GET 215
LECTURE NOTE ON:

Orthographic projection

Orthographic projection

- A view of an object is know technically as a **projection**

- A projection is a view conceived to be drawn or projected on to a plane, known as the **plane of projection**
- Orthographic projection is a system of views of an object formed by projectors from the object perpendicular to the desired plane of projection.

- ORTHOS - straight, rectangular, upright
- GRAPHOS - written, drawn

Orthographic projection (Contd.)

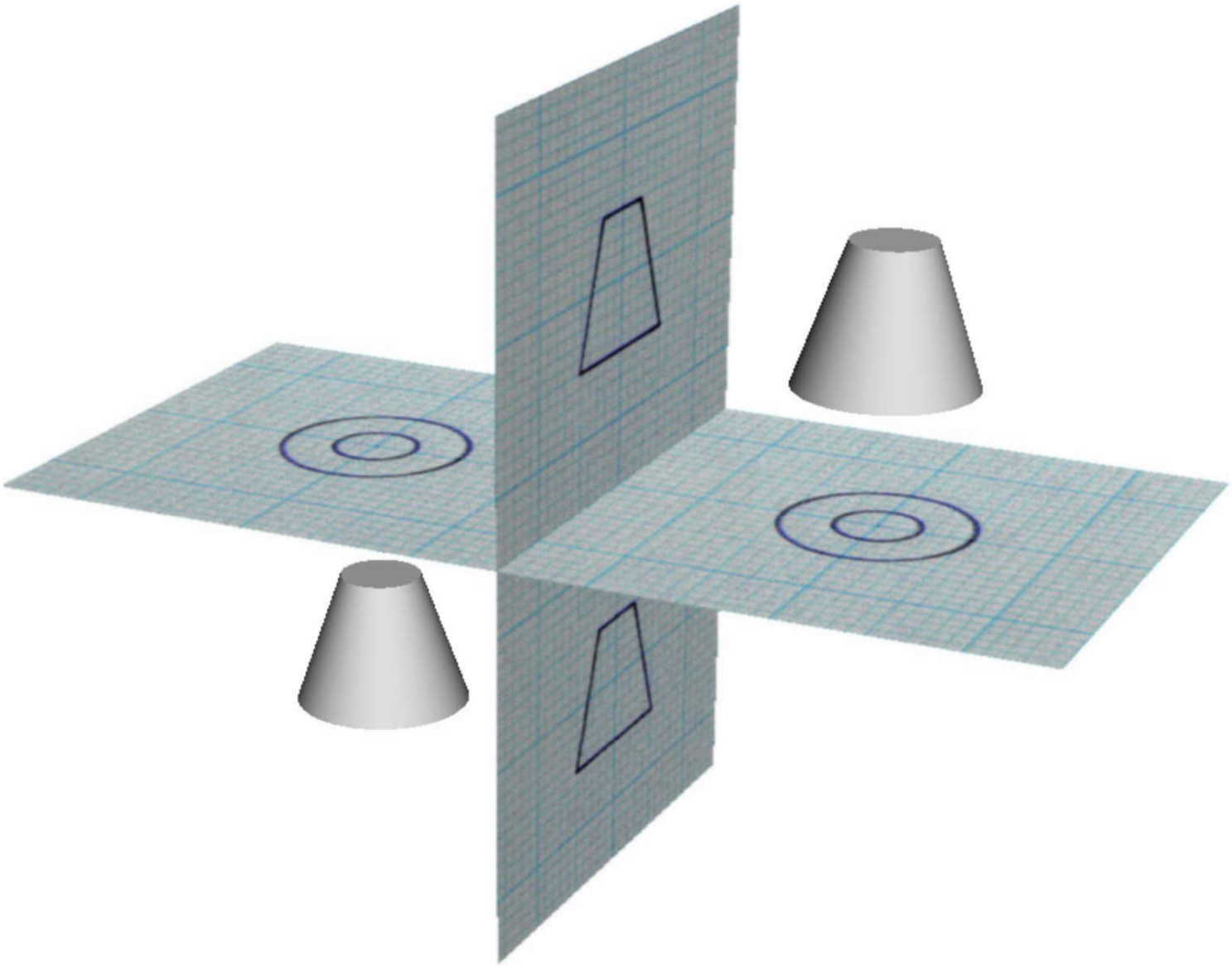
- Orthographic projection is the graphical method used in modern engineering drawing.
- In order to interpret and communicate with engineering drawings a designer must have a sound understanding of its use and a clear vision of how the various projections are created.

Orthographic projection (Contd.)

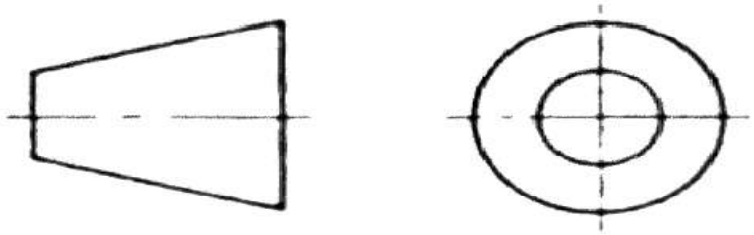
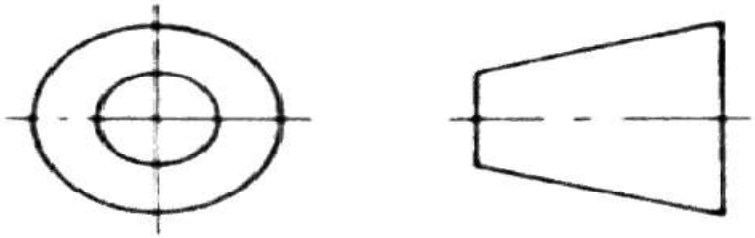
- They are based on Monge's original right angle planes and are shown fully in Figure below. They define four separate spaces, or quadrants. Each of these quadrants could contain the object to be represented. Traditionally however, only two are commonly used, the first and the third

Orthographic projection (Contd)

- Projections created with the object placed in the first quadrant are said to be in First
- Angle projection, and likewise, projections created with the object placed in the third quadrant are said to be in Third Angle projection.

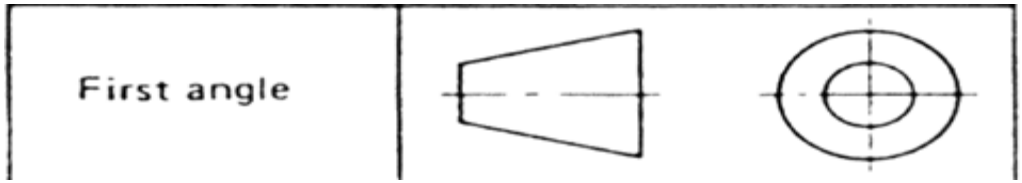


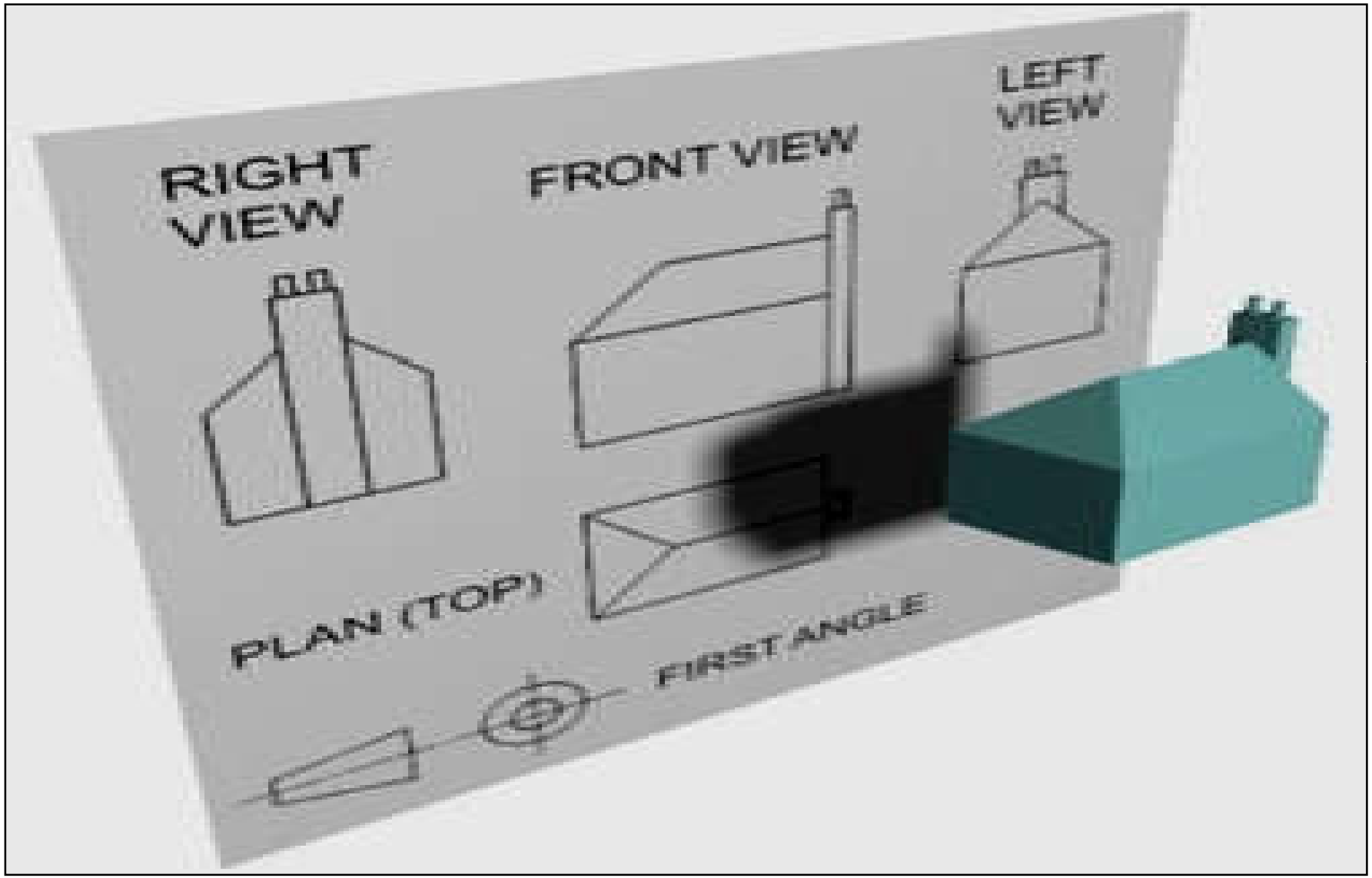
Orthographic projection (symbols)

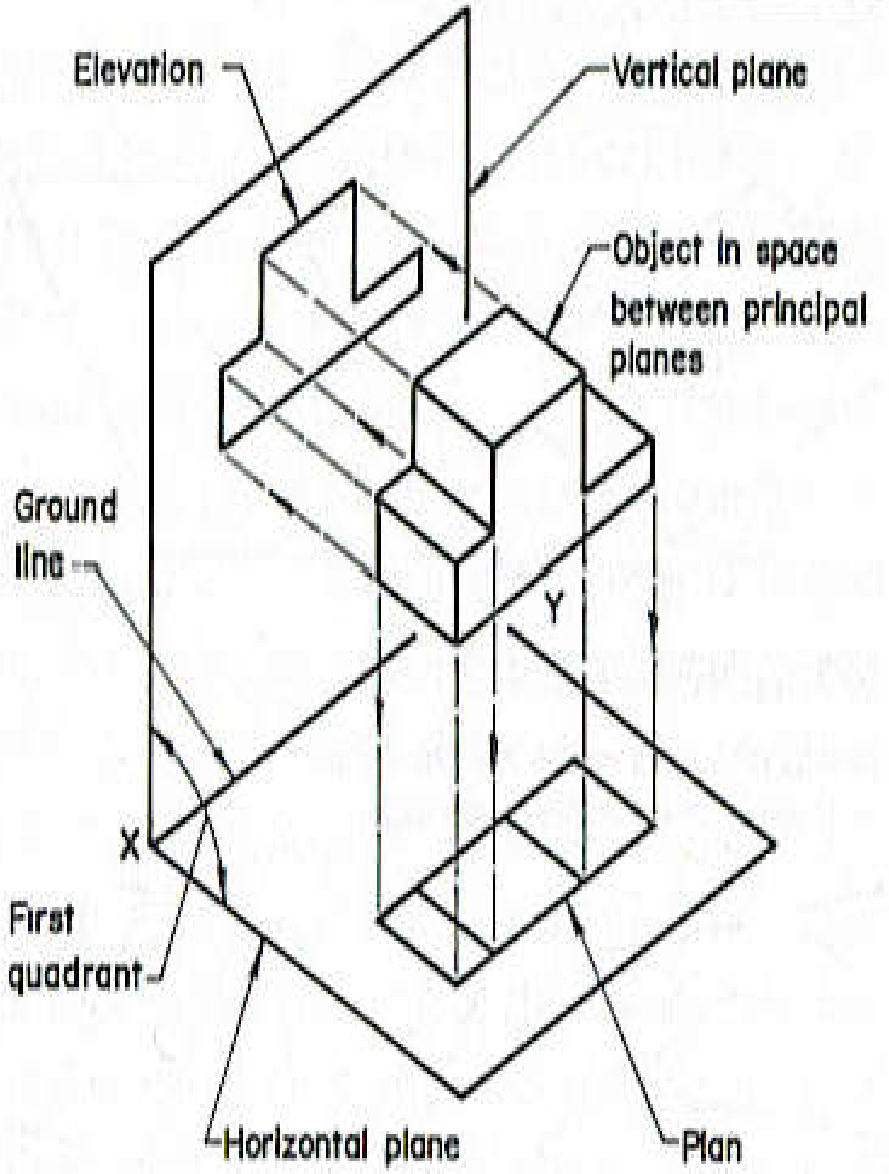
Projection	Symbol
First angle	
Third angle	

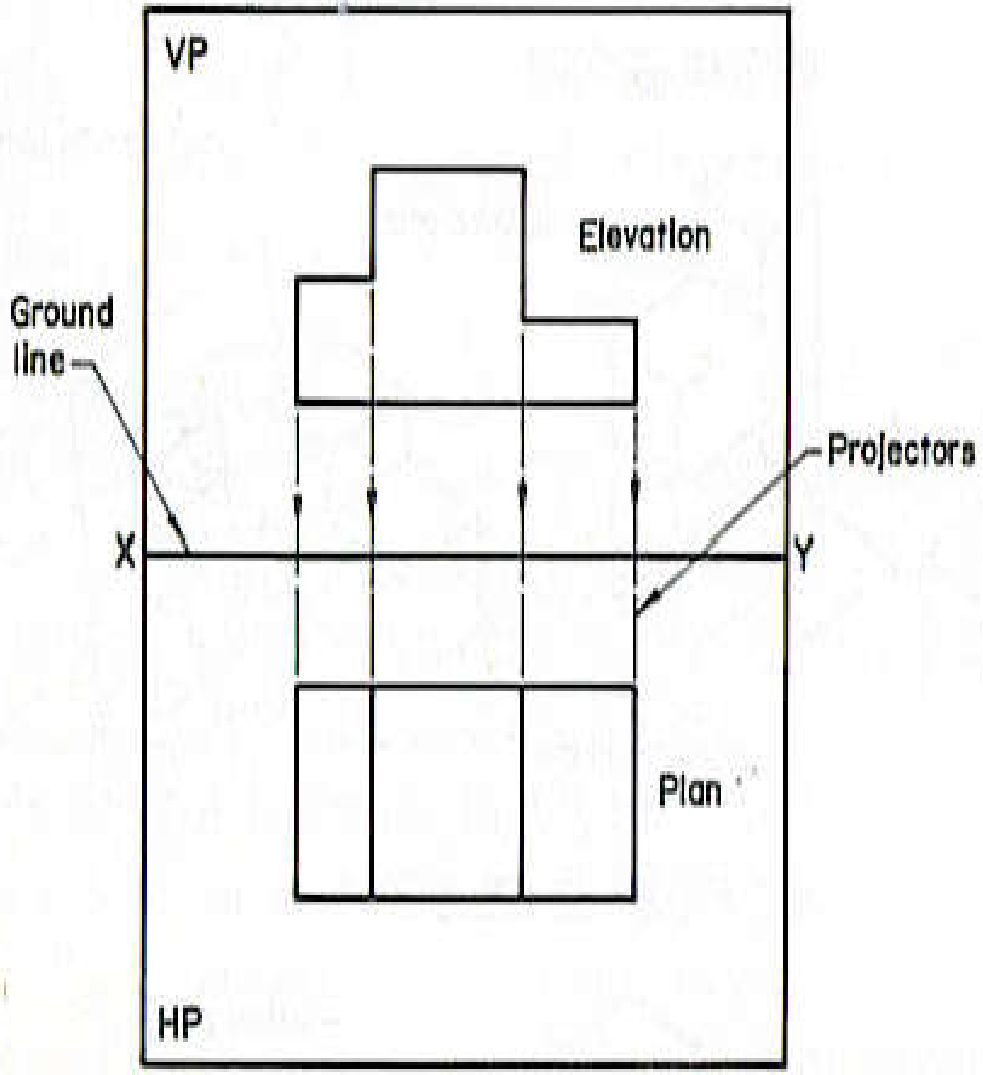
First angle projection – European System

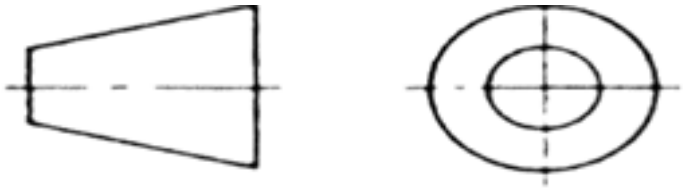
Third angle projection – American System


First angle


RIGHT VIEW
FRONT VIEW
LEFT VIEW
PLAN (TOP)
FIRST ANGLE


Elevation
Vertical plane
Object in space
between principal
planes
Ground
line
X
Y
First
quadrant
Horizontal plane
Plan

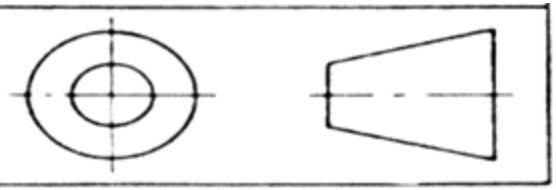

VP
Elevation
Ground
line
Projectors
X
Y
Plan
HP

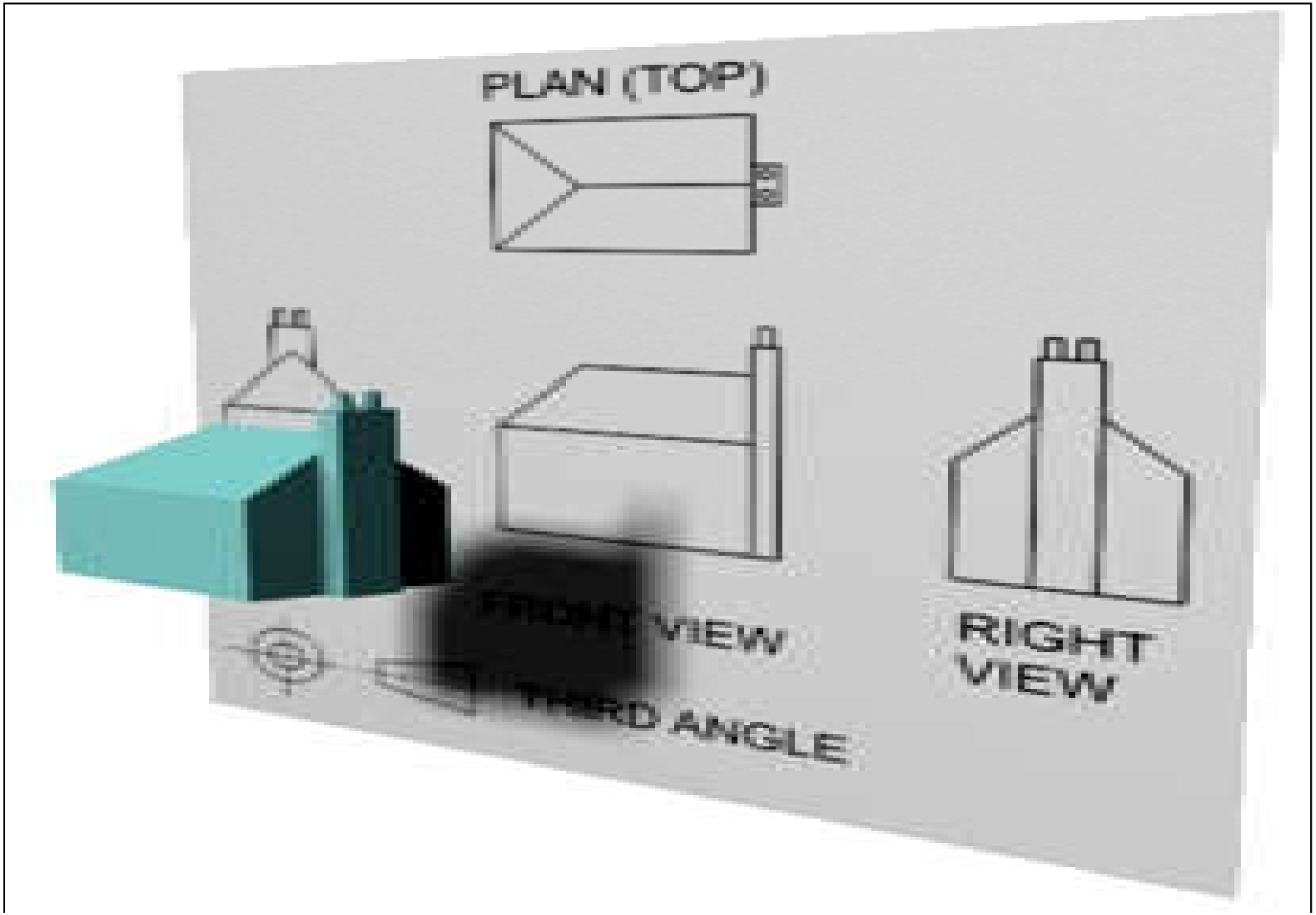


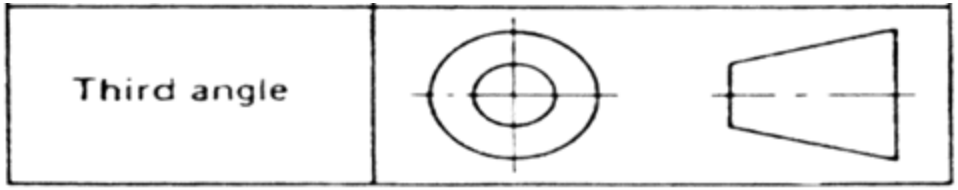
First Angle Projection

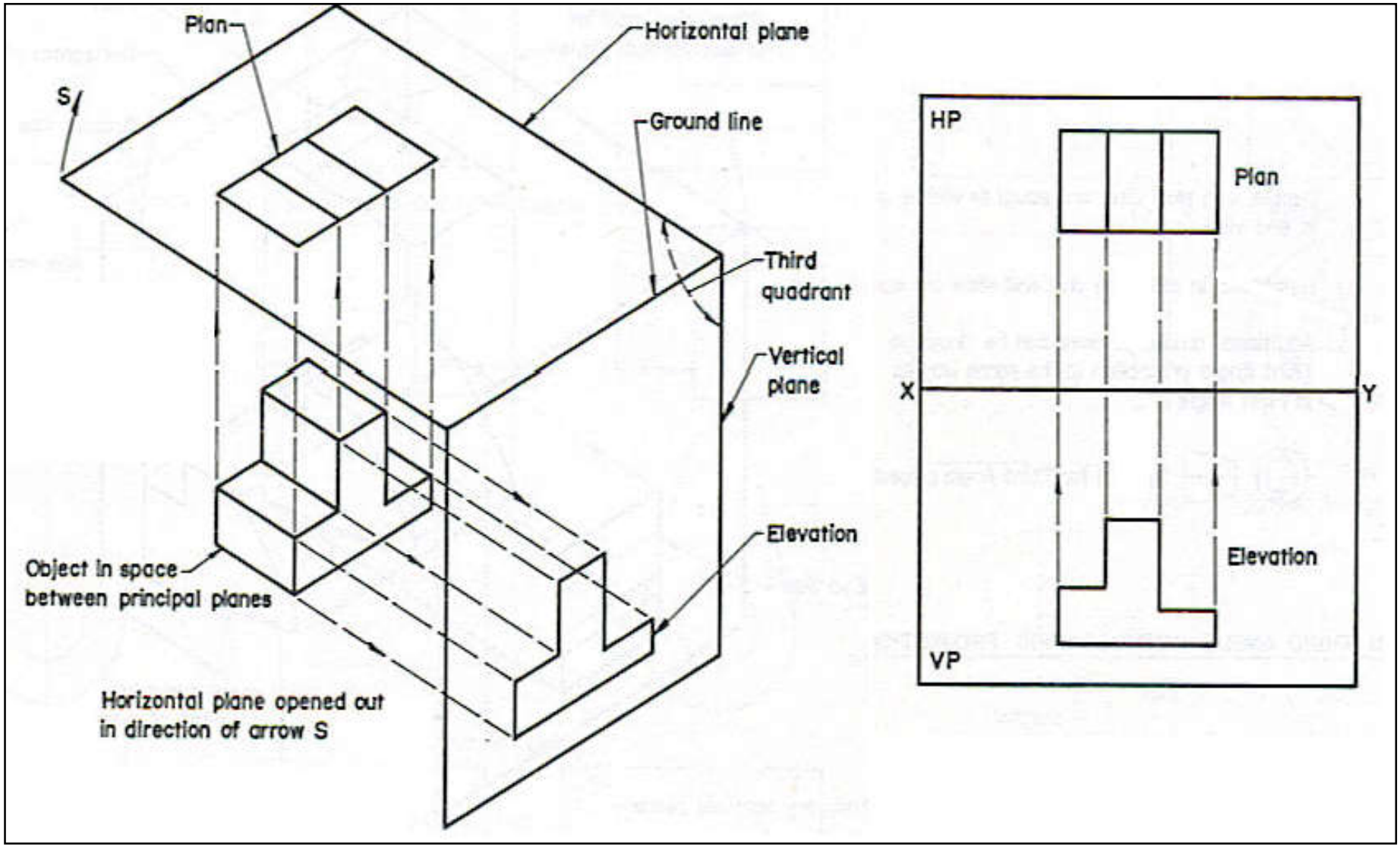
Points to remember:

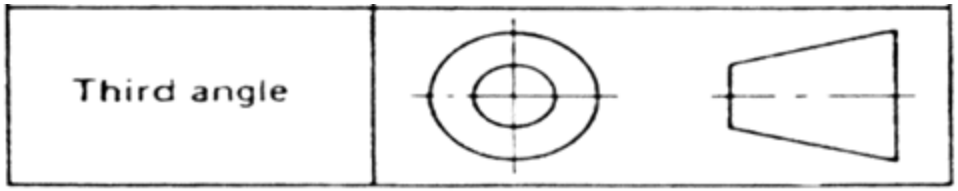
- The ‘front view’ (or elevation) is the view with maximum information.
- The ‘plan’ is below the ‘elevation’ (in projection).
- The ‘end view’ is placed on the right if viewed from left side of object and on the left if viewed from right side.

Third angle	




Third angle


Plan
Horizontal plane
S
Ground line
Third
quadrant
Vertical
plane
Elevation
Object in space
between principal planes
Horizontal plane opened out
in direction of arrow S
HP
Plan
X
Y
Elevation
VP



Points to remember:

- The ‘front view’ (or elevation) is the view with maximum information.
- The ‘plan’ is above the ‘elevation’ (in projection).
- The ‘end view’ is placed on the right if viewed from right side of object and on the left if viewed from left side.
- ‘End view’ and plan face outwards from ‘elevation’.

Orthographic projection (Contd.)

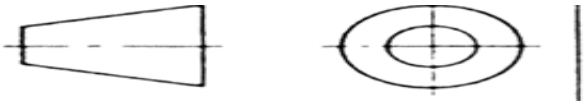
Guidelines to select and present the orthographic views

1. Use proper line types to express different features of the object.
2. Object or visible lines (thick continuous) to describe the visible surface or edge of the object.
3. Hidden or dotted lines to represent invisible features.
4. Centerlines are used to show and locate the centers of circles and arcs. Centerlines are also used to show the centre axis of a circular form.

As and when required, make use of other line types, such as Construction lines, Extension lines, Dimension lines. Follow the correct precedence sequence.

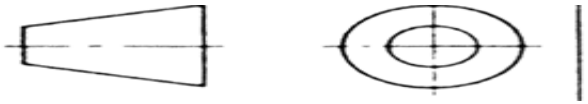
5. Label the views – for example, FRONT, TOP and SIDE
6. Leave adequate space between the views for labels and dimensions
7. Draw the views necessary to describe the object

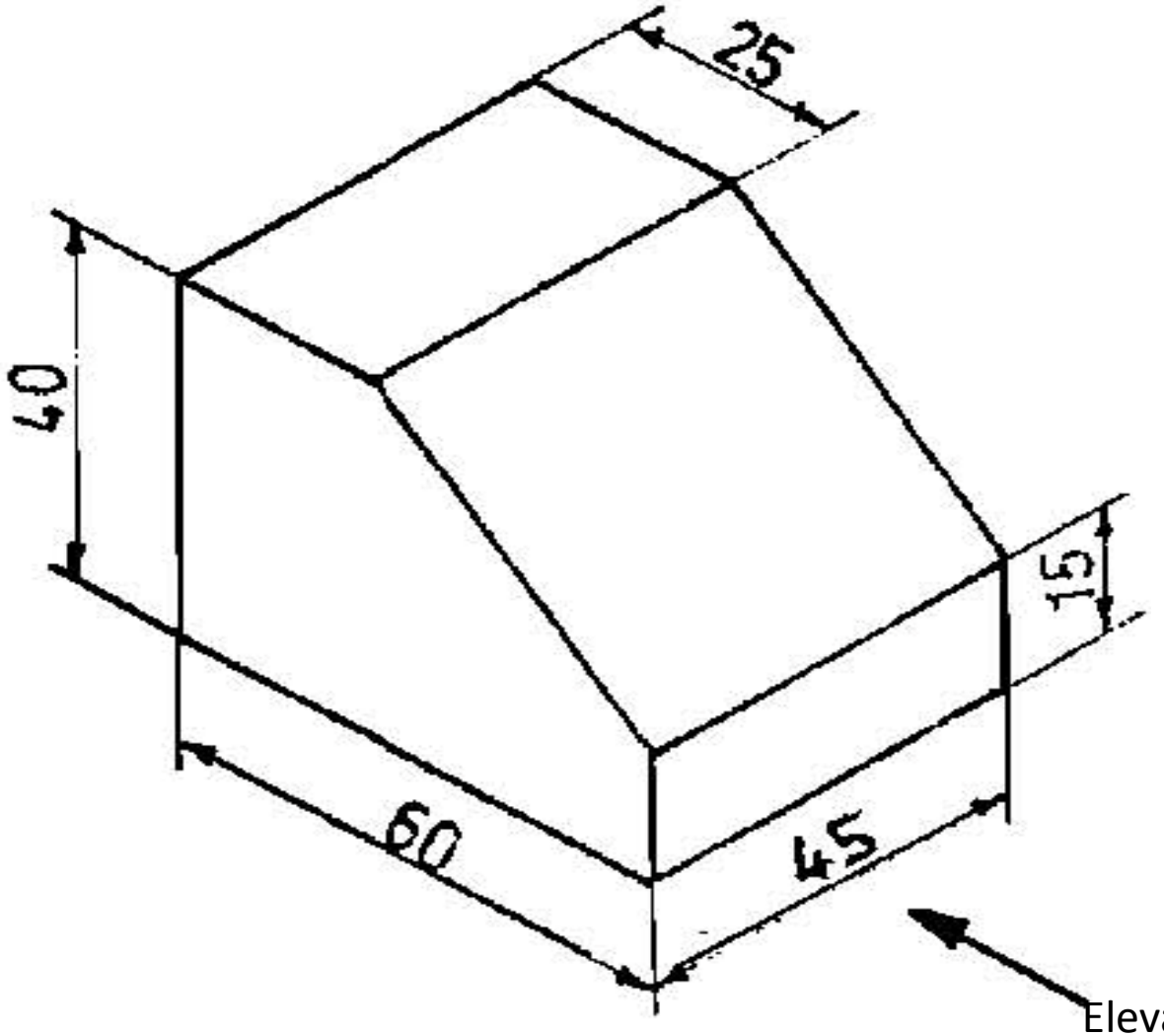
Example 1: Draw the below figure in first angle



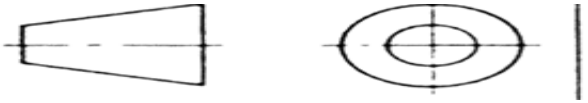
Elevation Direction

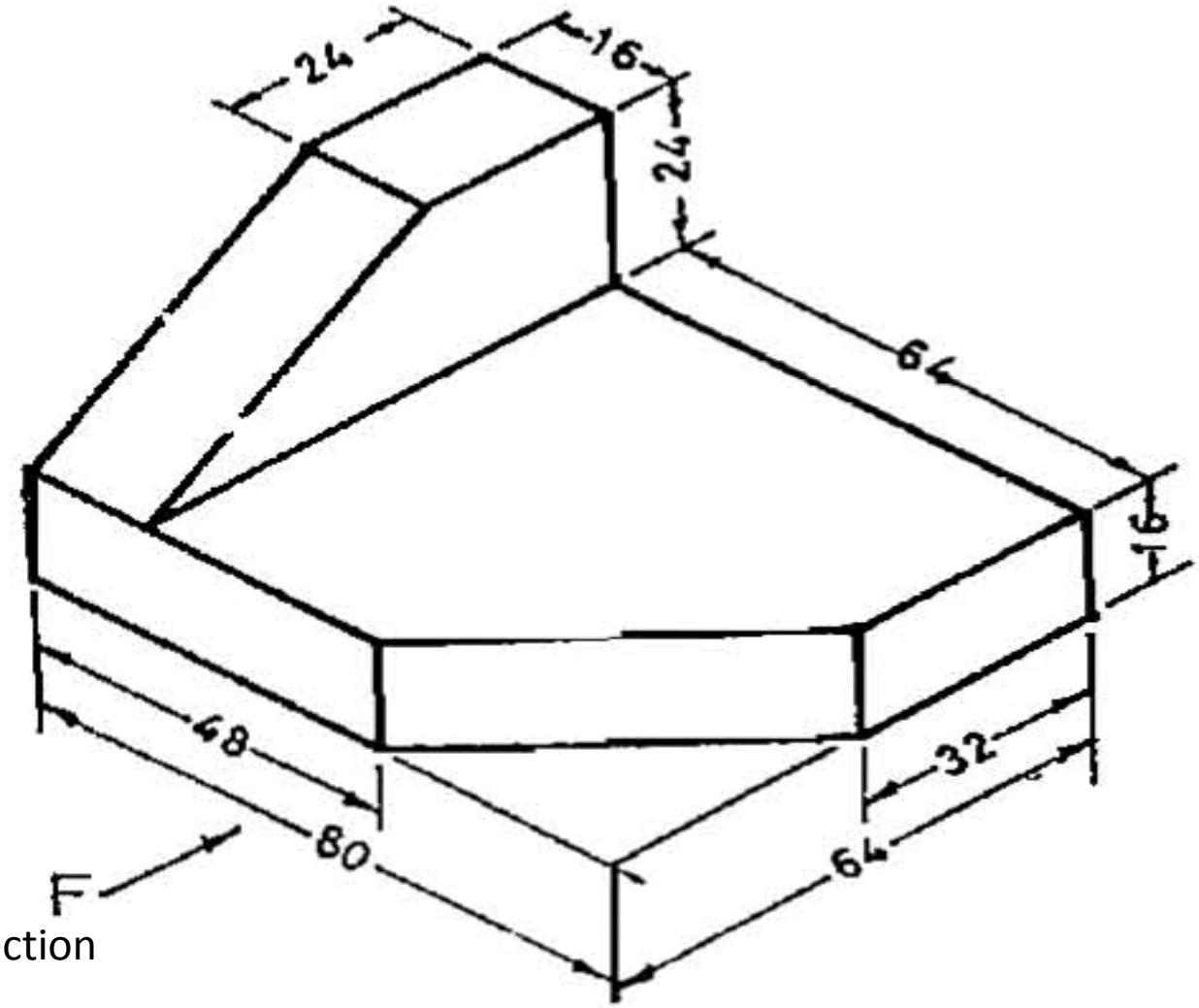
Class Work : Draw the below figure in first angle





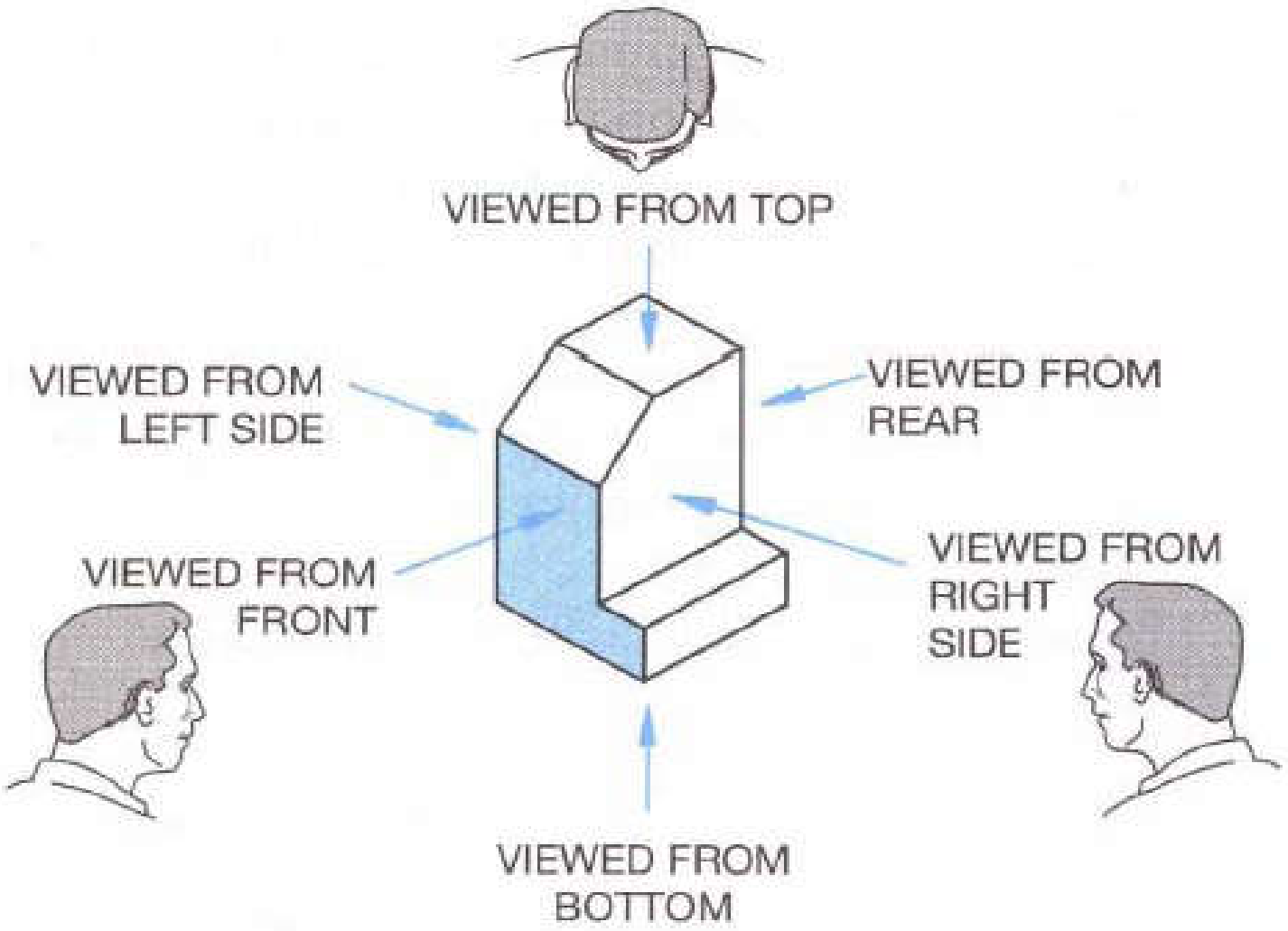
Assignment : Draw the below figure in first angle



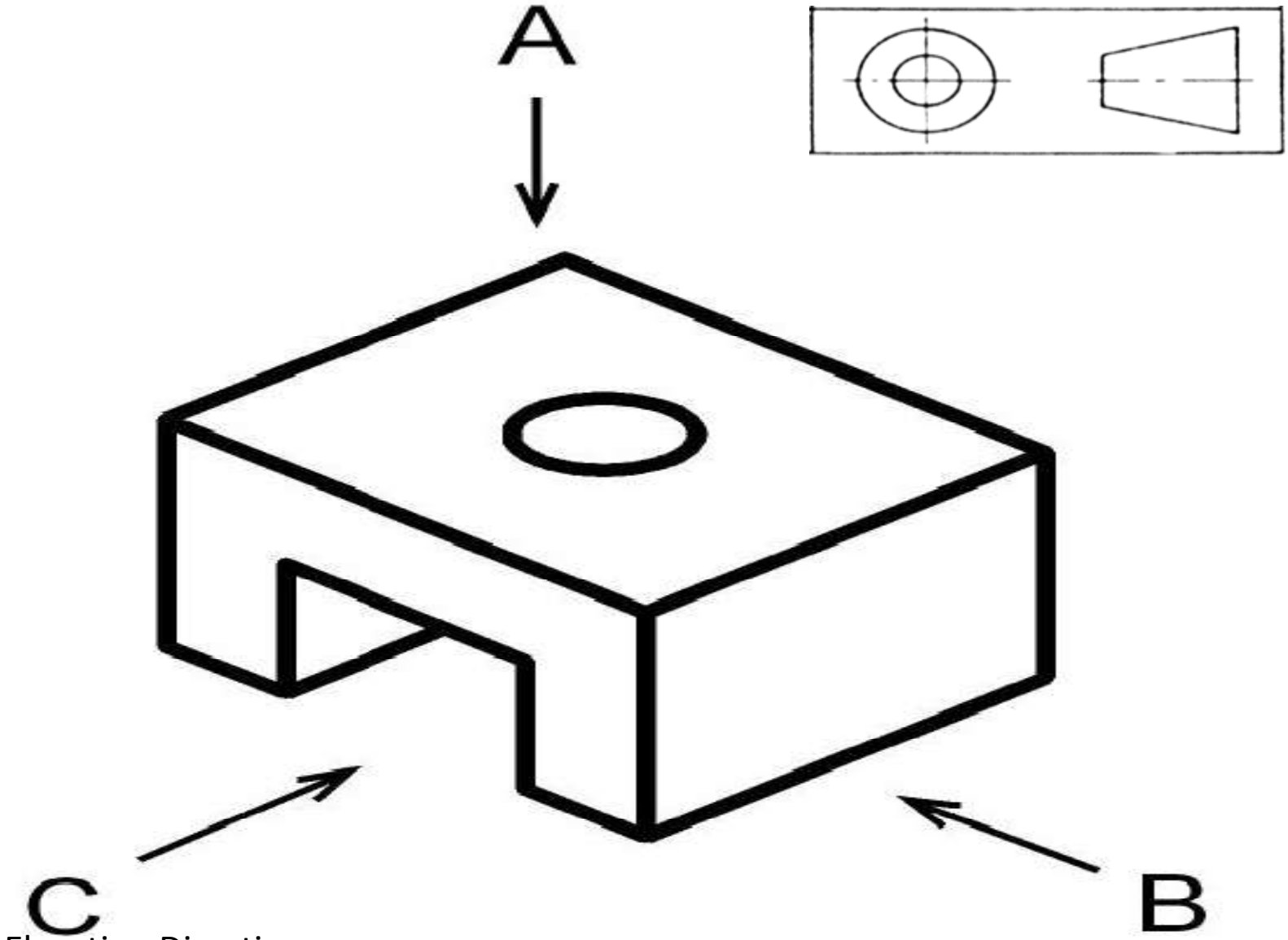


Elevation Direction

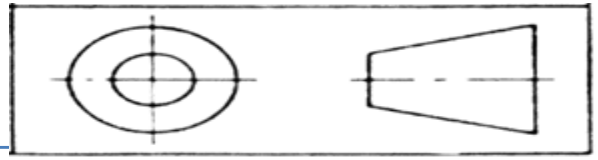
Third angle Orthographic projection

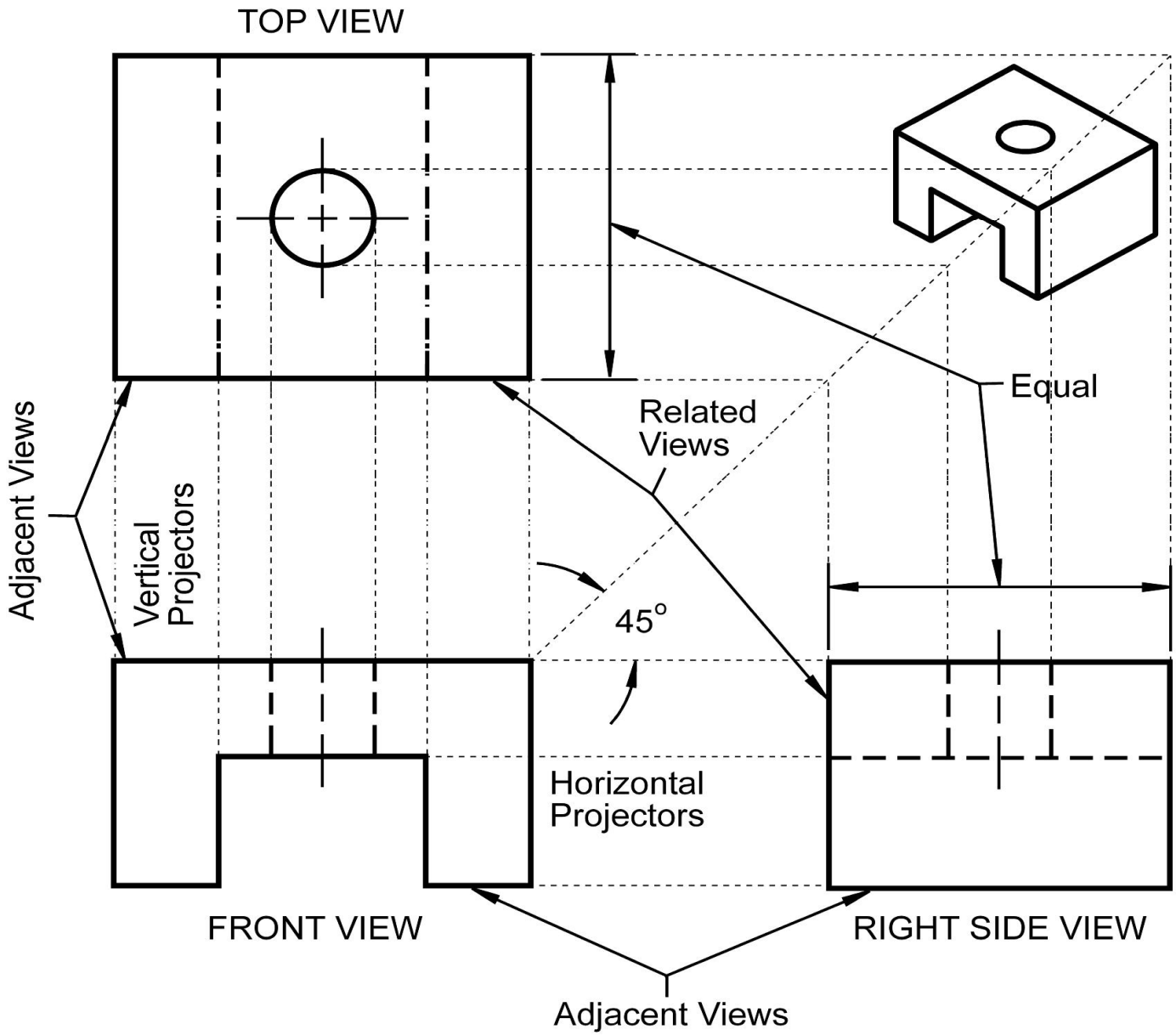


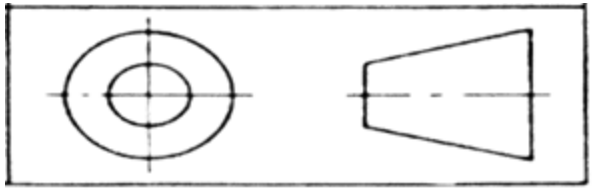
Example 2: Draw the below figure in third angle

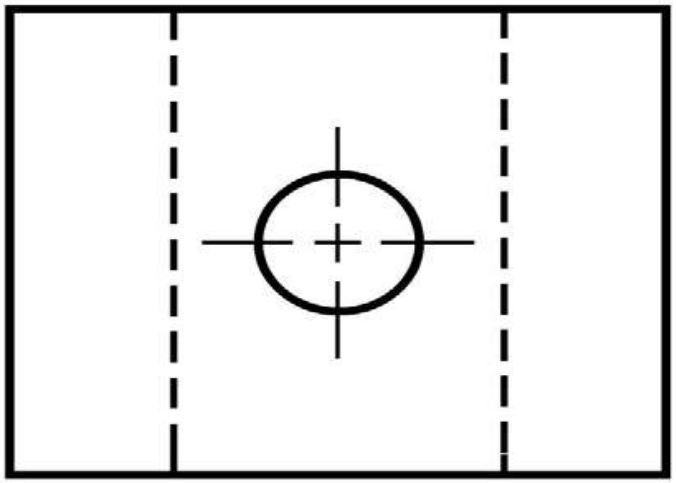


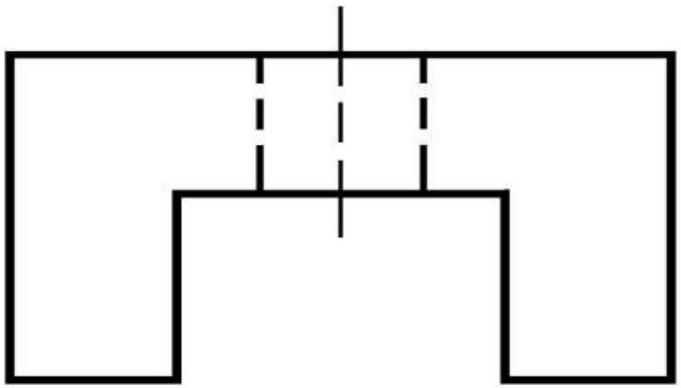
Elevation Direction

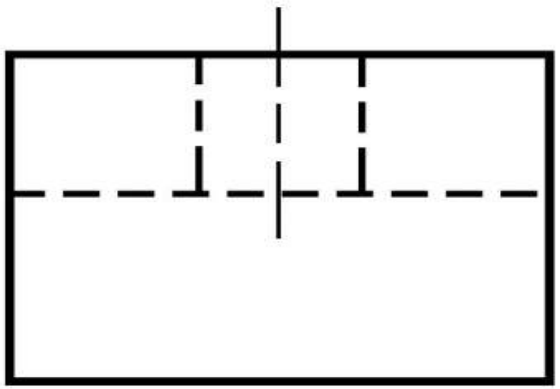



TOP VIEW
Equal
Related
Views
Adjacent Views
Vertical
Projectors
45°
Horizontal
Projectors
FRONT VIEW
RIGHT SIDE VIEW
Adjacent Views

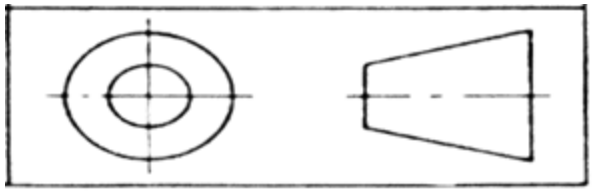


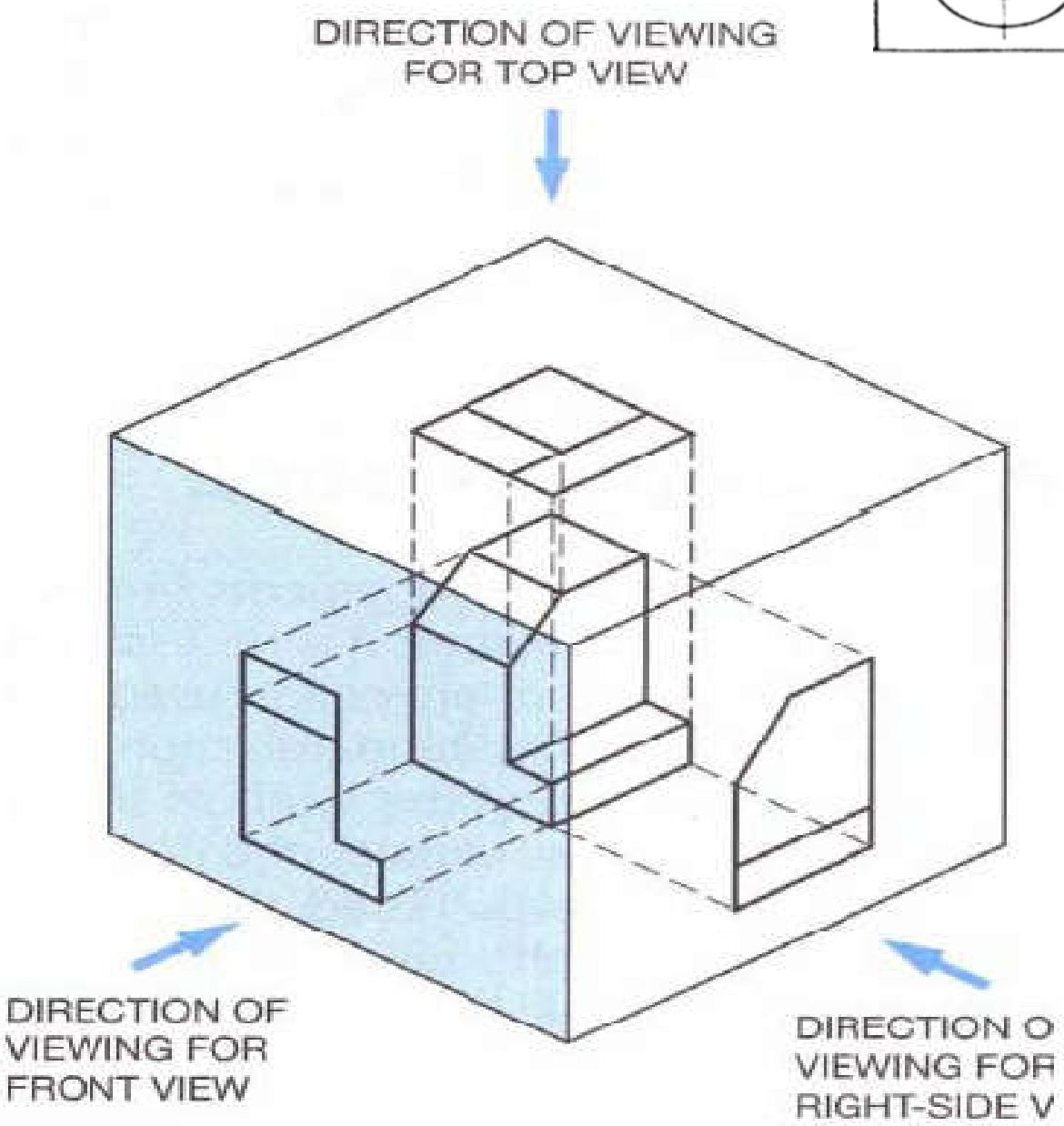




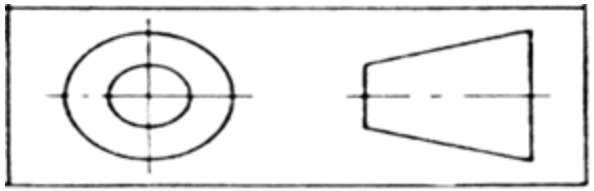


Example 2

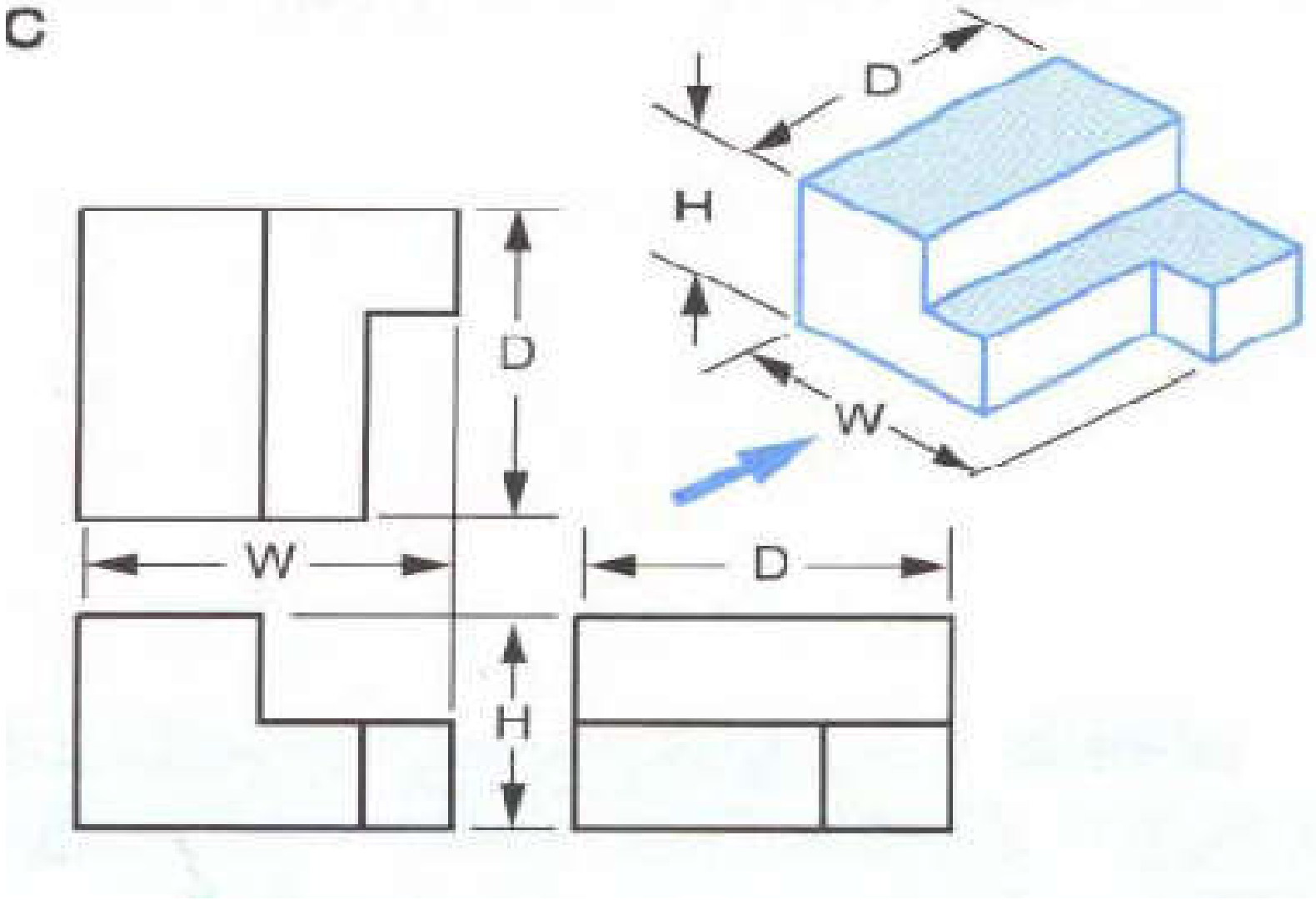



DIRECTION OF VIEWING
FOR TOP VIEW
DIRECTION OF
VIEWING FOR
FRONT VIEW
DIRECTION O
VIEWING FOR
RIGHT-SIDE V

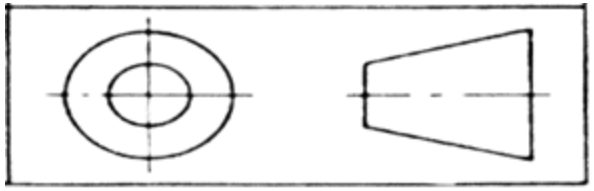
Example 3

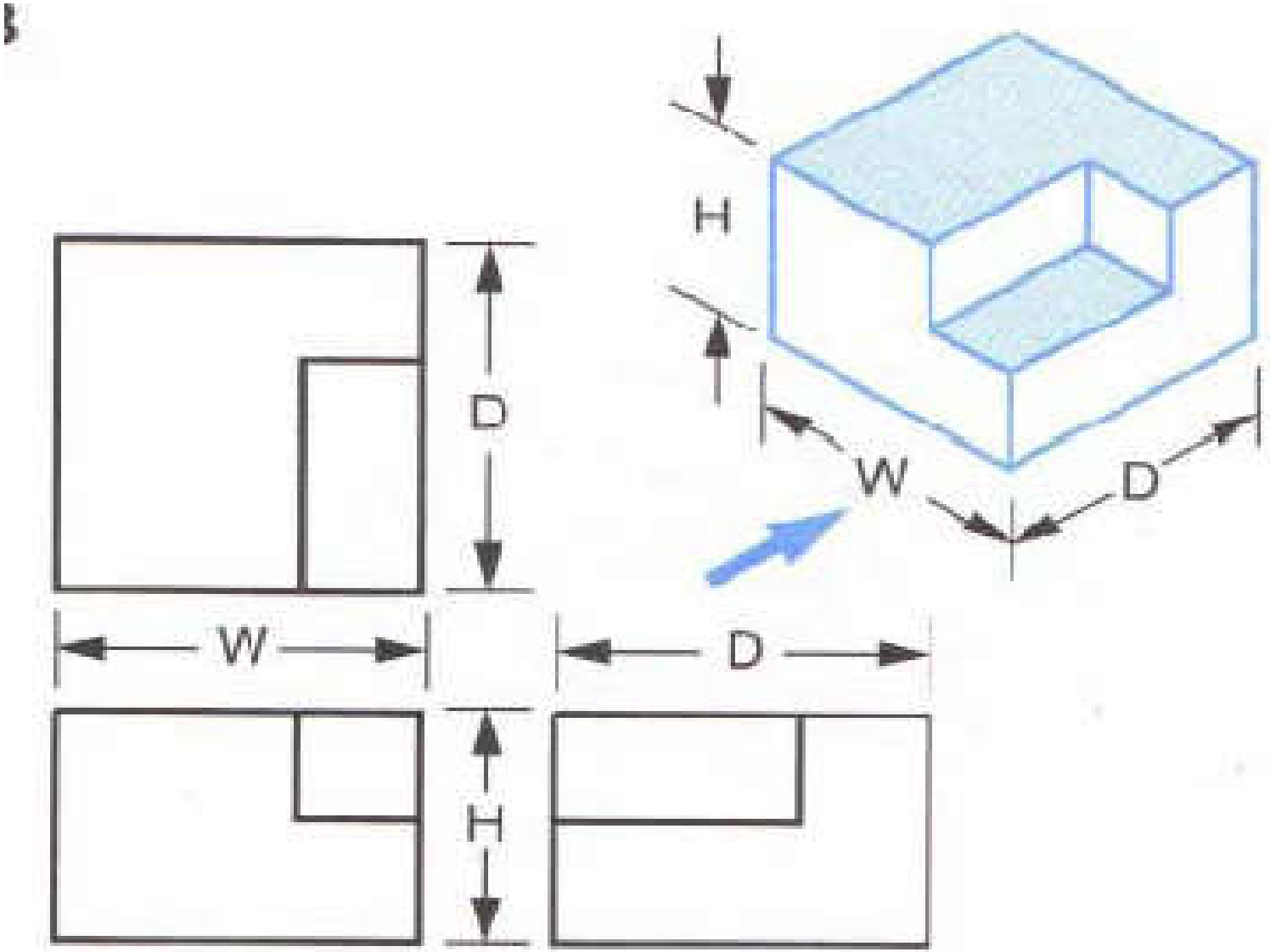


C

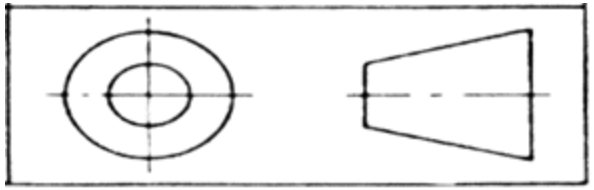


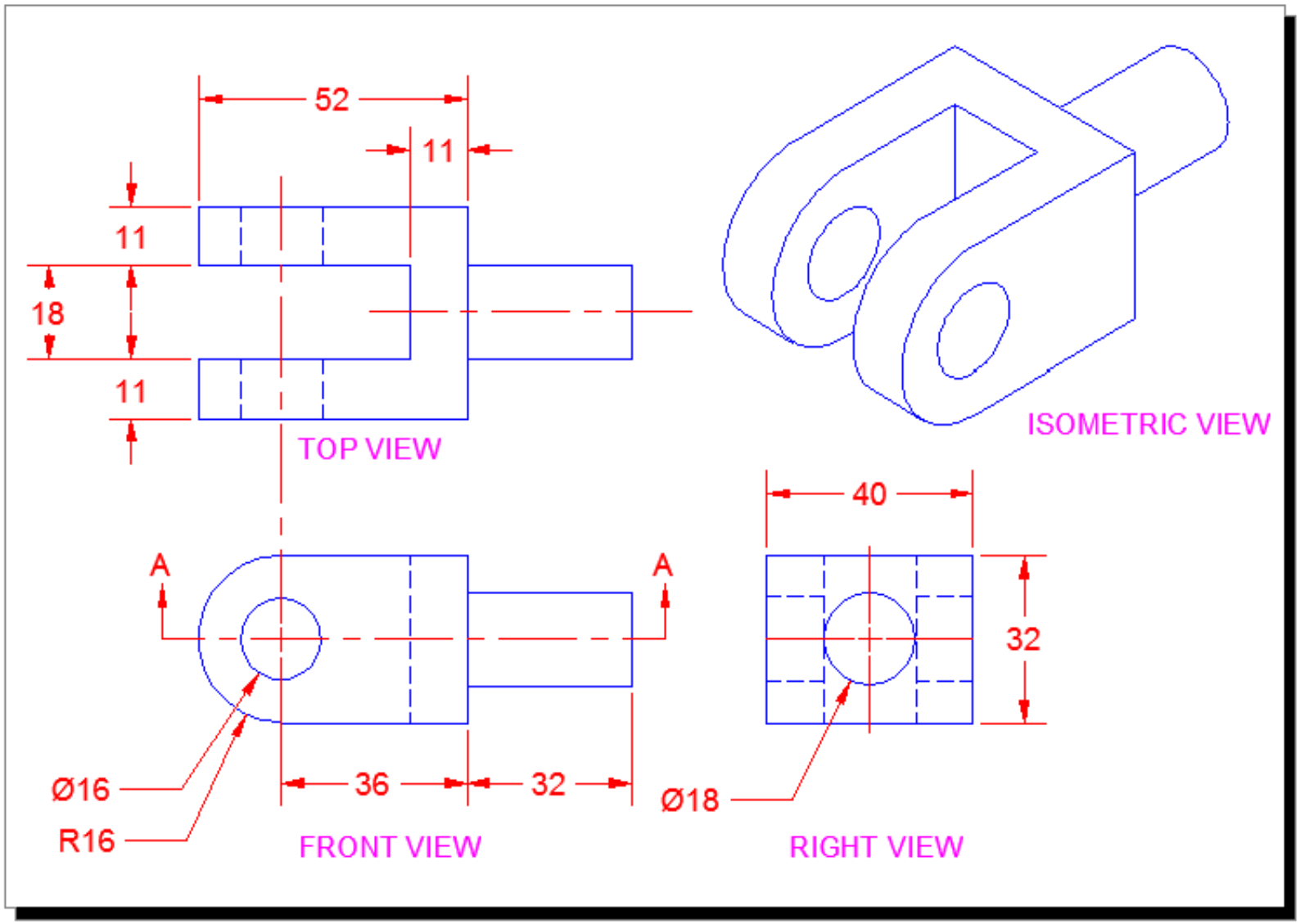
Class Work 1



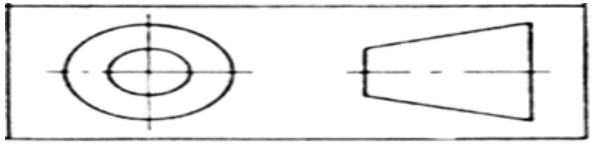


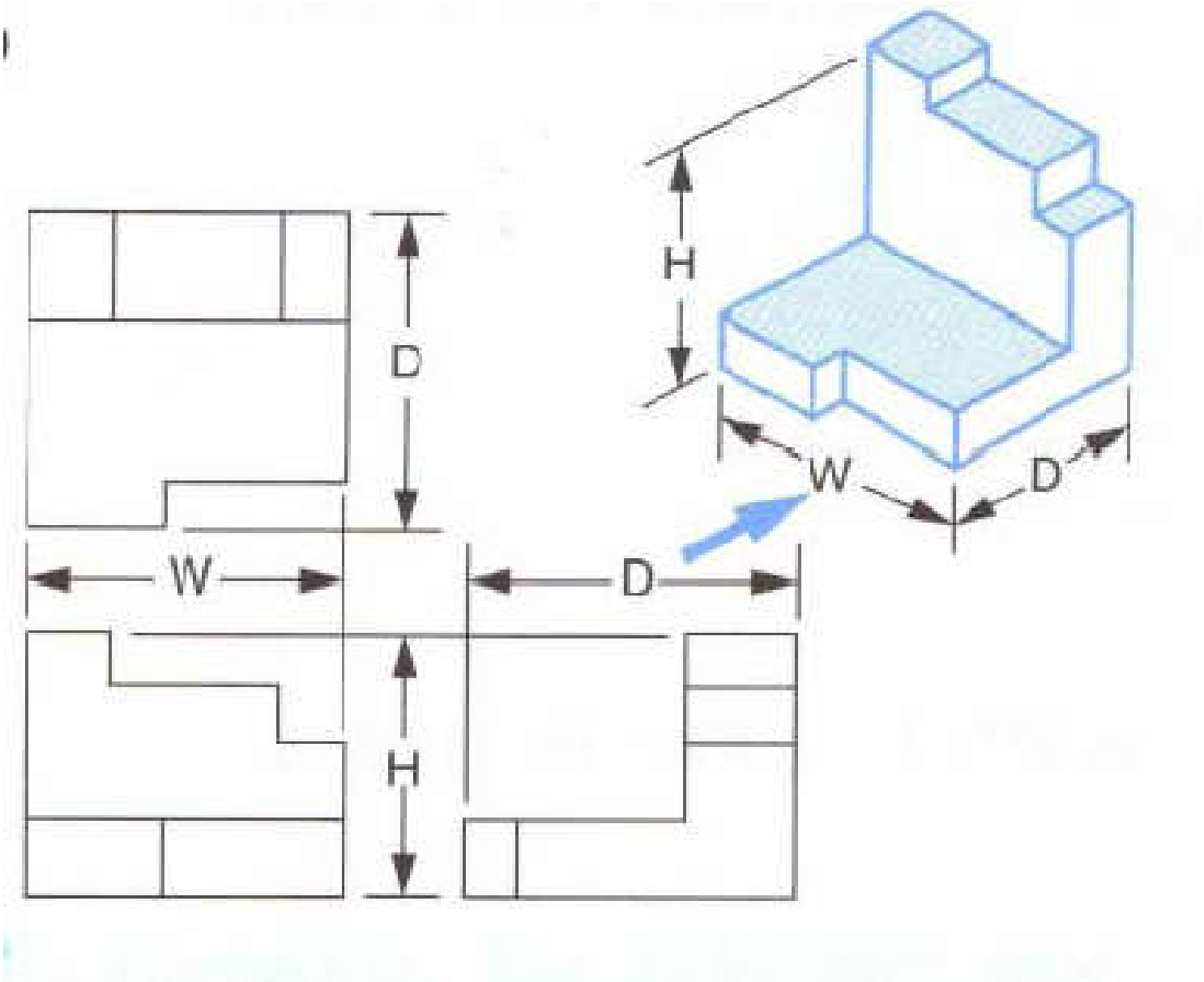
Class work 2:



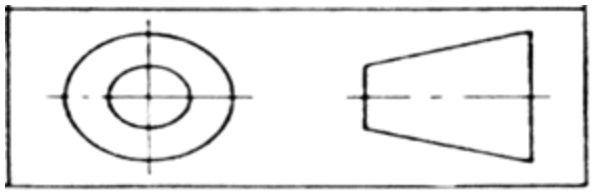

52
11
11
18
11
TOP VIEW
ISOMETRIC VIEW
A
A
Ø16
R16
36
32
FRONT VIEW
40
32
Ø18
RIGHT VIEW

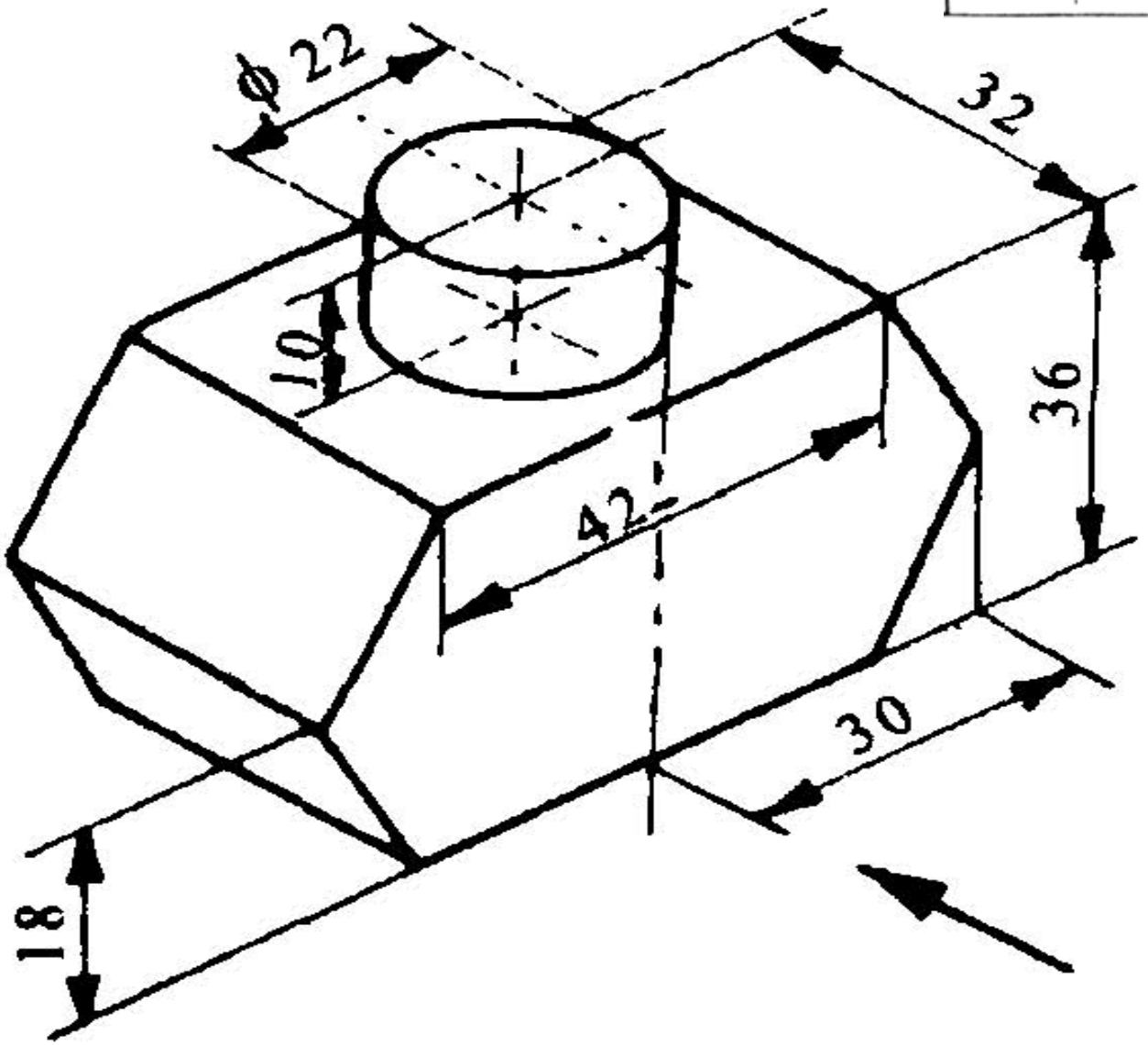
Assignment 1



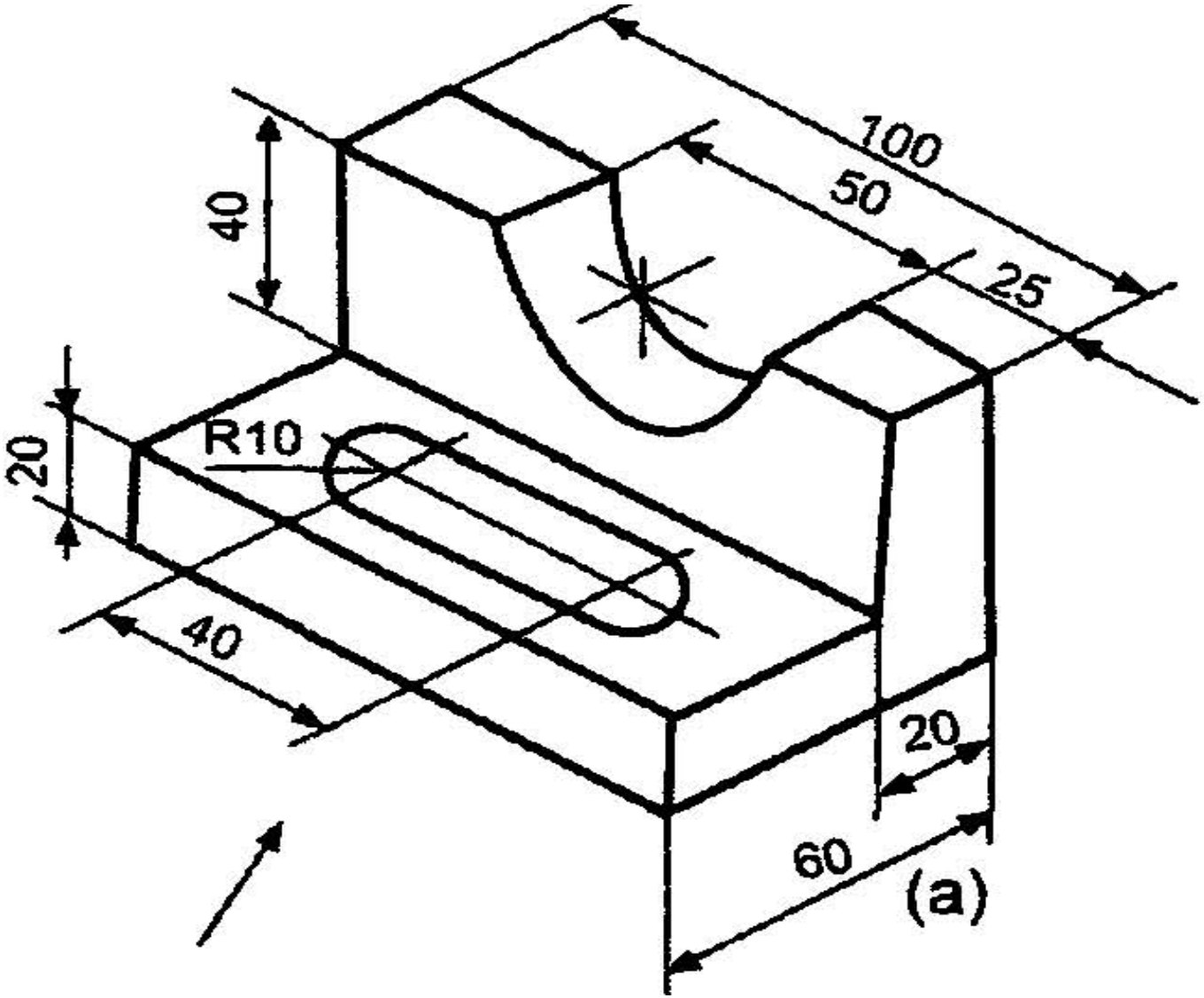


Assignment 2

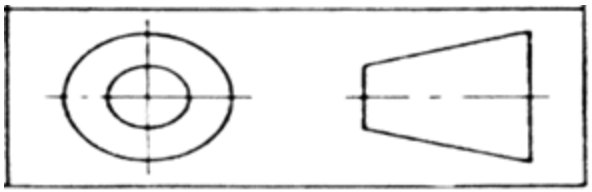


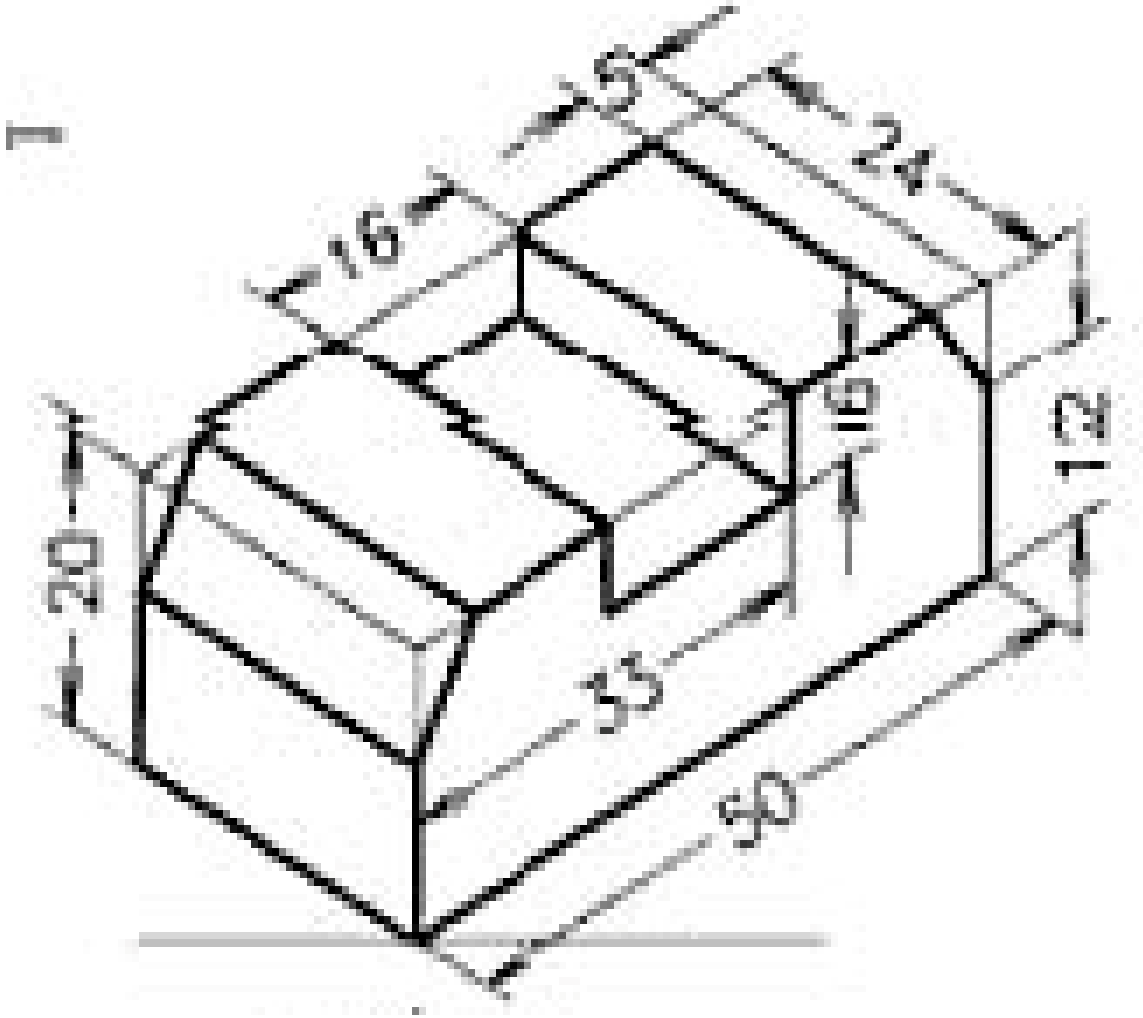


EXERCISE

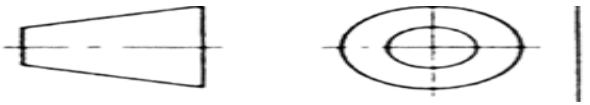


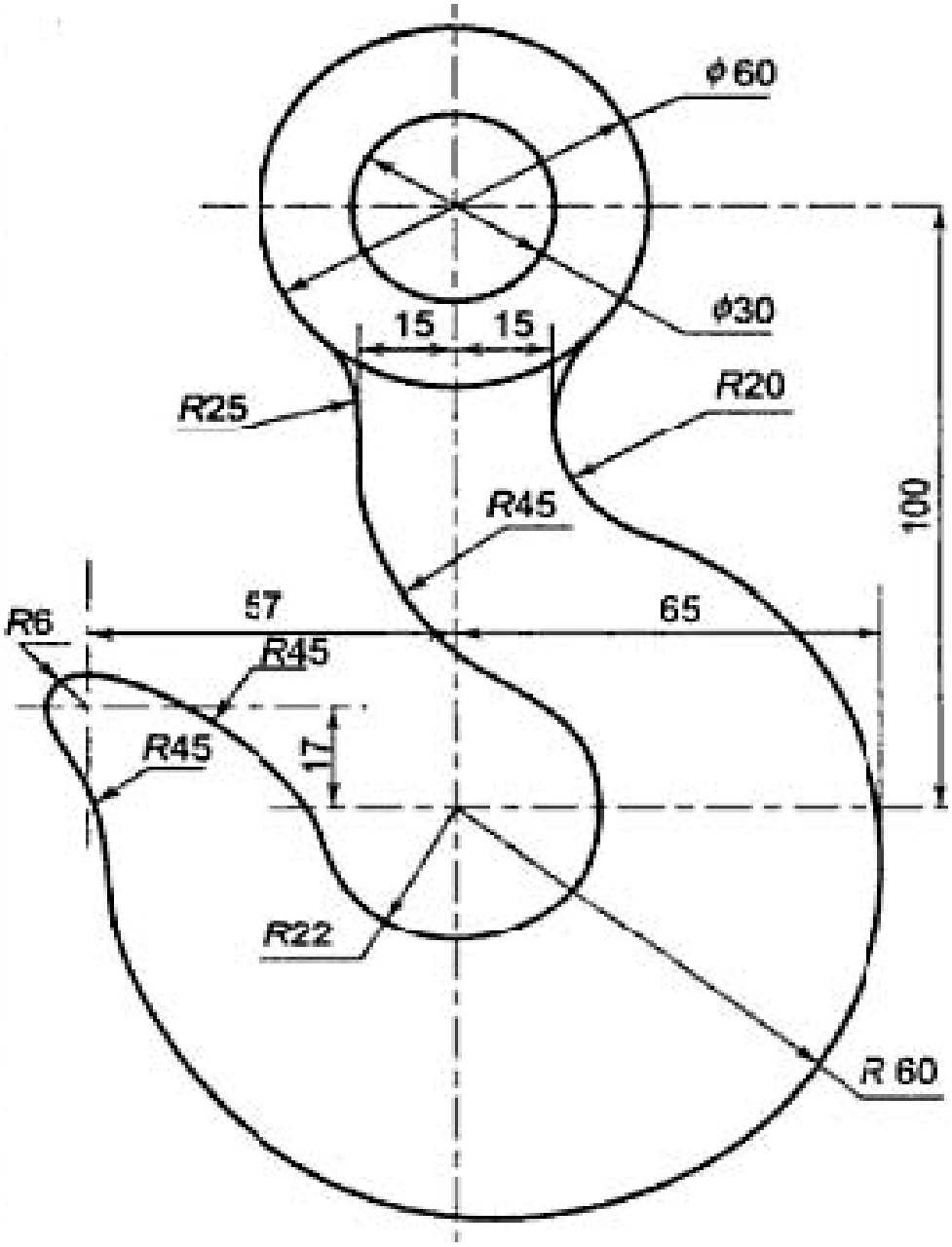
EXERCISE



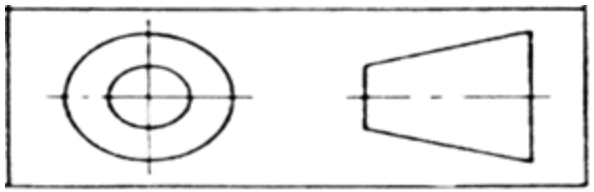


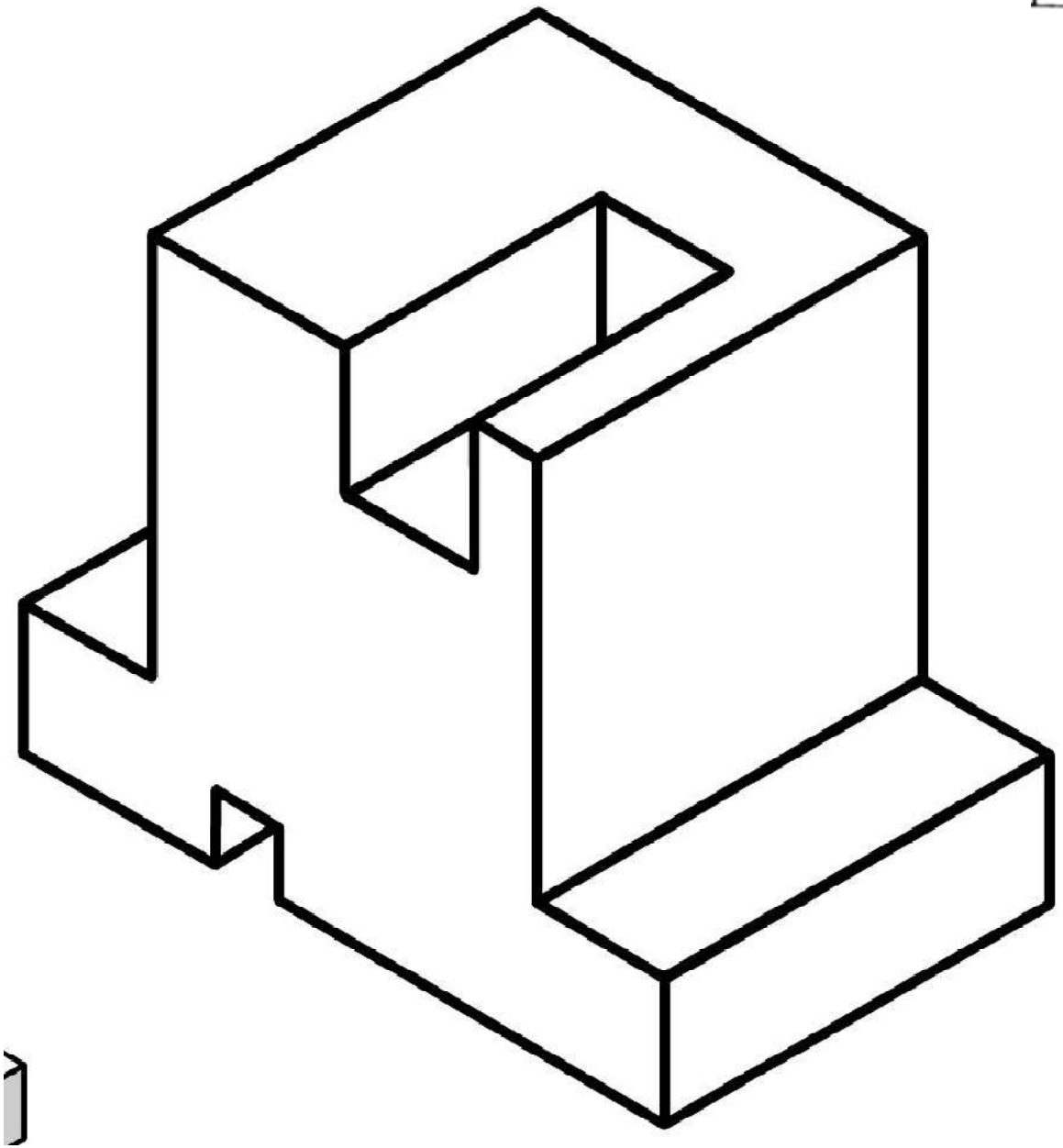
EXERCISE





EXERCISE





EXERCISE