EAST WEST UNIVERSITY

Course Name: Computer Aided Engineering Drawing

Course Code: CSE200

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Topic: Theory of Projection

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Theory of Projection

Projection is the image of an object represented (drawn on a plane of projection /picture plane) as it would appear to the observer stationed at a point and viewing along the direction of the line of projection.

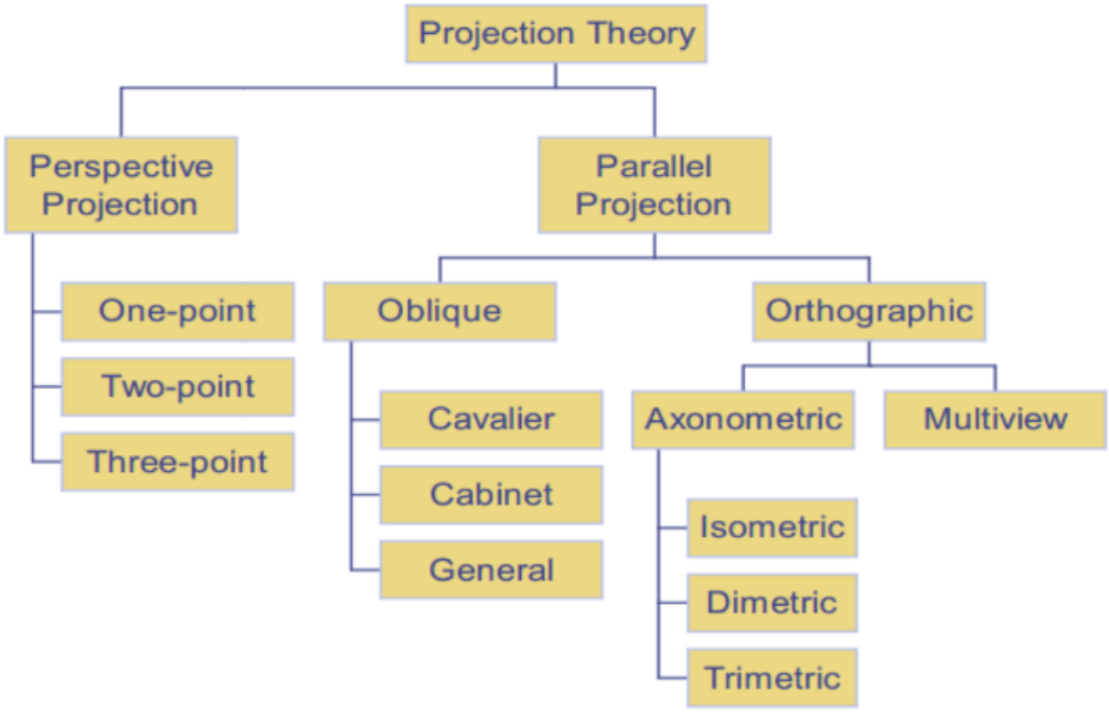
Projectors/lines of projection are imaginary lines that emerge from observer's eyes and moves to the contour of an object.

The station point is the location of an observer.

The plane of projection/picture plane is an imaginary plane on which the image of an object is represented/drawn.

The three principal planes are vertical planes used to represent the front/rear view; horizontal plane used to represent top/bottom view; and profile plane used to represent the right/left side view of an object.

Classification of Projection



Perspective Projection

- The observer is placed at a fixed distance.
- The projectors would converge and meet at what is referred to as the vanishing point (VP). It can have one, two, or three vanishing points.
- The resulting view formed on the picture plane is of different size and shape as compared to the actual size of the actual object.
- Not suitable for working drawings.

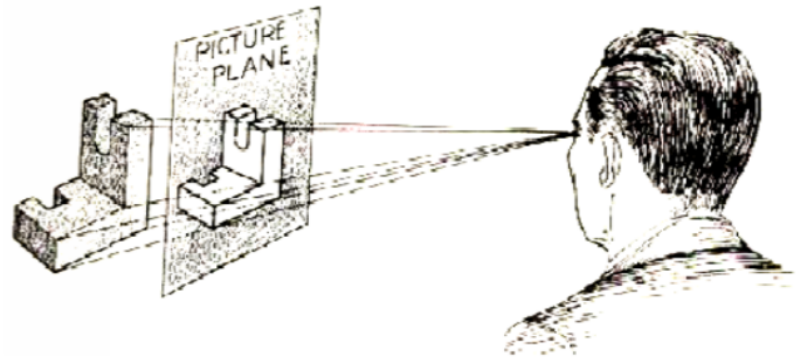


Figure 1: View of Perspective Projection

Parallel Projection

- The projectors are parallel and do not meet.
- The observer is placed at an infinite distance from the object.
- The view formed on the picture plane is of the same size and shape as that of the object.

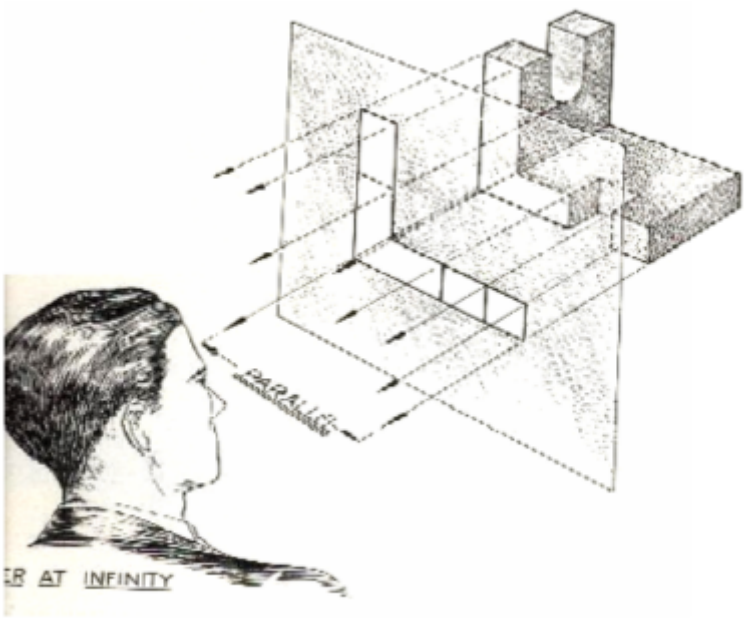


Figure 2: View of Parallel Projection

Orthographic Projection

Each of the necessary view is obtained by looking directly at the particular side of the object the view is to represent. In this case, the object will be revolved to produce the six basic views or the the observer moves around the object.

Orthographic Projection (Multi-view Drawings)

To represent the six principal views (front, rear, top, bottom, right side and left side) of an object, multi-view drawing uses orthographic projection.

The representation can be done using:

1) First angle projection technique

2) Third angle projection technique.

Projection Draw Technique

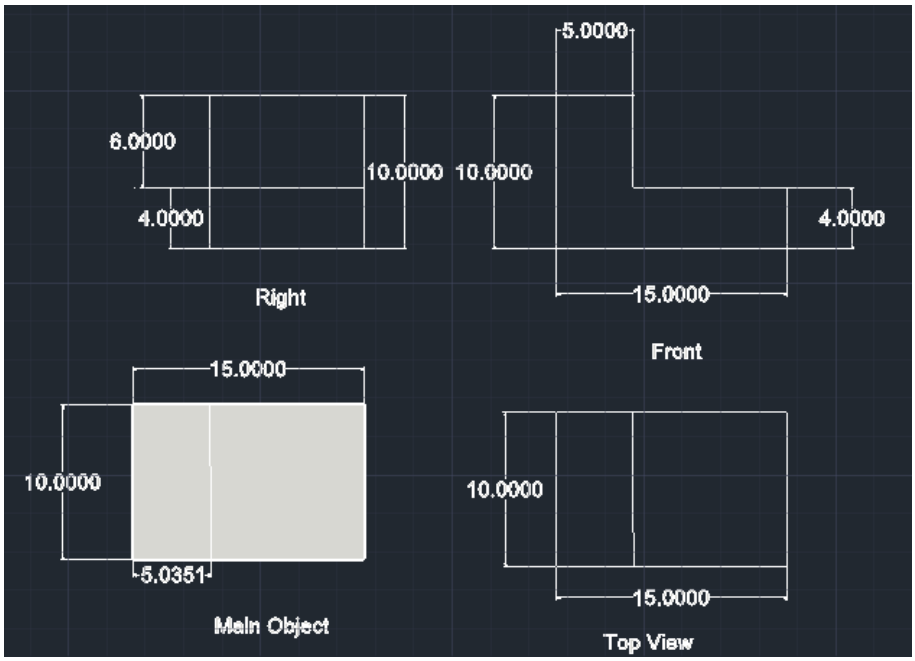
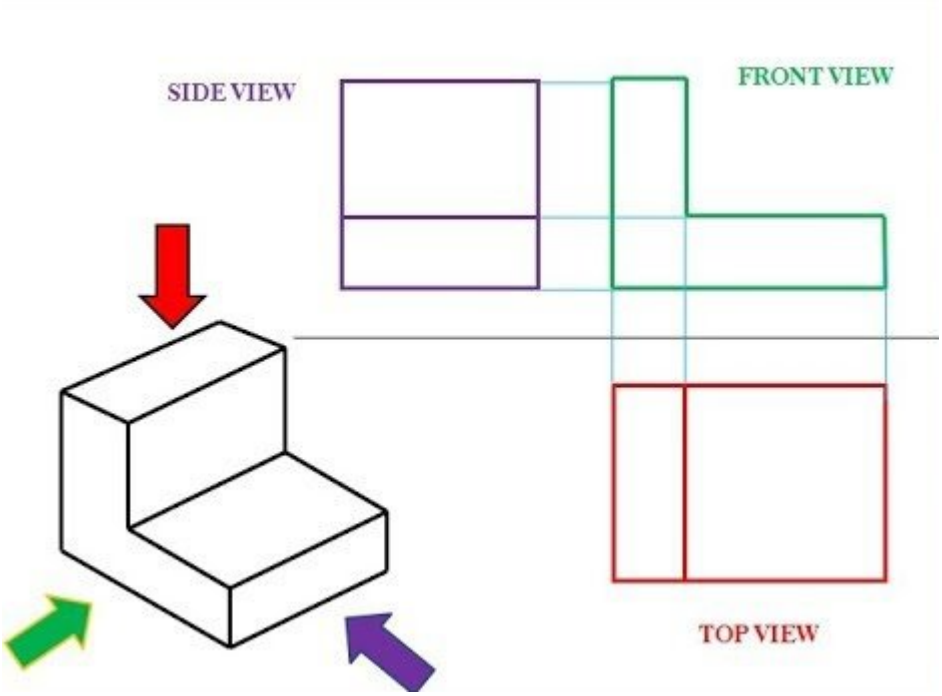
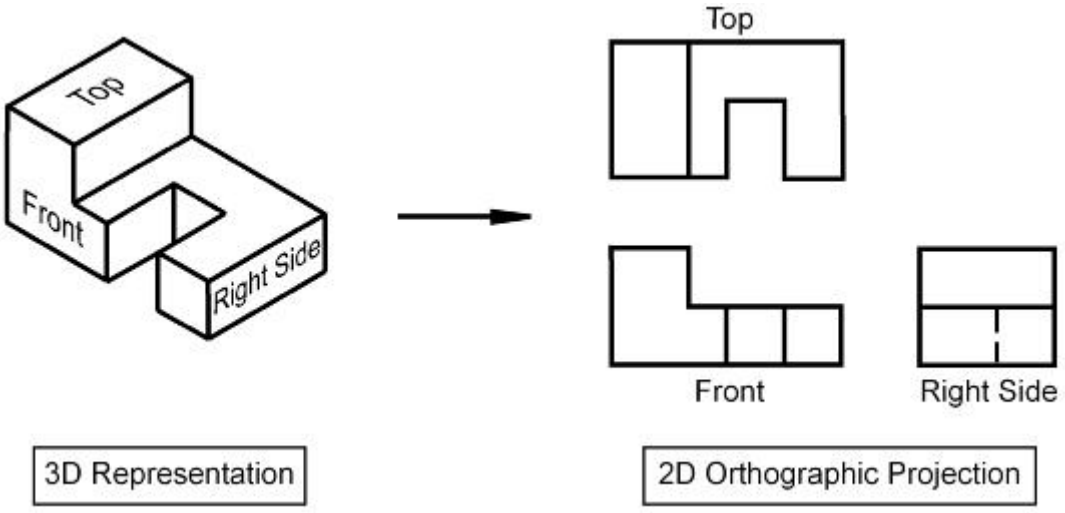


Figure 3: First Angle Projection Technique

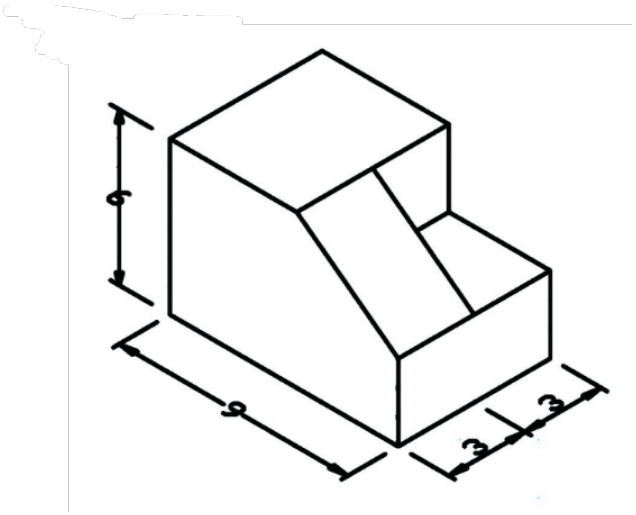
Problem 1



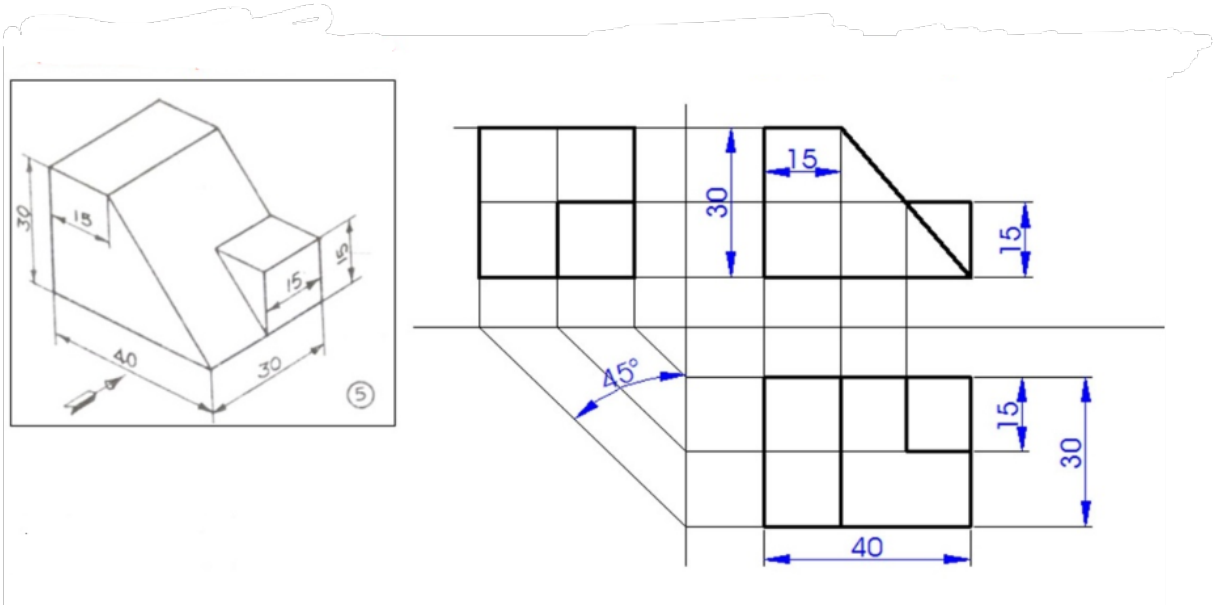
Problem 2



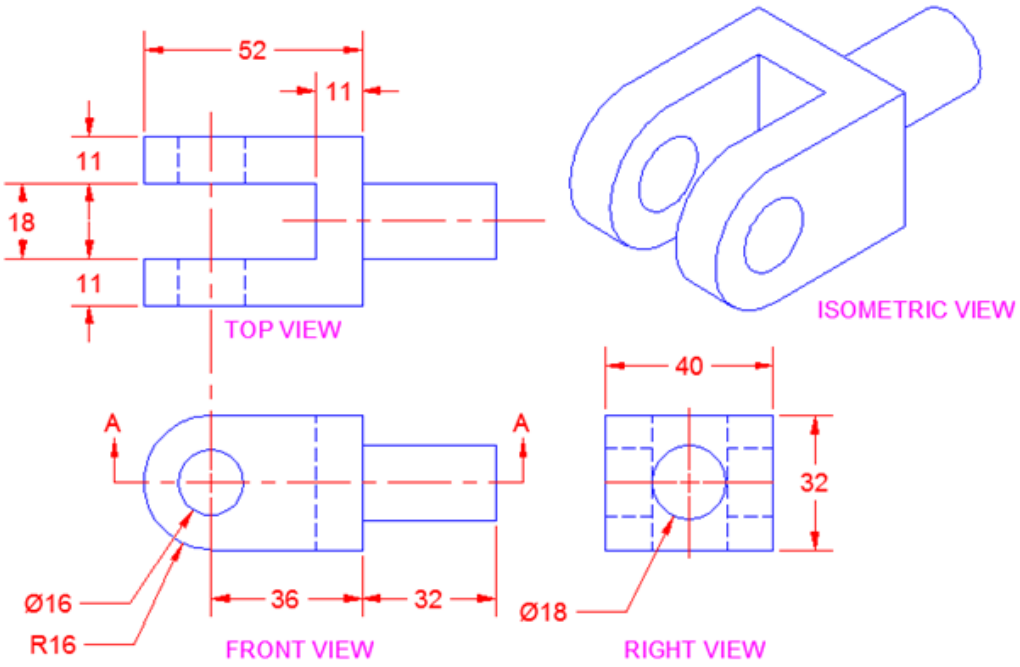
Problem 3



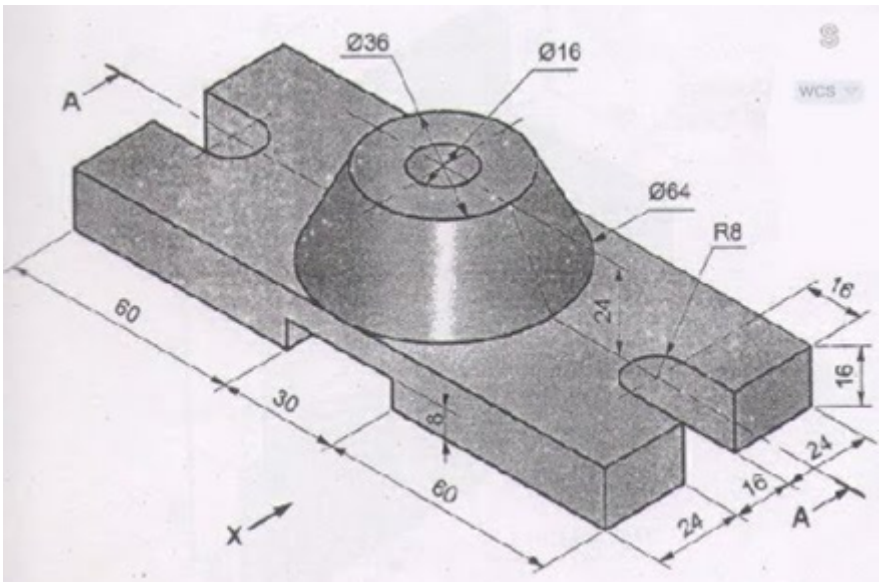
Problem 4



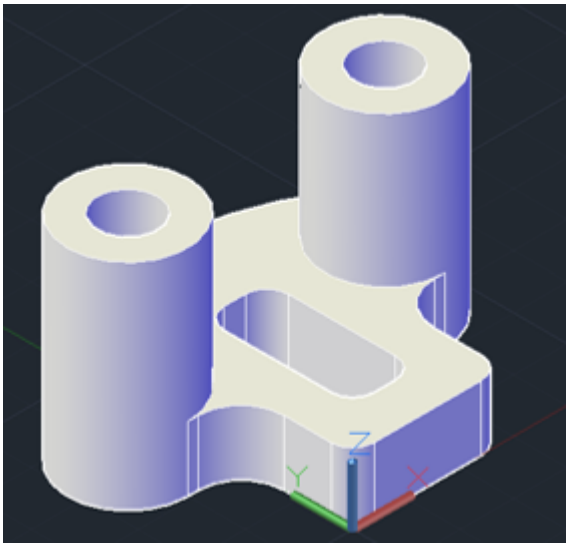
Problem 5



Problem 6



Problem 7



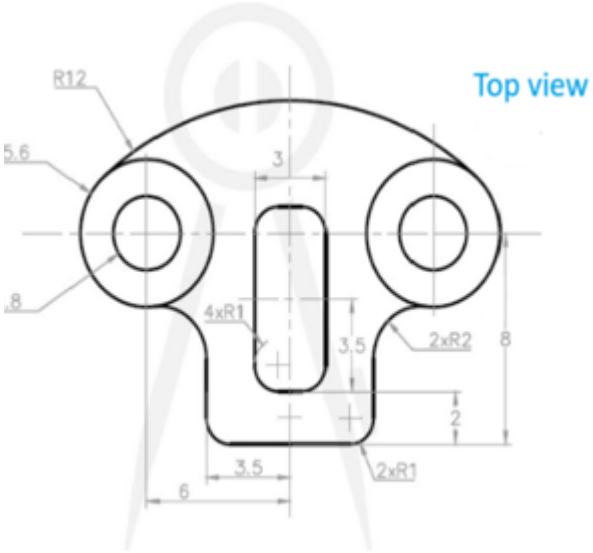


Figure 4: Top View of Problem 7