ME-160
Mechanical Engineering Drawing

Orthographic Projection Drawing

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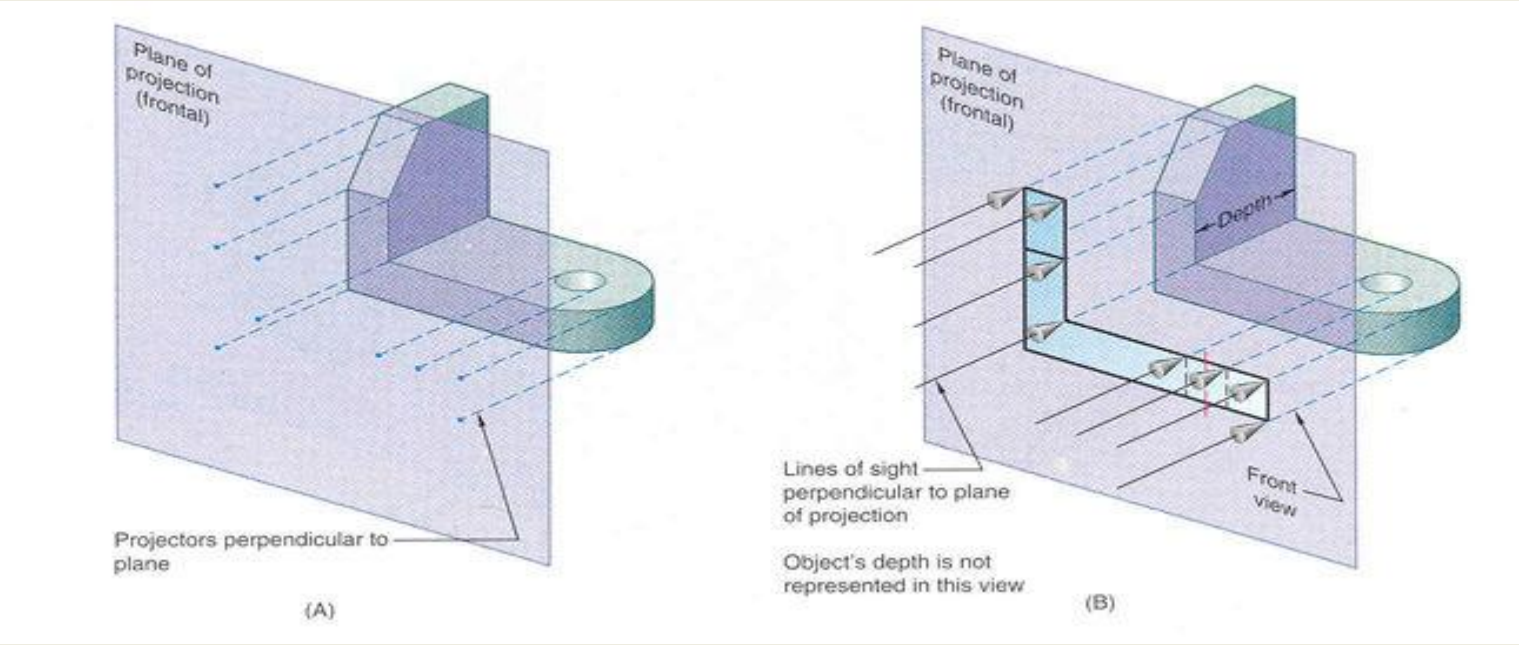
Orthographic Projection

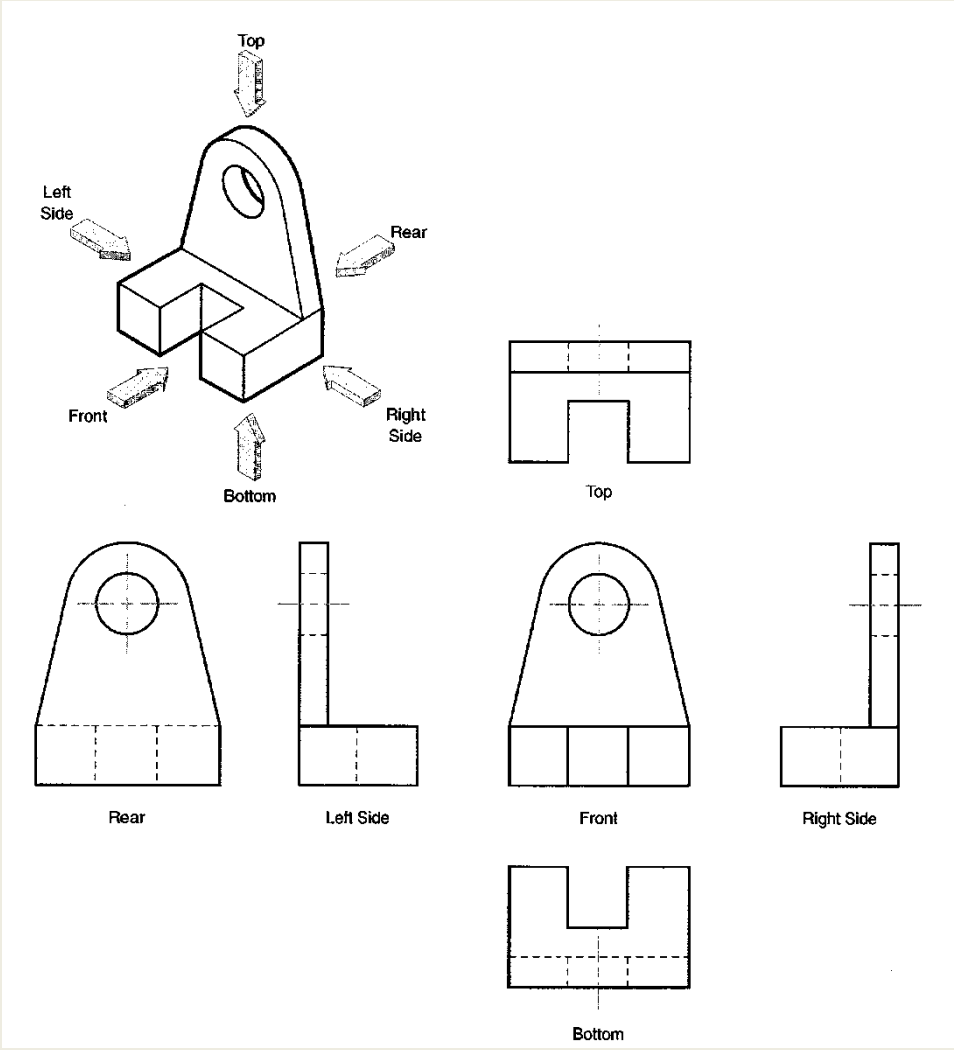
- Orthographic Projections are a collection of 2-D drawings that work together to give an accurate overall representation of an object.



Six Principle Views

The 6 views of projection include:

- Front
- Right Side
- Top
- Bottom
- Left side
- Rear

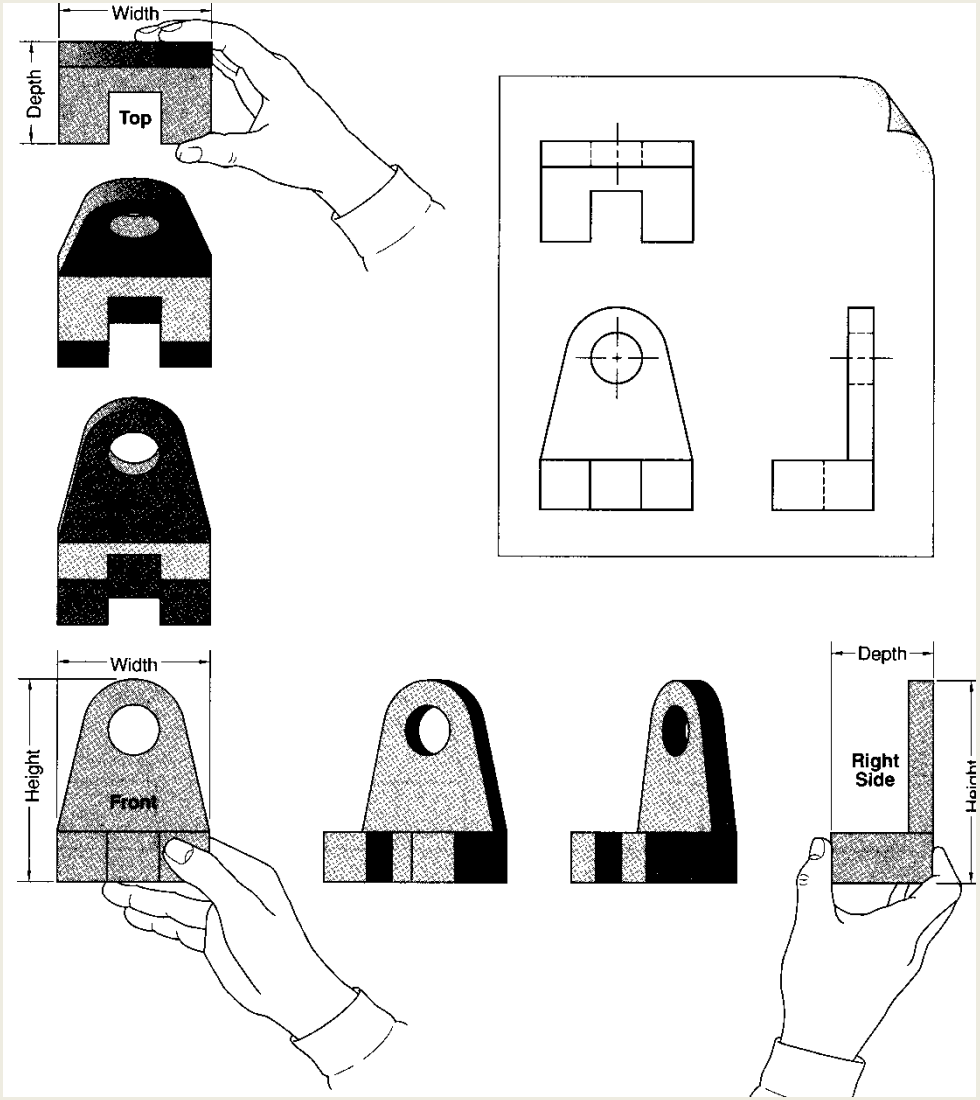


Rules of Orthographic Drawing

- Pick a Front View that is most descriptive of object, normally the longest dimension is chosen as the width (or depth)
- Most common combination of views is to use are Front, Top, and Side View

Principle Views

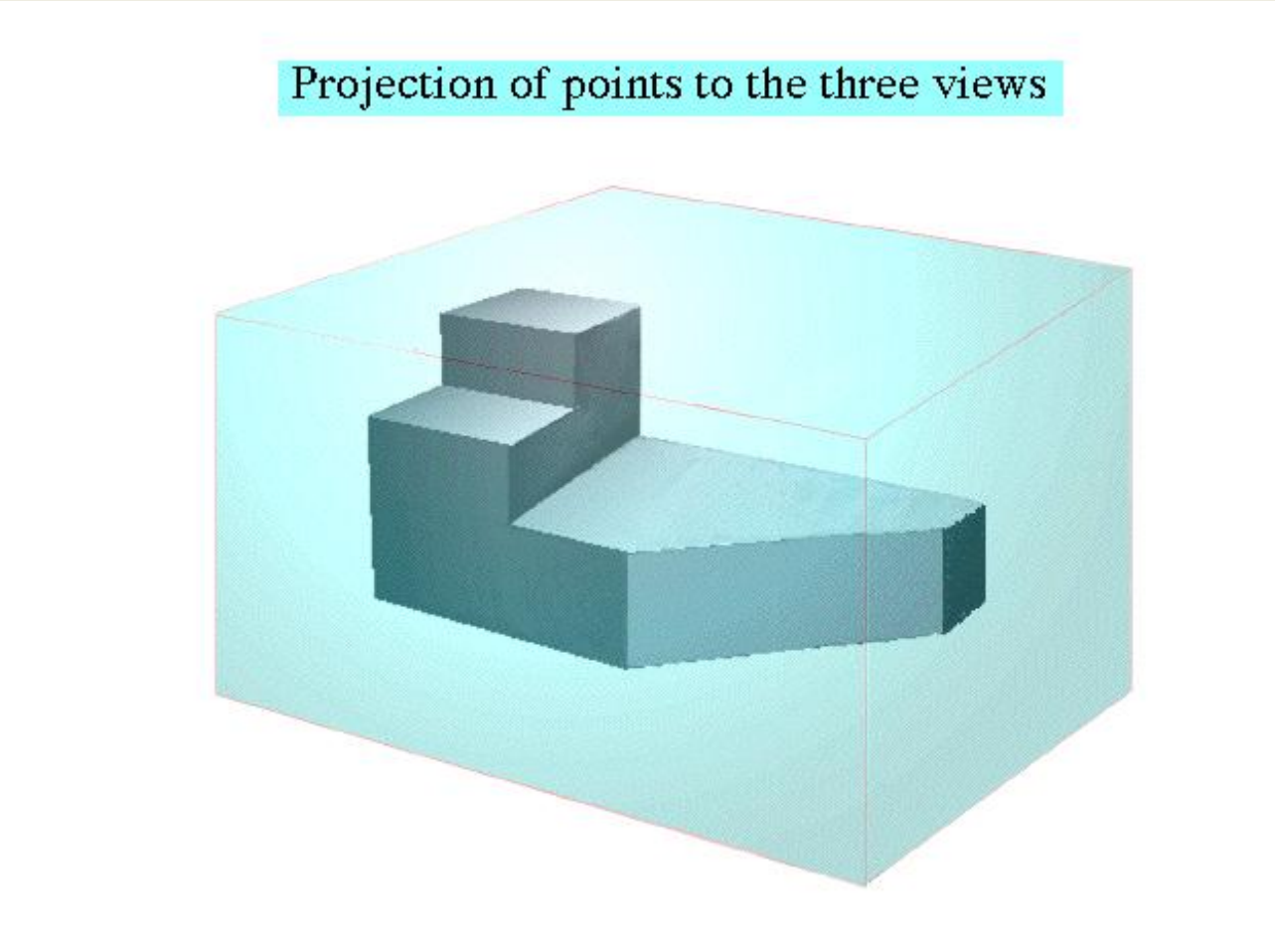
- Front, Right Side and Top are views that simply represented by rotating the object



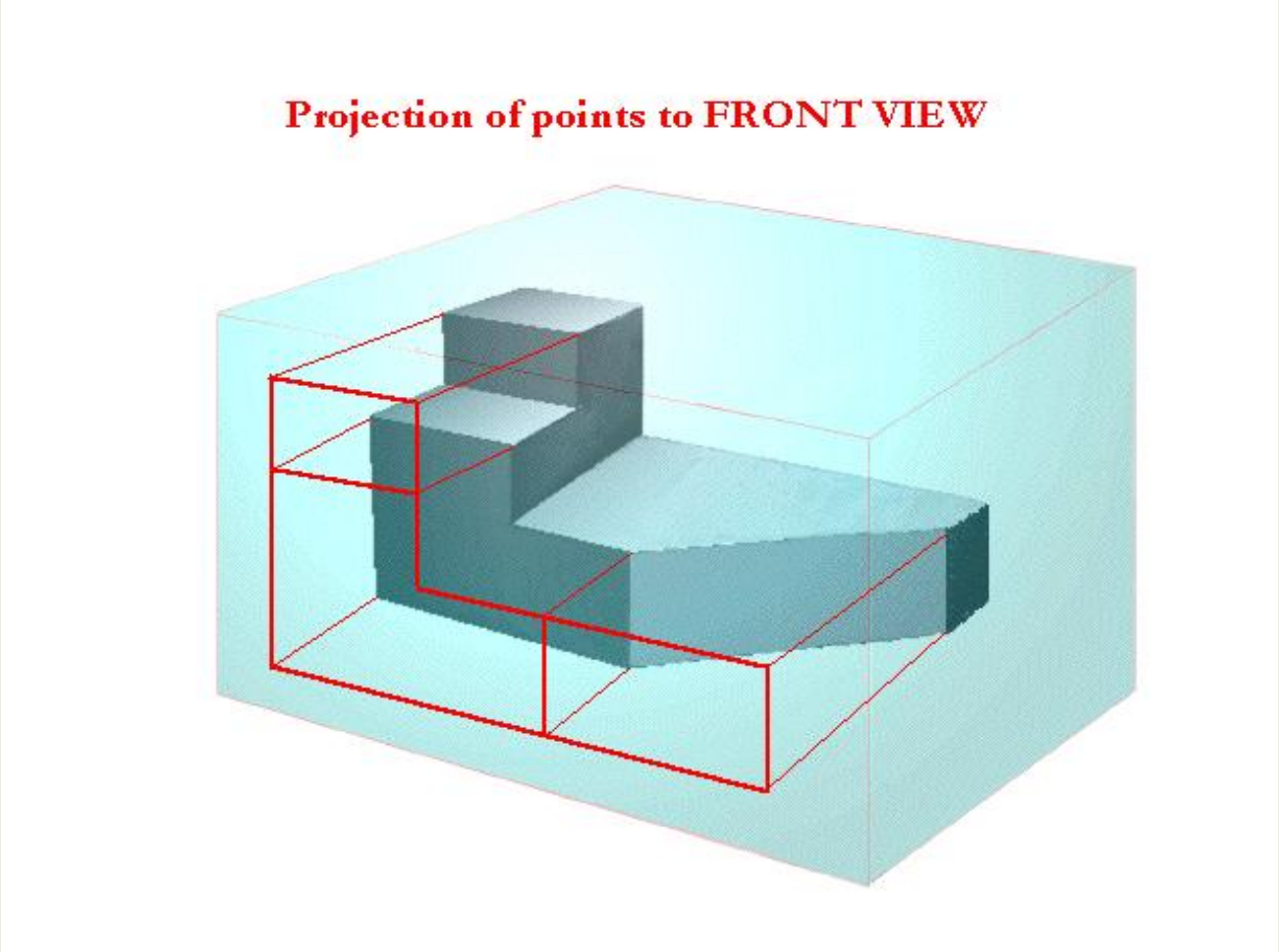
Glass Box

- Most powerful technique to understand orthographic projections
- Suspend the object with transparent strings inside a glass box
- Freeze the view from each direction (each of the six sides of the box) and unfold the box

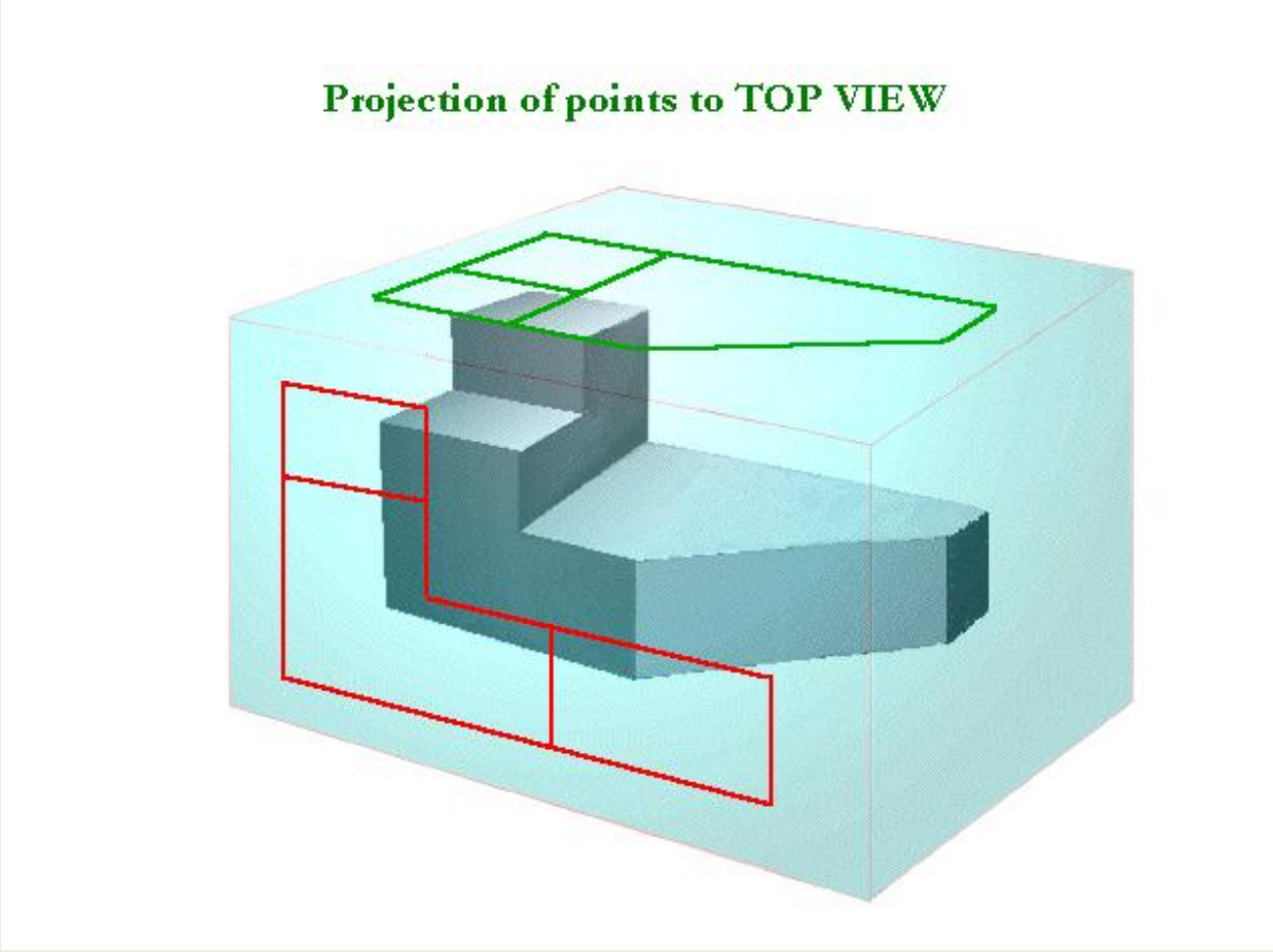
Glass Box



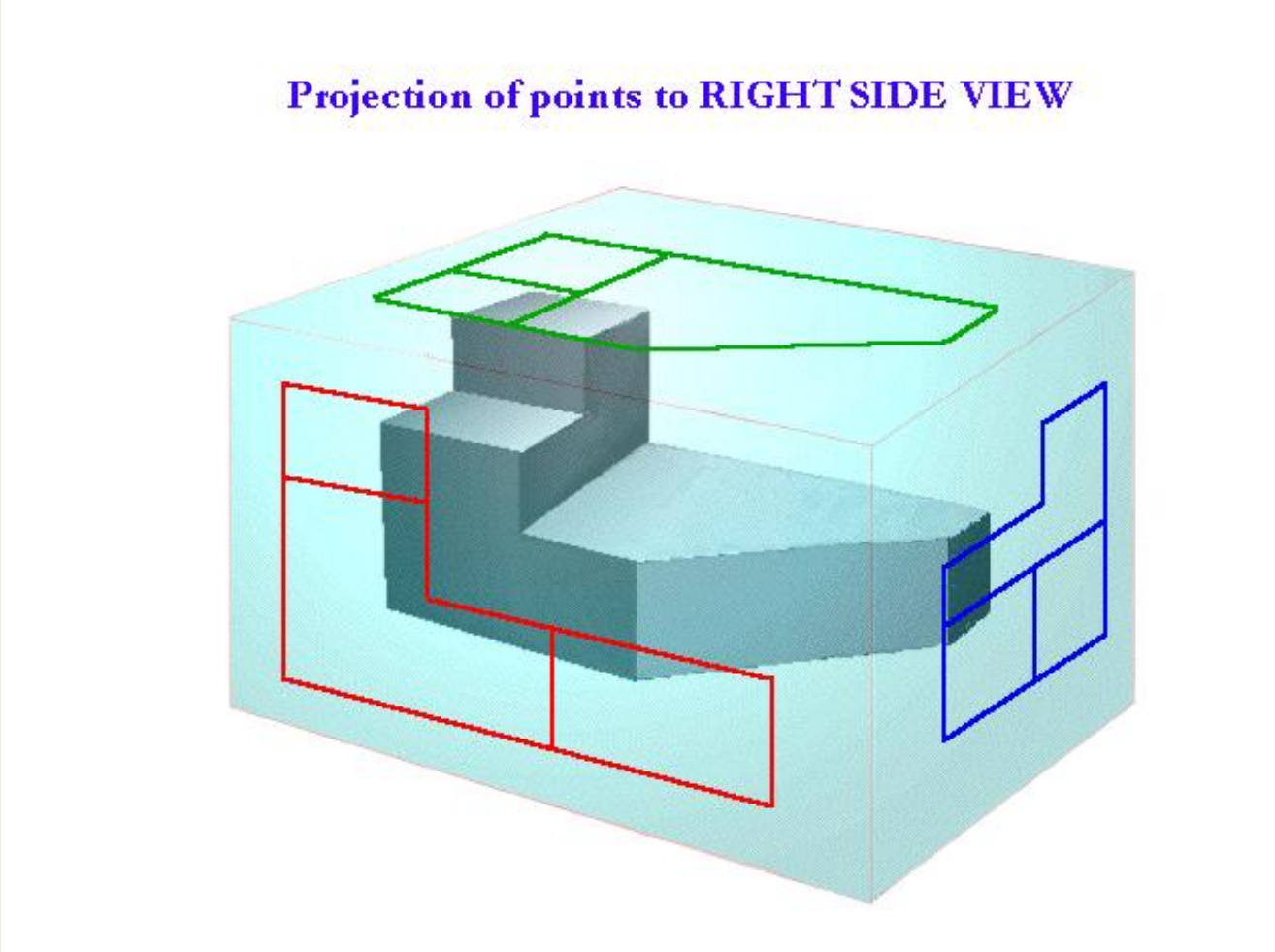
Glass Box



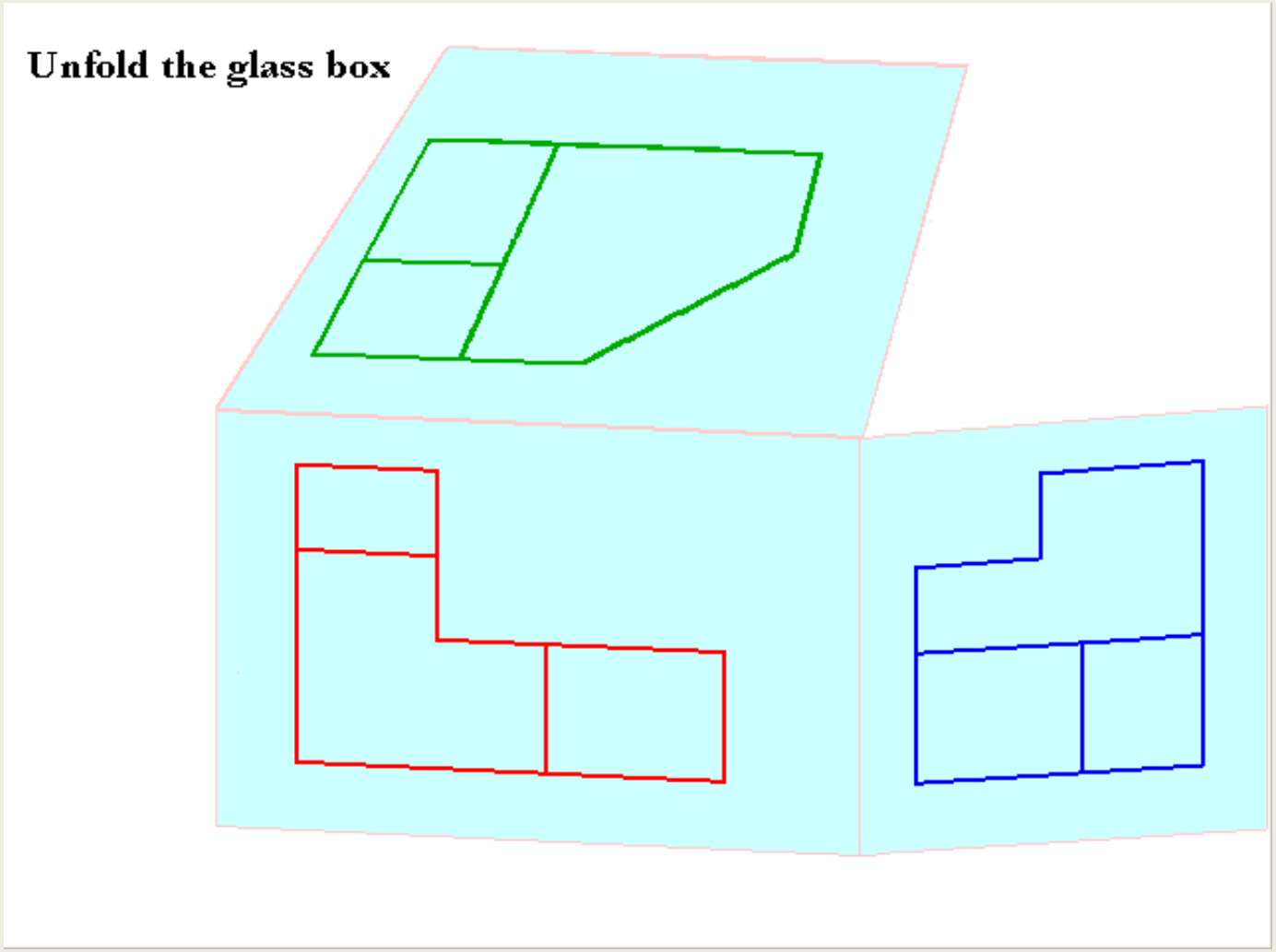
Glass Box



Glass Box

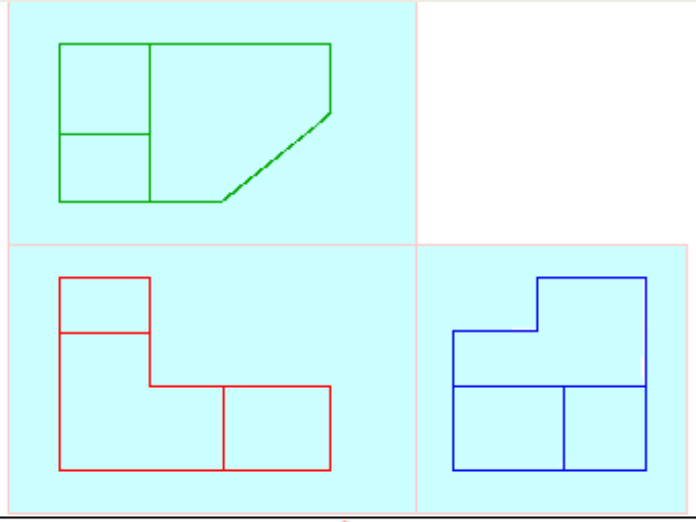


Glass Box

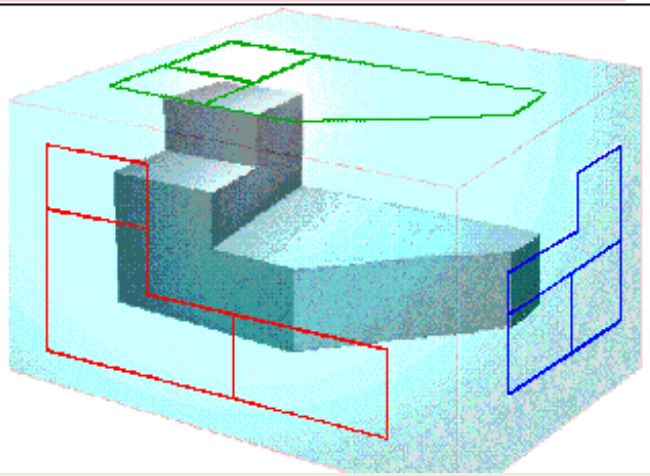


Glass Box

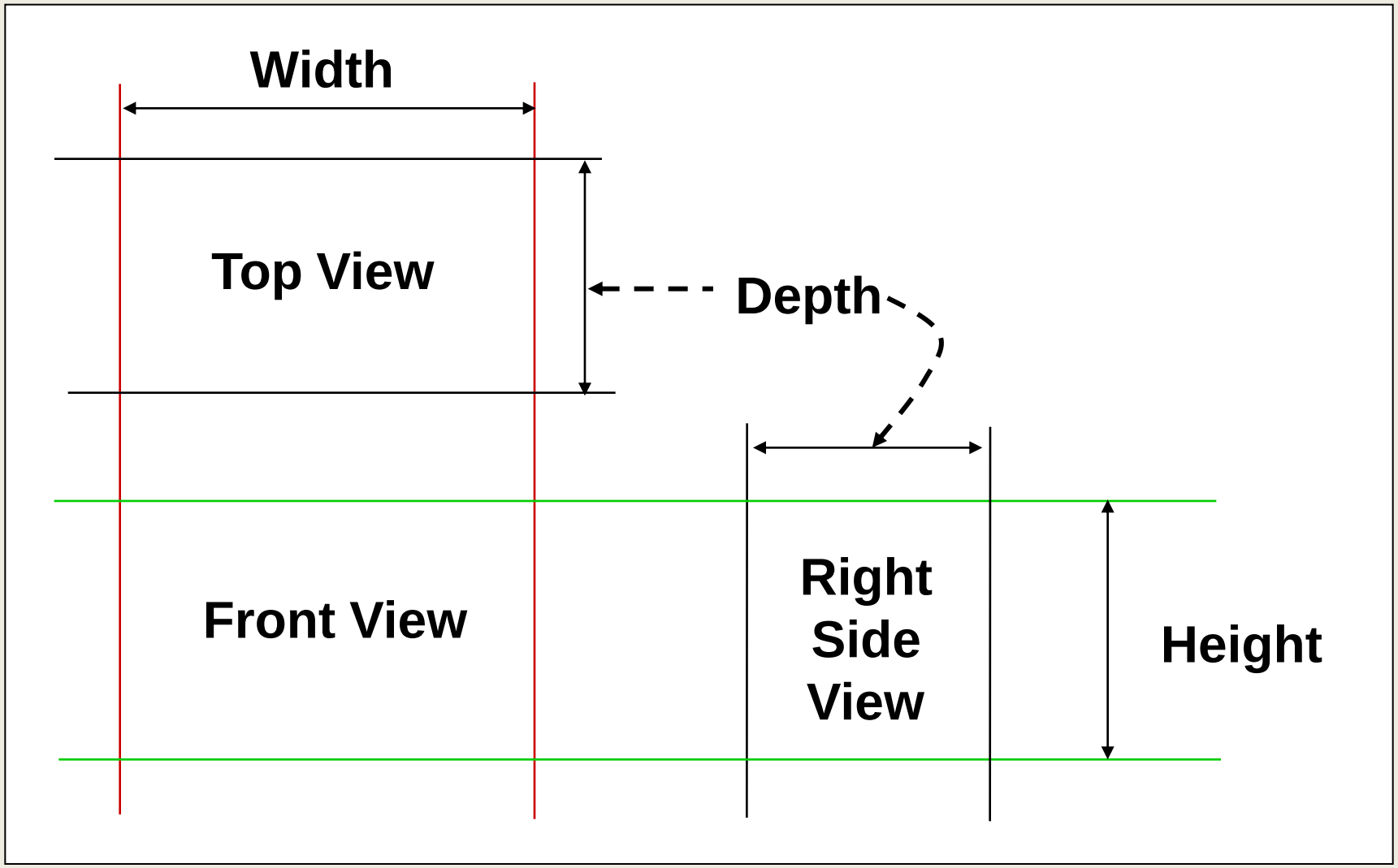
Unfolded glass-box



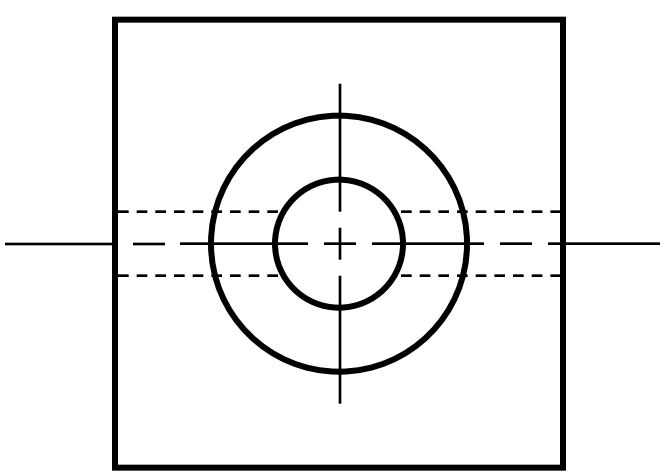
Object in the glass-box

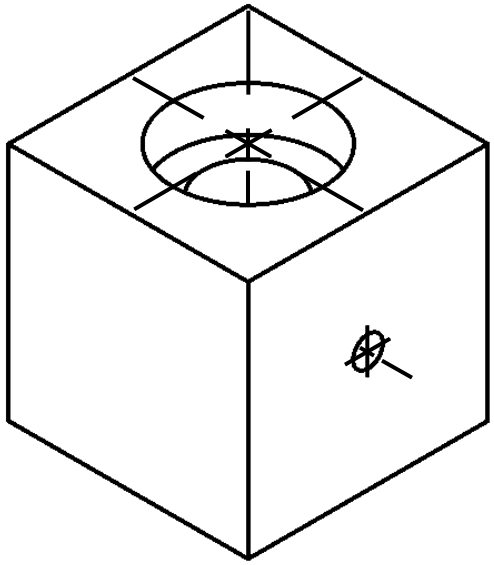


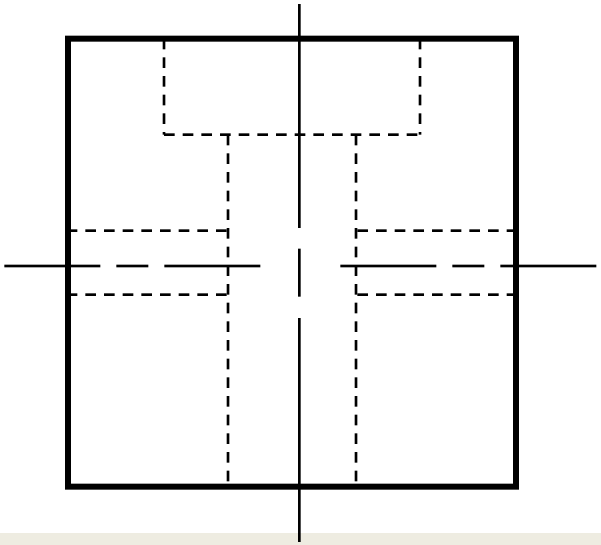
Front, Side and Top Views

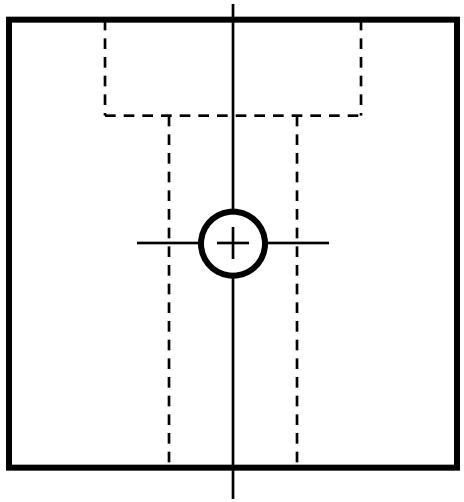


Example





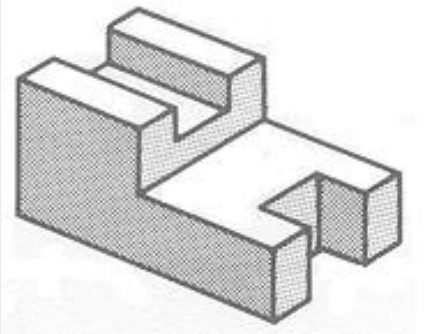


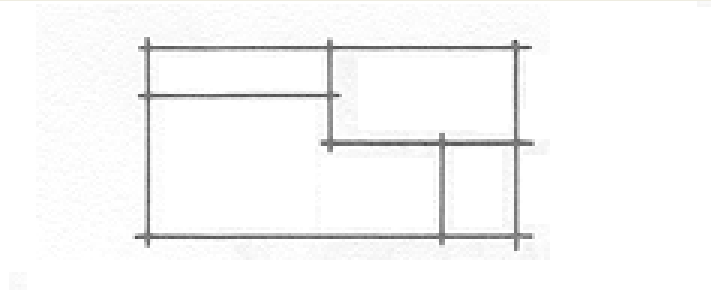


1. Visible
2. Hidden
3. Center

Drawing the Views

To complete an orthographic projection drawing follow these steps.



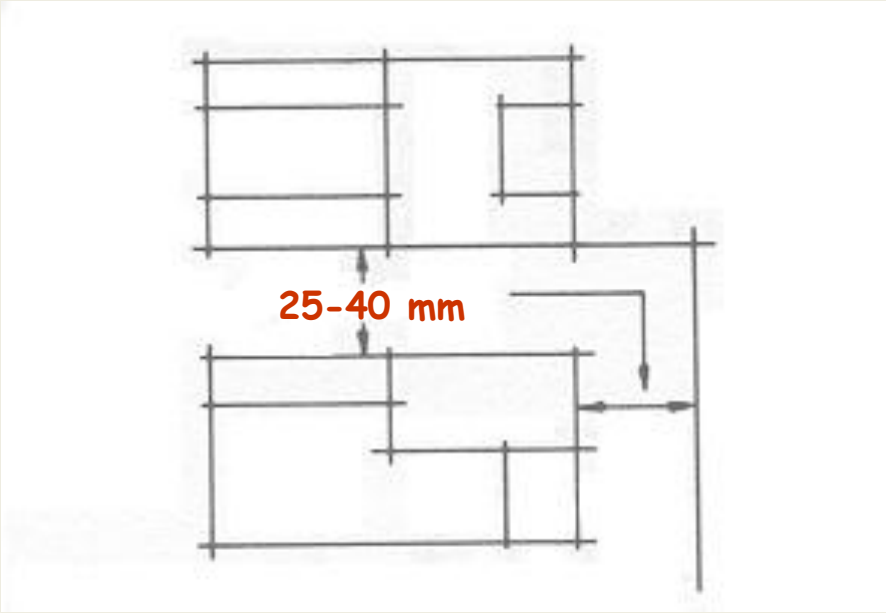


Step 1:

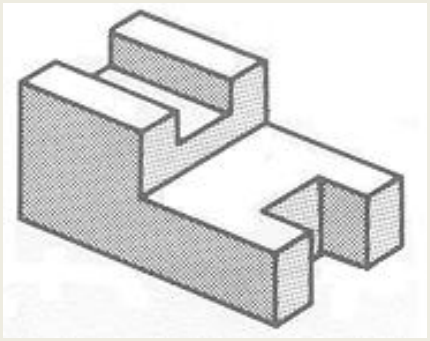
Lightly construct the front view.

Step 2:

Space the top view 25-40 mm above the front view. Lightly construct the top view directly over the front view. Extend the lower side of the top view to intersect a vertical line drawn to the right of the front view.

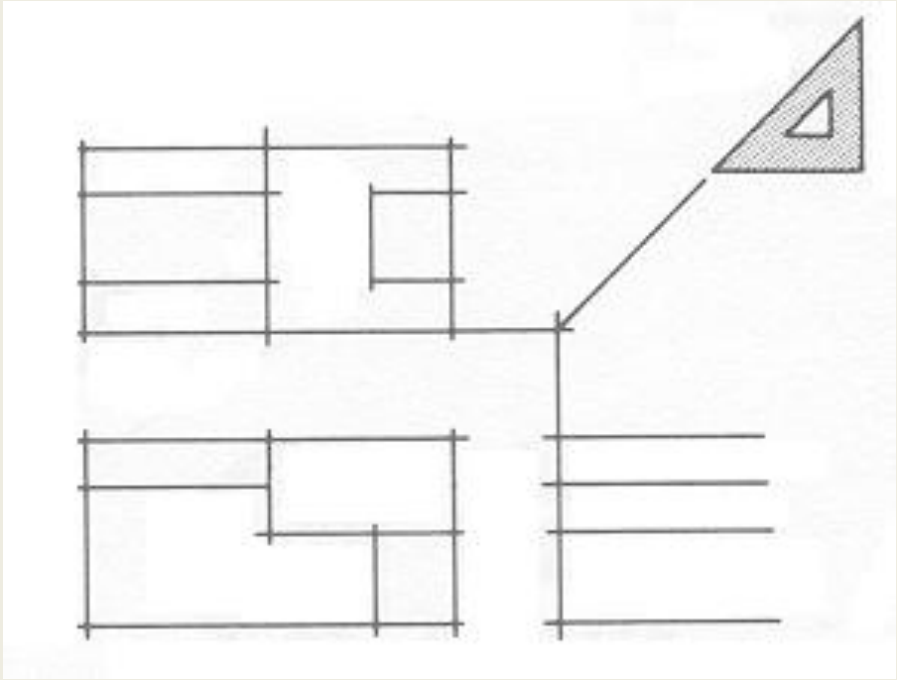


Drawing the Views



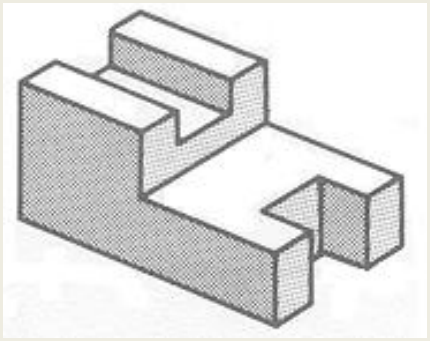
Step 3:

Project the features of the front view to the right of the vertical line. Draw a line at 45° from the point of intersection as shown.



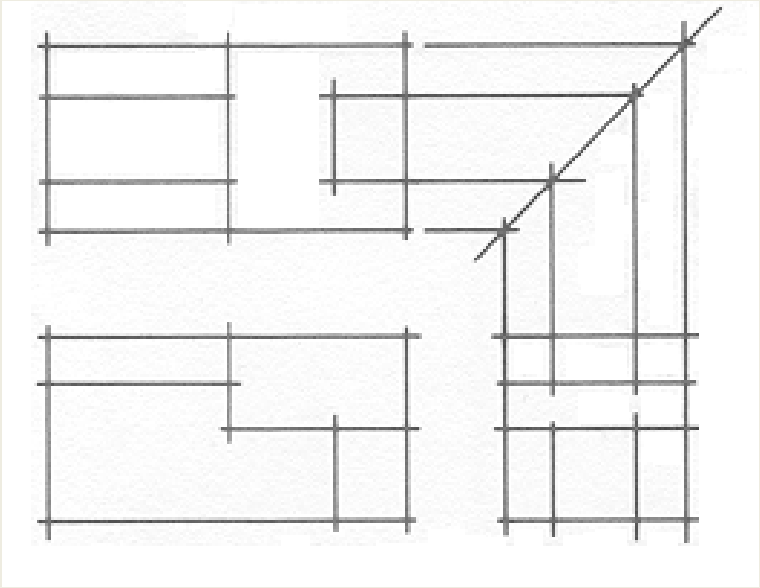
The use of a 45° miter line helps to project features from the top view to the side view.

Drawing the Views

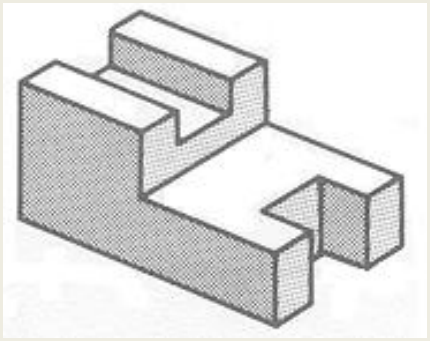


Step 4:

Where the horizontal projection lines of the top view intersect with the miter line, draw vertical projection lines to the side view.

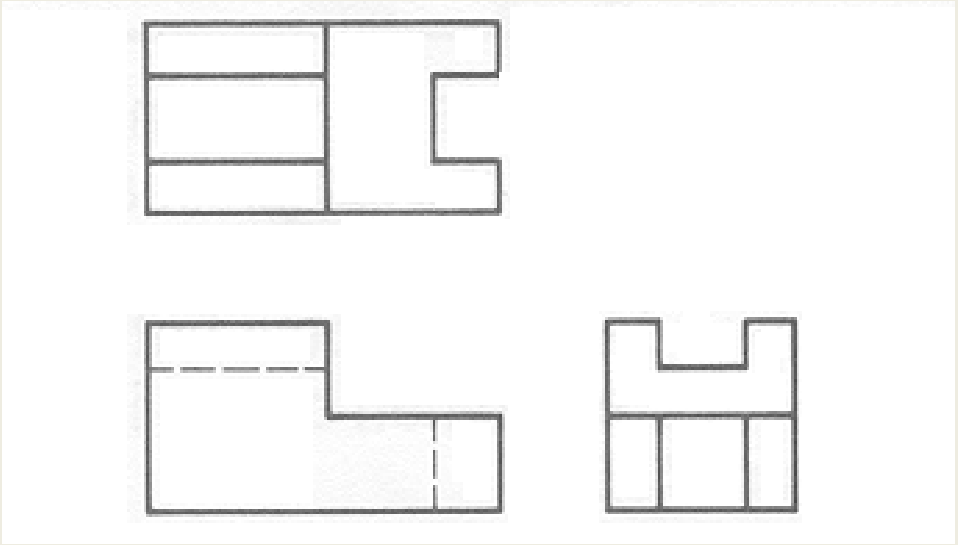


Drawing the Views

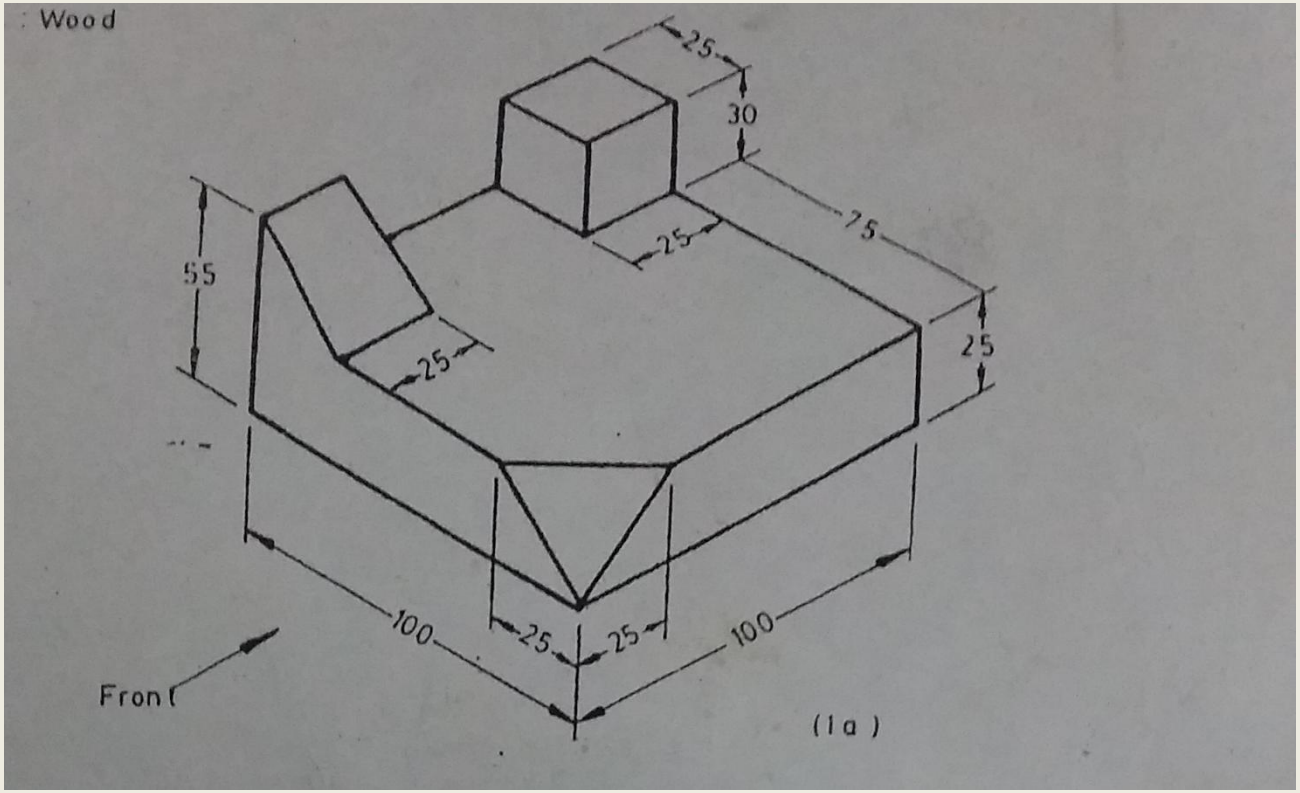


Step 5:

Erase all unnecessary lines. Complete the finished linework to complete the required orthographic views. Add the necessary information into the title block.



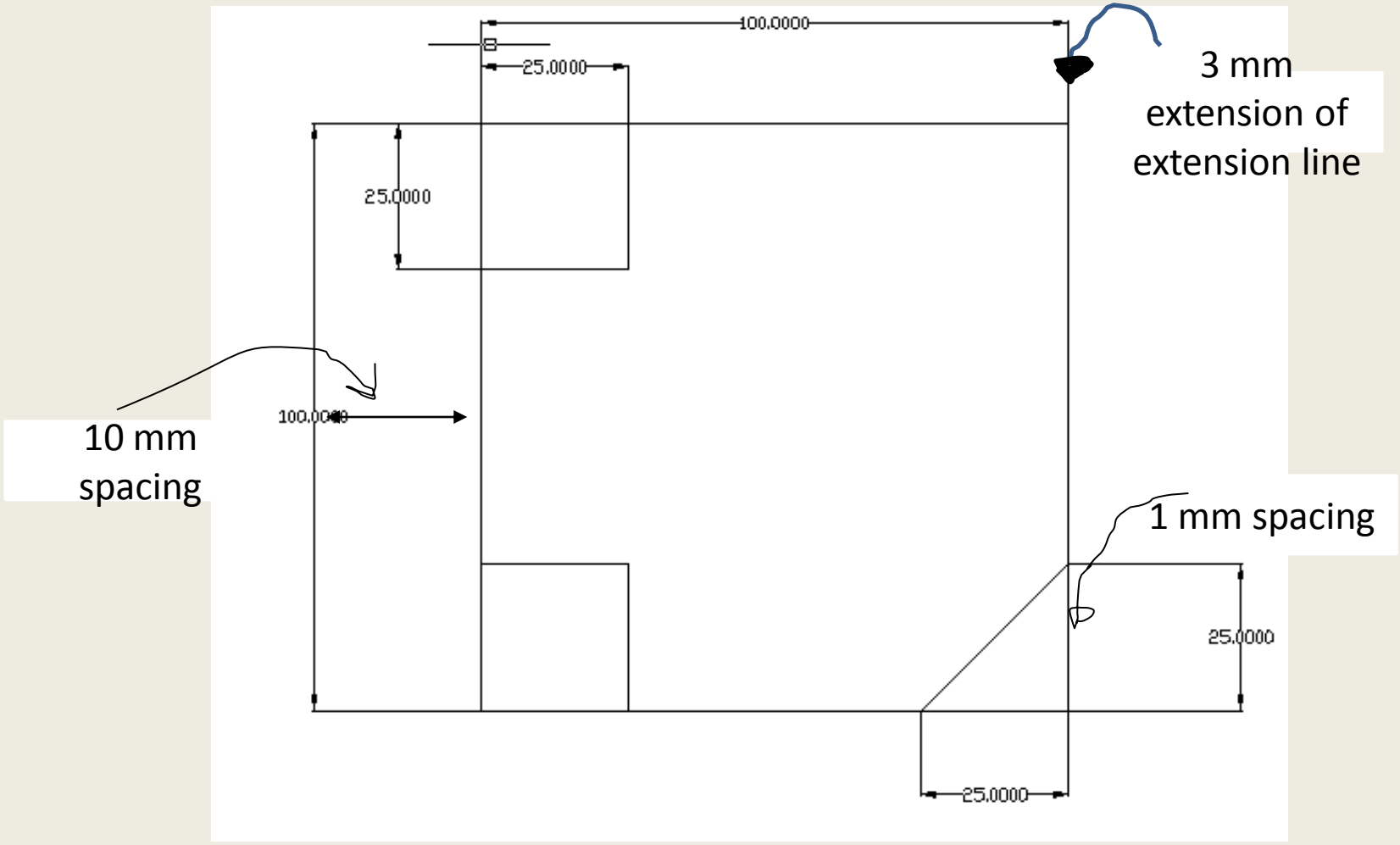
First Problem



To draw FRONT, TOP and R.H.S views

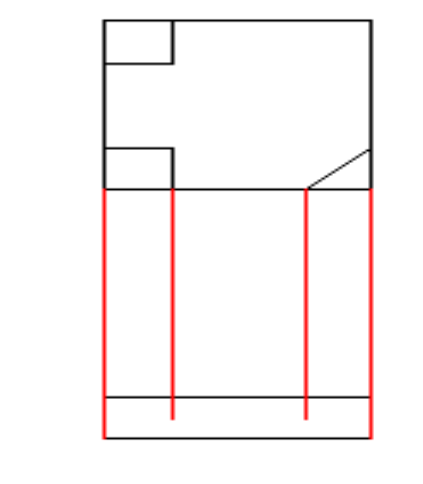
Step 1:

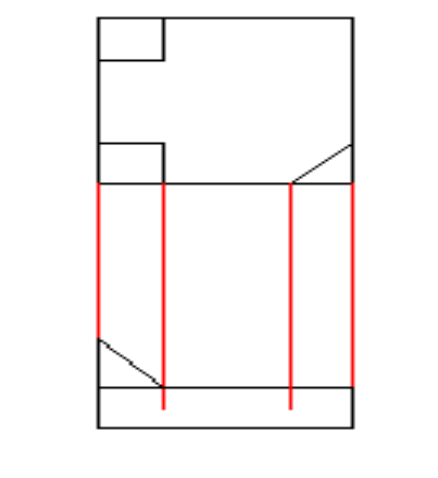
Lightly construct the top view.

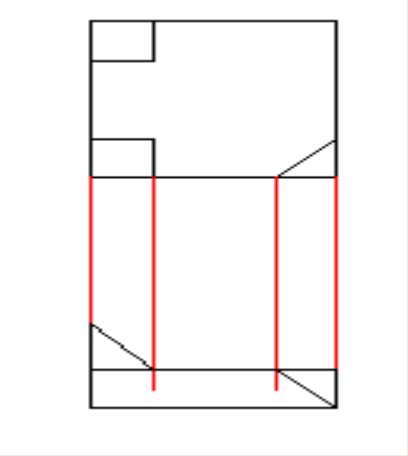


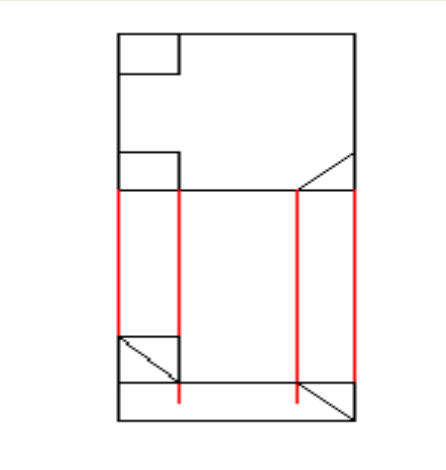
Step 2:

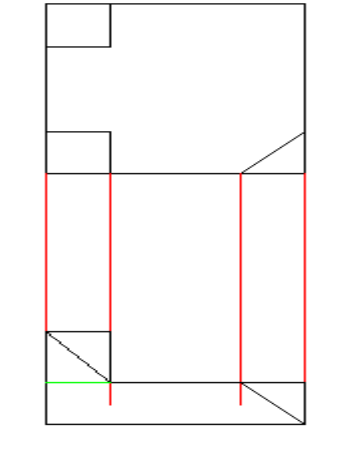
Space the front view 25-40 mm below the top view. Lightly construct the front view directly under the top view.





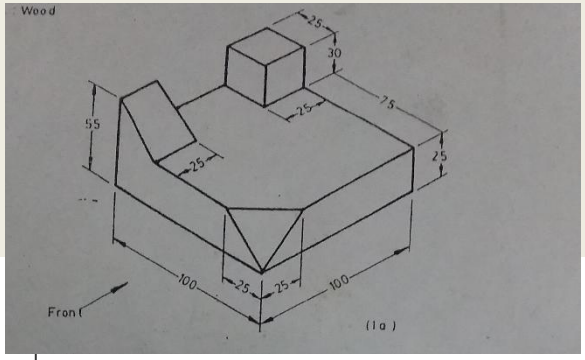


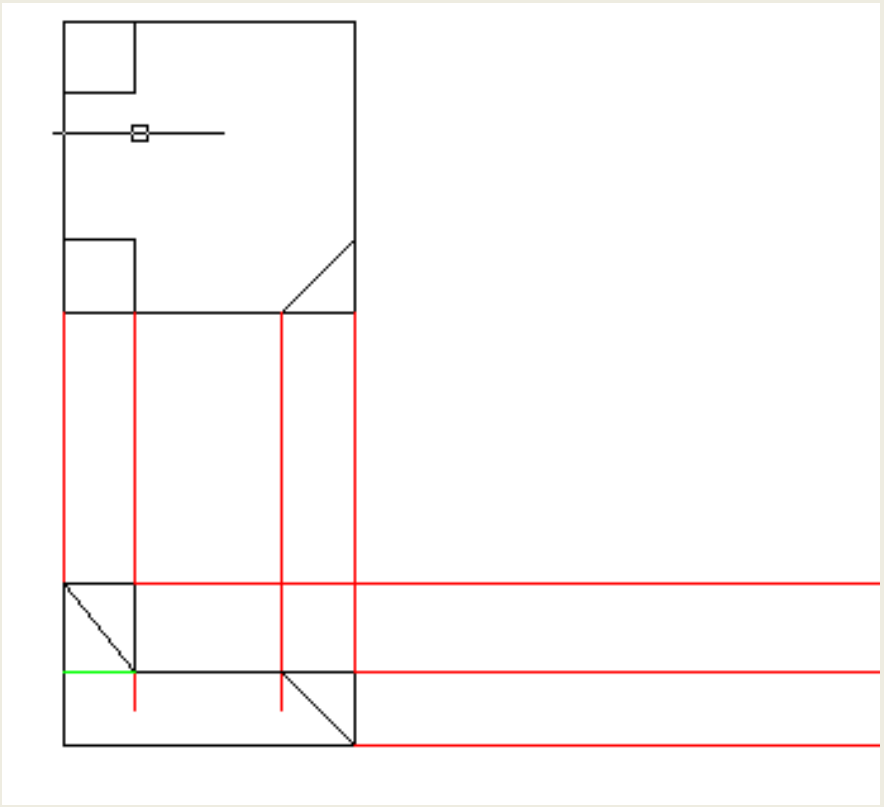


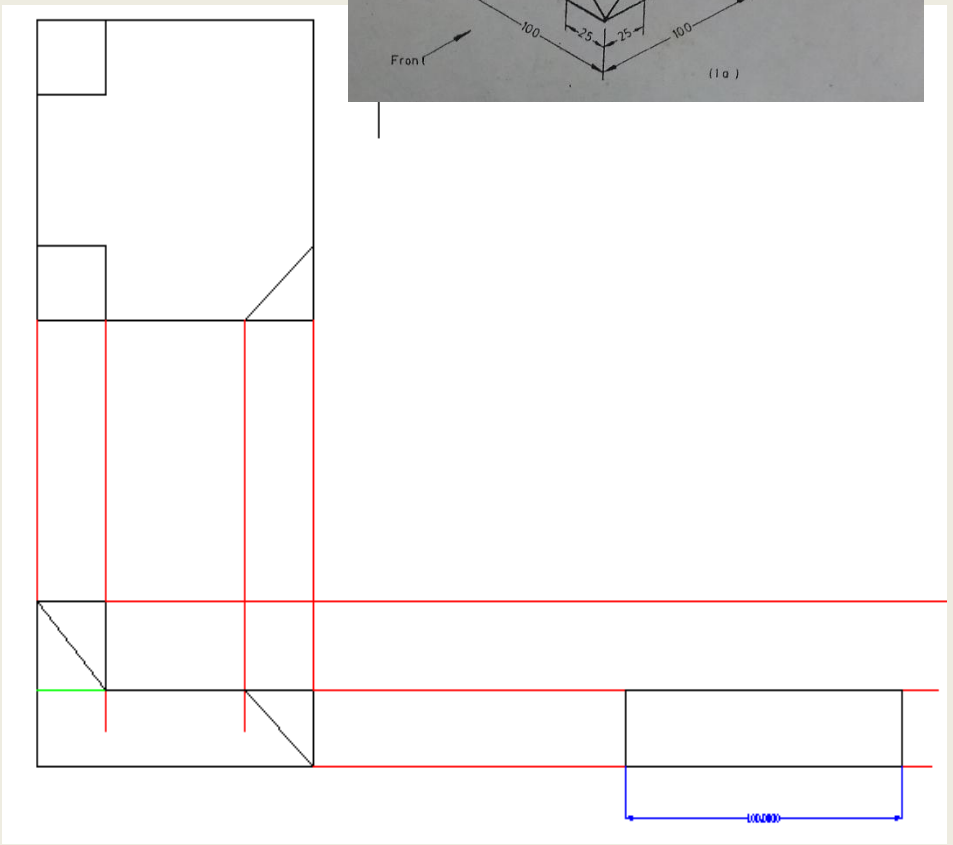


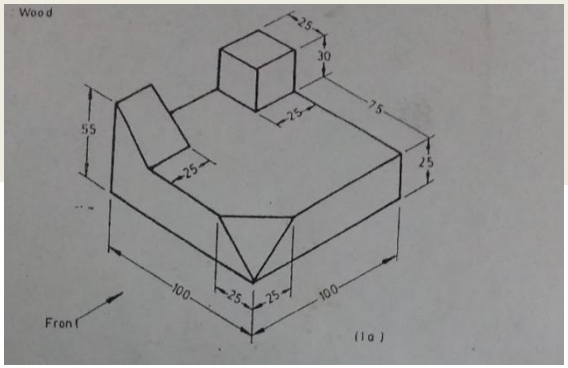
Step 3:

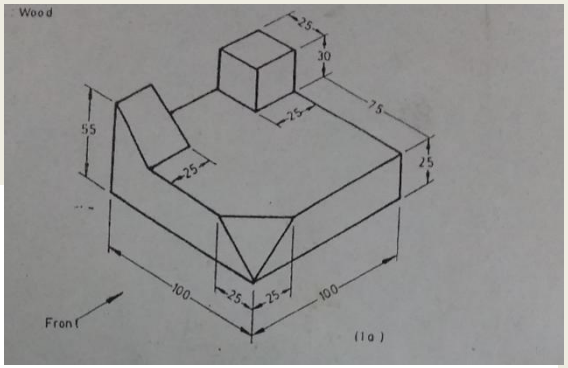
Space the R.H.S view 25-40 mm right of the front view.

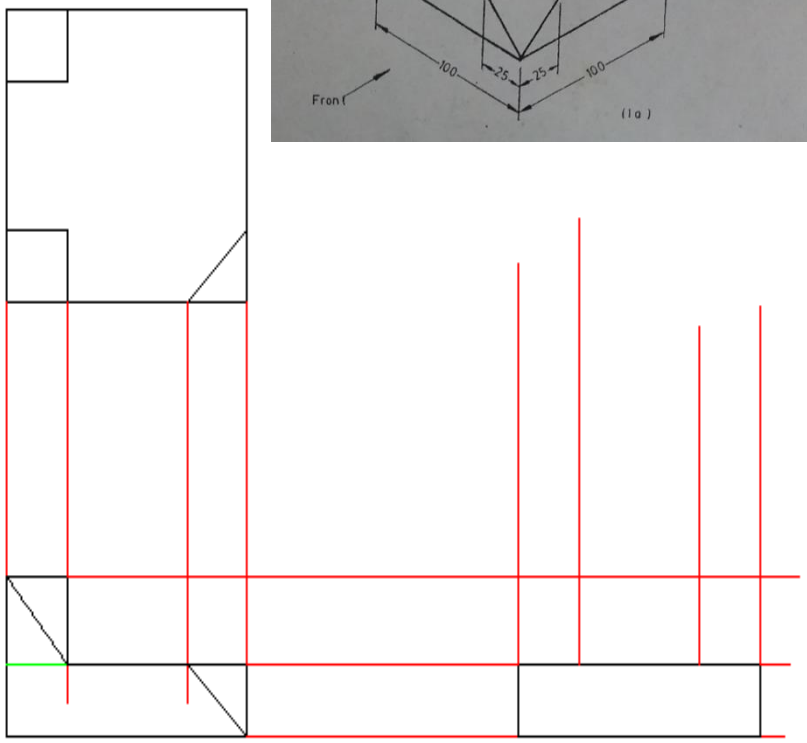


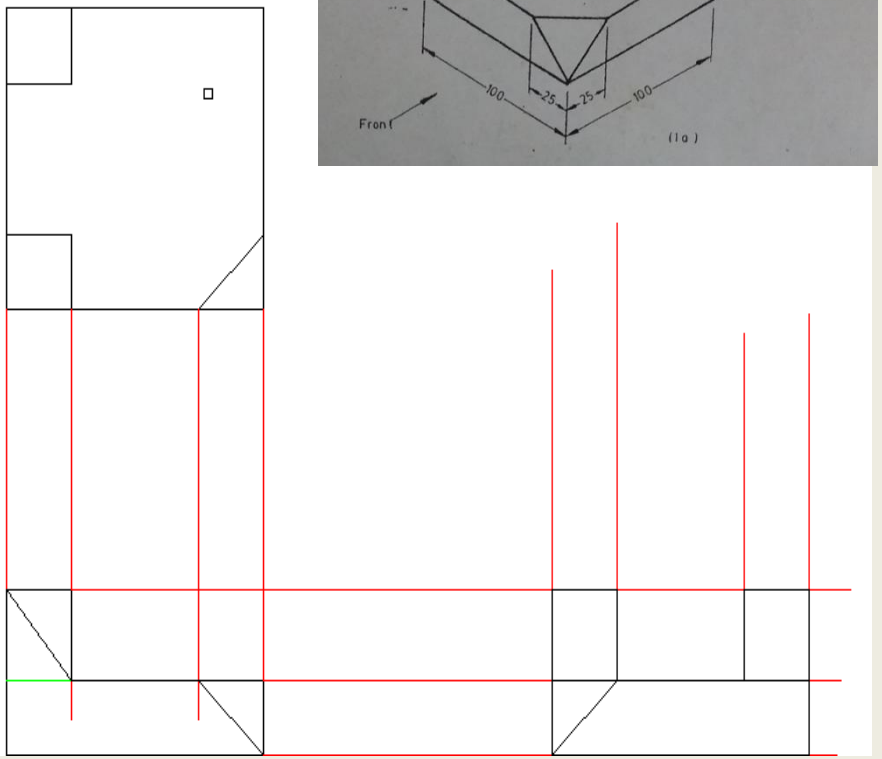




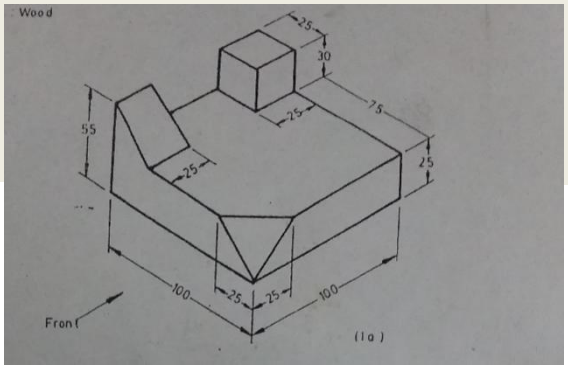


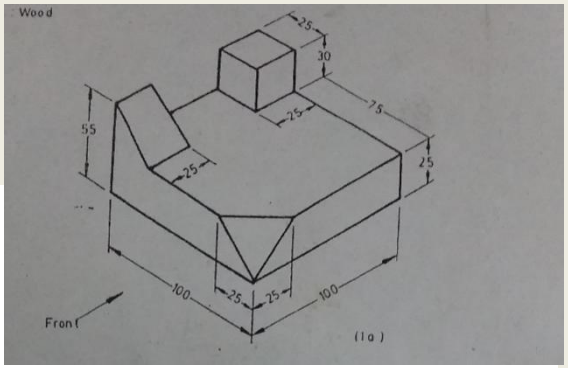


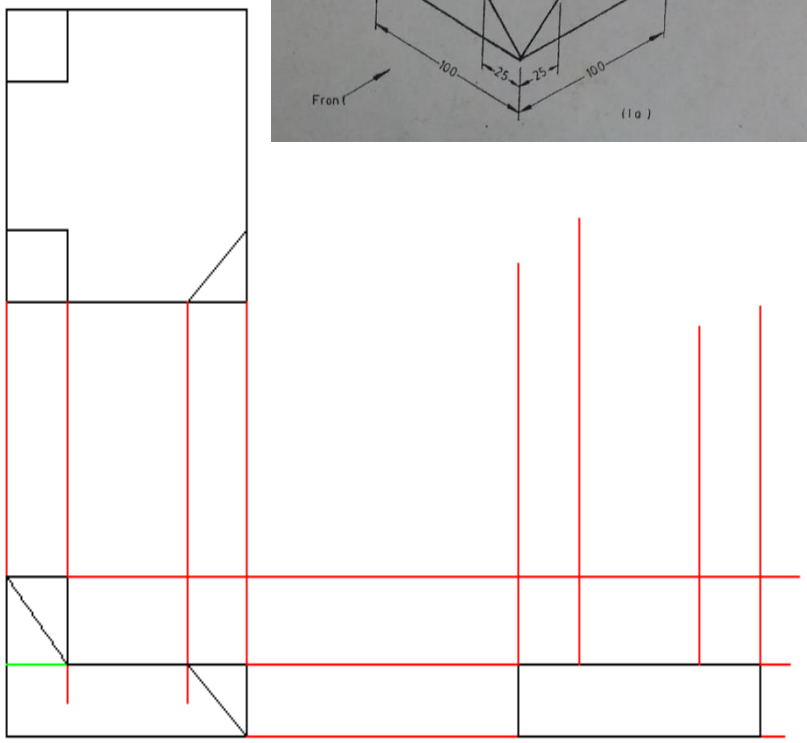


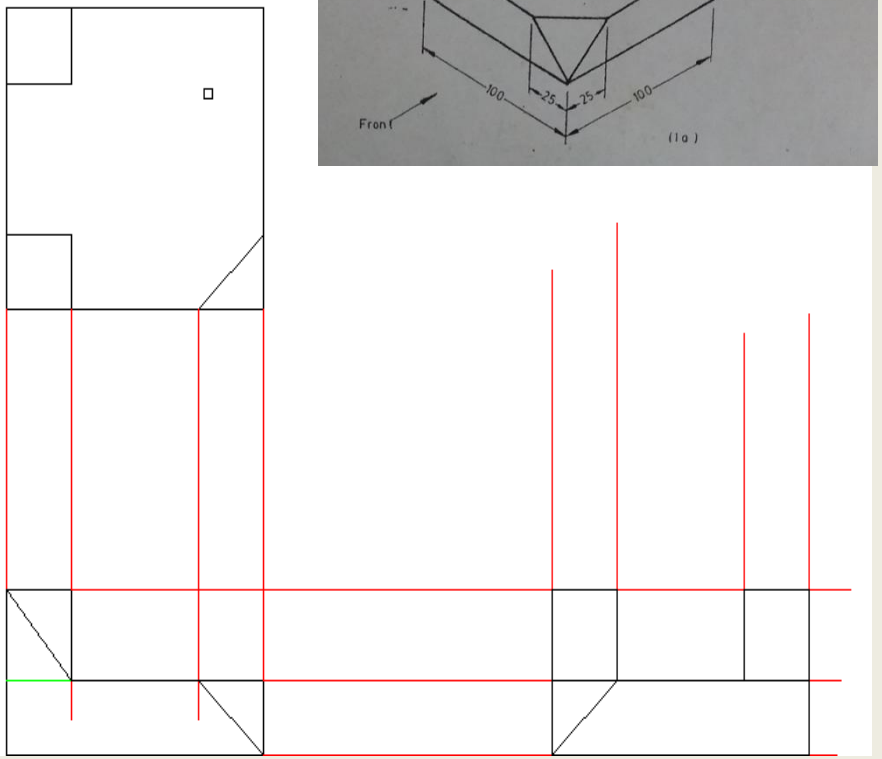


Erase All the Red Lines & Give Dimensions









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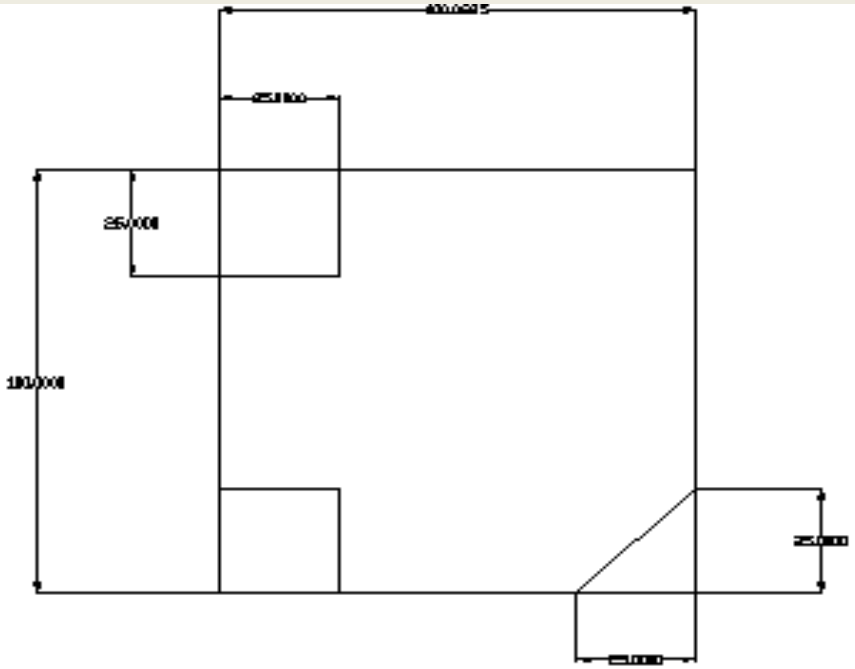
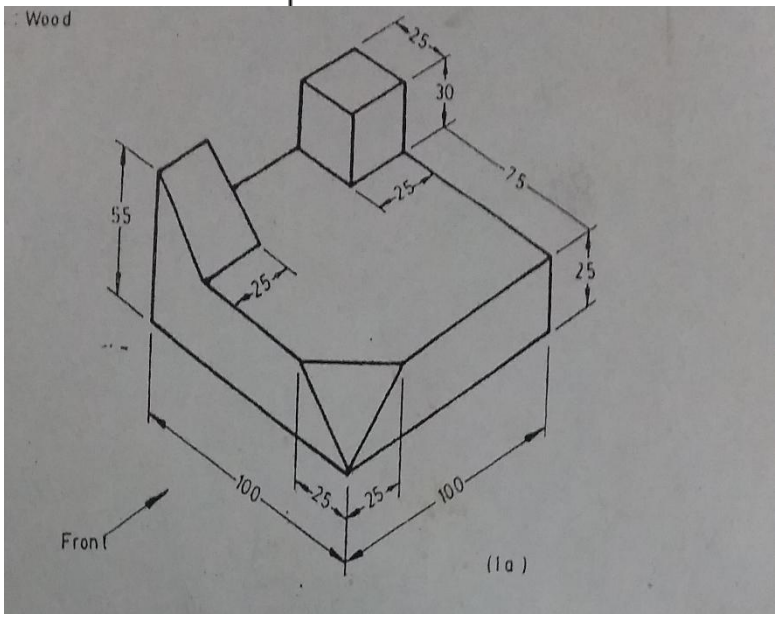
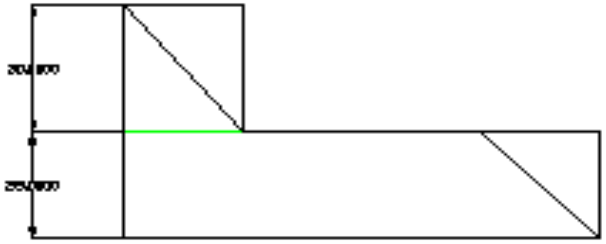
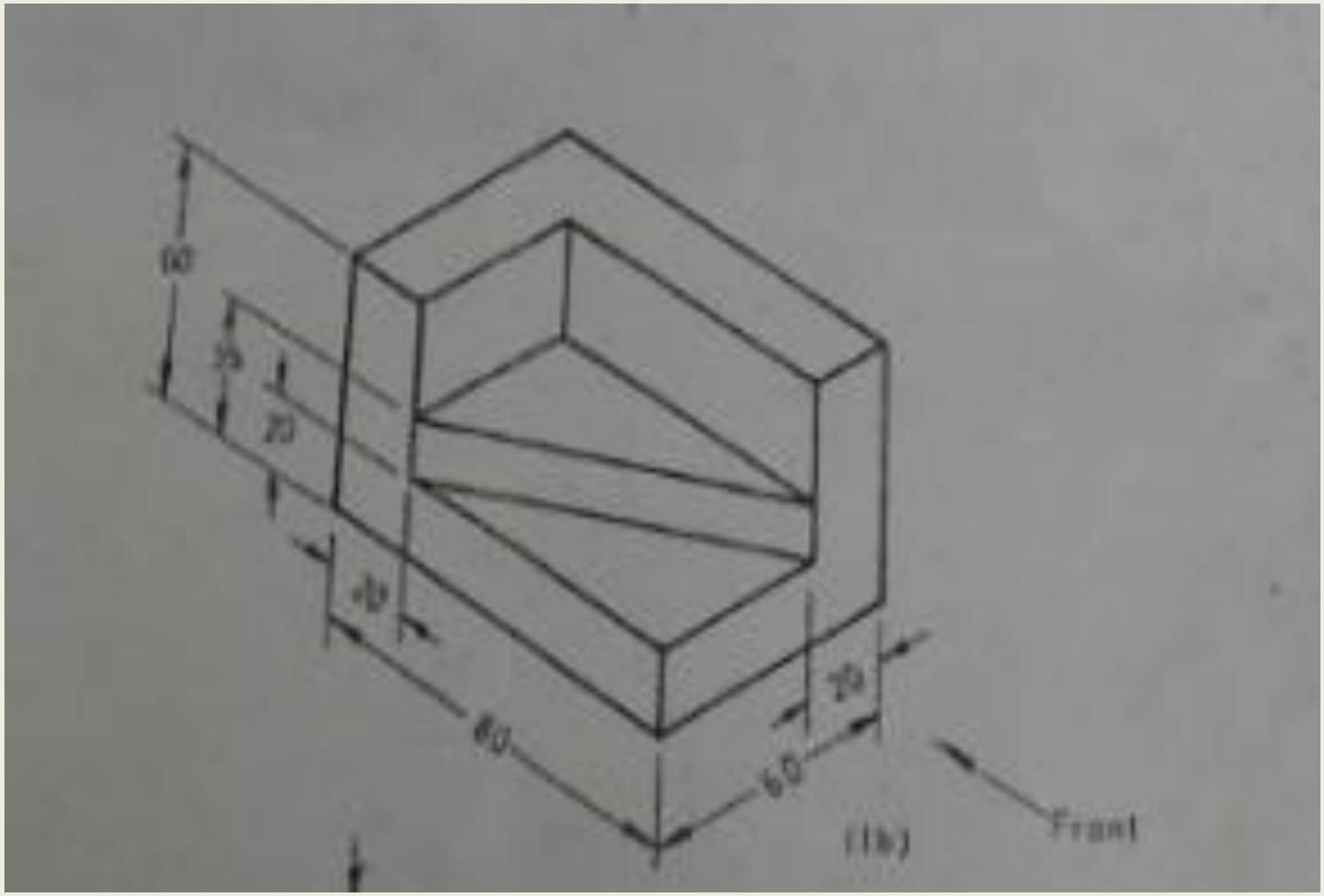
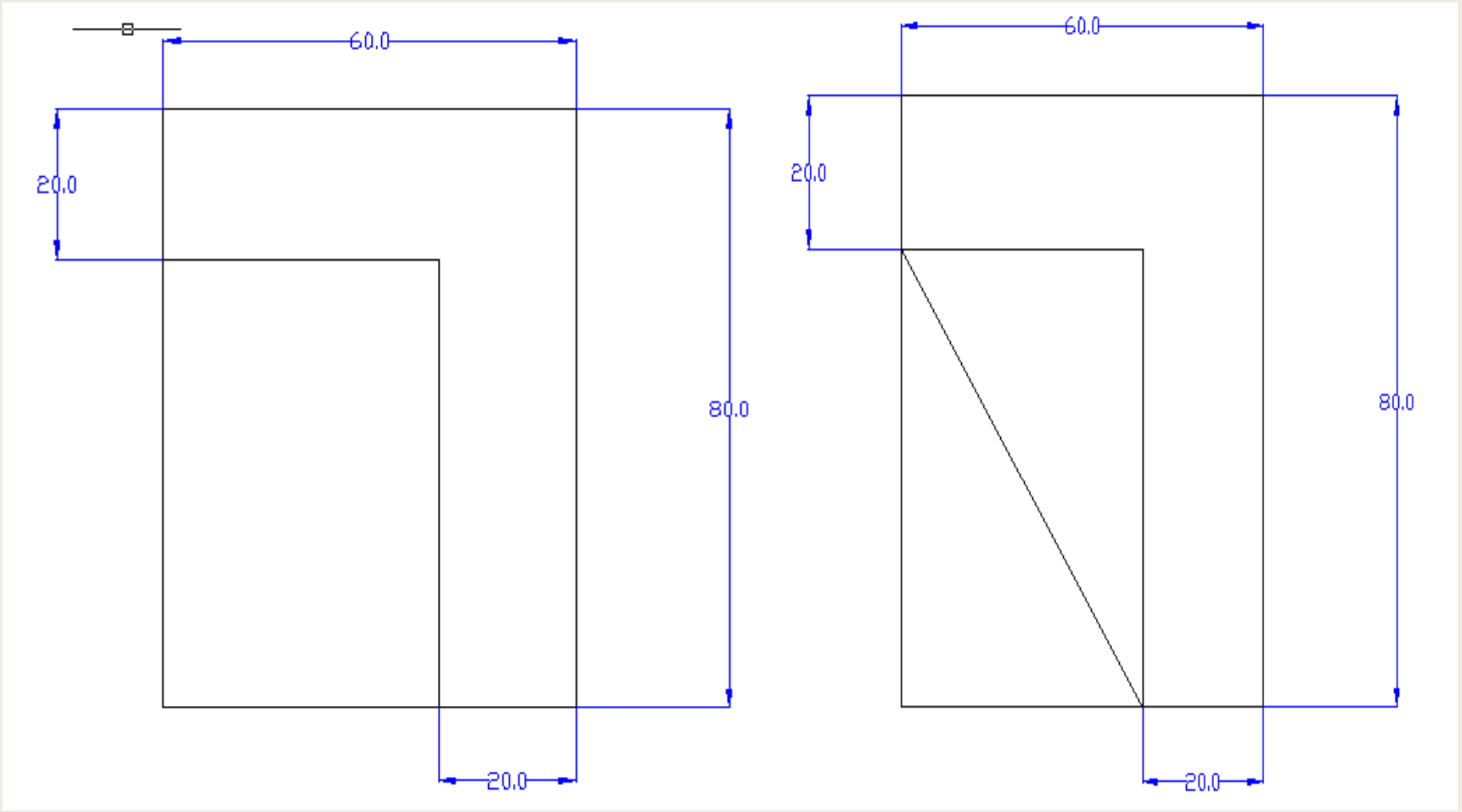



: Wood
25
30
75
25
55
25
25
25
25
100
25
25
100
Front
(1a)

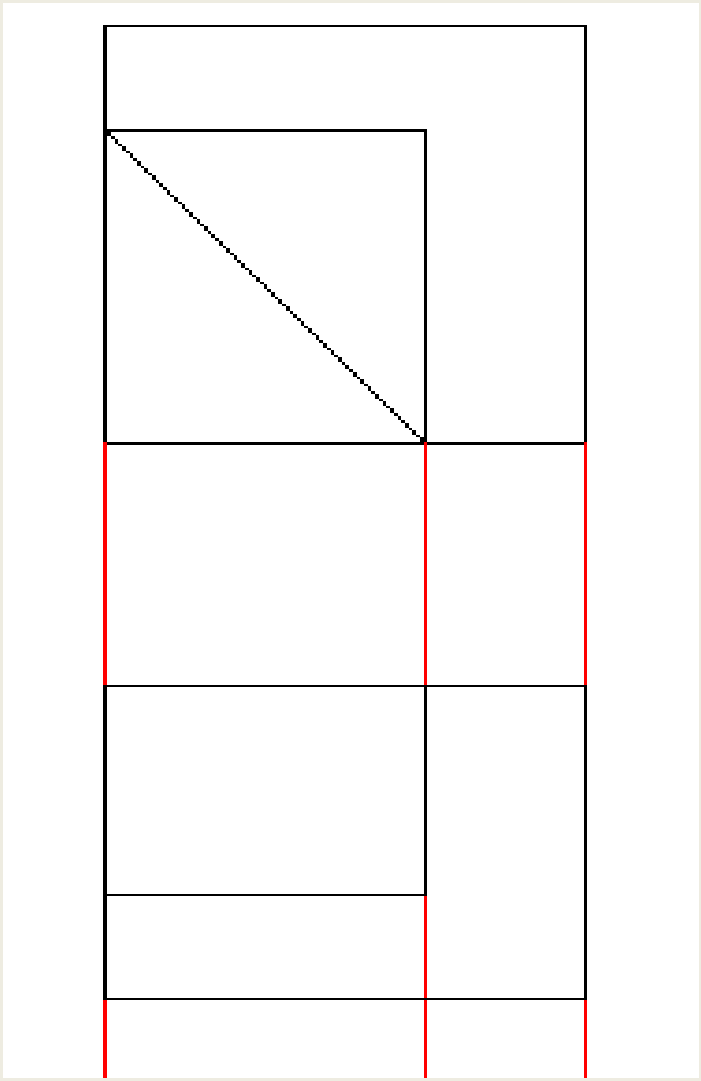


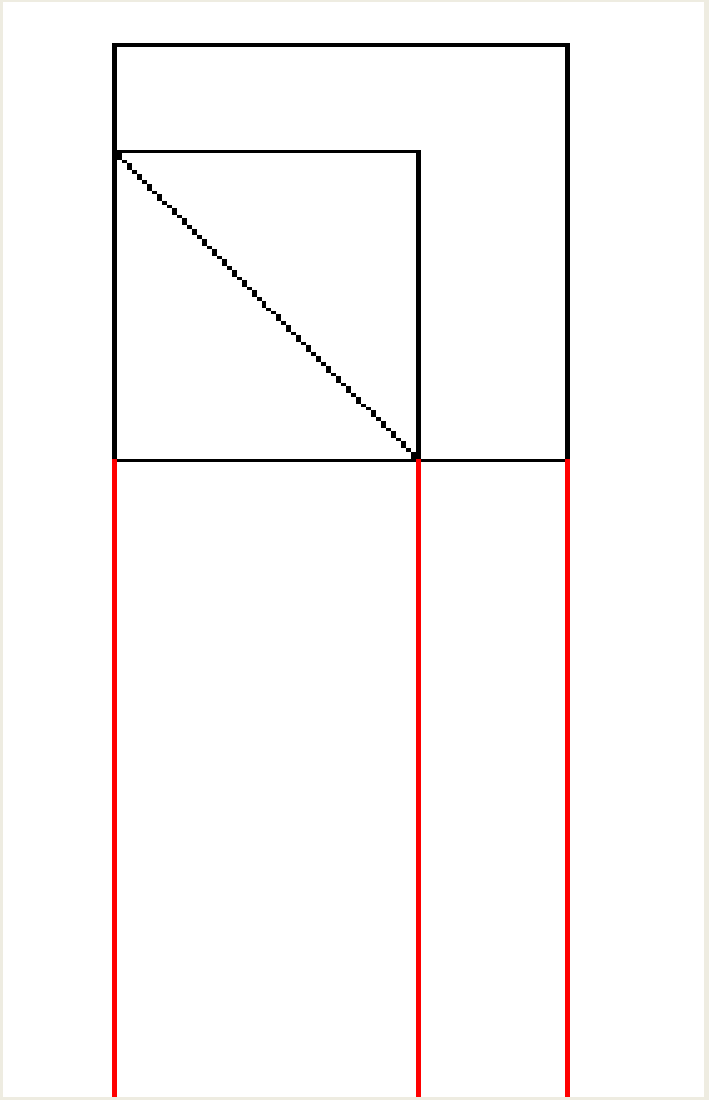
Second Problem

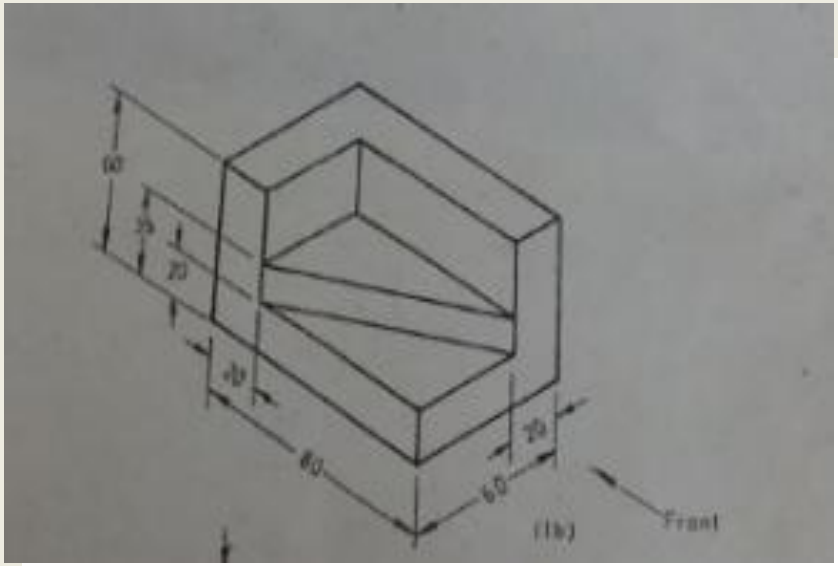


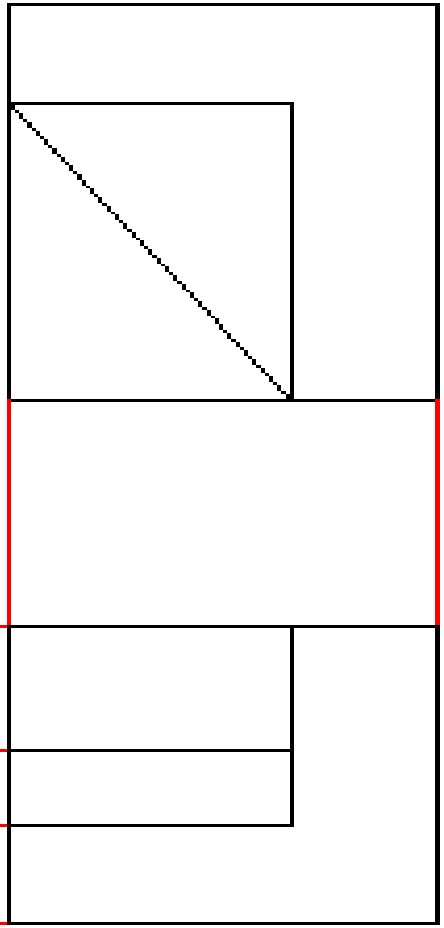


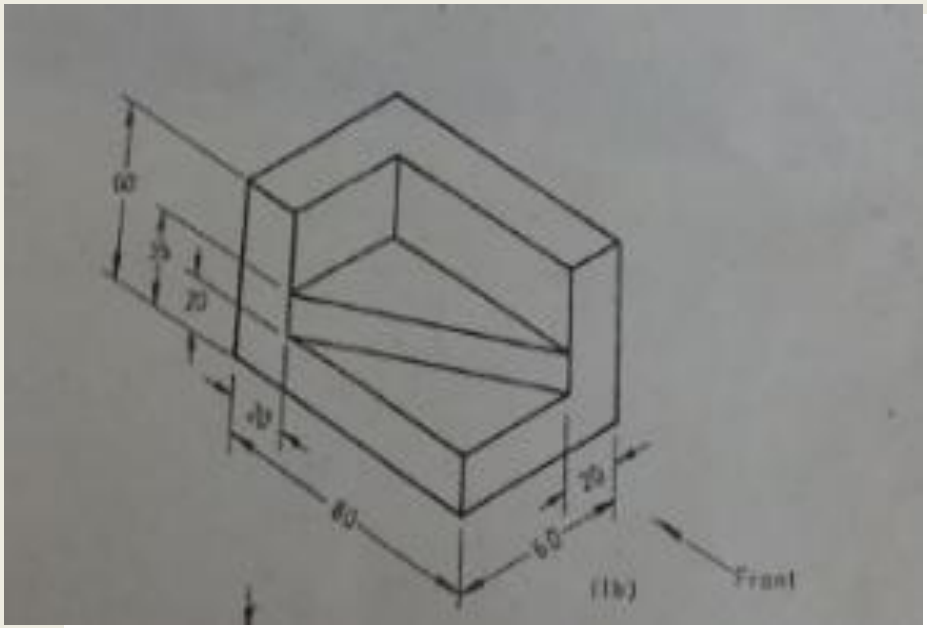
Top View

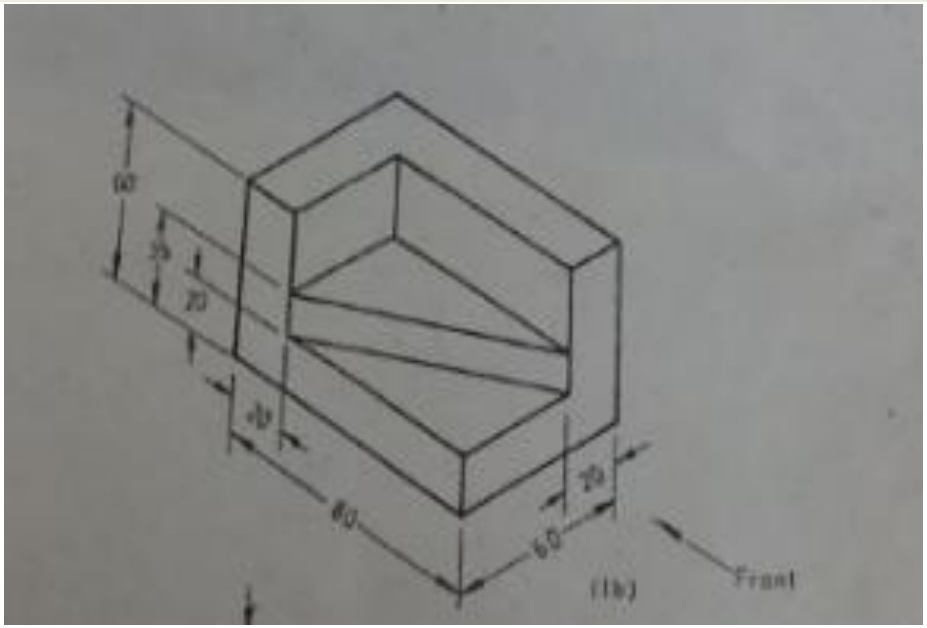


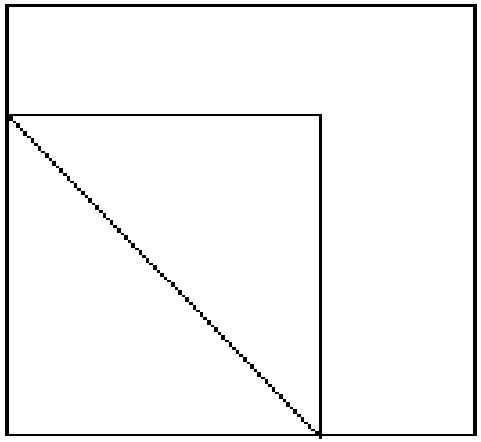



80
70
20
60
20
60
Front
(1b)

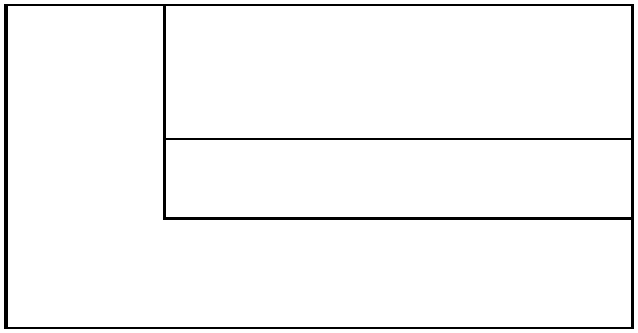



60
20
20
20
80
60
20
(1b)
Front

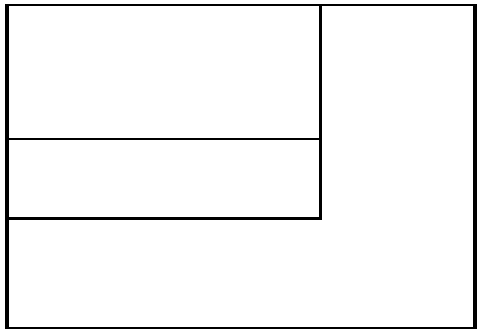




TOP VIEW

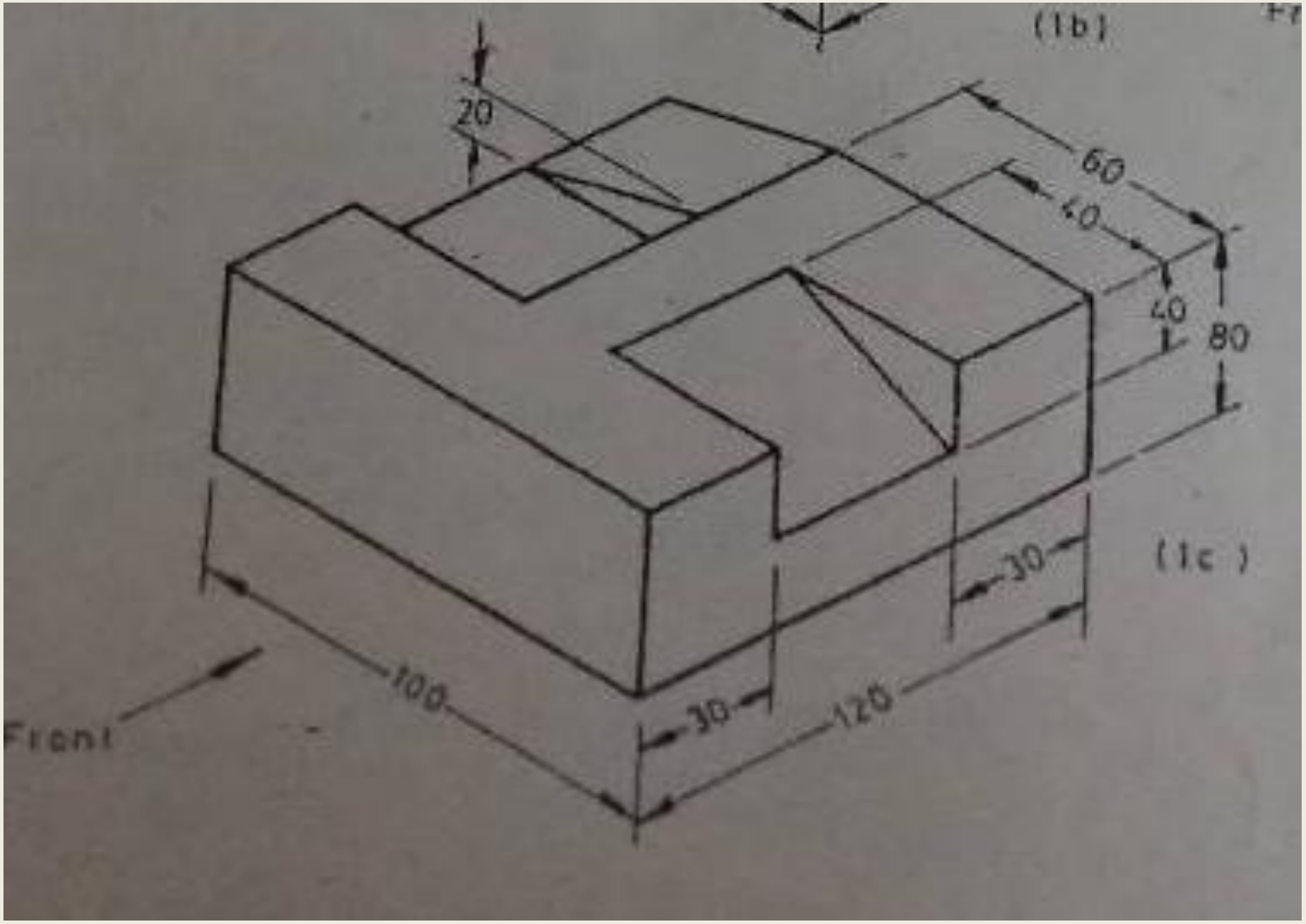


LEFT HAND SIDE VIEW



FRONT VIEW

Third Problem



Persist Until Succeed !!!