

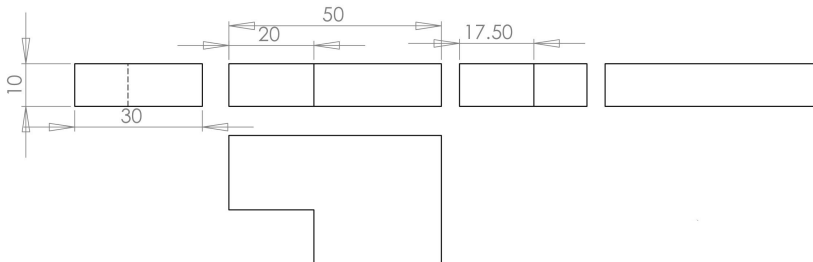
Engineering Drawing

Anup Ghosh

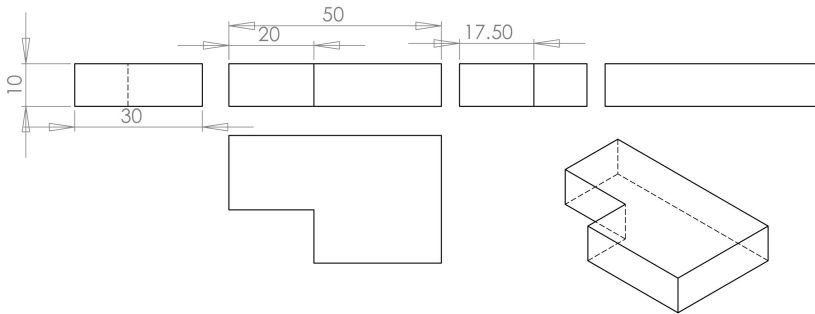
Department of Aerospace Engineering
Indian Institute of Technology Kharagpur

September 7, 2012

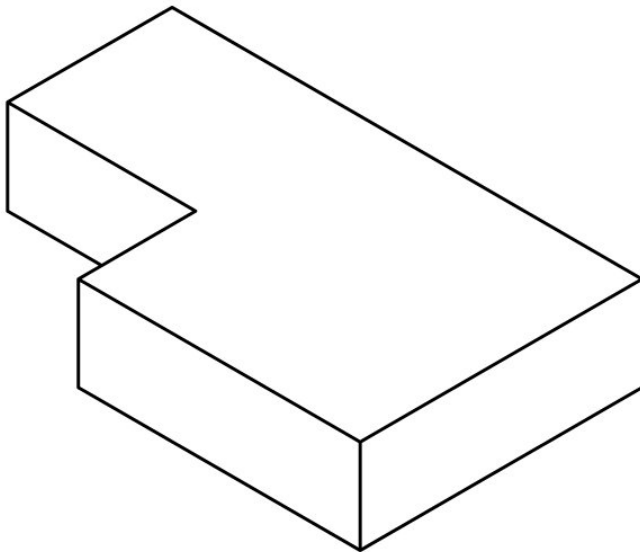
Example - 1



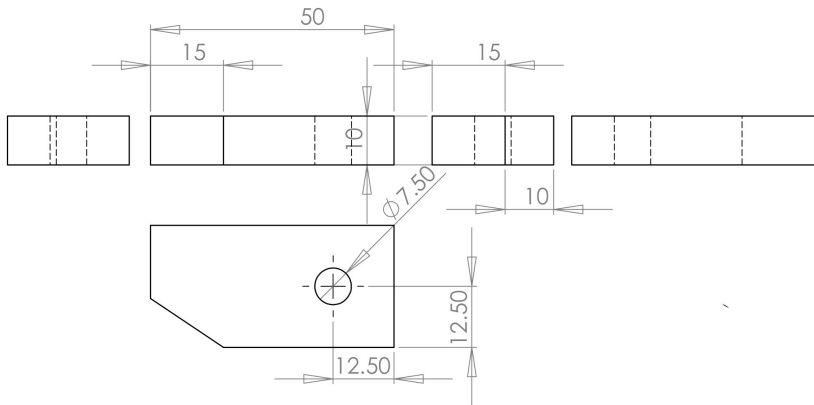
Example - 1



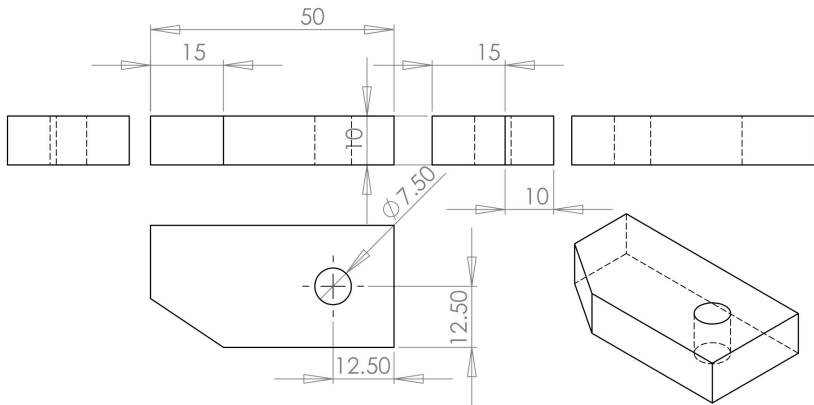
Example - 1



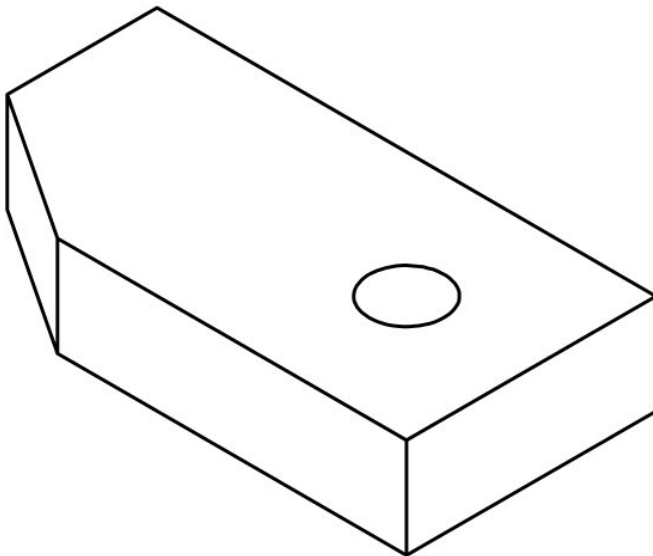
Example - 2



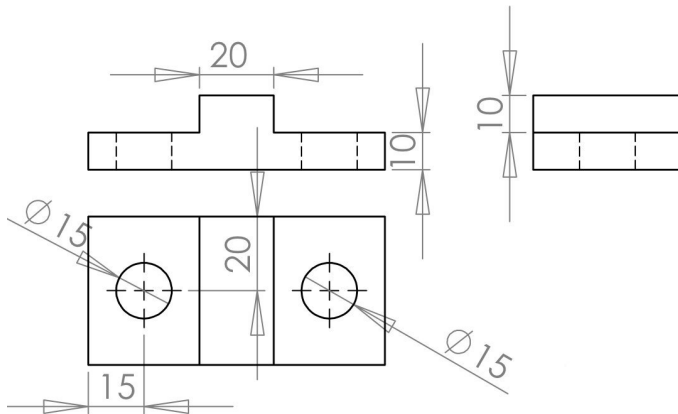
Example - 2



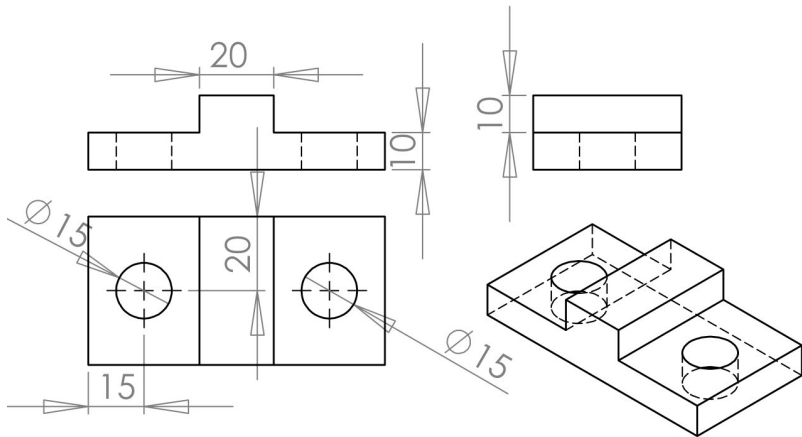
Example - 2



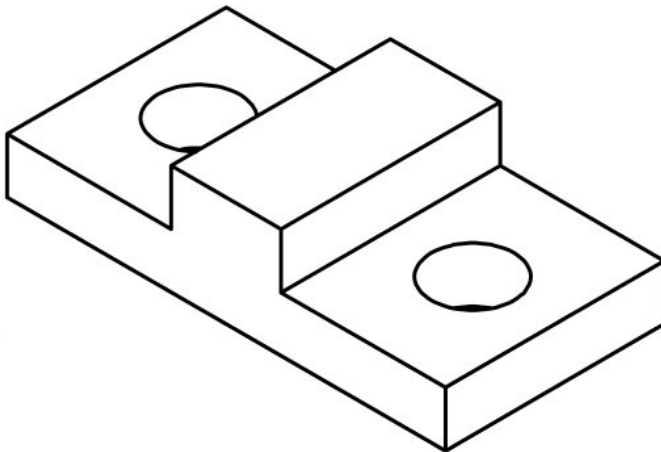
Example - 3



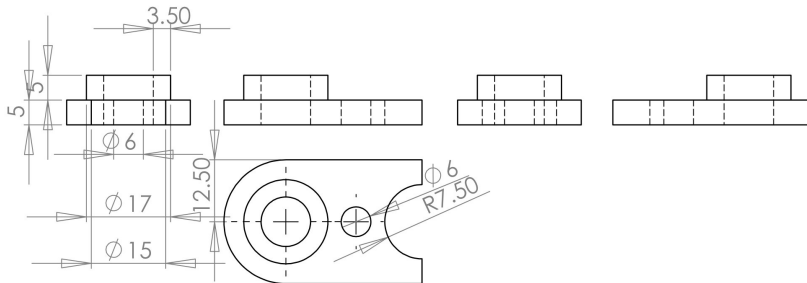
Example - 3



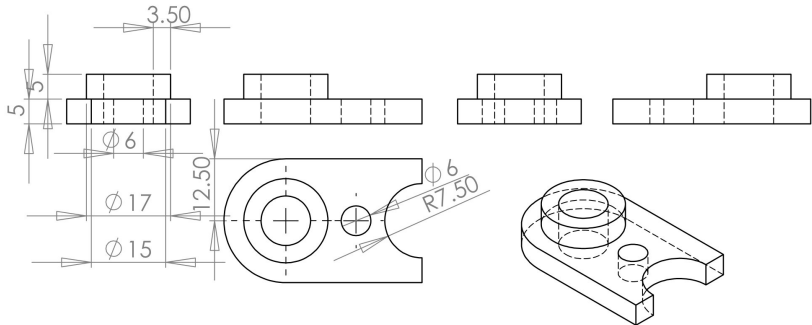
Example - 3



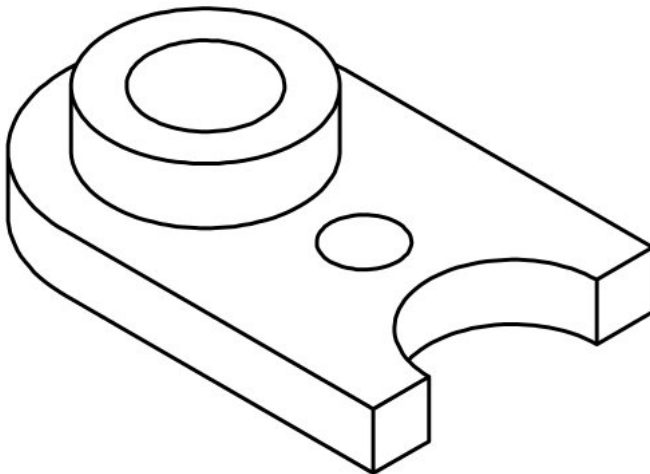
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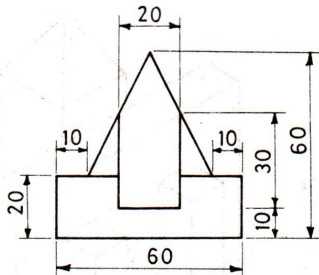
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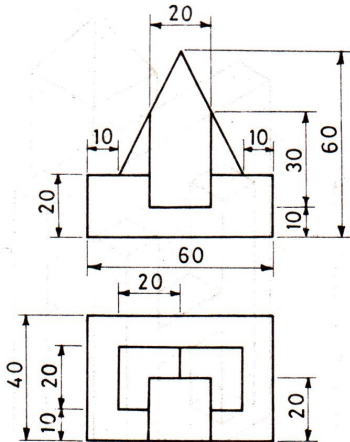
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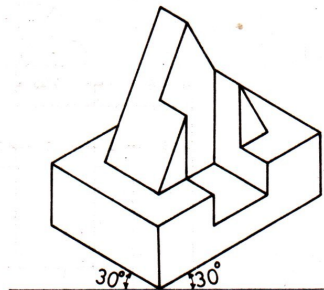
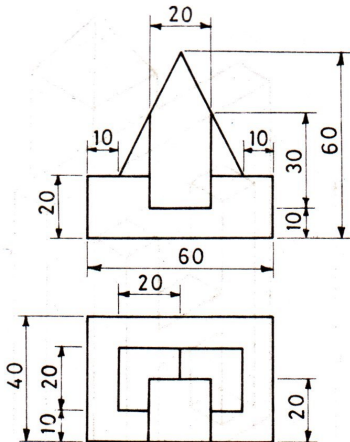
Example - 5



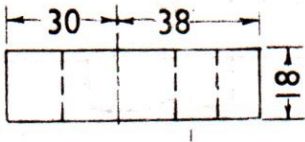
Example - 5



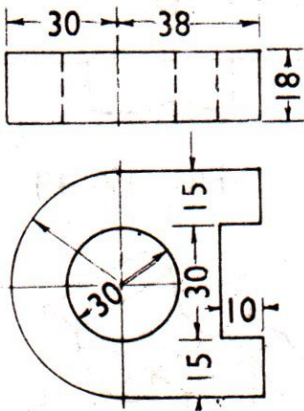
Example - 5



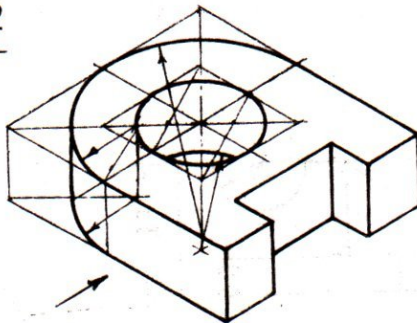
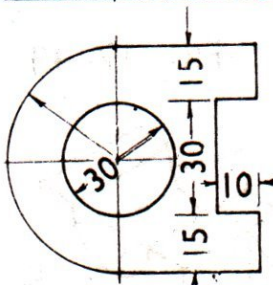
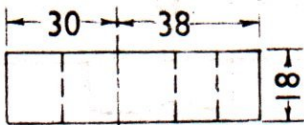
Example - 6



Example - 6



Example - 6

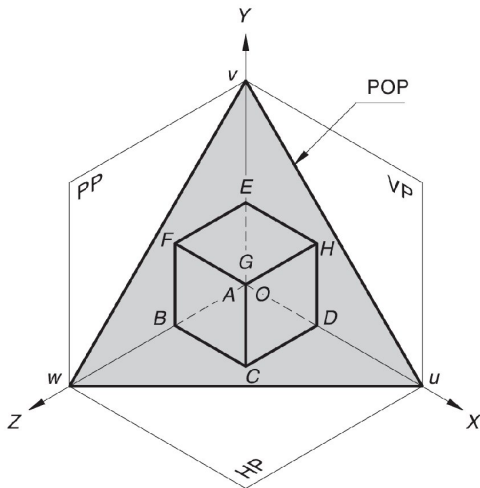


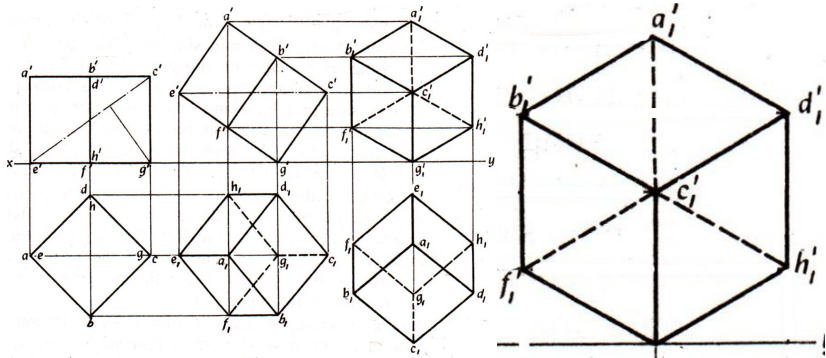
Isometric Projection

- 1 Isometric means equal measure
- 2 mutually perpendicular plane surfaces of an object and the edges formed by these surfaces are equally inclined to a plane of projection
- 3 **only one view on a plane is drawn to represent the three dimensions of an object**
- 4 provides a pictorial view with a real appearance

Orthographic Projection	Isometric Projection
Two or more views are drawn to understand the object properly	Only one view is drawn
A good imagination is required to visualize in 3D	Easy to visualize 3D

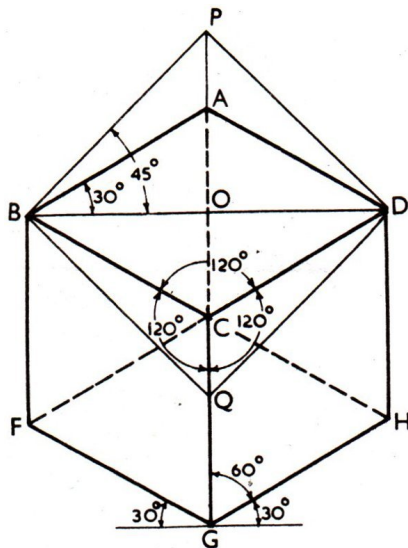
The plane of projection





A specific type of projection of a cube

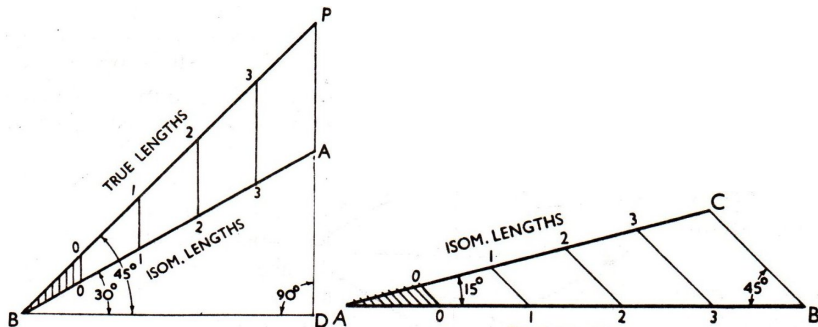
Cube resting on ground on one of its corners with a solid diagonal perpendicular to VP, Front view is isometric projection



Terminologies

- 1 Isometric Axes : CB, CD and CG 120° apart
- 2 Isometric line : lines parallel to this axes
- 3 Isometric Plane : Planes representing the faces of the cube and all parallel planes to those.

Isometric Scale and True Scale



Comparison with cube projection

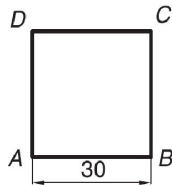
All the edges of the cube are equally foreshortened, only BD is the true diagonal, BPDQ is the true length top face of the cube.

$$\frac{BA}{BD} = \frac{1}{\cos 30} = \frac{2}{\sqrt{3}} \Rightarrow \frac{BP}{BD} = \frac{1}{\cos 45} = \sqrt{2} \Rightarrow \frac{BA}{BP} = \frac{\sqrt{2}}{\sqrt{3}}$$

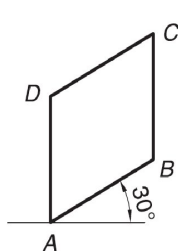
Isometric View of Solids

Due to the ease in construction and the advantage of measuring the dimensions directly from the drawing, it has become a general practice to use the true scale instead of the isometric scale. **The view drawn with true scale is called isometric view, while that drawn with isometric scale is called isometric projection.**

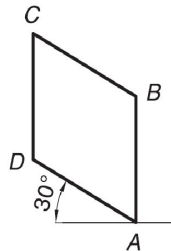
Isometric view of plane figures



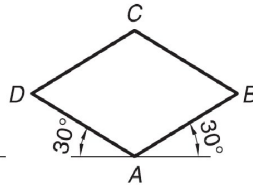
Square



(a)

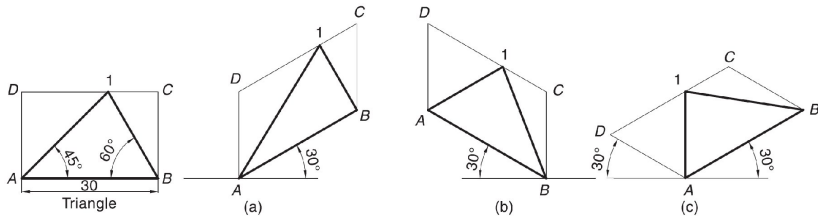


(b)

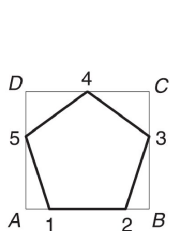


(c)

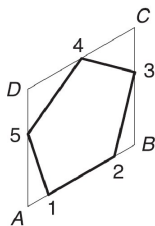
Isometric view of plane figures



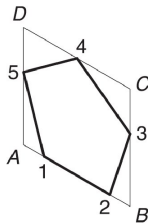
Isometric view of plane figures



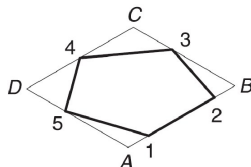
Pentagon



(a)

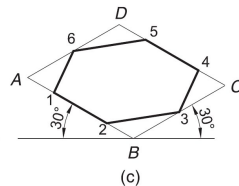
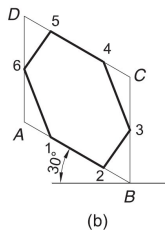
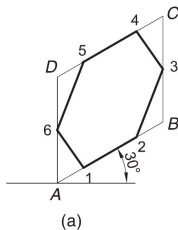
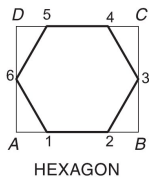


(b)



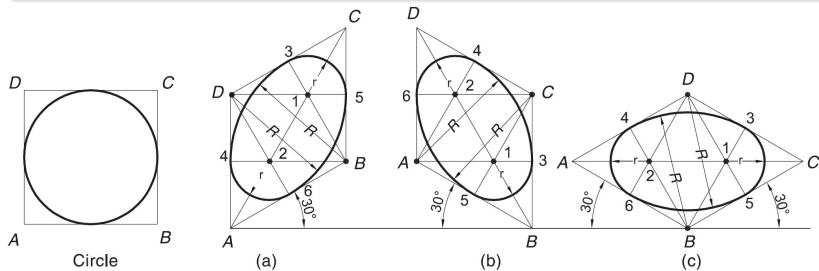
(c)

Isometric view of plane figures



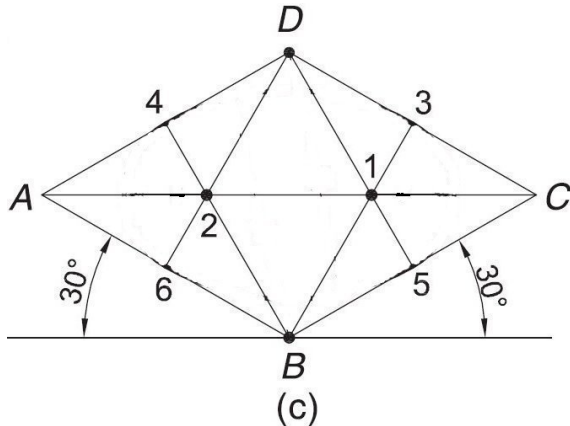
Isometric view of plane figures

Four-center method



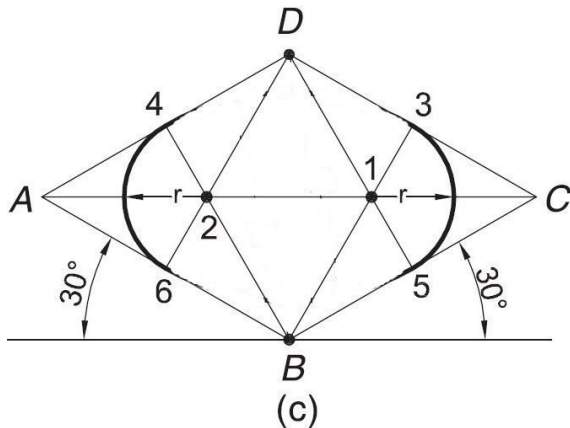
Isometric view of plane figures

Four-center method



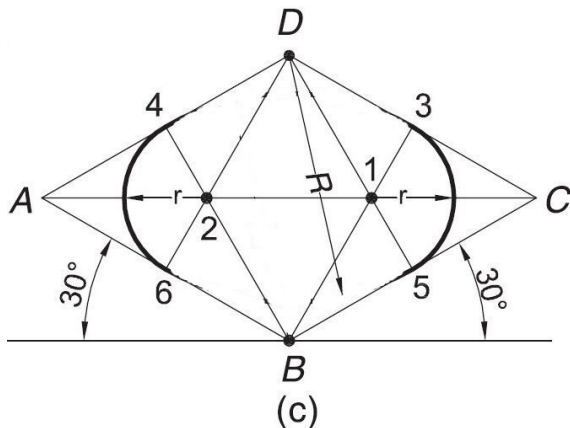
Isometric view of plane figures

Four-center method



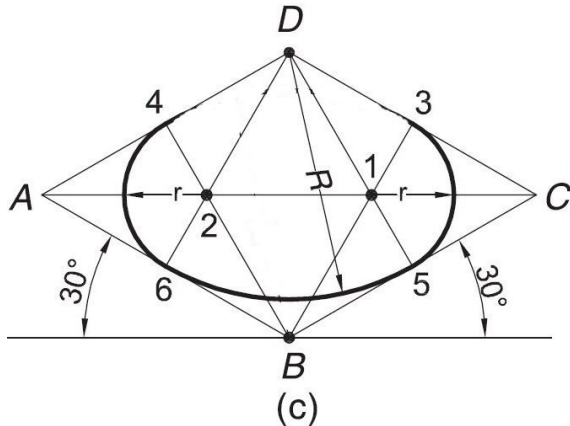
Isometric view of plane figures

Four-center method



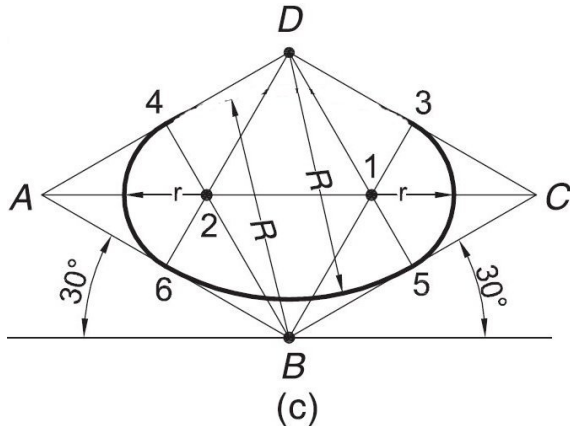
Isometric view of plane figures

Four-center method

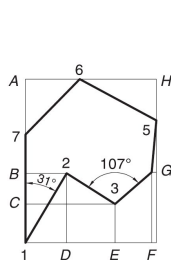


Isometric view of plane figures

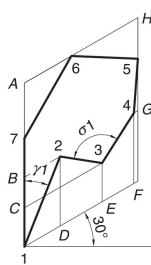
Four-center method



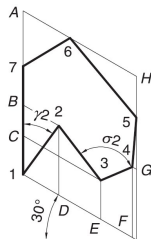
Isometric view of plane figures



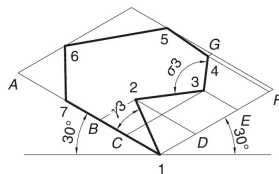
Irregular Shape



(a)

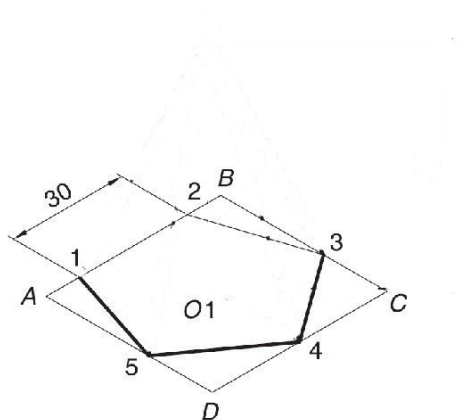
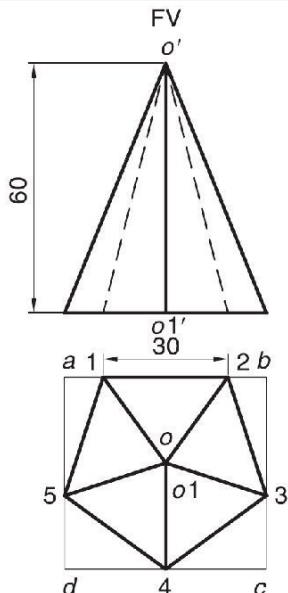


(b)

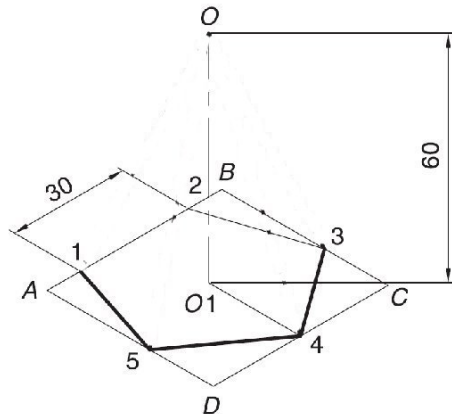
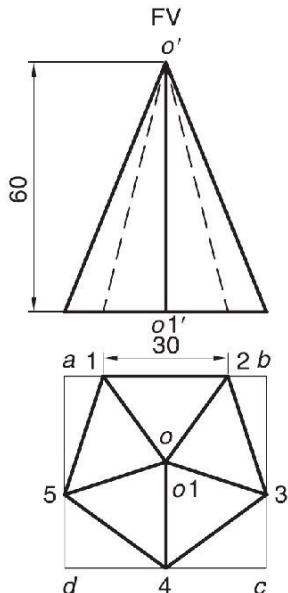


(c)

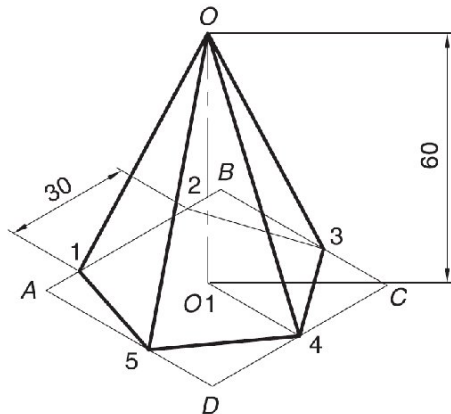
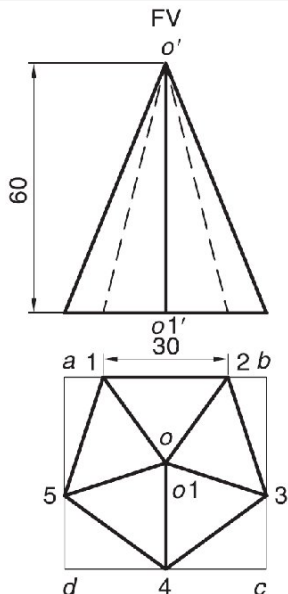
A Pentagonal Pyramid



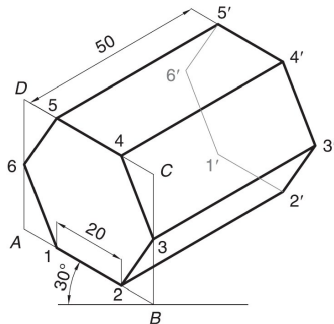
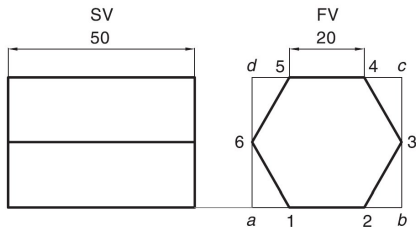
A Pentagonal Pyramid



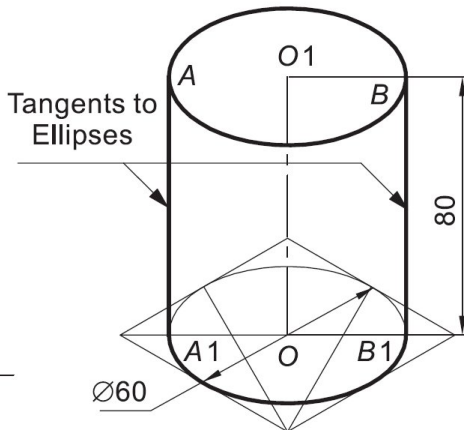
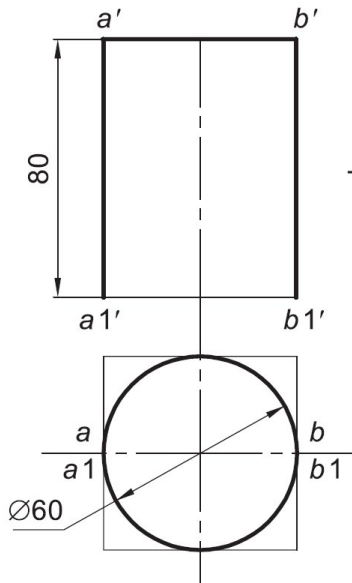
A Pentagonal Pyramid



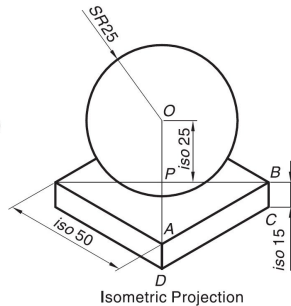
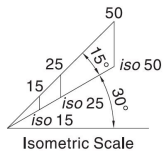
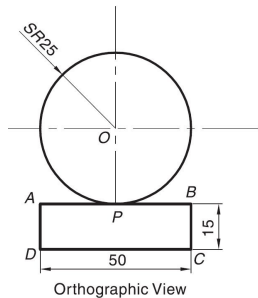
A Hexagonal Prism



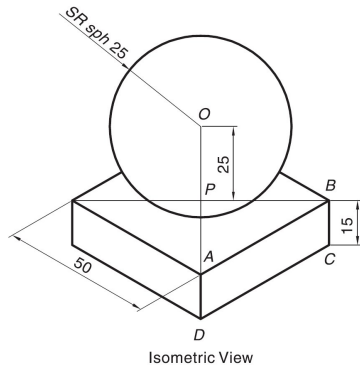
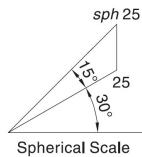
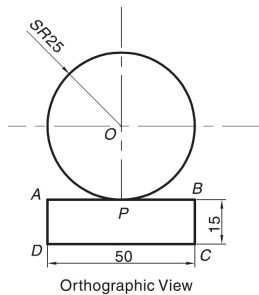
A Cylinder



Isometric projection of sphere



Isometric view of sphere



Isometric view of solids

