

Third Tern JS 3 Basic Tech Lesson Notes

Week One Topic: Orthographic Drawing

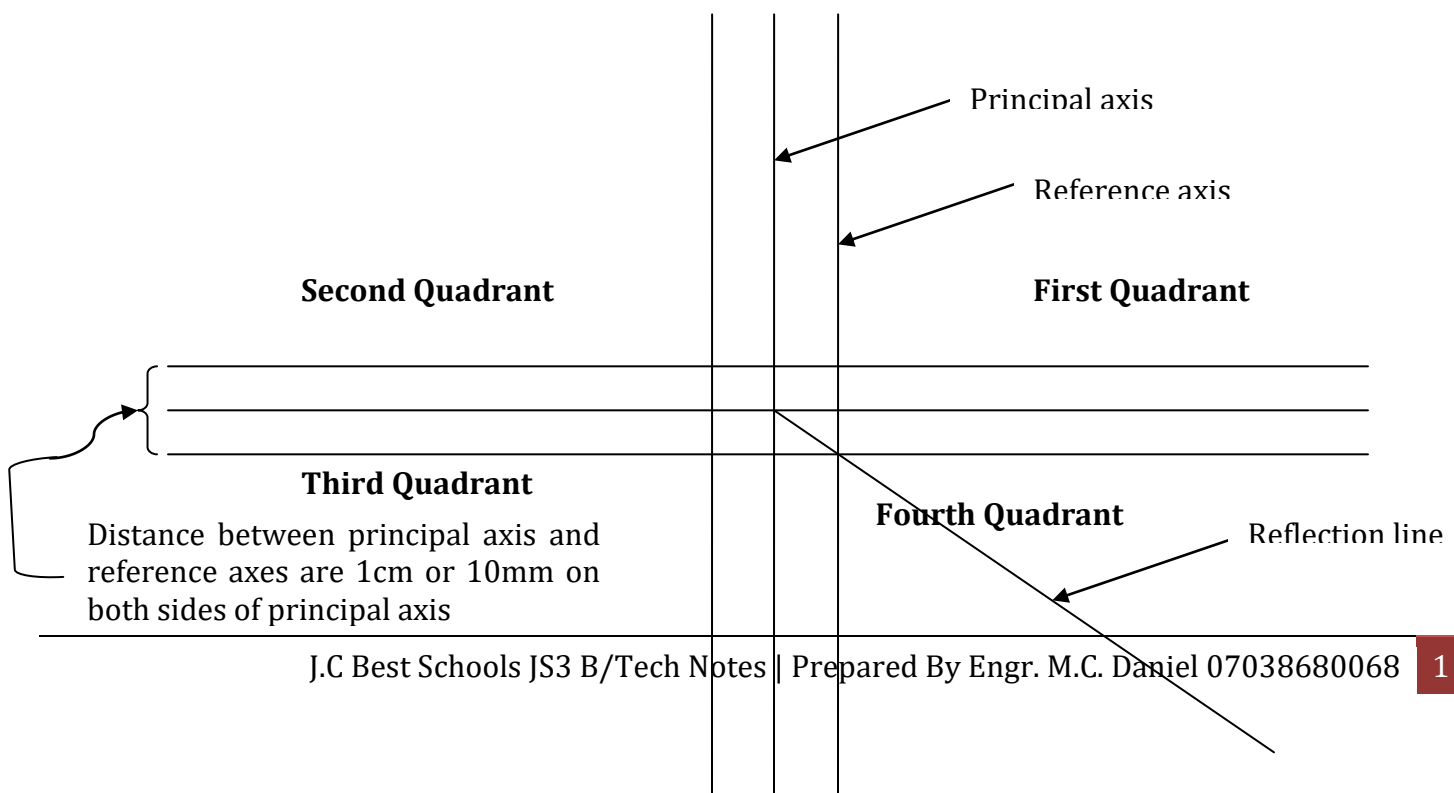
Sub-Topics: Definition. Introduction. Axis. Types of Angles used during projection.

Definition. Orthographic drawing is the method of drawing whereby an object is presented in a 2-dimensional format, which allows the true lengths, hidden parts and true shape of an object to be seen. Another for orthographic drawing is working or manufacturing drawing. This is because it contains all the details that a manufacturer needs to produce the object that was drawn.

Introduction. Orthographic drawing is the only drawing type used in technical drawing that allows a technician to see all the drawing details in an object. It does this by placing three faces of the object on a drawing sheet. These faces are gotten by looking at the object from three positions or locations namely: Front of the object called Front View (FV) also known as Front Elevation (FE). Looking from the Sides (right side or left side) of the object is called End View (EV) or Side View (SV). Then, the object can be looked at from the top and it's known as Plan View (PV). But the commonly used name for this Plan View is Plan Top (PT). This is because it is impossible for one to look at a very large object like a house, bridge, vehicles, etc. from under them. So, the look is only from the top.

Orthographic Axis. Orthographic drawing makes use of certain axes. There are mainly three of them, namely: The principal axis, the reference lines, and the reflection line. There are two principal axes and they cross each other at 90° . Each of the principal axes has two reference lines on both sides of them. The reference lines are 1cm or 10mm away from each of the principal axes. The body of the object being drawn on these axes can only touch some of the four reference lines drawn by the sides of the two principal axes. The axes are drawn to divide the drawing sheet into four quadrants that are not always equal in space. Although, the four quadrants can be equal in space, their spaces are determined by the size and shape of the object that is to be drawn.

The reflection line is one. It is placed on the quadrant where none of the faces or views of the object will occupy. It is drawn by starting at the point where the two principal axes cross each other, passing it through one of the four points where the four reference lines cross each other, and then extending it to whatever distance the technician wants. The length of the reflection line must cross all the lines that will later be drawn to connect the faces or views with each other. The angle between the reflection line and the reference lines is 45° . The diagram below explains all these details in one whole swoop.



Angles used in orthographic drawing. There are two angles that are known to technicians, which are used in presenting the views of an object. These angles are First Angle and Third Angle projections. The first and third tags used above come from any of the quadrants where the Front View is placed. Second and fourth are not used because the type of drawing presentation that First Angle will give is the same that Second Angle will give. In the same way, Third and Fourth Angles will give the same type of drawing arrangement. This is the reason why the Second and Fourth Angles are not mentioned in the case. The rules followed to carry out this drawing type make all these things possible.\

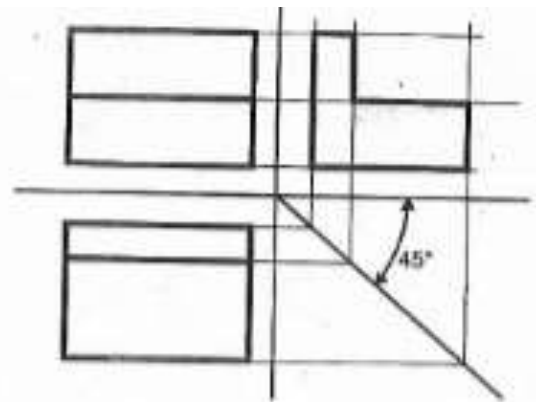
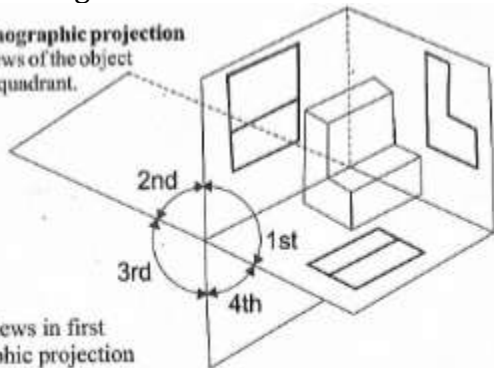
Week Two Topic: Orthographic Drawing

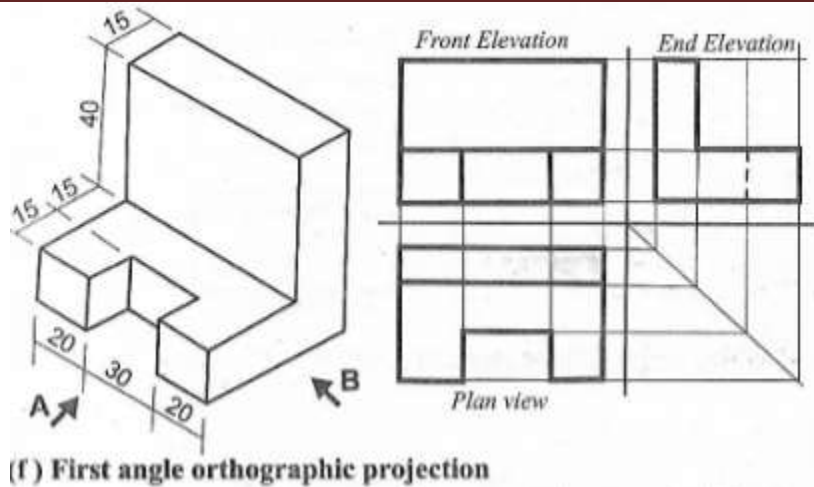
Sub-Topics: The rules for placement of view in O.P. axis

Rules for First Angle Projection:

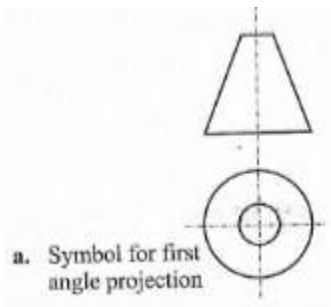
1. The main object that the eye is seeing is normally called the Front View or Front Elevation. The shape or nature of the Front View that eye sees is placed on the First Quadrant or Second Quadrant to produce the same type of drawing placement.
2. The side views are placed either to the left or to the right sides of the Front Elevation. How this is done is that, you look at, for instance, the left side of the object. Whatever shape or form that the person sees, you draw it on the right side of the object. And the object here is represented by the Front View, which you had drawn.
3. In the same way, if you look at the object from the left side, you draw what you see on the right side of the Front View.
4. The same method is applied when presenting the Plan Top on the paper. What the eye sees after looking at the object is placed below the Front View.
5. So, the idea here is that in First Angle projection, what the eye sees after it had looked at an object is placed on the other side of the object, and not on the same side the person is standing to look at the object. The diagrams below illustrate this.

1. First angle orthographic projection
This shows the views of the object placed in the first quadrant.



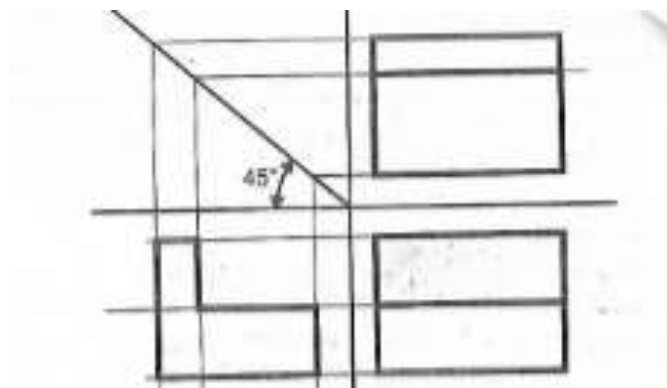


The symbol used to tell any technician that drawing he or she is seeing is a First Angle projection is shown below.

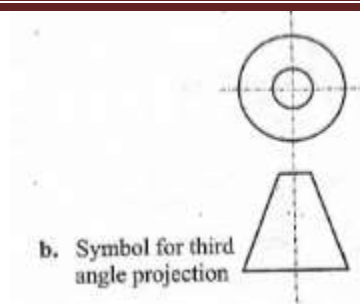


Rules for Third Angle Projection:

The rules stated above are the same and applicable to Third Angle projection. The only difference is that the Front View or Elevation in Third Angle is placed on the Third or Fourth Quadrant. But the nature or shape of the object remains the same. The diagram below shows to us what will be the result when the faces of the object above are presented in Third Angle projection.

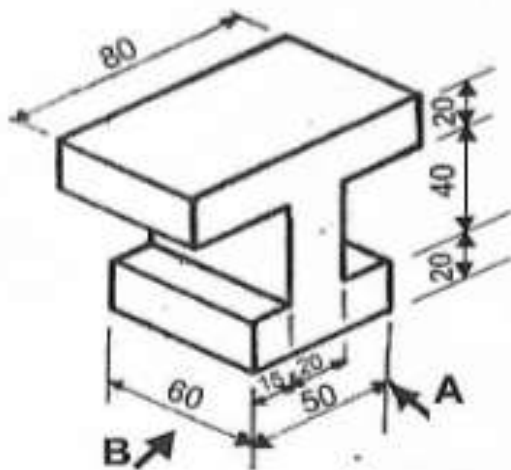


Below is the symbol used to identify Third Angle drawings.

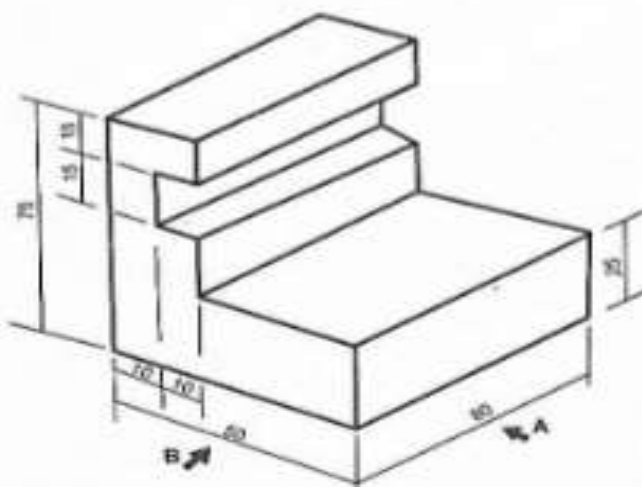
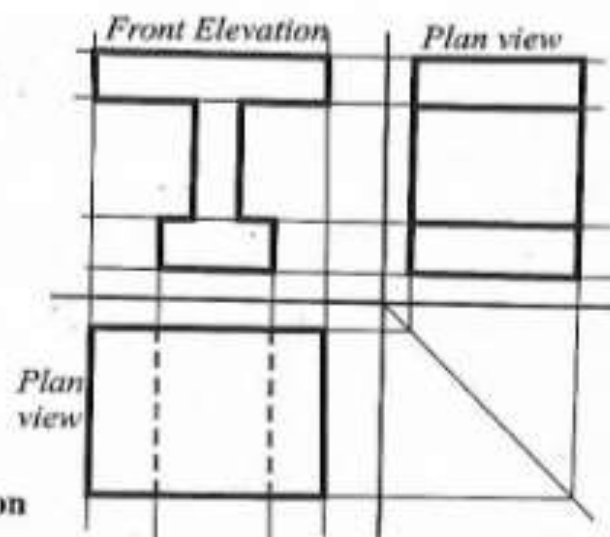


Week Three Topic: Orthographic Drawing

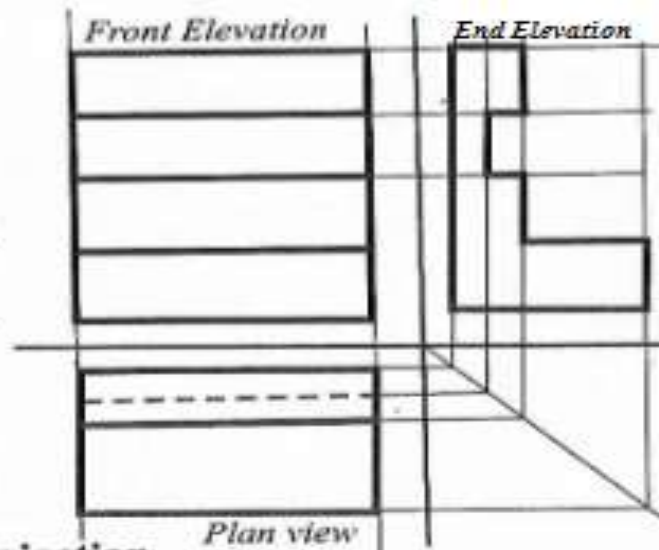
Sub-Topics: Projecting Simple Objects in First Angle



(b) First angle orthographic projection



(e) First angle orthographic projection

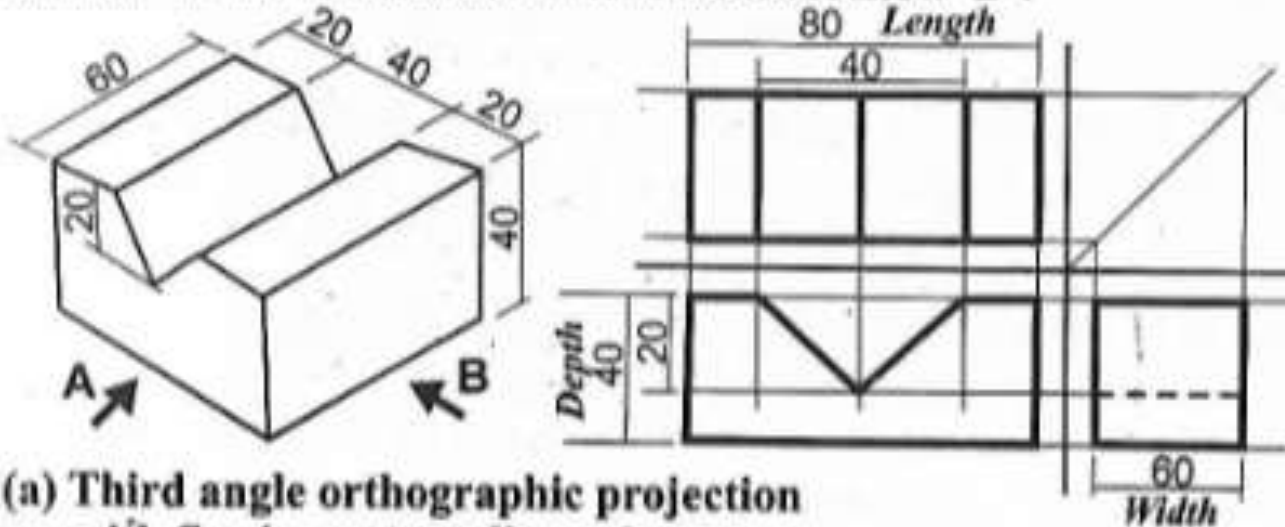


Week Four Topic: Orthographic Drawing

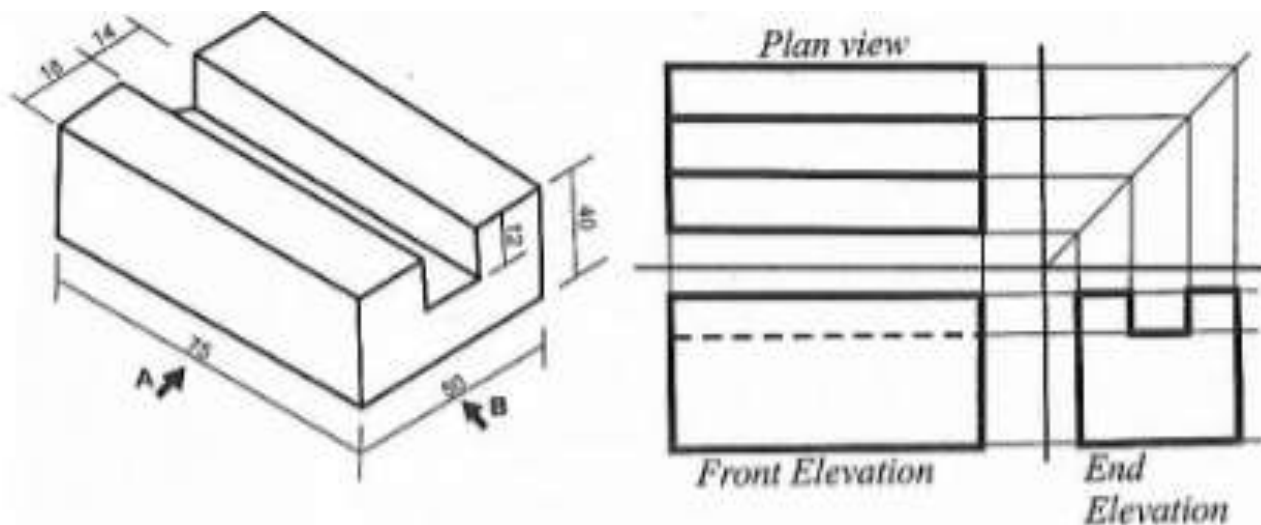
Sub-Topics: Projecting Simple Objects in Third Angle

Examples

Draw the blocks below in third angle or first angle orthographic projection and insert five important dimensions. Taking Front elevation in the direction of arrow "A" and End elevation in the direction of arrow "B".



(a) Third angle orthographic projection with five important dimensions



(c) Third angle orthographic projection

Assignment

Refer to the text book given to you in the school for more exercises and practical work.