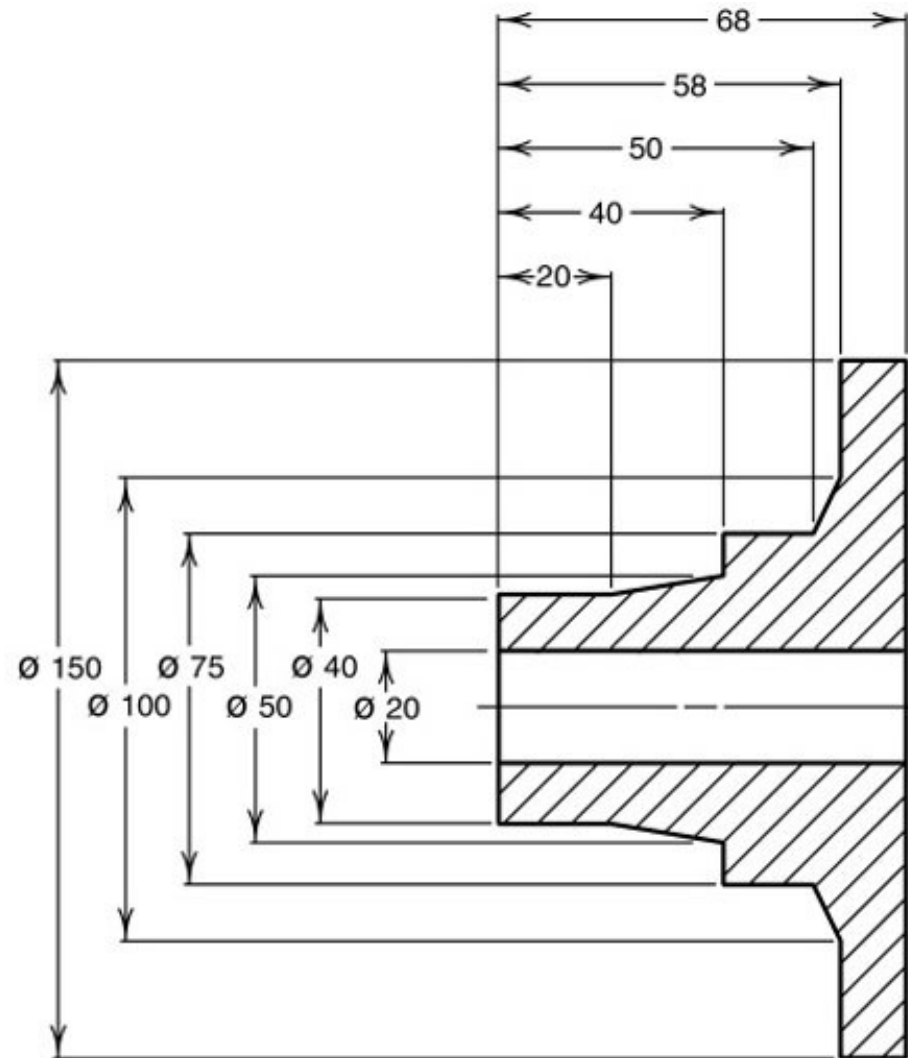
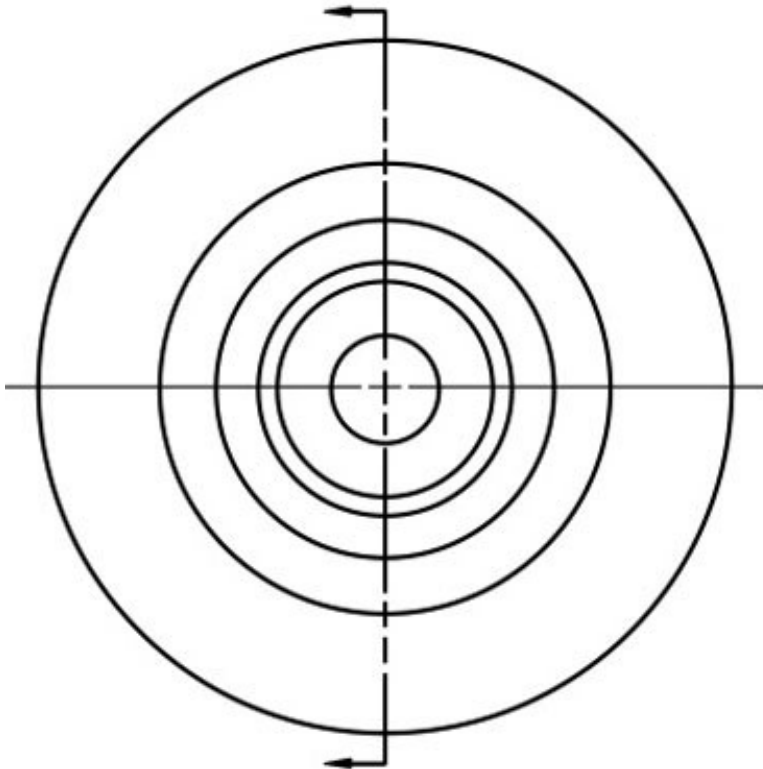
(B) Yes

Centerline used as an extension line

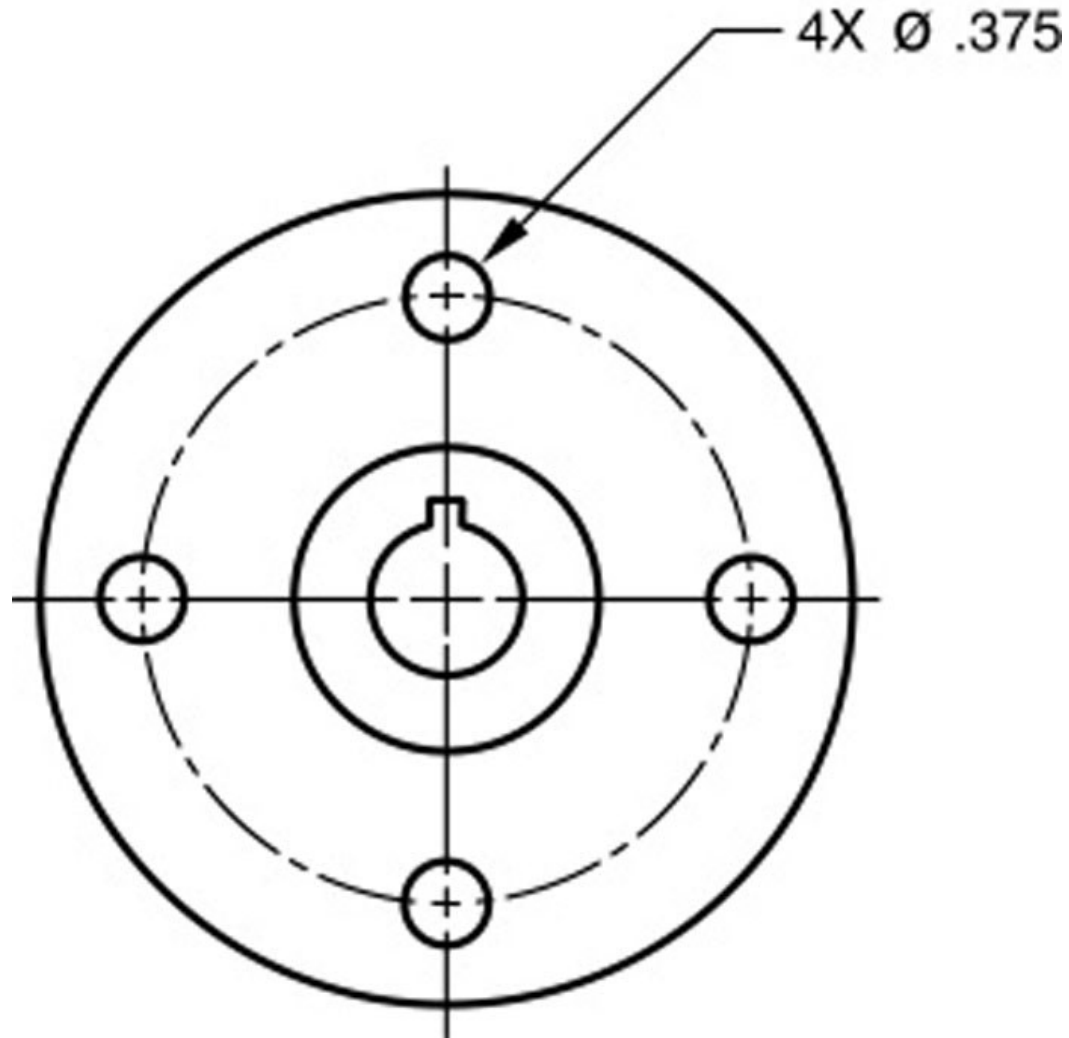


(B)

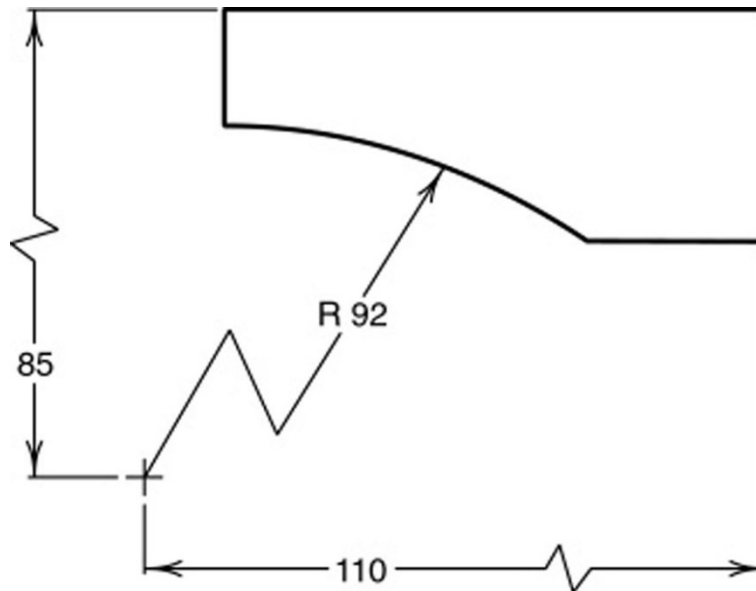
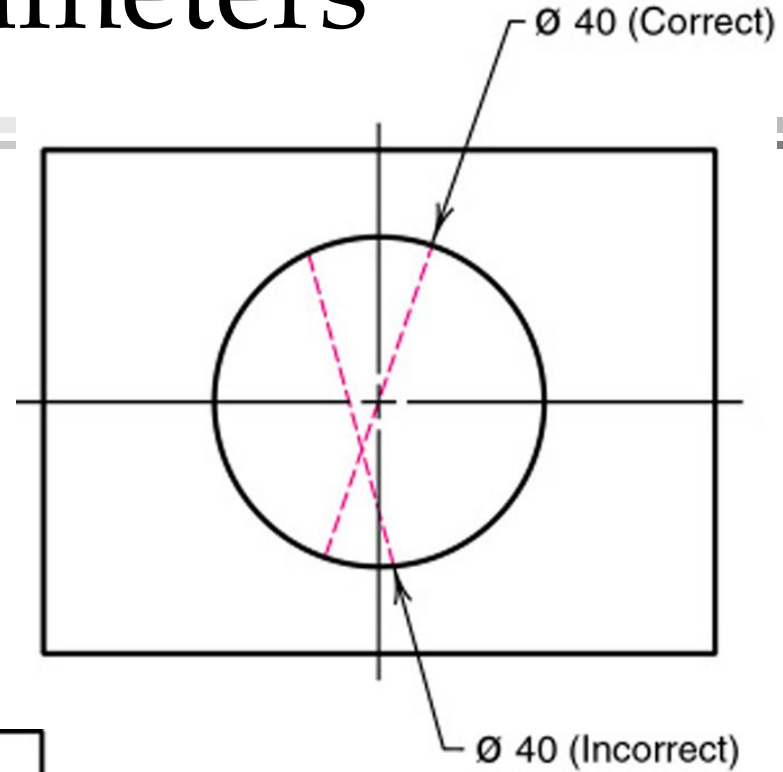
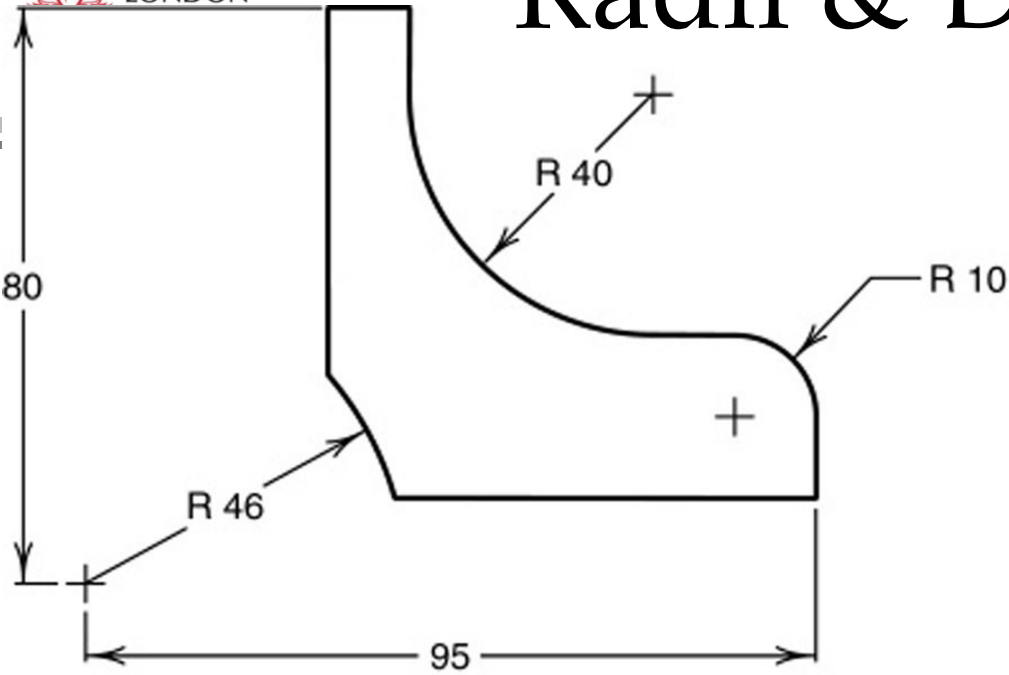
Circular patterns



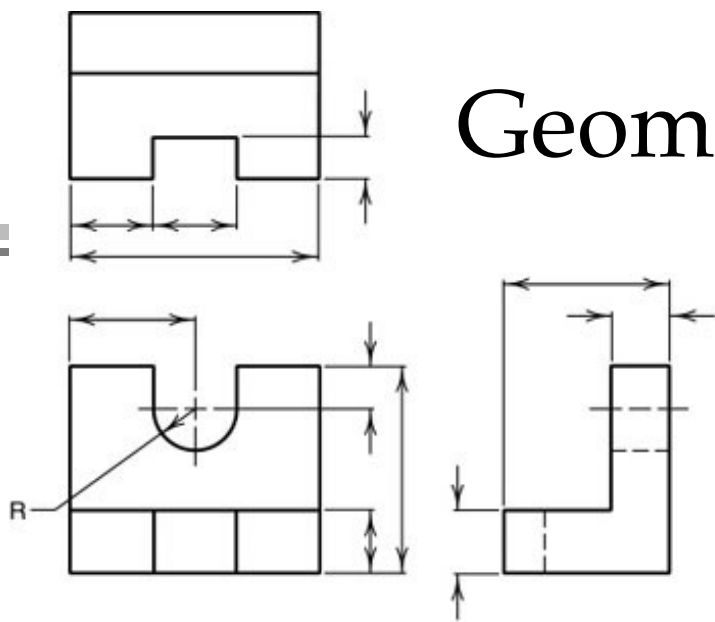
Circular patterns



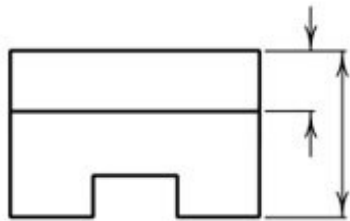
Radii & Diameters



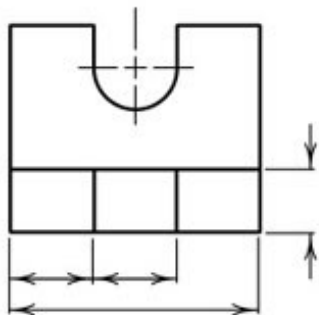
Geometric breakdown technique



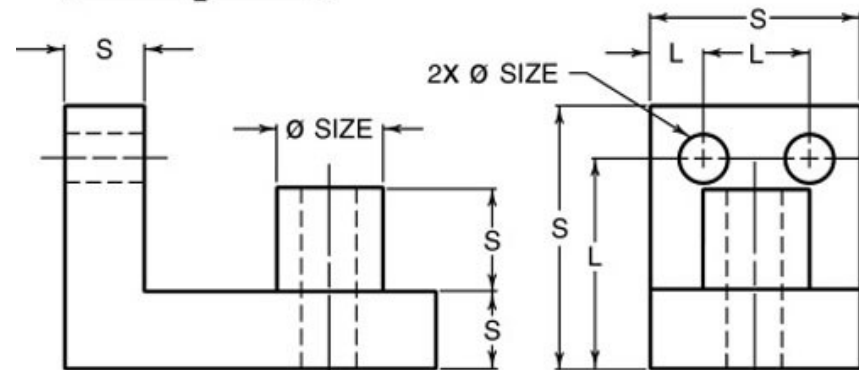
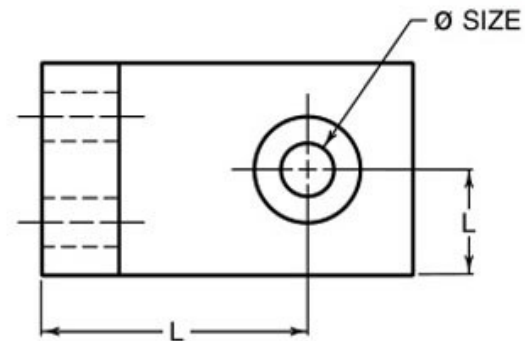
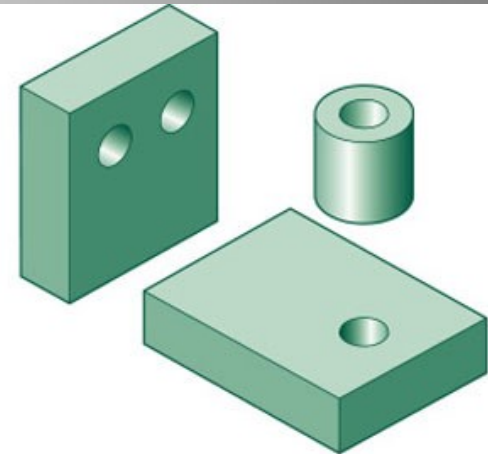
(A) Correct contour dimensioning



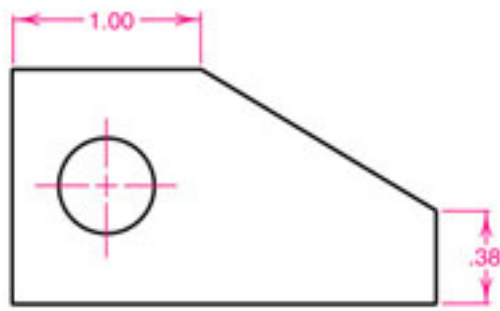
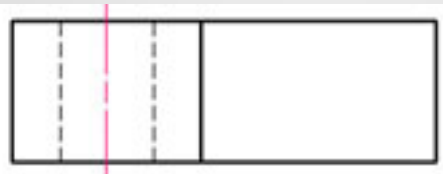
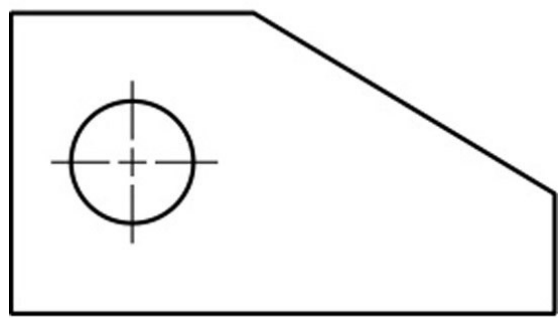
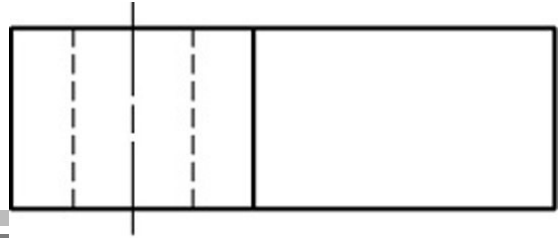
No!



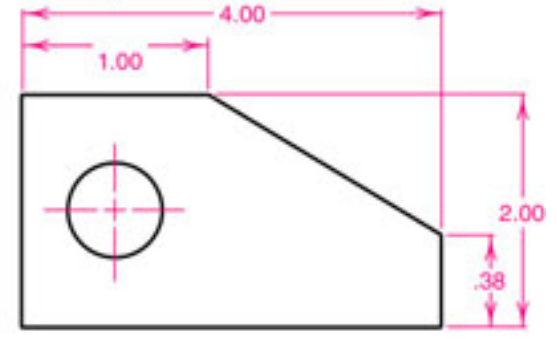
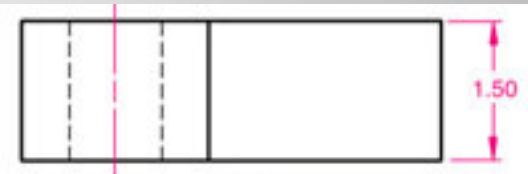
(B) Incorrect contour dimensioning



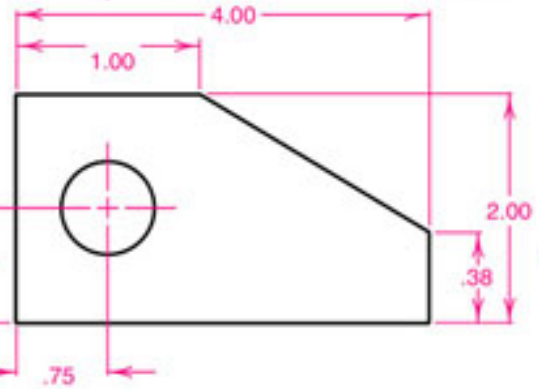
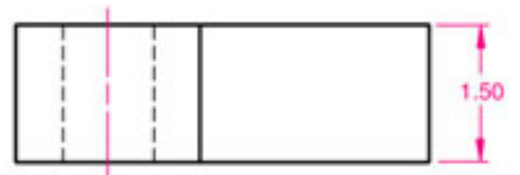
Dimensioning procedure



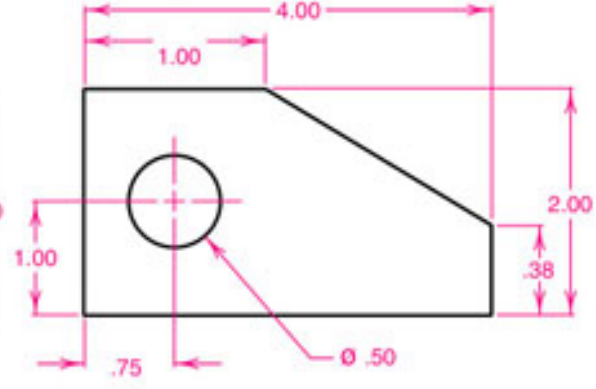
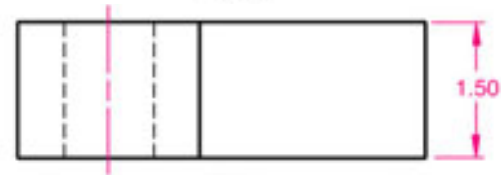
Step 1



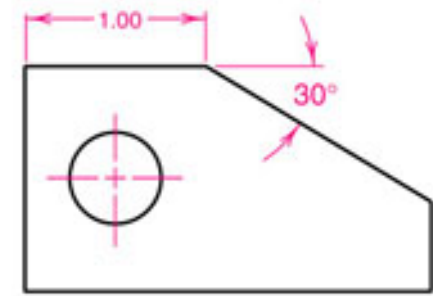
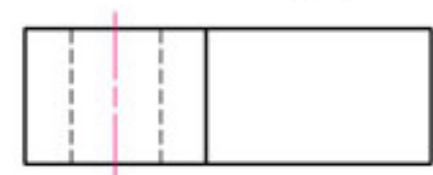
Step 2



Step 3



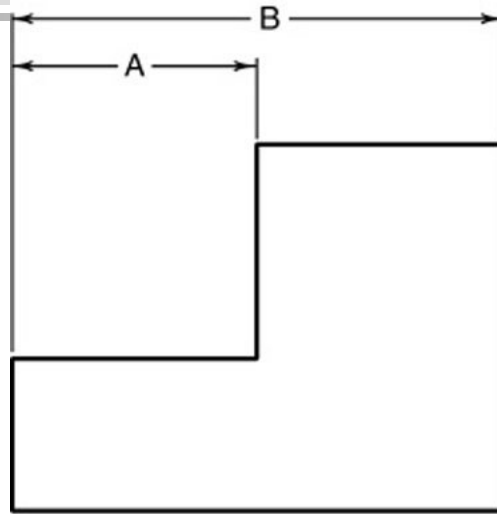
Step 4



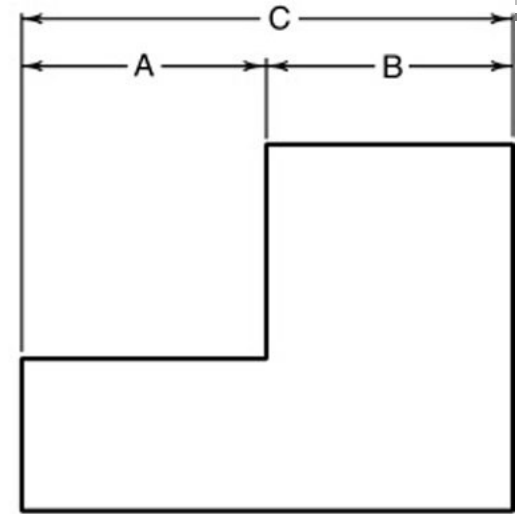
Alternate Method

Some general rules

Do not over
dimension

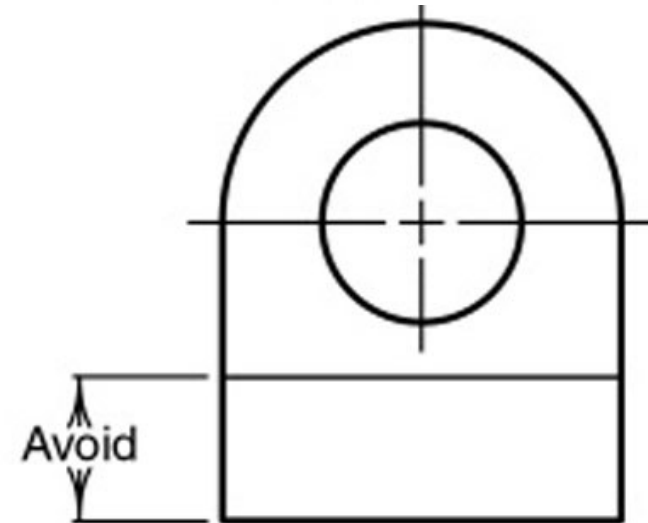
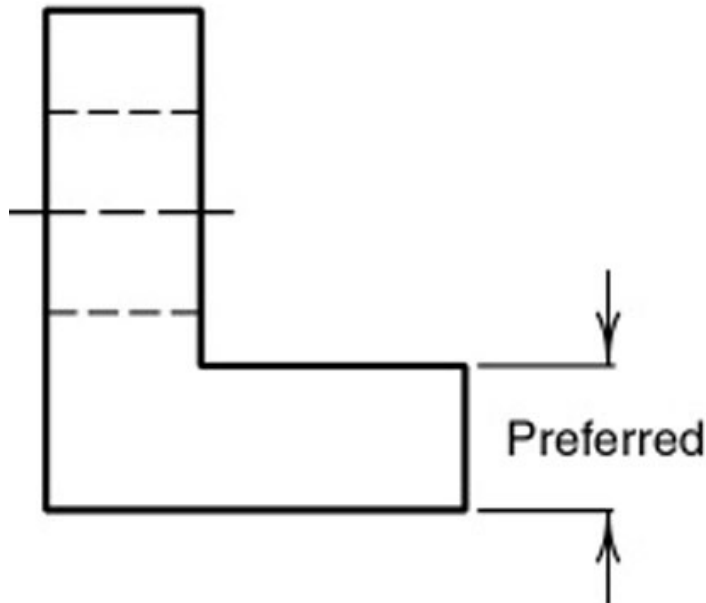


A. Correct

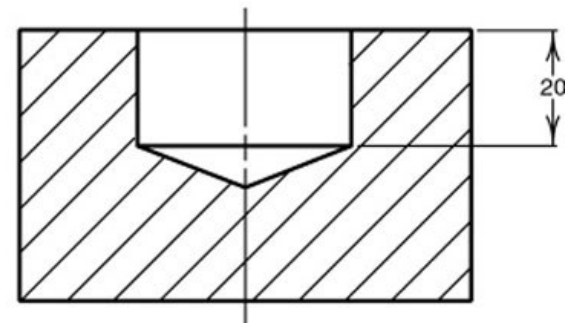
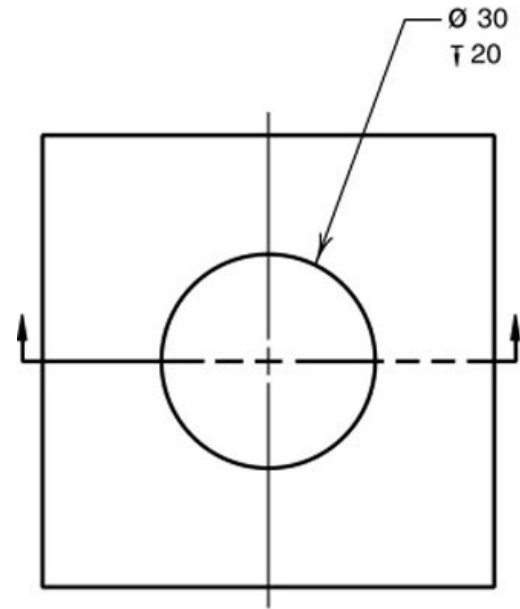
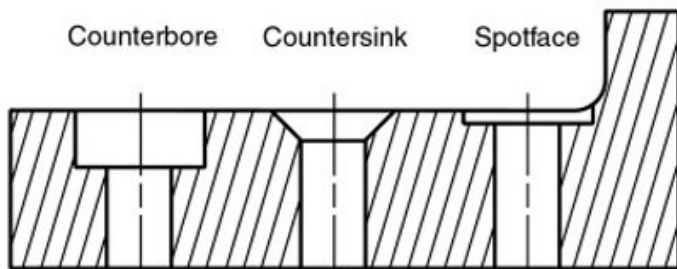
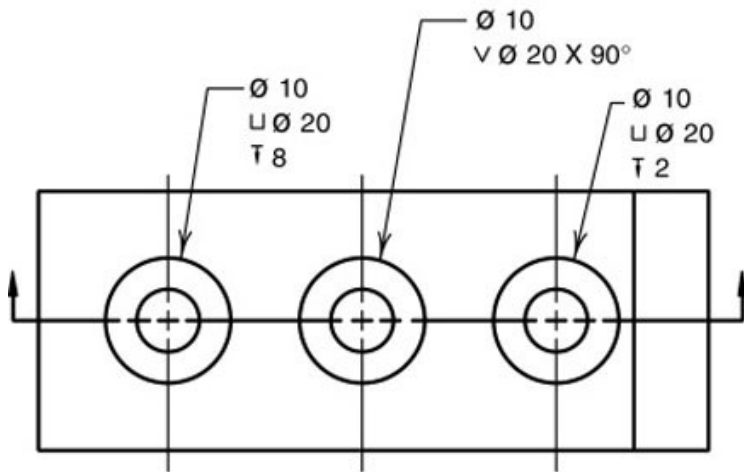
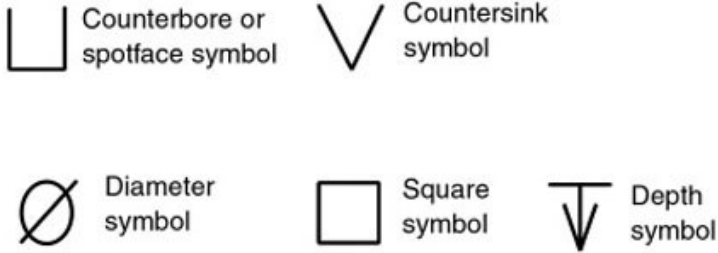


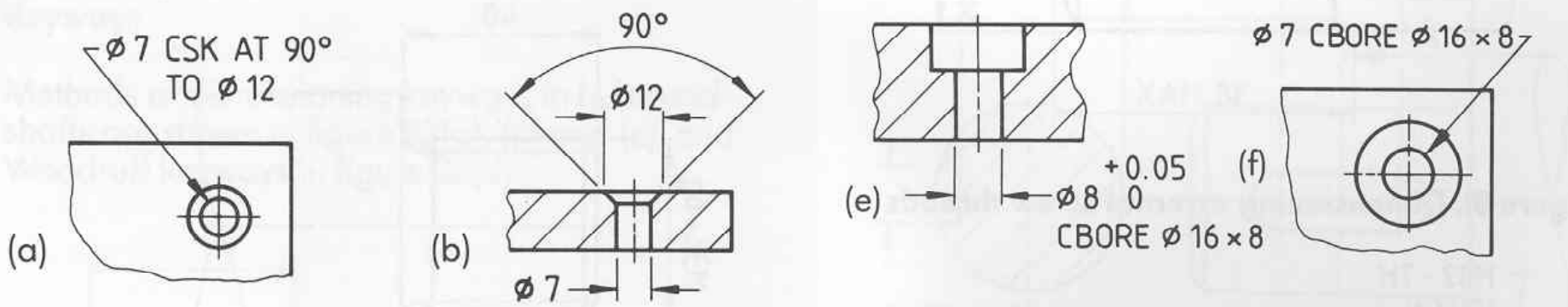
B. Avoid

Dimension
the most
descriptive
view

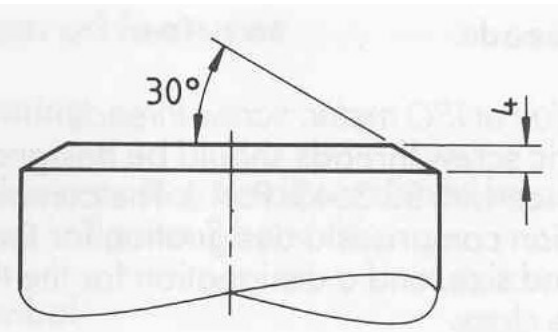
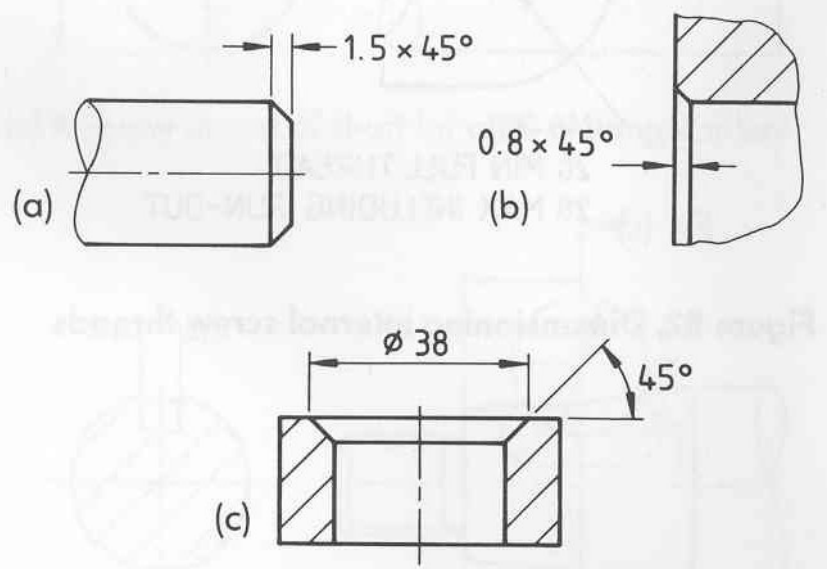


Symbols for drilling operations



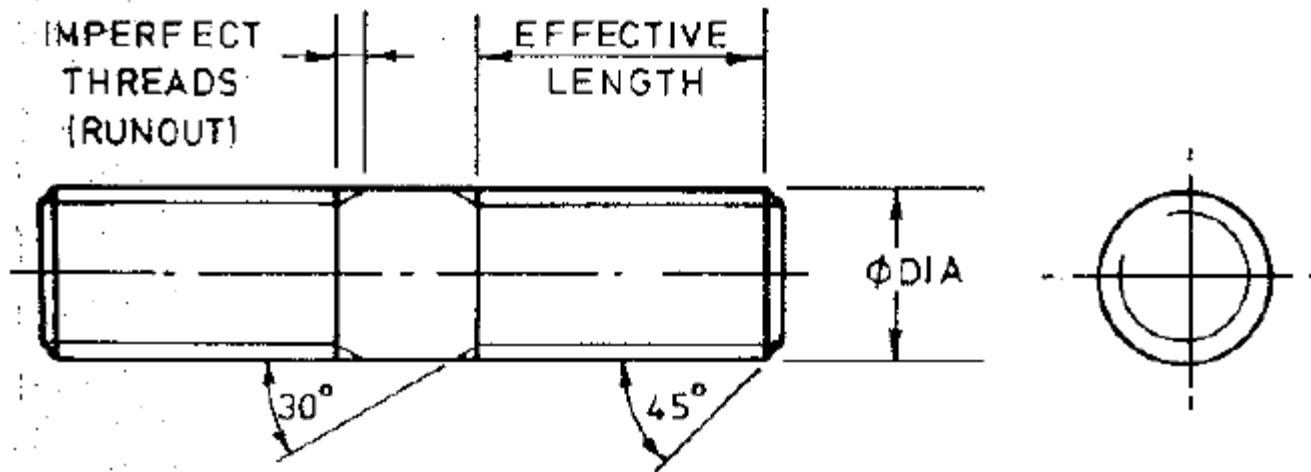


Dimensioning countersinks, figures (a), (b) and (c); counterbores, figures (d), (e) and (f); and spotfaces, figures (g) and (h)

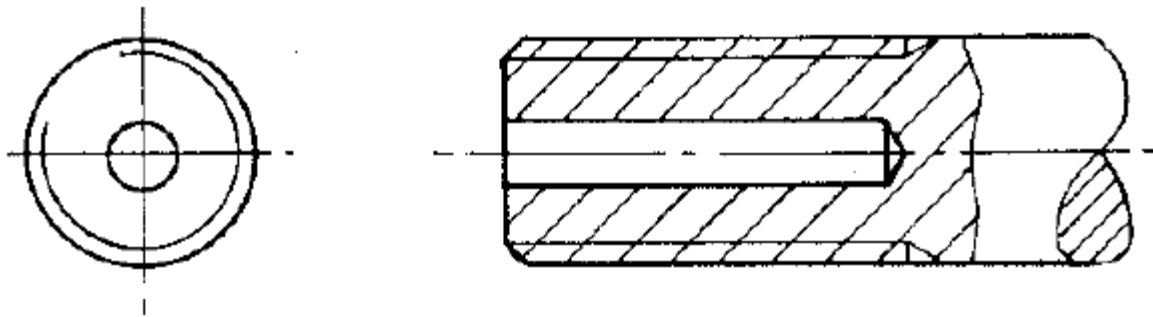


Dimensioning chamfers

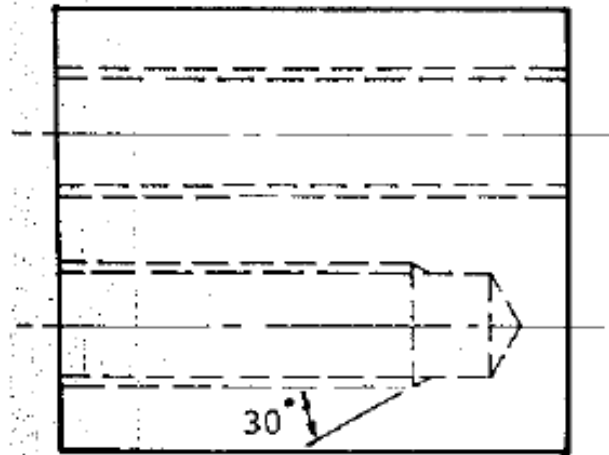
Representing external thread



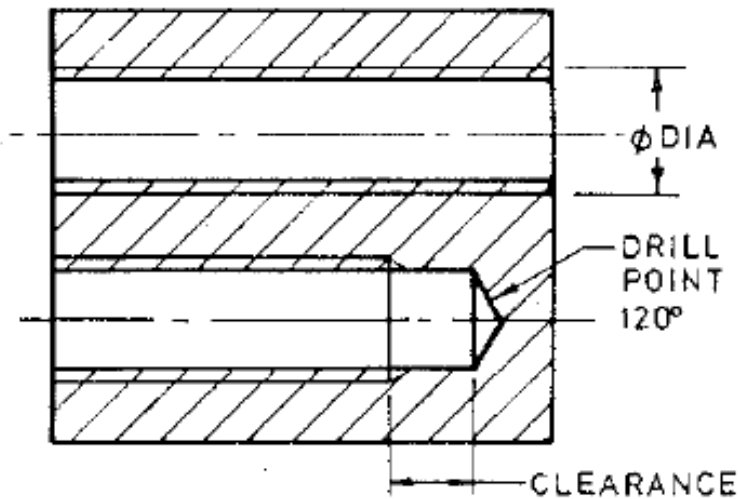
(a) external thread: side and end view



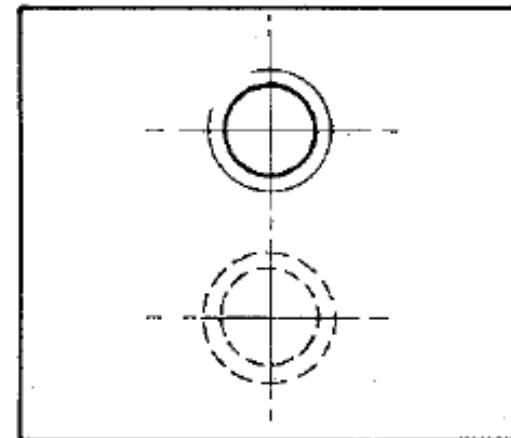
Representing internal threads



(c) internal thread: outside view

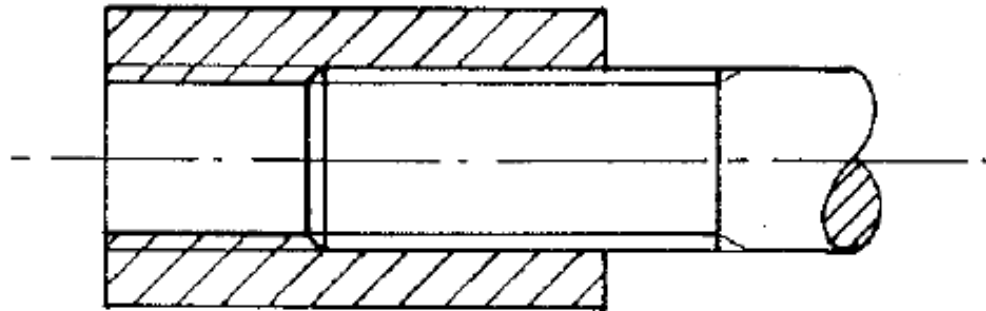


(d) internal thread: sectional view

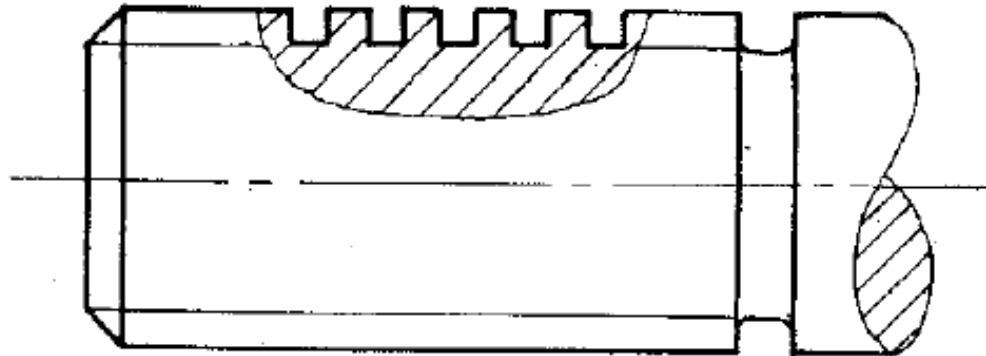


(e) internal thread: end view

Representing threads in assembly

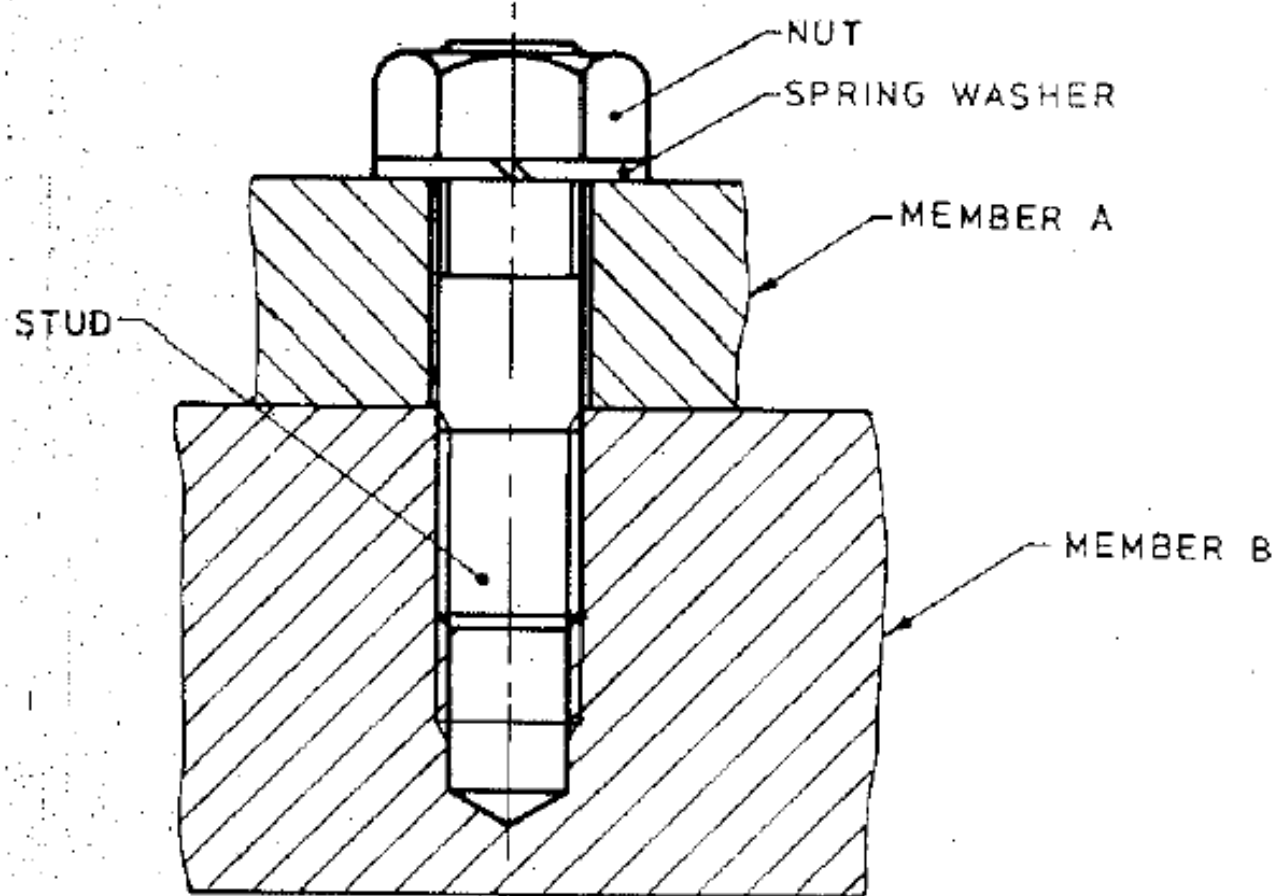


(a) threads in assembly



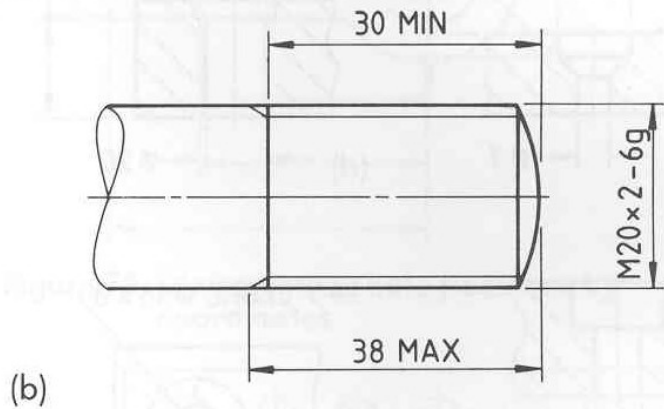
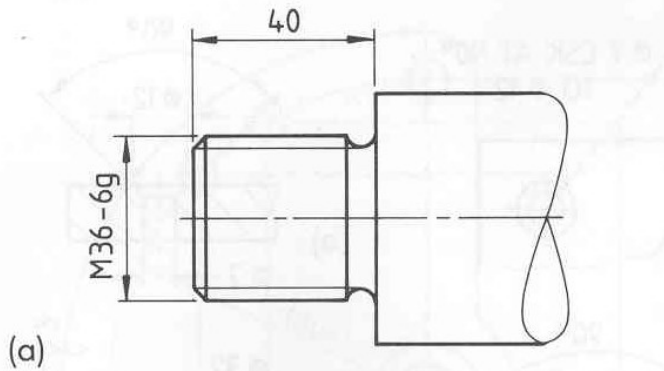
(c) square thread

Representing bolted assembly

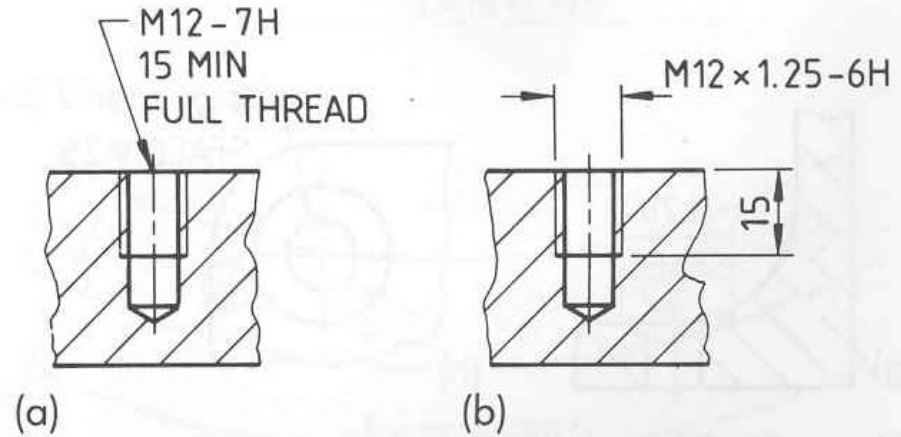


(b) assembly of a stud
in a blind hole

How to dimension threads

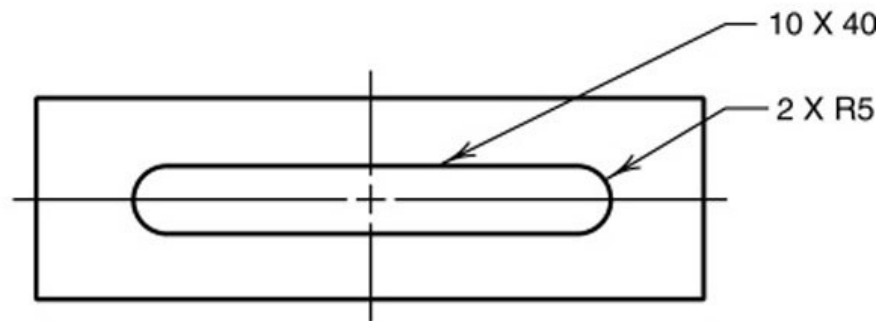
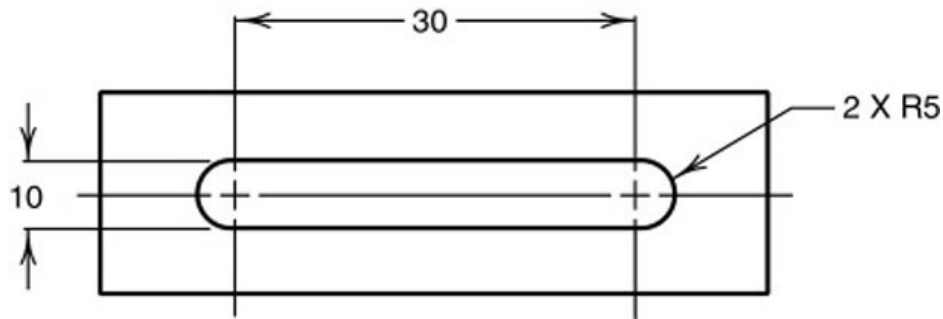
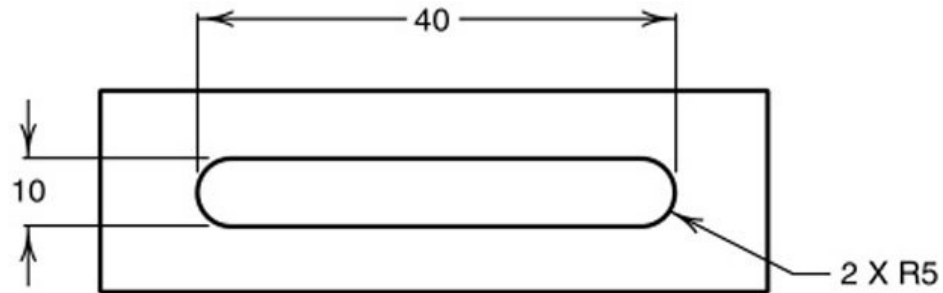


External

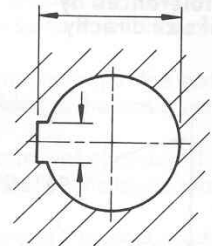


Internal

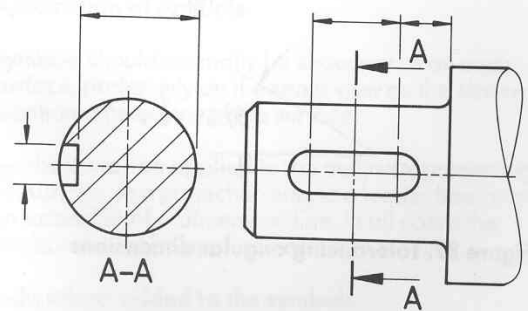
Dimensioning slots



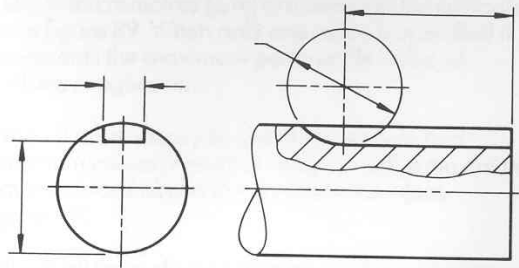
Key ways



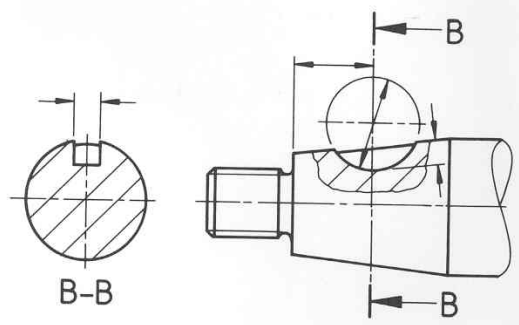
(a) Keyway in a parallel hub



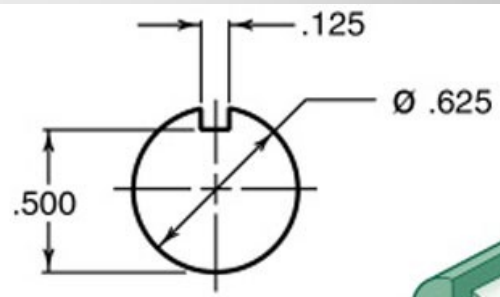
(b) Keyway in a shaft for a BS rectangular key



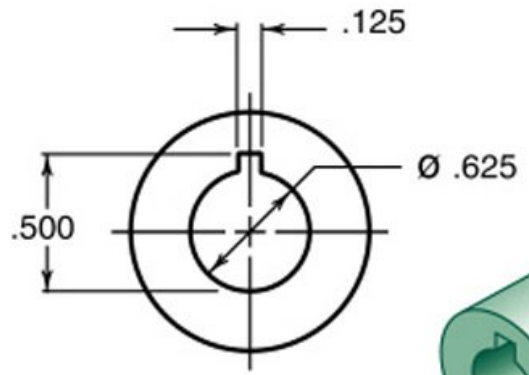
(c) Keyway at end of shaft for a BS rectangular key



(d) Woodruff keyway (in a tapered shaft)



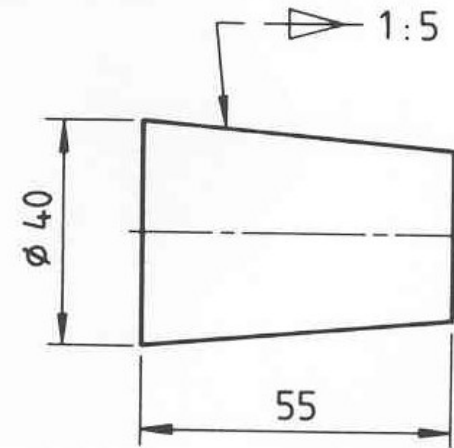
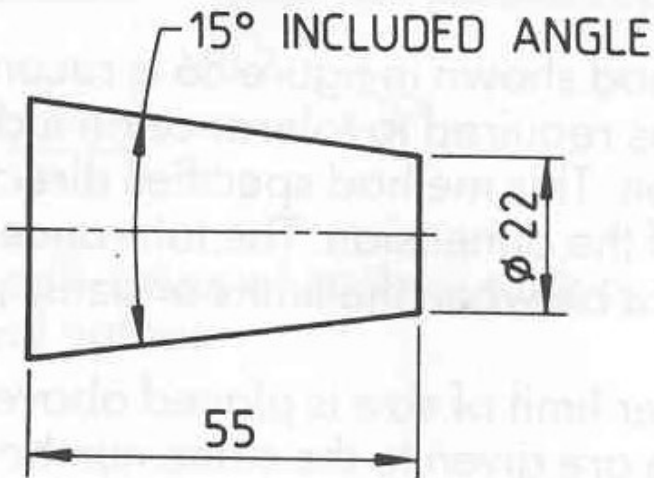
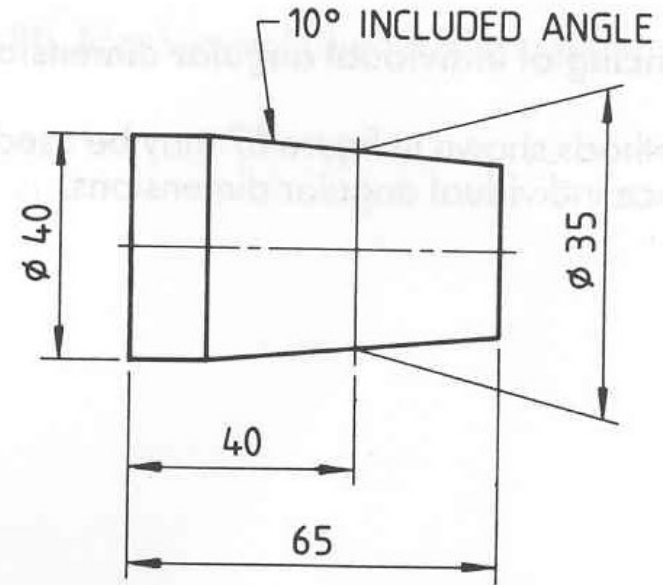
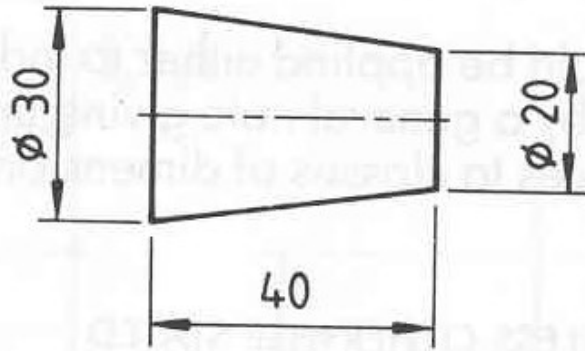
Keyseat



Keyway



Dimensioning tapered features



DrE-4

