

University Institute of Engineering

Academic Unit-1

Bachelor of Engineering (CSE, IT, CSE-IBM)

Computer Graphics using CAD Lab. (20MEP114)

Experiment No. 7 & 8

Prepared By: Paras Khullar



ISOMETRIC PROJECTIONS

DISCOVER . **LEARN** . EMPOWER

ISOMETRIC PROJECTIONS

Course Outcome

CO Number	Title	Level
	After completion of the course the students may be able to:	
CO1	Sketch the different conventions and representations of engineering graphics on AutoCAD software.	Remember & Understand
CO2	Explain the use of engineering drawing, compare and predict the geometrical details of common engineering objects.	Understand
CO3	Classify, examine and draw the dimensioned figures expressing information about the shape and size of physical objects	Understand
CO4	Identify and express the geometrical features of a product on AutoCAD software.	Understand
CO5	Draw orthographic views of computer components.	Understand

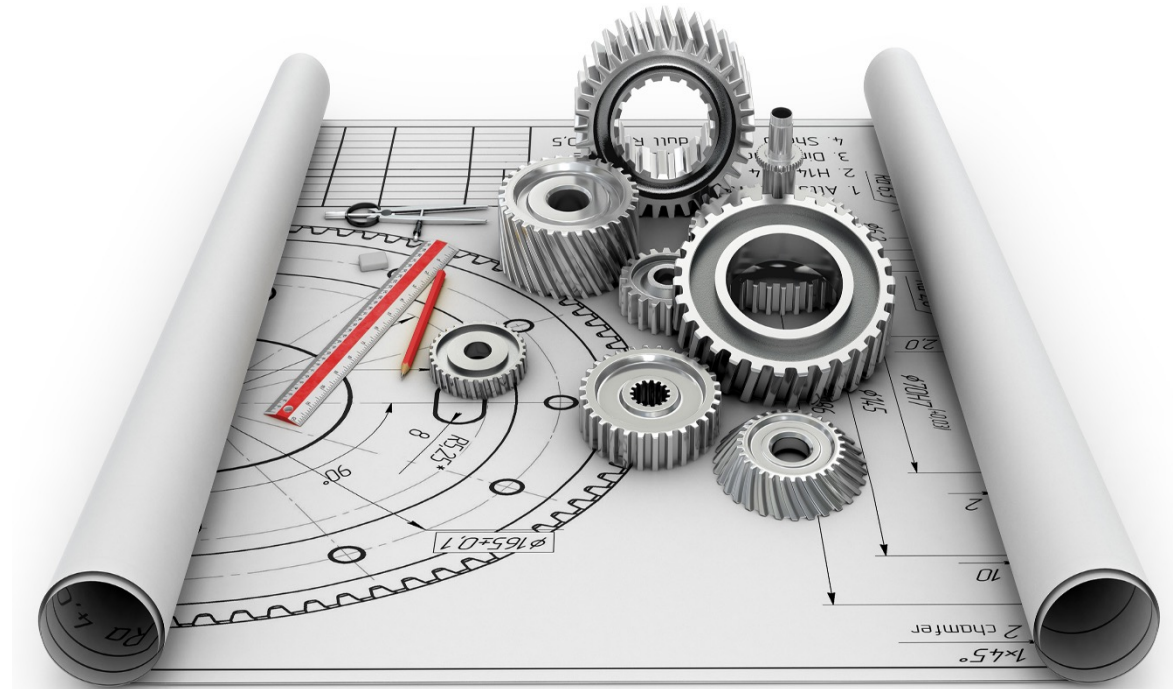


Image Source: <http://cadmasters.guru/2d-to-3d-conversions/>

Will be covered in this lecture

COURSE OBJECTIVES

Students may be able to

- draw isometric front, top and side views of the objects
- differentiate between isometric projection and isometric view.
- create an isometric drawing using a multiview drawing
- draw basic isometric views and projections of solids



Image Source: https://img-a.udemycdn.com/course/750x422/1925256_3592_5.jpg

Introduction

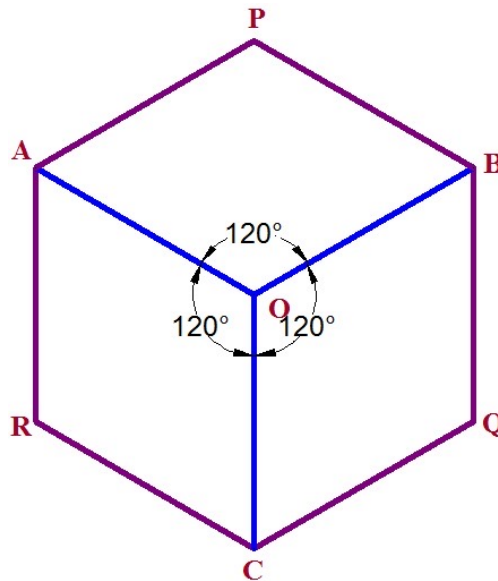
- Isometric Drawing:-
- All the views of an object are visible in the single view i.e. front, top and side views are visible in a single view.
- This type of drawing is also known as 3D drawing of an object.
- All the 3D axes are maintained at 120° to each other.

Isometric View and Isometric Projection

- Isometric View: To draw Isometric View of an object, the actual dimensions of the object are used
- Isometric Projections: To draw the isometric projections of an object the isometric lengths of the object are used.
- Isometric Lengths can be determined by drawing Isometric Scales

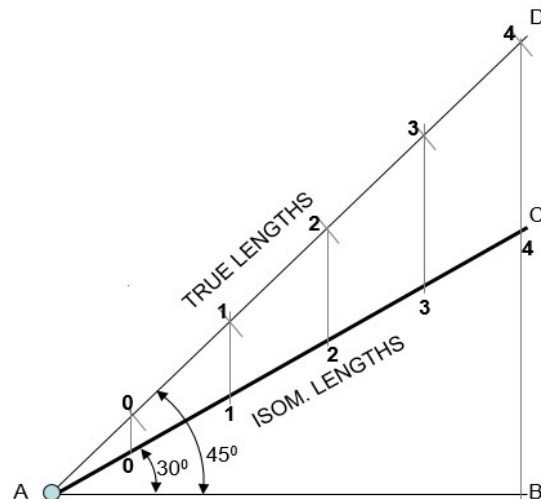
Terms in Isometric Drawing

- Isometric Axes: The lines OA, OB and OC are all known as Isometric Axes. These all make an angle 120° with each other.
- Isometric Planes: The planes OAPB, OARC and OCQB are all known as Isometric Planes.
- Isometric Lines: All the lines in this cube except and parallel to Isometric Axes are known as Isometric Lines.



Isometric Scale

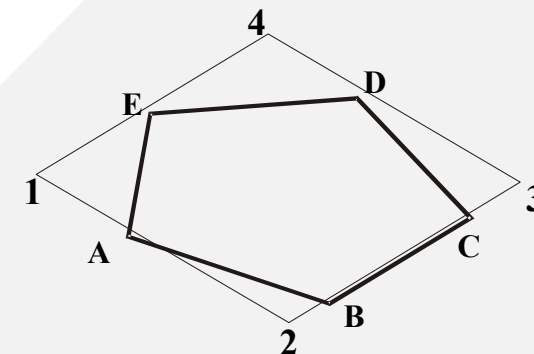
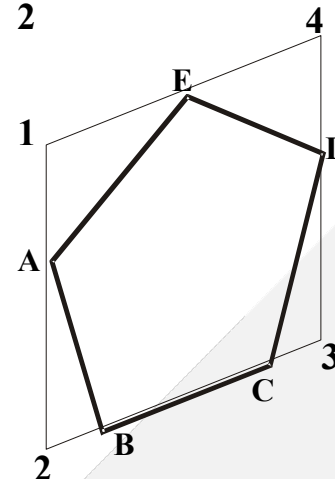
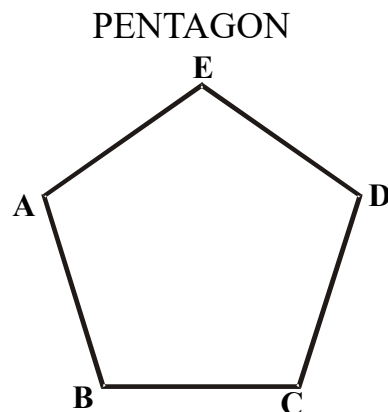
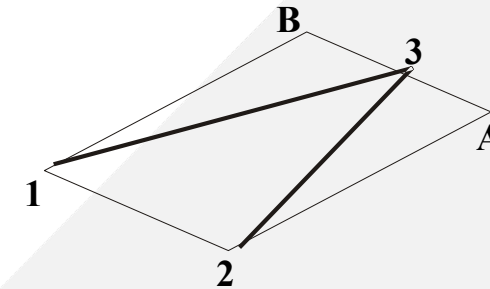
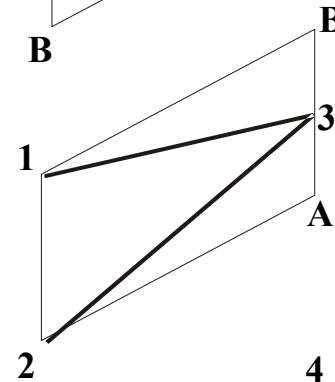
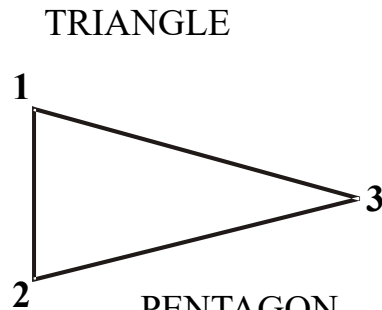
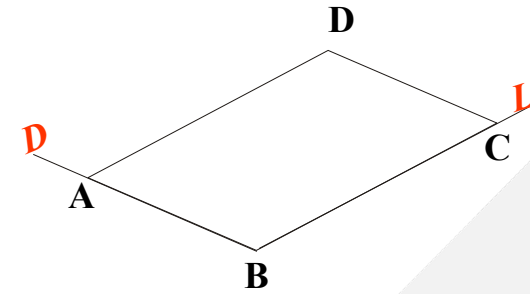
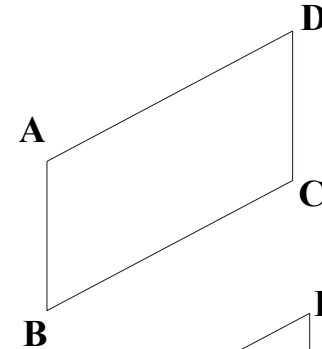
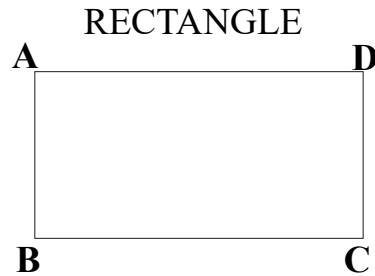
- When an object is viewed in Isometric Projections, all its sides become inclined to our vision
- True length of the object can't be seen in Isometric Projection
- Isometric Scale is used to find out the length of the sides which are visible to us
- Isometric Length = $0.815 \times \text{Actual length}$



Isometric Views of Plane Figures

SHAPE

Isometric view if the Shape is
F.V. or T.V.



Isometric View of a Circle

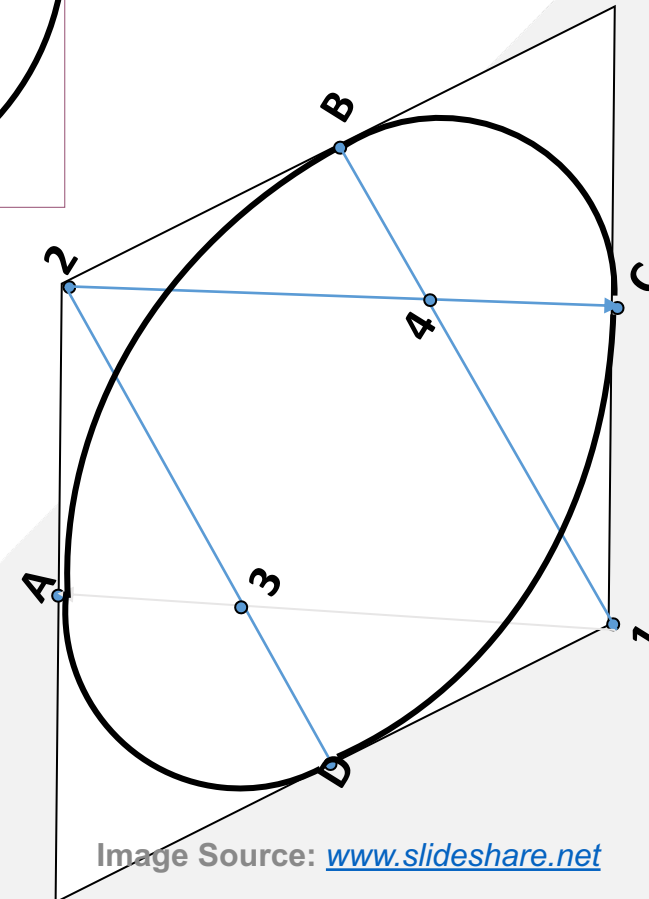
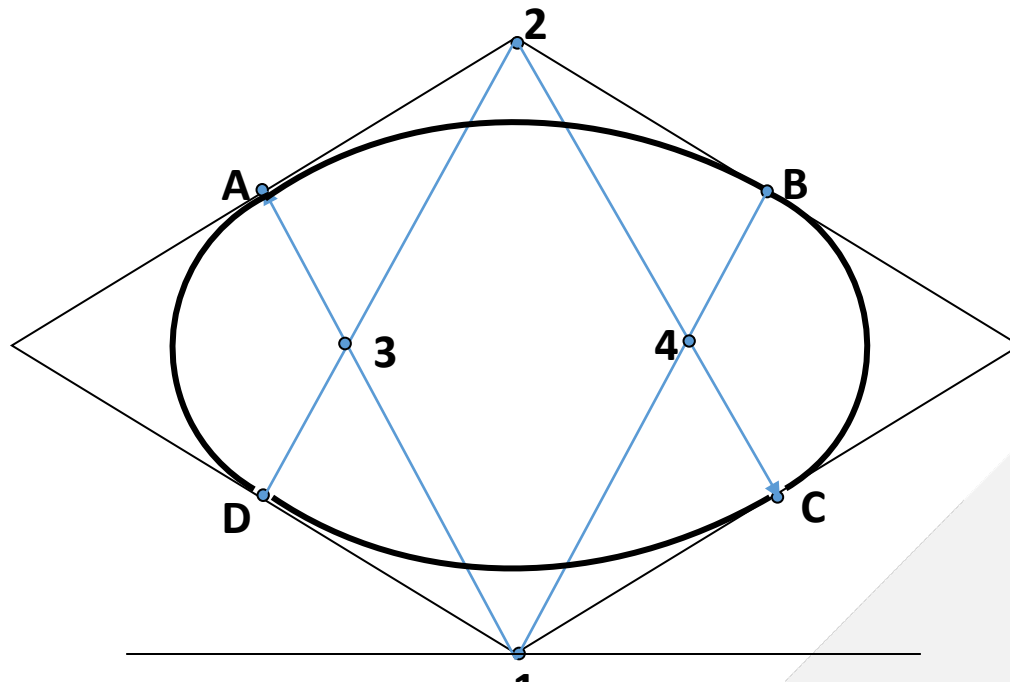
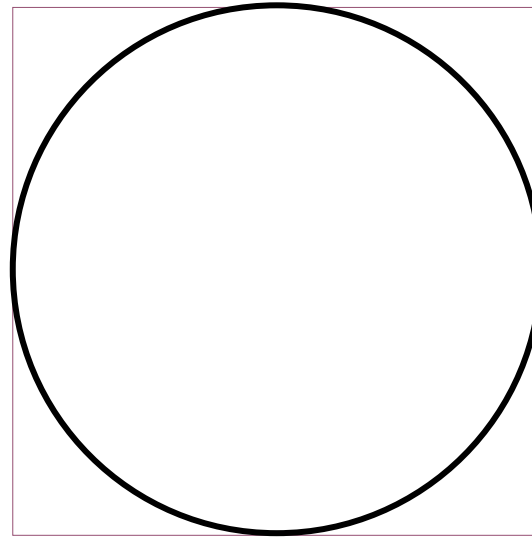
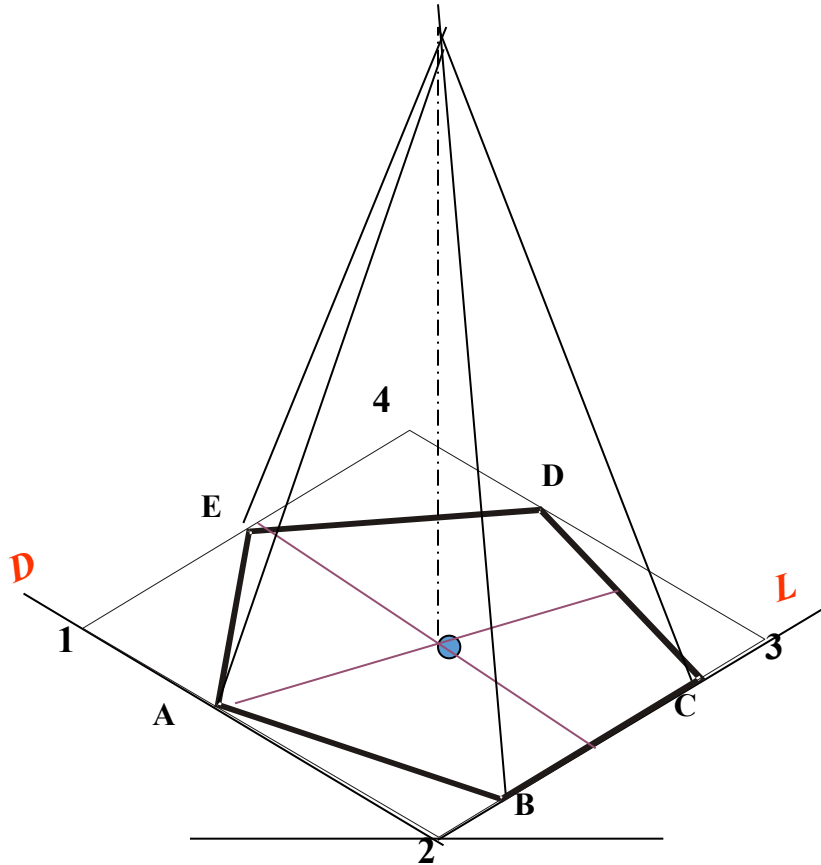
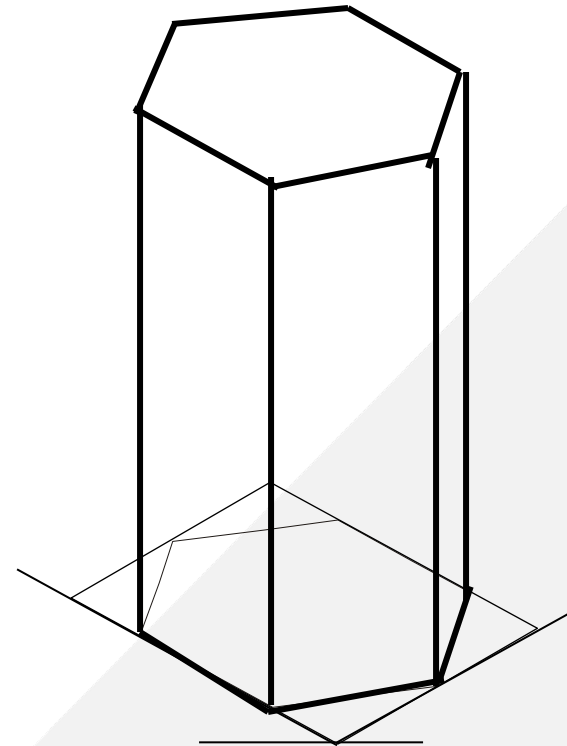


Image Source: www.slideshare.net

Isometric Views of Solids

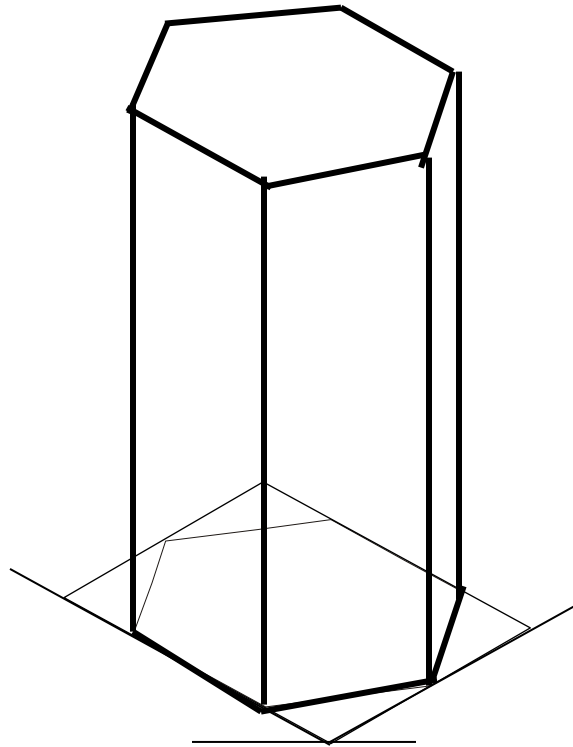


ISOMETRIC VIEW OF PENTAGONAL PYRAMID STANDING ON H.P.
(Height is added from center of pentagon)



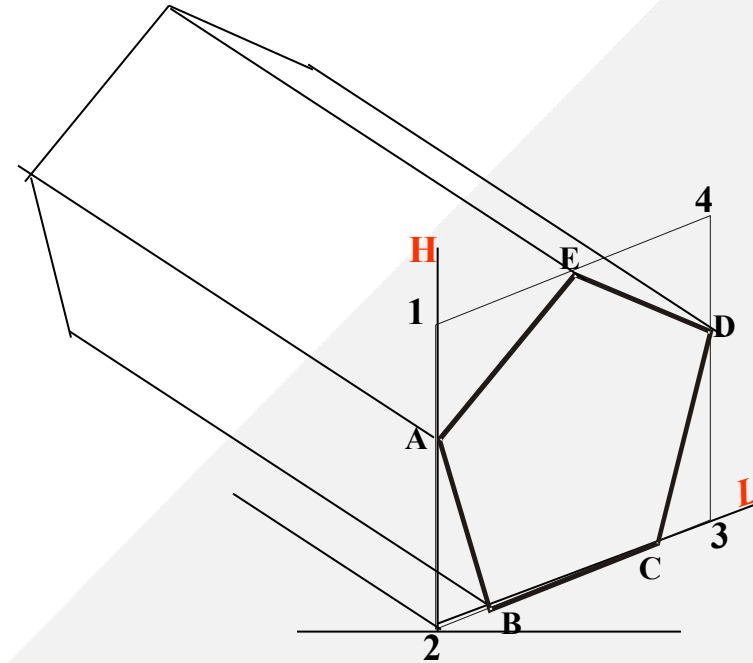
ISOMETRIC VIEW OF HEXAGONAL PRISM STANDING ON H.P.

Isometric Views of Solids



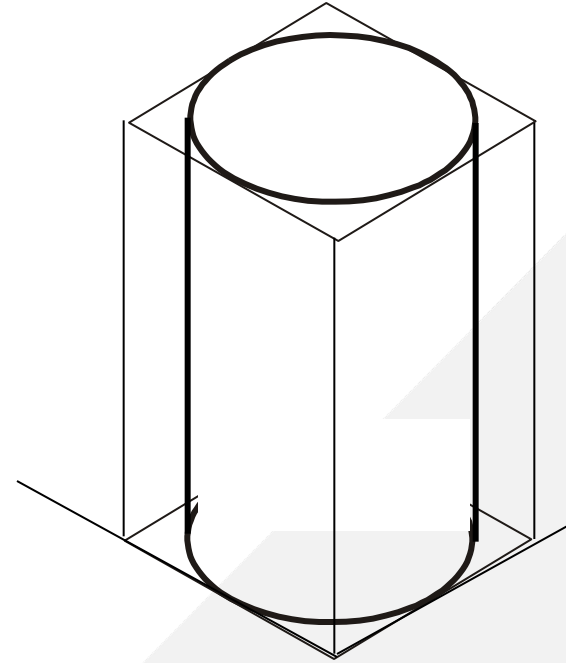
ISOMETRIC VIEW OF
HEXAGONAL PRISM
STANDING ON H.P.

ISOMETRIC VIEW OF
PENTAGONAL PRISM
LYING ON H.P.

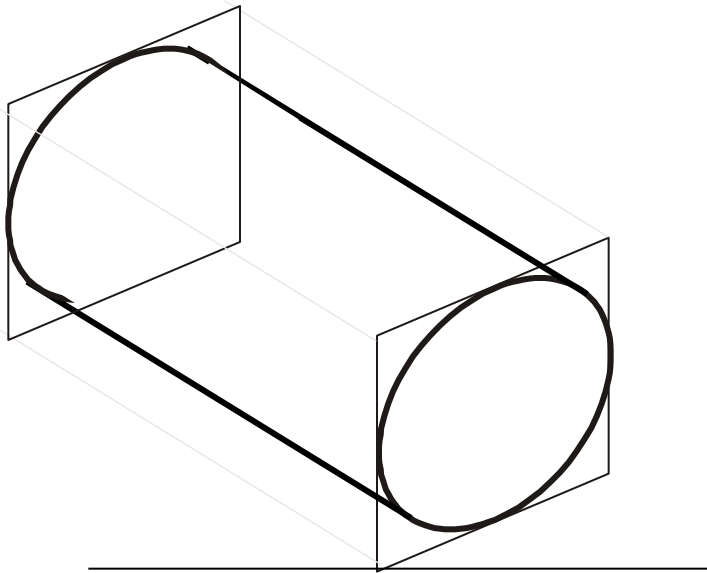


Isometric Views of Solids

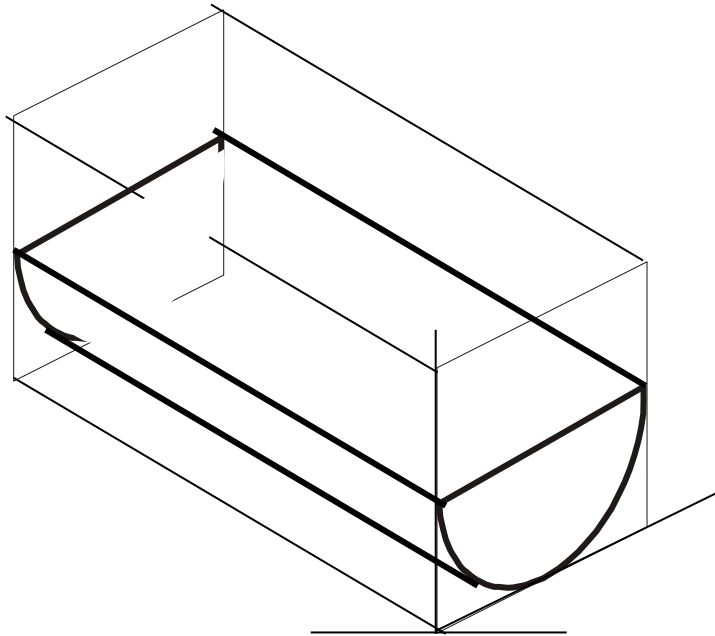
CYLINDER STANDING ON H.P.



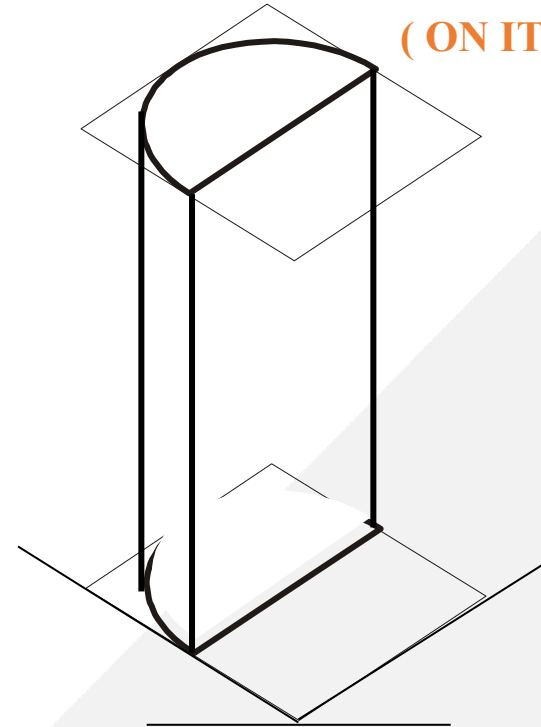
CYLINDER LYING ON H.P.



Isometric Views of Solids



**HALF CYLINDER
LYING ON H.P.
(with flat face // to H.P.)**



**HALF CYLINDER
STANDING ON H.P.
(ON IT'S SEMICIRCULAR BASE)**

Isometric Views of Solids

ISOMETRIC VIEW OF
A FRUSTUM OF SQUARE PYRAMID
STANDING ON H.P. ON IT'S LARGER
BASE.

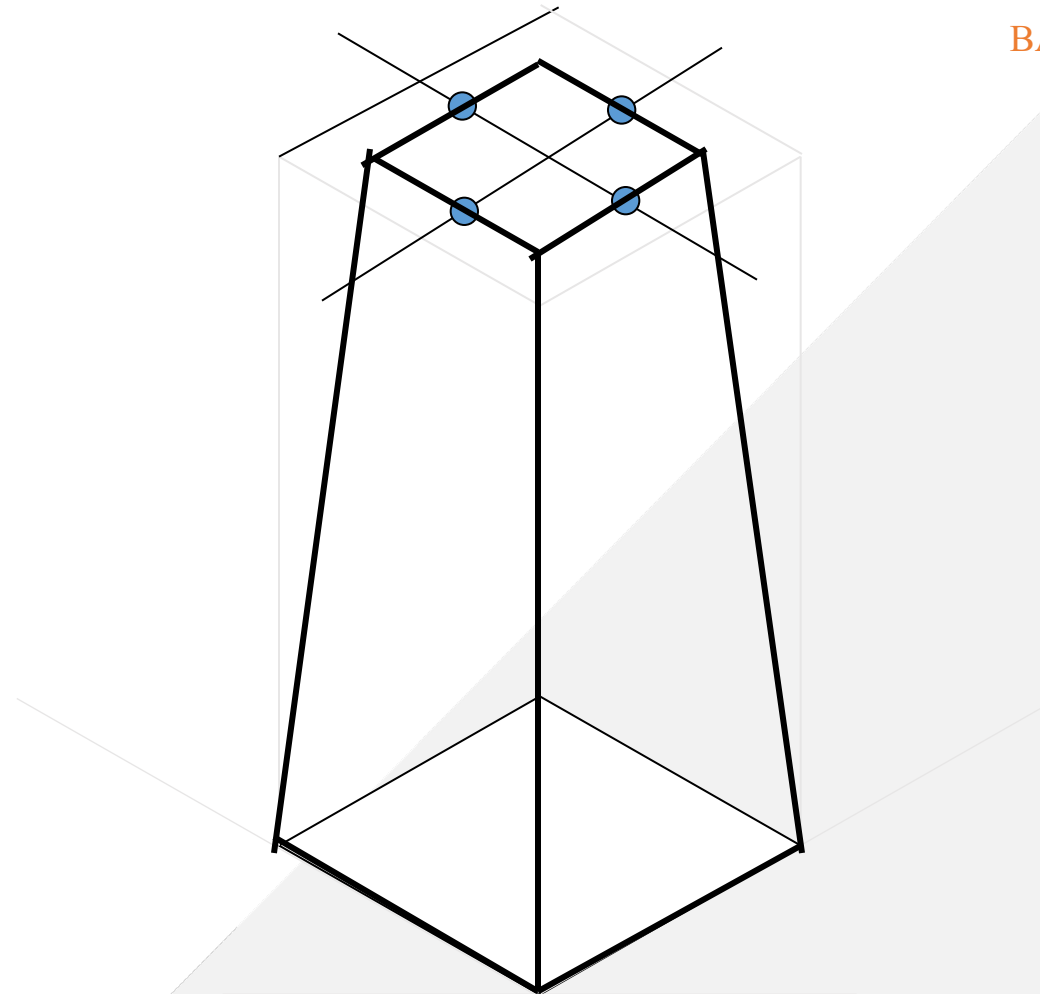
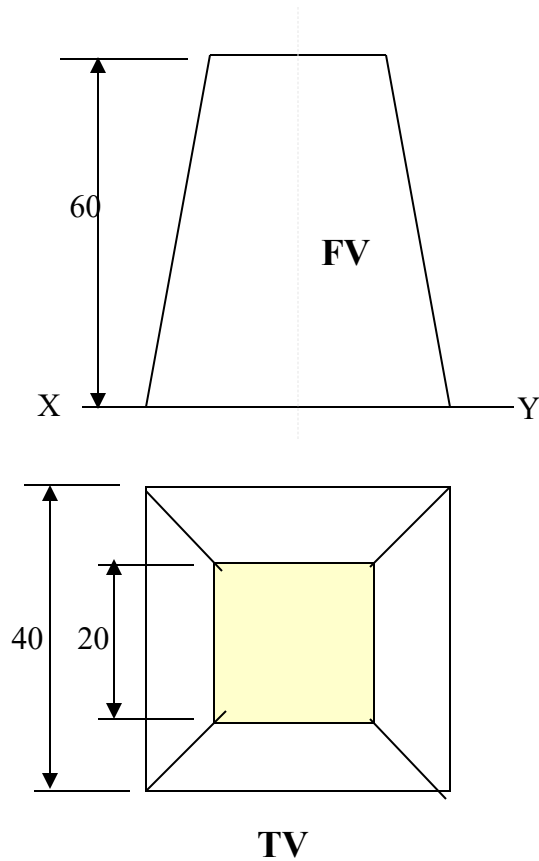


Image Source: www.slideshare.net

Assessment Pattern

Sr. No.	Type of Assessment Task	Weightage of actual conduct	Frequency of task	Final Weightage in Internal Assessment (Prorated Marks)	Remarks
1.	Practical Worksheet (In Journal Category) and Class-room Learning	20 marks for each experiment	8-10 experiments	40 marks	Depending upon no. of experiments
2.	Mid-Term Test	20 marks	1 per semester	12 marks	At-least after the completion of 5 experiments.
3.	Discussion Forum/Short Digital Assignment/Journal to submit design/Portfolio	4 marks for each task	1 per semester	4 marks	
4.	Presentation*	-----		Non Graded: Engagement Task	
5.	Attendance and BB Engagement Score	-----		4 marks	End Semester

Applications

- Isometric projections are used to view the three dimensional drawings of machines.
- These are also used to show the front view, top view and side view in a single view.

Frequently Asked Questions

- What are isometric lines, planes and axes?
- Why is isometric drawing known as 3-D drawing?
- What is the significance of projection line in isometric projections?

Recommended Books

- Rhodes R.S, Cook L.B; Basic Engineering Drawing, Pitman Publishers,
- Rana and Shah; Engineering Drawing, Pearson Education India Publishers.
- Jolhe D.A; Engineering Drawing: With an Introduction to AutoCAD, Tata McGraw Hill
- Gill P.S; Engineering Drawing, S.K. Kataria and Sons Publications.
- Dhawan R. K; Engineering Drawing, S. Chand and Sons Publishers.

References

- <https://hamiltonianofdesign.wordpress.com>
- Basant Agrawal, Engineering Drawing, McGraw-Hill Education, 2014
- R.K.Dhawan, A Text Book of Engineering Drawing, S. Chand Publishing, 2012
- B. Bhattacharyya, Engineering Graphics, I. K. International Pvt Ltd, 21-Nov-2008
- Dean Estes Hobart, Engineering drawing, D. C. Heath and Company, 1947
- <https://www.slideshare.net/hareeshang/isometric-projections>



THANK YOU

For queries
Email: erparaskhullar@gmail.com

