

# Chapter 6

## Orthographic Reading



# TOPICS

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

# DEFINITION

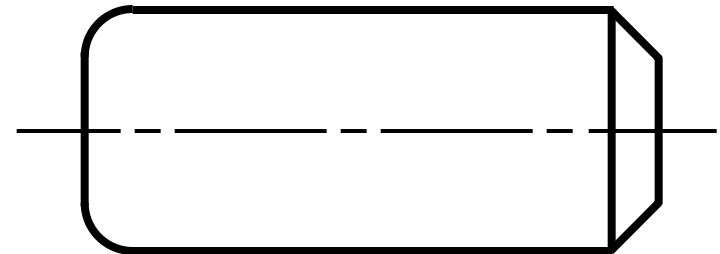
Reading a drawing is the process of *recognizing the shape of an object* by interpreting the orthographic views.



Orthographic  
Writing

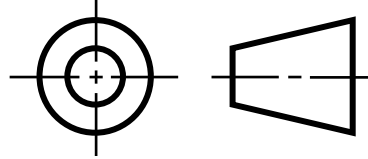


Orthographic  
Reading



# VIEWING DIRECTION

Given



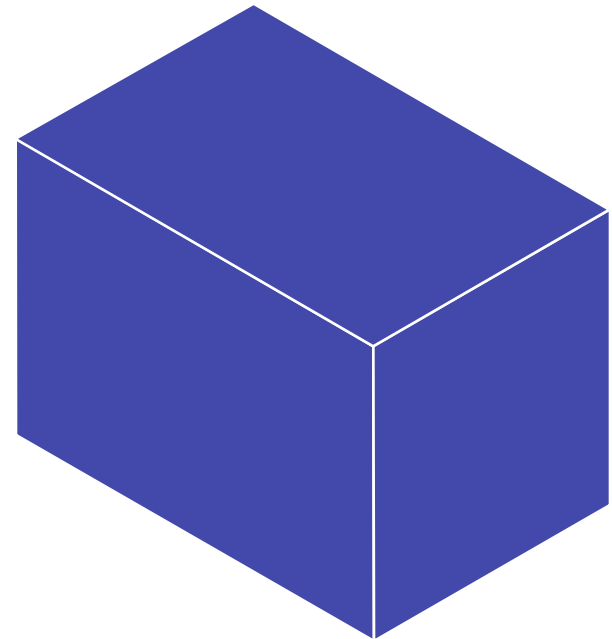
T.V.

L.S.V

F.V.

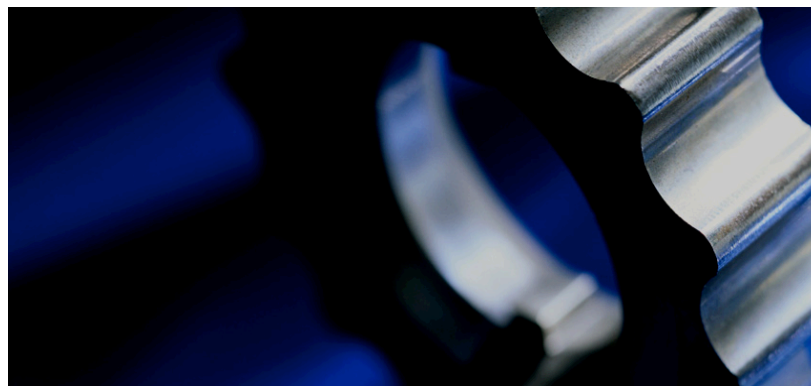
R.S.V

B.V.



# ORTHOGRAPHIC READING

## *Analysis by Solids*

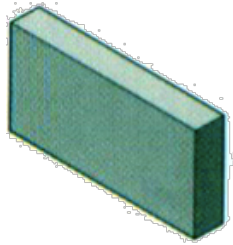


# BASIC IDEA

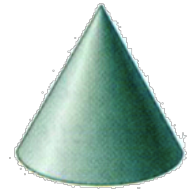
■ Objects can be decomposed into solid geometric primitives.

Some of familiar solid geometry

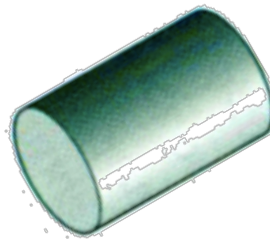
■ Rectangular prism



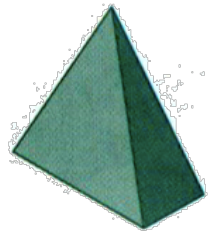
■ Cone



■ Cylinder

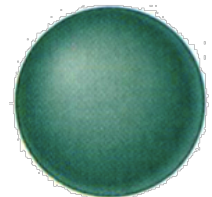


■ Pyramid



■ **Negative** cylinder  
(Hole)

■ Sphere

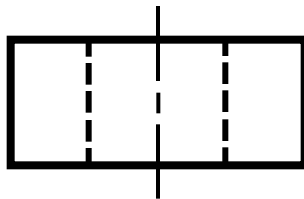
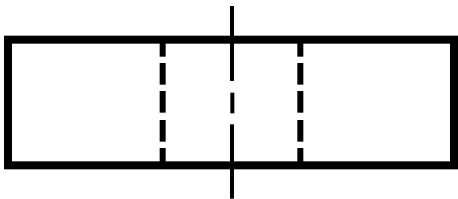
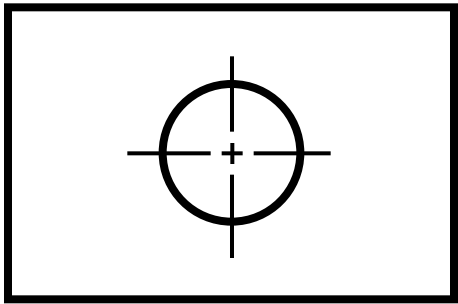
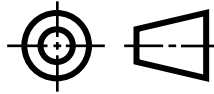


# VISUALIZATION STEPS

1. Choose an *appropriate viewing direction* according to a given orthographic views.
2. *Choose* an *area* in orthographic views, *relate* it to other views, and *form* a primitive solid geometry.
3. *Repeat* step 2 until all areas are analyzed.
4. *Combine* all of primitive solid geometries according to their positions in orthographic views.

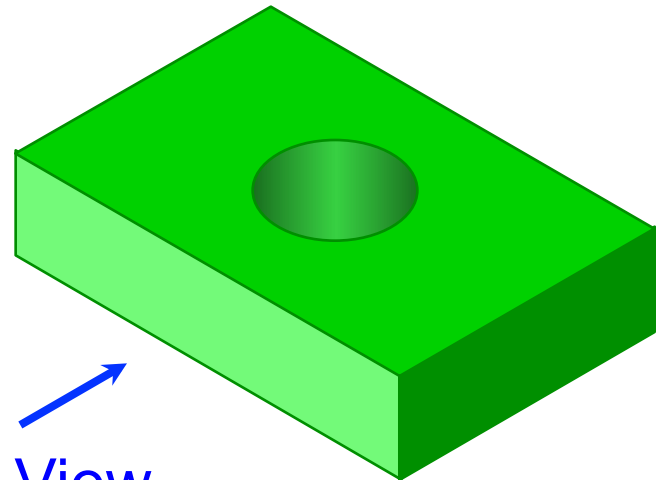
# EXAMPLE A

**Given**



## Primitive solid geometry

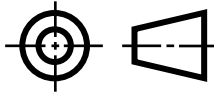
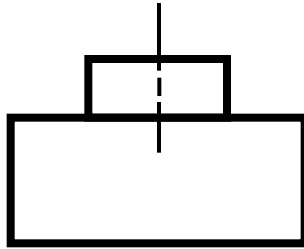
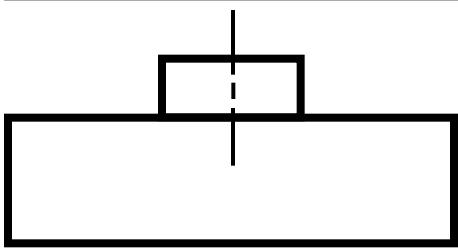
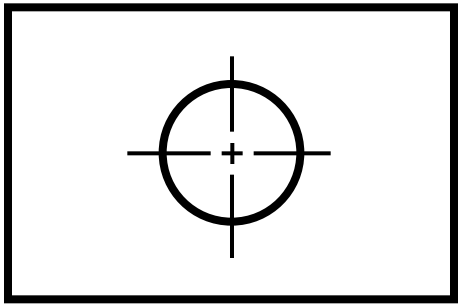
- Rectangular prism
- Hole



Front View

# EXAMPLE B

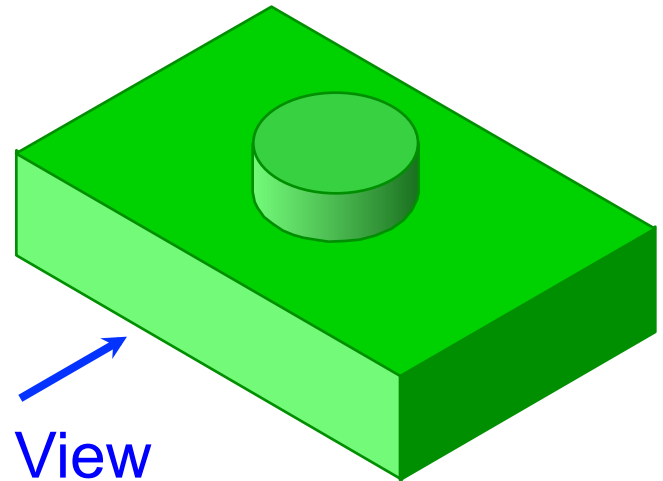
**Given**



## Primitive solid geometry

■ Rectangular prism

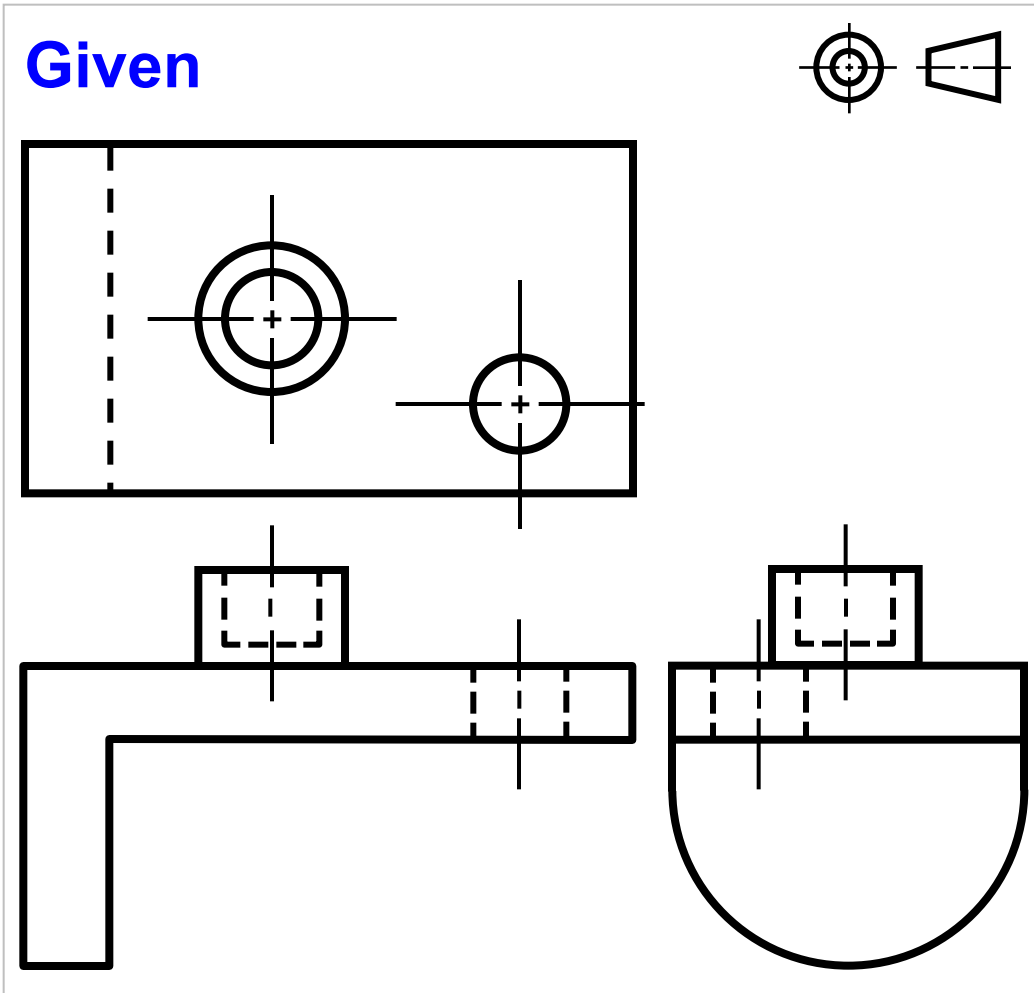
■ Cylinder



Front View

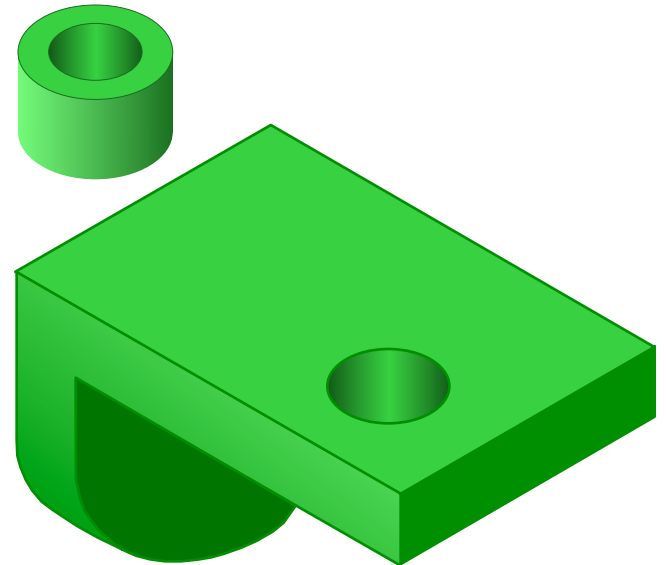
# EXAMPLE C

Given



## Primitive solid geometry

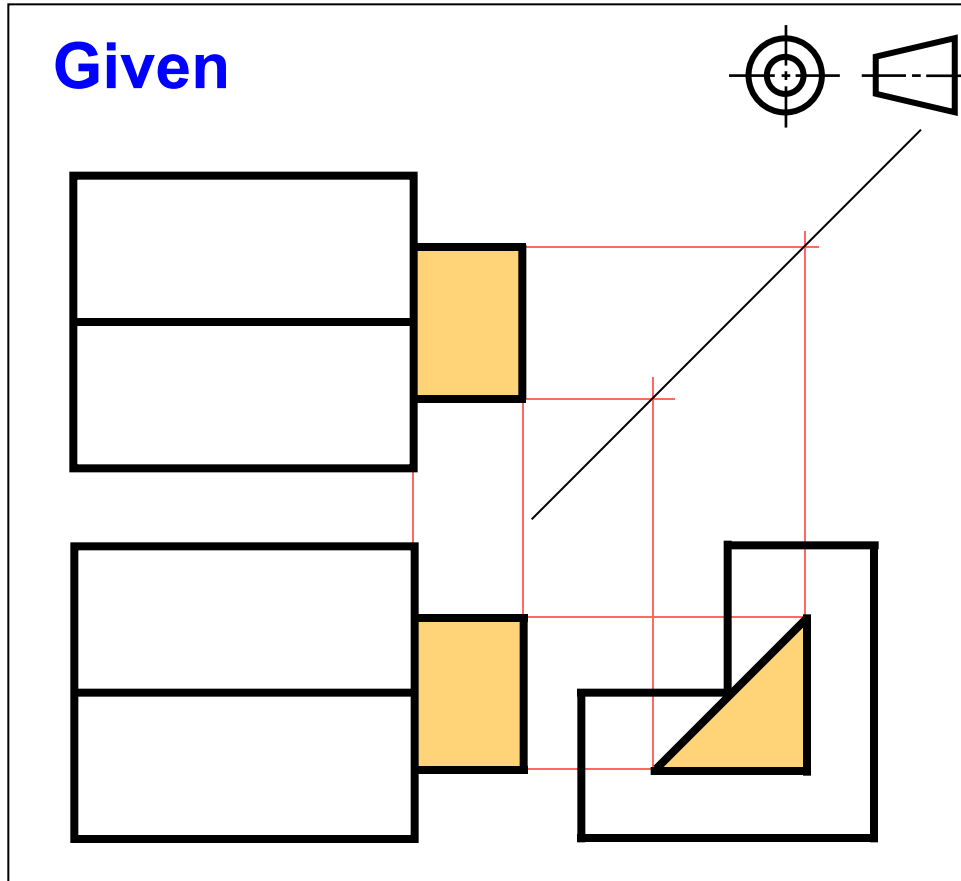
- Cylinder with a blind hole.
- L-shaped with round end
- Hole



# EXAMPLE D

## Composition

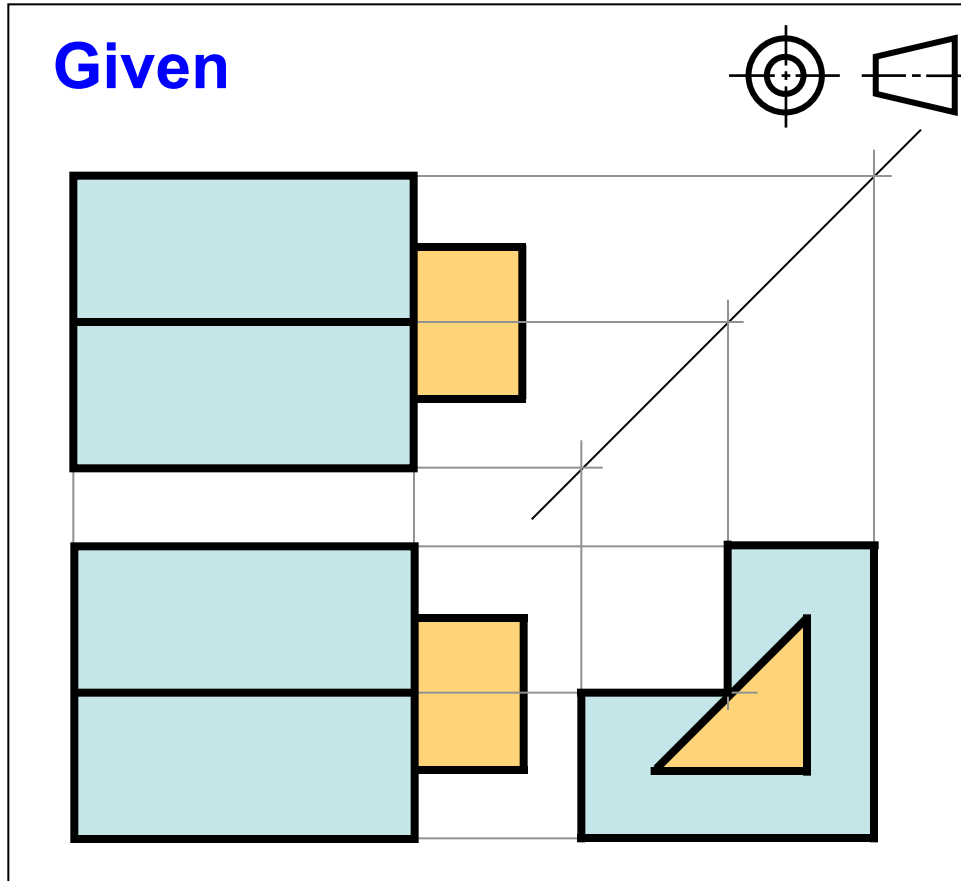
■ Wedge



# EXAMPLE D

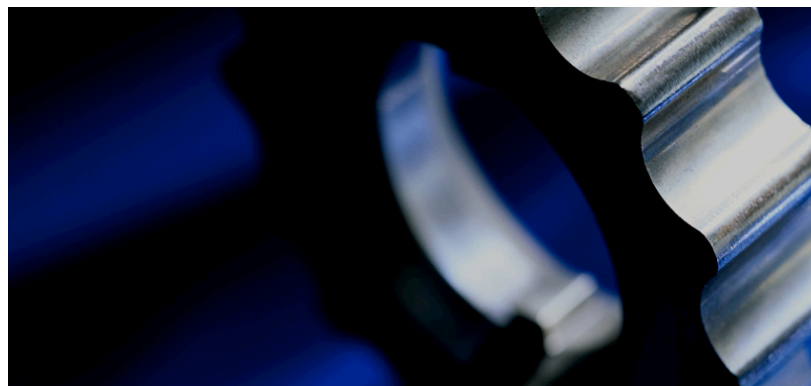
## Composition

- Wedge
- L-shaped block



# ORTHOGRAPHIC READING

## *Analysis by Surfaces*



# READING STEPS

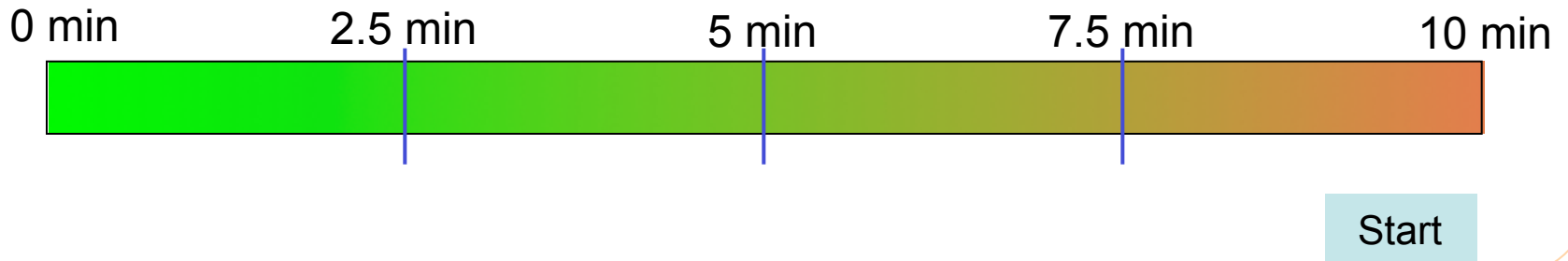
1. **Choose** an **appropriate viewing direction** according to a given orthographic views.
2. **Choose** an **area** or **lines** in orthographic views, **relate** it to other views, and **identify** type of a surface (or plane).
3. **Sketch** a **pictorial view** of a reading surface.
4. **Repeat** steps 2 and 3 until all surfaces are read.

Knowing the **types of surfaces** is very important.

At this step, details of an object will gradually build up.

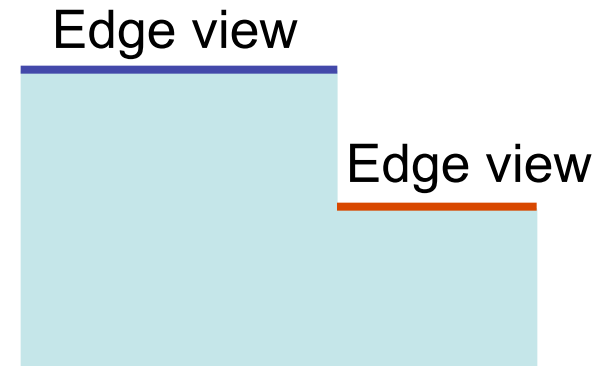
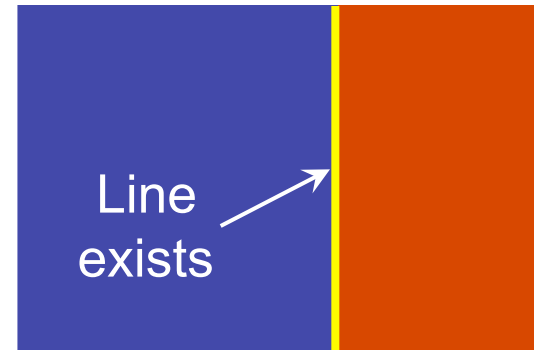
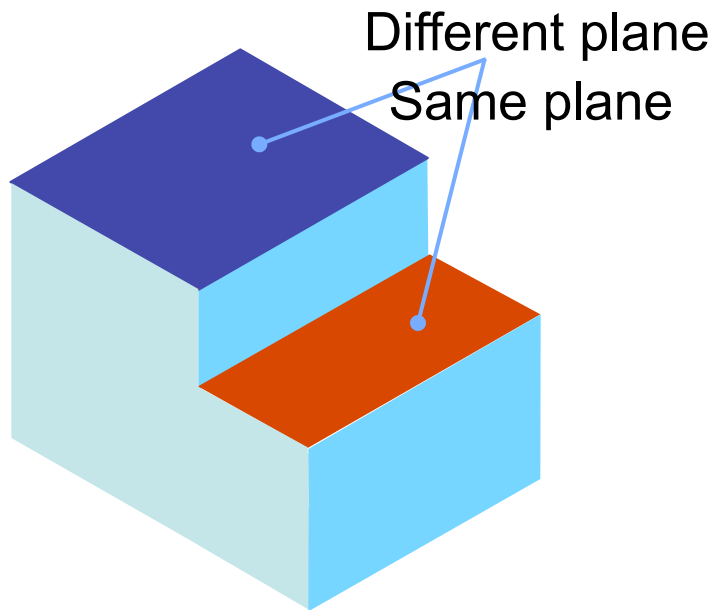
# Class Activity

1. Complete page 1 of a given handout.
2. Try to identify plane type.



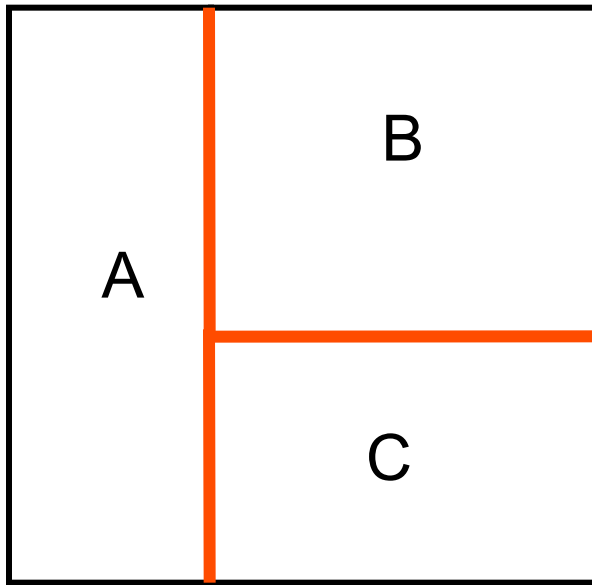
# GUIDANCE 1

- Adjacent areas that are not lie in the same plane must be separated by **lines**.



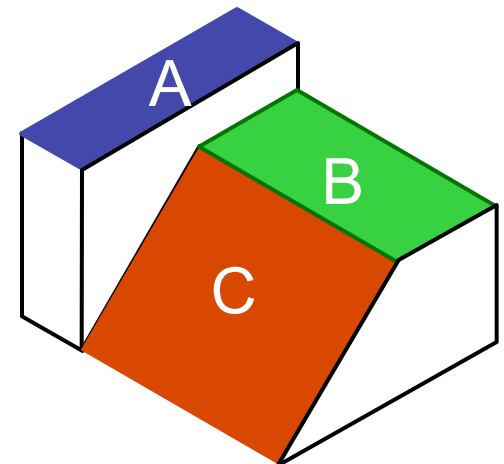
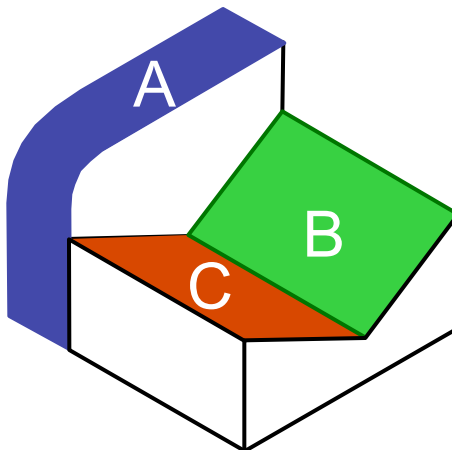
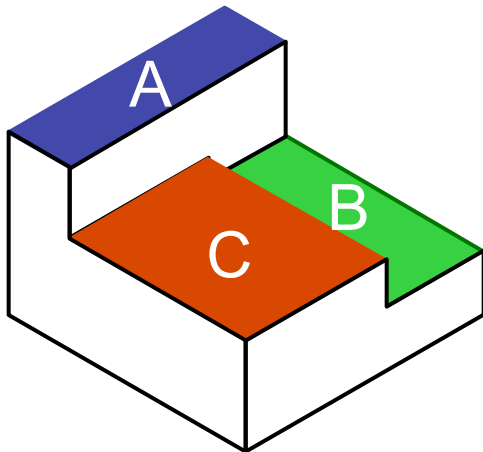
# EXAMPLE

Top view



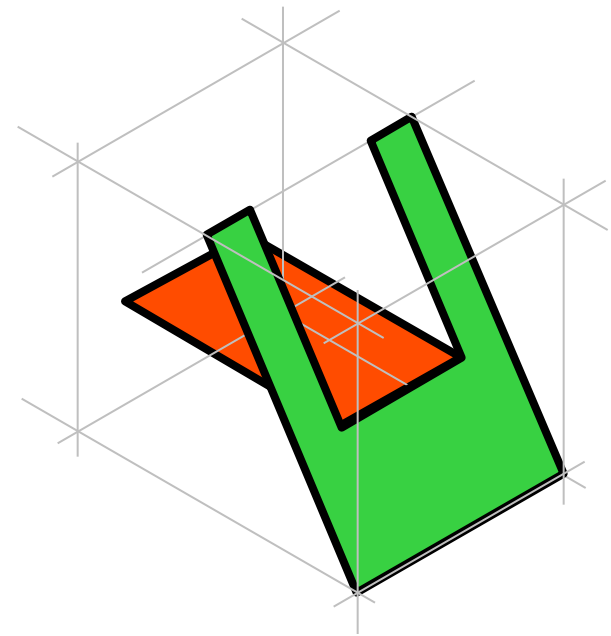
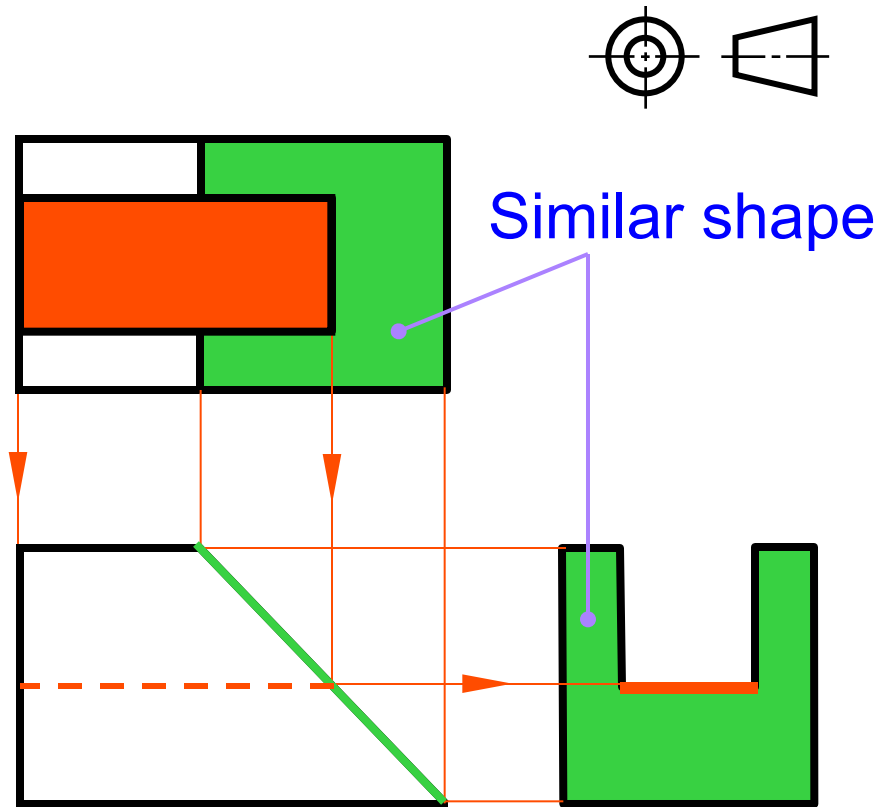
All surfaces A, B and C are **not** lie in the same plane.

Some of possible objects' shape.



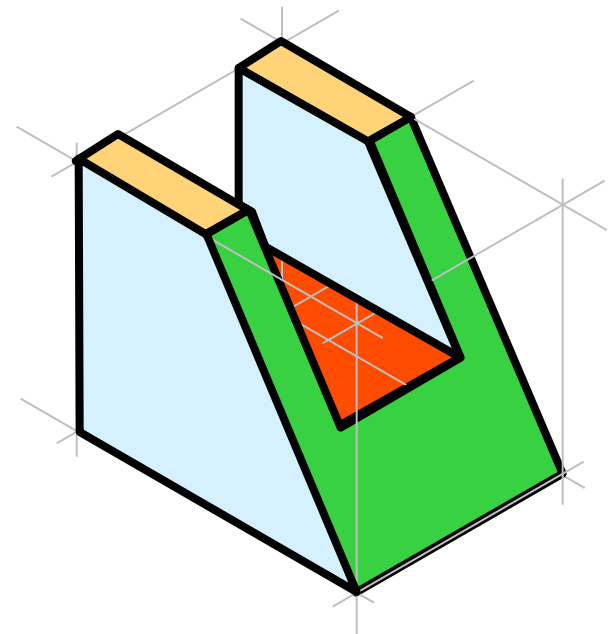
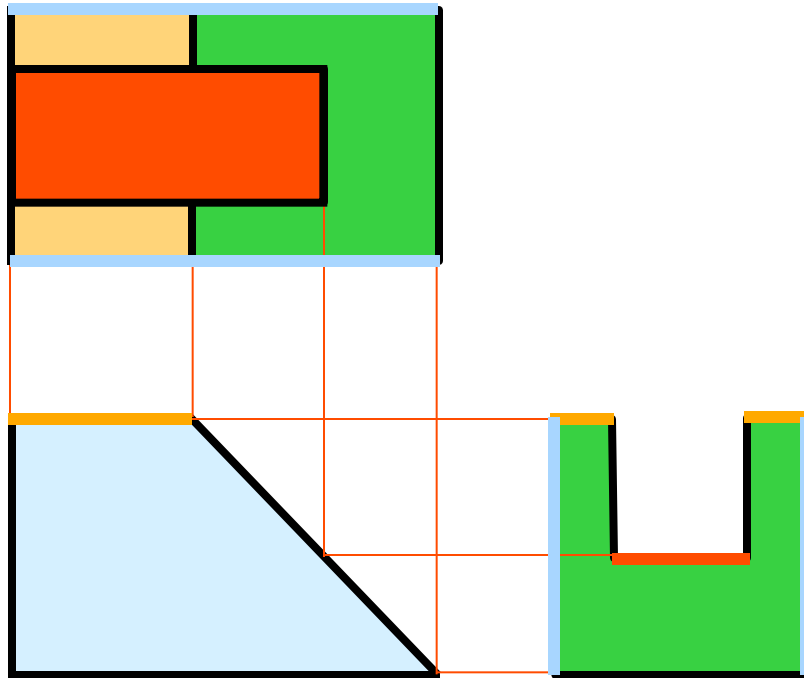
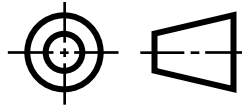
# GUIDANCE 2

- Areas that show a similar shape in more than one view is the same surface.

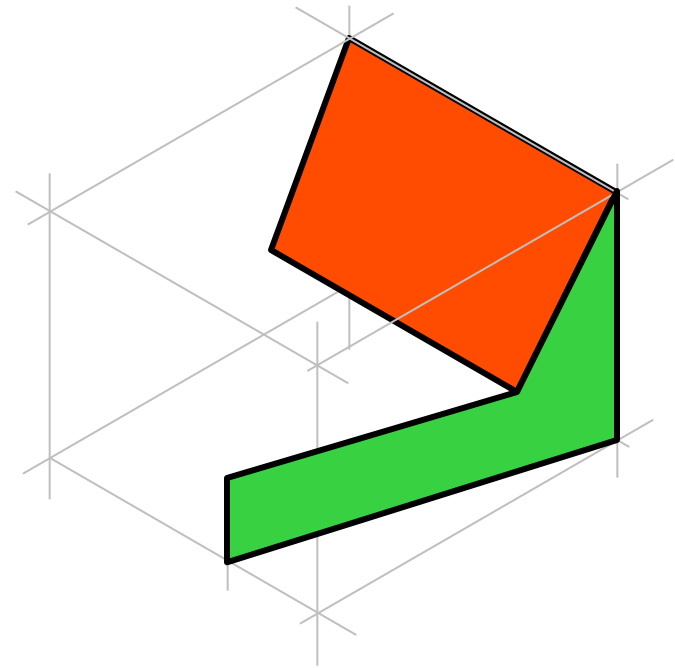
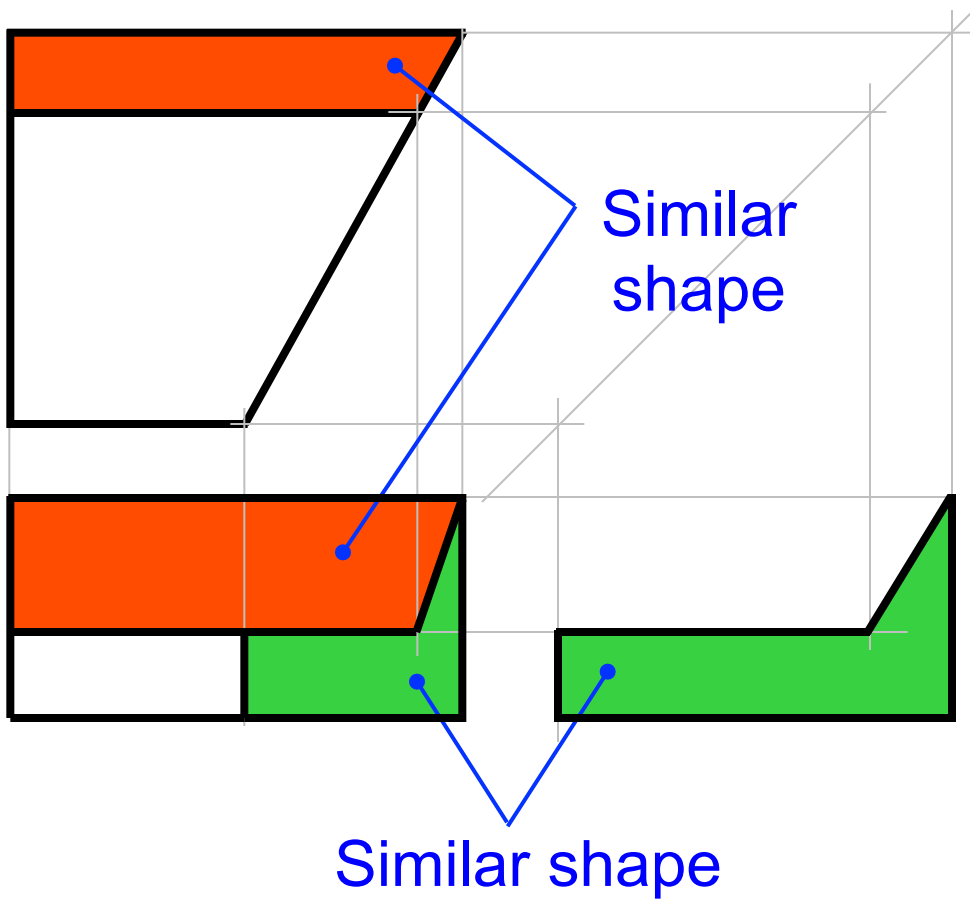
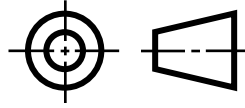


# GUIDANCE 2

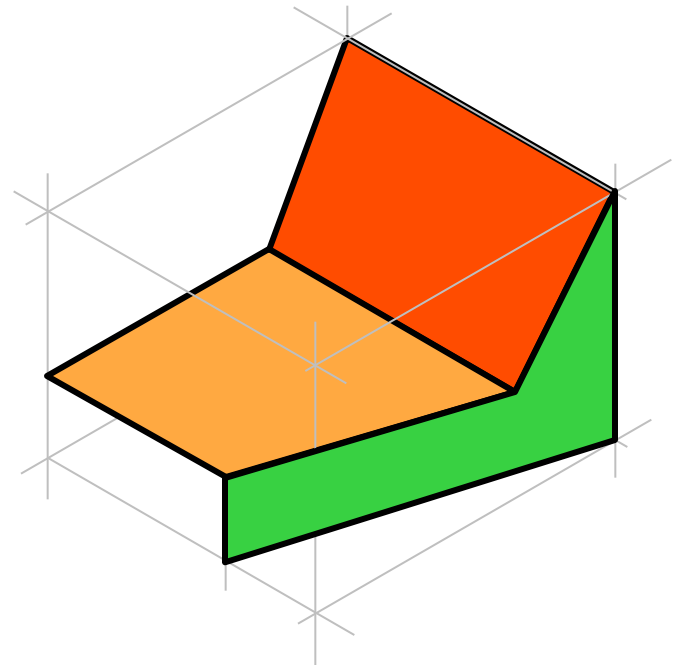
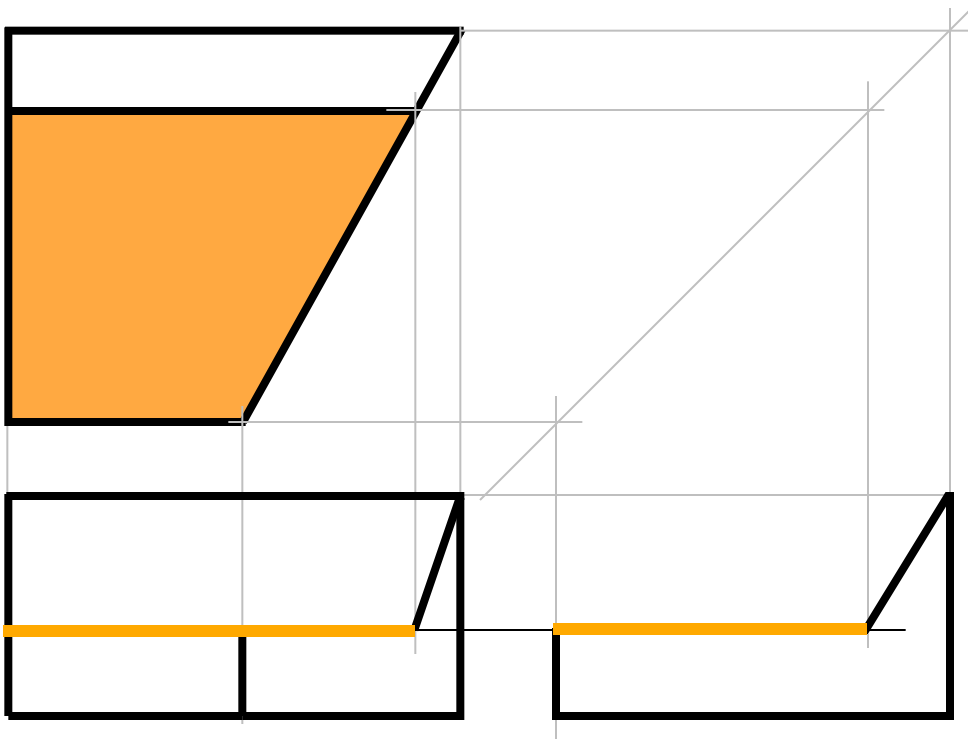
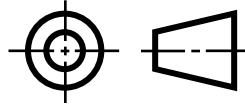
- Areas that show a similar shape in more than one view is the same surface.



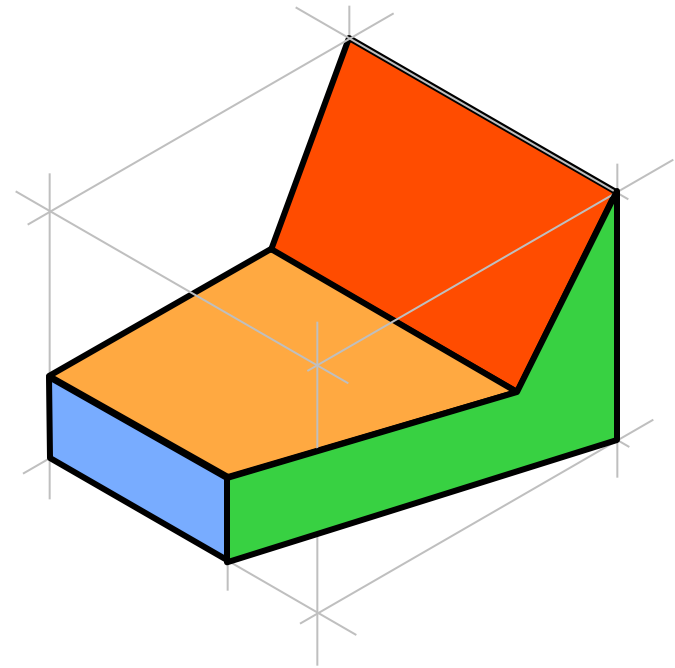
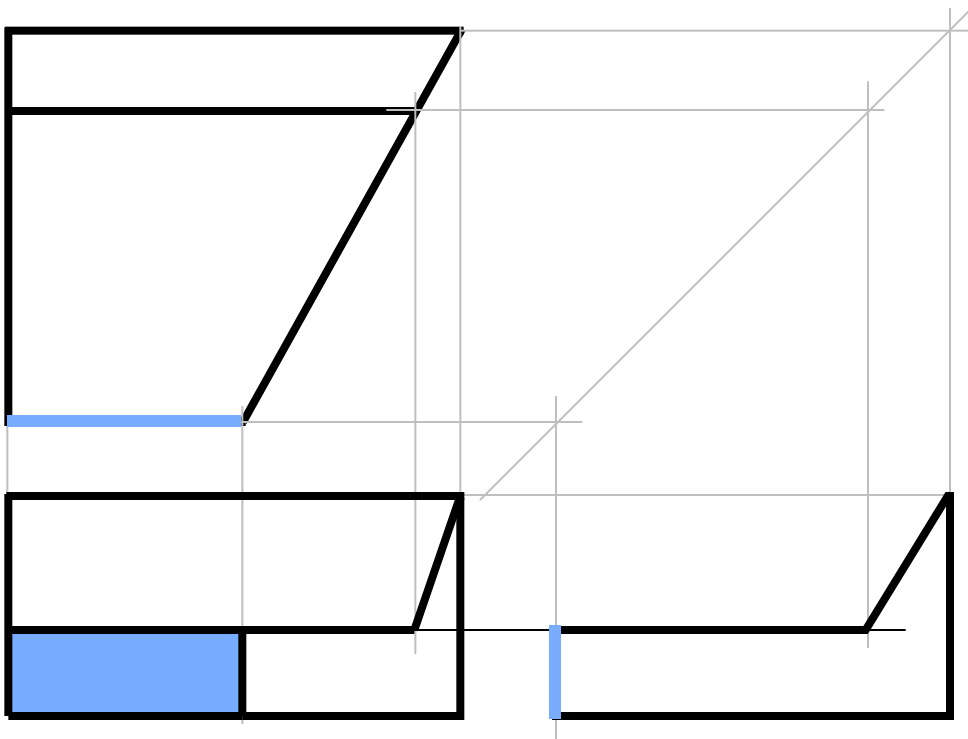
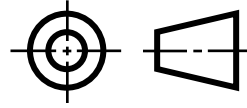
# EXAMPLE A



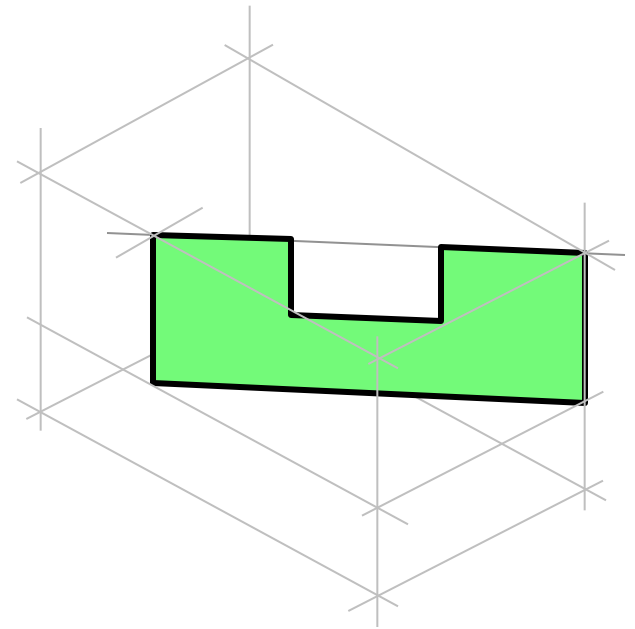
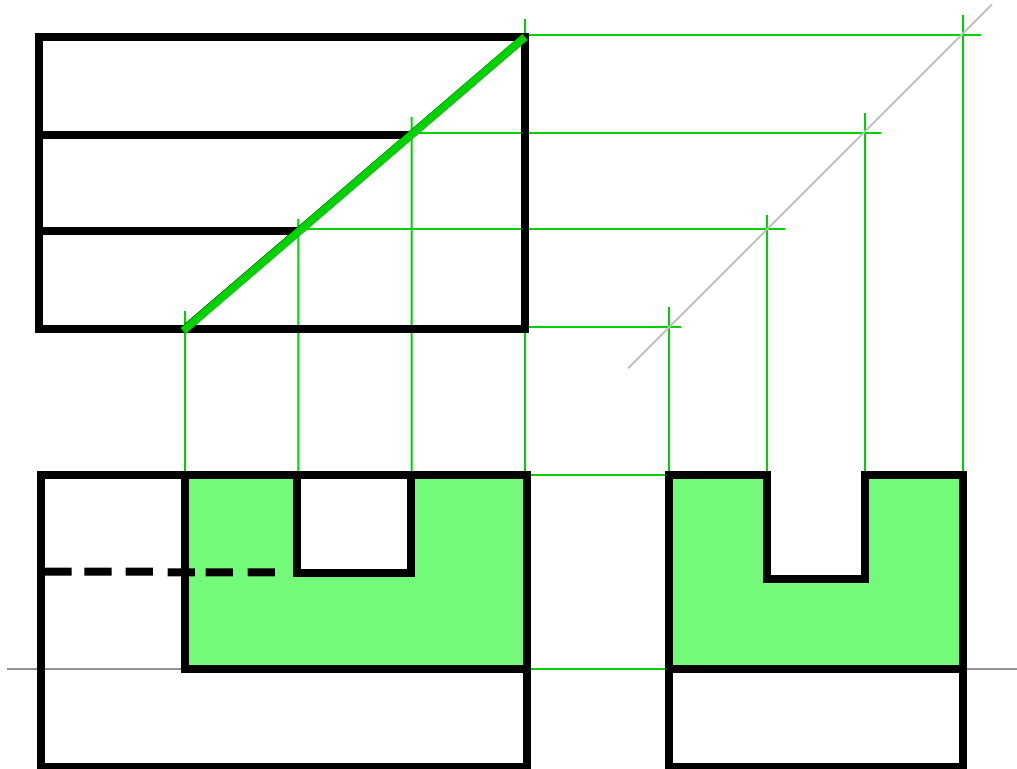
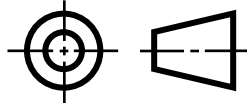
# EXAMPLE A



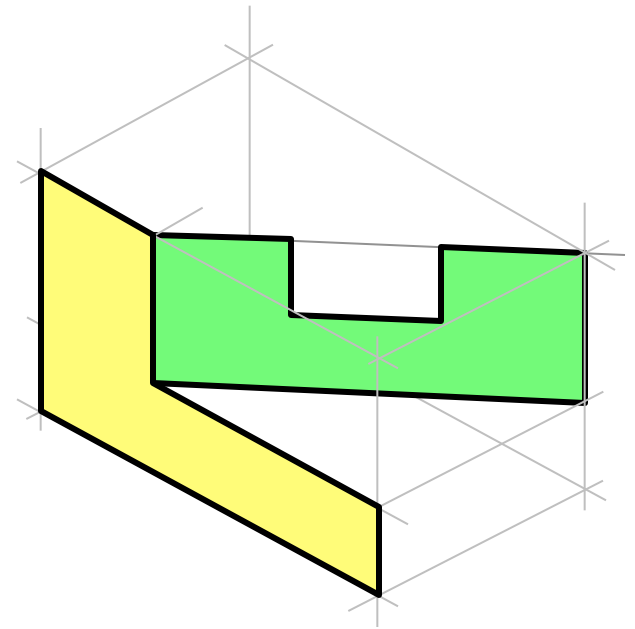
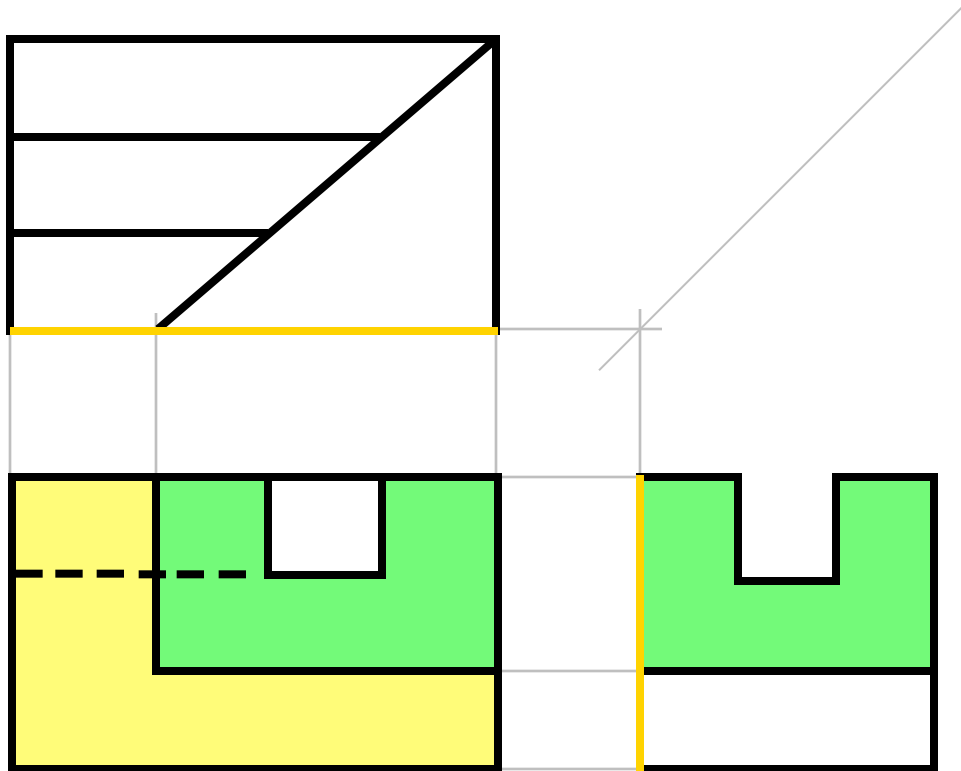
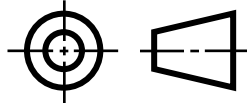
# EXAMPLE A



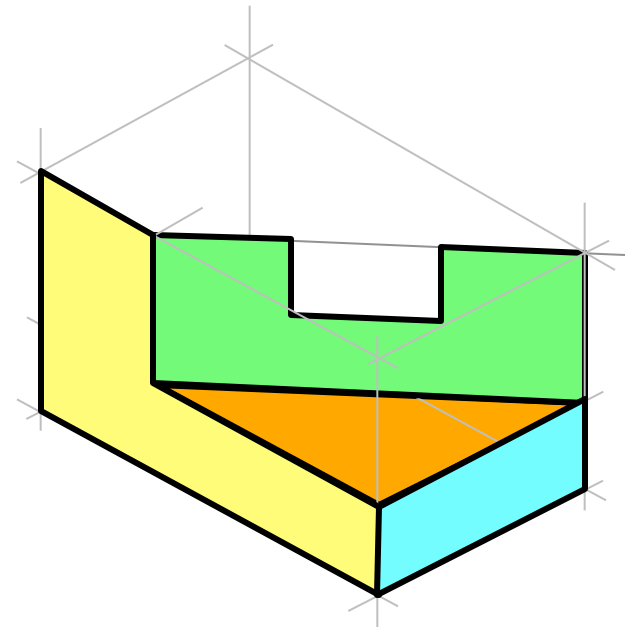
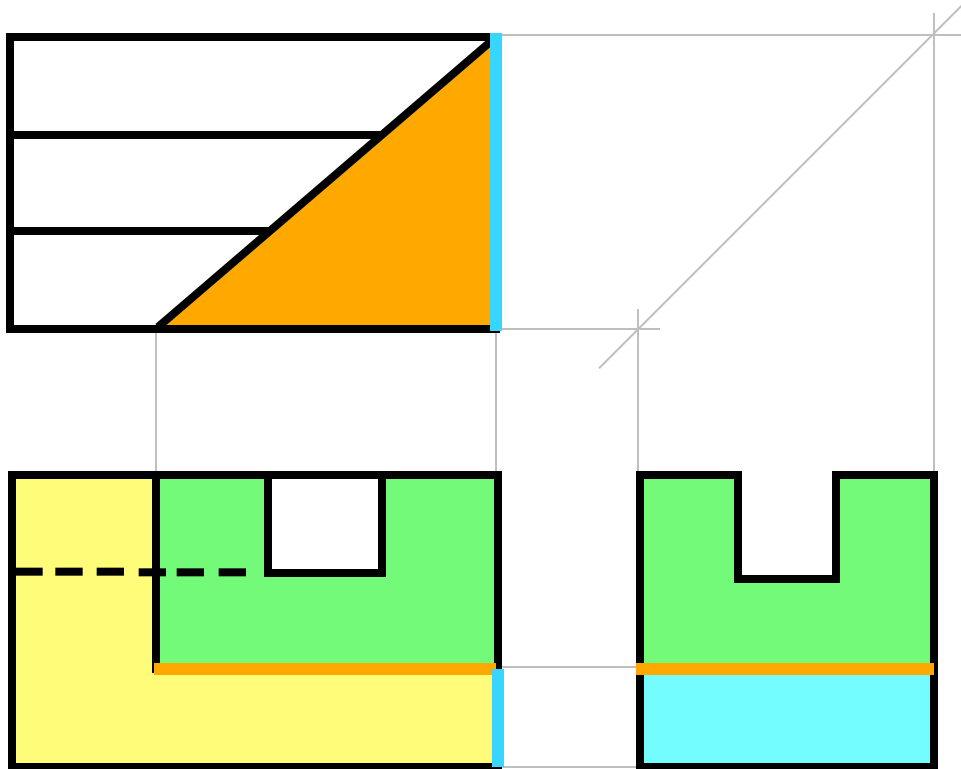
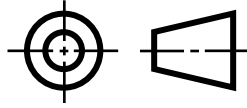
# EXAMPLE B



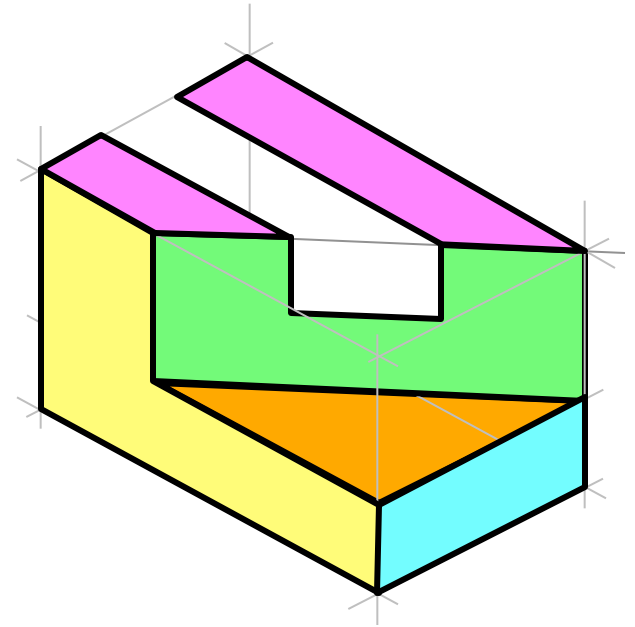
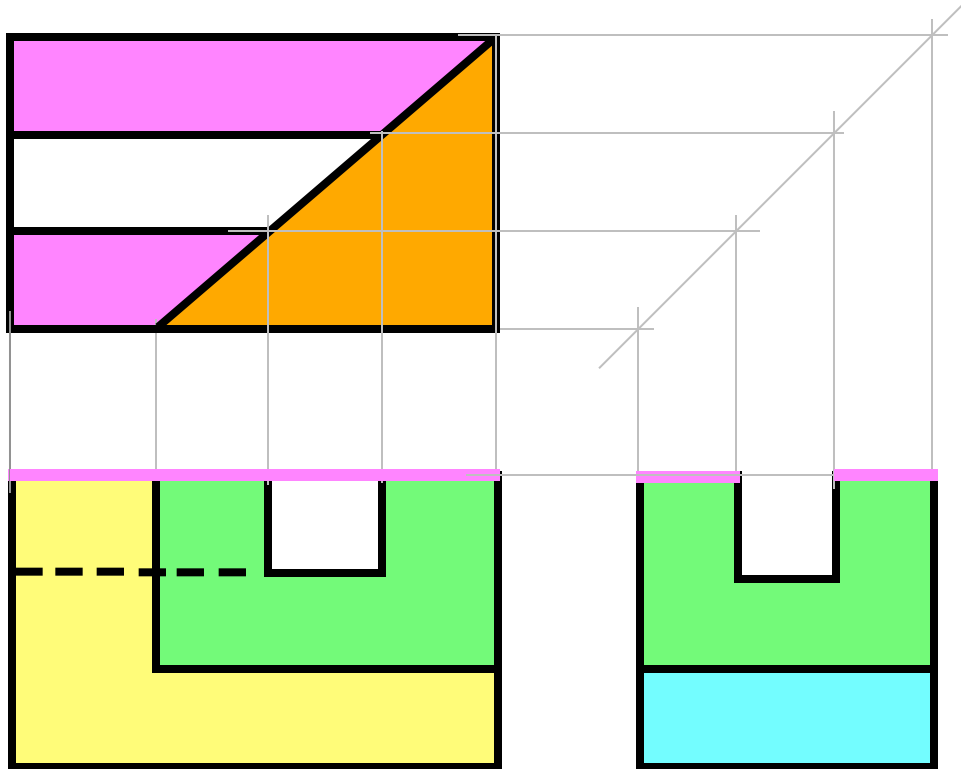
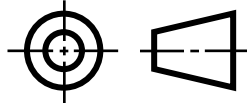
# EXAMPLE B



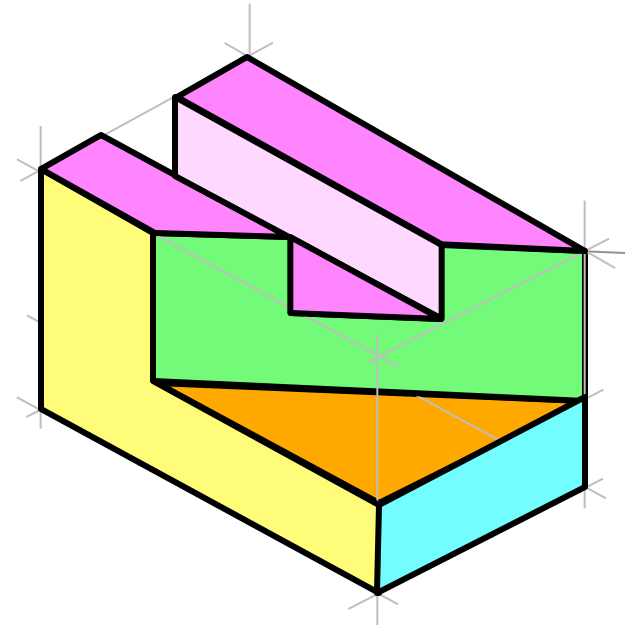
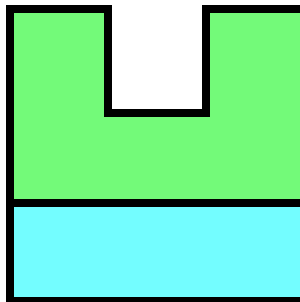
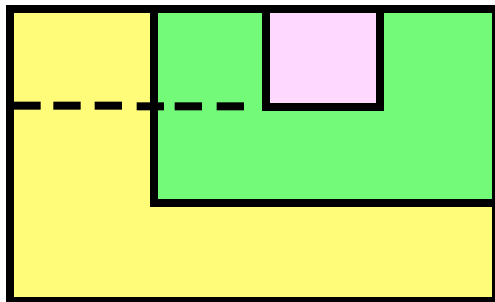
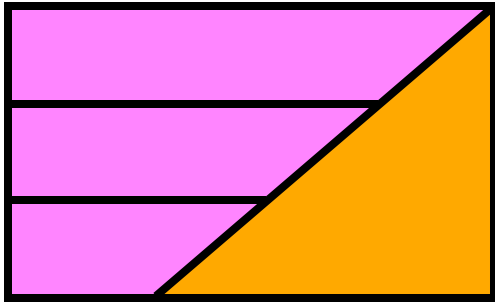
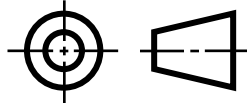
# EXAMPLE B



# EXAMPLE B



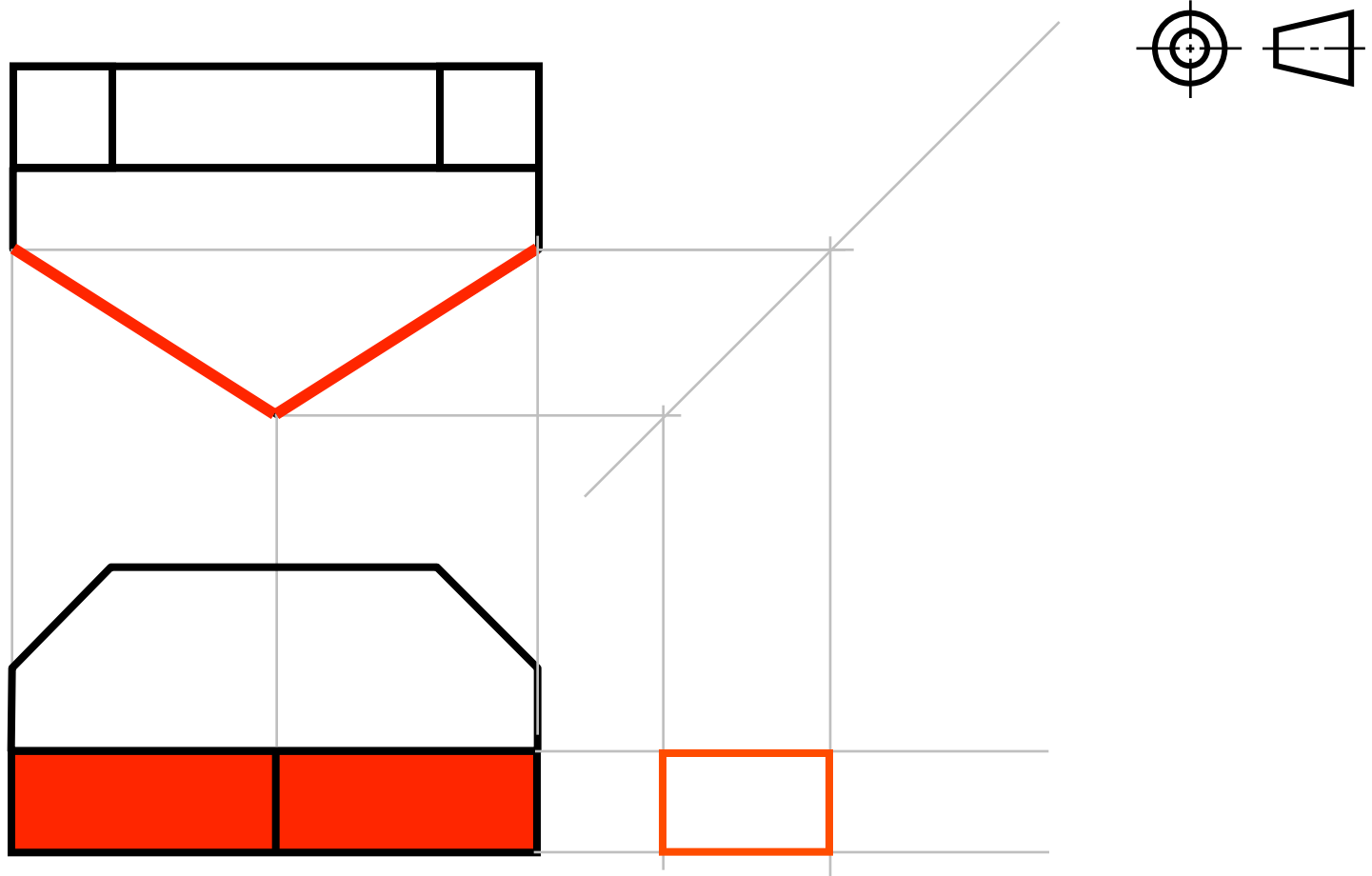
# EXAMPLE B



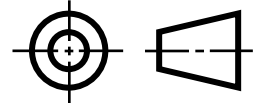
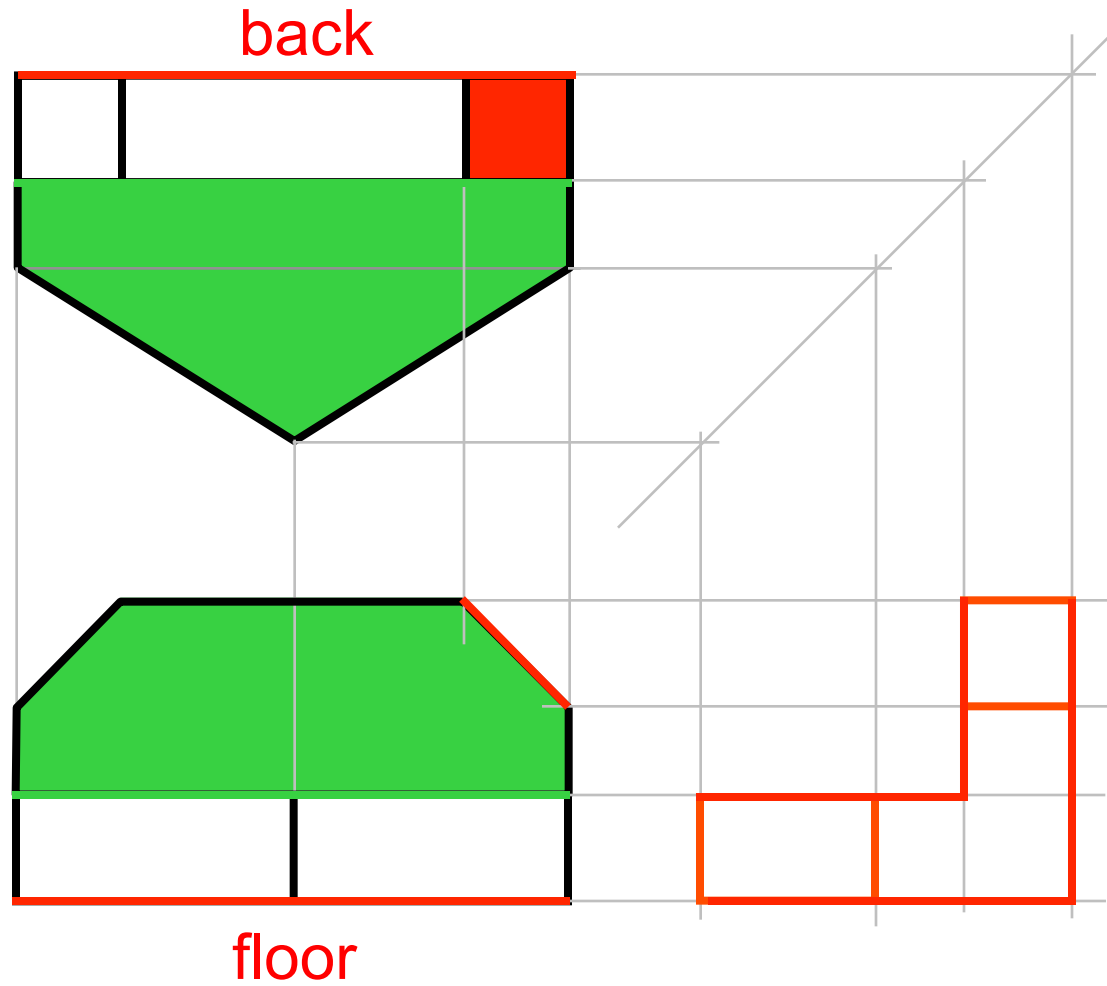
# ***Missing View Problems***



# EXAMPLE A

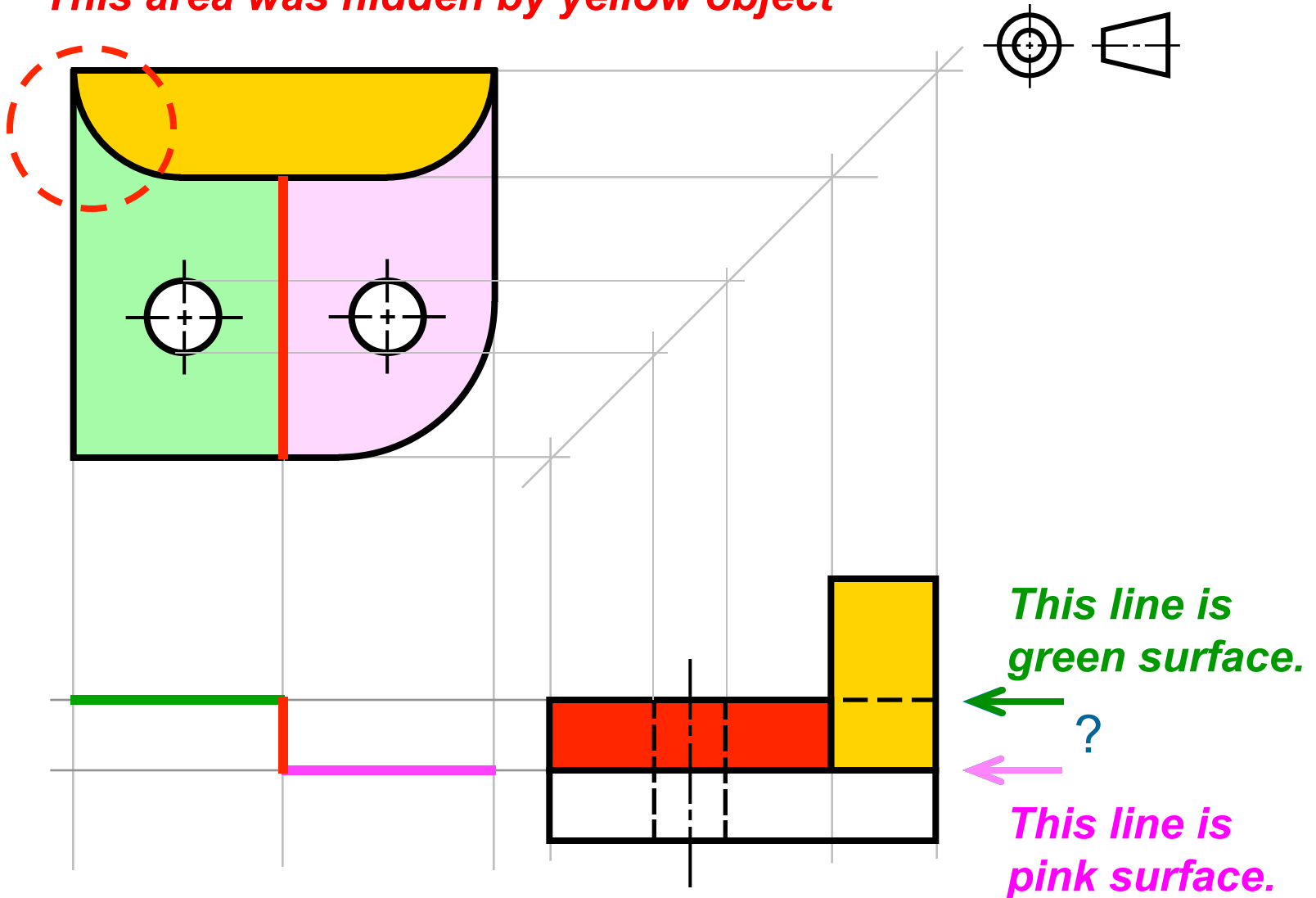


# EXAMPLE A

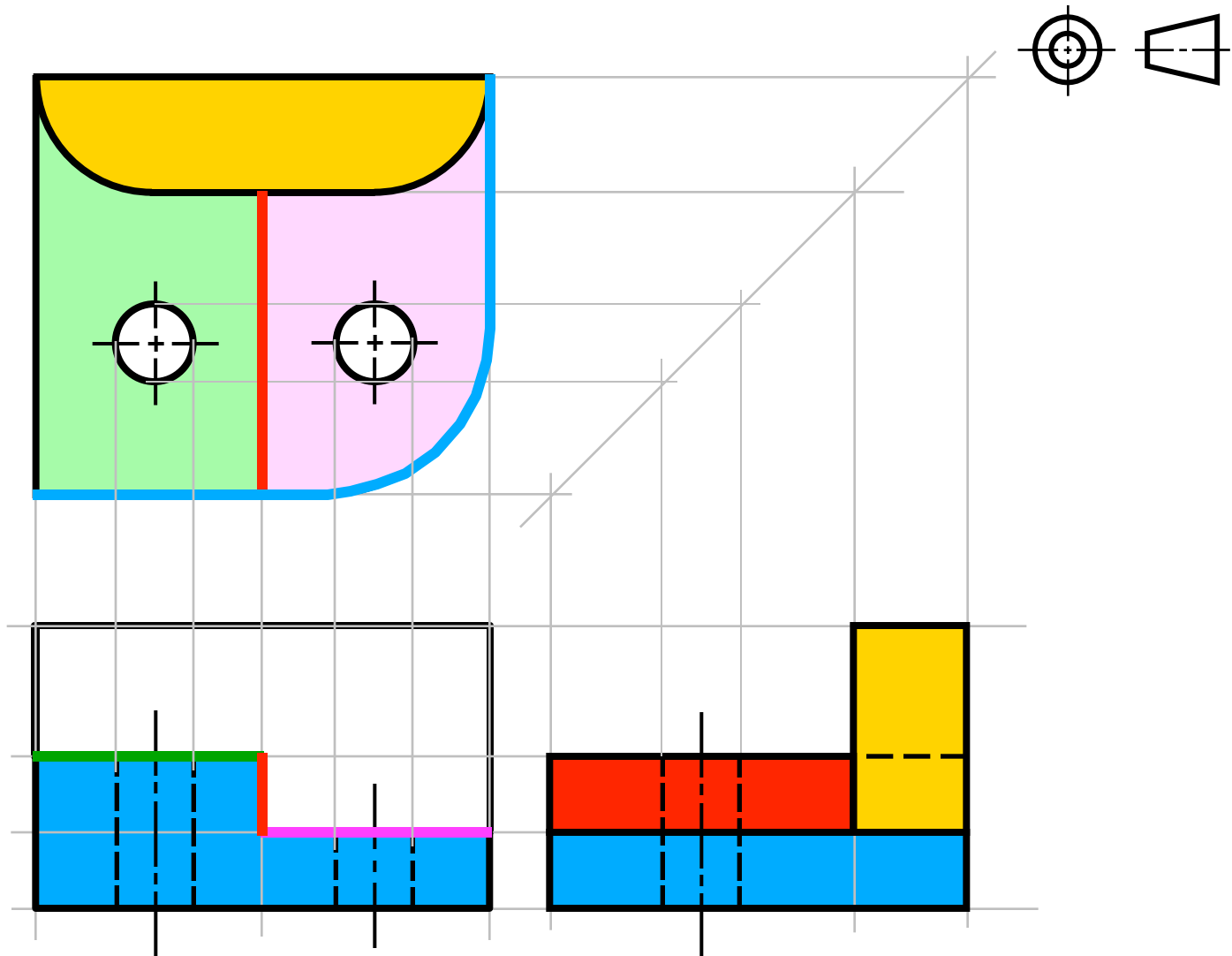


# EXAMPLE B

*This area was hidden by yellow object*

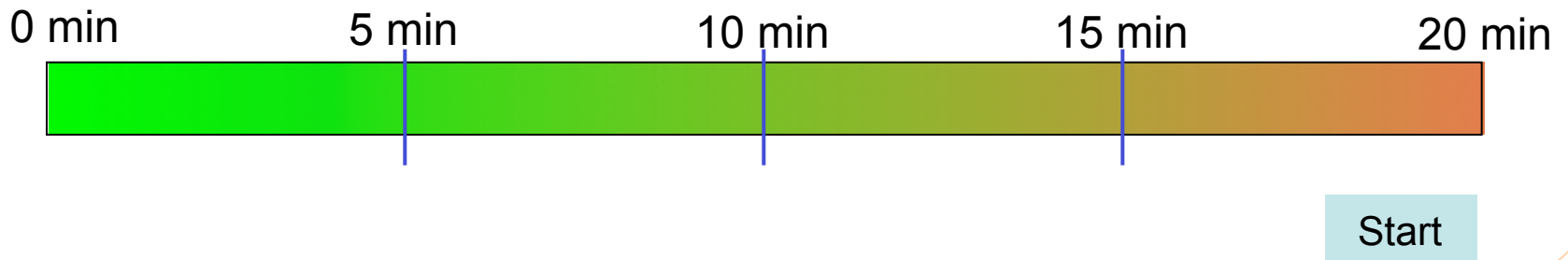


# EXAMPLE B



# Class Activity

1. Complete page 2 of a given handout.



Enjoy doing a homework.

Prepare yourself for quiz 1 on next Monday.

Make an enough practice for Midterm Exam.