Lecture 5

Missing Views
Orthographic Reading



TOPICS

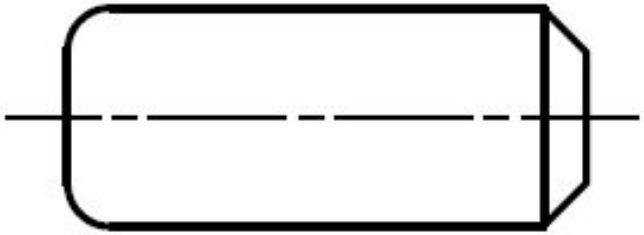
- Definition
- Orthographic Reading
  - Analysis by Solids
  - Analysis by Surfaces
- Missing View Problems

DEFINITION

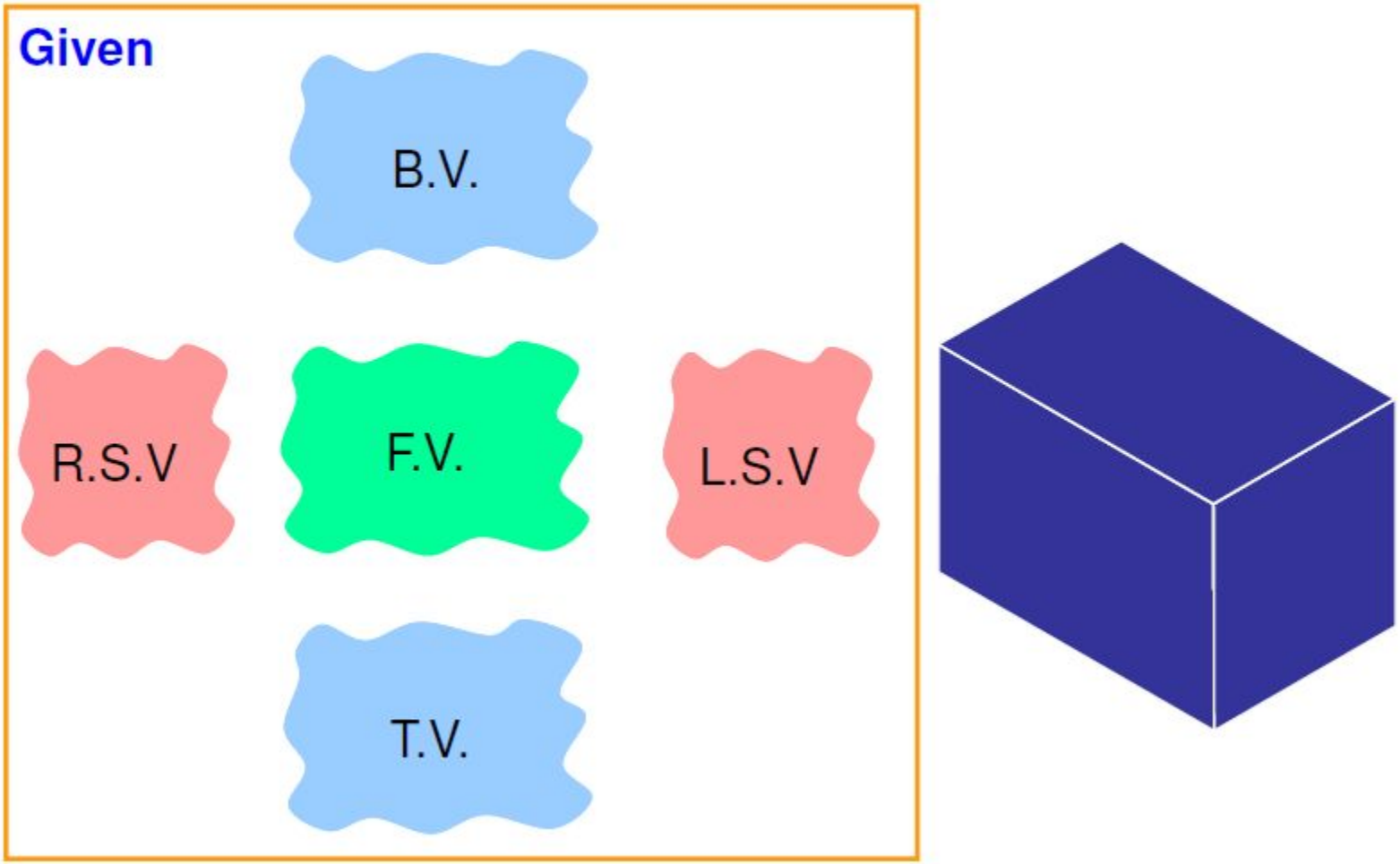
Reading a drawing is the process of ***recognizing the shape of an object*** by interpreting the orthographic views.

Orthographic Writing

Orthographic Reading

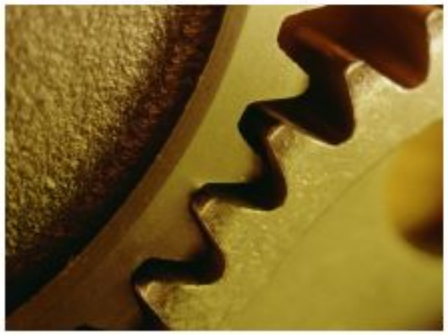


VIEWING DIRECTION



ORTHOGRAPHIC READING

Analysis by Solids

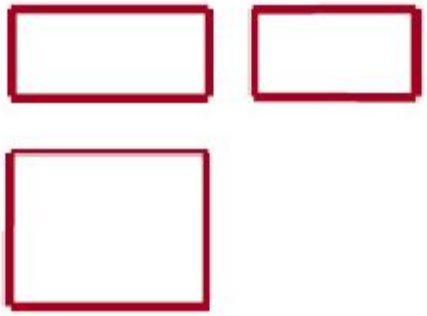


BASIC IDEA

- Objects are decomposed into solid geometric primitives.

Some of familiar solid objects

- Rectangular prism

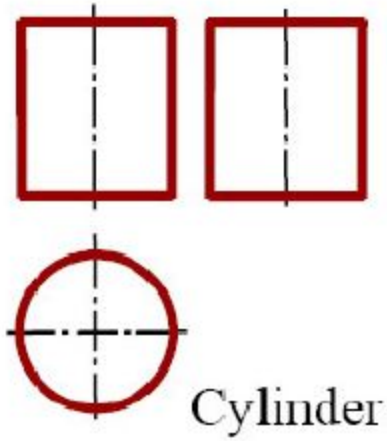


BASIC IDEA

- Objects are decomposed into solid geometric primitives.

Some of familiar solid objects

- Cylinder

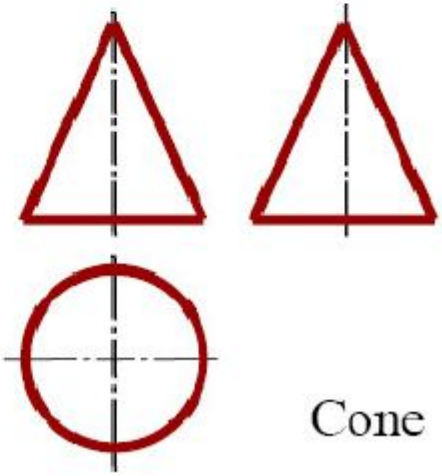


BASIC IDEA

- Objects are decomposed into solid geometric primitives.

Some of familiar solid objects

- Cone



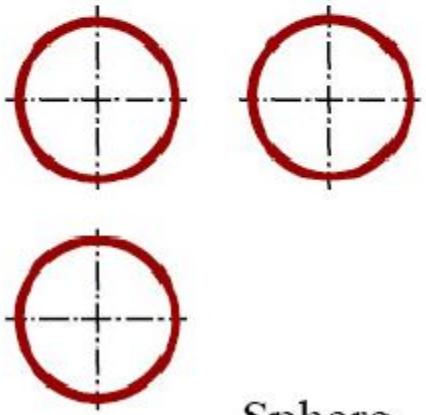
Cone

BASIC IDEA

- Objects are decomposed into solid geometric primitives.

Some of familiar solid objects

- Sphere

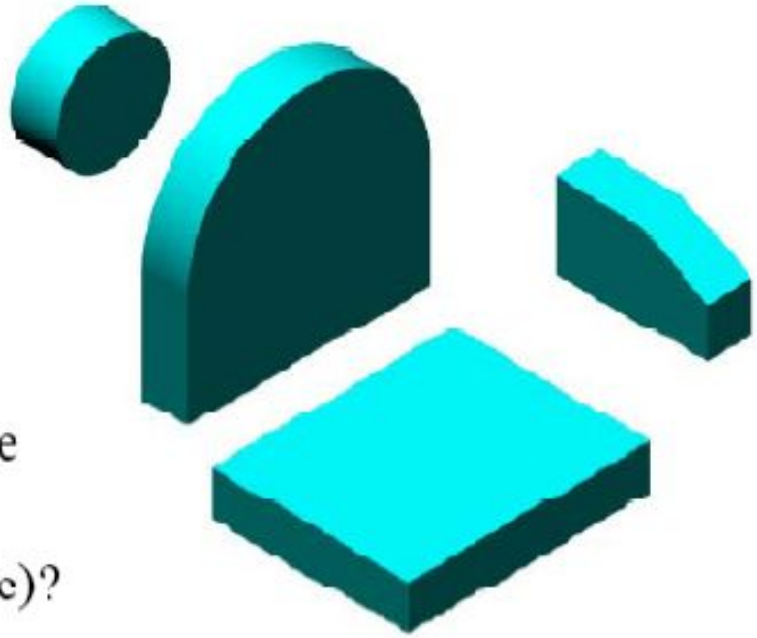


Sphere

READING STEPS

1. Orient yourself with the views given.
   (Choose the viewing direction.)
2. Read the individual surfaces that appeared in each view and related to each other.
3. Create a proper solid geometric primitive from each reading.
4. Assembly all of solid geometric primitive according to orthographic views.

Analysis of solids for an object



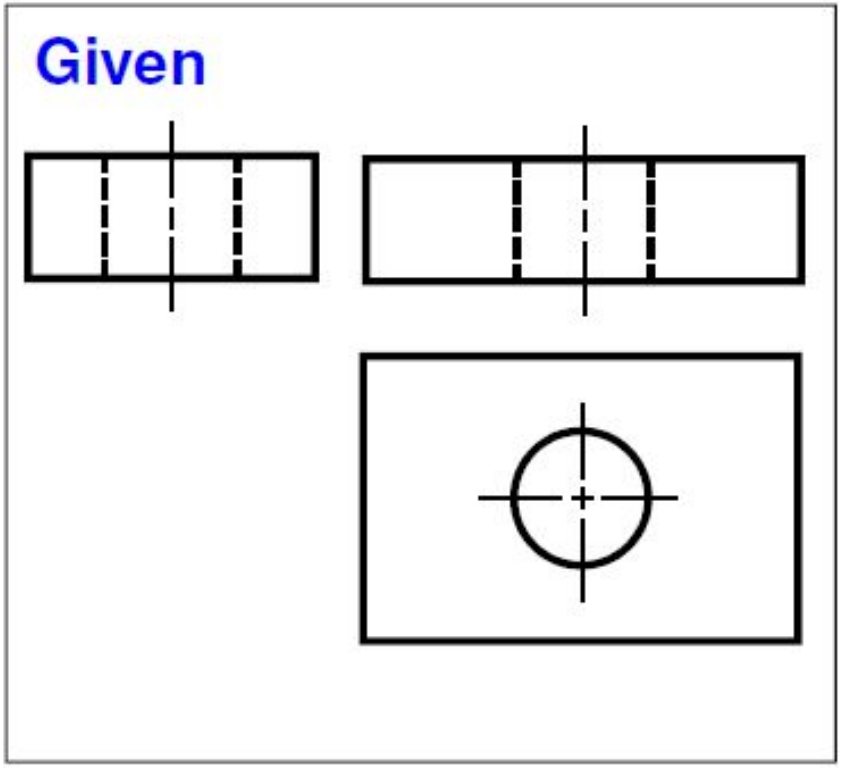
- How many solids(primitives) are integrated in this object?

  Union or subtraction(difference)?
- Relative position ?

  Up or down, right or left, rear or front?
- Relationship between these solids?

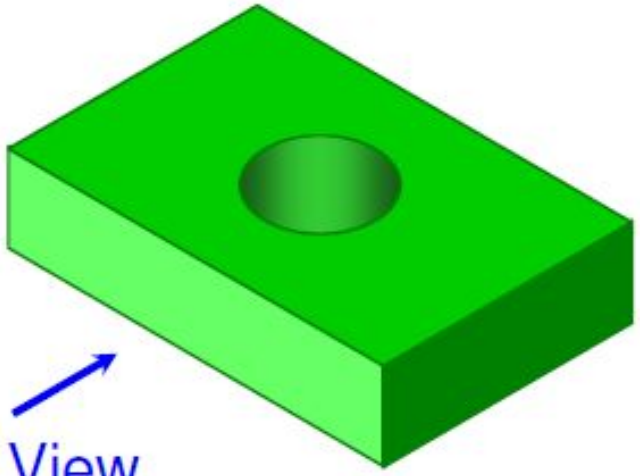
  Coplane? Tangency? Intersection?
- Shapes of three views for different solid?

EXAMPLE A



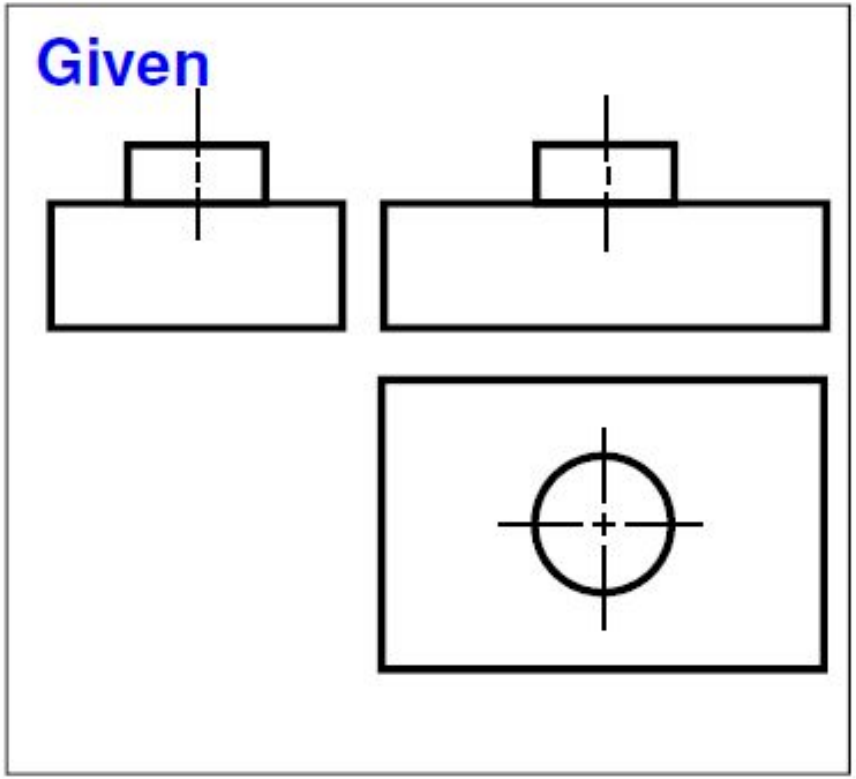
Composition

- Rectangular prism
- Hole



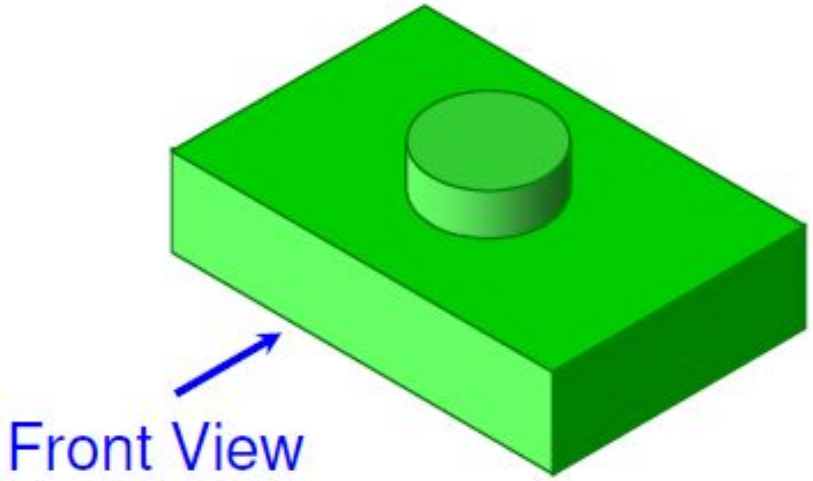
Front View

EXAMPLE B

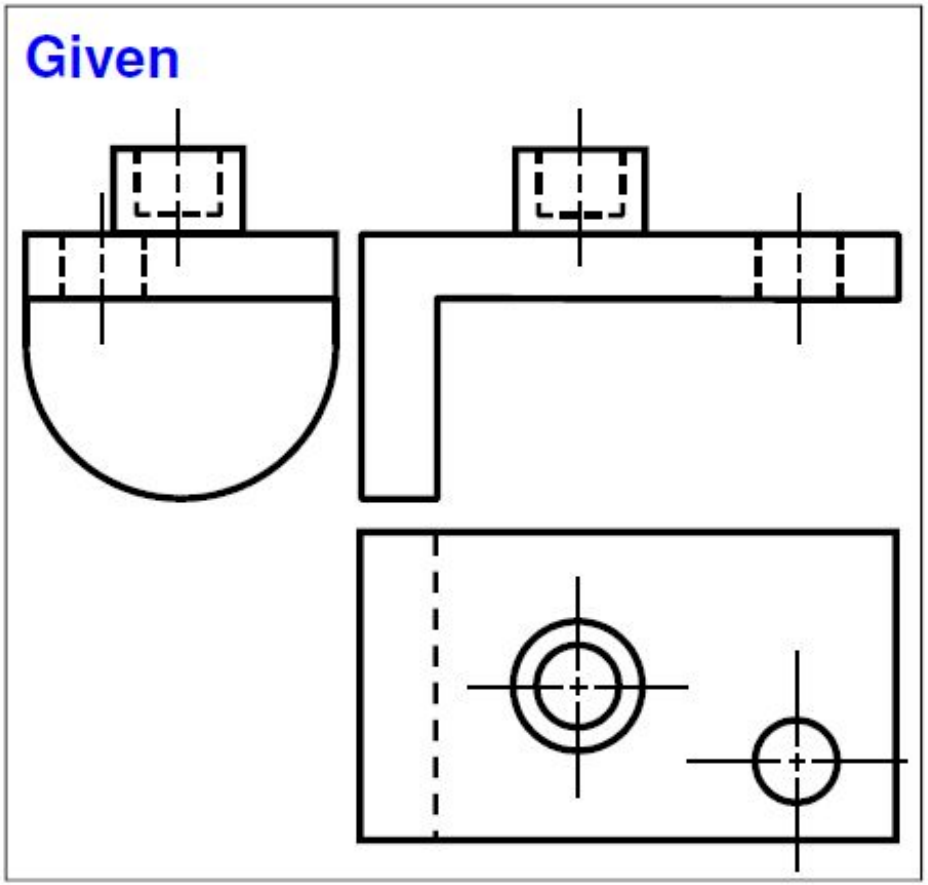


Composition

- Rectangular prism
- Cylinder

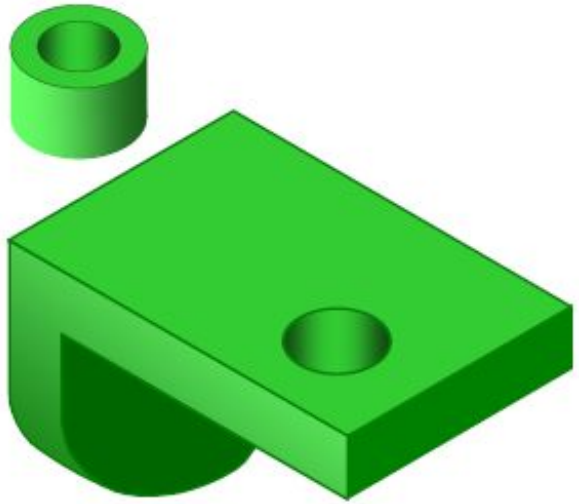


EXAMPLE C



Composition

- Cylinder with a blind hole.
- L-shaped with round end
- Hole



ORTHOGRAPHIC READING

Analysis by Surfaces



READING STEPS

1. Orient yourself with the views given.

2. Read the individual set of lines or surface that appeared in each view and related to each other.

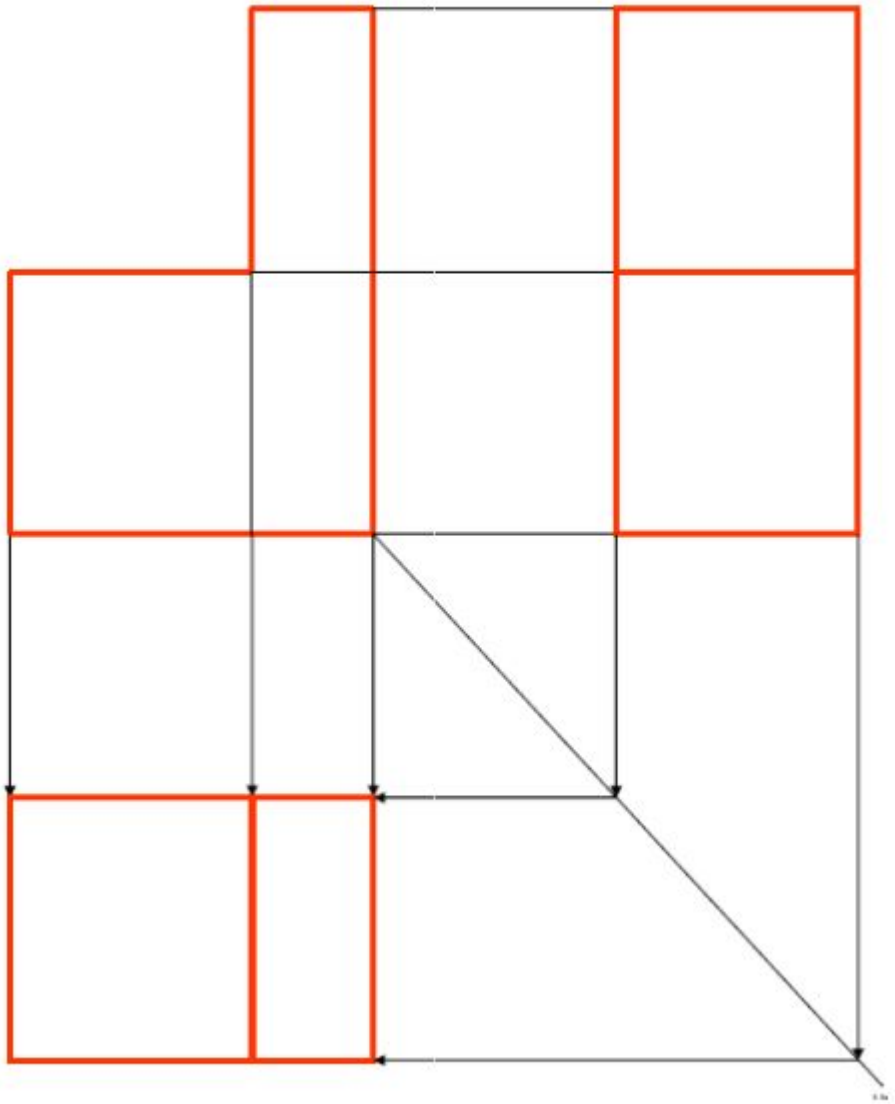
An understanding in orthographic projection, i.e. **meaning of lines and surfaces** are almost important.

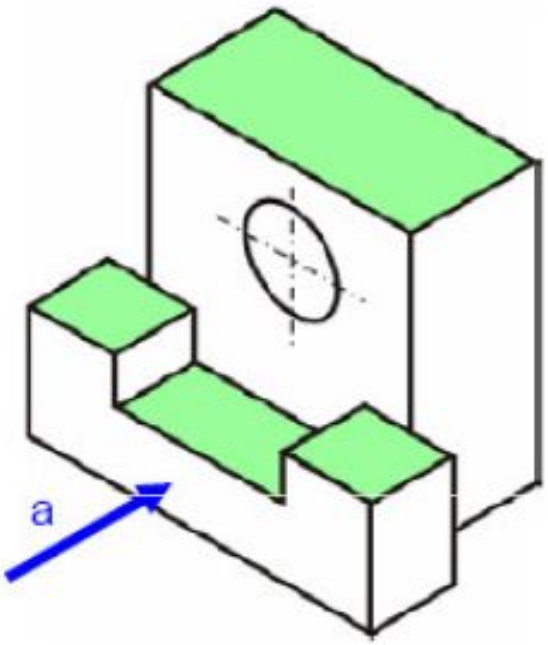
READING STEPS

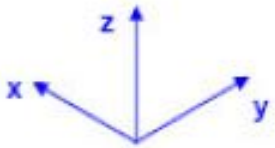
3. Mentally create and sketch a form of the surface that produce the same orthographic views as those at the beginning.

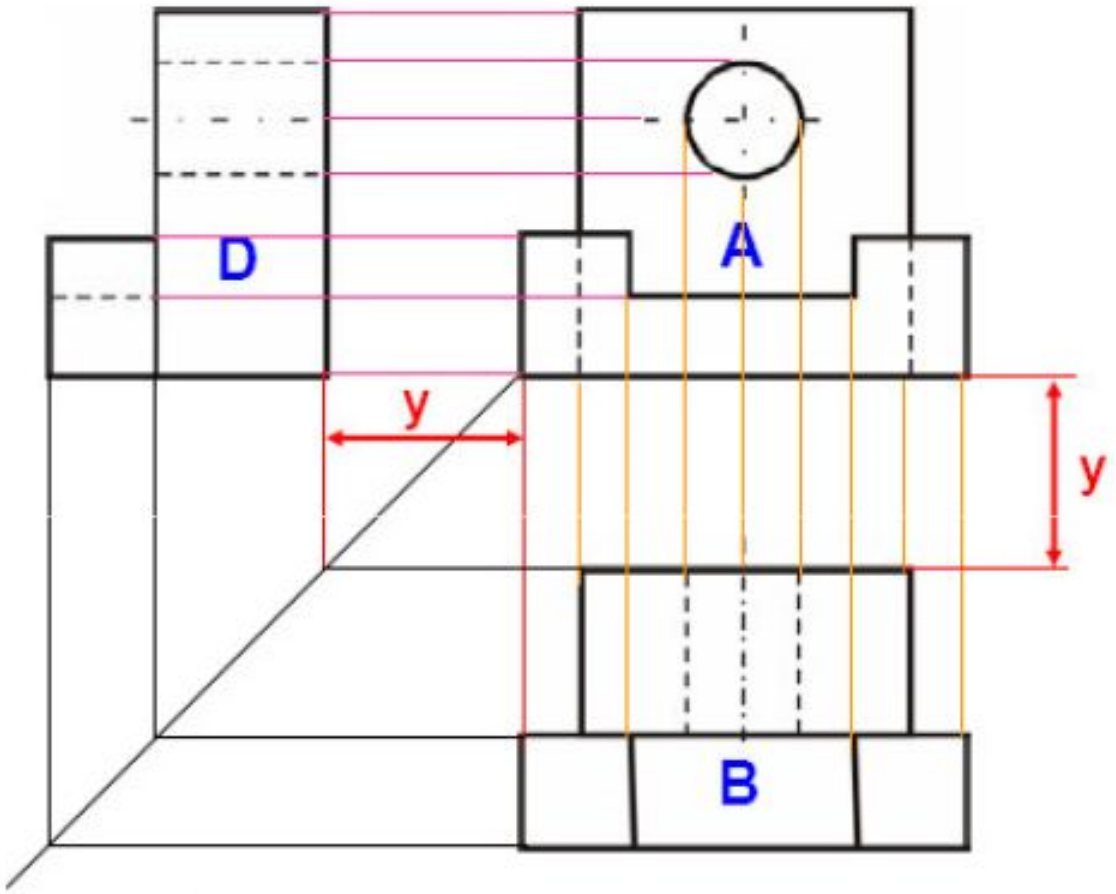
4. Repeat steps 2 and 3 until all surfaces are read.

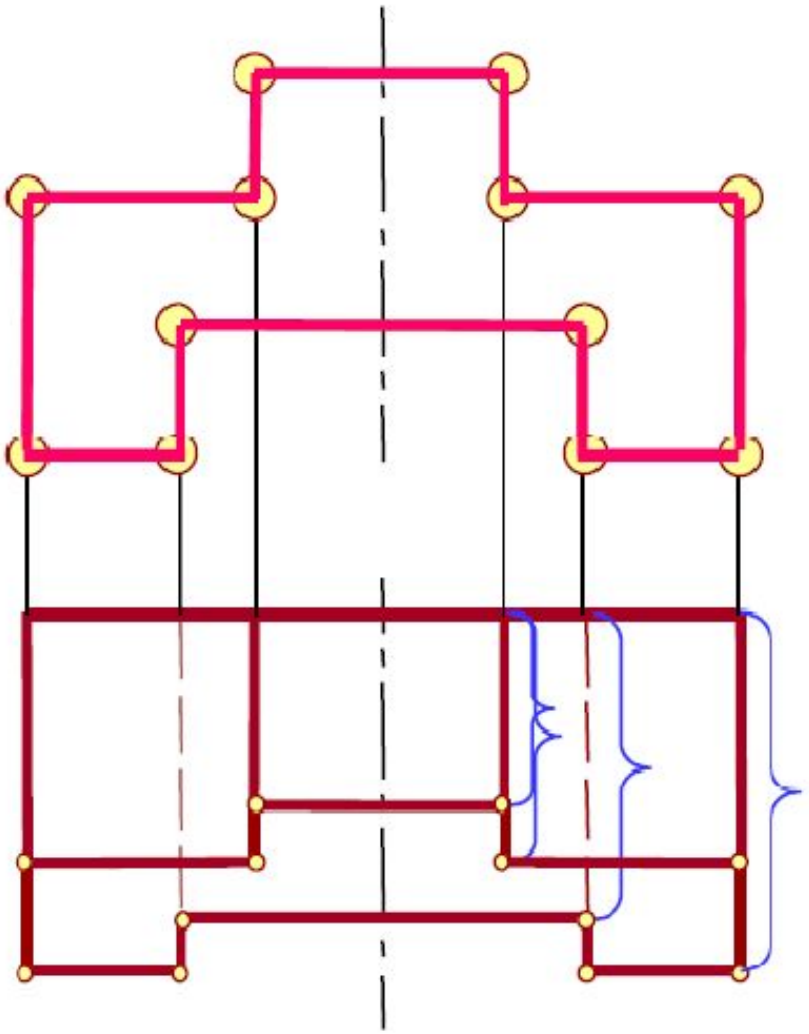
During this repeating process, the details of an object are added up until its completed shape is obtained.

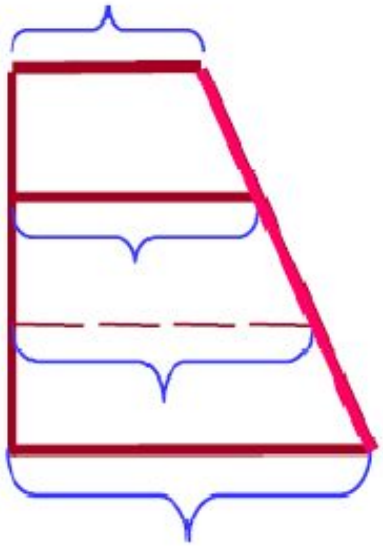


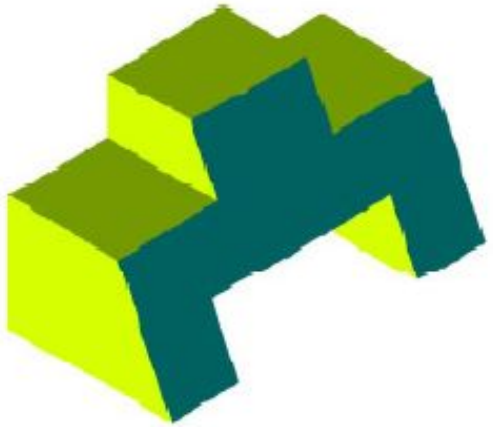

a


z
x
y


D
A
y
y
B

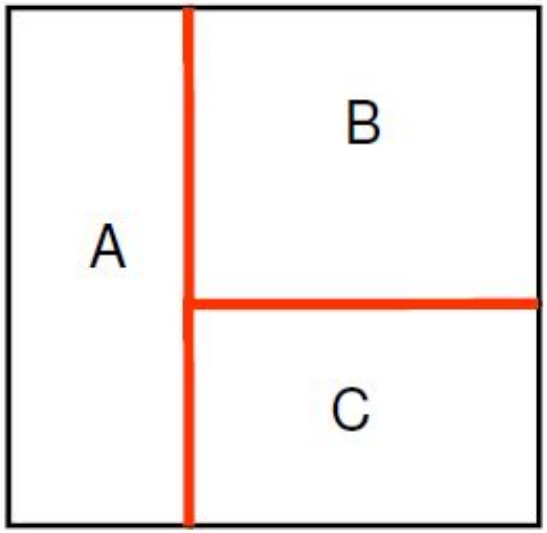






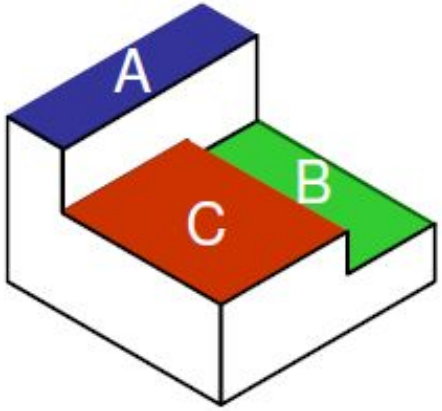
EXAMPLE

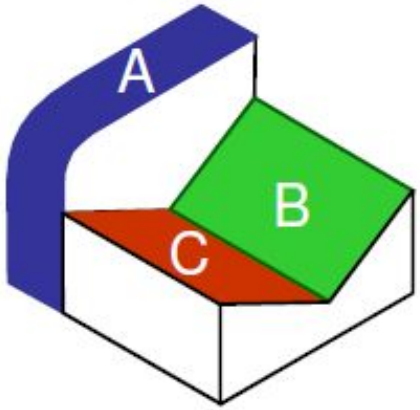
Top view

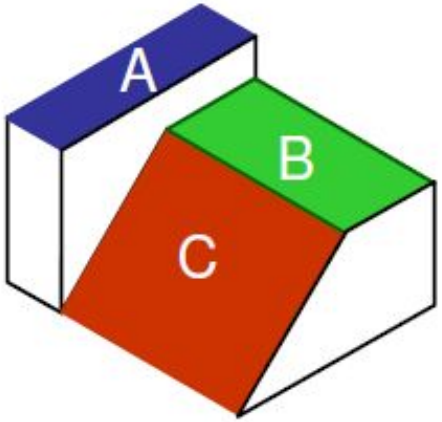


All surfaces A, B and C are **not** in the same plane.

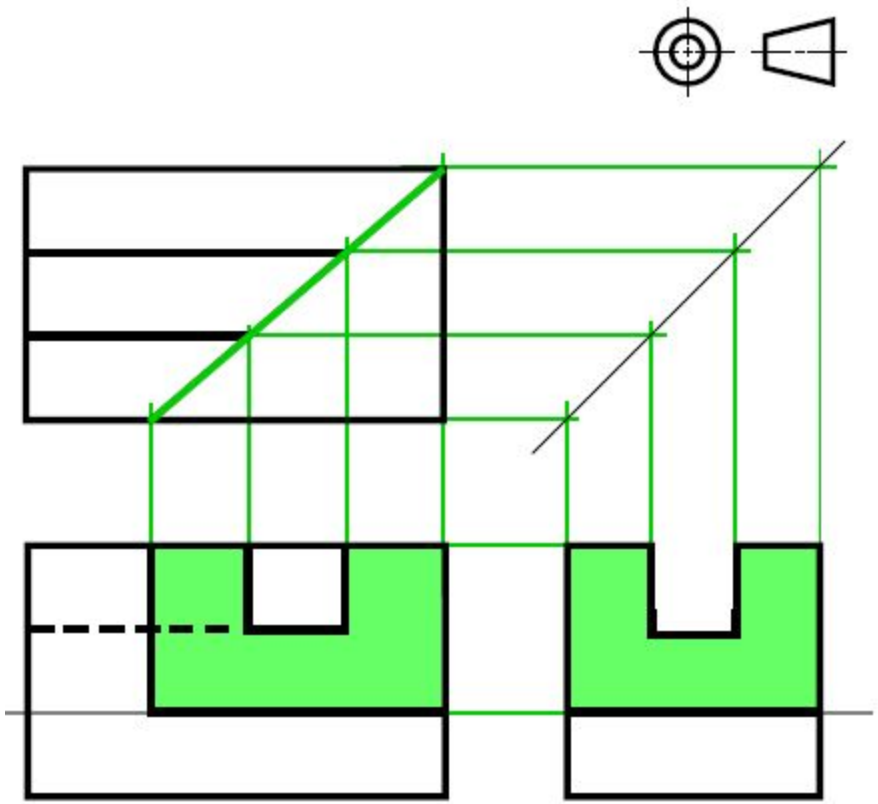
Some of possible objects' shape.

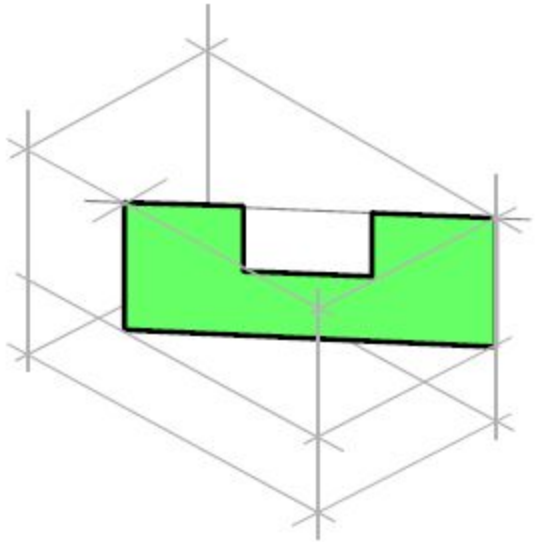




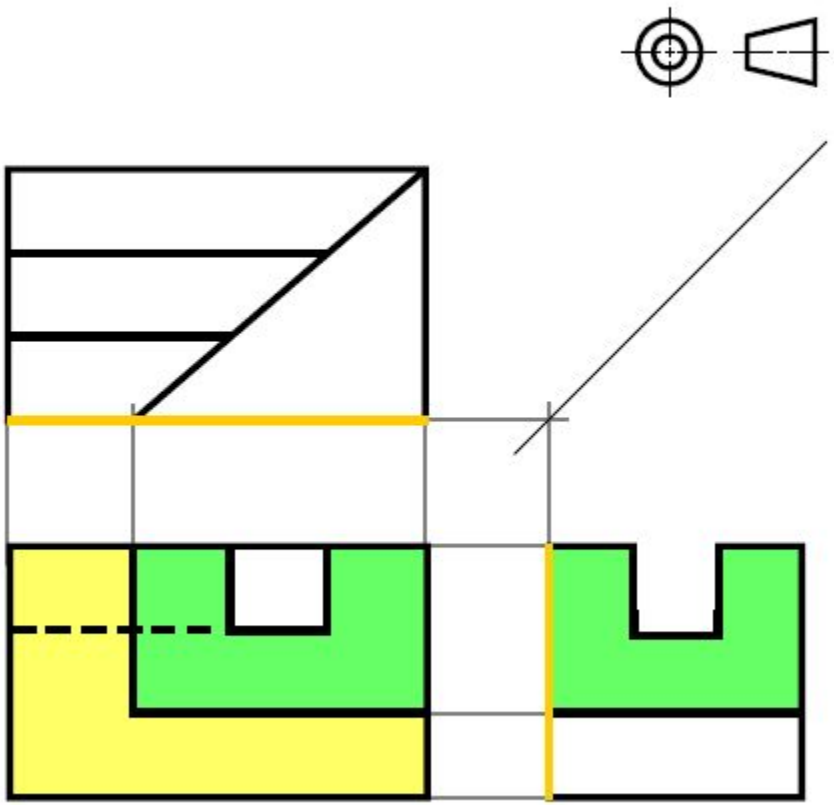


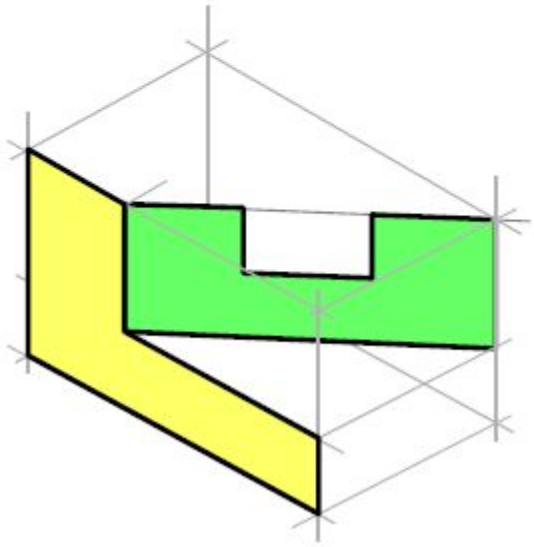
EXAMPLE



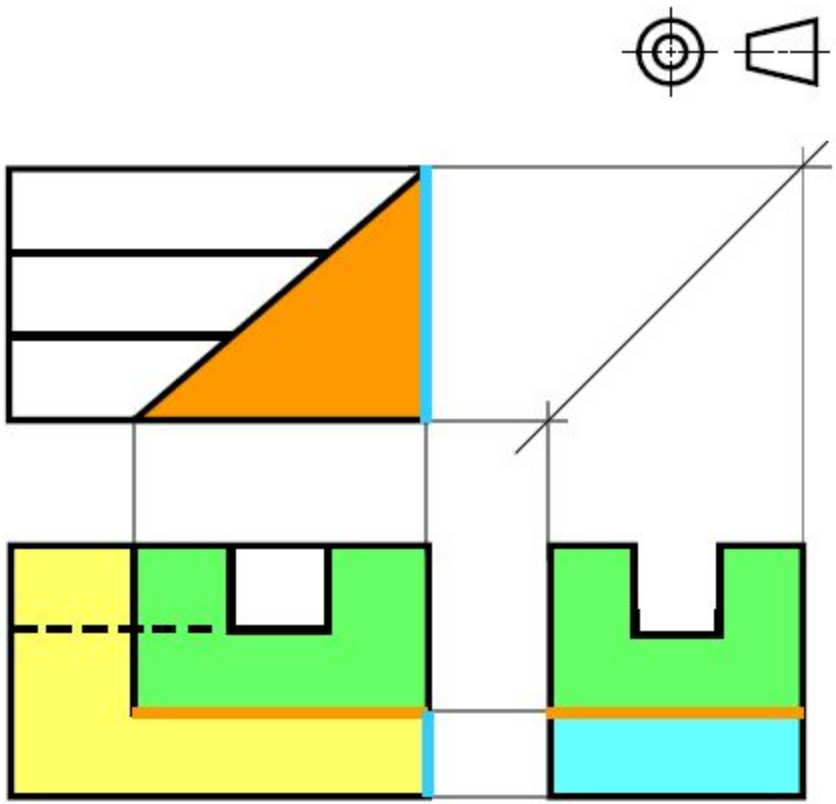


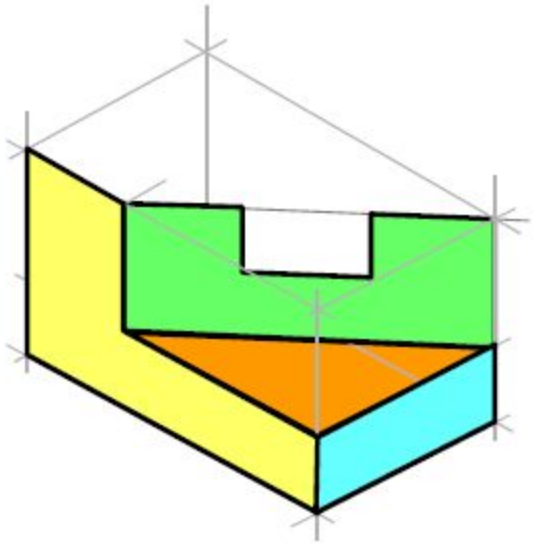
EXAMPLE



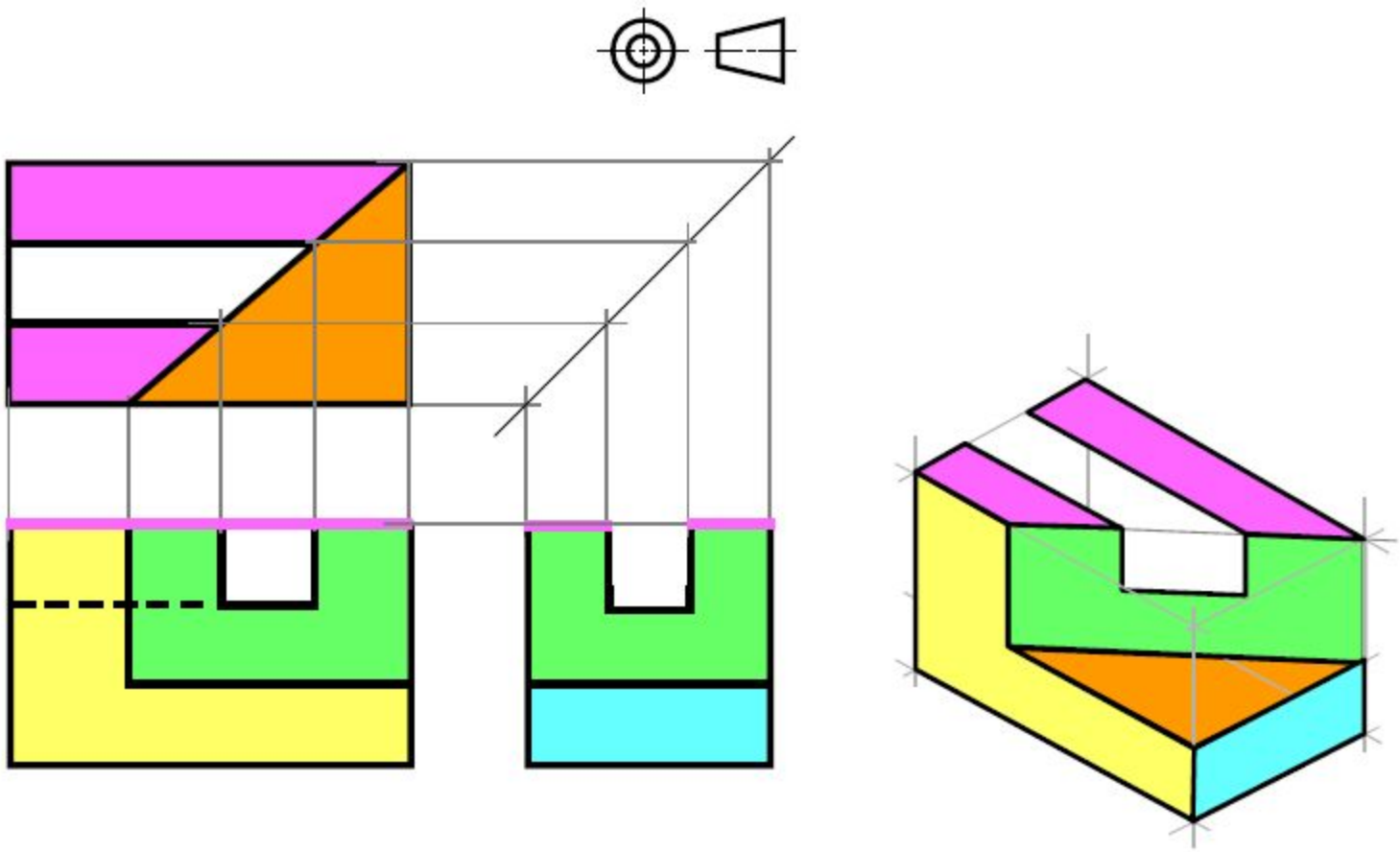


EXAMPLE

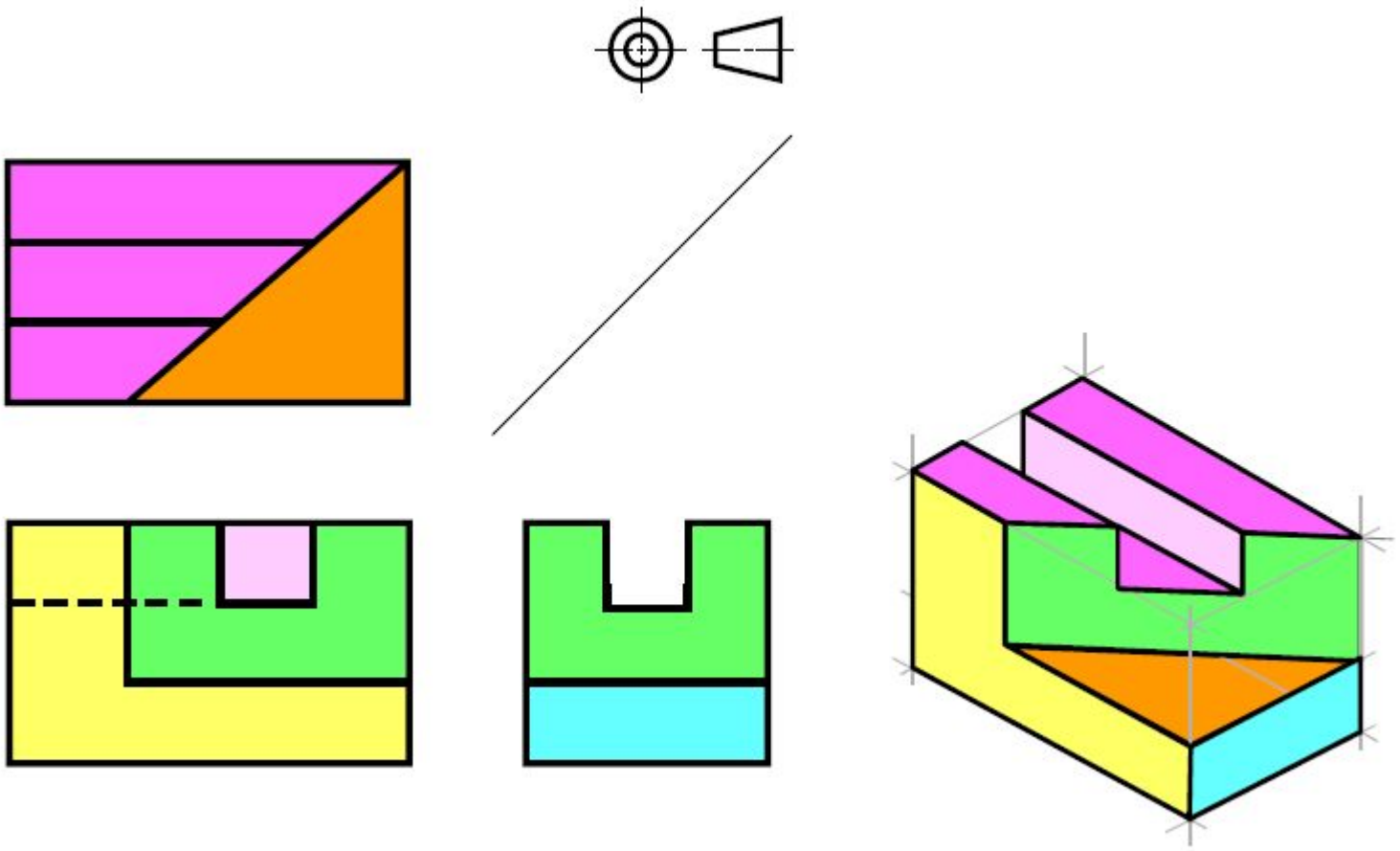




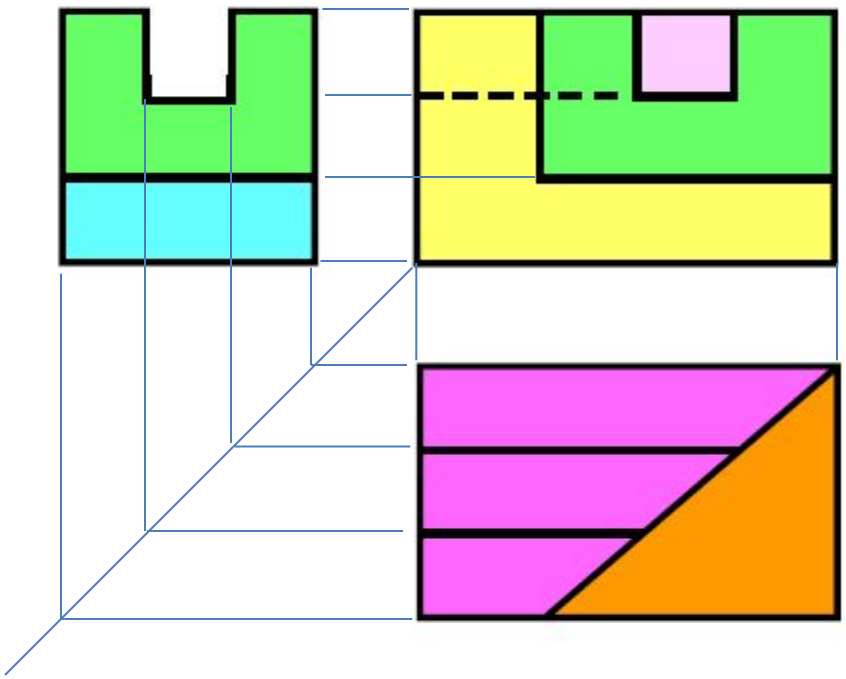
EXAMPLE

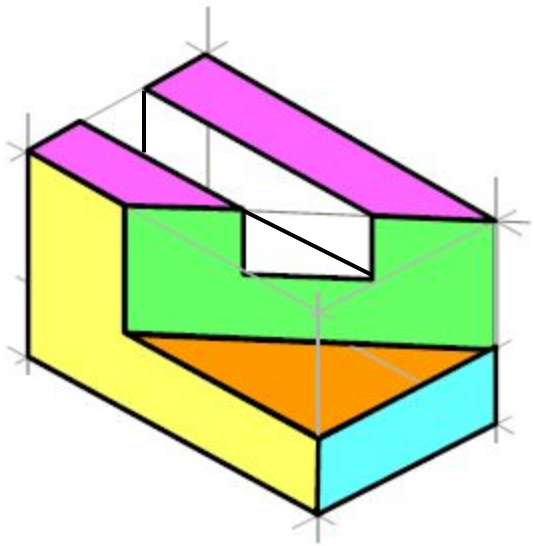


EXAMPLE



EXAMPLE





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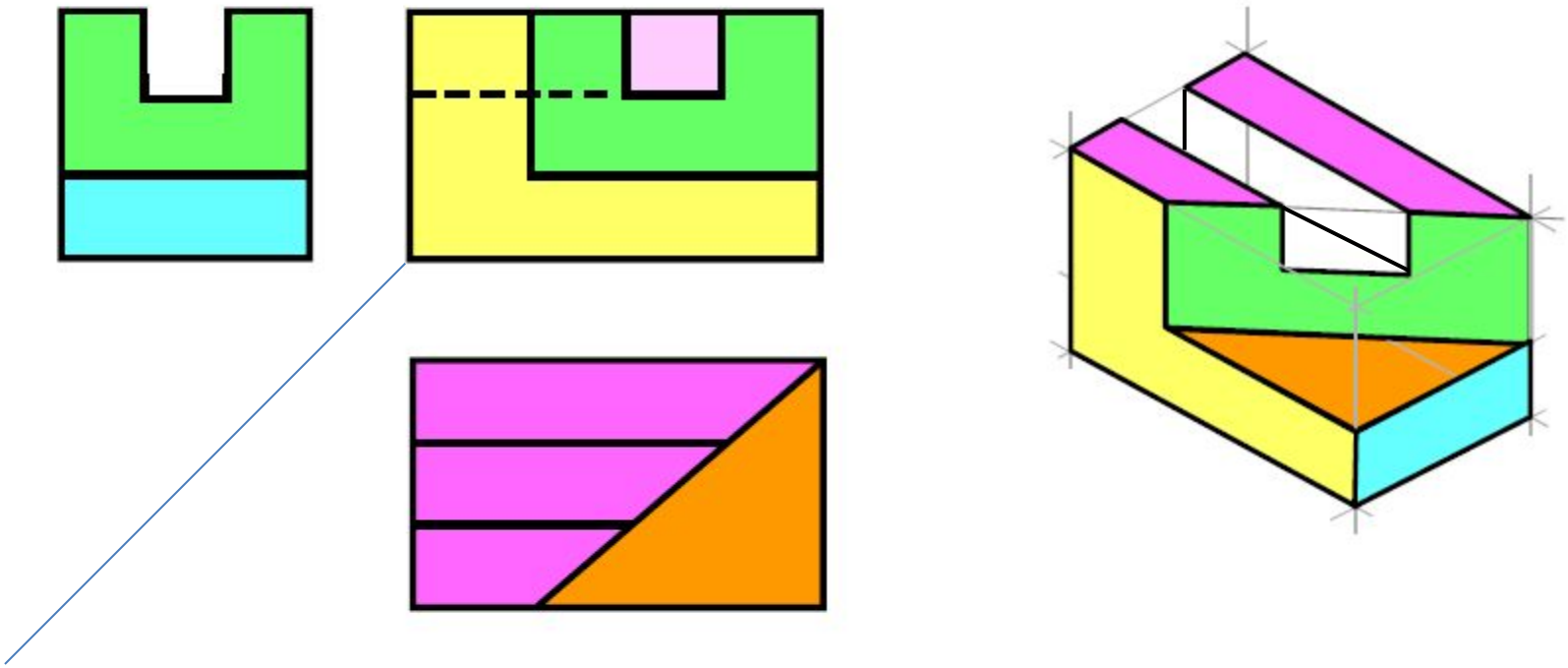
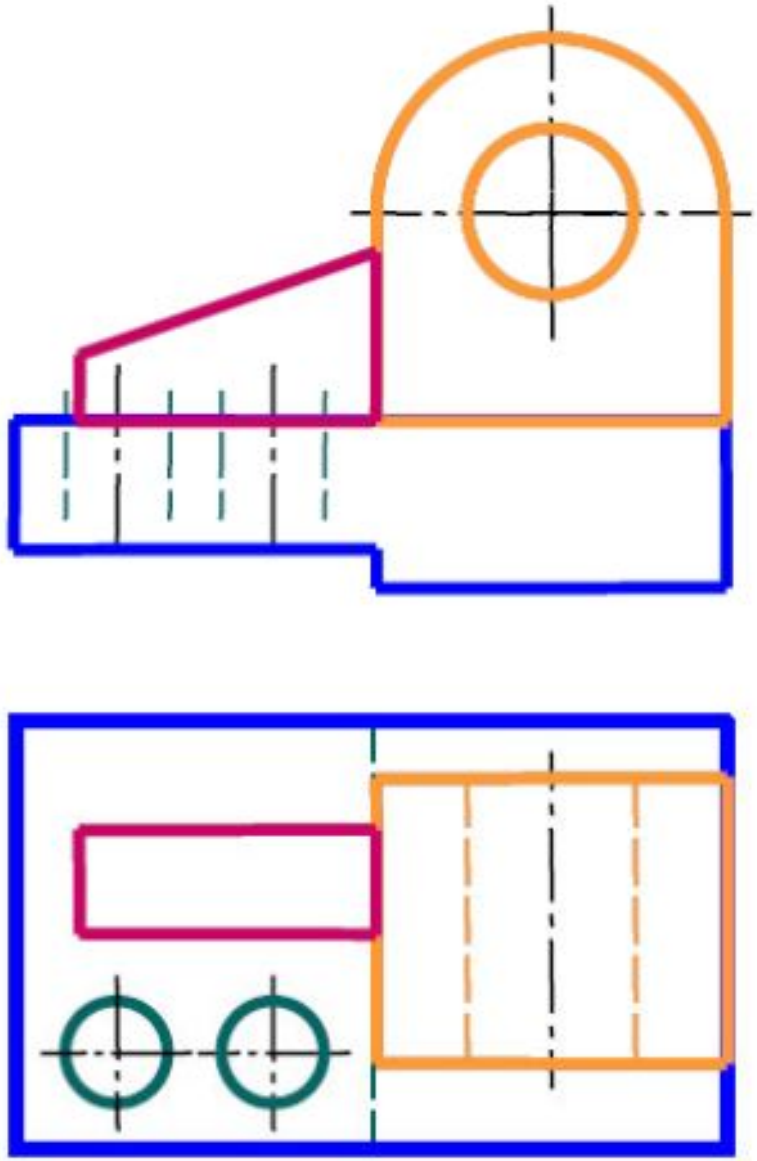
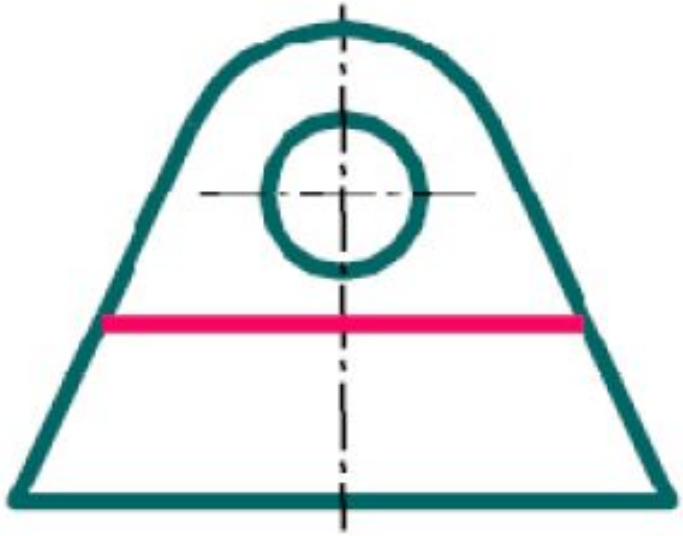
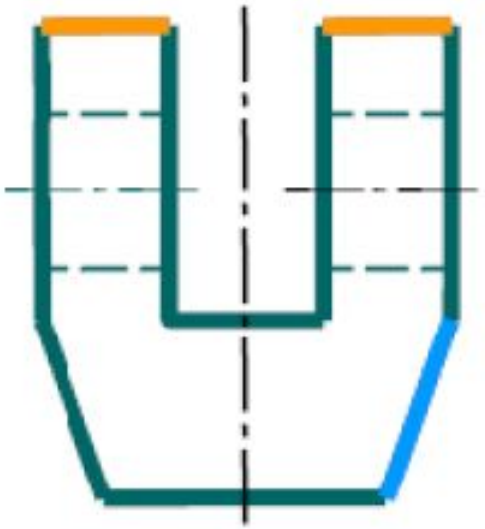
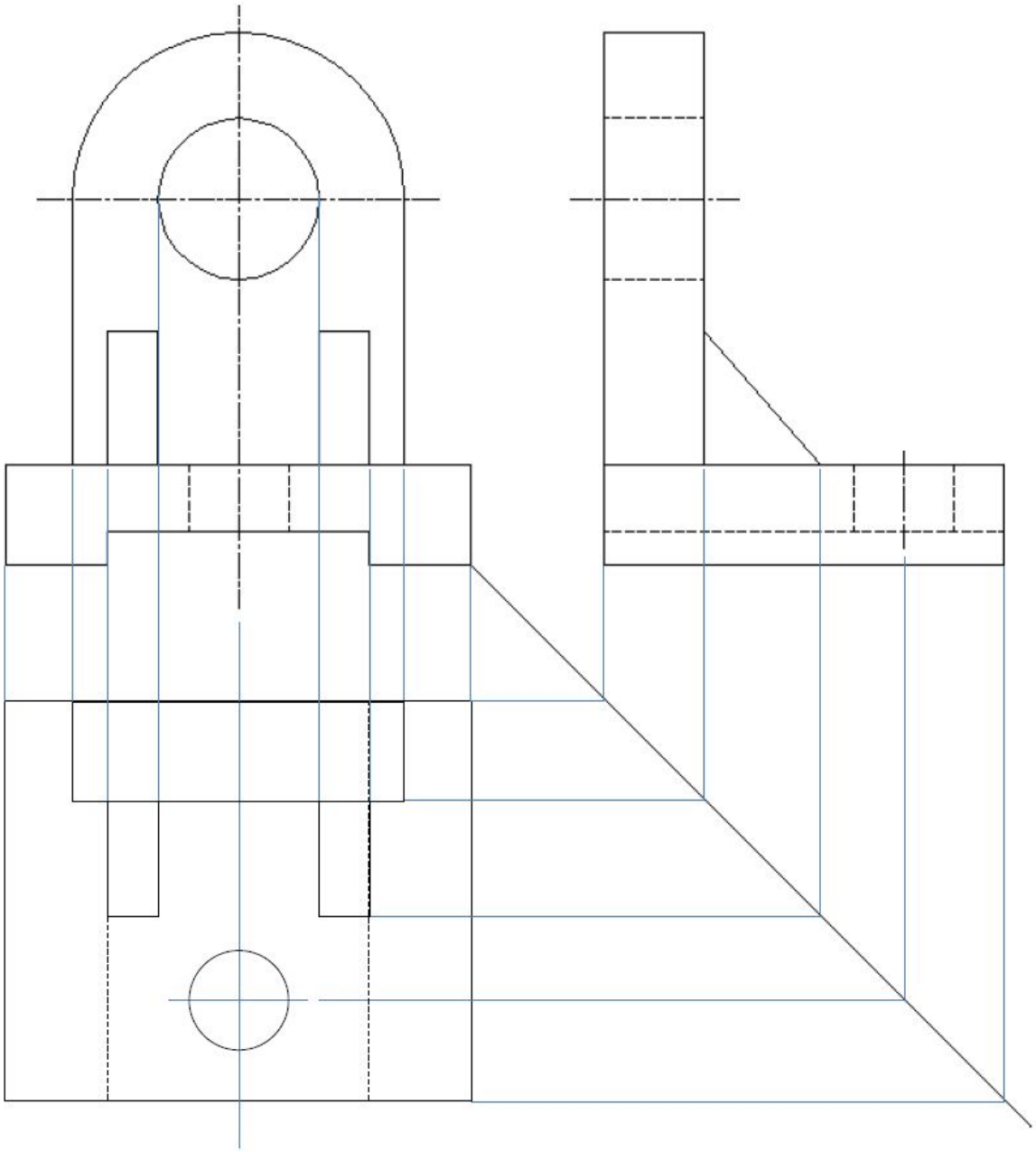


Missing View Problems

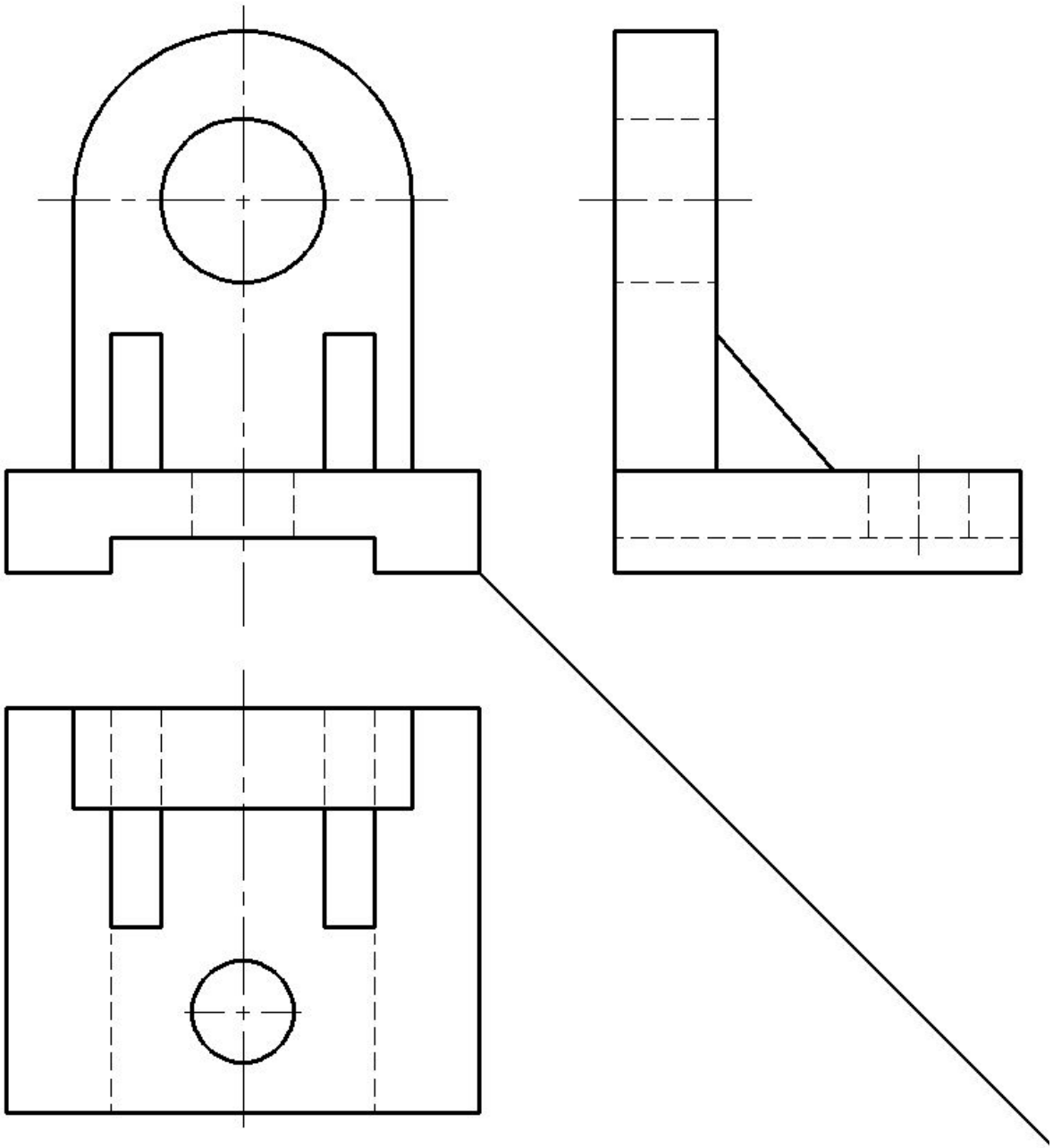


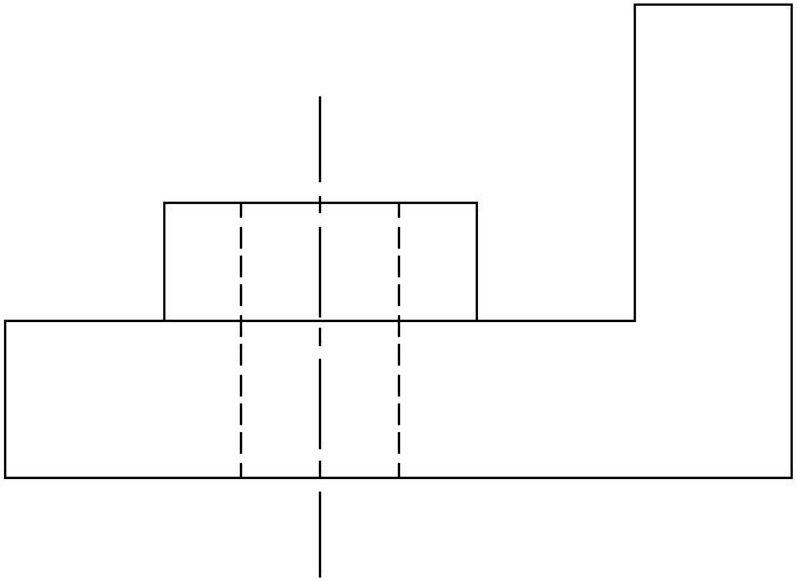


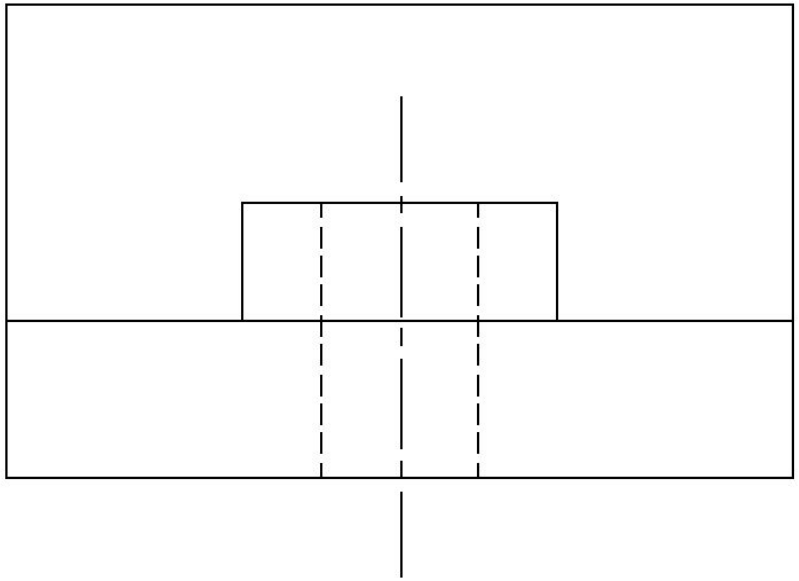


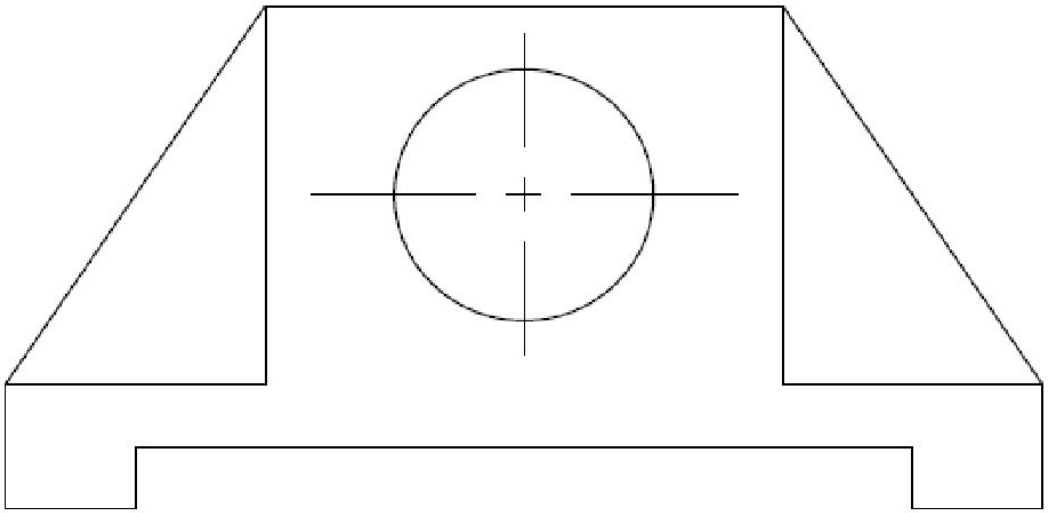


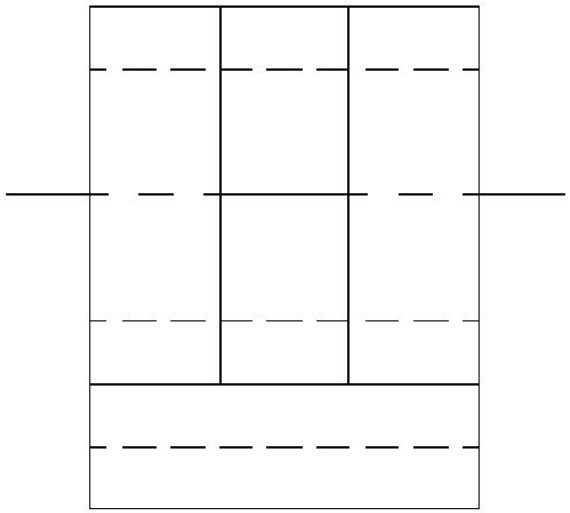
Should Look like this

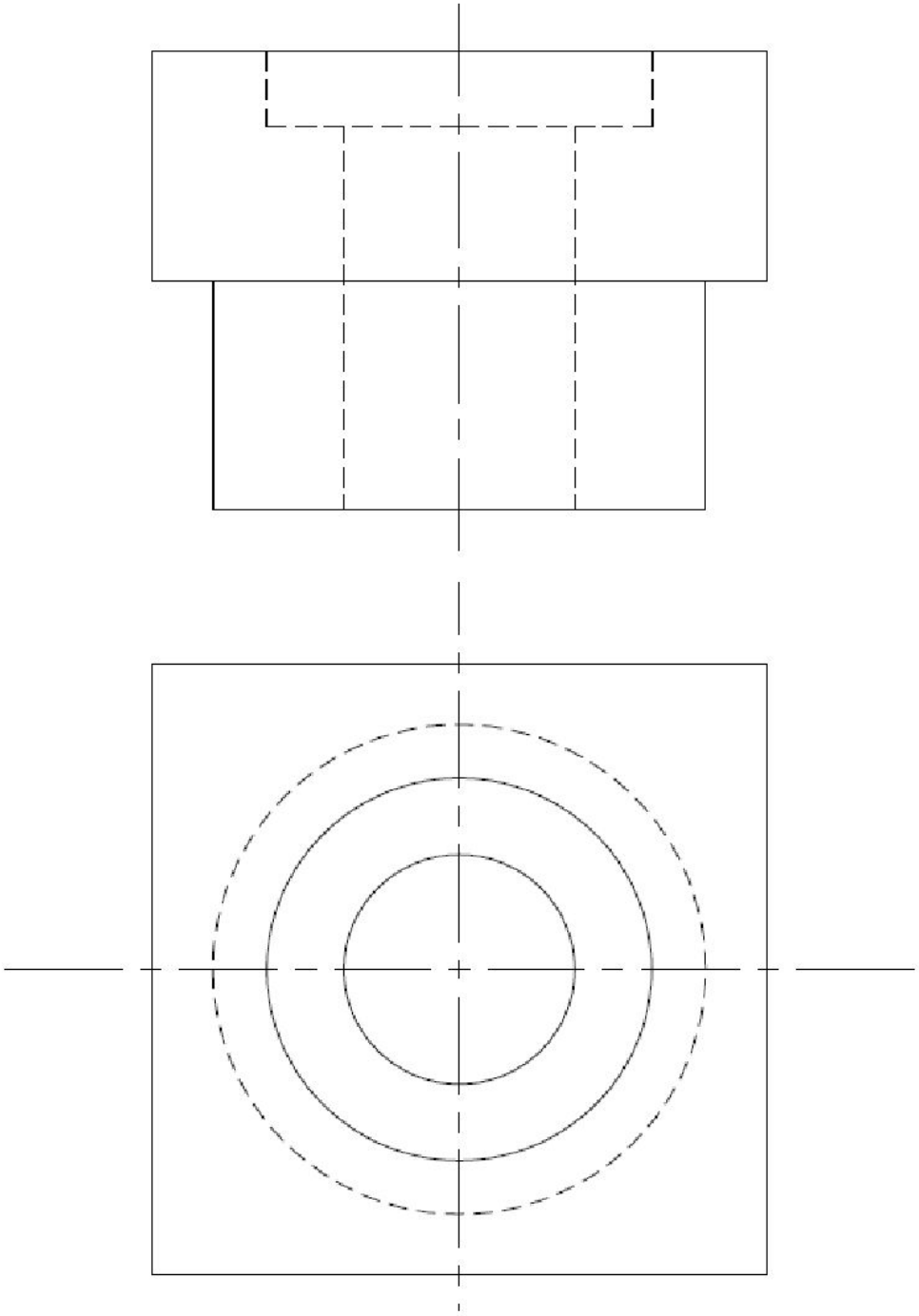


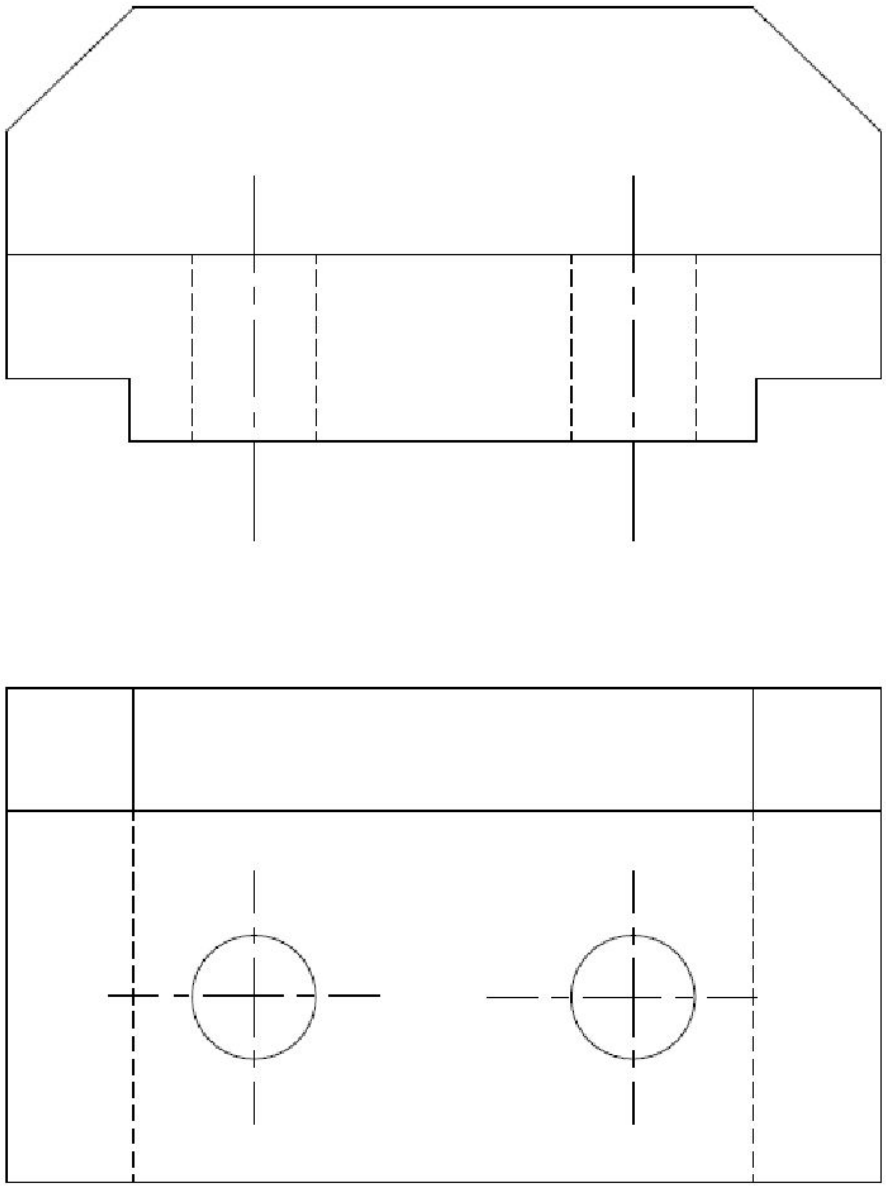


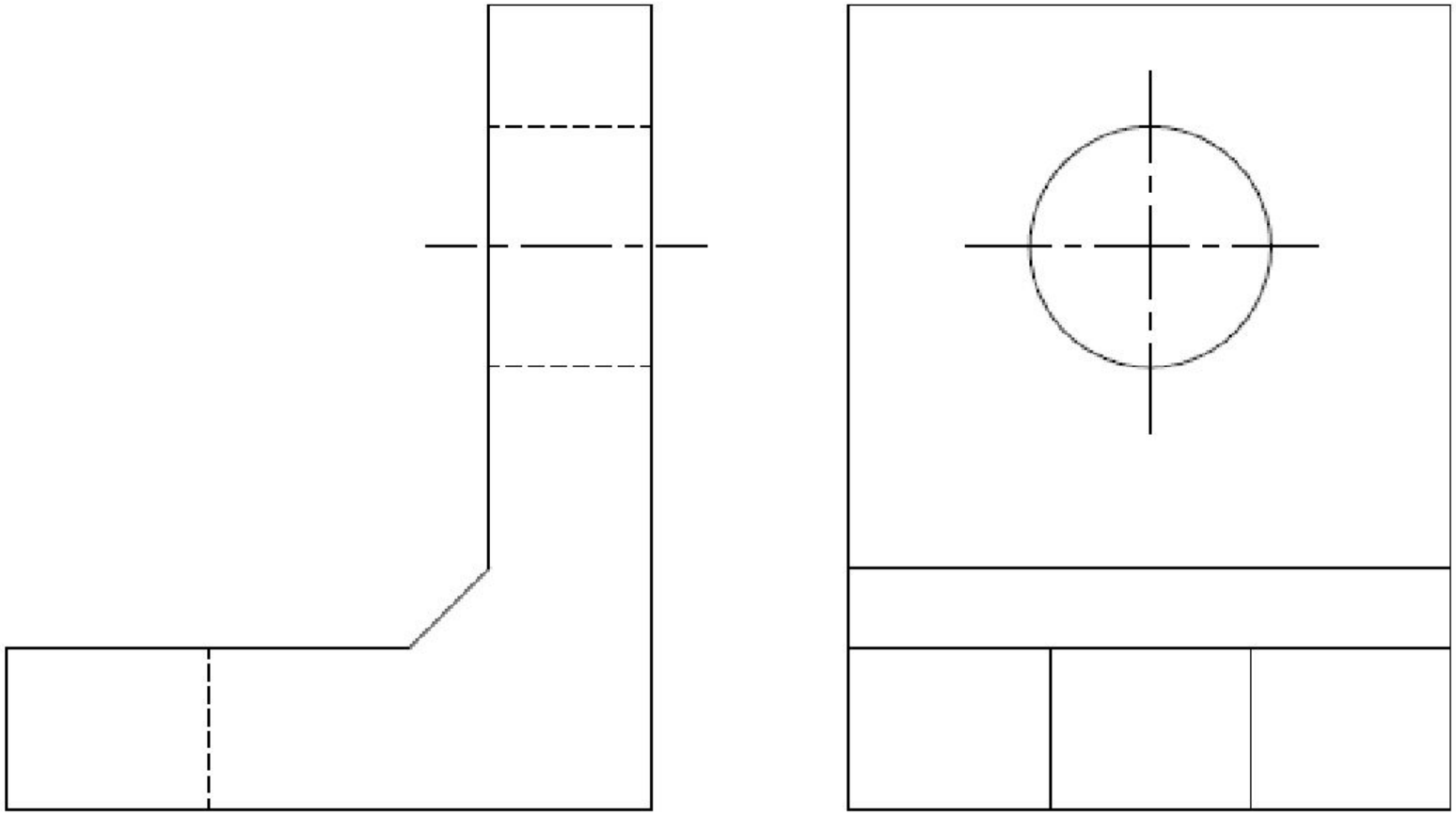












Summary

Firstly, Know how to apply the method of *analysis of solids* during reading a drawing; secondly, if encounter some complex figures, adopt the method of *analysis of lines and surfaces* to work it out; thirdly, inspect the views carefully, make it sure if the views can represent the object correctly; finally, complete and tidy the drawing.