**PENANG SANGAM HIGH SCHOOL**

**P. O. BOX 44, RAKIRAKI**

**LESSON NOTES - 24**

**SCHOOL: PENANG SANGAM HIGH** **SUBJECT: BASIC TECHNOLOGY** **YEAR/ LEVEL: 9**

| | |
|---|---|
| Strand | BT9.5: GEOMETRICAL DRAWINGS |
| Sub - Strand | BT9.5.1 2D DRAWINGS |
| Content Learning Outcome | BT9.5.1.1 Recognise and develop skills in orthographic projection and acquire the concepts of 3rd angle projection. |

## GEOMATERICAL DRAWINGS

**Introduction**

Engineering drawings are used to indicate the shape and the size of an object. All objects have three dimensions, i.e. length, width and height. Usually an object is represented in a pictorial projection (isometric, oblique and perspective).

The first and the most important of the four methods is the orthographic projection.

Orthographic projections enable us to see the objects in its real shape with all correct angles. Orthographic projection looks at the true shape of the object in each view.

Pictorial Drawings show the three views together. Orthographic Projection shows the same three views separately but linked together. The **FRONT ELEVATION** and the **END ELEVATIONS** are views of the **VERTICLE PLANE**. The **PLAN** is a view seen in the **HORIZONTAL PLANE** and is in line with the Front Elevation.

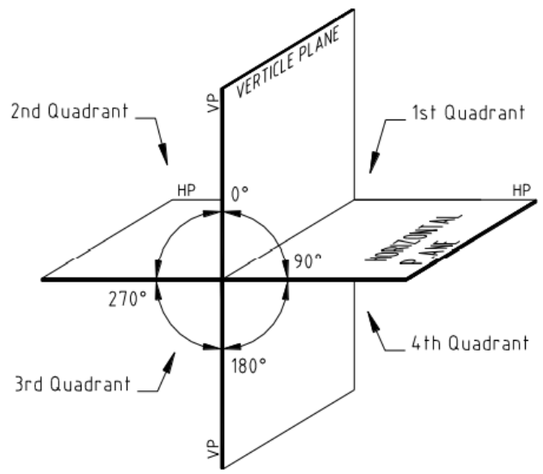
Solid geometry is concerned with showing the orthographic views of an object together with development of its surface showing how it was formed or the outline from which it was made.

## ORTHOGRAPHIC PROJECTION

The term ORTHOGRAPHIC PROJECTION means true or correct shape.

THIRD ANGLE PROJECTION FIRST ANGLE PROJECTION

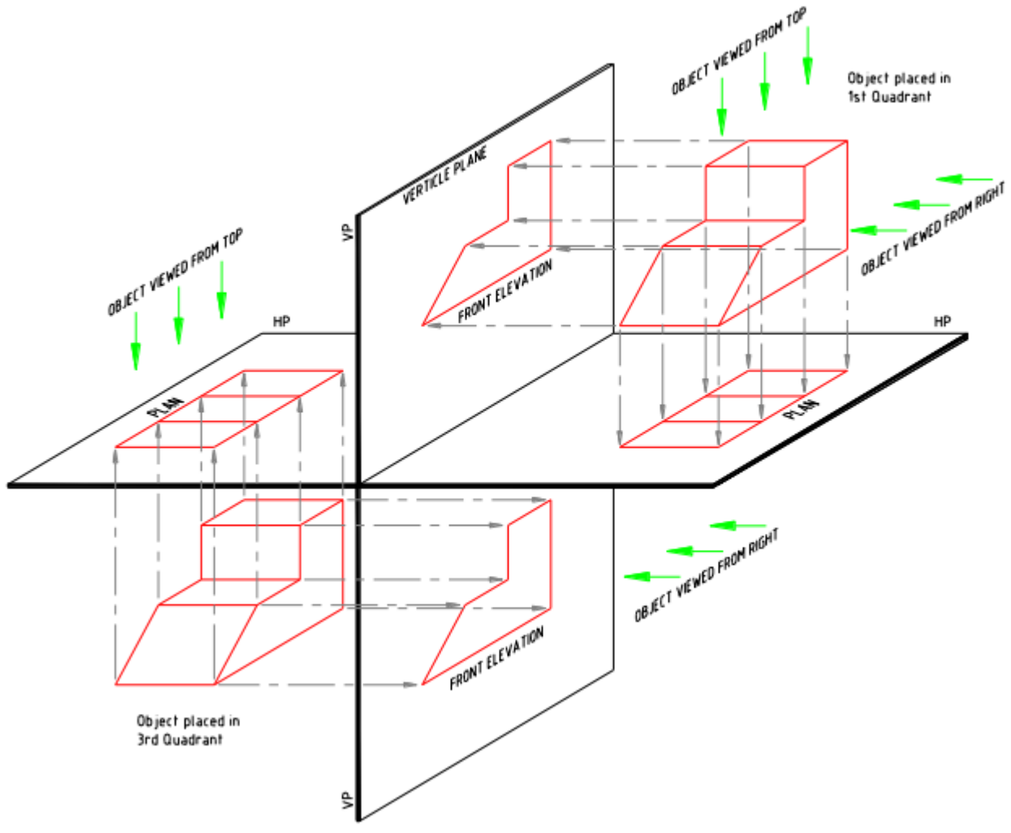
## ORTHOGRAPHIC PROJECTIONS BOX




The 1st Quadrant 0°-90° is the First Angle. The 3rd Quadrant 180°-270° is the Third Angle.

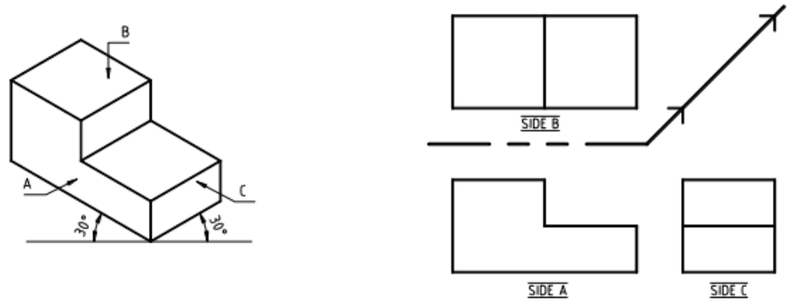
In the 1st Angle Projection, the object to be viewed is placed in the 1st Quadrant and viewed from the right and the top. The Front Elevation is seen on the V.P. and the Plan is on the H.P.

In the 3rd Angle Projection, the object to be viewed is placed in the 3rd Quadrant and again viewed from the right and the top. The Front Elevation is seen on the V.P. and the Plan is on the H.P.




In the first angle projection, the object is viewed from one side and drawn on the other side as is the case with X-rays in the hospitals. While in the third angle projection, the object is viewed and drawn on the same side as is the case with the photos taken from a camera.

**3 rd ANGLE ORTHOGRAPHIC PROJECTION**

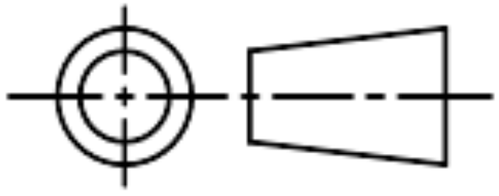



**View A** is known as the **front elevation**.

**View B** is known as the **plan**. It looks at the drawing from the top and gives us the length and the width of the shaped block.

**View C** is known as the **end elevation**. It looks at the drawing from the end of the shaped block and gives us the width and the height of the solid.

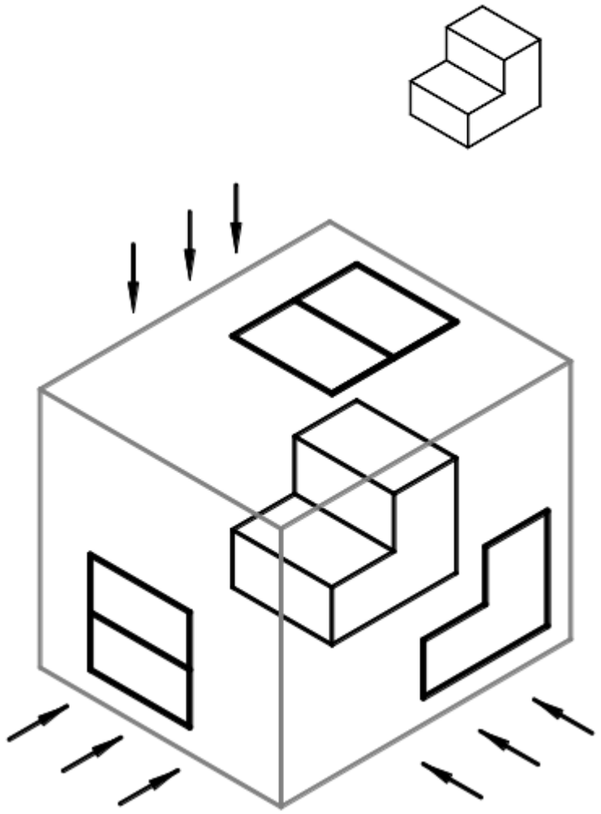
The symbol shown below is used to represent 3rd Angle Orthographic Projections and Drawings.



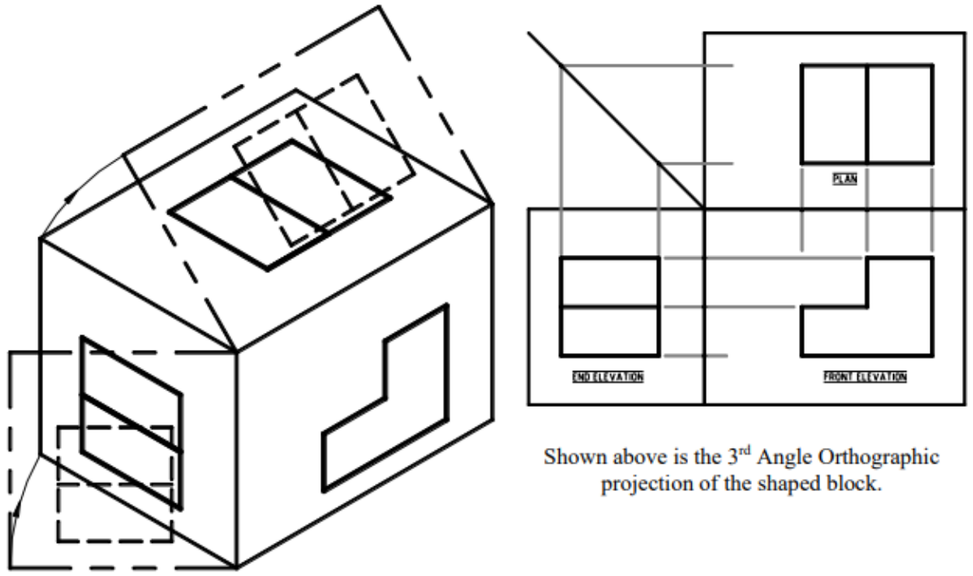
3rd Angle Projection Symbol

An L - shaped block is used for understanding 3rd angle projection in which the object is viewed and drawn on the same side.

Note: In orthographic projections, the longer side (length) of any object will be taken in the front elevation while the shorter side (width) will be taken in the end elevation.



**Note:** When the box is opened, the plan and the end elevation are in line with the front elevation. The plan is drawn in line & above the front elevation and the end elevation drawn in line but on the side of the front elevation where it is viewed from.




Shown above is the 3rd Angle Orthographic projection of the shaped block.

## SHORT ANSWER QUESTIONS

1. Differentiate between pictorial drawing and orthographic projection.

   _____

   _____

2. Explain the term solid geometry.

   _____

   _____

## SHORT ANSWER QUESTIONS CONTINUED

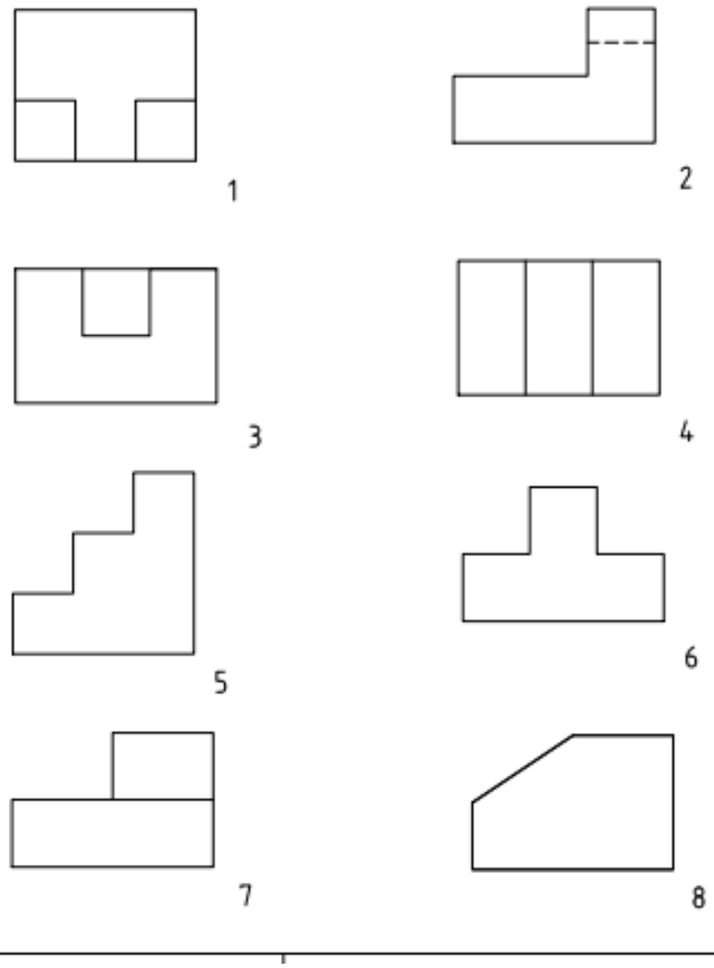
3.

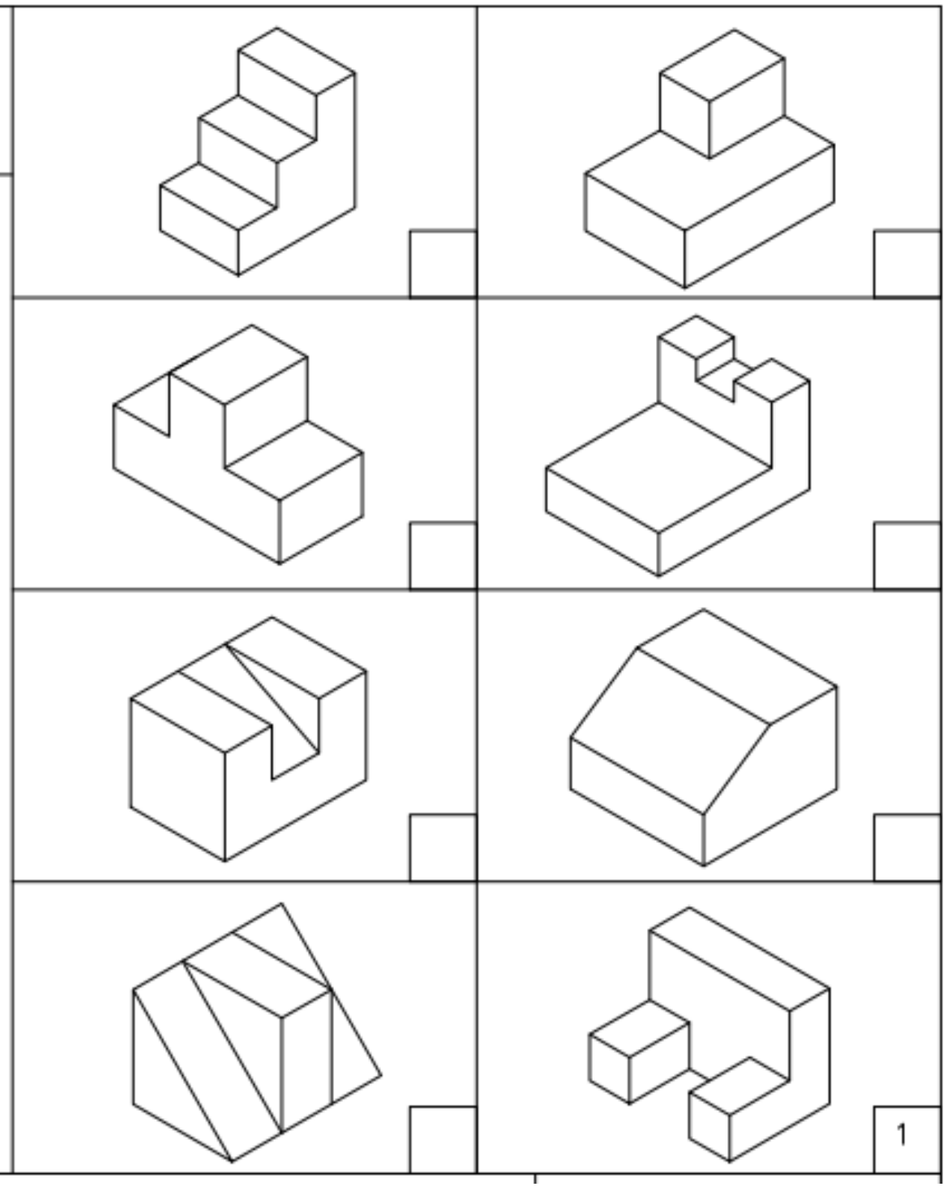
EXERCISES : MATCHING

MATCH THE ELEVATIONS DRAWN BELOW WITH ITS CORRESPONDING PICTORIAL VIEWS

WRITE THE ANSWERS IN THE BOXES PROVIDED WITH EACH OF THE PICTORIAL VIEW.

NOTE: NO: 1 HAS BEEN DONE AS AN EXAMPLE.



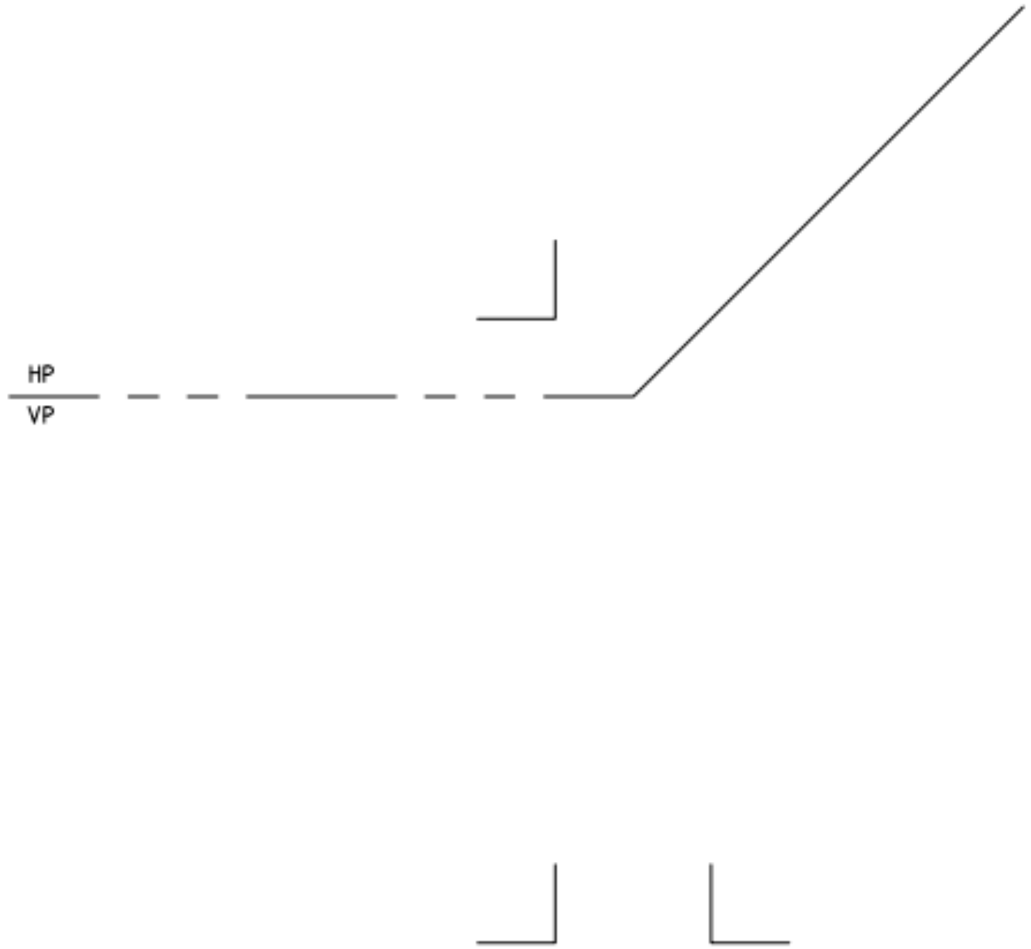



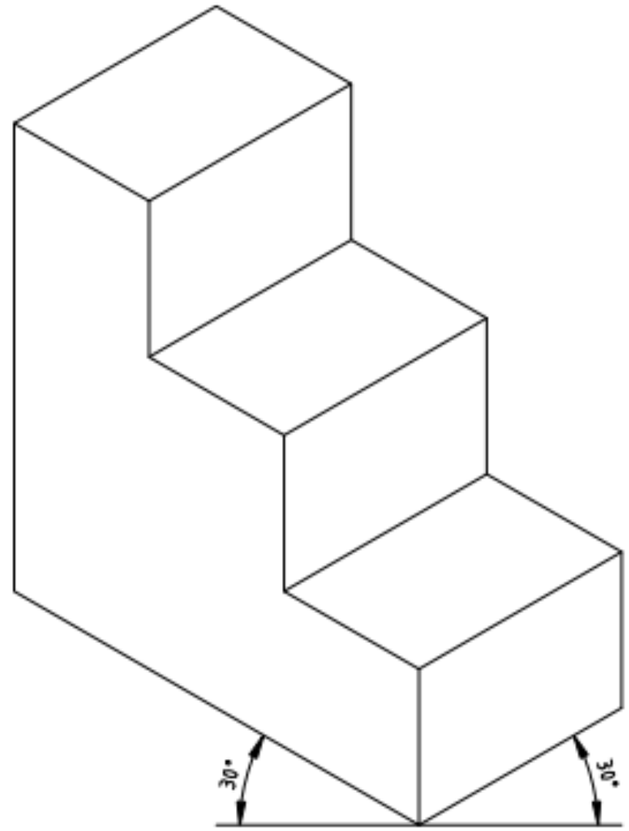
**SHORT ANSWER QUESTION CONTINUED**

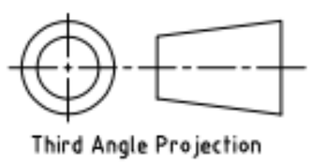
4.

GIVEN: A SIMPLE SHAPED BLOCK DRAWN IN ISOMETRIC

REQUIRED: DRAW THE SHAPED BLOCK IN 3rd ANGLE ORTHOGRAPHIC PROJECTION USING THE GIVEN STARTING MARKS.
LABEL THE DRAWINGS AS FRONT ELEVATION, END ELEVATION OR PLAN.
NOTE : TAKE MEASUREMENTS FROM THE GIVEN ISOMETRIC DRAWING.






**THE END**