ENGINEERING DRAWING FOR CIVIL ENGINEERS

PROJECTION

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Lecture – 6

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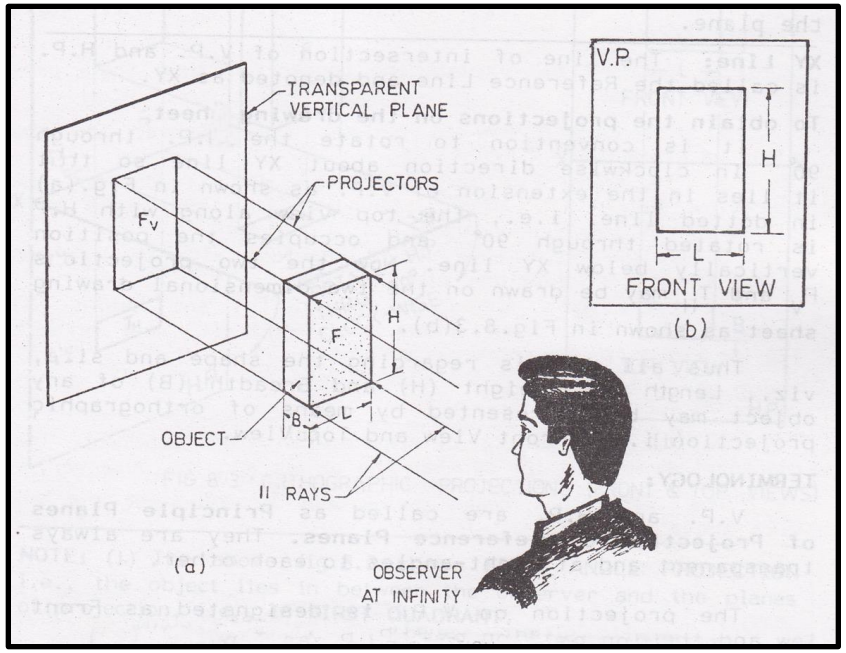
WHAT IS PROJECTION?

The figure or view formed by joining, in correct sequence, the points at which these lines meet the plane is called the **Projection of the object**.



- The lines or rays drawn from the object to the plane are called **Projectors**.
- The transparent plane on which the projections are drawn is known as **Plane of Projection**.

Note: It is obvious that the outlines of the shadow arc the projections of an object.

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TYPES OF PROJECTION

- Pictorial Projections
  - Perspective Projections
  - Isometric Projections
  - Oblique Projections
- Orthographic Projections

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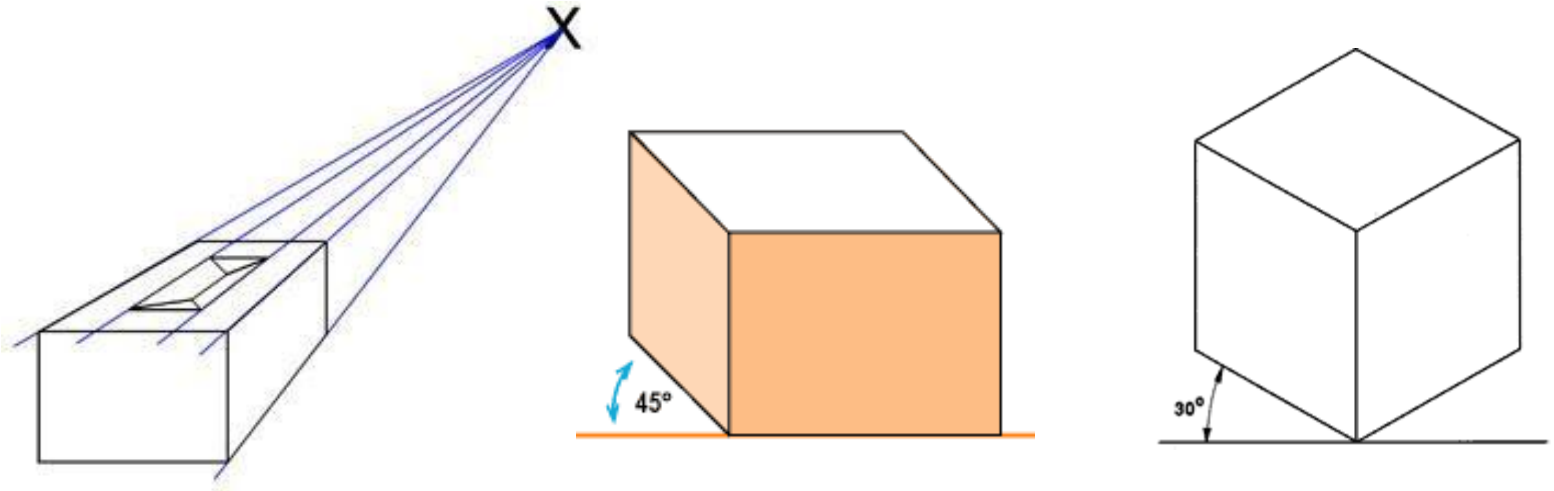
PICTORIAL PROJECTION

The Projection in which the description of the object is completely understood in one view is known as **Pictorial Projection**.

The pictorial projections have the advantage of conveying an immediate impression of the general shape and details of the object, but no its true dimensions or sizes.



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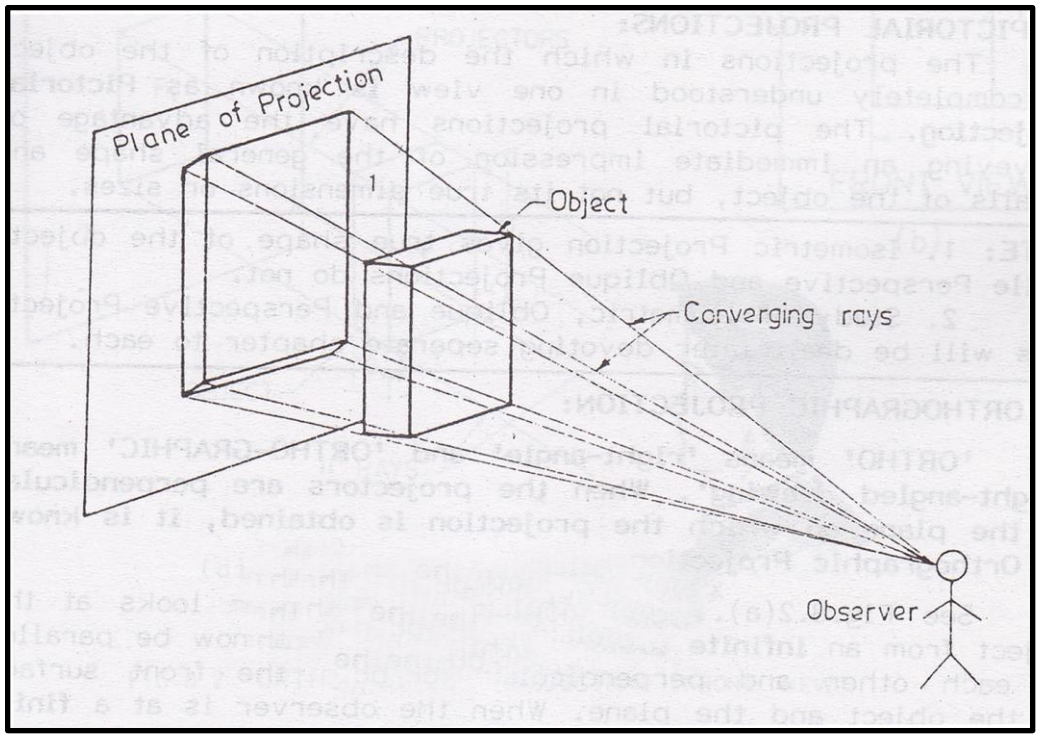
PERSPECTIVE PROJECTION



If any transparent plane is introduced such that the object is in between the observer and the plane. The image obtained on the plane/screen is as shown. This is called **Perspective View** of the object.

Here straight lines (rays) are drawn from various points on the contour of the object to meet the transparent plane, thus the object is said to be projected on that plane

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ISOMETRIC PROJECTION

"**Iso**" means „**equal**" and "**metric projection**" means „**a projection to a reduced measure**".

An ***Isometric Projection*** is one type of pictorial projection in which the three dimensions of a solid are not only shown in one view, but also their dimension can be scaled from this drawing.

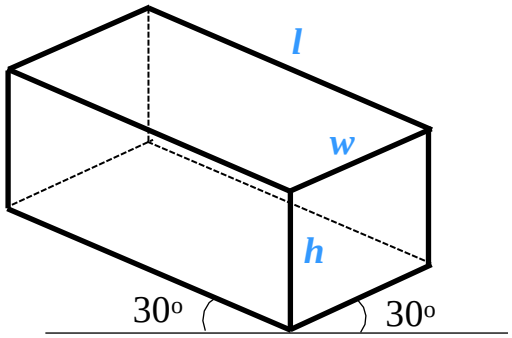

Fig. Isometric Projection

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OBLIQUE PROJECTION

The word "**oblique**" means "**slanting**" There are three axes-vertical, horizontal and oblique. The oblique axis, called receding axis is drawn either at 30^{o} or 45^{o}. Thus an oblique drawing can be drawn directly without resorting to projection techniques

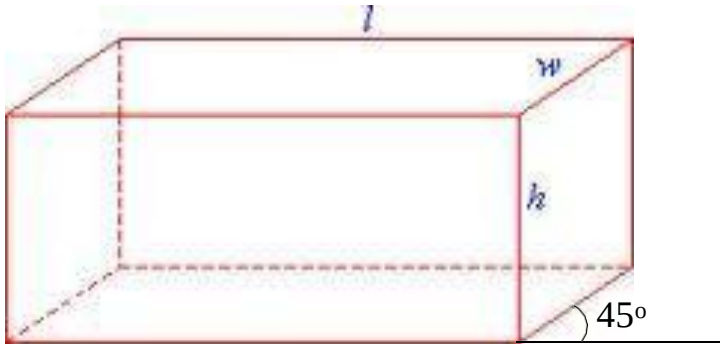

Fig. Oblique Projection

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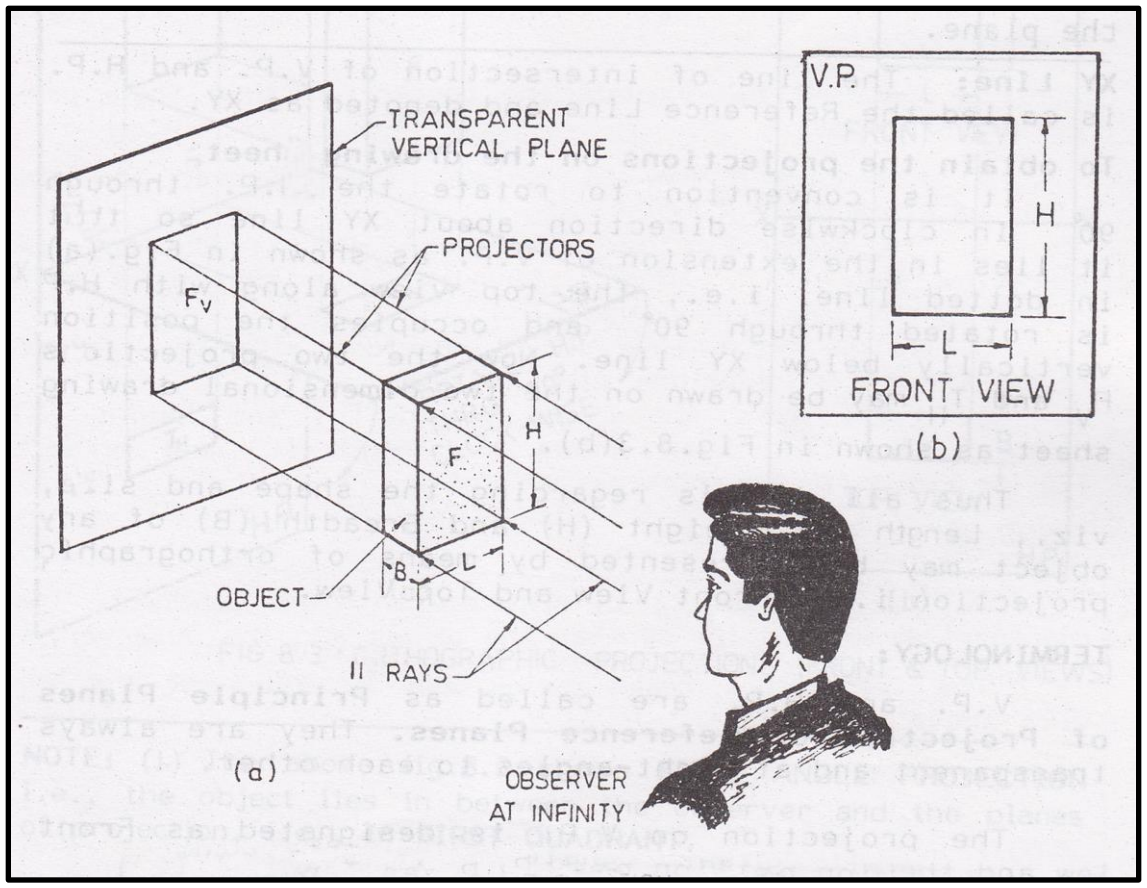
ORTHOGRAPHIC PROJECTION

„**Ortho**“ means „**right-angle**“ and „**Ortho-graphic**“ means „**right-angled drawing**.“

When the projections are perpendicular to the plane on which the projection is obtained, it is known as **Orthographic Projection**.

Continue.. Orthographic Projection



<u>Vertical Plane</u>:

Extend the rays or projectors further to meet a Vertical (Transparent) Plane (V.P) located behind the object. Join the points at which the projectors meet the plane, in correct sequence. The resulting view (F_v) is called the Front View of the object which is shown in fig. (b)

Front view shown only two dimensions of the object i.e. Length (L) and Height (H). It does not show the breadth (B). Thus one view or projection is insufficient for the complete description of the object.

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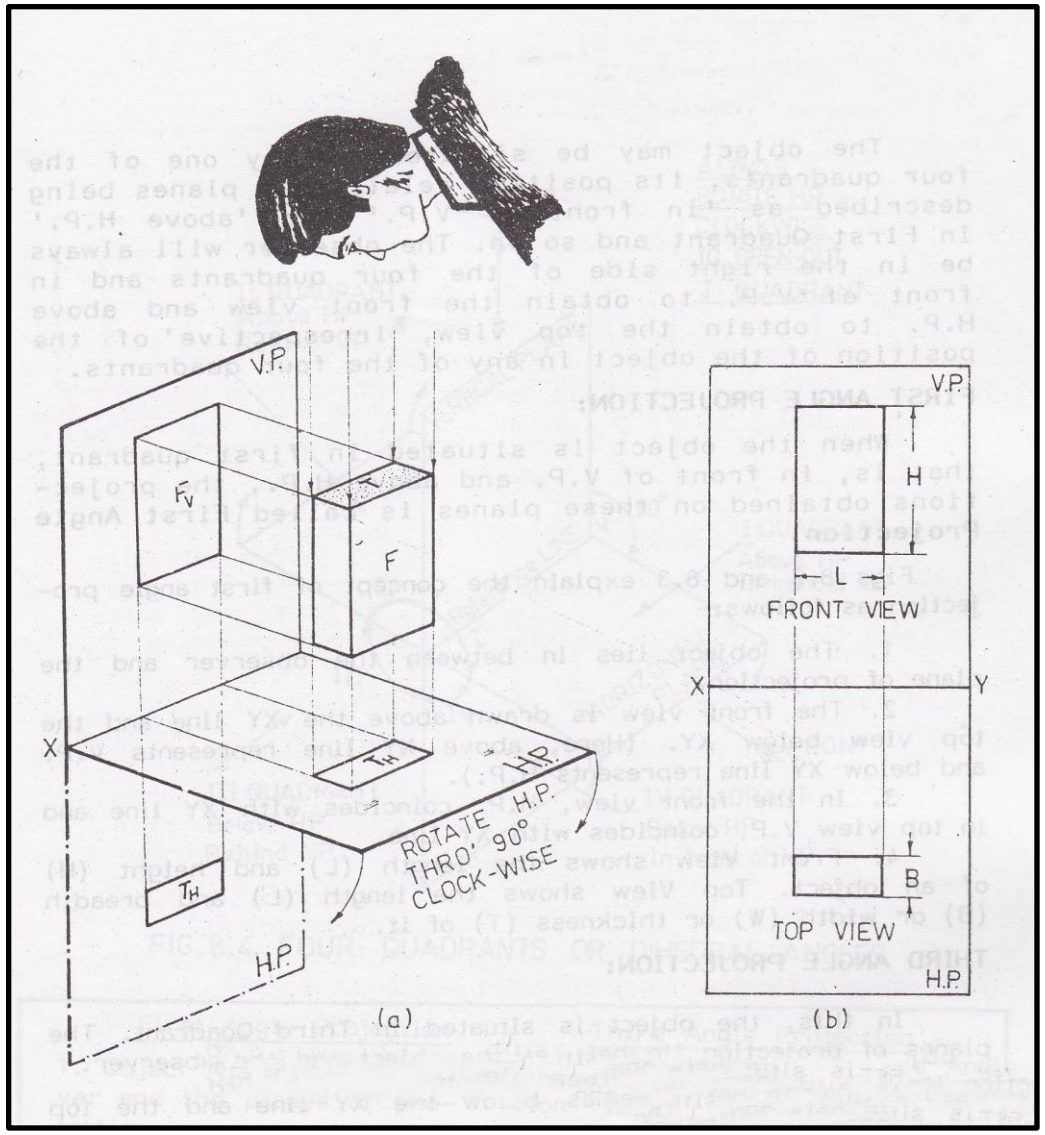
Continue.. Orthographic Projection



Look at the object from the top. The projection of the top surface T is T_H. T_H is the Top View of the object. Both T and T_H are of exactly the same shape and size.

Thus T_H gives the Length (L) and Breadth (B) of the block but not the Height (H).

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EXAMPLES OF ORTHOGRAPHIC PROJECTION

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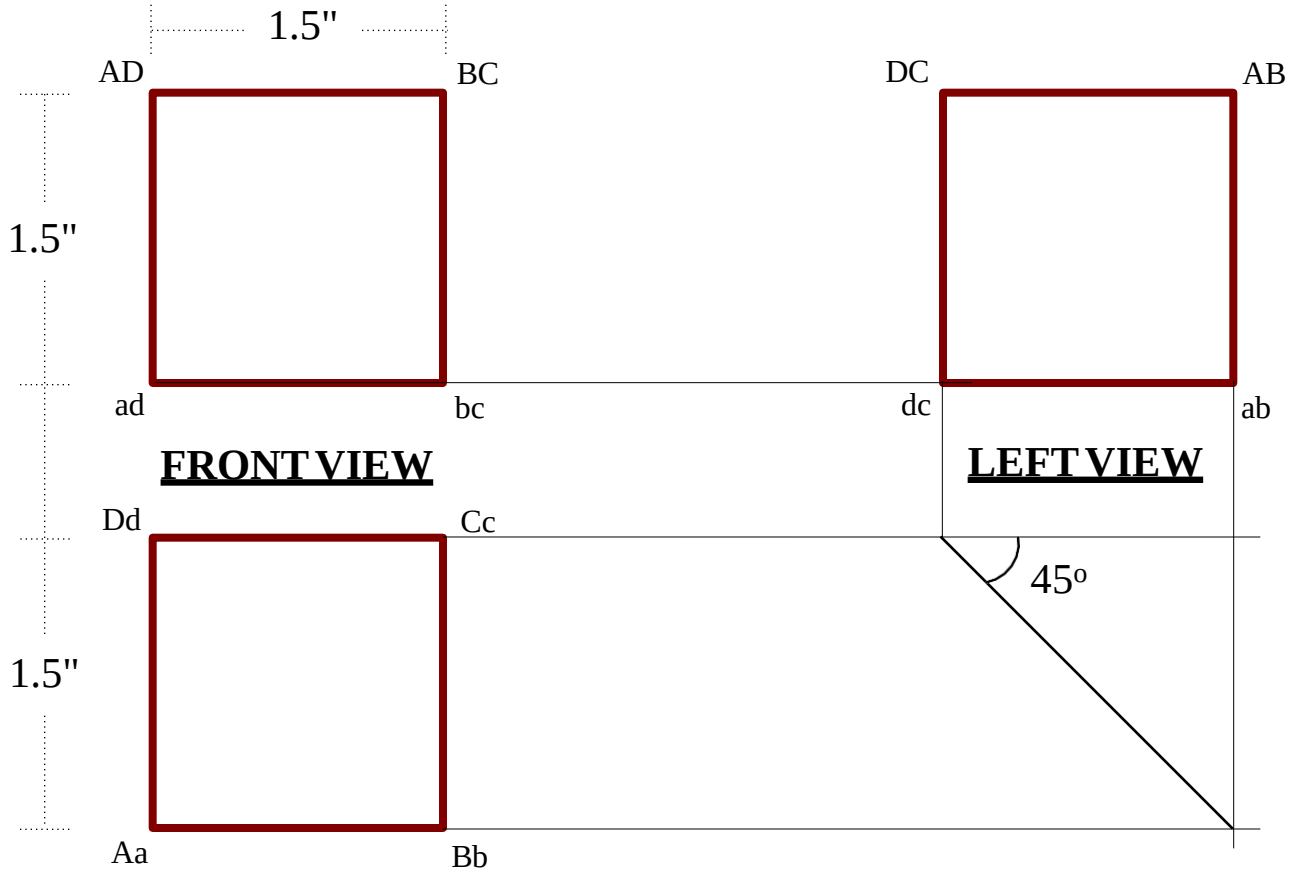
A cube of 1.5" rests on one of its square faces on horizontal plane with another square face being parallel to the vertical plane. Draw its Plan, Front Elevation and Left-End View



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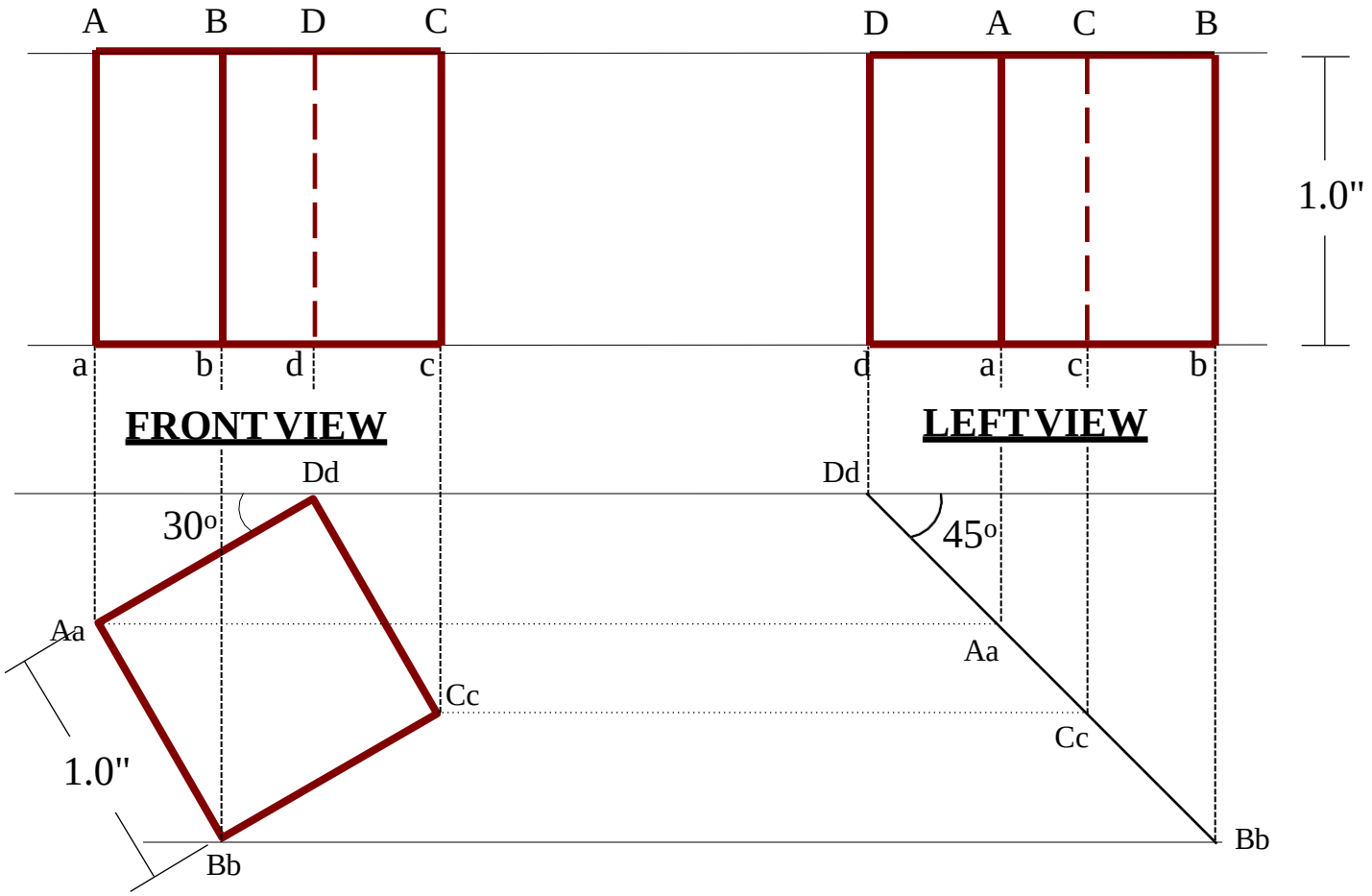
A cube of 1.0" sides rests on one of its square faces in horizontal plane with another square faces making an angle of 30° with the vertical plane. Draw its Plan, Front Elevation and Left End View



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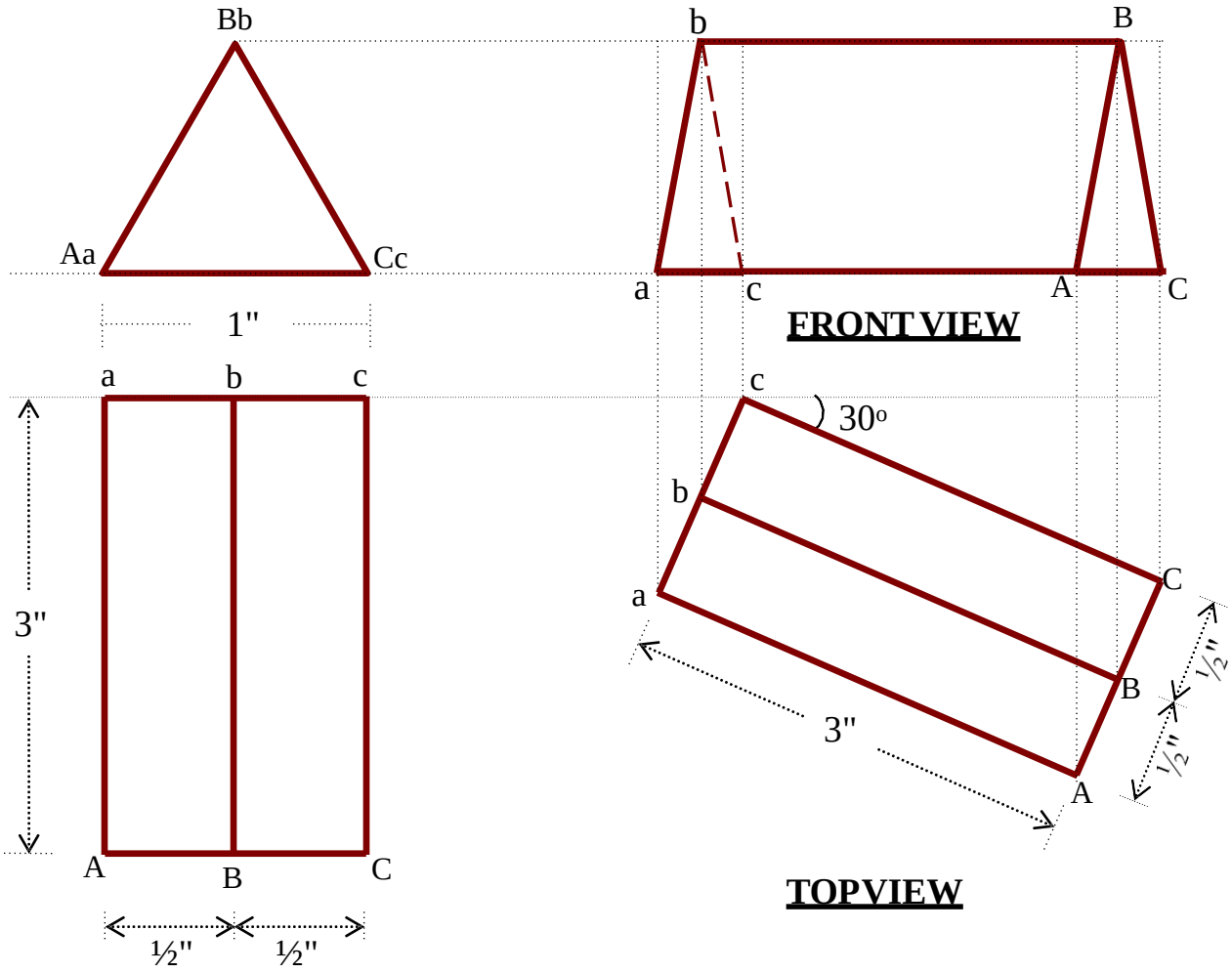
An equilateral triangular prism of 1" sides and 3" height rests on one of its rectangular faces on horizontal plane with its axis inclined at 30° to vertical plane. Draw its Plan and Front Elevation



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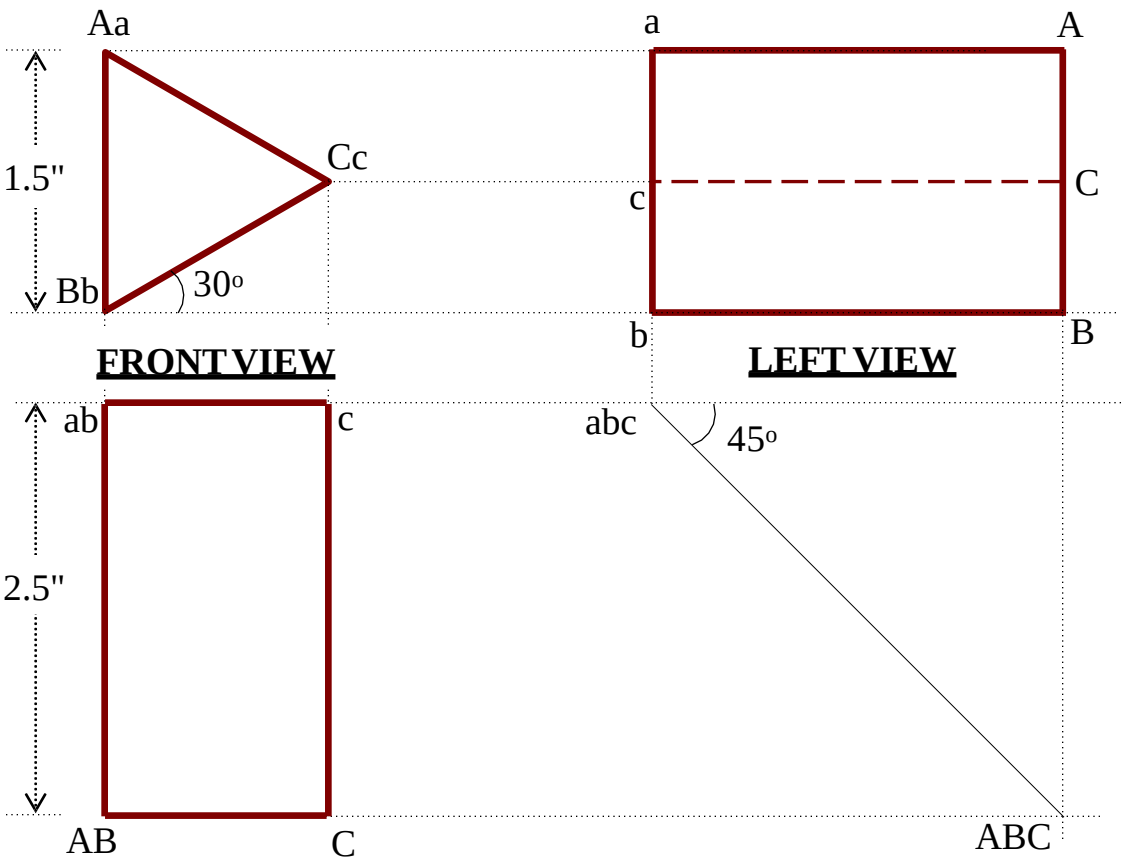
An equilateral triangular prism of 1.5" sides and 2.5" height rests on one of its edges in horizontal plane with its axis perpendicular to vertical plane and one rectangular face making an angle of 30° with horizontal plane. Draw its Plan, Front Elevation, Left view.



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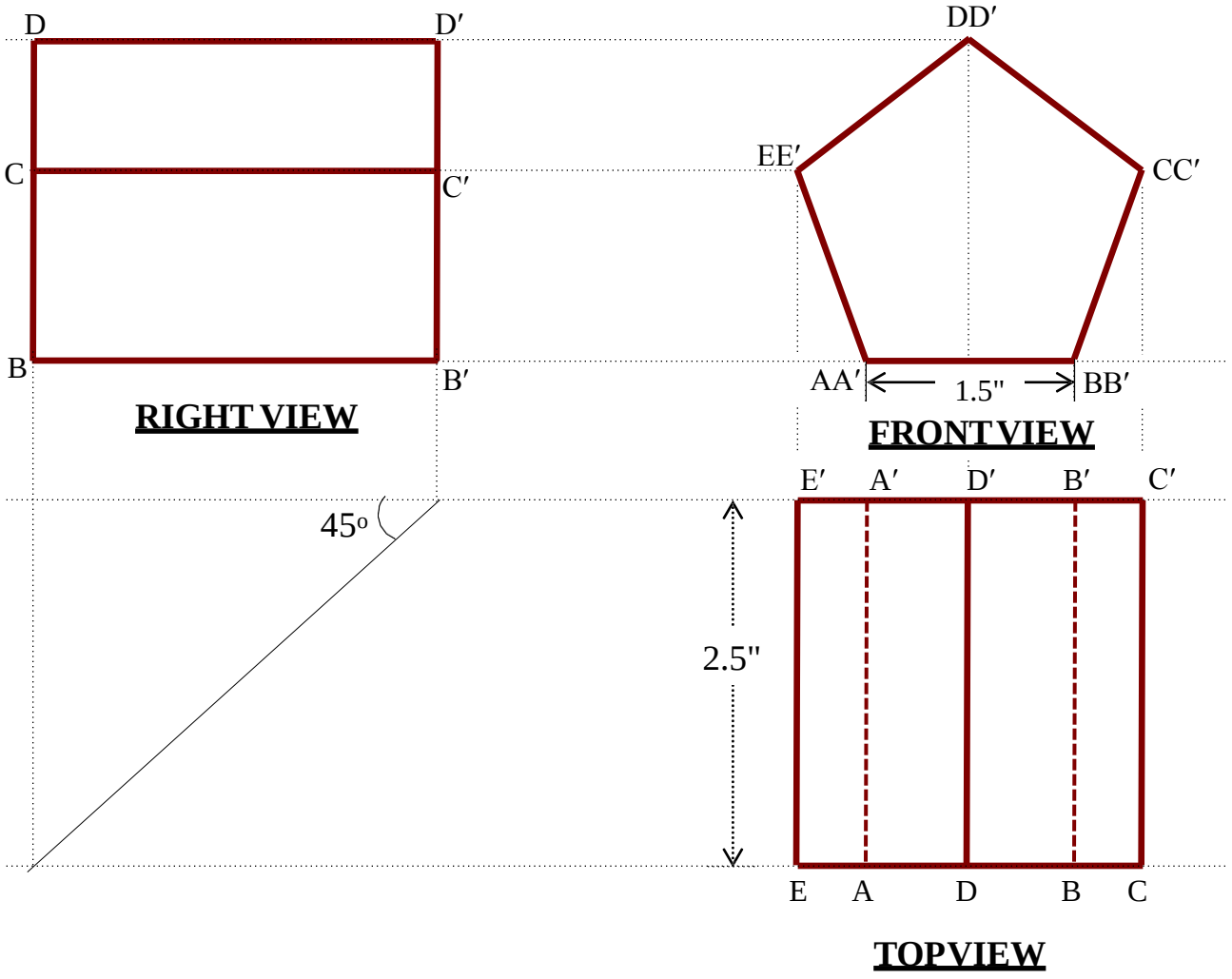
A regular pentagonal prism of 1.5" sides and 2.5" heights rest on horizontal plane with its axis perpendicular of vertical plane. Draw its Top view, Front view and Right view.



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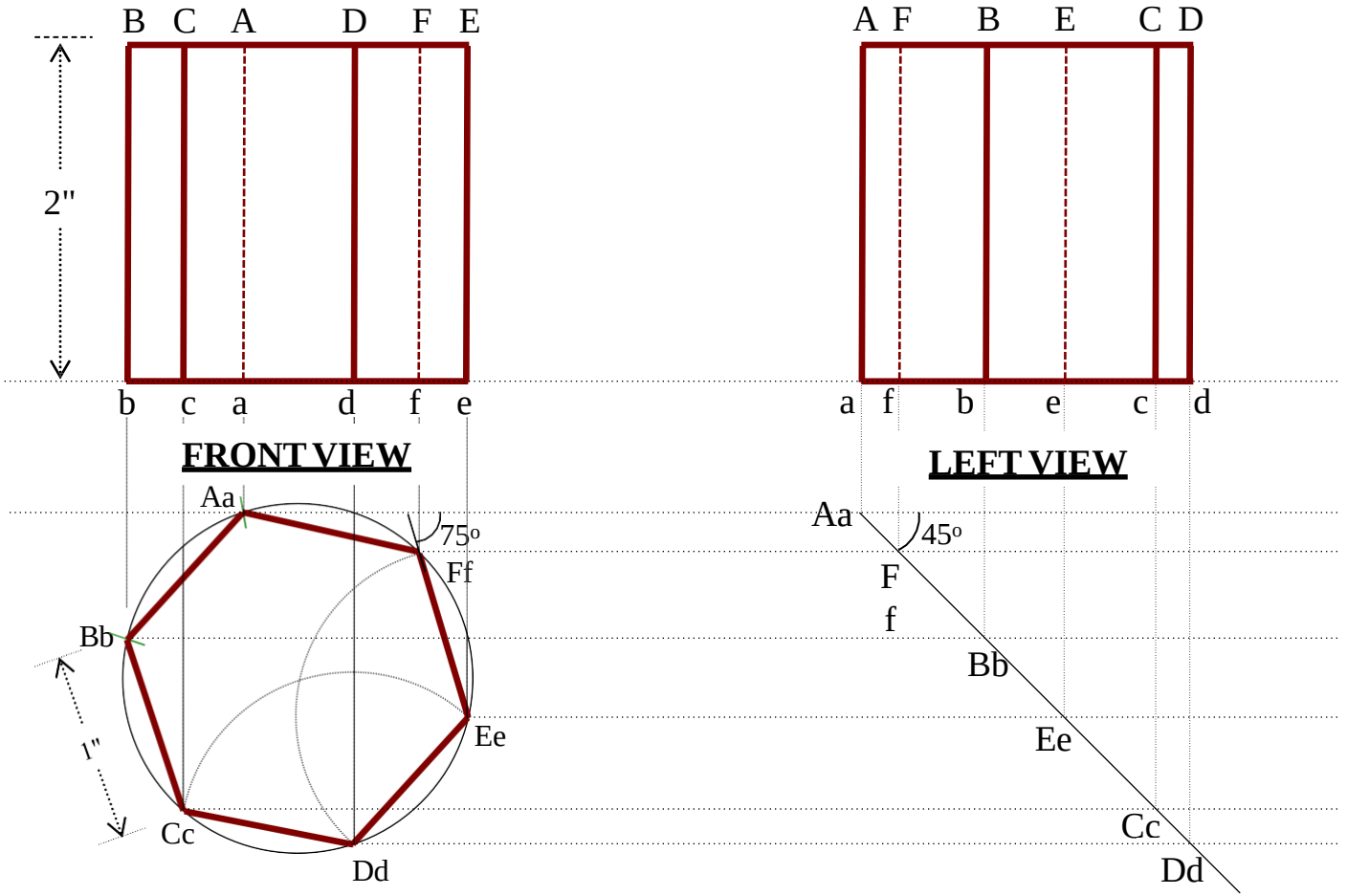
A hexagonal prism of 1" sides and 2" heights rests vertically on its base on horizontal plane and its one edge of the base makes an angle of 75º with vertical plane. Draw Pop view, Front view and Left view.



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Thank You