24ESGE101 – ENGINEERING GRAPHICS

Module VI – Isometric Projections

Course Outcome 6

Draw the isometric view, projection for regular and truncated solids like Prism, Pyramid, Cylinder and Cone. (K3)

Content

Isometric Projection – **Principle, Isometric Scale, Isometric Views** and **Isometric Projections** of **Truncated Solids** - **Prisms, Pyramids, Cylinder and Cone** in **Simple Vertical Positions** only.

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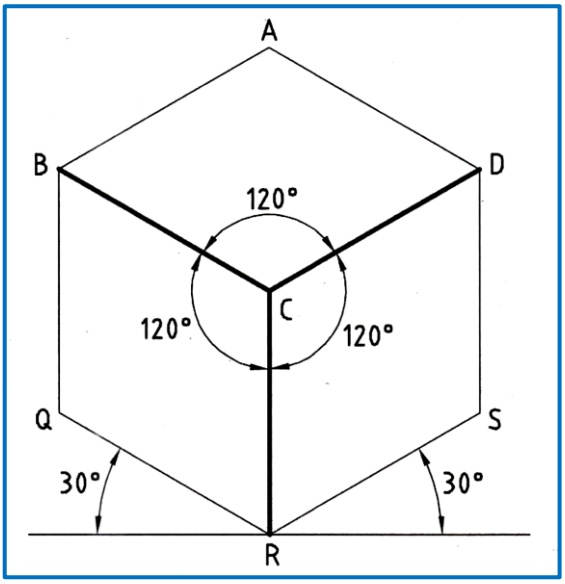
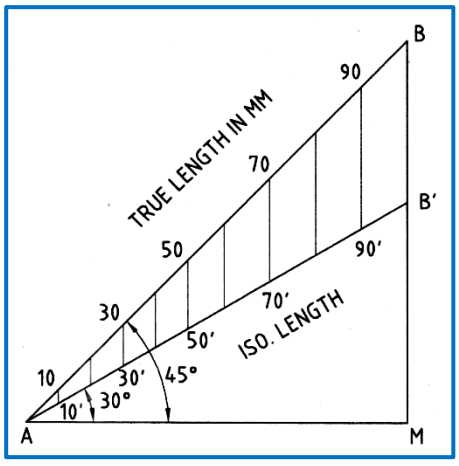
- Isometric projections are commonly used to prepare the pictorial view of smaller objects.
- Commonly used in Mechanical, Production, Automobile, Aerospace and Chemical engineering to show the machine components.

Isometric Axes

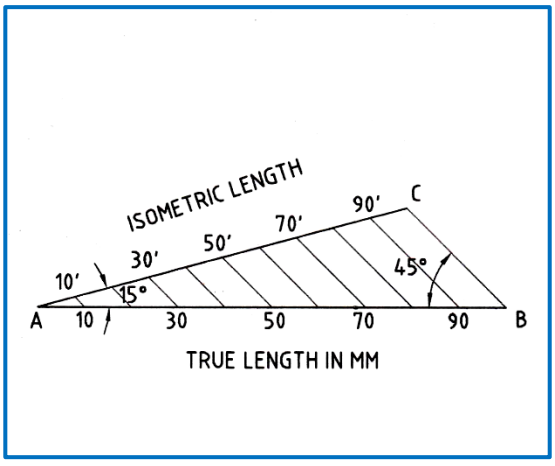


Isometric Scale

- ✓ In isometric projection, the true length may be converted into isometric length, by multiplying it with 0.82.



Method 1



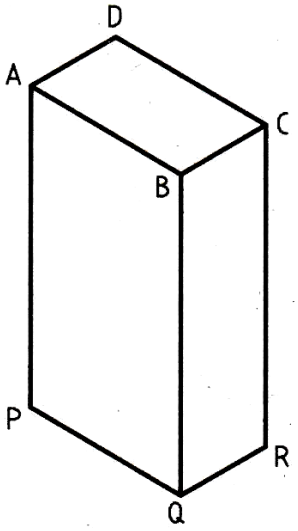
Method 2

❖ **Isometric Projection**

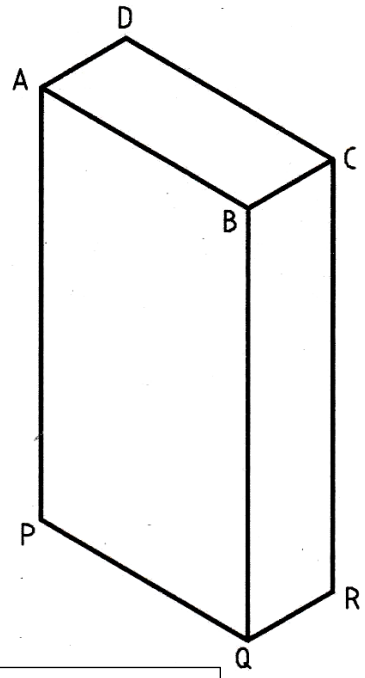
✓ In isometric projection, isometric lengths (0.82 x true length) are always used to prepare the drawing.

❖ **Isometric View**

✓ ln isometric view, true lengths are used to prepare the drawing



Isometric Projection



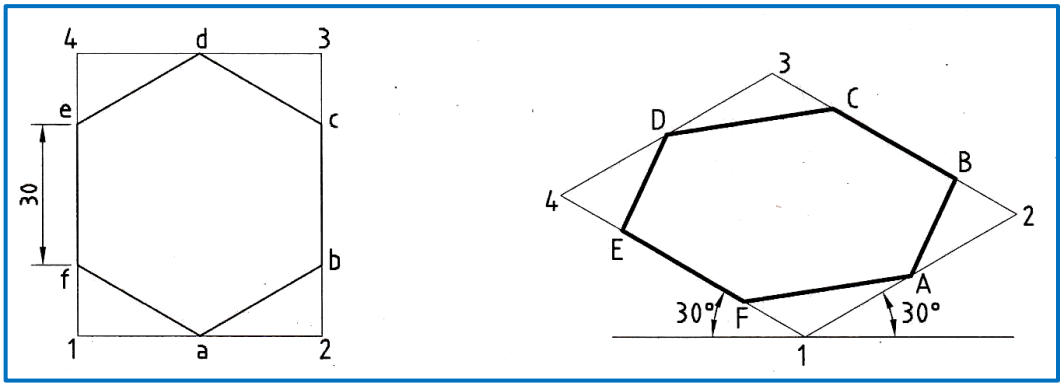
Isometric View

❖ **Methods to Draw Isometric Projection / Isometric View**

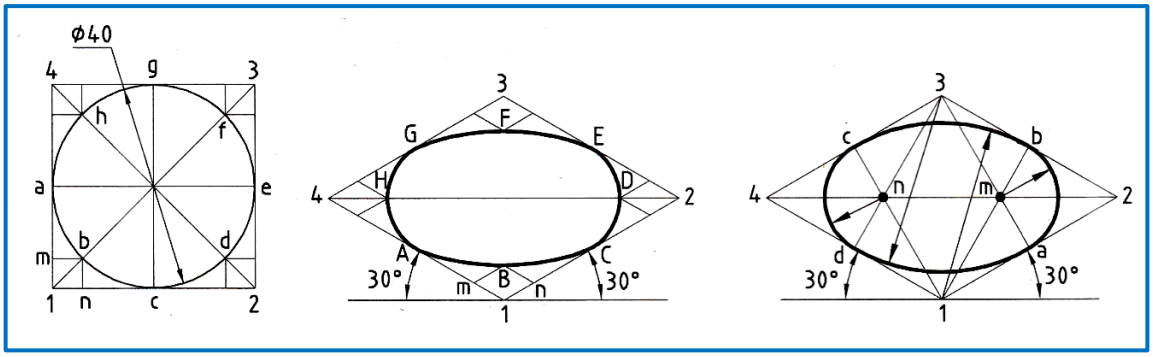
✓ Box Method

✓ Co-ordinate or Offset Method

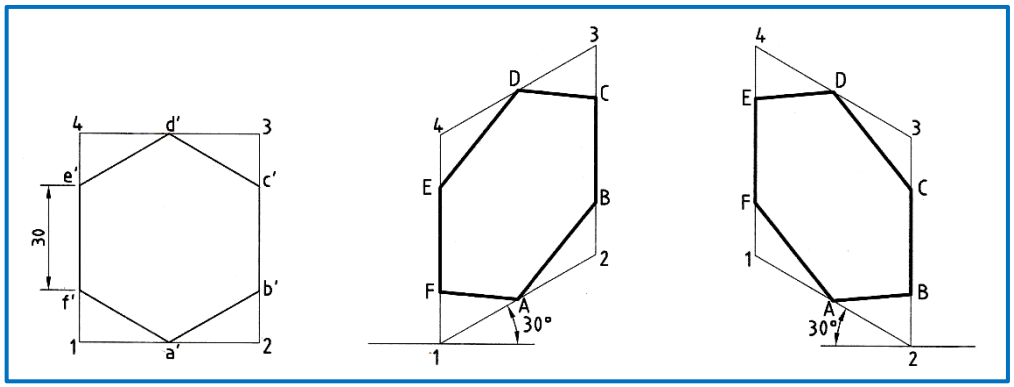
1. Draw the **Isometric View** of a regular **Hexagon** of side 30 mm placed with its **surface parallel to HP** and a **side perpendicular to VP.**



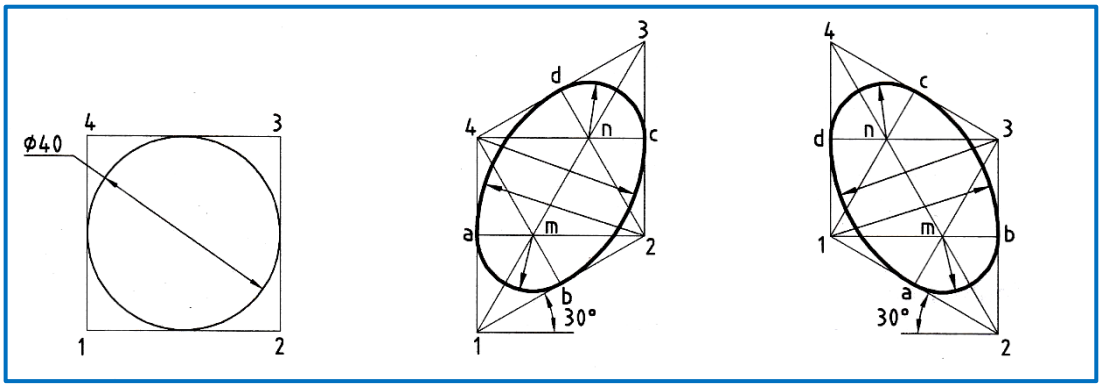
2. Draw the **Isometric View** of a **Circular Lamina** of diameter 40 mm placed with its **surface parallel to HP.**



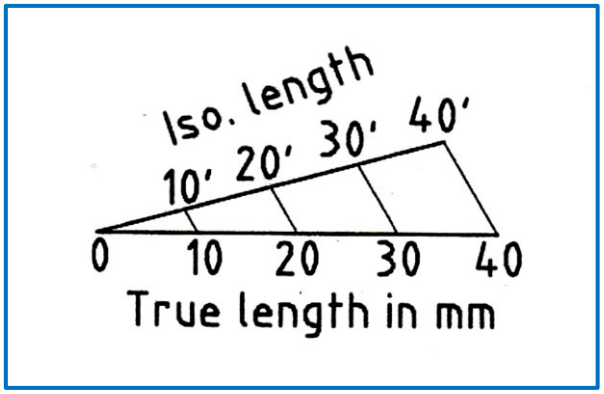
3. Draw the **Isometric View** of a regular **Hexagon** of side 30 mm placed with its **surface parallel to VP** and a **side perpendicular to HP.**

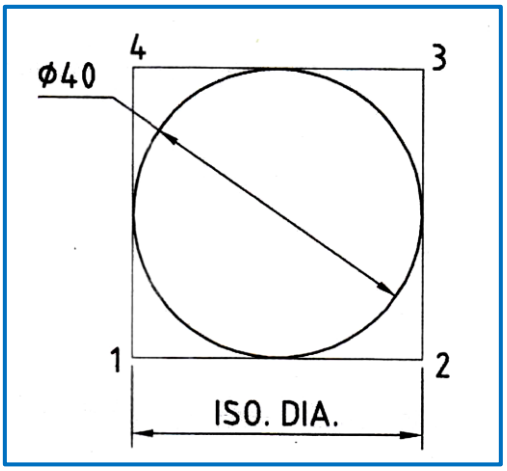


4. Draw the **Isometric View** of a **Circular Lamina** of diameter 40 mm placed with its **surface parallel to VP.**

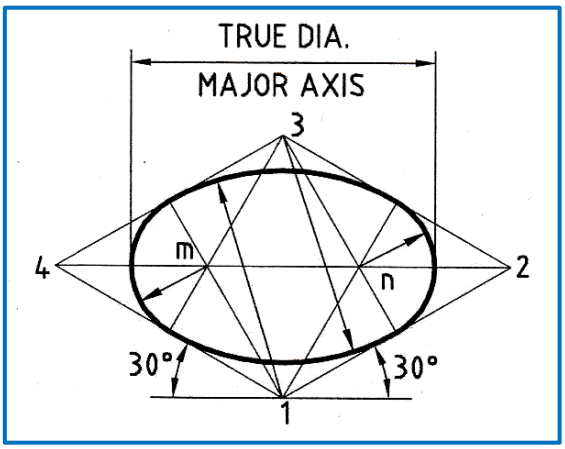


5. Draw the **Isometric Projection** of a **Circle** of diameter 40 mm by placing its **surface**, (i) **Parallel to HP**; (ii) **Parallel to VP**.

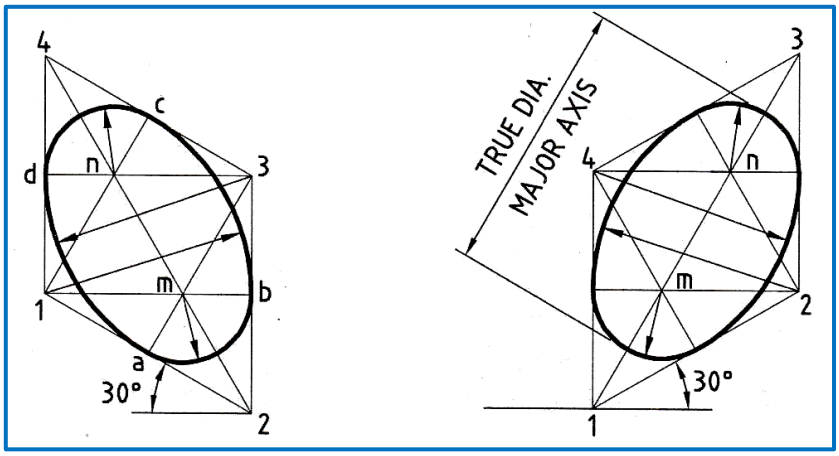




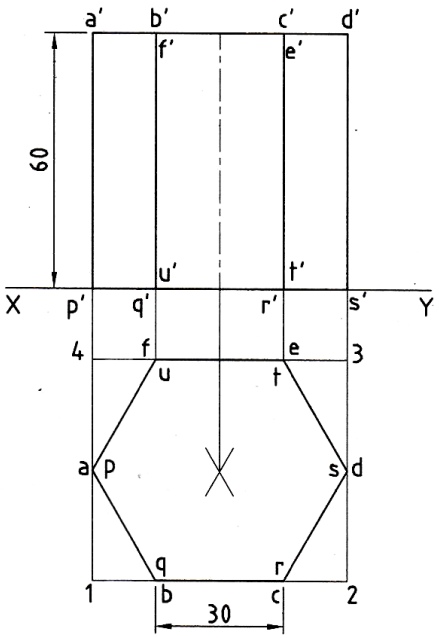
(i)

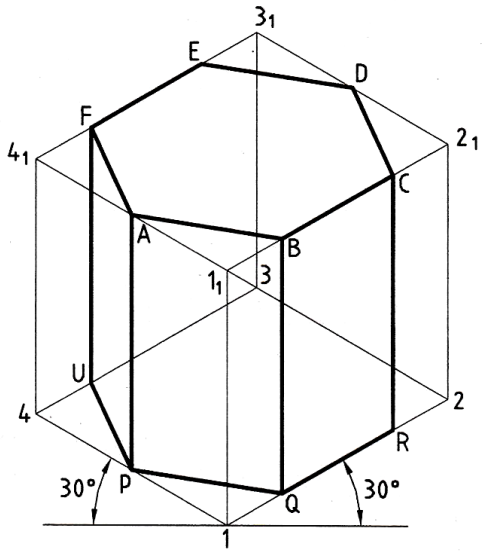


(ii)

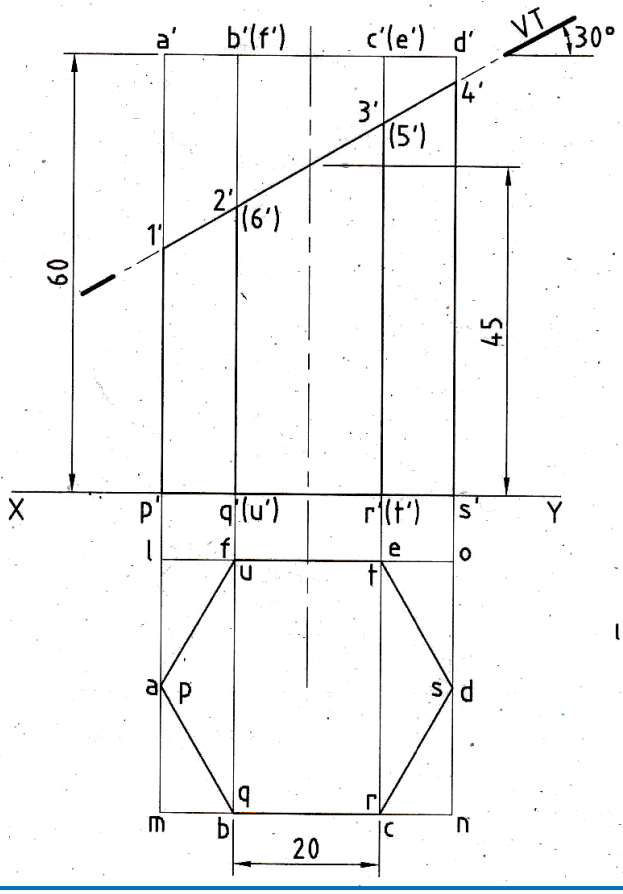


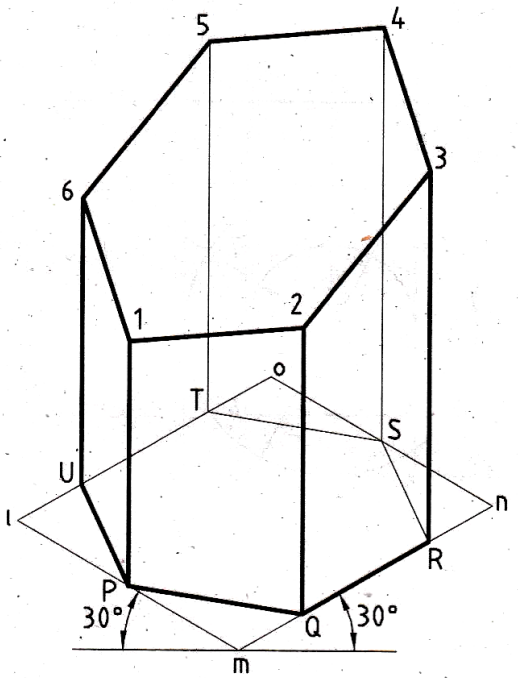
6. A **Hexagonal Prism** of base side 30 mm and axis length 60 mm is **resting on HP on its base** with **a side of base parallel to VP**. Draw the **Isometric View** of the prism.



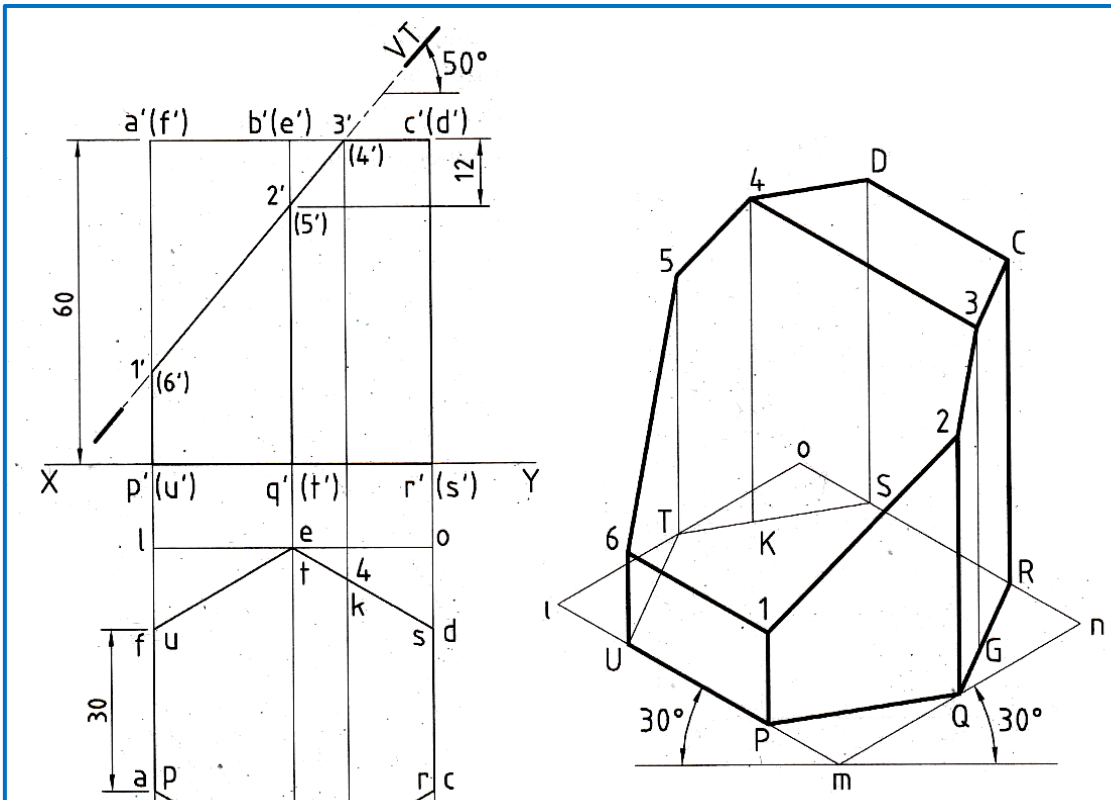


7. A **Hexagonal Prism** of base edge, 20 mm and height 60 mm **rests on the HP on its base** with **two of its rectangular faces parallel to VP.** It is **cut by a plane inclined at 30° to HP cutting the axis of the prism at a height of 45 mm from its base.** Draw the **Isometric View** of the truncated prism.

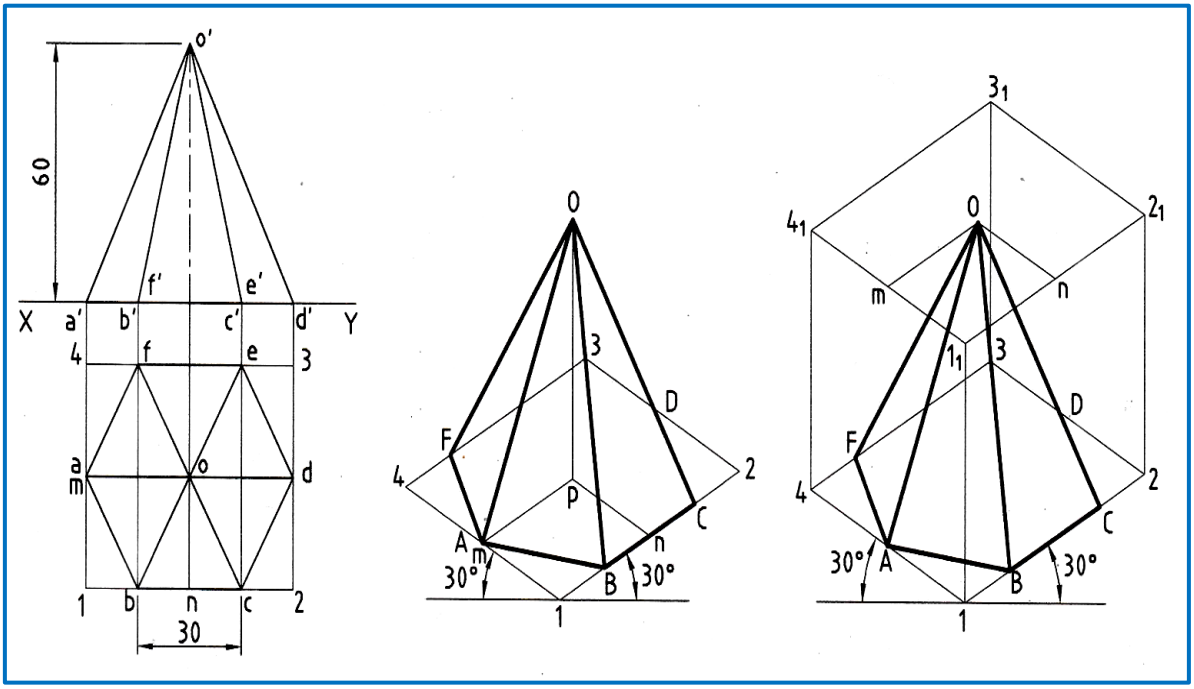




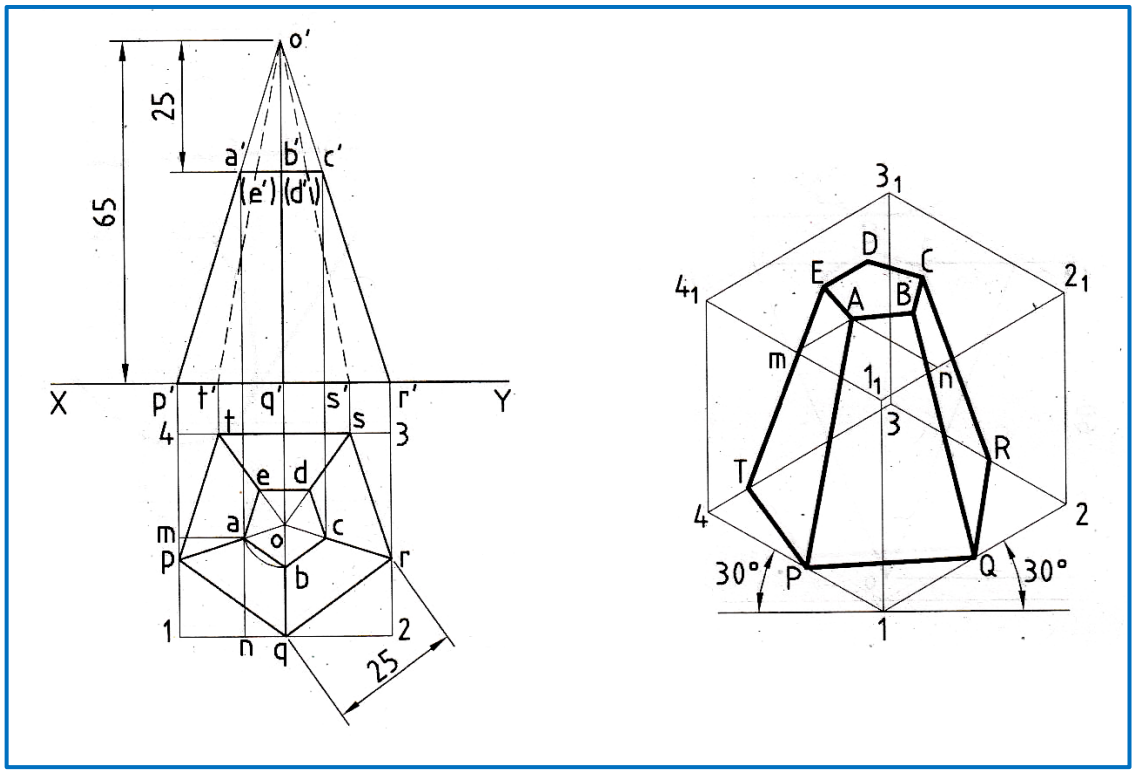
8. A **Hexagonal Prism** of base side 30 mm and axis length 60 mm is **resting on the HP on its base** with **two of its vertical faces perpendicularto VP.** It is **cut by a plane inclined at 50° to HP and perpendicular to VP and passing through a point on the axis of the prism at a distance 12 mm from the top base.** Draw the **Isometric Projection** of the truncated prism.



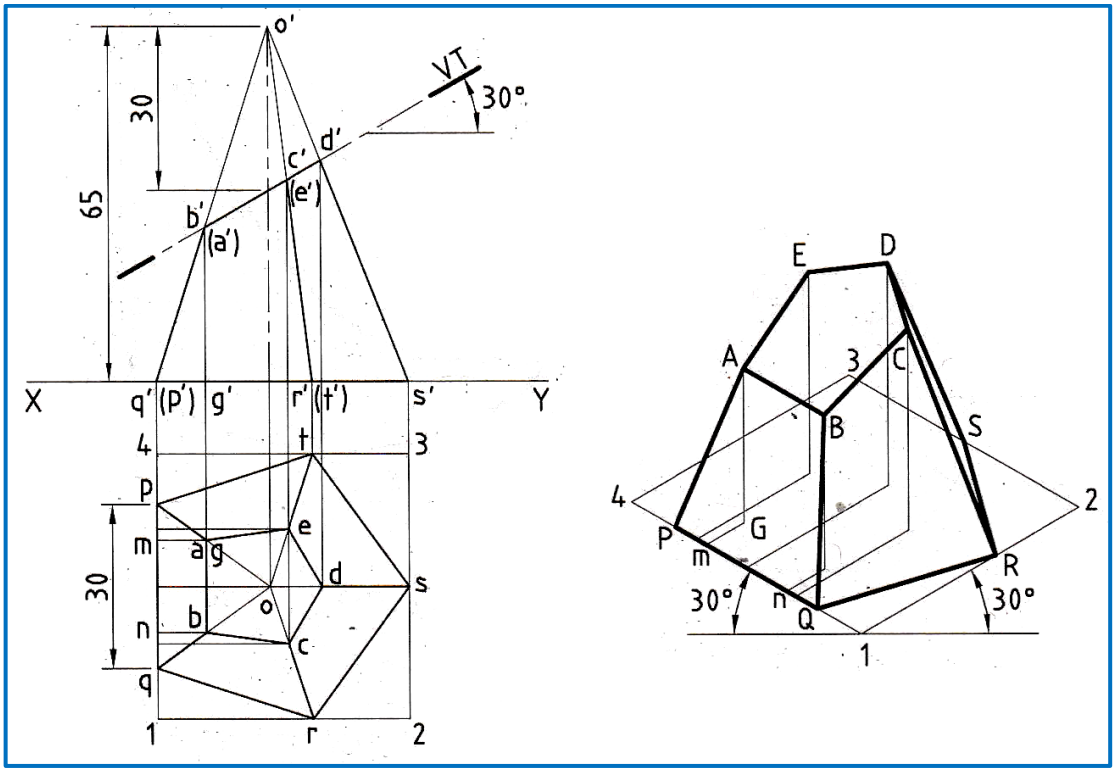
9. Draw the **Isometric View** of a **Hexagonal Pyramid** of base side 30 mm and axis length 60 mm that is **resting on HP on its base.**



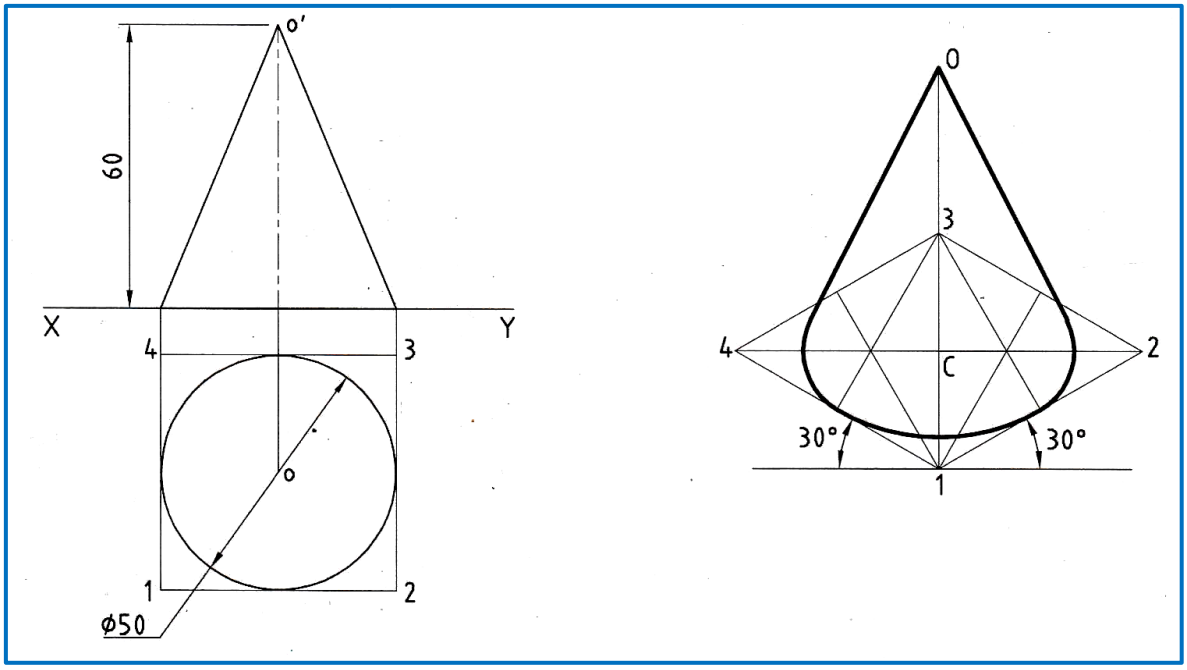
10. A **Pentagonal Pyramid**, base 25 mm and height 65 mm **stands with its base on HP.** An **edge of the base** is **parallel to VP** and **nearer to it.** A **horizontal section plane cuts** the pyramid and **passes through a point on the axis at a distance 25 mm from the apex.** Draw the **Isometric View** of the frustum of the pyramid.



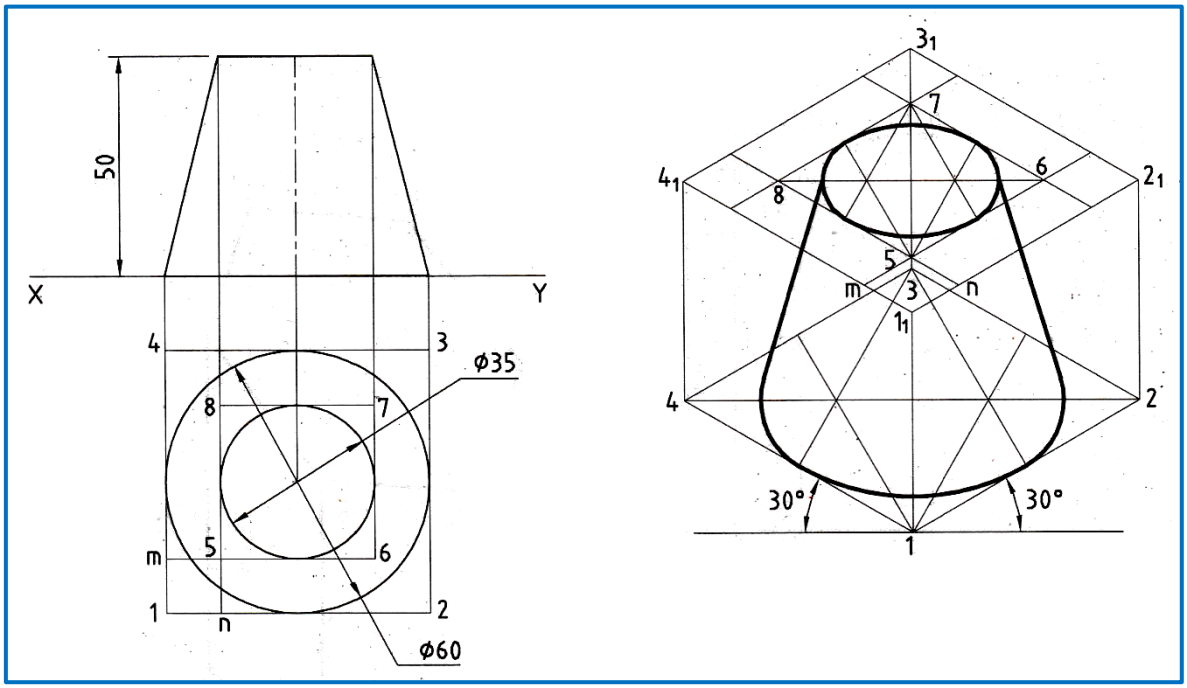
11. A **Pentagonal Pyramid** of base side 30 mm and axis length 65 mm is **resting on HP on its base with a side of base perpendicular to VP.** It is **cut by a plane inclined at 30° to HP and perpendicular to VP and passes through a point at'a distance 30 mm from the apex.** Draw the **Isometric View** of the remaining portion of the pyramid.



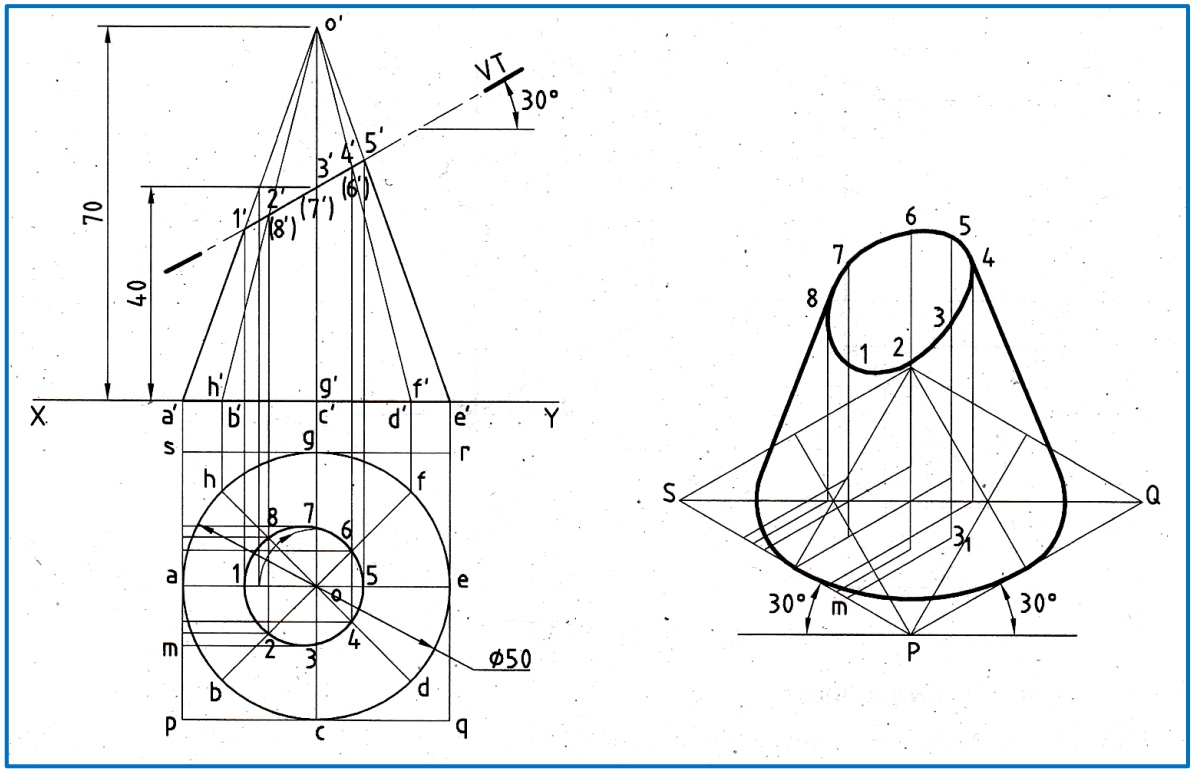
12. Draw the **Isometric View** of a **Cone** of base diameter 50 mm and axis length 60 mm **resting on HP on its base.**



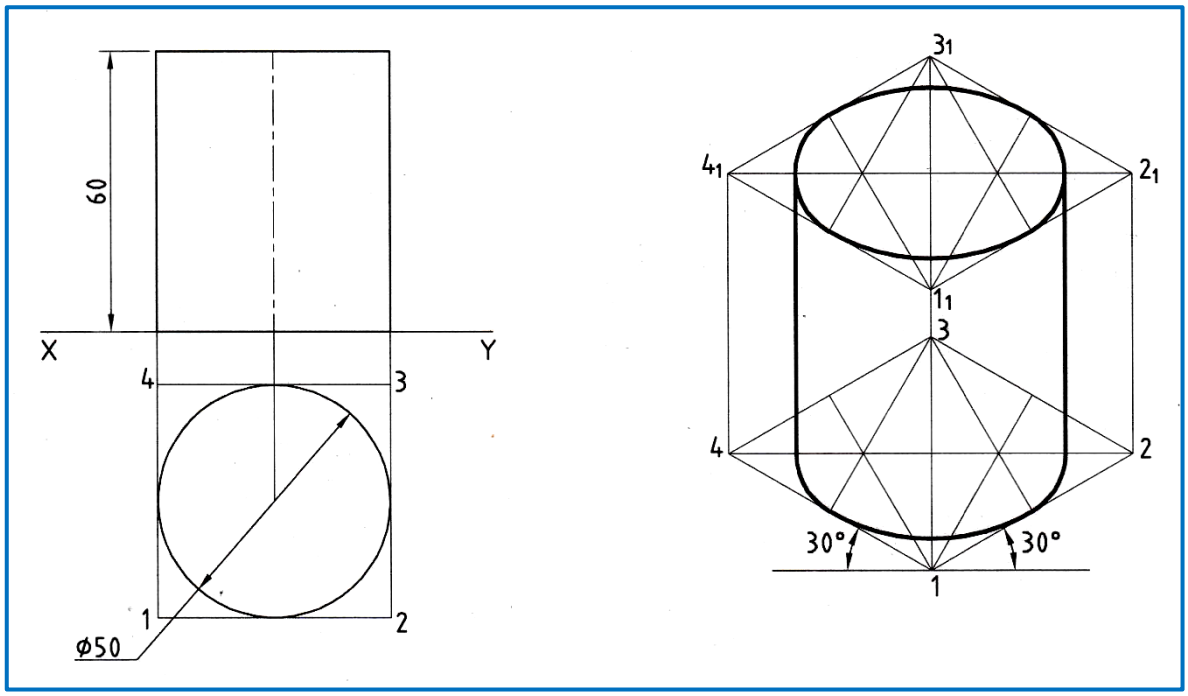
13. Draw the **Isometric Projection** of a **Frustum of a Cone** of base diameter 60 mm, top base diameter 35 mm and axis length 50 mm **rests on HP on its base.**



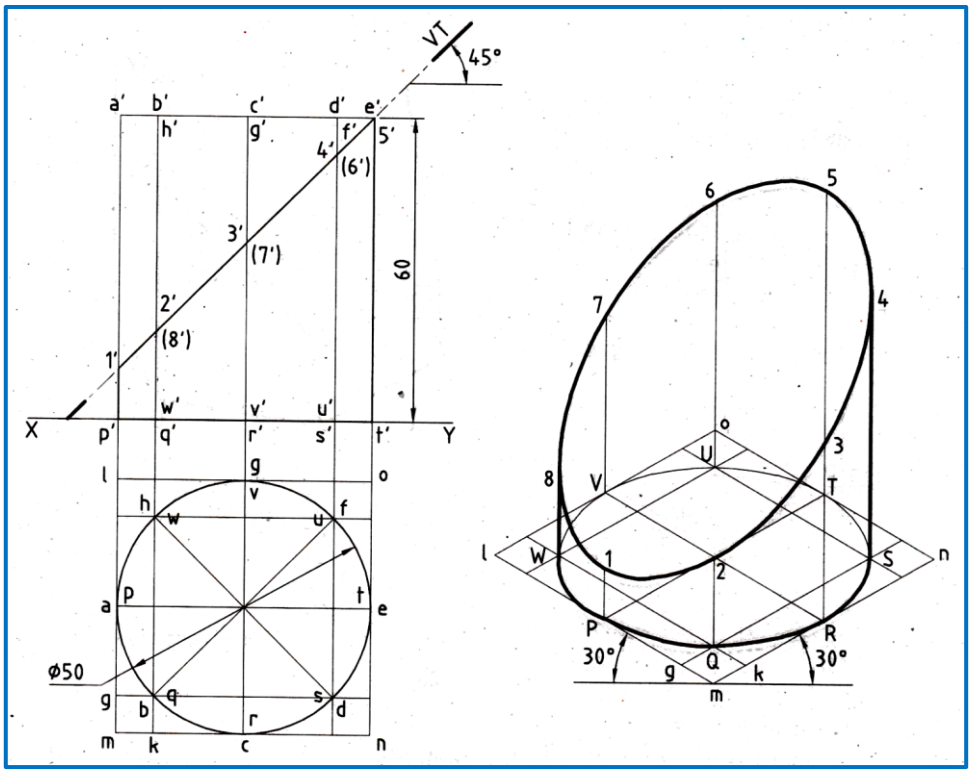
14. A **Cone** of base diameter 50 mm and height 70 mm **stands on HP with its base.** It is **cut by a cutting plane inclined at 30° to HP cutting the axis of the cone at a height of 40mm from its base.** Draw the **Isometric View** of the remaining part of the cone.



15. Draw the **Isometric View** of a **Vertical Cylinder** of base diameter 50 mm and axis length 60 mm.



16. A **Cylinder** 50 mm diameter and 60 mm axis length **rests on HP on one of its bases,** a **section plane perpendicular to VP, inclined at 45° to HP cuts the cylinder and passes through a point on the top base circle of the cylinder.** Draw the **Isometric View** of the bottom portion of the cylinder clearly showing the shape of the cut portion.



17. A **Cylinder** 50 mm diameter and 60 mm height **stands on HP,** a **section plane perpendicular to VP inclined at 55° to HP cuts the cylinder and passes through a point on the axis at a height of 45 mm above the base.** Draw the **Isometric Projection** of the truncated portion of the cylinder when the cut surface is clearly visible to the observer.