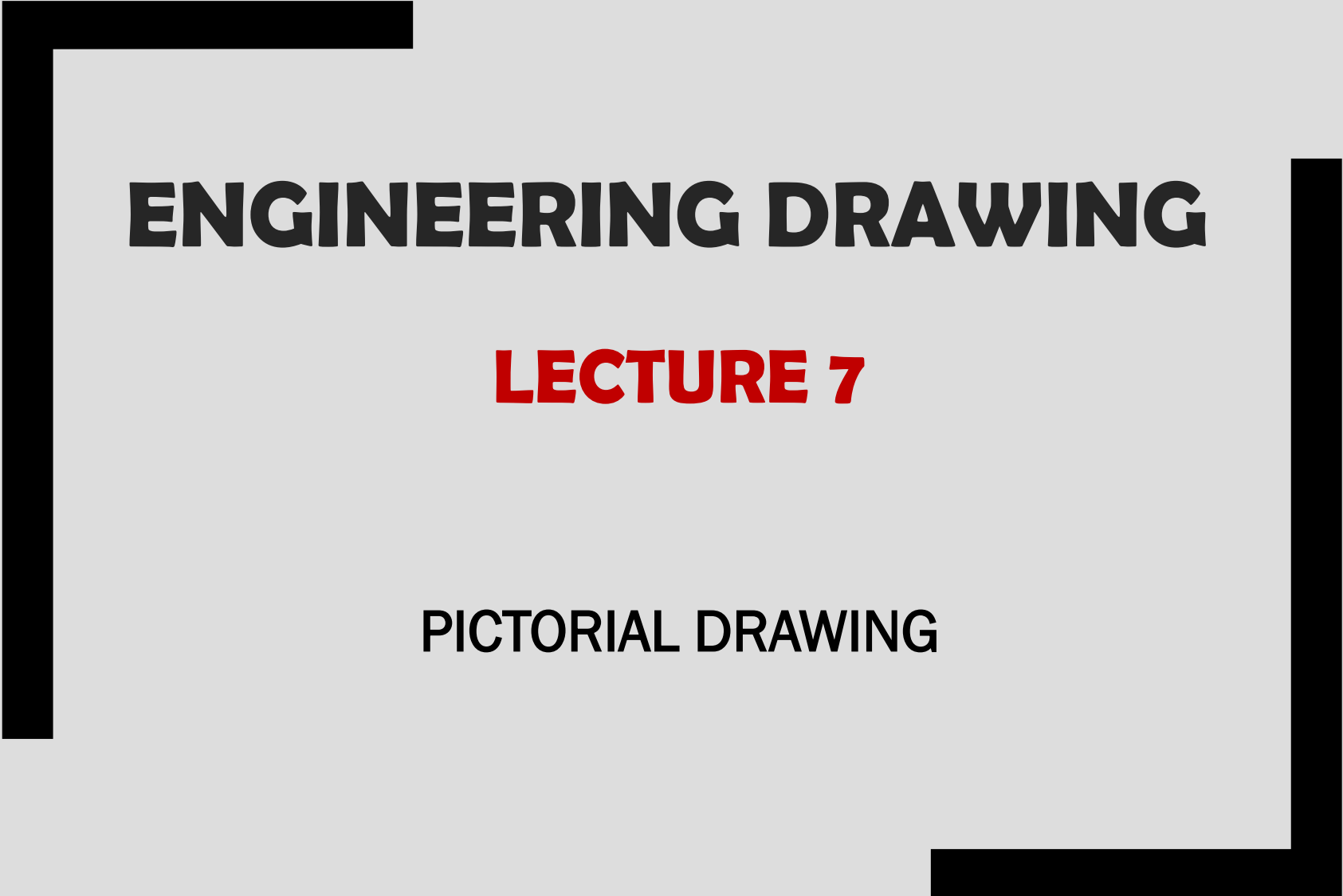


A thick black L-shaped frame is positioned on the left and right sides of the slide, framing the central text.

ENGINEERING DRAWING

LECTURE 7

PICTORIAL DRAWING

PICTORIAL DRAWINGS

- Pictorial means picture
- It refers to any realistic form of drawing
- Pictorial drawing facilitates the communication of technical information during all phases of a design process
- Pictorial drawing produces a three dimensional view of an object i.e. it shows height, width and depth
- These three (3) faces of the object are shown simultaneously

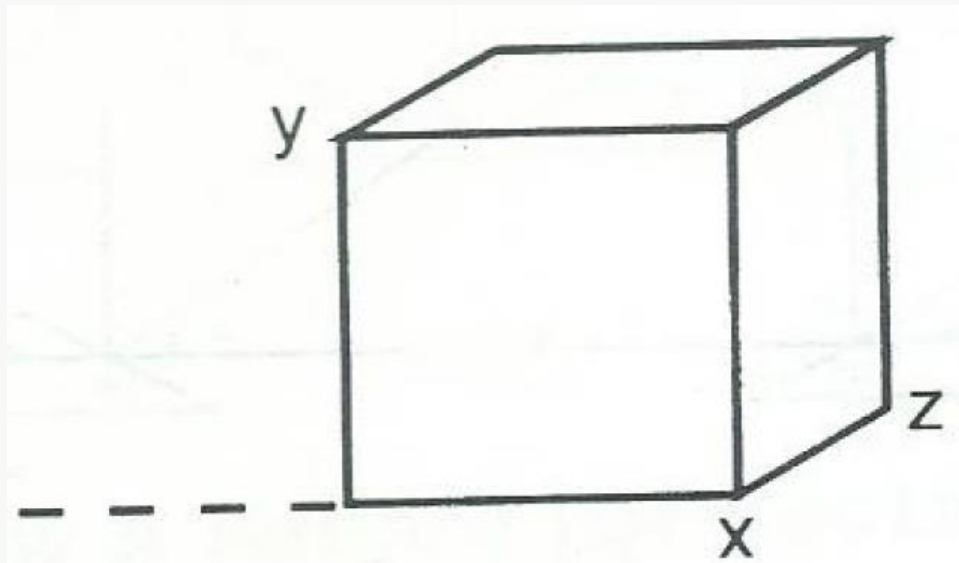
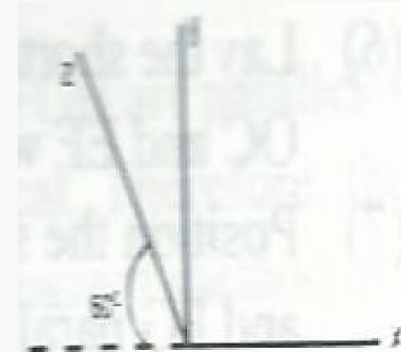
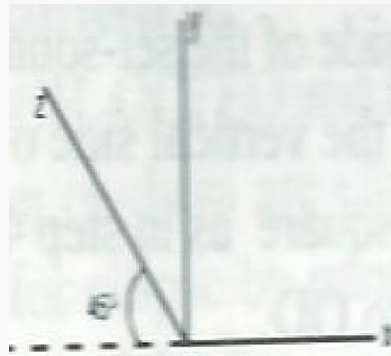
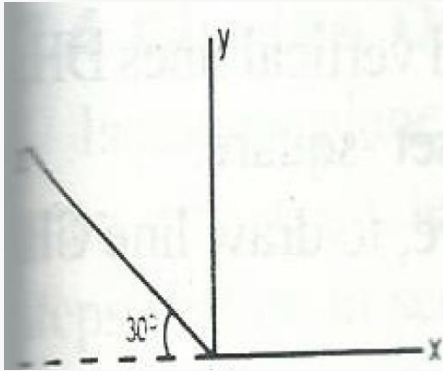
PICTORIAL DRAWINGS

- The major types of pictorial drawings are :
 - *Oblique drawing*
 - *Perspective drawing*
 - *Isometric drawing*
- Oblique drawing is simple but least realistic
- Perspective drawing is the most realistic and most complex
- Isometric drawing in terms of realism and complexity falls in between perspective and oblique drawings.

OBLIQUE DRAWING

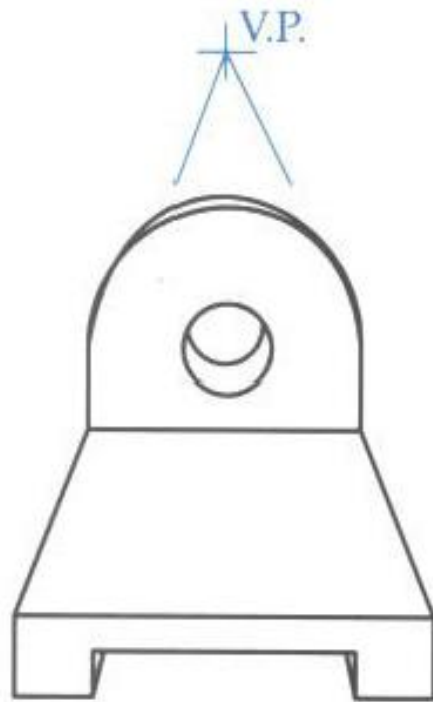
- Oblique drawing shows objects with one or more parallel faces having true shape and size.
- One face, especially the front view is exactly as it would appear in multi-view drawing.
- Circles are true circles and drawn with compass or circle template.
- Rectangles parallel to the front plane are true size and have square corners. Projectors are parallel but oblique to the plane.
- Oblique drawings use three axes; two at right angles (X and Y axes) and the third at any convenient angle usually 30° or 45° .
- **A scale has to be selected for the orthographic or front faces.**
- **An angle has to be selected for the receding axis or depth.**

OBLIQUE DRAWING

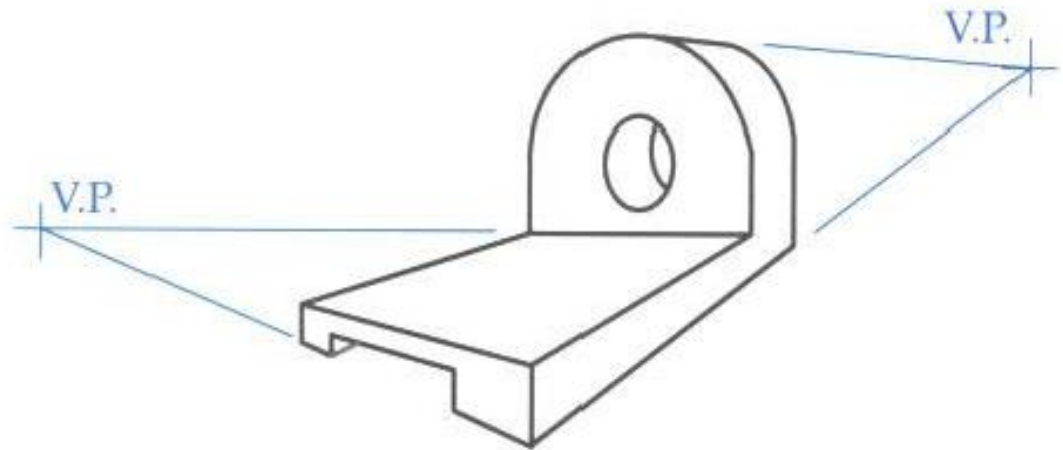


PERSPECTIVE DRAWING

- Perspective is the most realistic form of pictorial drawing.
- If you look down a long hall, you will notice that the walls and floor lines seem to converge at an imaginary point (vanishing point).
- Perspective drawing can be one point, two points or multiple points.



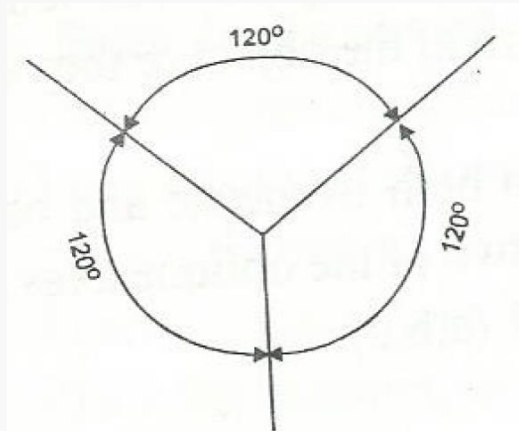
One-point
Perspective



Two-point
Perspective

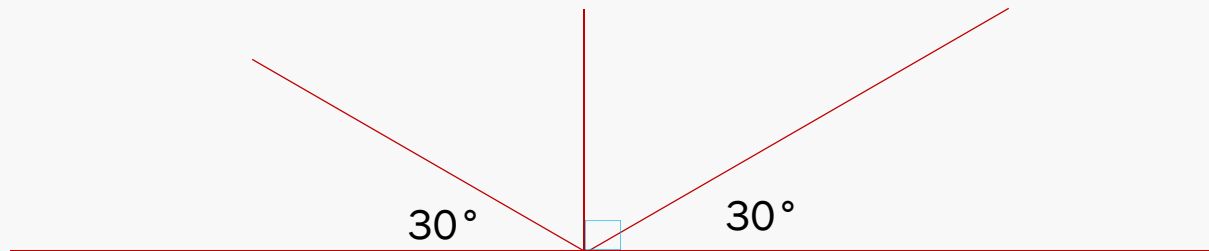
ISOMETRIC DRAWING

- Isometric means equal measure.
- Isometric drawings is a pictorial view which uses three axes at 120° to each other to show three faces of an object simultaneously.
- The three axis lines are measured using the same scale.
- Isometry is the most common type of pictorial drawing used in the industry.



ISOMETRIC DRAWING

- Isometric drawing provides a single view showing three sides that can be measured using the same scale.
- In isometric, the entire object is as if it is tilted towards the observer.
- Isometric angles are 30° x 90° x 30° .

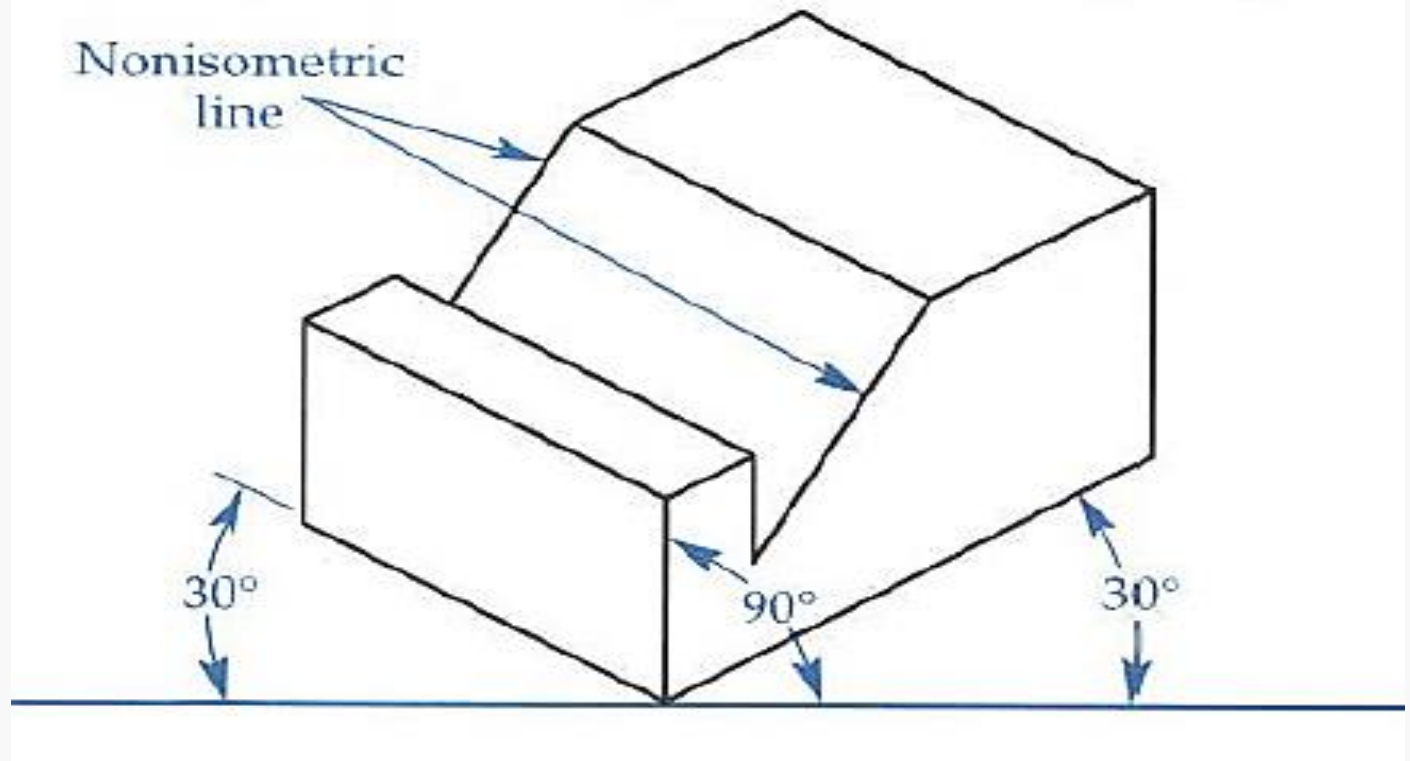


ISOMETRIC DRAWING

- All lines parallel in the orthogonal view must be parallel in the isometric view.
- Lines that appear horizontal in the orthographic view are drawn at 30° angle in isometric views.
- While lines that appear vertical in orthographic views remain vertical lines in isometric views.
- Isometric lines: are lines that are parallel to the axis and are drawn vertically or at 30° angle in isometric views.
- Isometric lines can be measured.

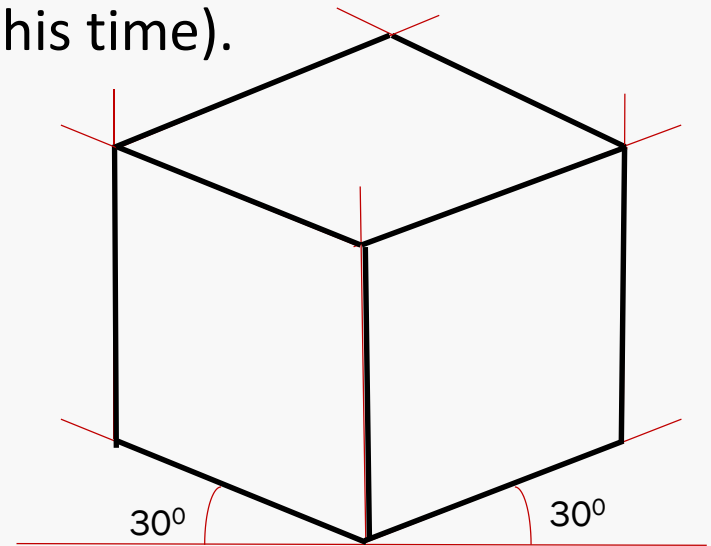
ISOMETRIC DRAWING

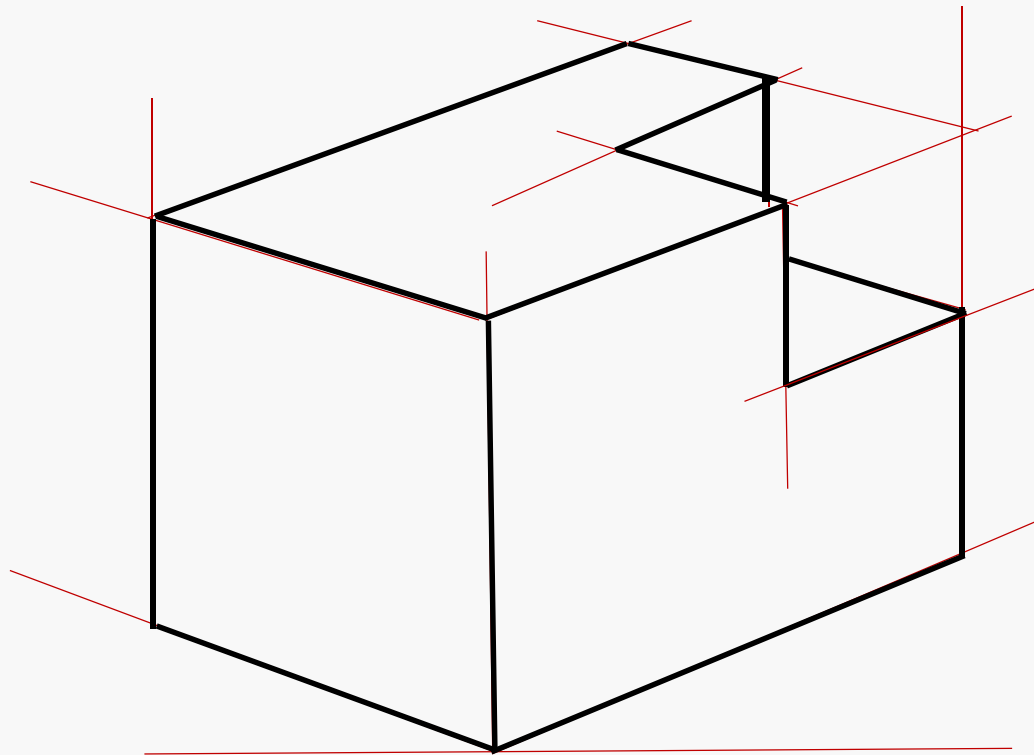
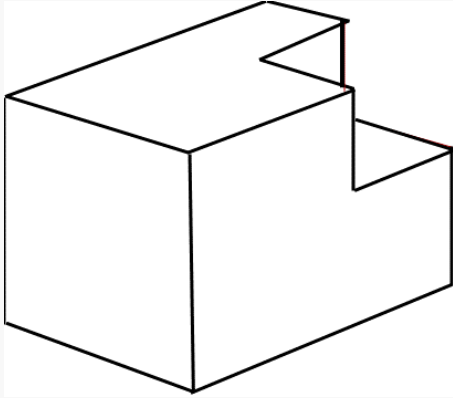
- Non-isometric lines are lines that are not parallel to the axes. They cannot be measured.
- Hidden lines are never shown in isometric views.

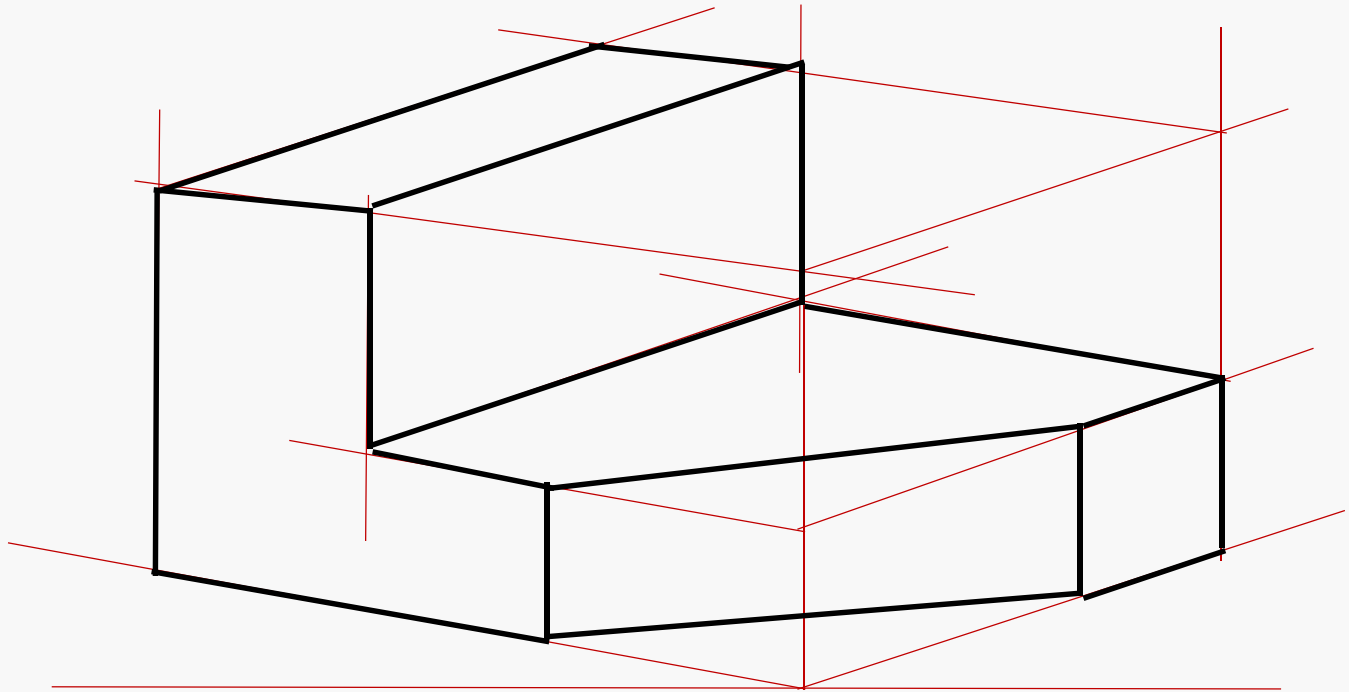
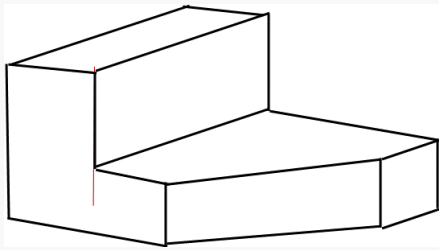


DRAW A SQUARE BOX IN ISOMETRIC

- Draw a horizontal line.
- Erect a vertical line at any convenient point O on the horizontal line.
- Draw a line inclined at 30° at point O to the left and right of the vertical line.
- Transfer the length of the square to the three lines you now have (Using an outline this time).
- Generate vertical lines on both sides of point O thru the ends of the lines.
- Complete the box (Isometric box).
- Outline the complete box.



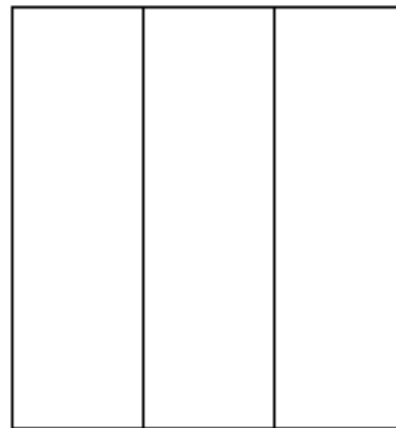
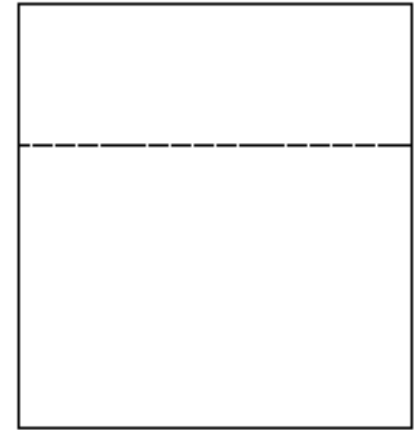
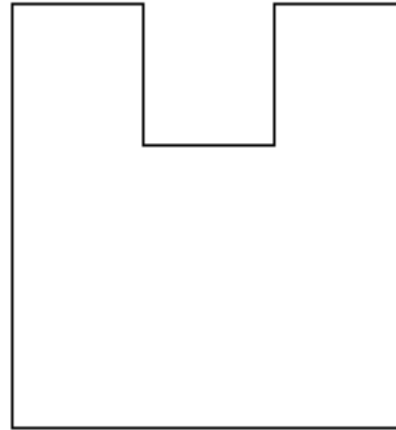
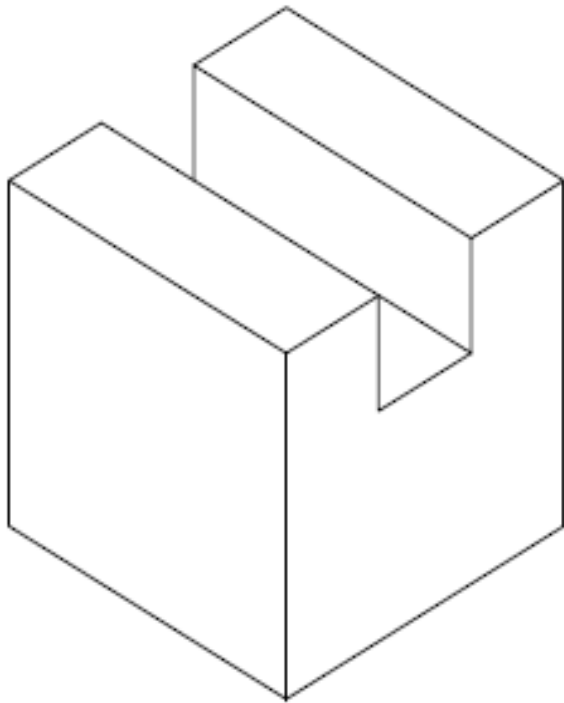




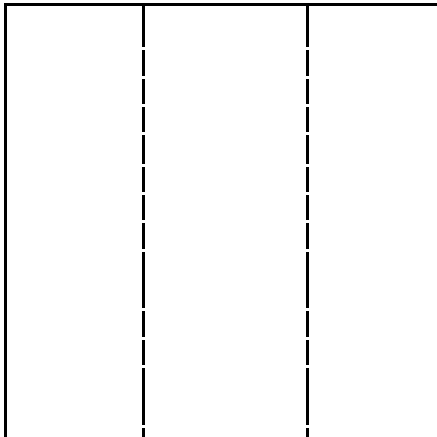
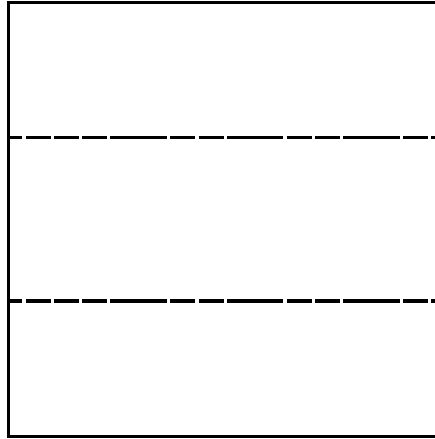
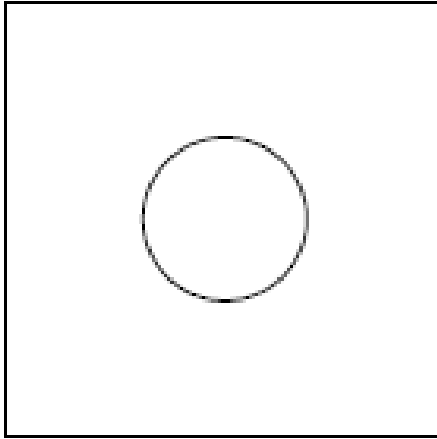
Orthographic to Isometric Drawings

- It is key to be able to convert orthographic drawings into pictorial drawings, particularly the isometric drawing.
- The same level of knowledge employed in converting isometric drawings to orthographic drawings is required in reverting the drawings to isometric drawings.
- Consider the following simple cases.

EXAMPLES



EXAMPLES



SOLUTION

EXAMPLES

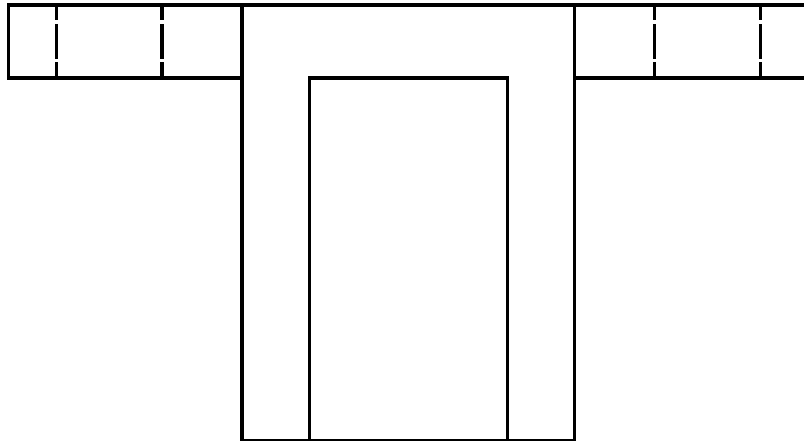
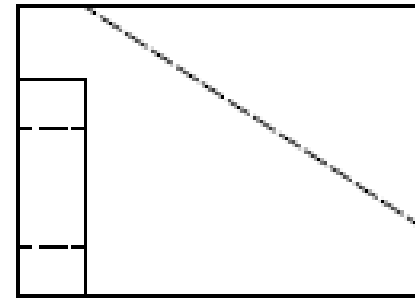
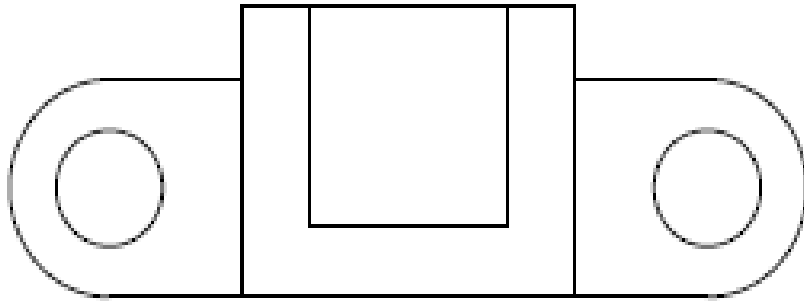
--	--	--

--	--	--	--	--	--

SOLUTION

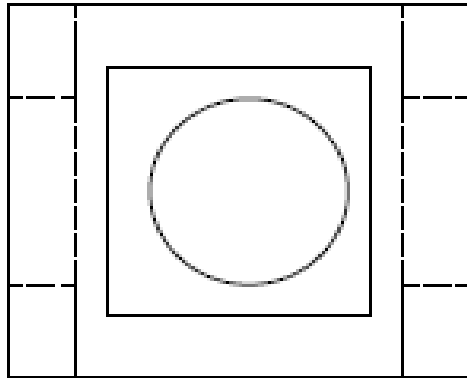
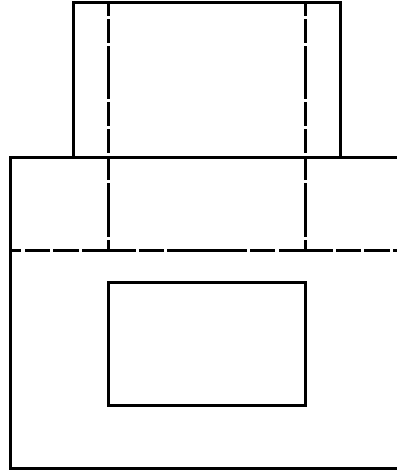
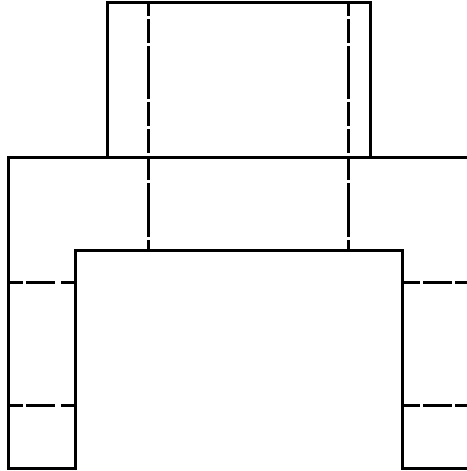
--	--	--

EXAMPLES



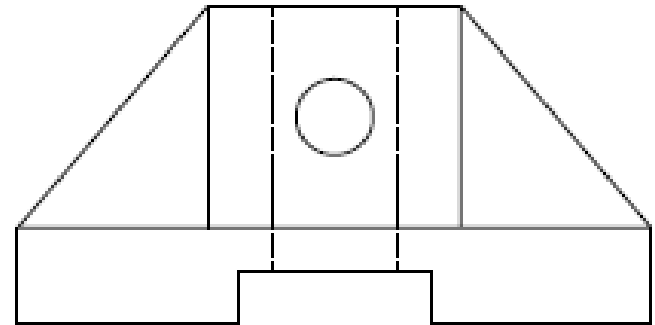
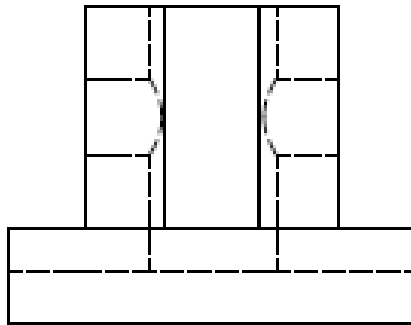
SOLUTION

EXAMPLES

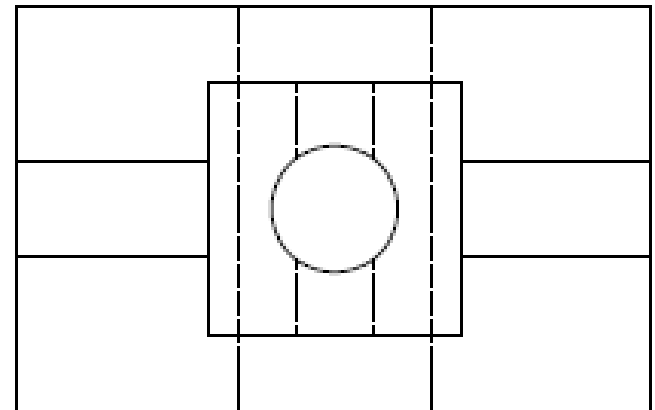


SOLUTION

EXAMPLES

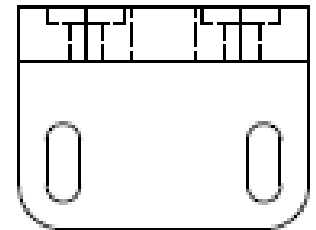
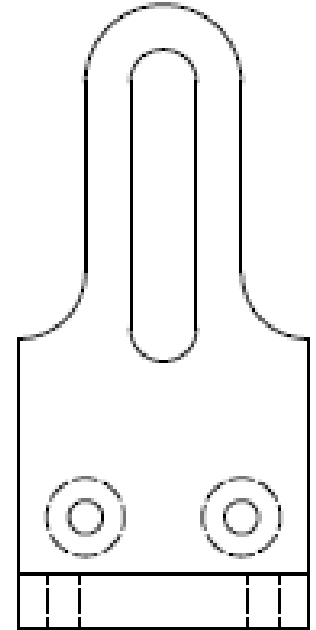
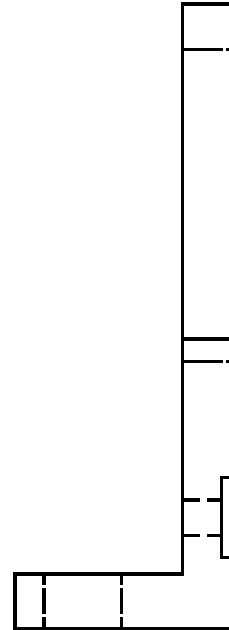


SOLUTION



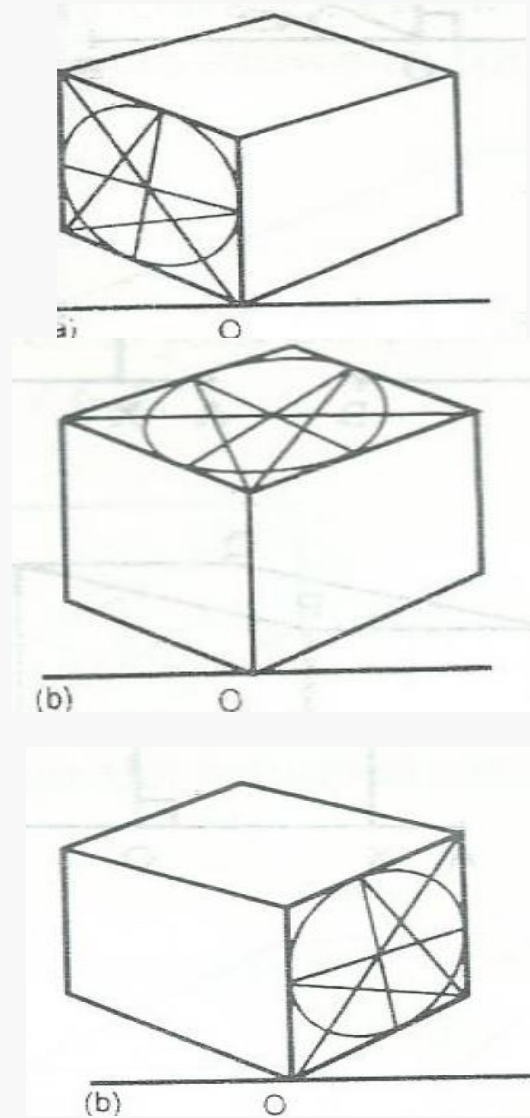
EXAMPLES

SOLUTION



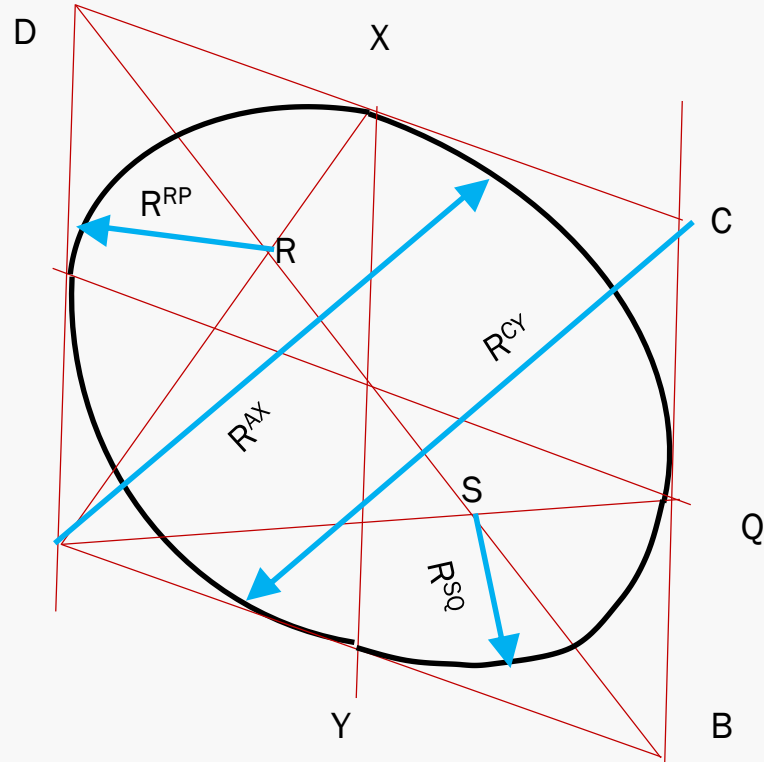
ISOMETRIC CURVES AND CIRCLES

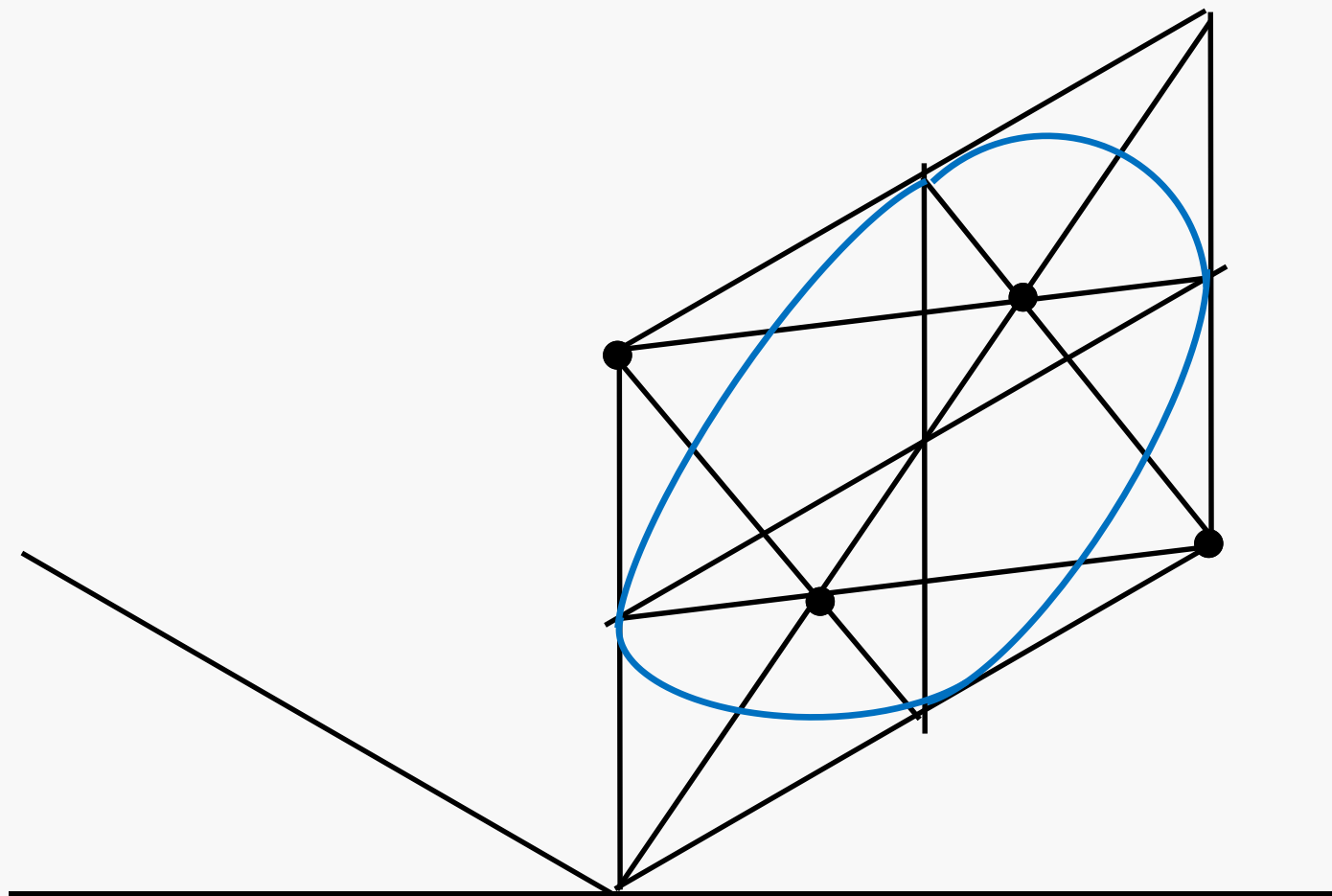
- Circles and curves on isometric planes appear as **an ellipse**.
- Isometric curves may be drawn using the **ordinate method** by selecting a number of points on the curved profile in the orthographic view and transferring the ordinate of each point to the isometric view.
- A more convenient and preferred method of drawing isometric curves and circles is the **approximate parallelogram method**.
- However, for small fraction of a circle the ordinate method must be used, since the approximate method deviate from a true ellipse at several points on the curve.
- Where there are two parallel curves, the ellipse construction is only needed in one, while parallel lines are projected to generate the other curve.
- The **circumscribing square method** may also be used to draw isometric curves.

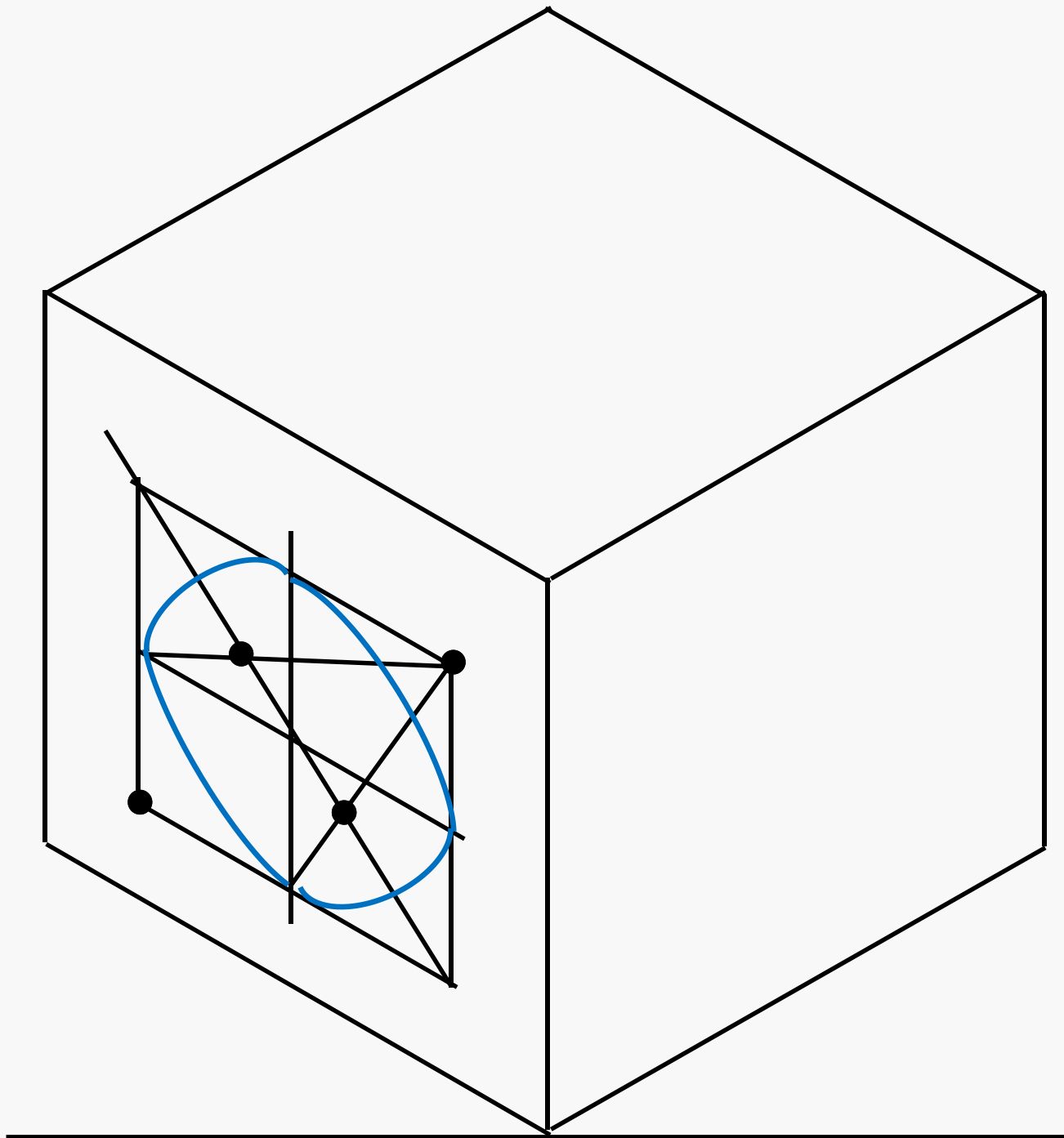


ISOMETRIC CIRCLES

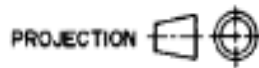
- Draw centre line PQ parallel to AB and DC.
- Draw centre line XY parallel to AD and BC to locate centre.
- Join the longest diagonal (BD) through centre.
- From A draw two lines to Q and X to cut the diagonal BD at R and S respectively
- With A as the centre and radius AX, draw an arc to join X and Q.
- With C as the centre and radius CY, draw an arc to join Y and P.
- With R as the centre and radius RP, draw an arc to join P and X.
- With S as the centre and radius SQ, draw an arc to join Q and Y to obtain the full isometric circle.



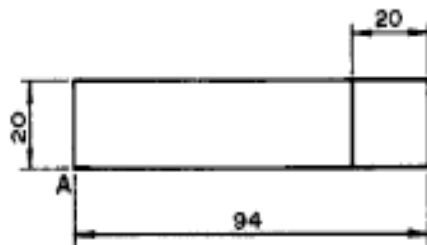
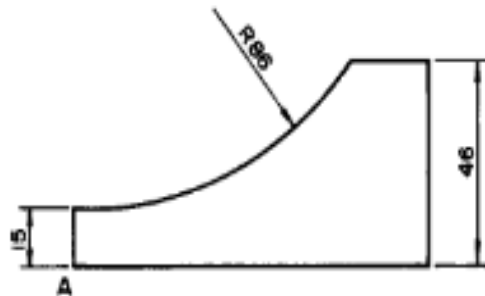




ISOMETRIC CURVES

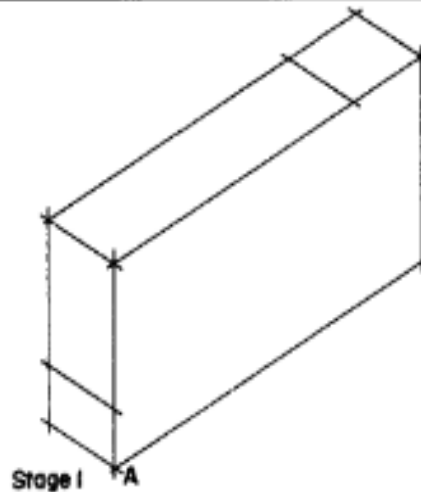


Example 3



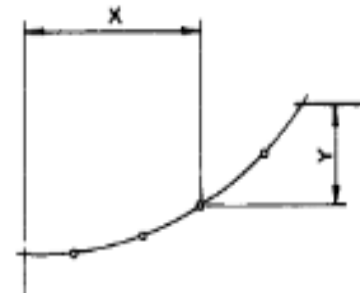
Make an isometric drawing of the object with corner A at the bottom.

The curve is drawn by locating a series of points by ordinates X and Y. The parallel curve is drawn using these points and the width of the part.



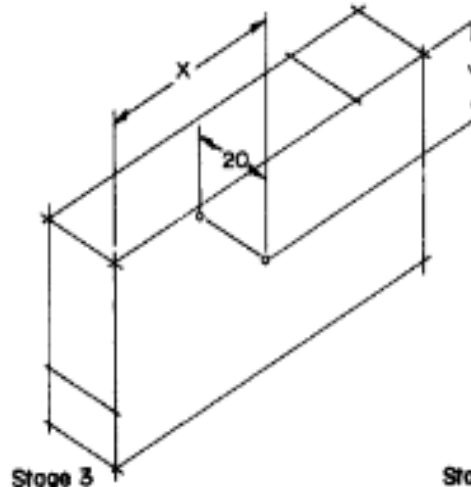
Stage 1

Draw box to contain object as in Example 1.



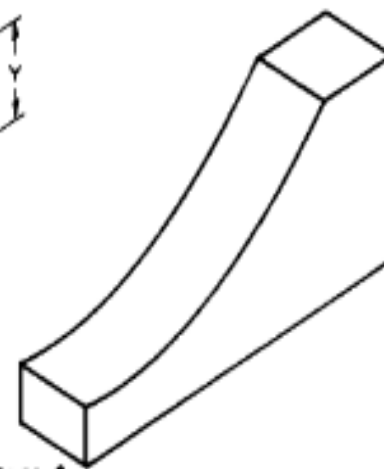
Stage 2

Select points on curve and obtain ordinates X and Y.



Stage 3

Transfer ordinates to isometric drawing and plot points on parallel curve.



Stage 4

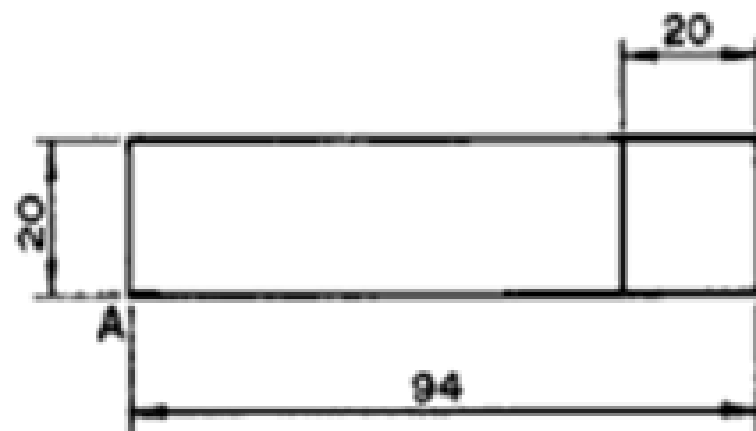
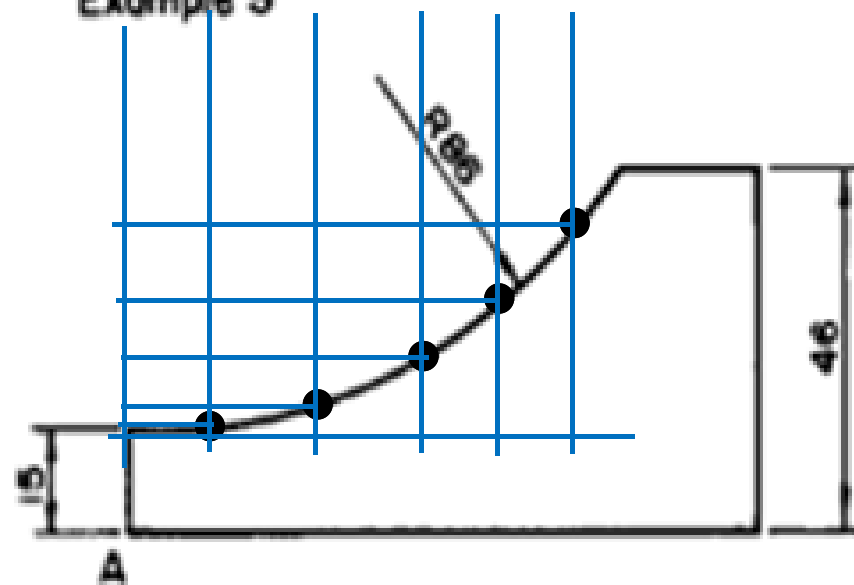
Plot remaining points and line in the view.

ISOMETRIC PROJECTION

PROJECTION

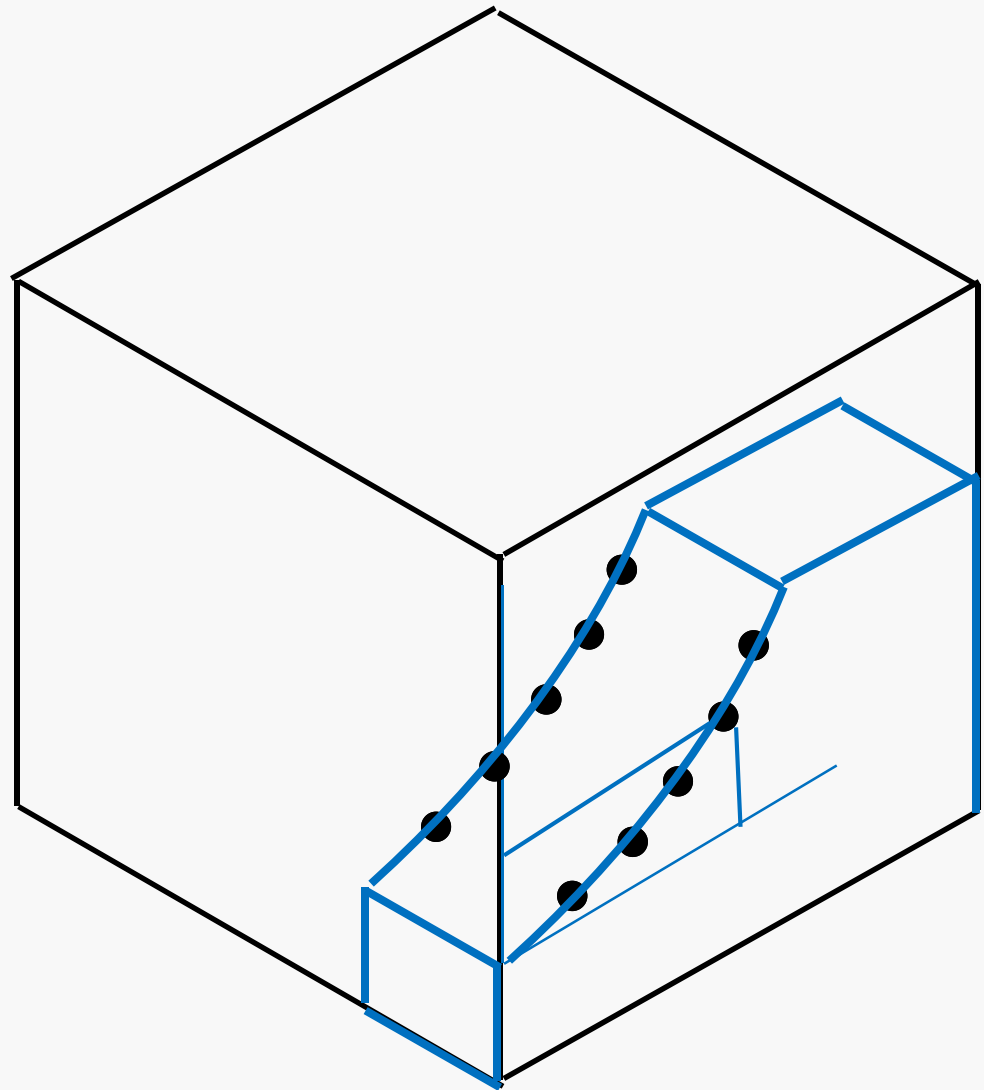
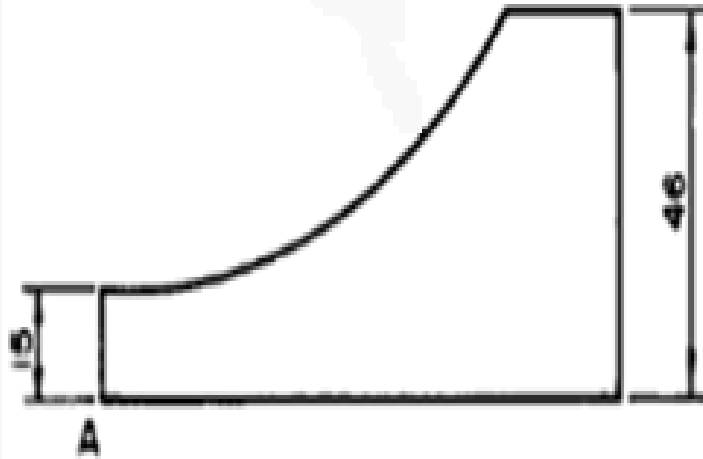


Exemple 3

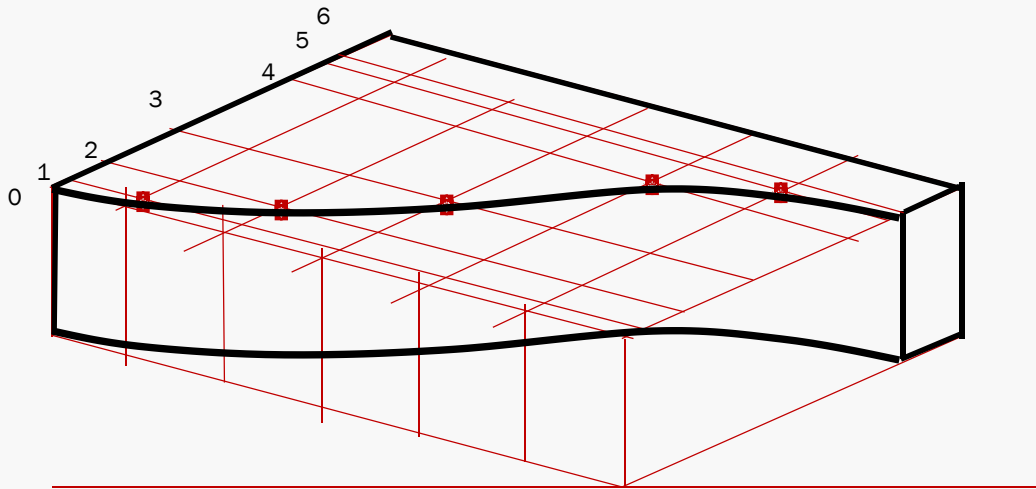
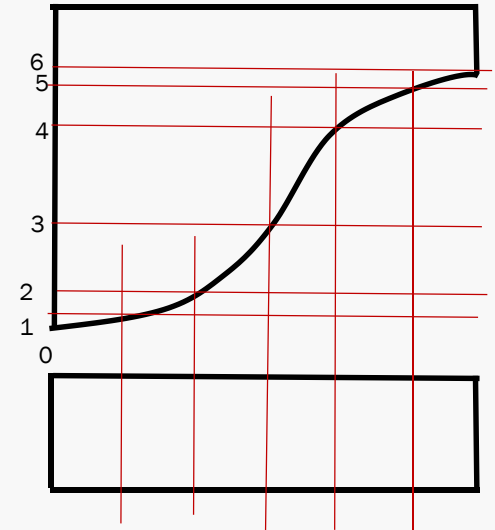
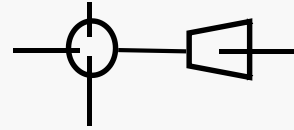


Make an isometric drawing of the object with corner A at the bottom.

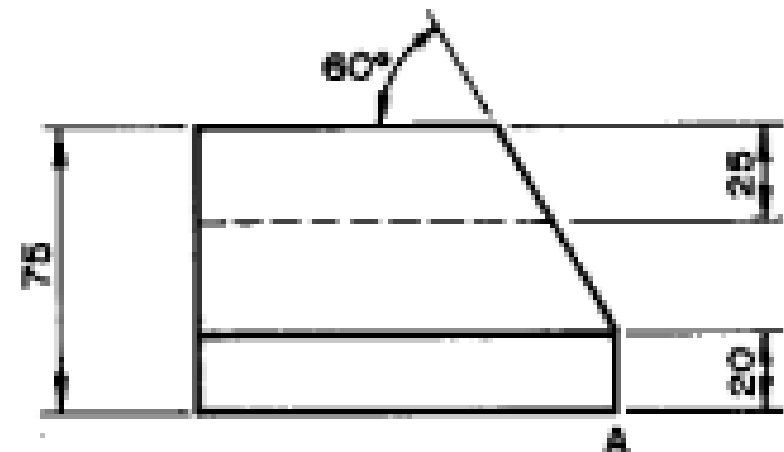
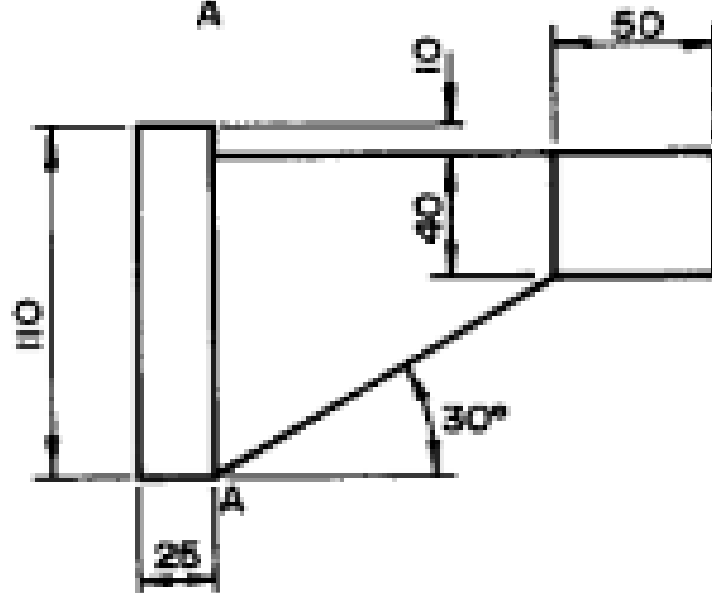
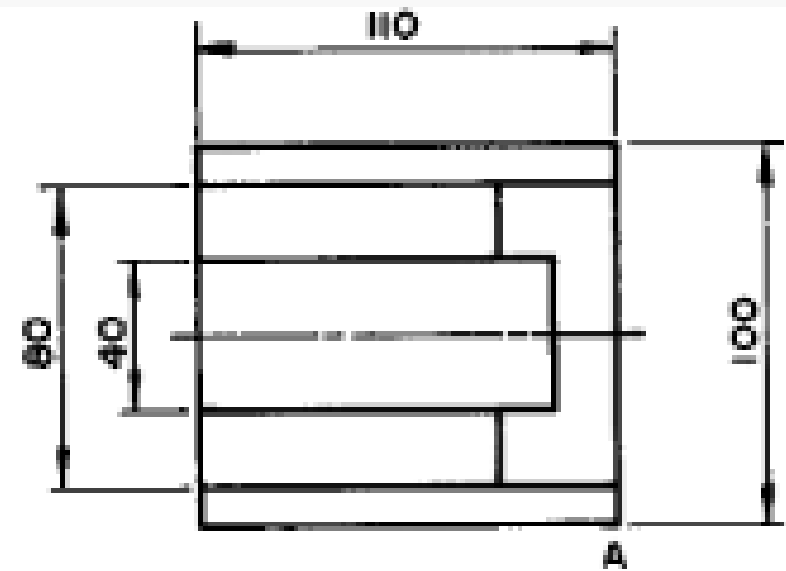
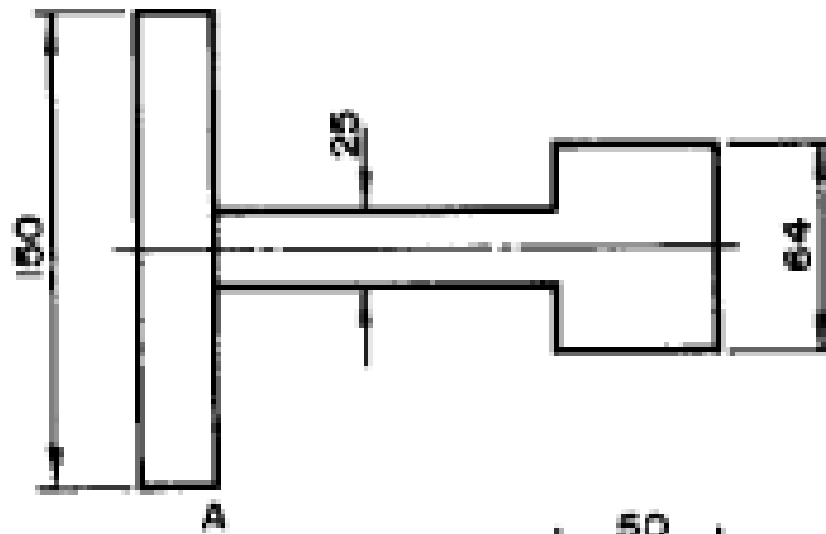
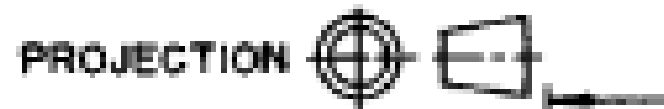
Exemple 3

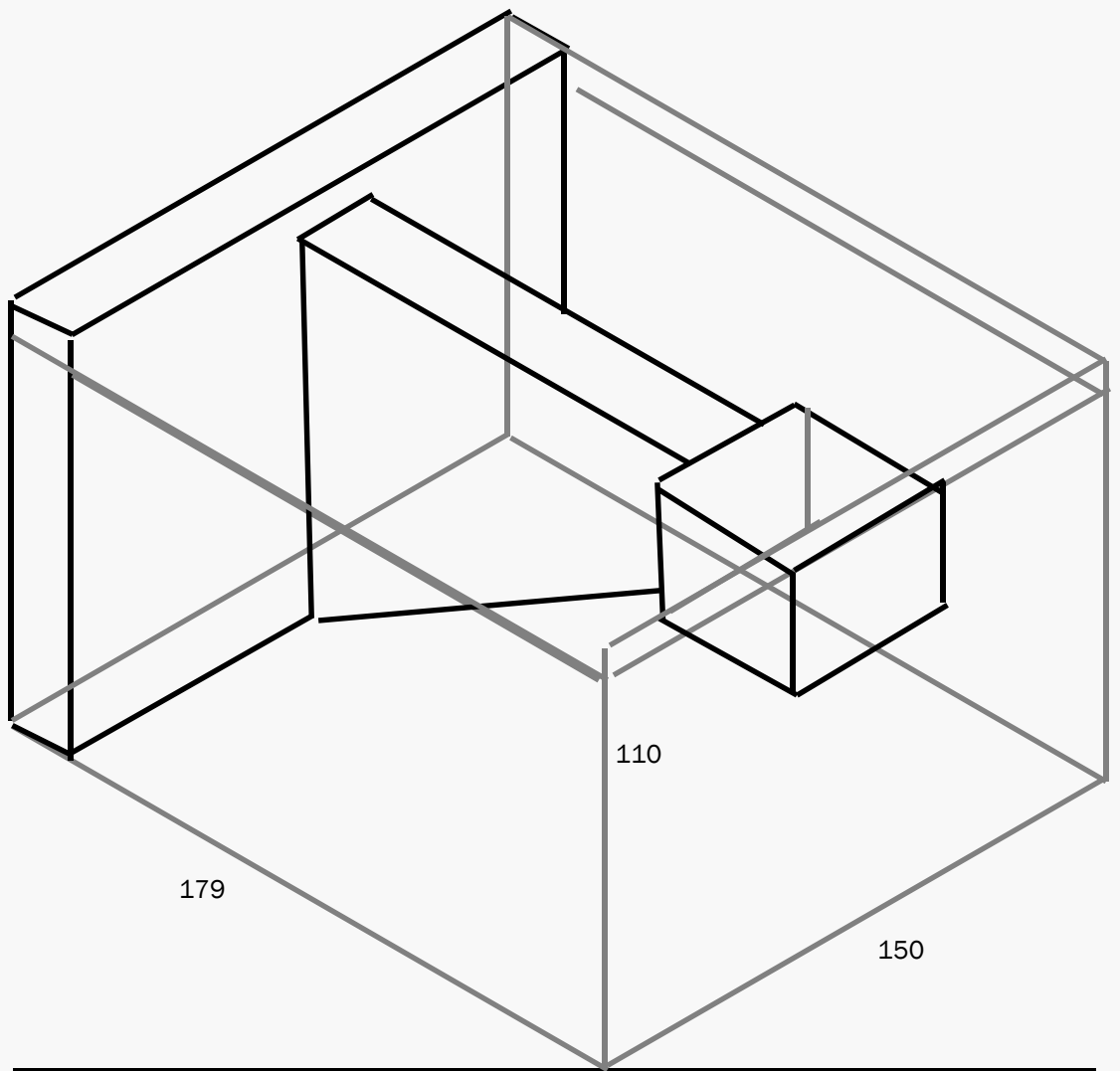
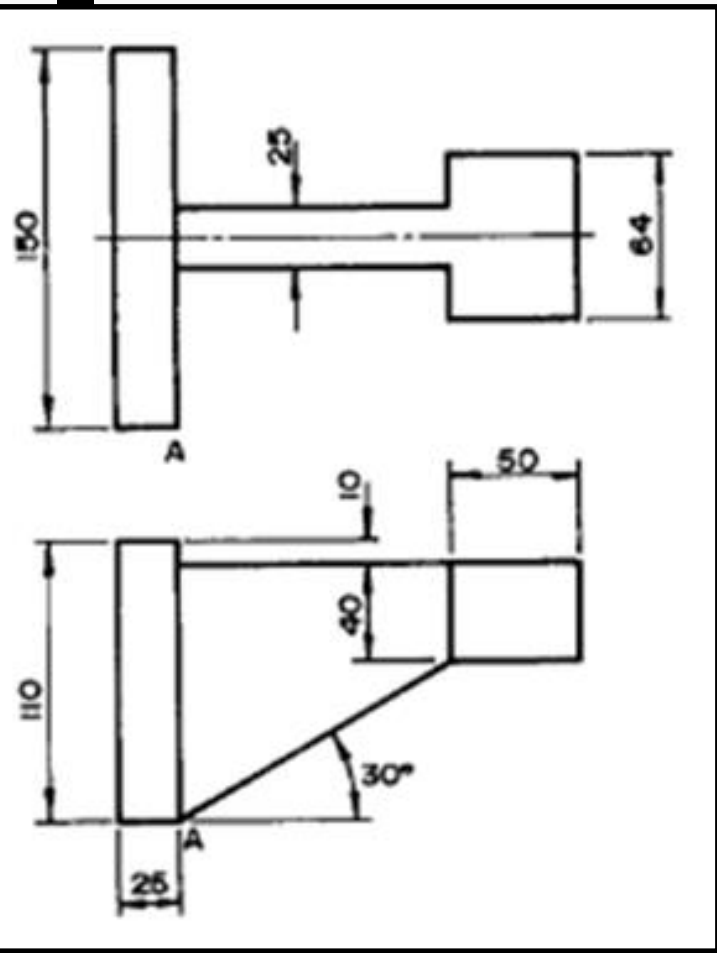


ISOMETRIC CURVES



ISOMETRIC PROBLEMS





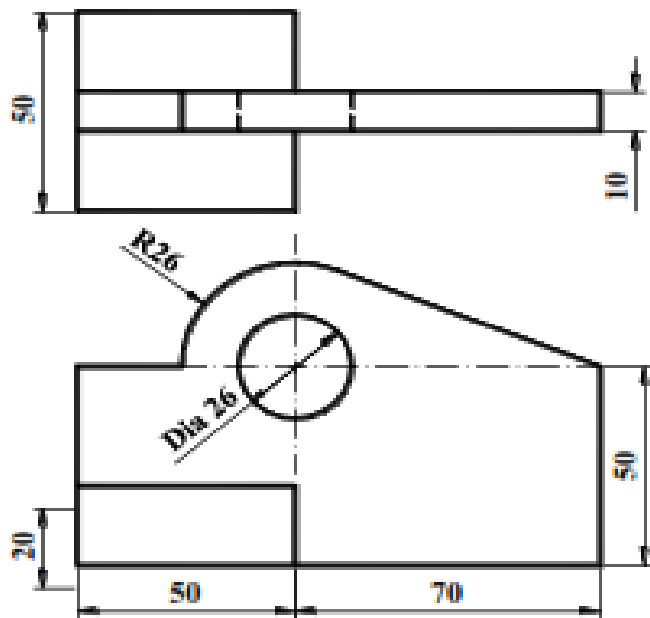
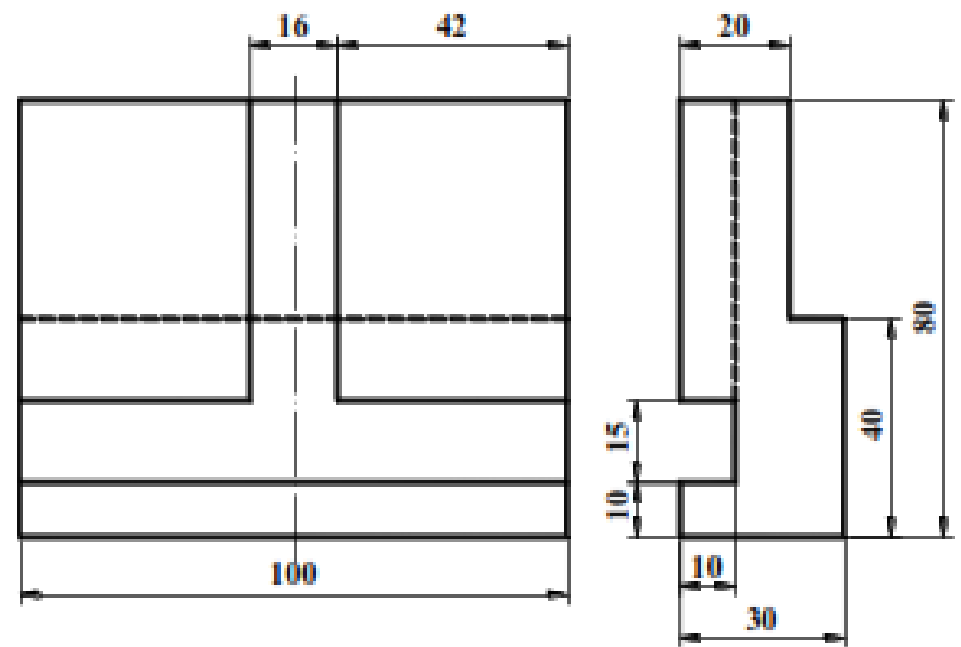
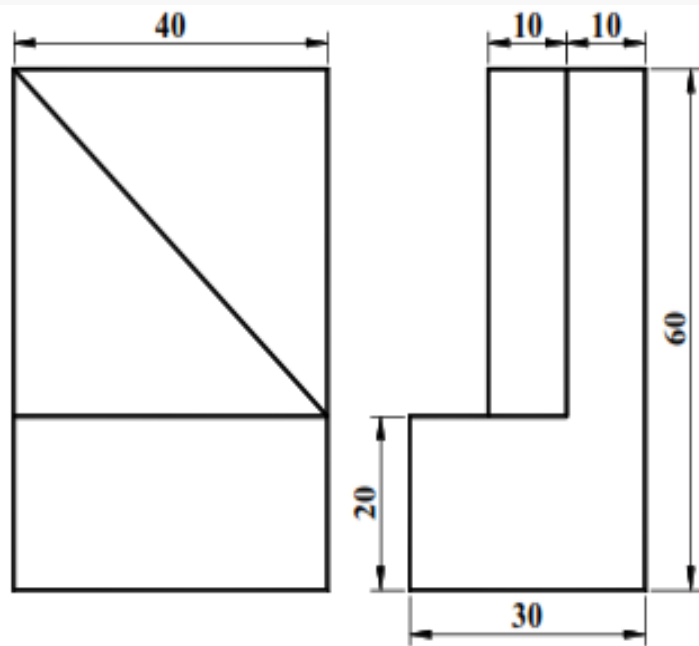


Figure T2.3

In 3rd Angle Projection

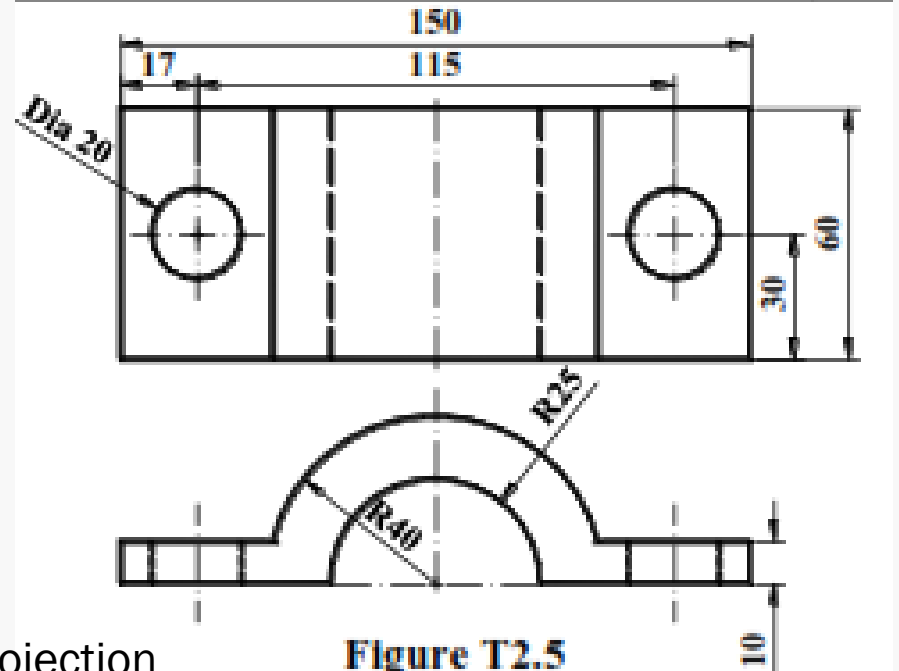
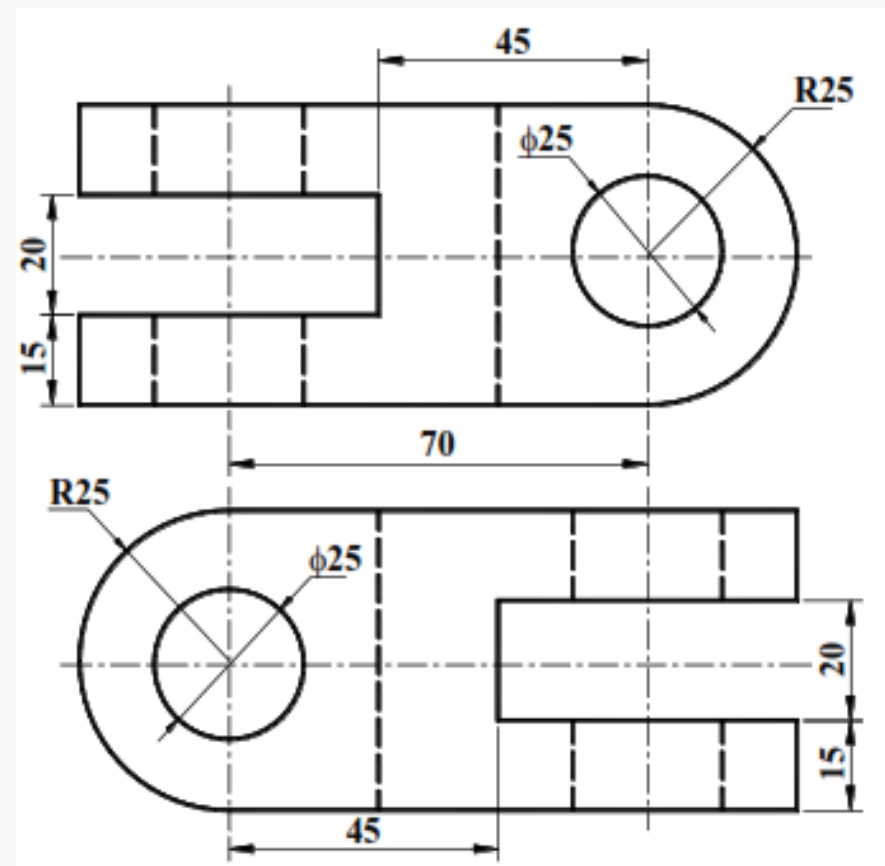
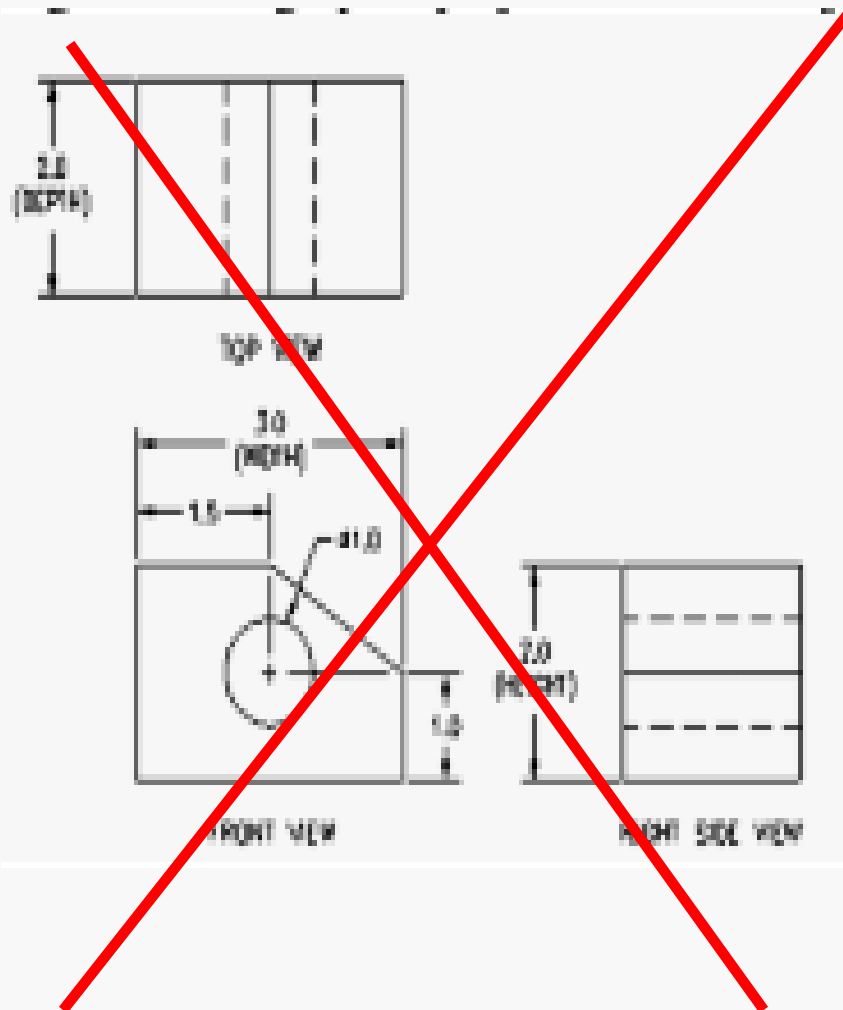
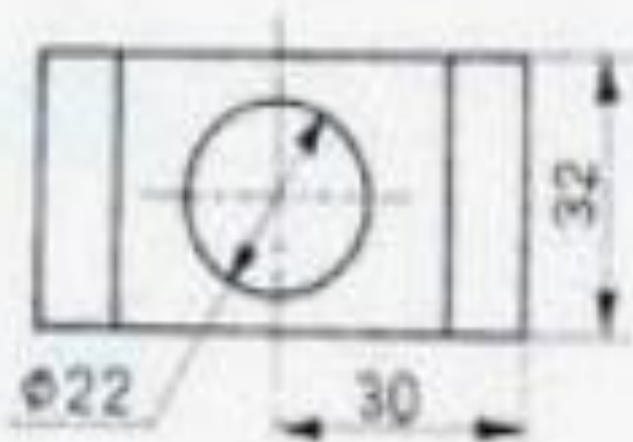
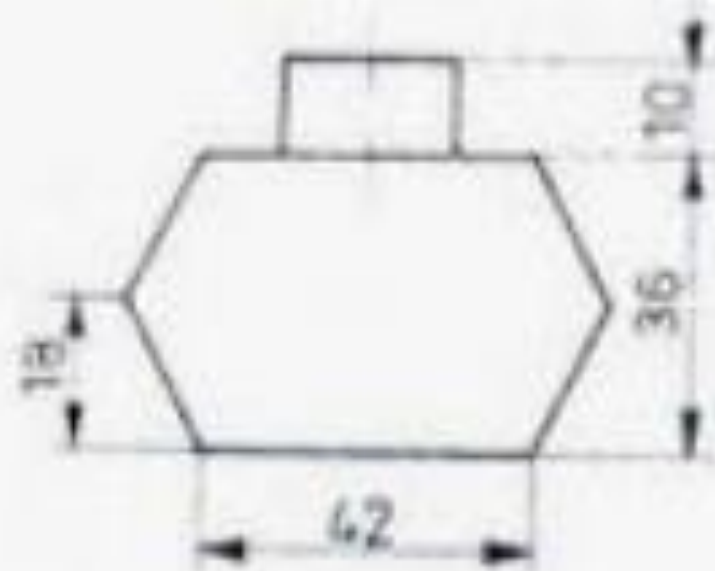
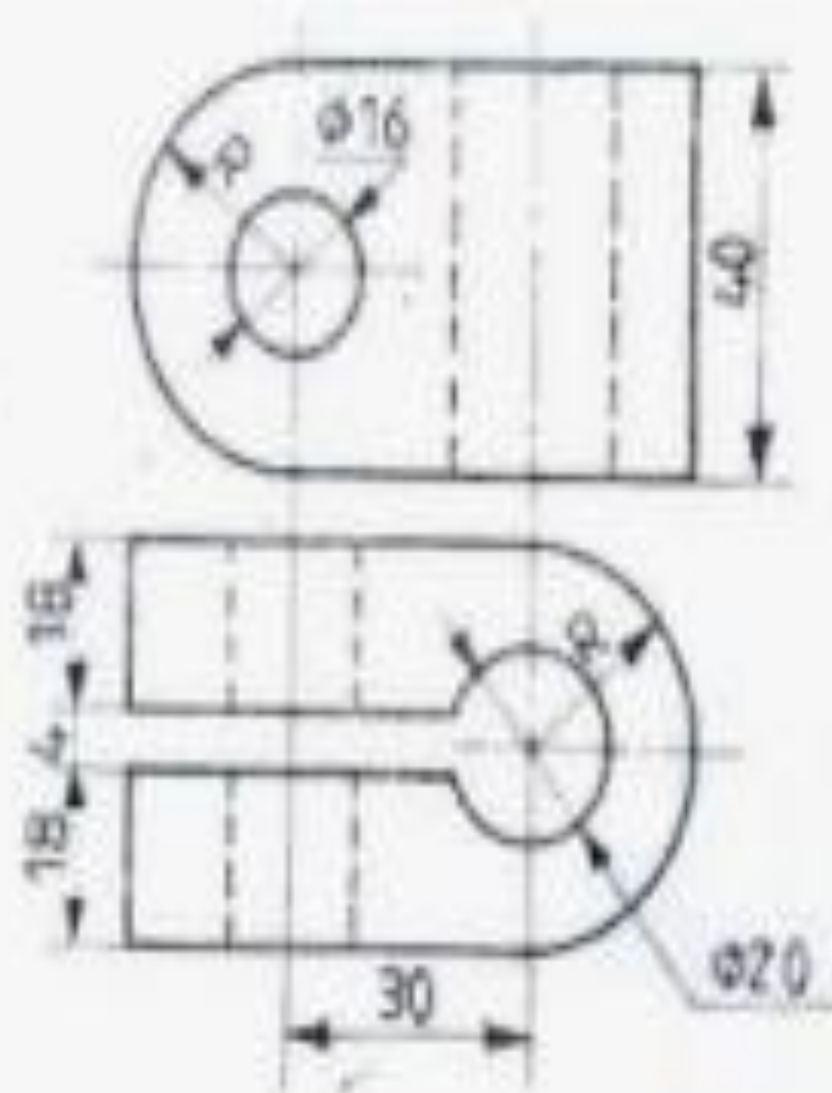


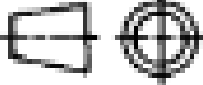
Figure T2.5

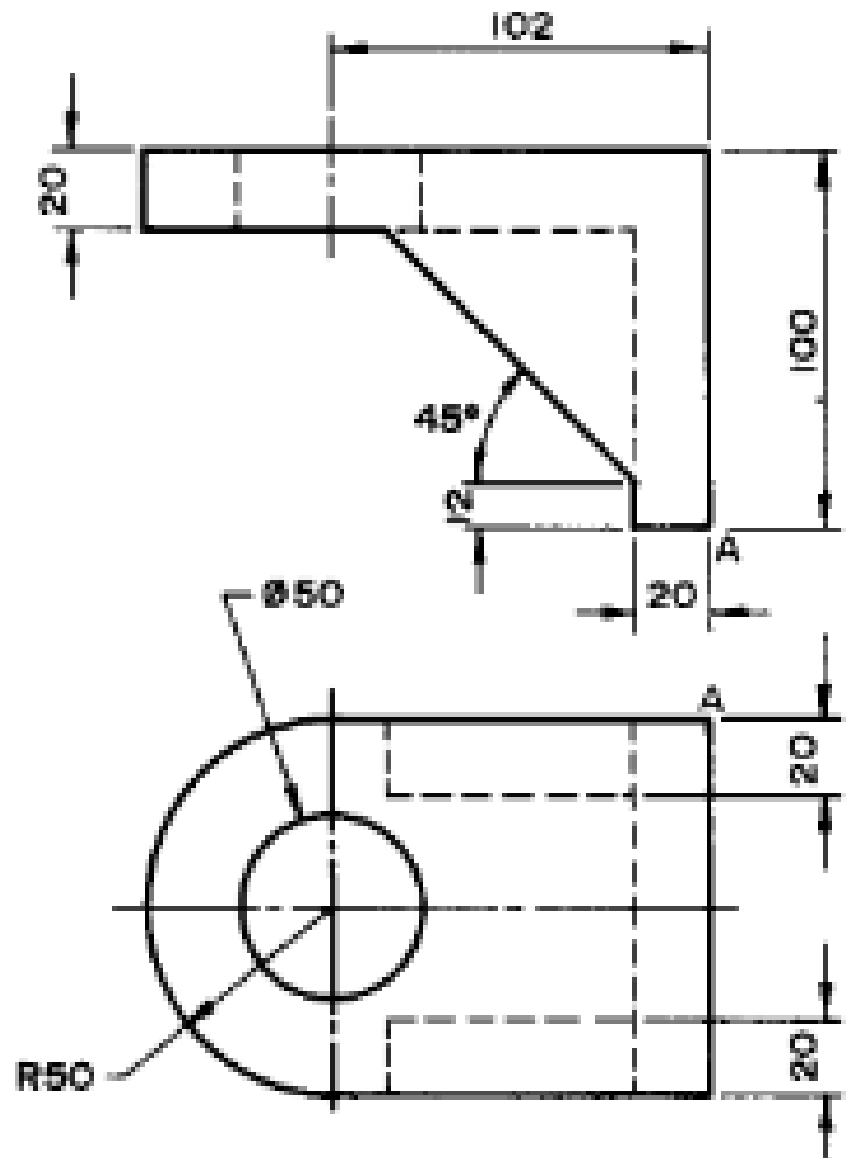
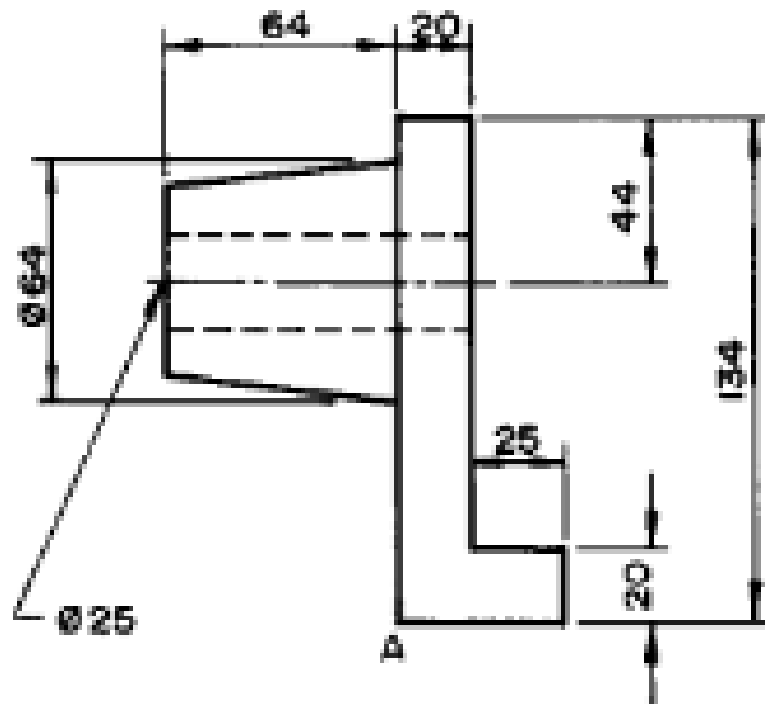


In 3rd Angle Projection



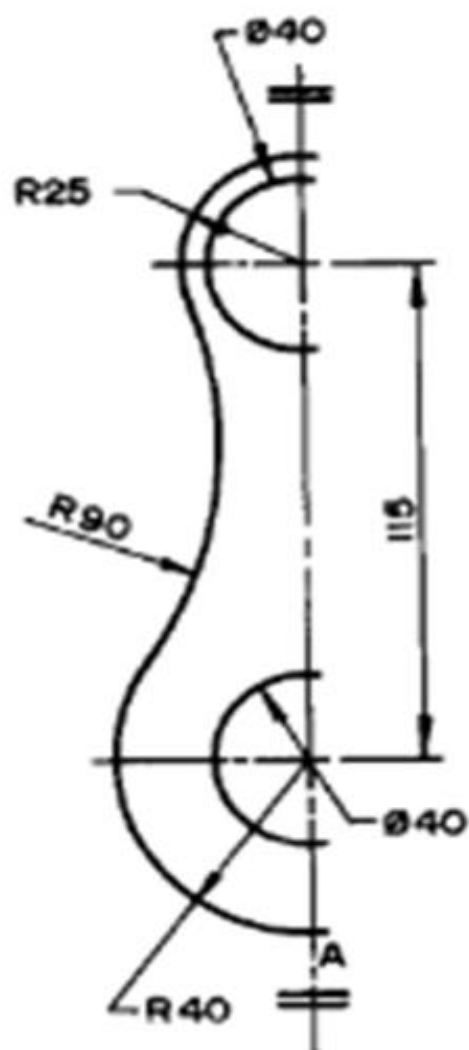
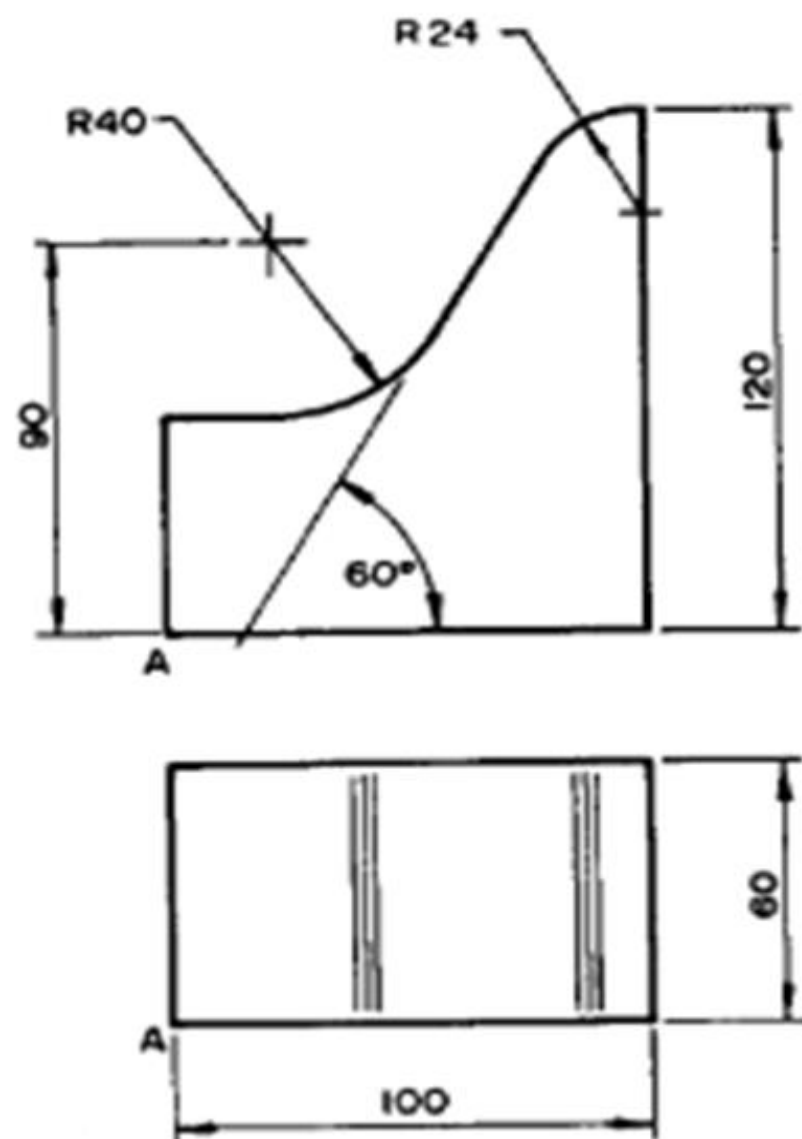
ISOMETRIC PROBLEMS

PROJECTION 



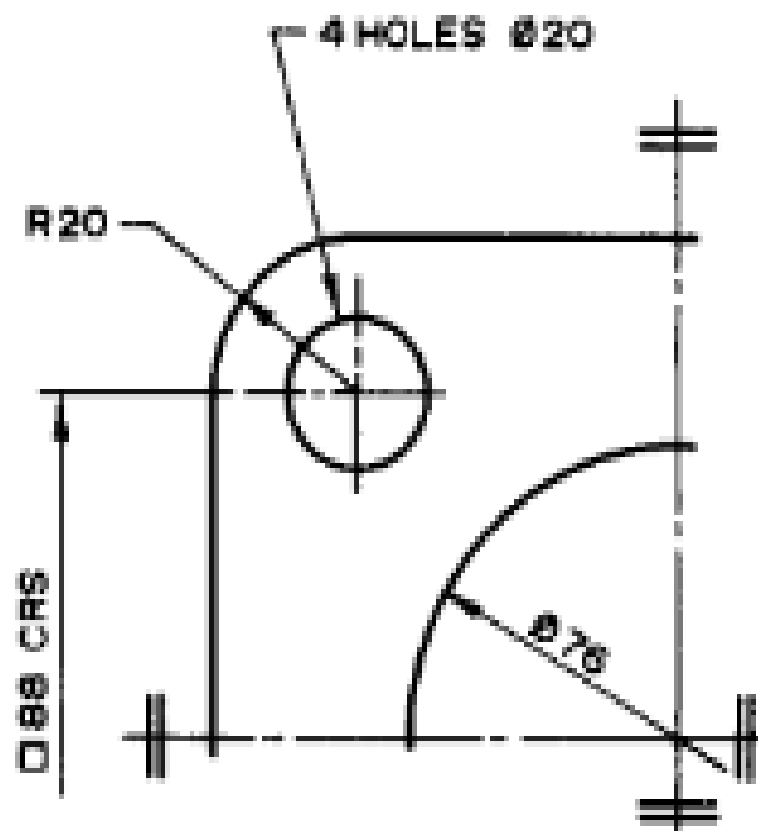
ISOMETRIC PROBLEMS

PROJECTION

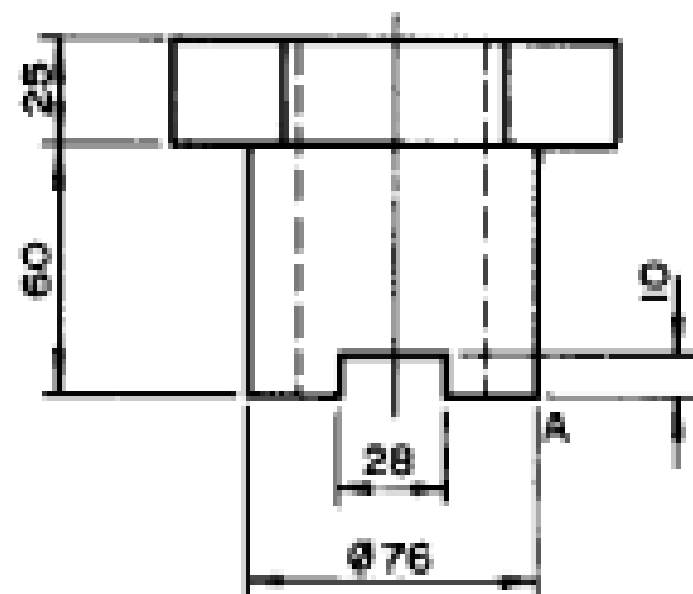
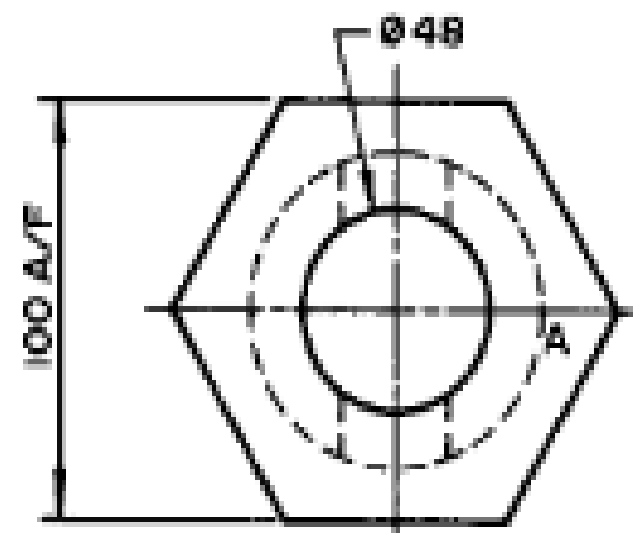


ISOMETRIC PROBLEMS

PROJECTION



MAKE FROM PLATE 20 THICK



END OF LECTURE 7