COLLEGE OF ELECTRICAL AND MECHANICAL ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING DRAWING (MENG 1011)

Chapter 5: Auxiliary Views

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Topics

- *Definitions and uses of auxiliary views*
- *Primary auxiliary views*
- *Secondary auxiliary views*
- *Complete and partial auxiliary views*

Definitions and uses of auxiliary views

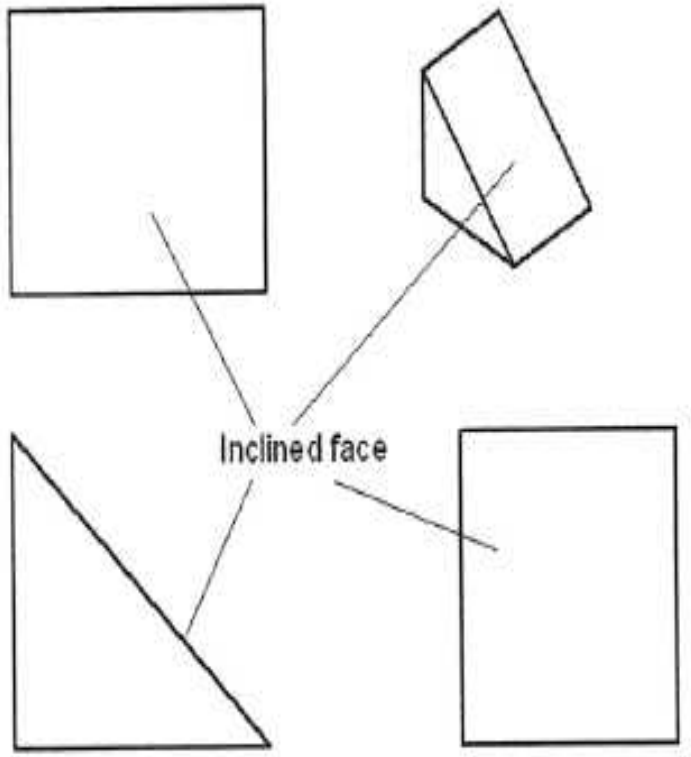
- *An auxiliary view is an orthographic view which is projected onto any plane other than the frontal, horizontal, or profile plane.*

- *One of the principle reasons for drawing auxiliary views is to show a surface at true size and shape.*

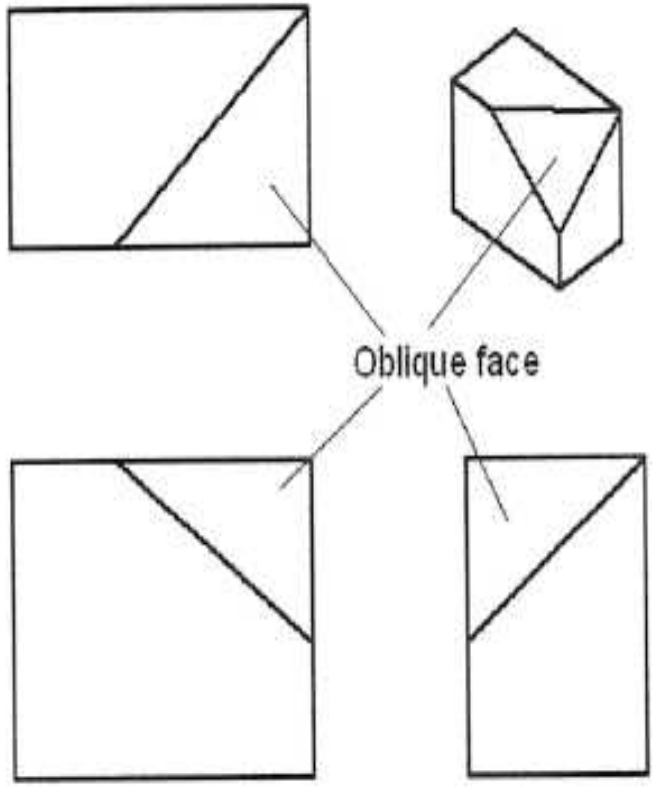
- *There are times when the six principal views will not completely describe an object. This is especially true when there are inclined or oblique planes or features on an object. For these cases, a special orthographic view called an auxiliary view can be created.*

Definitions and uses of auxiliary views

❑*Additionally, auxiliary views are used to show an object from an odd angle for any of a variety of reasons.*



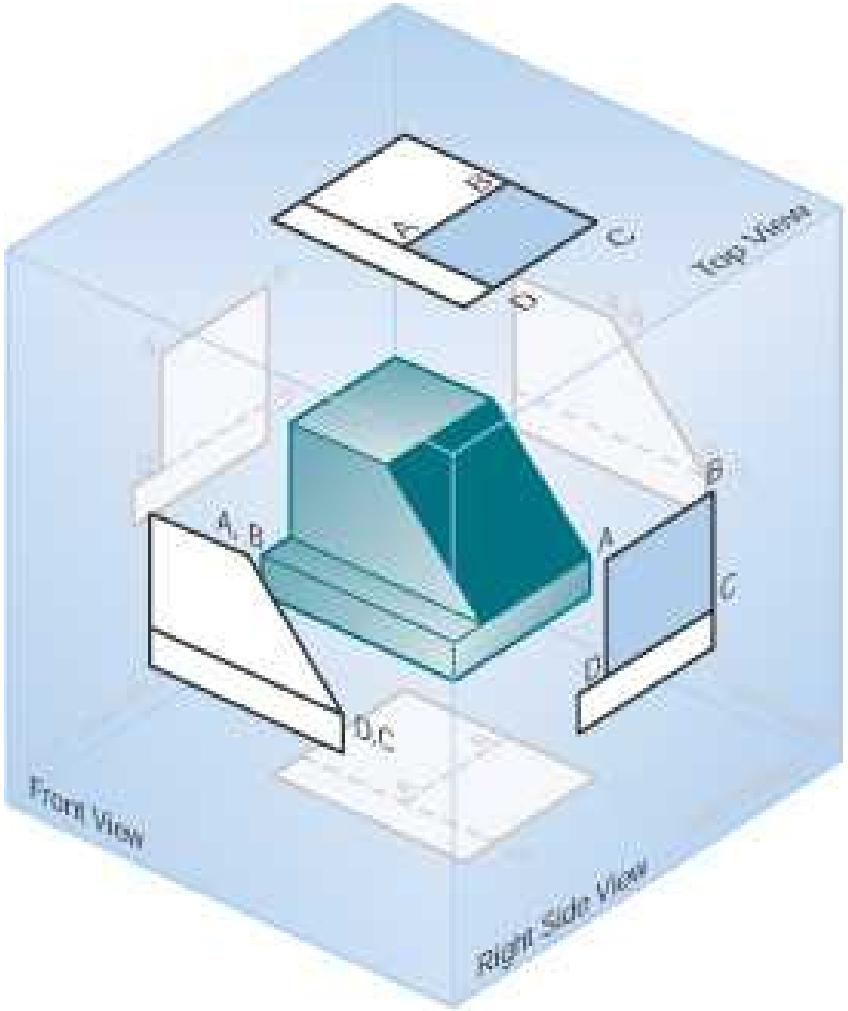
a) Inclined face

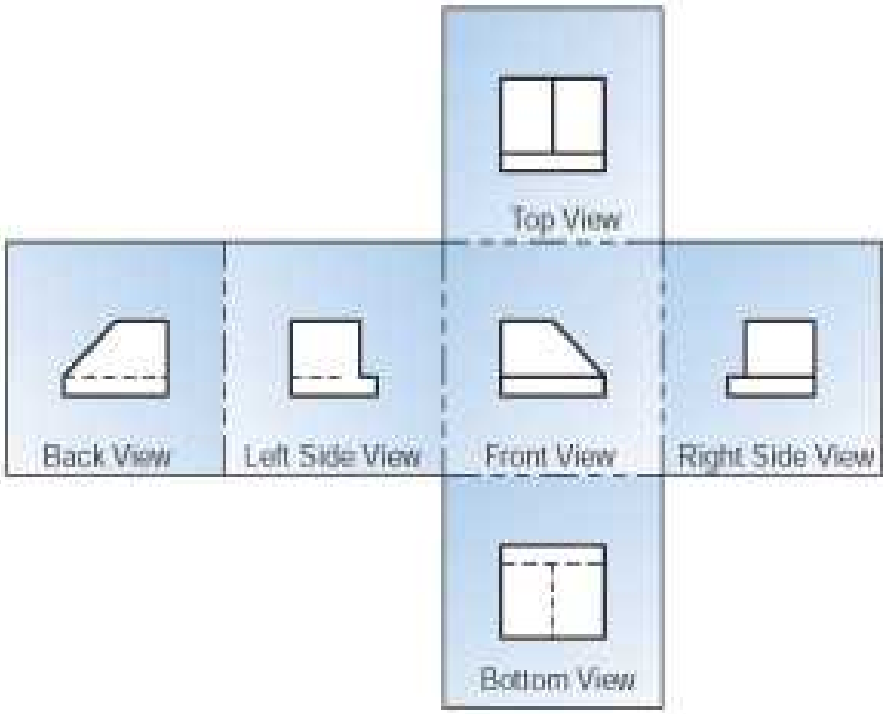


b) Oblique face

Definitions and uses of auxiliary views

The Six Principal Views: *None of the views gives an accurate depiction of surface ABCD.*

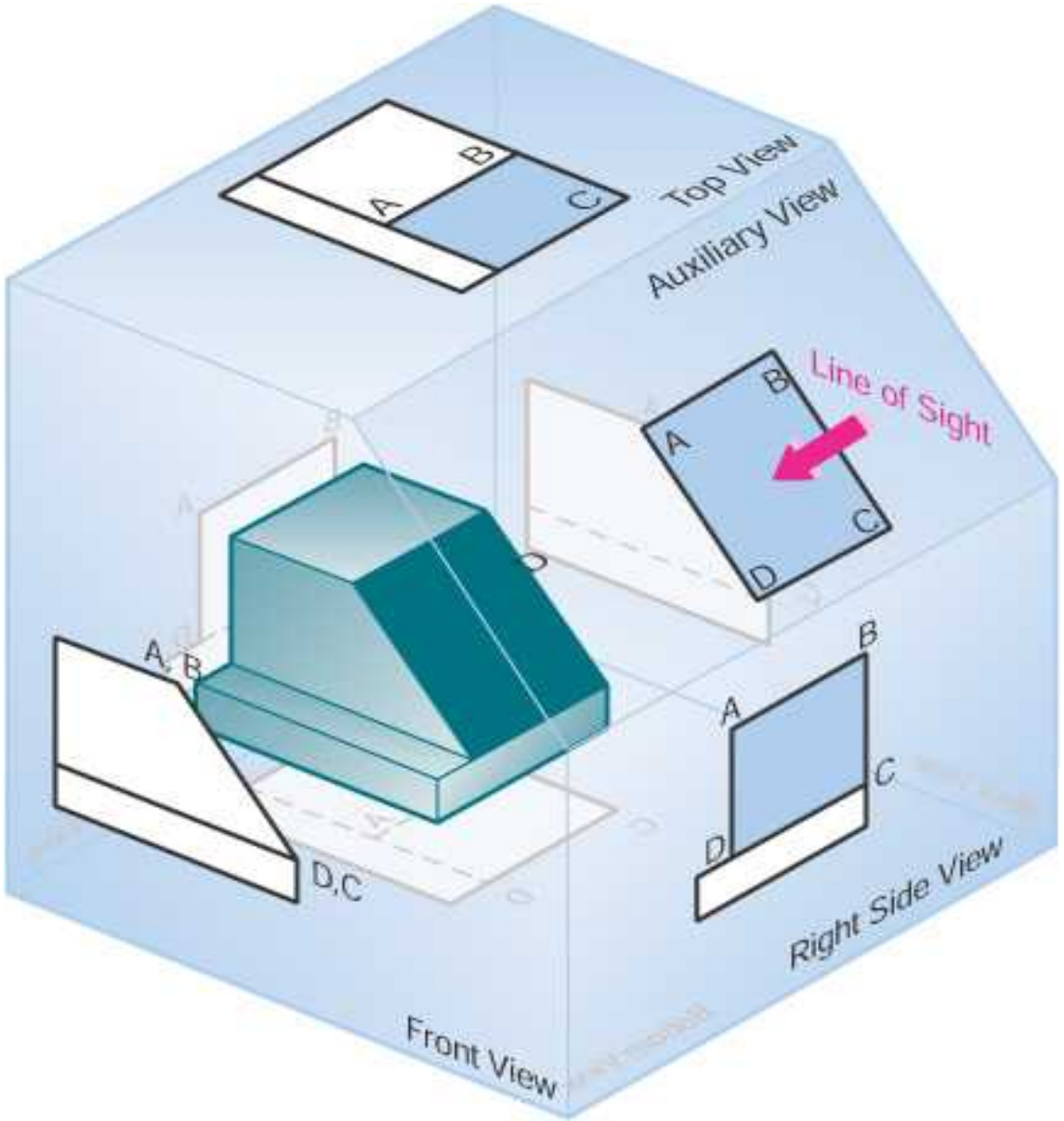




Definitions and uses of auxiliary views

Finding the True Shape

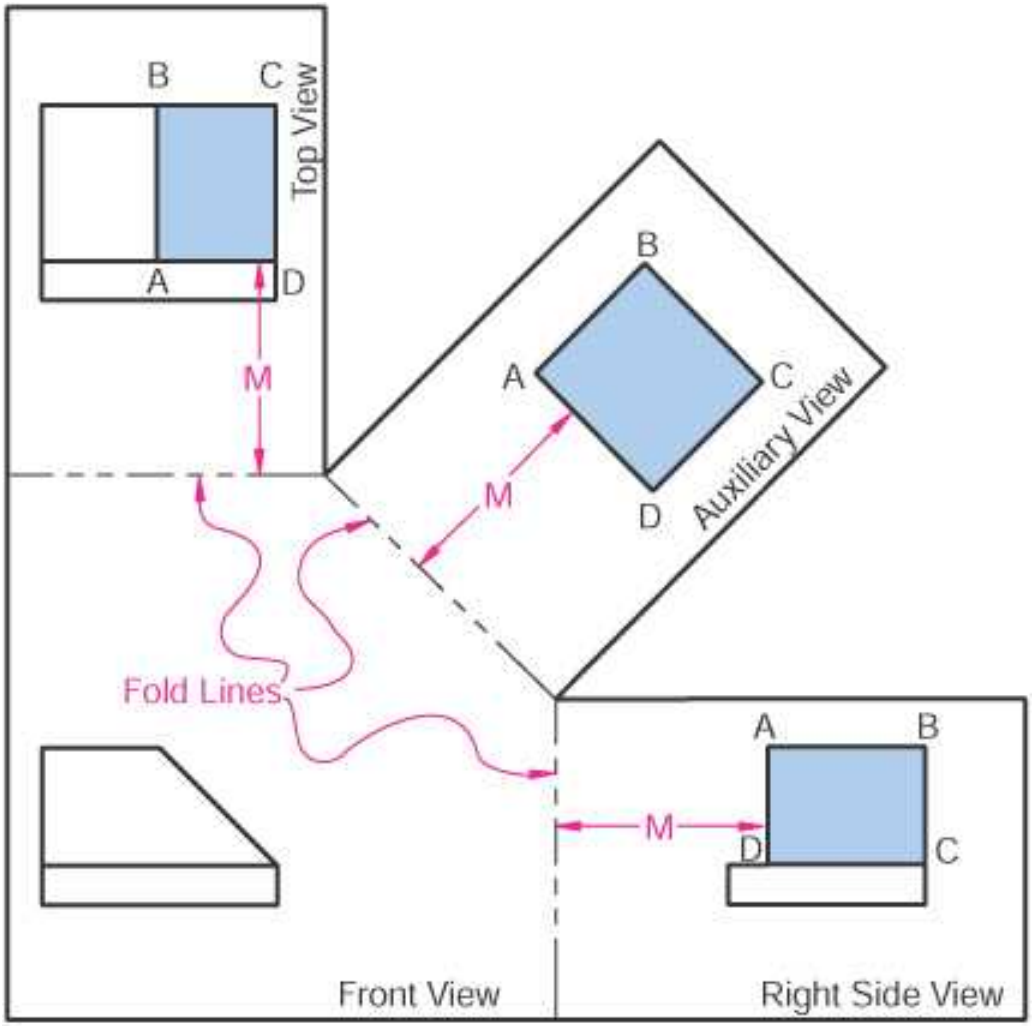
- *A viewing plane parallel to the surface is required to get true size and shape.*



Definitions and uses of auxiliary views

Fold Lines

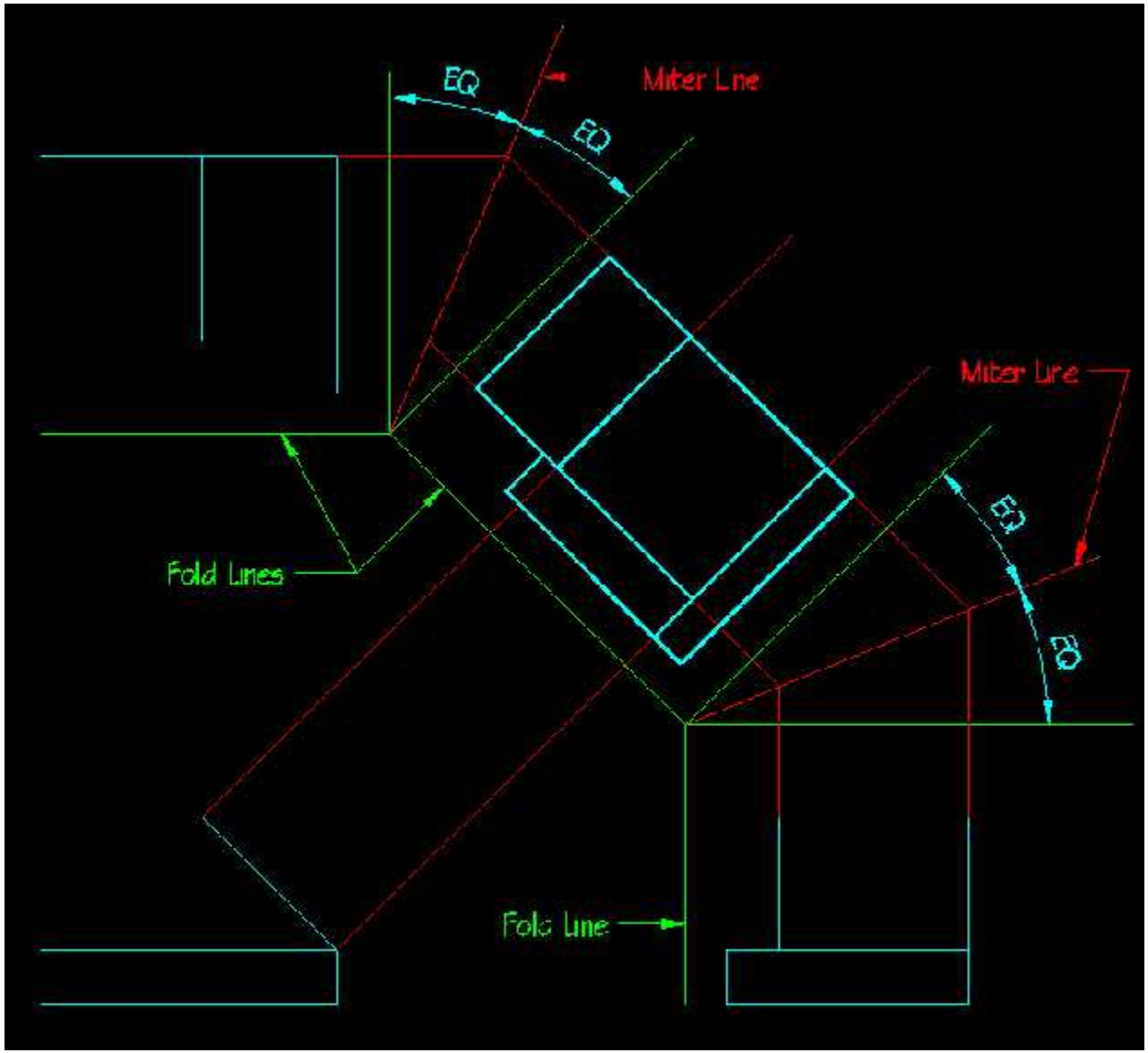
- **Fold lines** represent the edges of the “glass box”
- Orthographic **lines** are projected from **adjacent** views across fold lines.
- Object **distances** from fold lines are obtained from **related** views.



Definitions and uses of auxiliary views

Using Miter Lines to Transfer Distances between Related Views

- *The author does not cover this, but it is an easy way to transfer dimensions between related views.*
- *We have been using this in multi-view drawing anyway.*



Definitions and uses of auxiliary views

Uses of auxiliary views

*Generally, auxiliary views are used to show the **true shape** or true **angle of features** that appear distorted in the regular views. Auxiliary views are often used to produce views that show the following:*

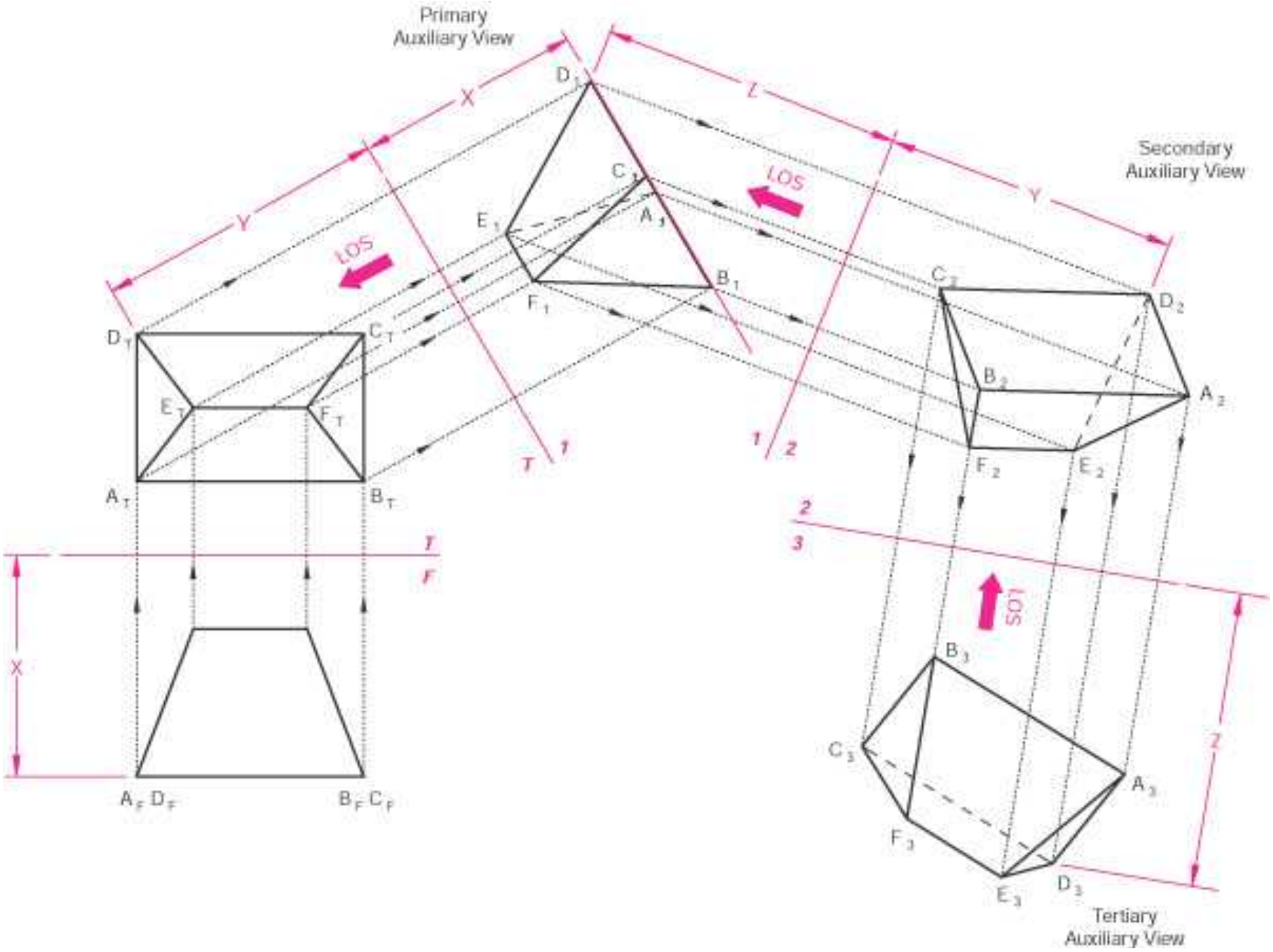
- *True length of line (TL)*
- *Point view of line (PV)*
- *Edge view of plane (EV)*
- *True size of plane (TS)*
- *True size of angle between a line and a plane or a plane and a plane*

Primary and secondary auxiliary views

- **Auxiliary views** are created by positioning a new line of sight relative to the object.
- It is possible to create any number of auxiliary views, including a new auxiliary view from an existing auxiliary view. Therefore, auxiliary views are first classified as:

  - A ***primary auxiliary*** view is a single view projected from one of the six principal views.
  - A ***secondary auxiliary*** view is a single view projected from a primary auxiliary view.
  - A ***tertiary auxiliary*** view is a single view projected from a secondary or another tertiary auxiliary view.

Primary and secondary auxiliary views



Primary and secondary auxiliary views

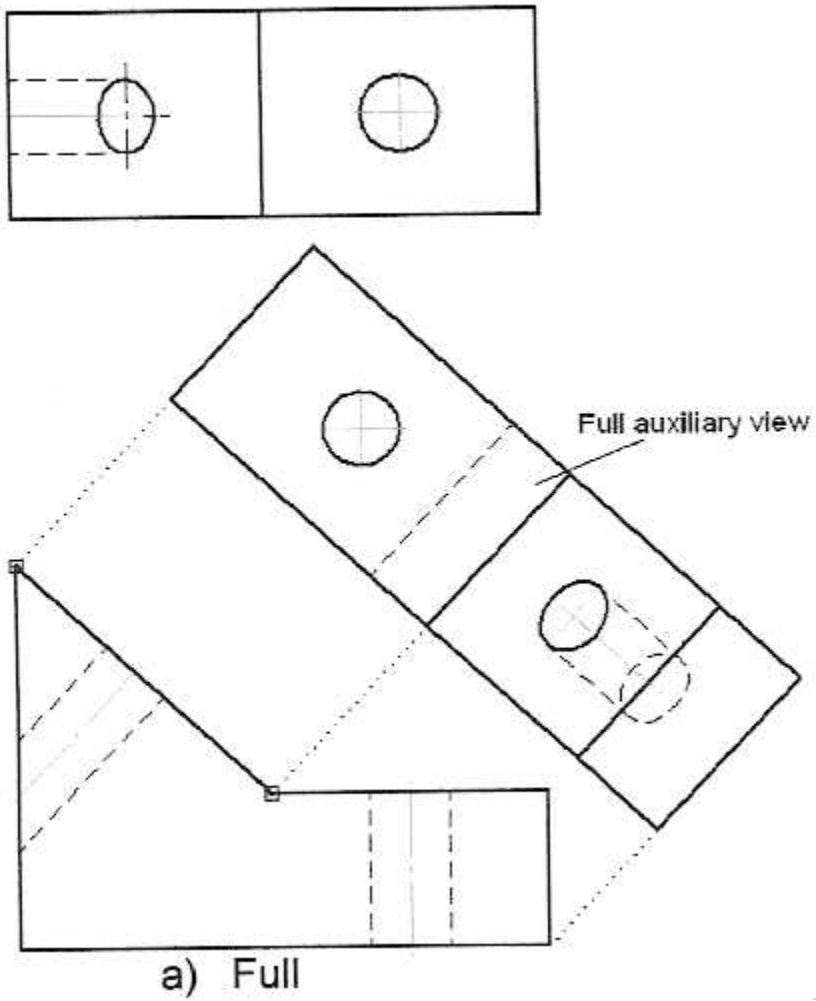
Auxiliary views are also classified by the space dimension shown in true size in the primary auxiliary view.

- *A **depth auxiliary** is an auxiliary view projected from the front view, and the depth dimension is shown true length.*
- *A **height auxiliary** view is an auxiliary view projected from the top view, and the height dimension is shown true length.*
- *A **width auxiliary** view is an auxiliary view projected from the profile view, and the width dimension is shown true length.*

Complete /Full/ and Partial Auxiliary Views

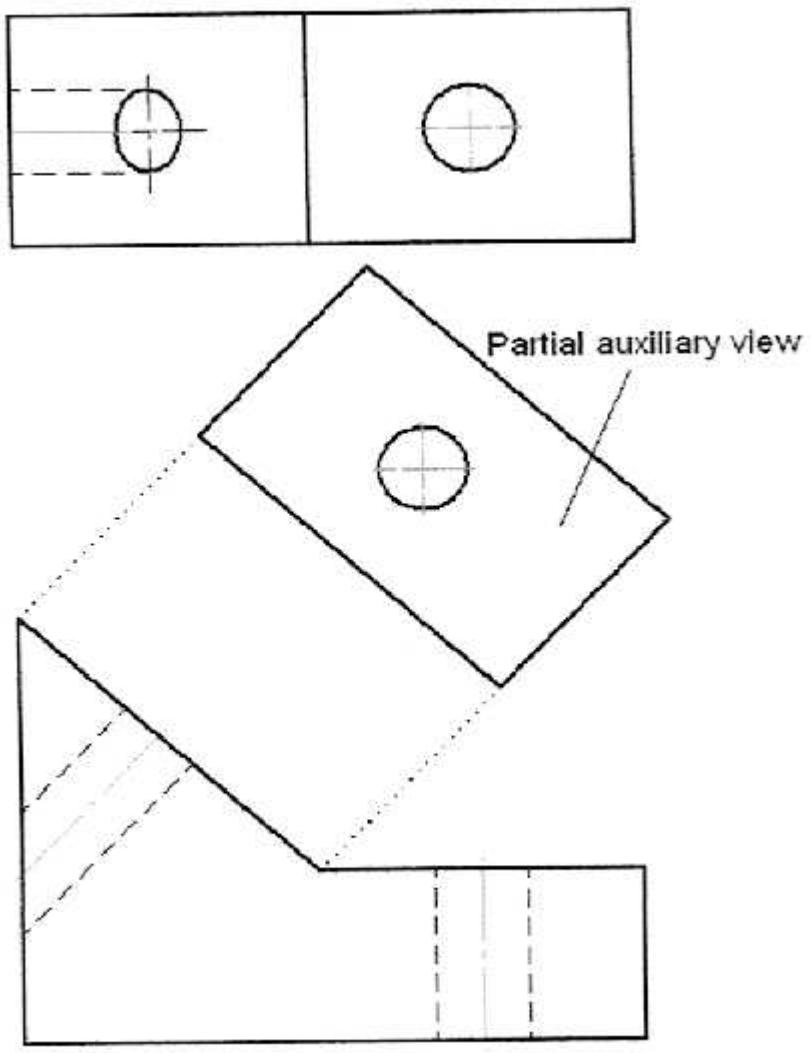
Auxiliary views may be created as full or partial views.

In a full auxiliary views, all elements and features on the object as seen from the direction are represented on the auxiliary view. The full auxiliary view is harder to draw, read, and visualize.



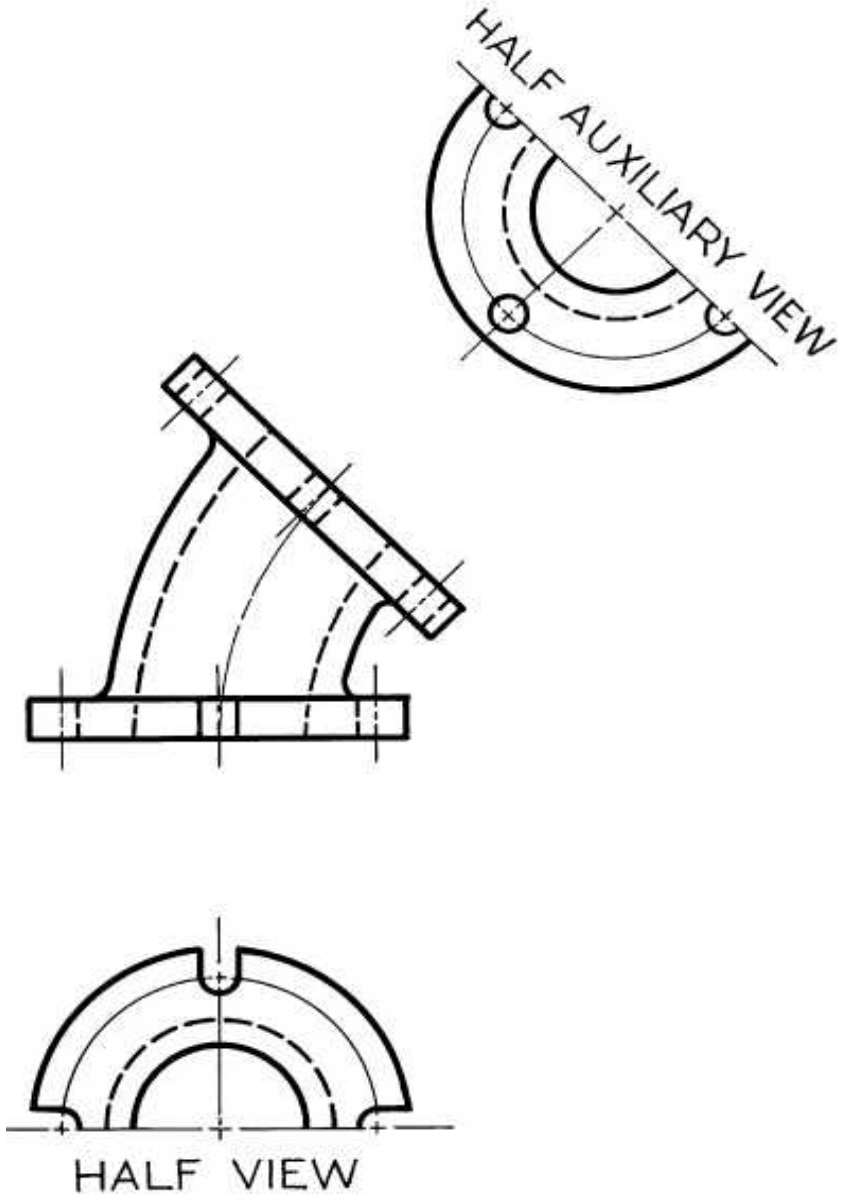
Complete /Full/ and Partial Auxiliary Views

- *In a **partial auxiliary** view, only the features on an inclined or oblique face are represented on the auxiliary view. It saves time and produces a drawing that is much more readable.*



Complete /Full/ and Partial Auxiliary Views

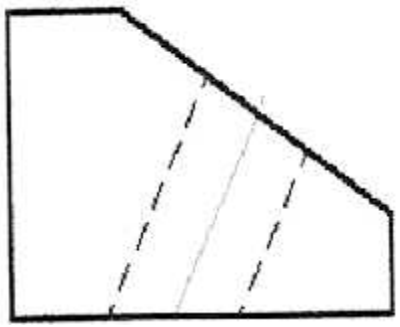
Symmetrical objects can be represented as a ***half auxiliary*** *view, that is, only half of the object is drawn.*



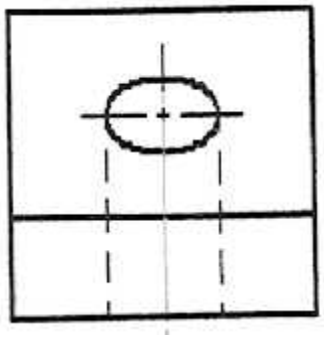
Complete /Full/ and Partial Auxiliary Views

Constructing features on inclined surfaces:

Step 1. Create two principal adjacent views.

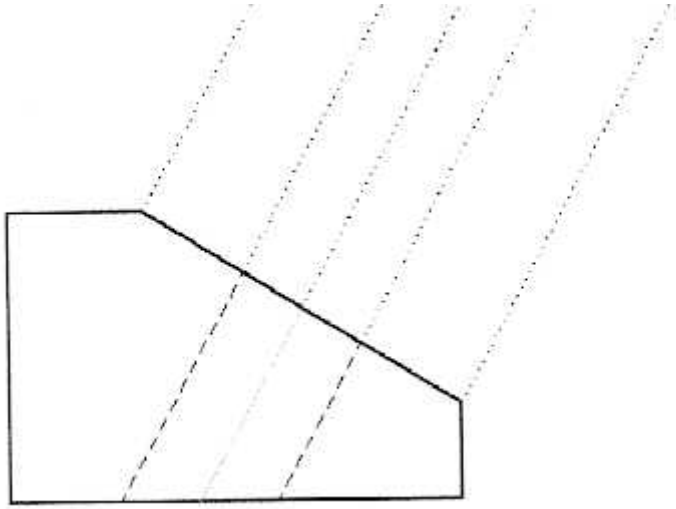


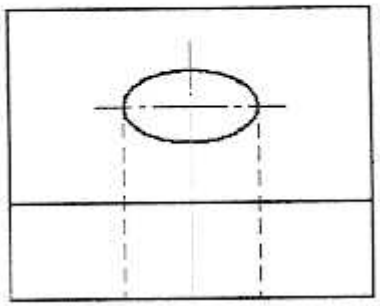
Front view



Right view

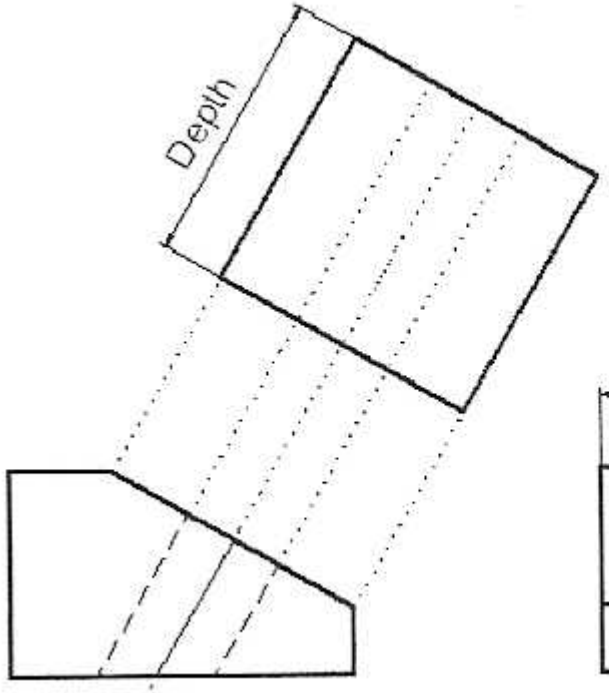
Complete /Full/ and Partial Auxiliary Views

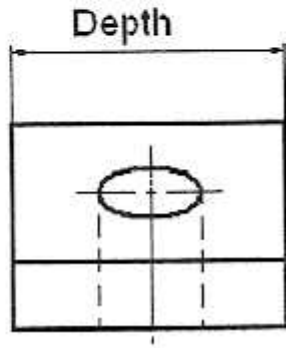




Step 2. Draw projection lines for auxiliary view.

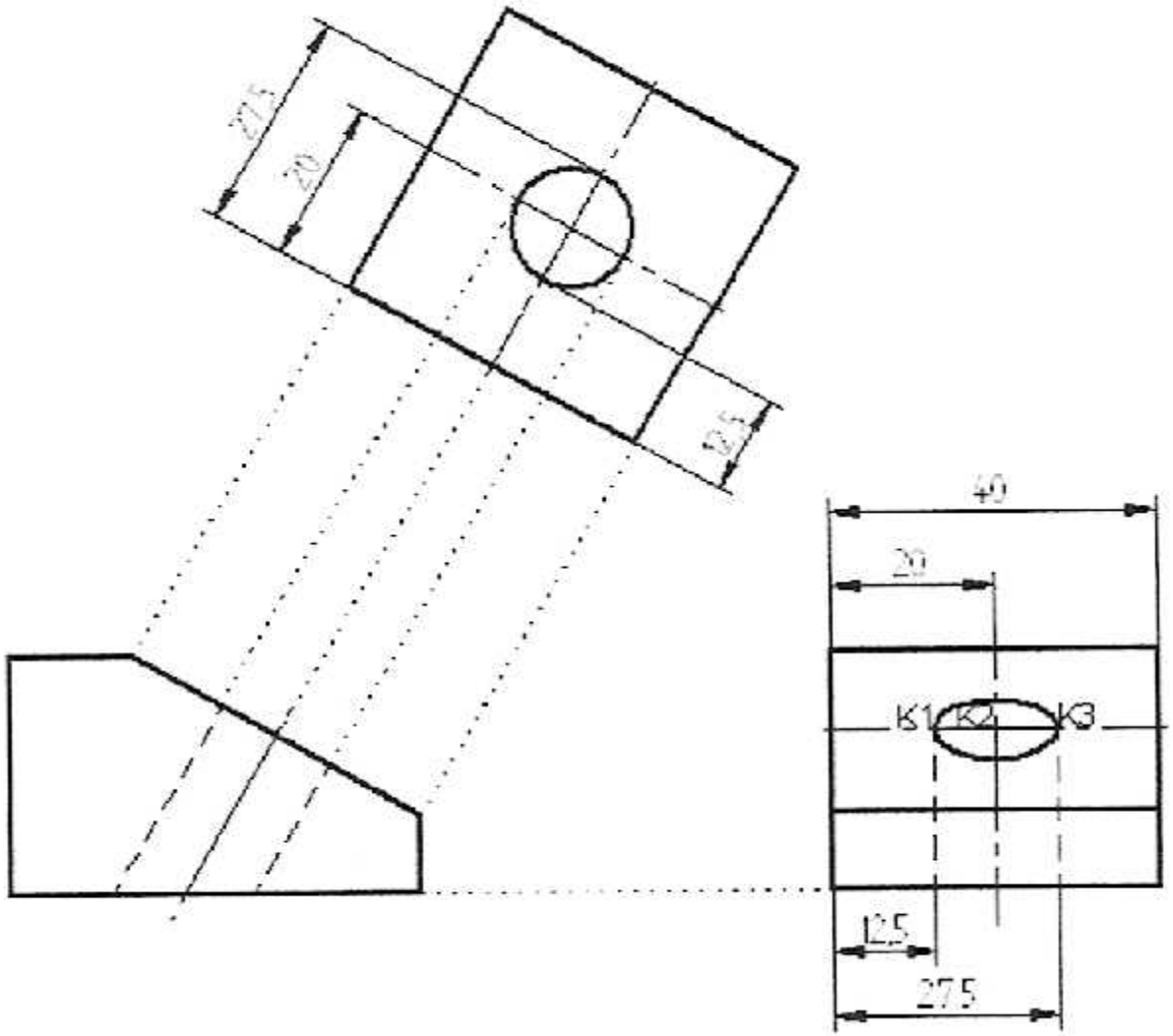
Step 3. Draw the outline of the inclined face

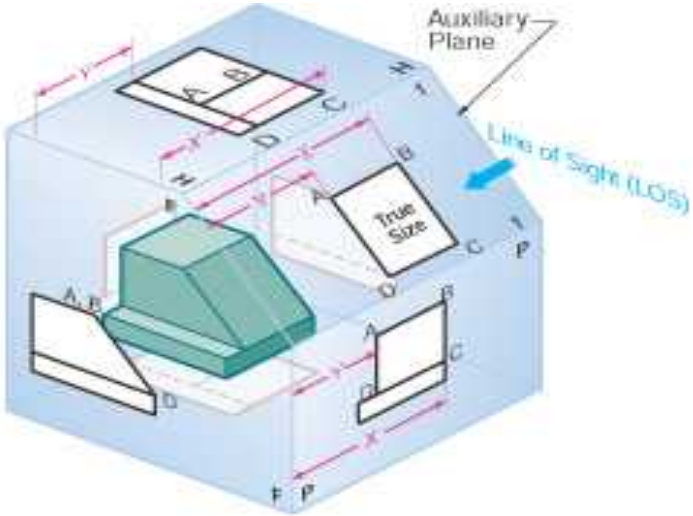


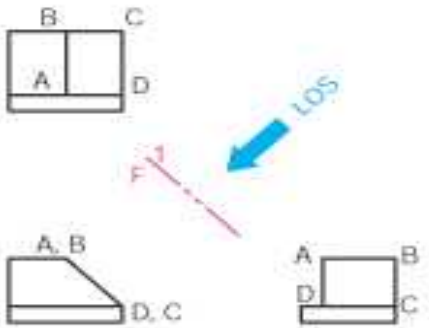


Complete /Full/ and Partial Auxiliary Views

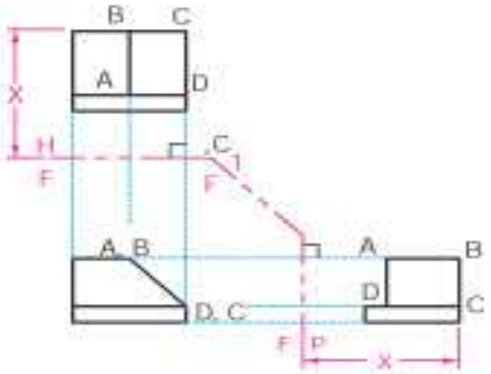
Step 4. Draw the features on inclined face.



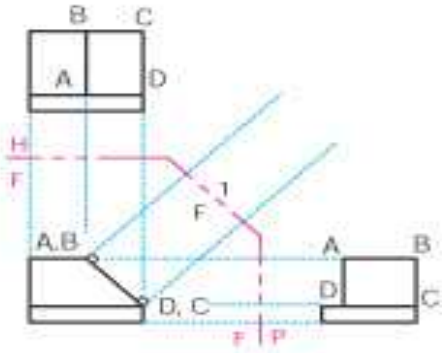




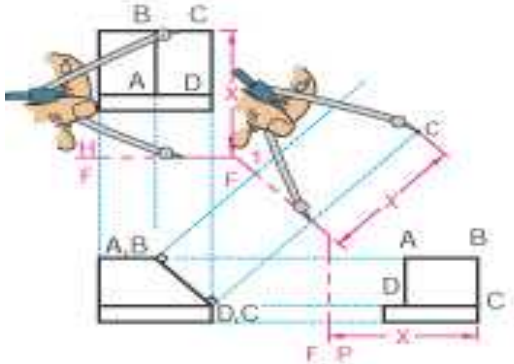
Step 1



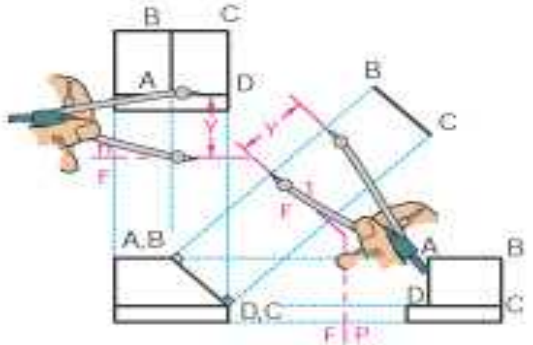
Step 2



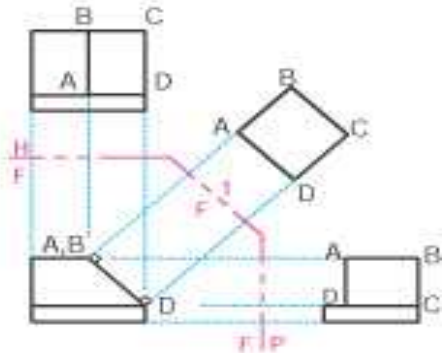
Step 3



Step 4



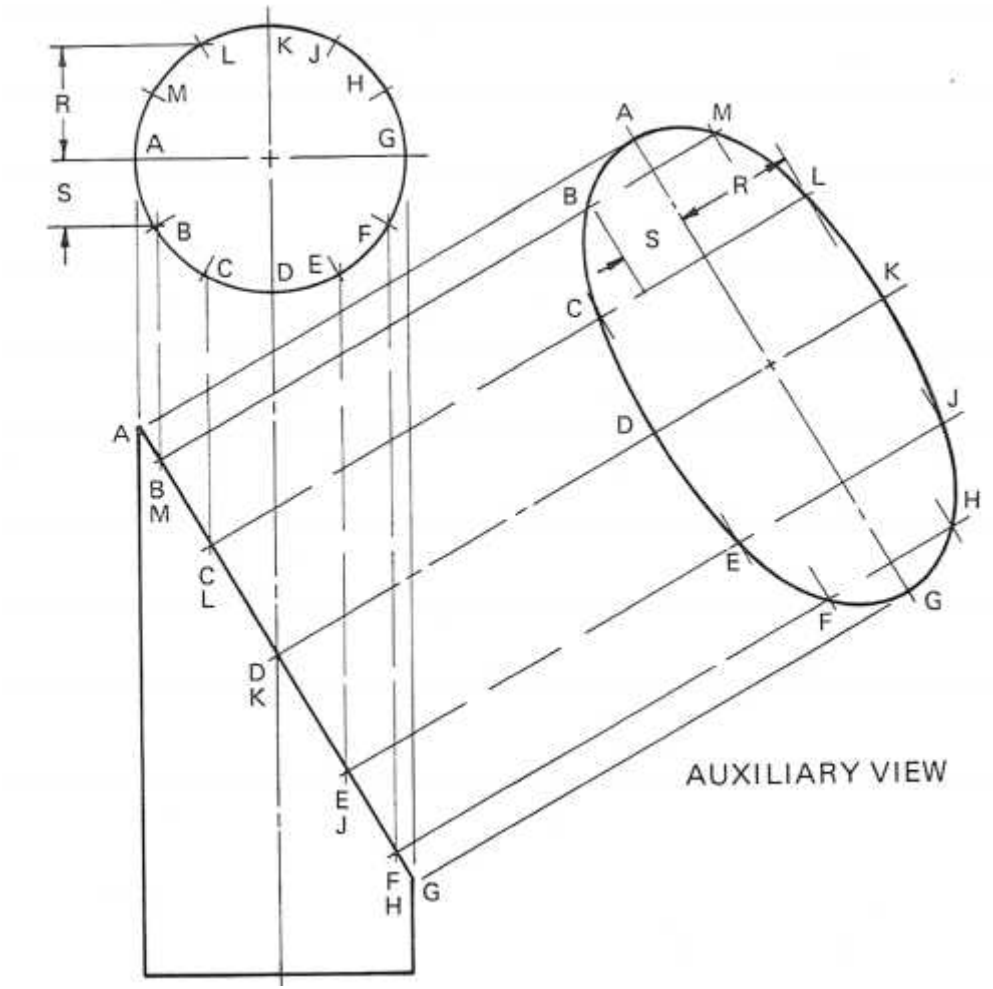
Step 5



Step 6

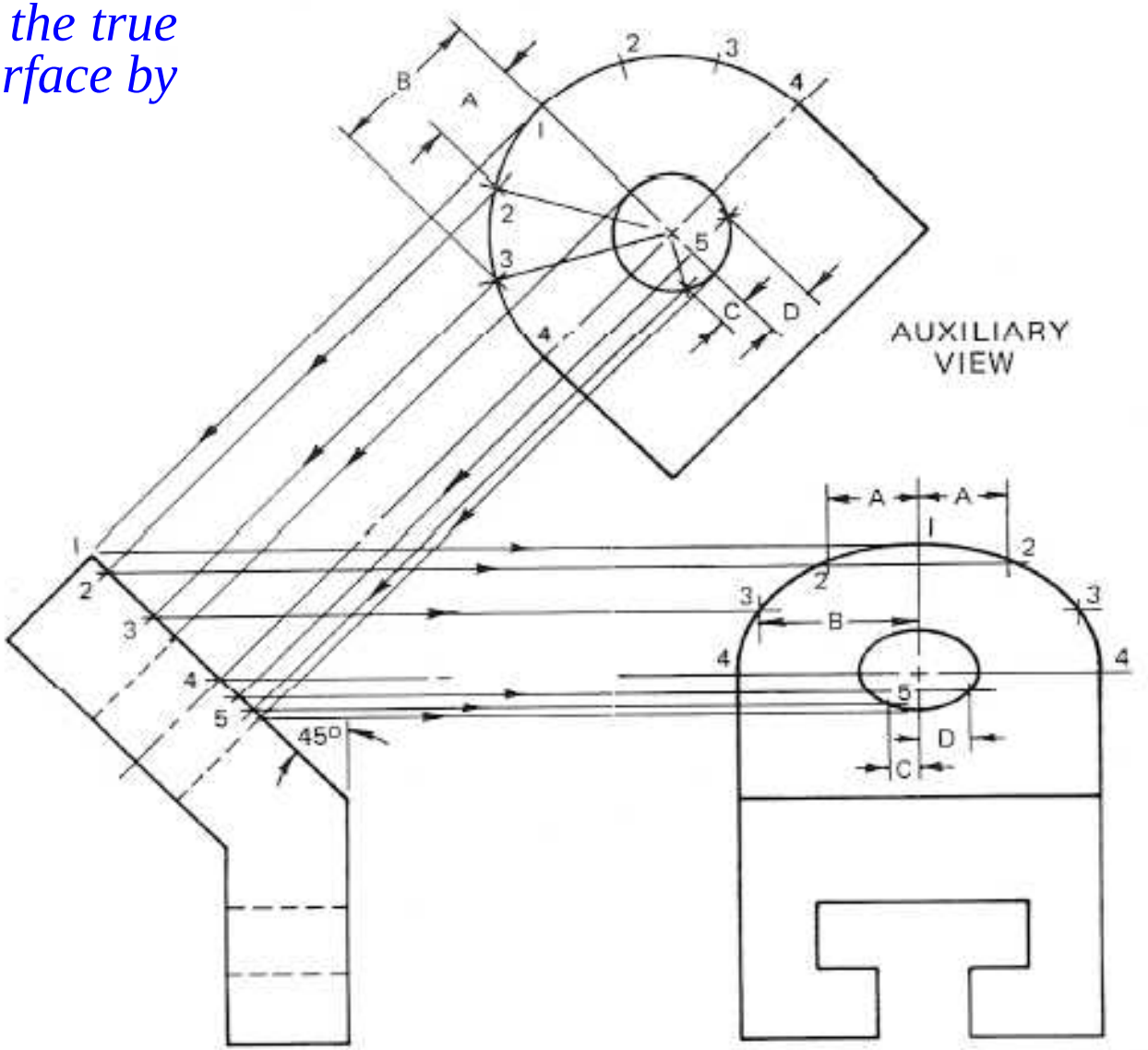
Complete /Full/ and Partial Auxiliary Views

Example: Establishing true shape of truncated cylinder



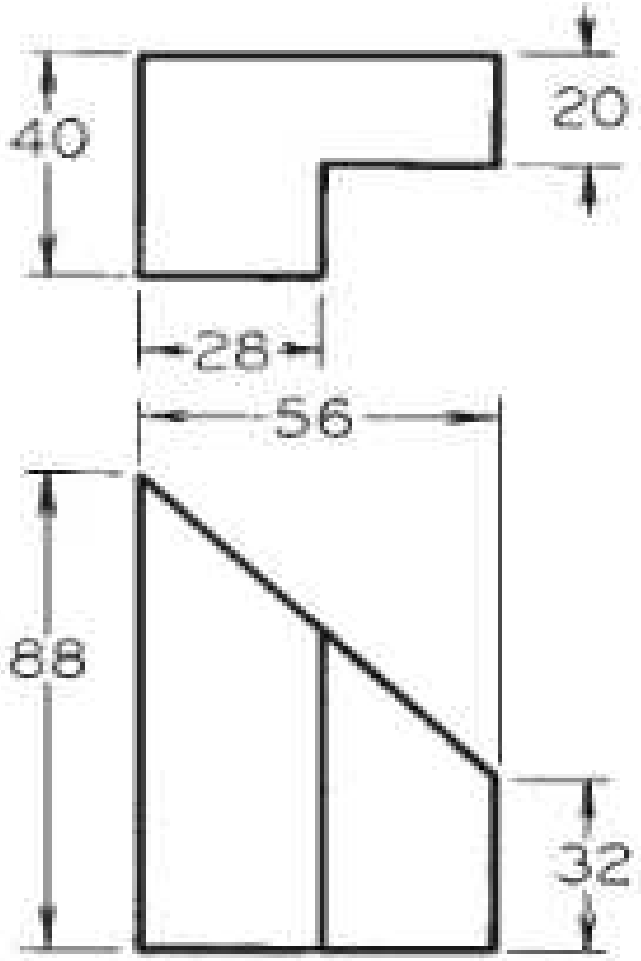
Complete /Full/ and Partial Auxiliary Views

Example: Constructing the true shape of a curved surface by plotting method

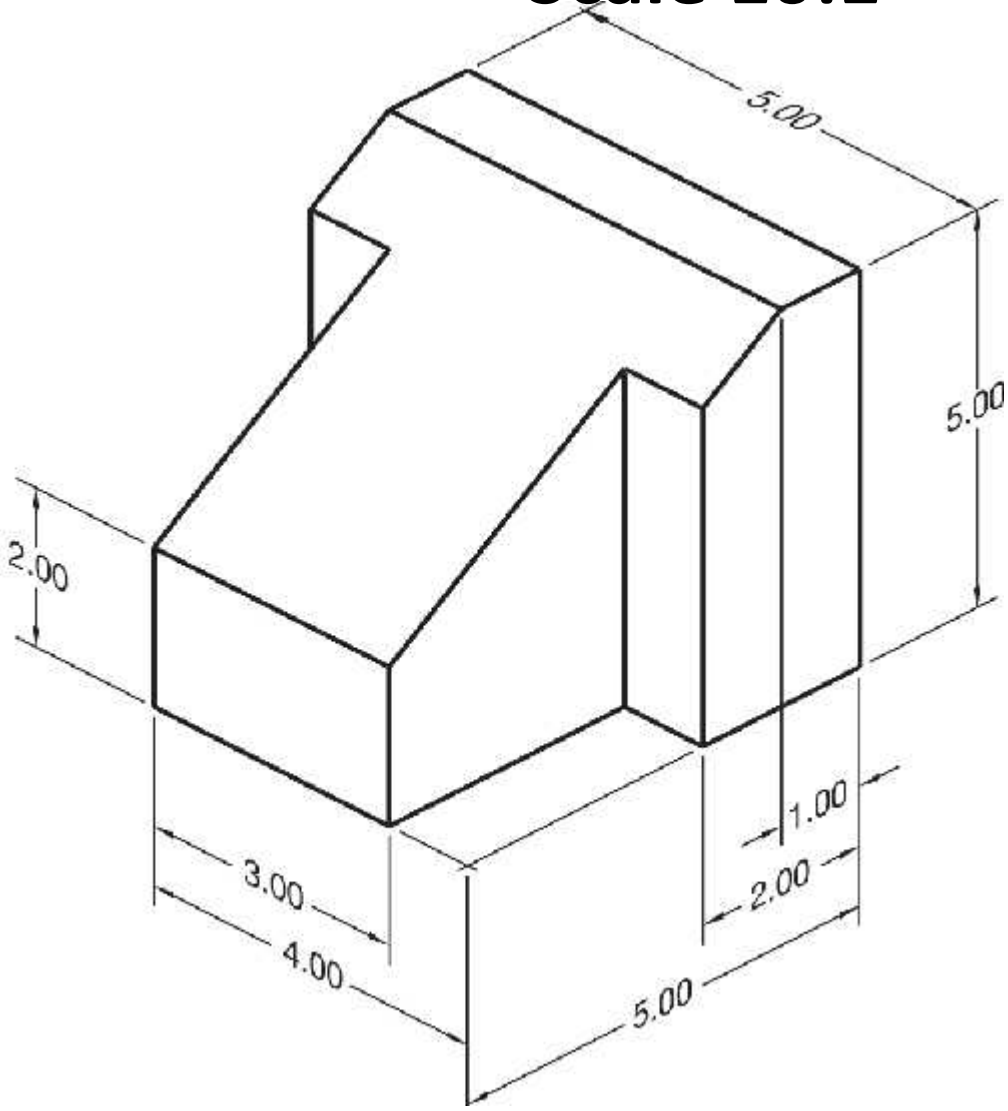


Example

Scale 1:1



Scale 10:1



THANK YOU