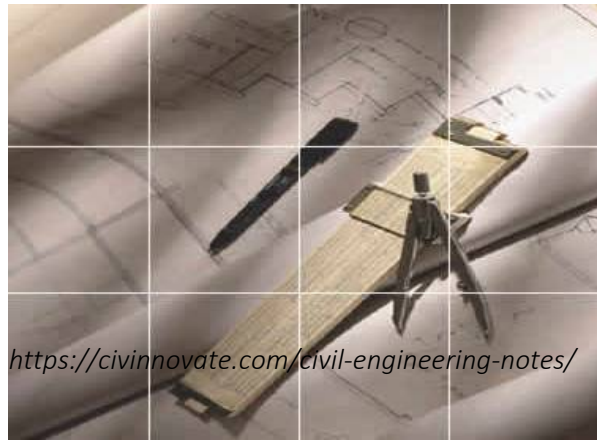




Chapter 4

Orthographic Writing



<https://civinnovate.com/civil-engineering-notes/>



TOPICS

- Views selection
- Alignment of views
- Orthographic writing steps
- Basic dimensioning
- Tangency and intersections



View Selection



<https://civinnovate.com/civil-engineering-notes/>

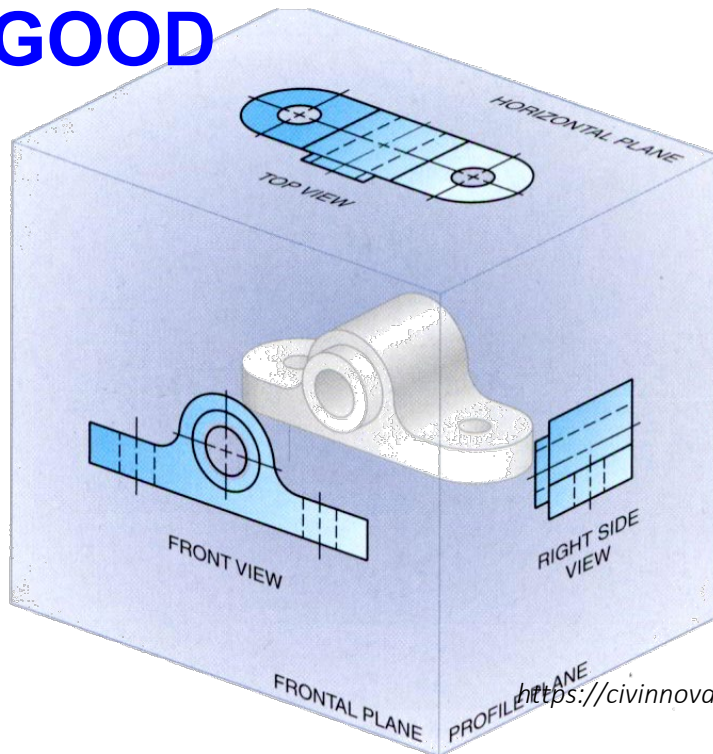
VIEW SELECTION STEPS

1. Orient the object to the best position **relative** to a glass box.
2. Select the front view.
3. Select adjacent views.

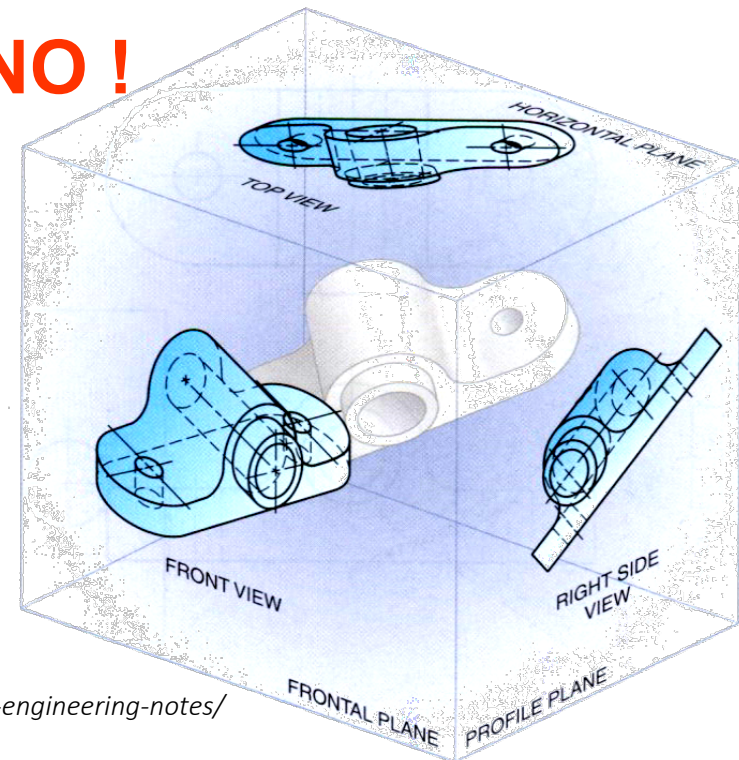
STEP 1 : Orient the Object

- The object should be placed in its **natural position**.
- The object should presents its features in **actual size** and **shape** in orthographic views.

GOOD



NO !



STEP 2 : Select a Front View

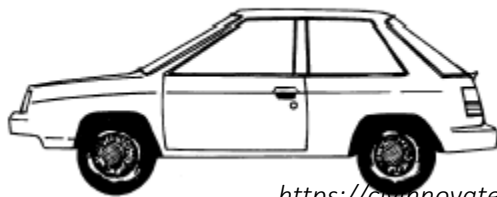
- The object's **longest dimension** should be presented as a **width**.

First choice

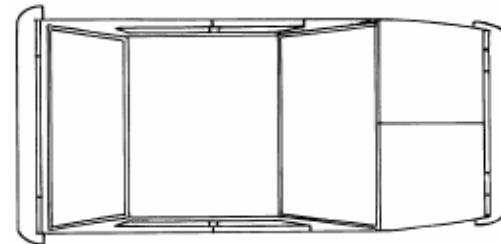


Waste more space

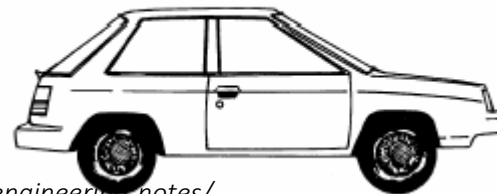
Inappropriate



Second choice



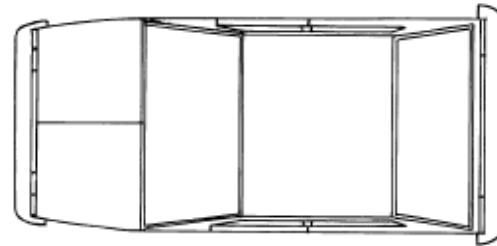
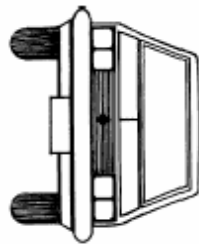
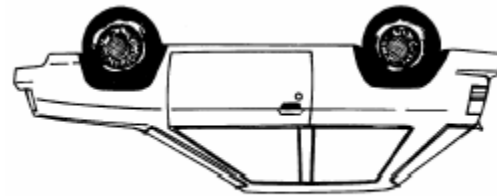
GOOD



STEP 2 : Select a Front View

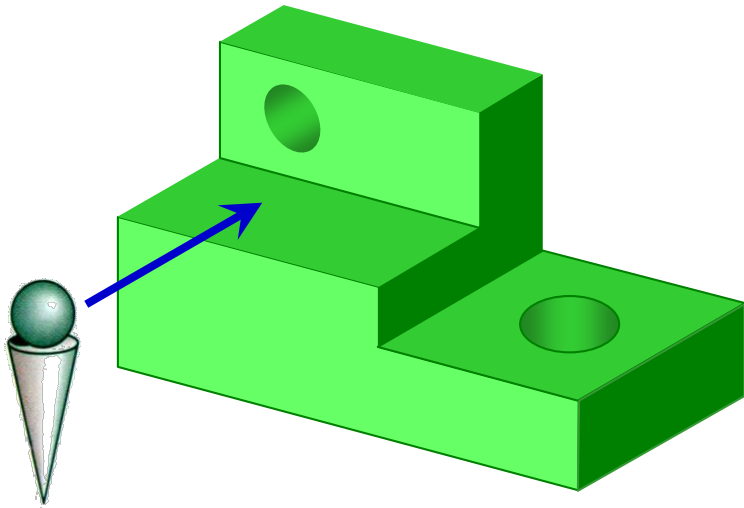
- The adjacent views that are projected from the selected front view should appear in its natural position.

Inappropriate

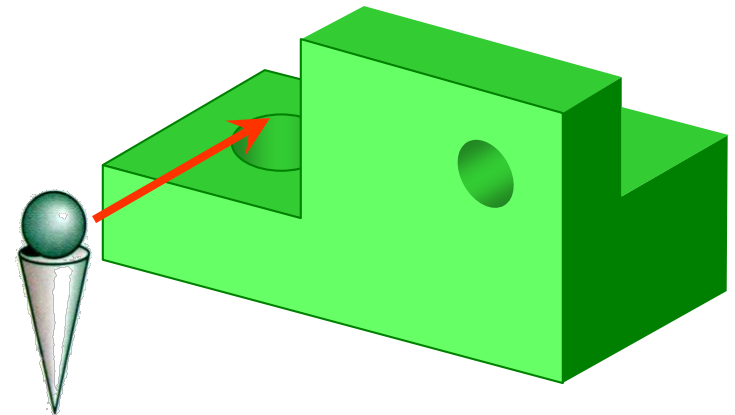
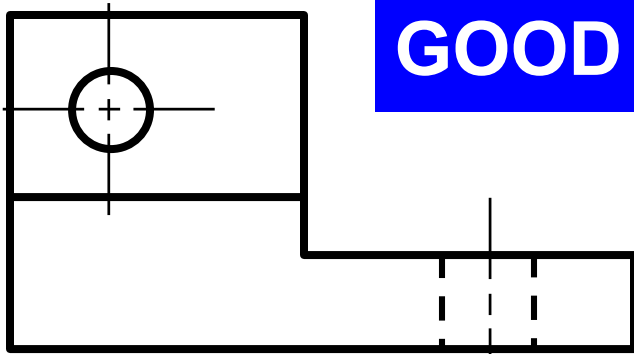


STEP 2 : Select a Front View

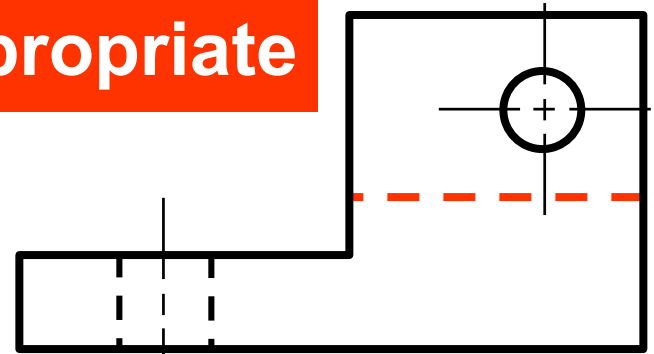
- Choose the view that have the **fewest number of hidden lines**.



GOOD

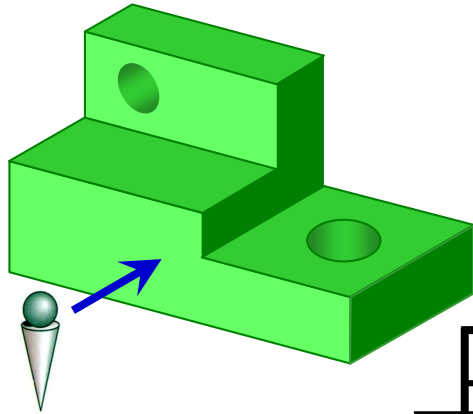


Inappropriate

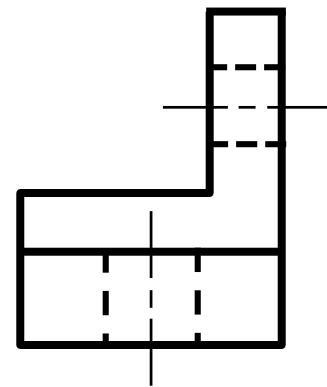
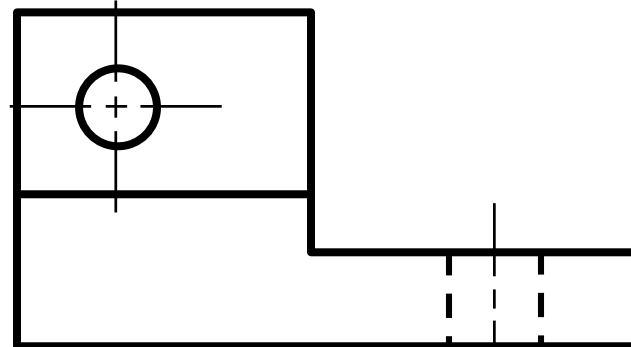
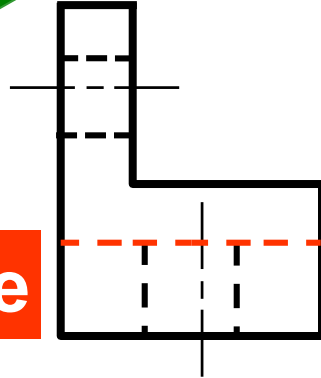
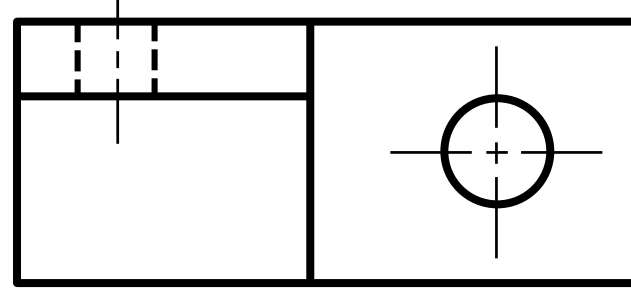


STEP 3 : Select an Adjacent View

- Choose the view that have the fewest number of hidden lines.



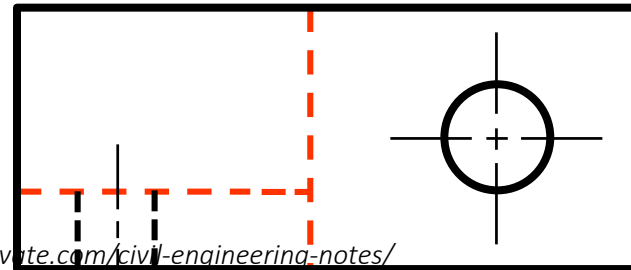
GOOD



GOOD

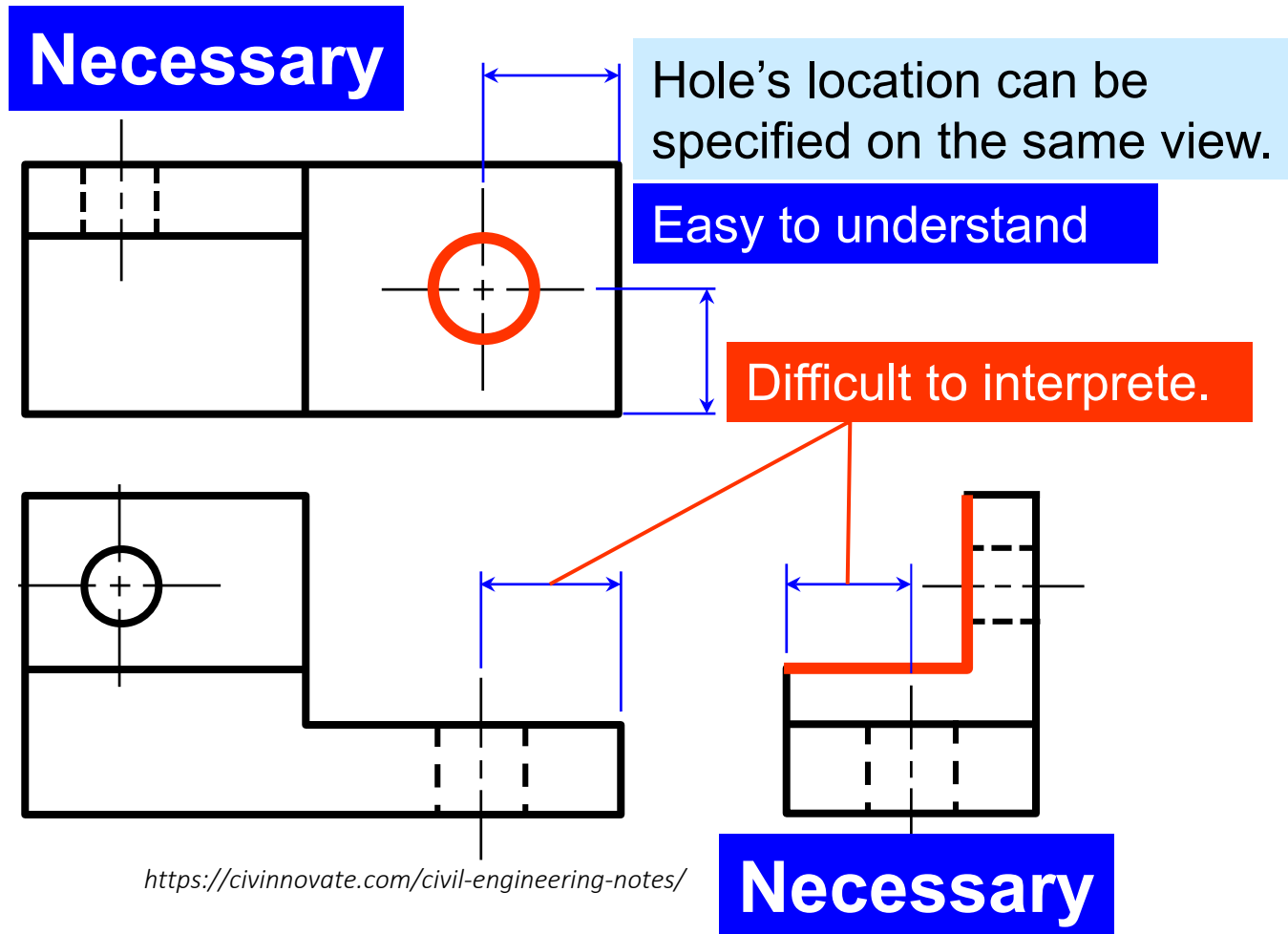
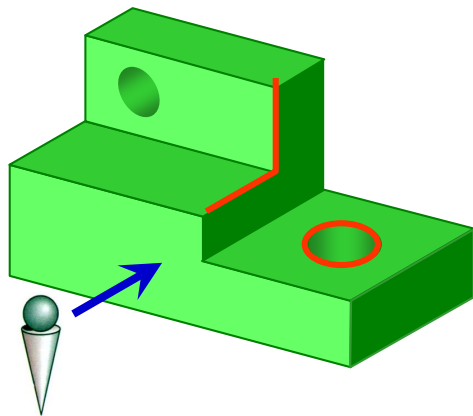
Inappropriate

Inappropriate



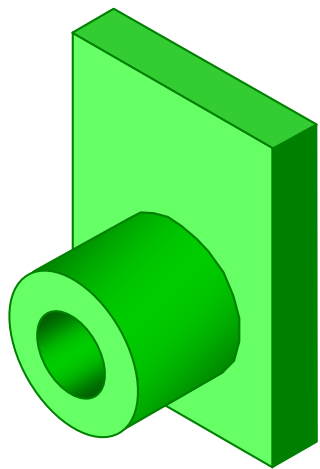
STEP 3 : Select an Adjacent View

- Choose the **minimum** number of views that can represent the major features of the object.

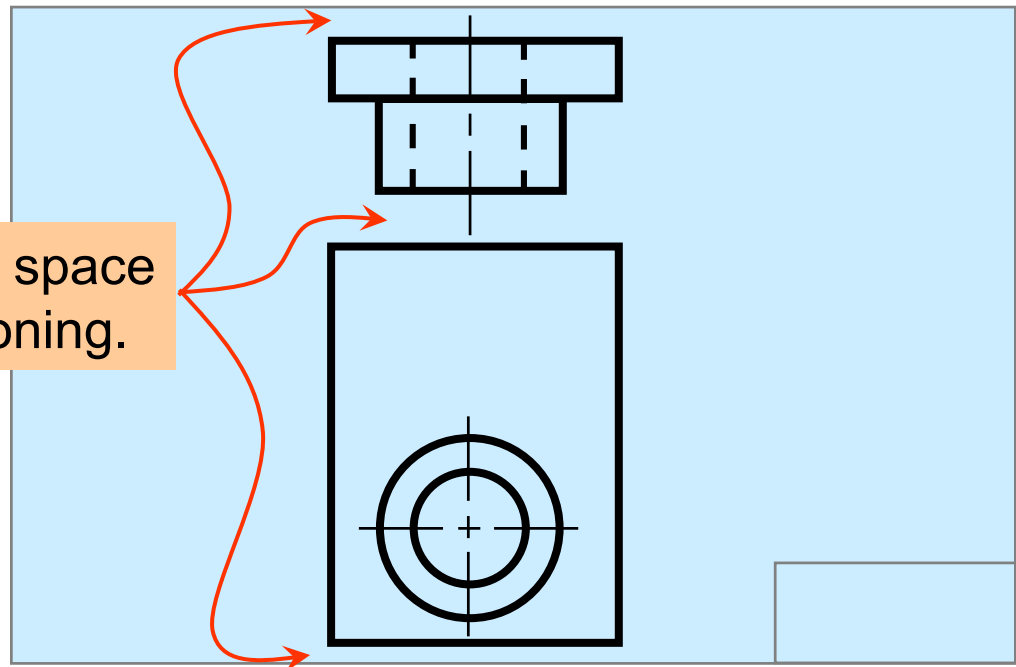


STEP 3 : Select an Adjacent View

- Choose the views that are suitable to a drawing space.

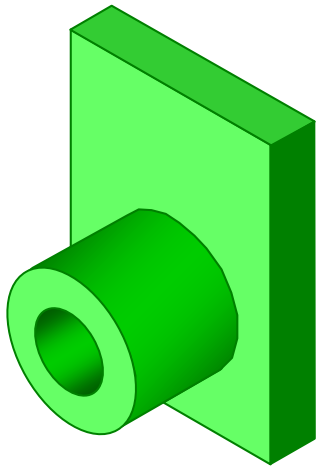


Not enough space for dimensioning.

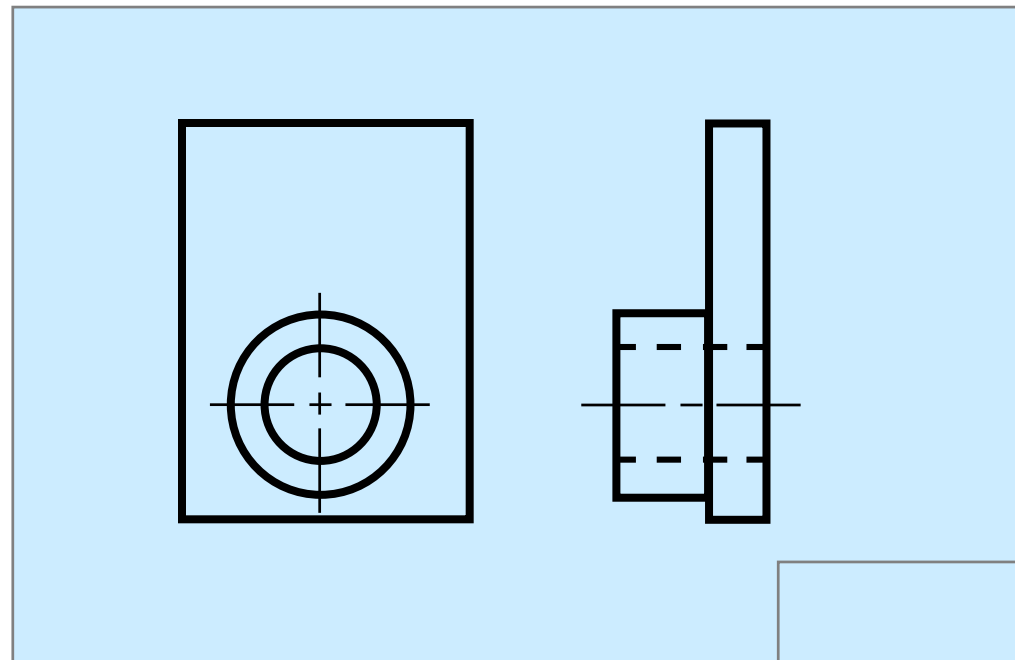


STEP 3 : Select an Adjacent View

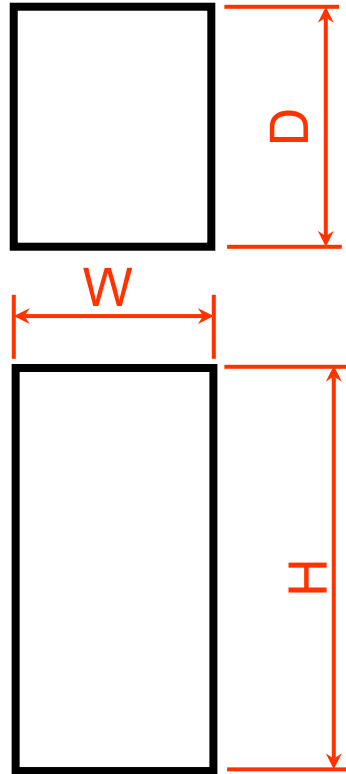
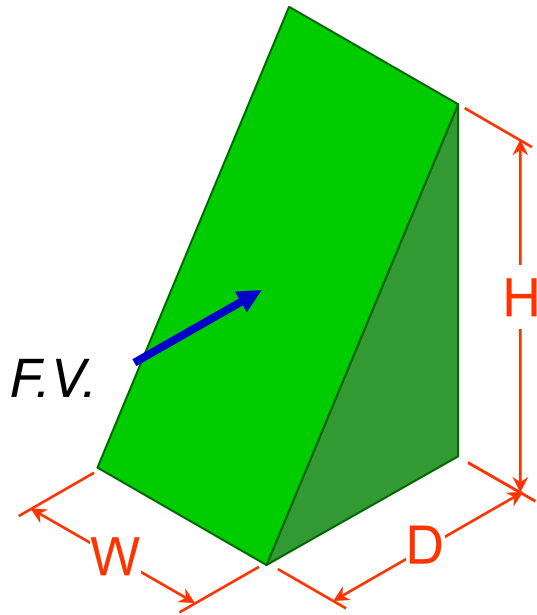
- Choose the views that are suitable to a drawing space.



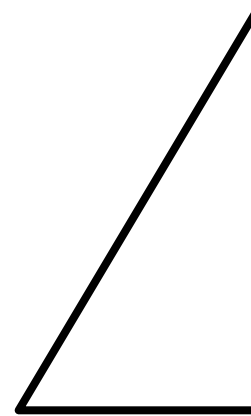
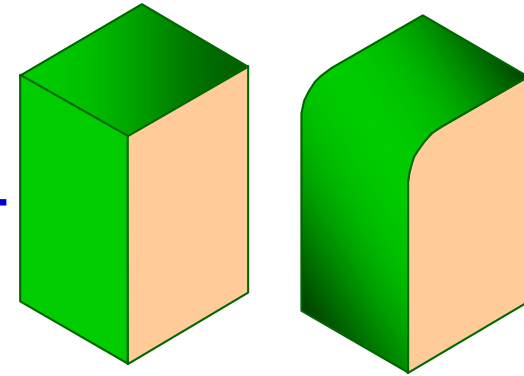
GOOD



Example : View selection



mislead to...



F.V. & T.V.

Three views

F.V. & R.S.V.

Size description

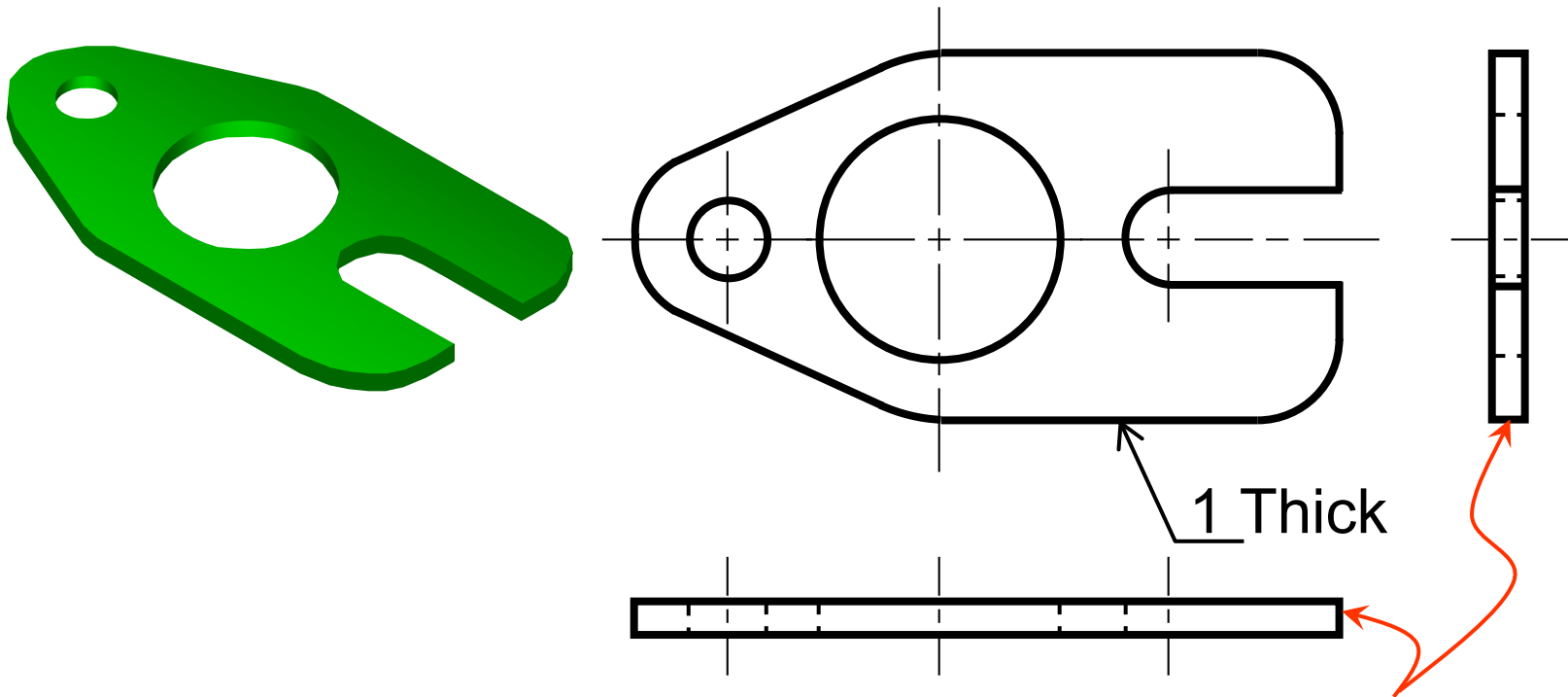


Shape description



ONE-VIEW DRAWING

- **Flat part** having a uniform thickness.



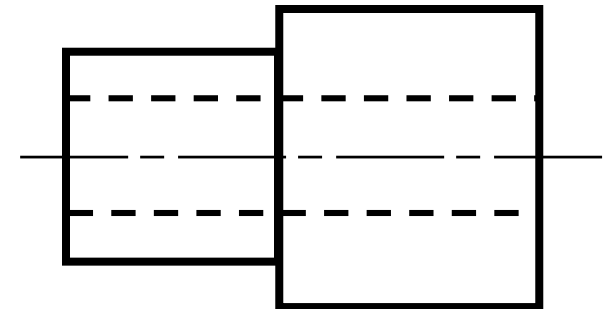
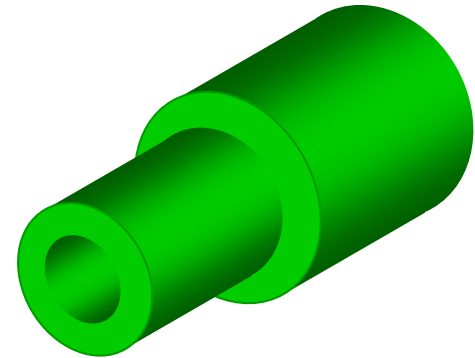
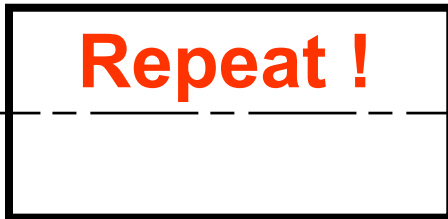
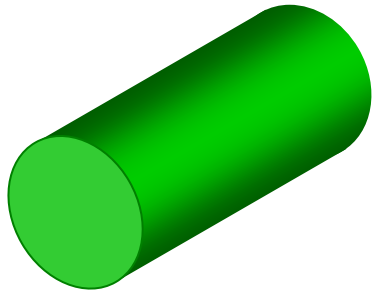
Unnecessary

These 2 views provide only information about the part thickness !

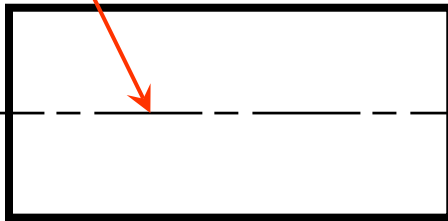
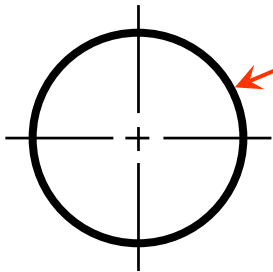
ONE-VIEW DRAWING

- ***Cylindrical-shaped*** part.

Unnecessary



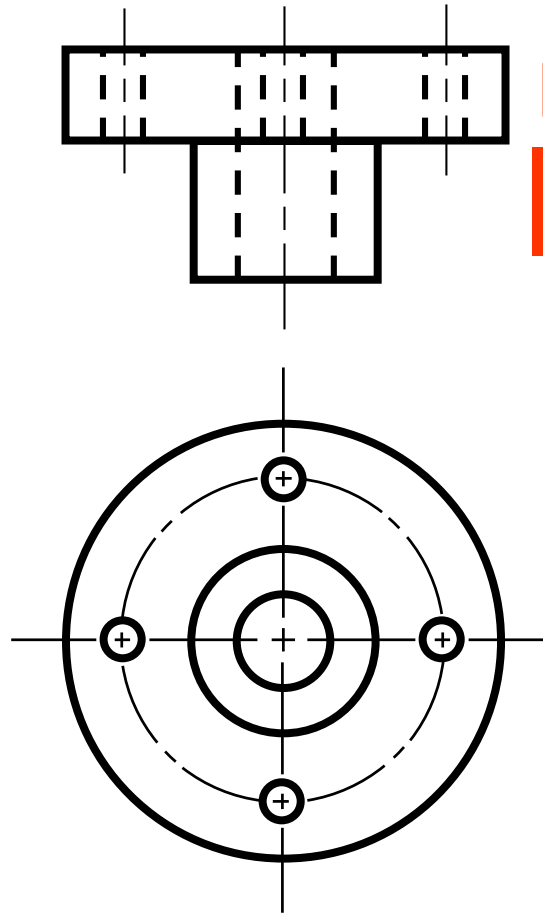
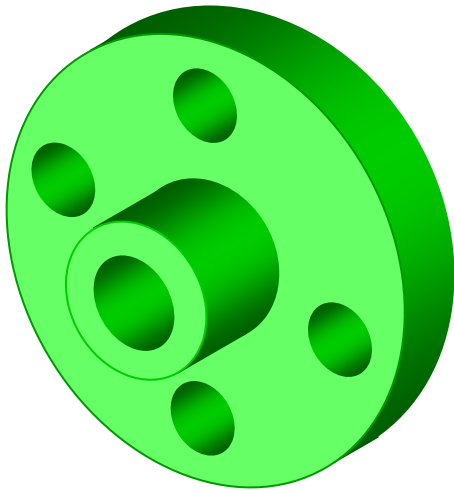
Infer from CL



Unnecessary

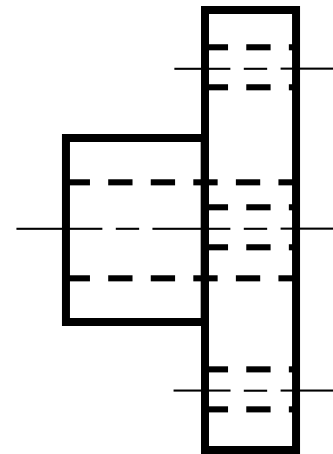
TWO-VIEW DRAWING

- There exists an identical view.



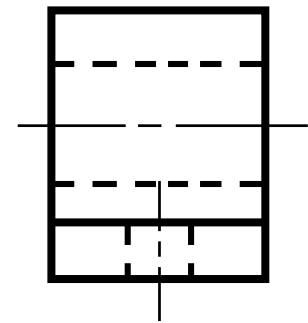
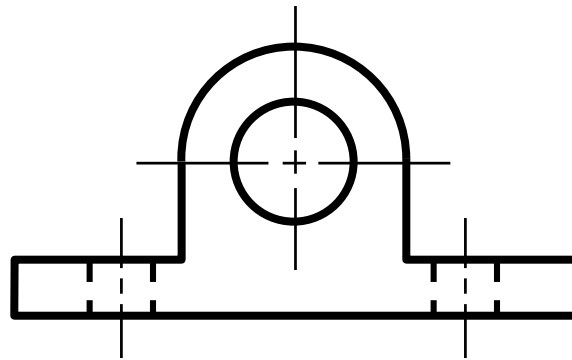
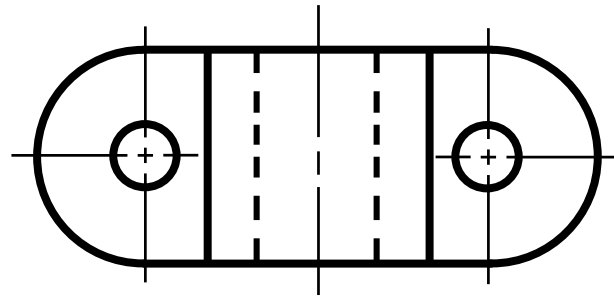
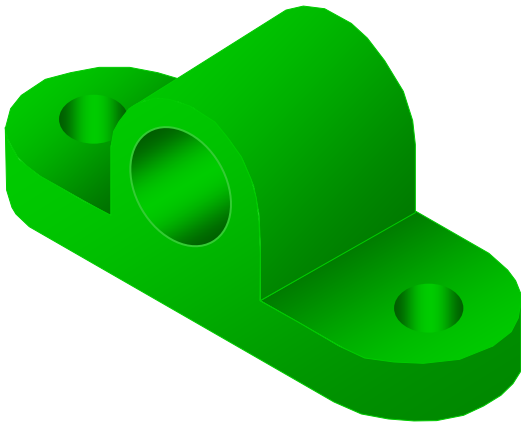
Repeat !

Unnecessary



TWO-VIEW DRAWING

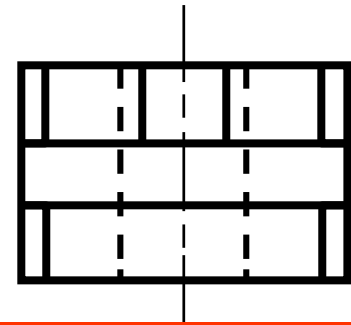
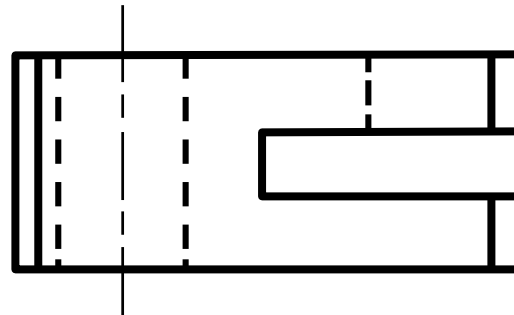
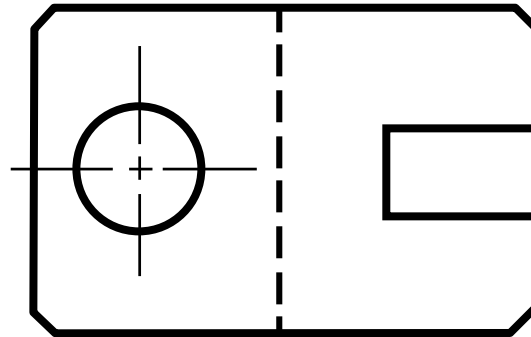
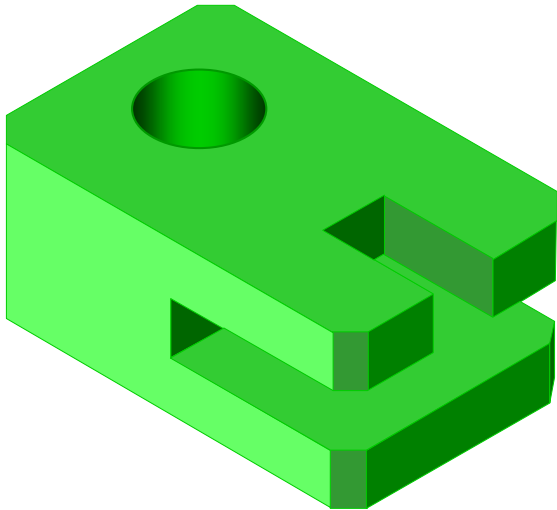
- The 3rd view has no significant contours of the object.



Unnecessary

TWO-VIEW DRAWING

- The 3rd view has no significant contours of the object.



Unnecessary



Alignment of Views



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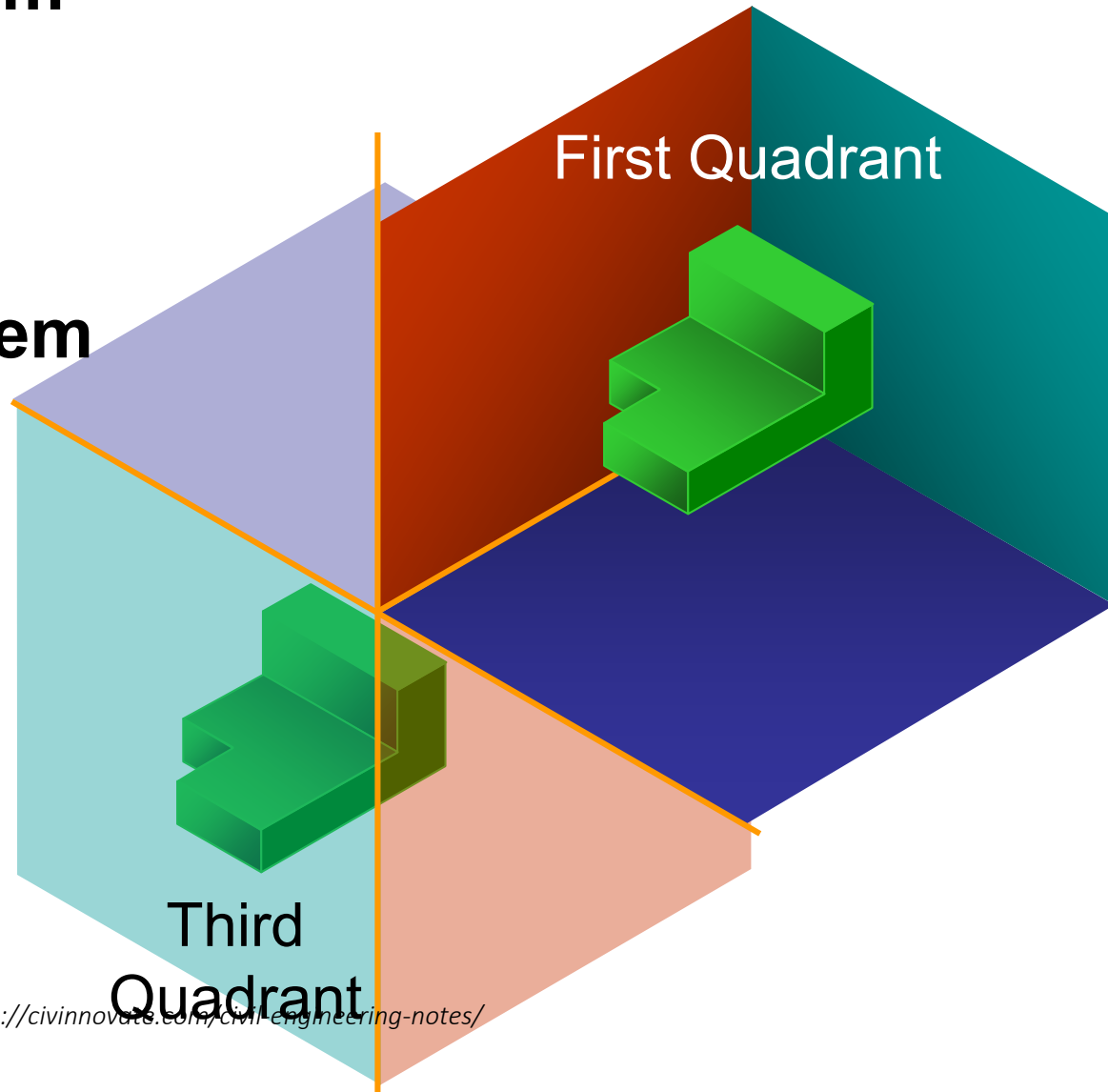
PROJECTION SYSTEMS

1. First angle system

- European country
- ISO standard

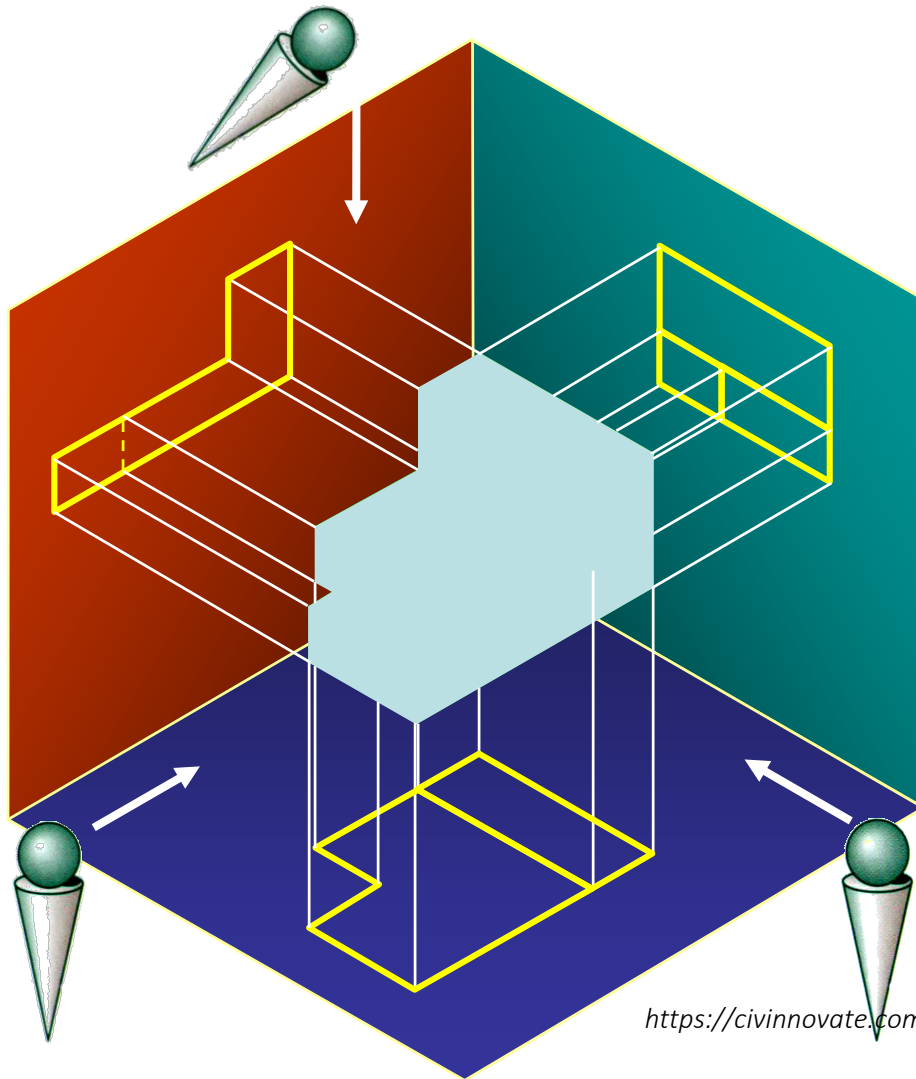
2. Third angle system

- Canada, USA, Japan, Thailand

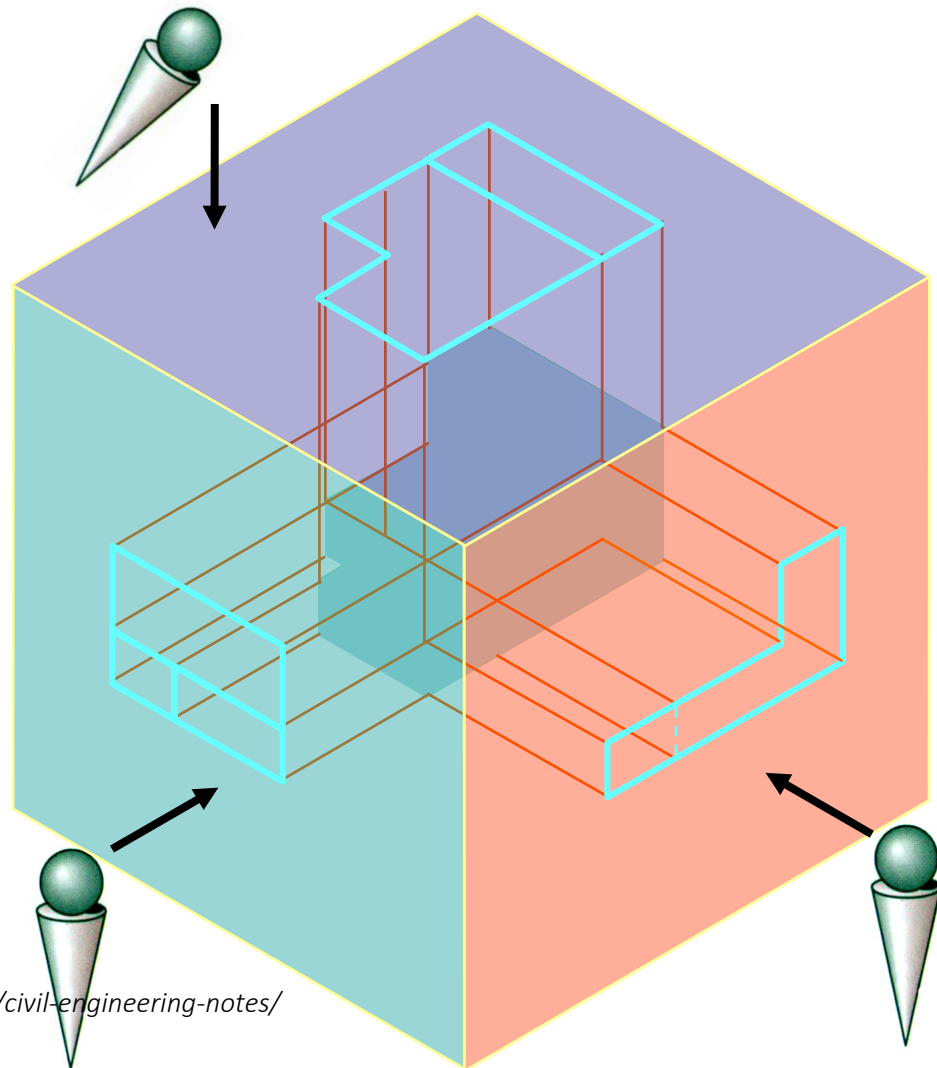


ORTHOGRAPHIC PROJECTION

1st angle system

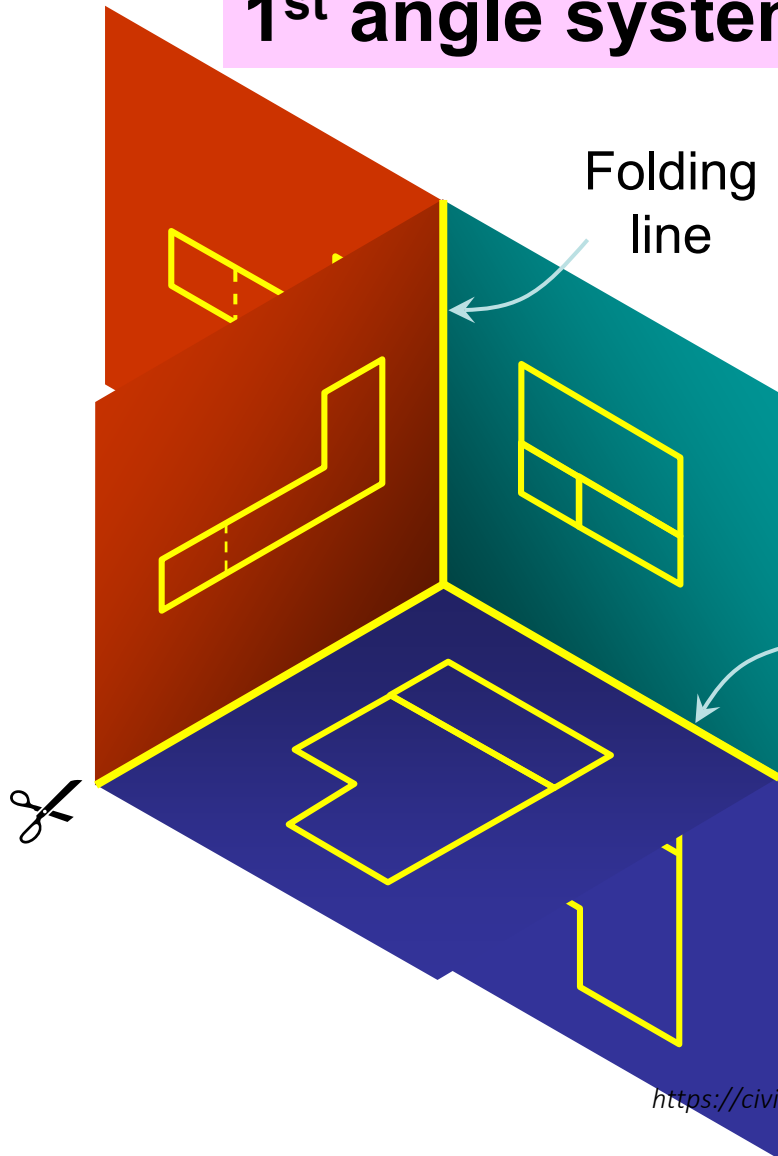


3rd angle system

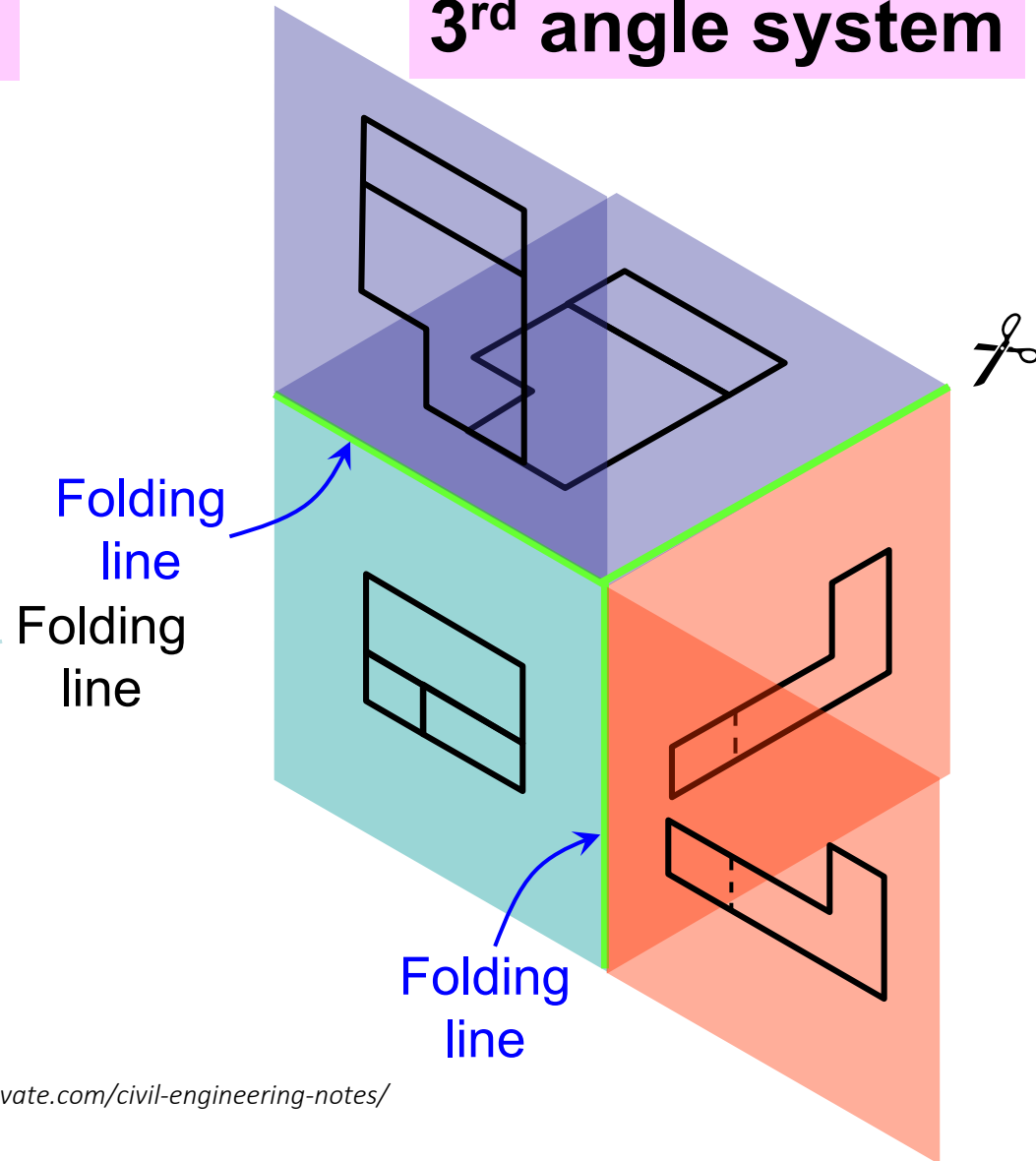


ORTHOGRAPHIC VIEWS

1st angle system

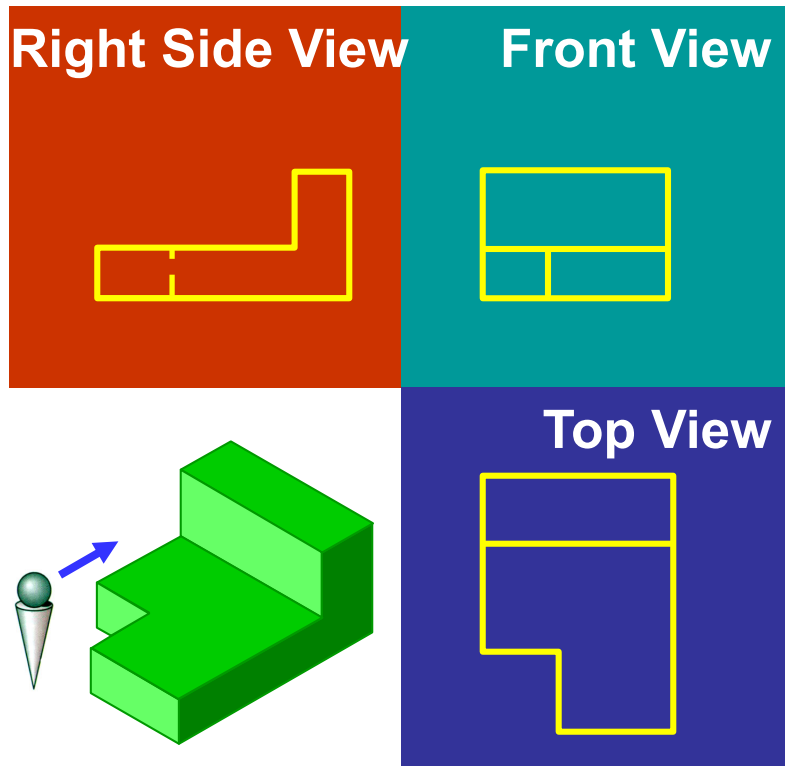


3rd angle system

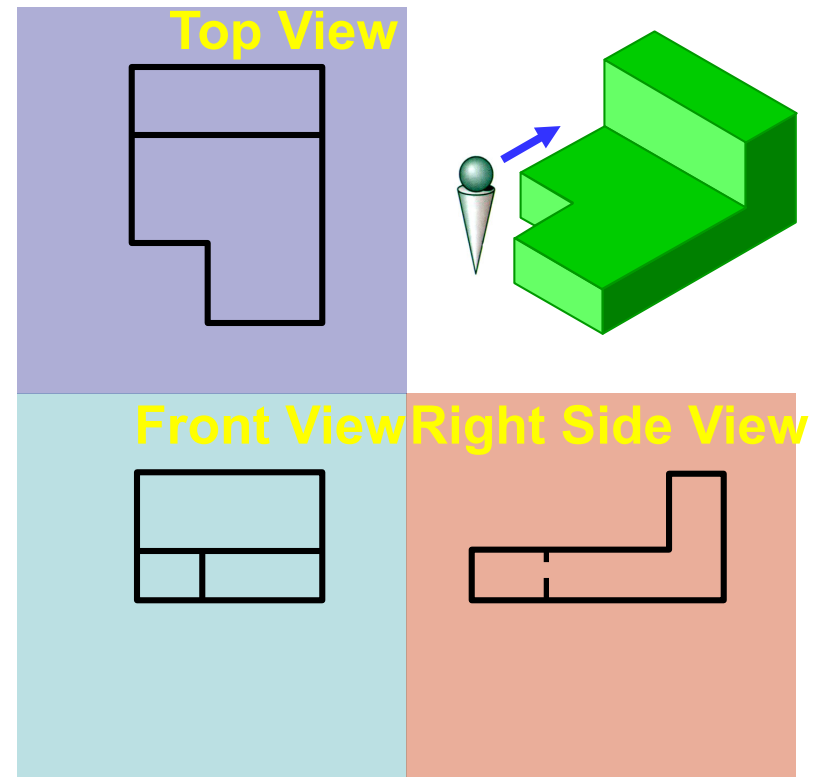


ORTHOGRAPHIC VIEWS

1st angle system

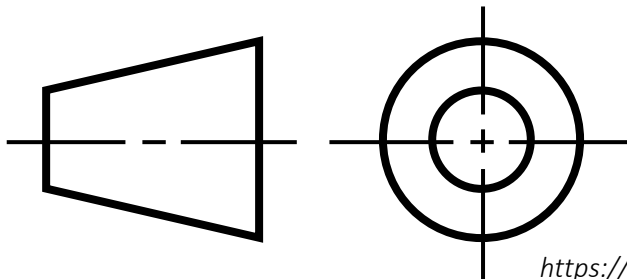
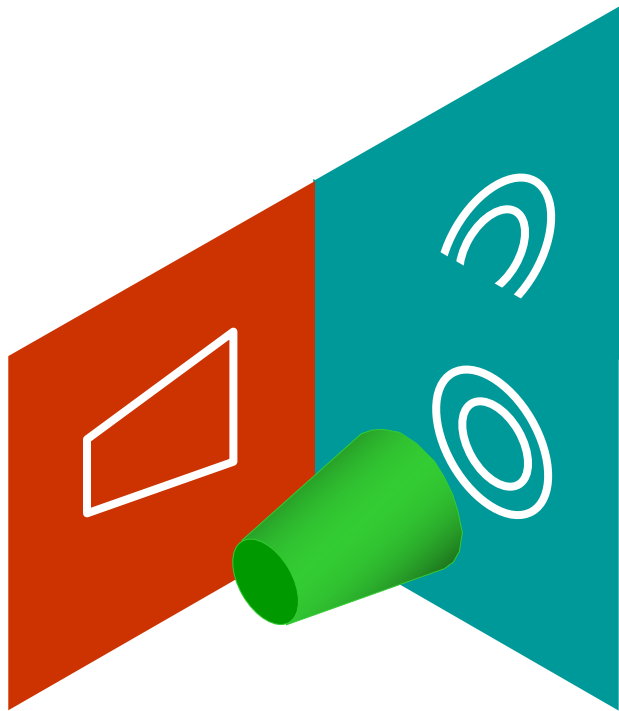


3rd angle system

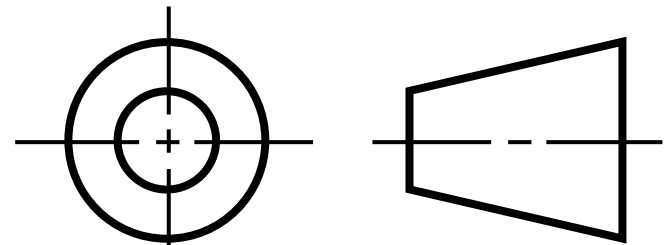
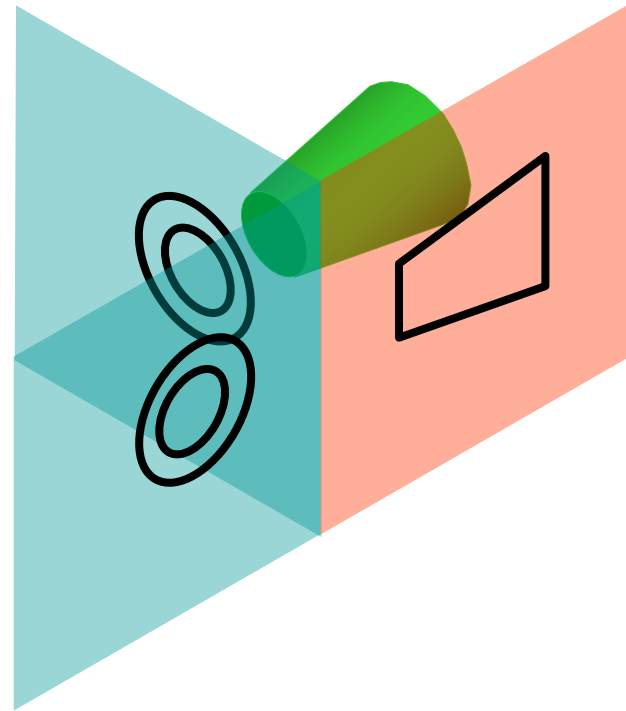


PROJECTION SYMBOLS

First angle system

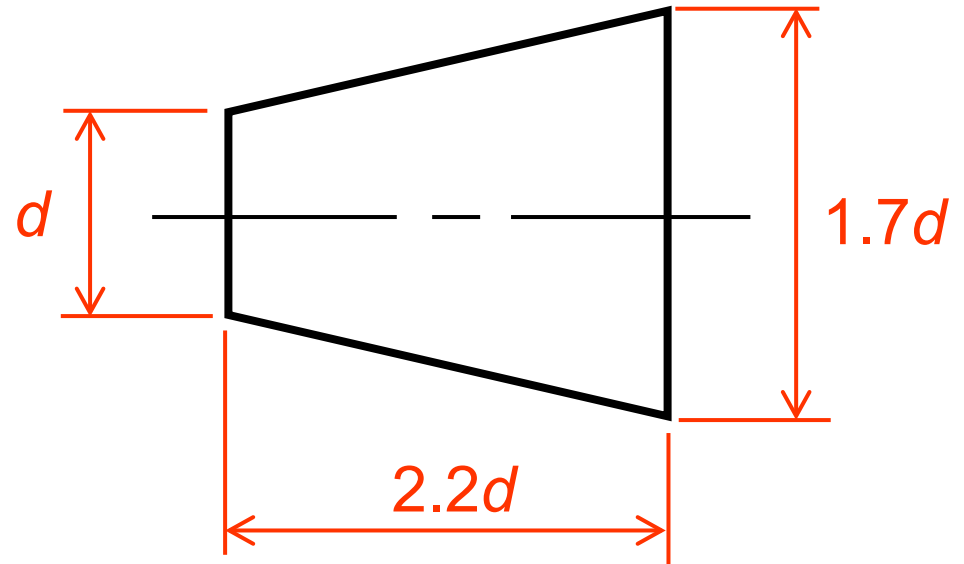
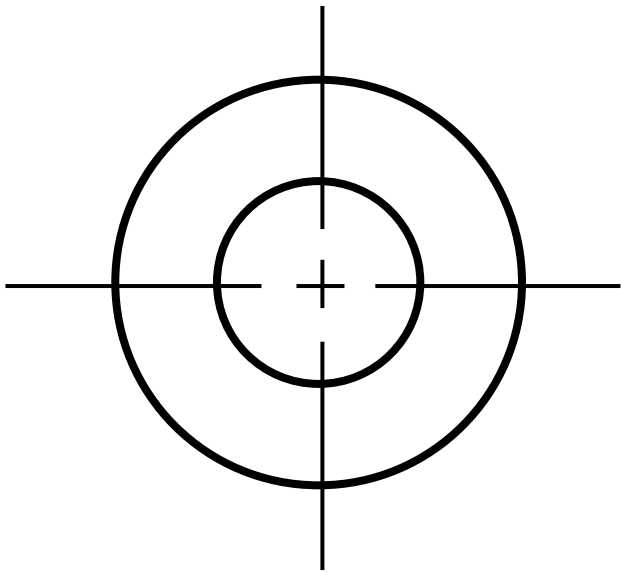


Third angle system



PROJECTION SYMBOLS

Suggested proportion





Orthographic Writing Steps

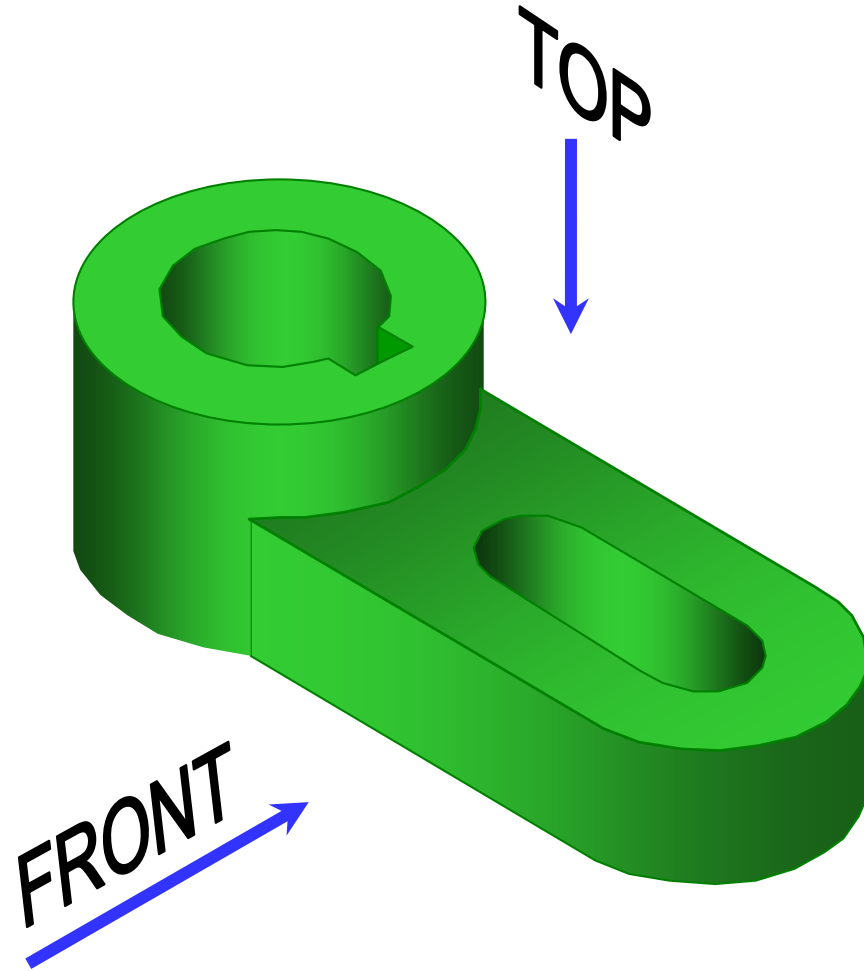


<https://civinnovate.com/civil-engineering-notes/>

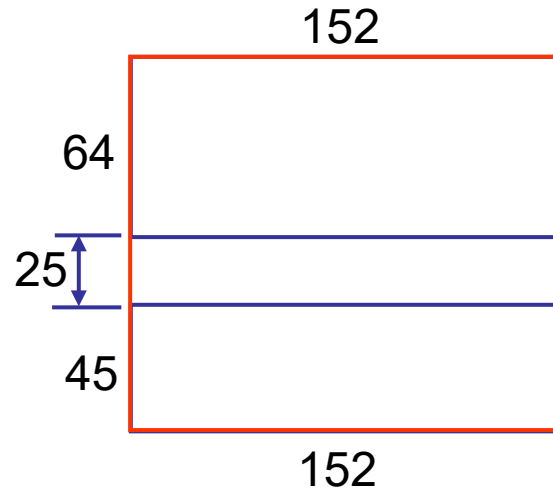
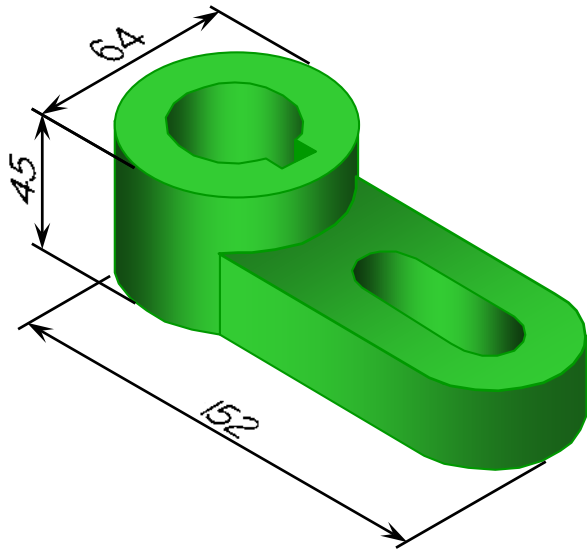
WRITING STEPS

1. Select the necessary views
2. Layout the views.
3. Project the views.
4. Dimension the views.

1. SELECT THE NECESSARY VIEWS



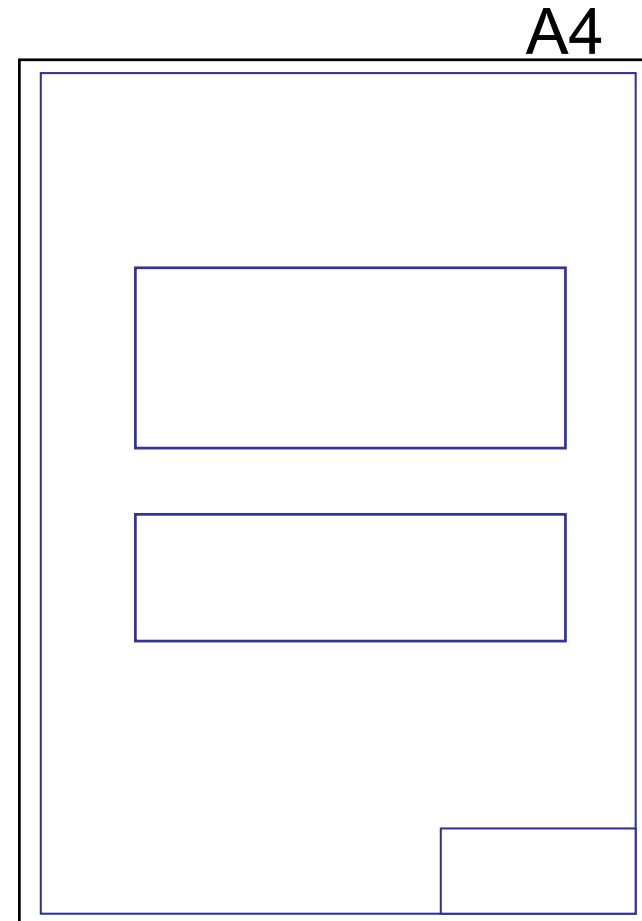
2. LAYOUT THE VIEWS



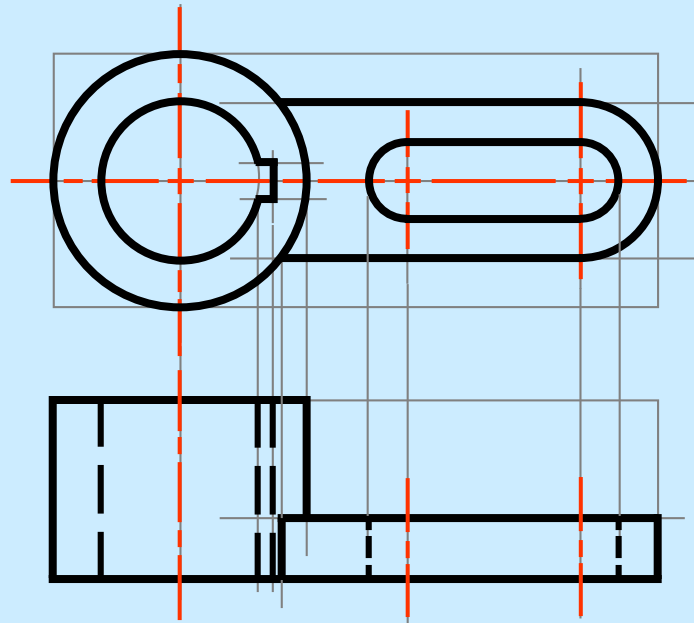
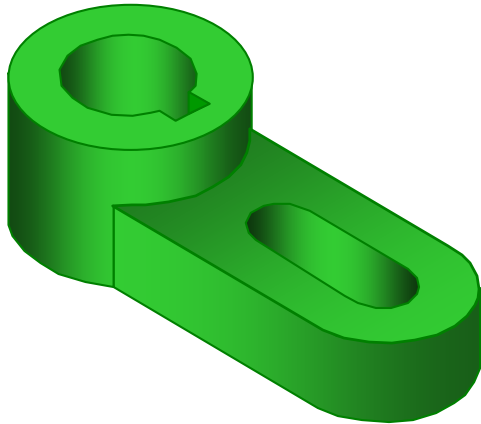
152

Choose an appropriate scale

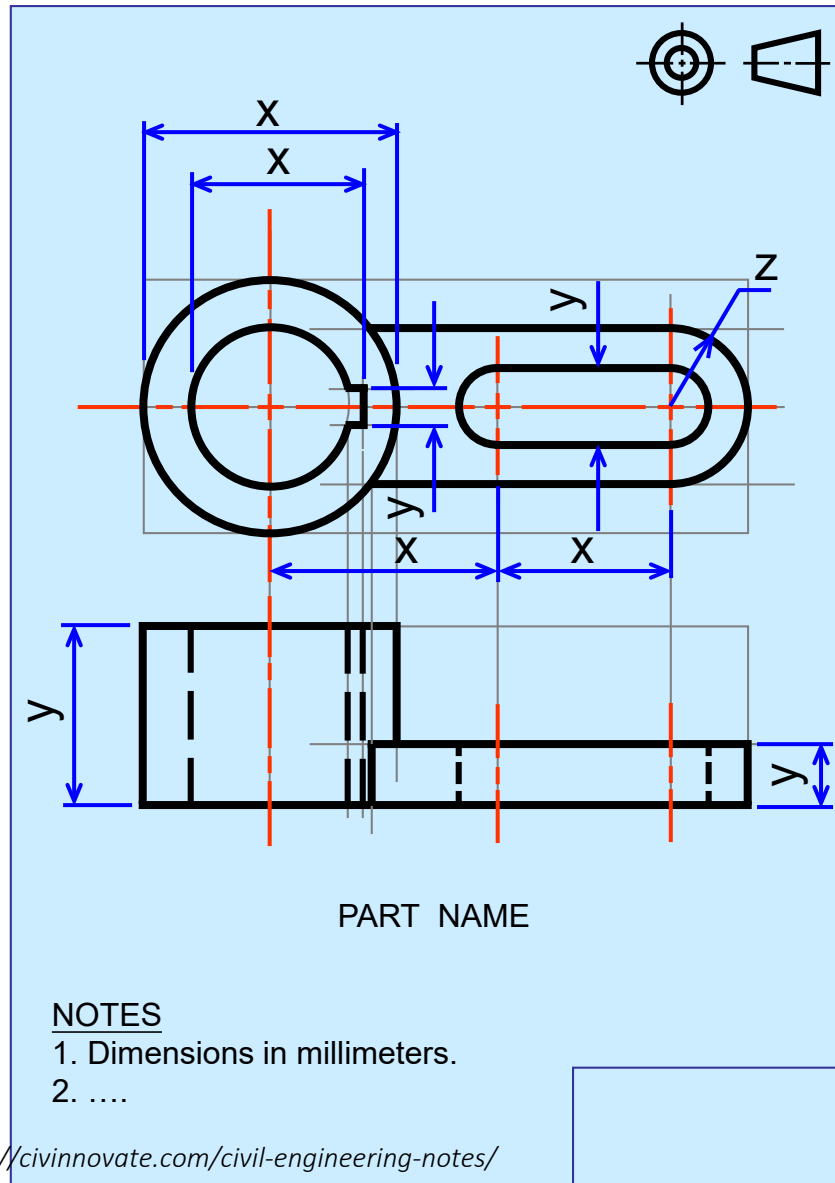
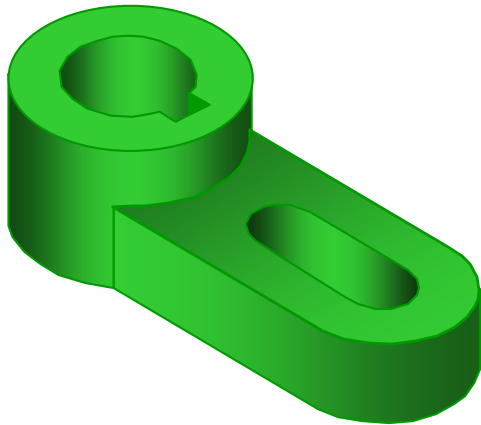
1:1



PROJECT THE VIEWS

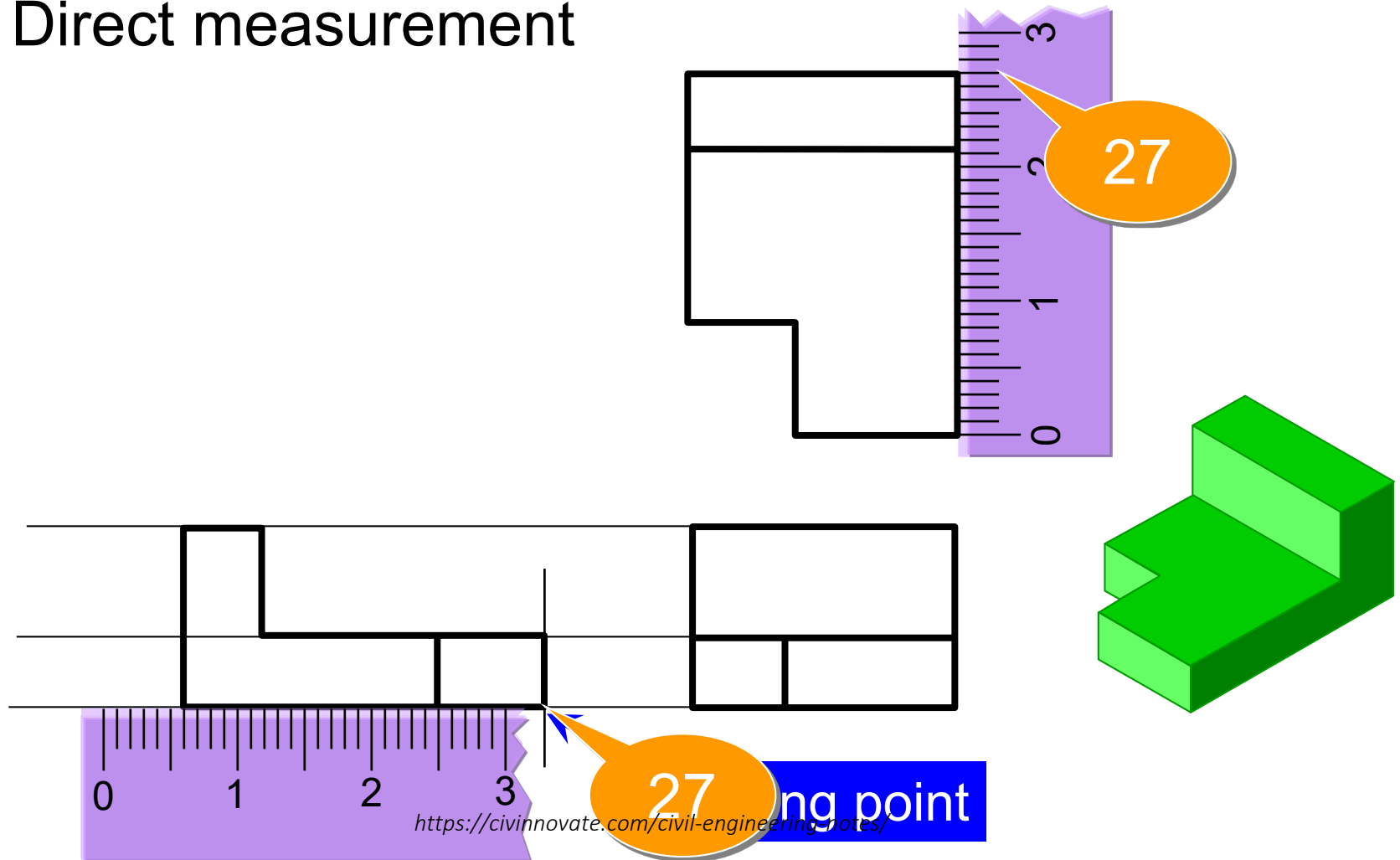


DIMENSION THE VIEWS



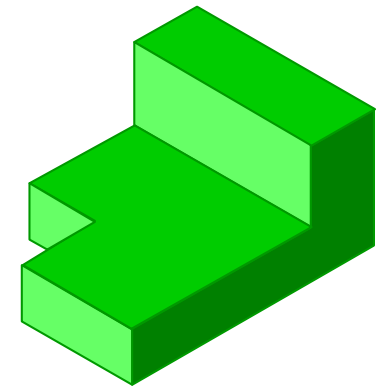
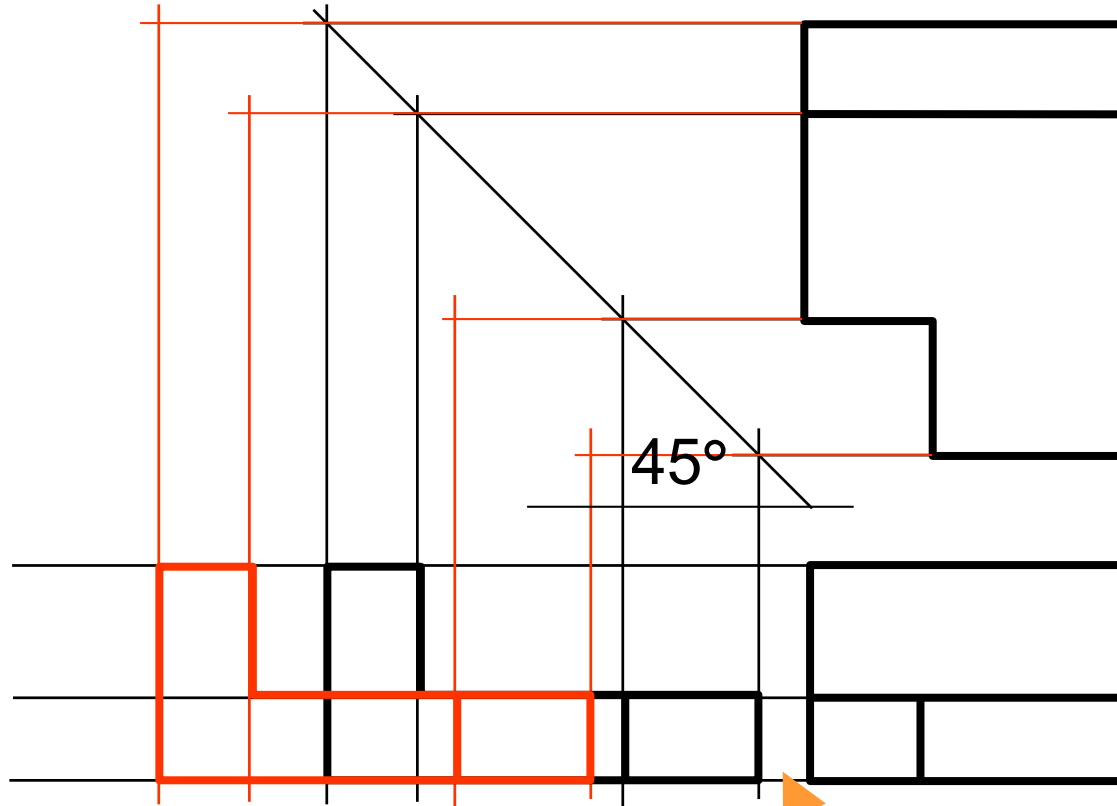
TRANSFERRING THE DEPTH DIMENSION

1. Direct measurement



TRANSFERRING THE DEPTH DIMENSION

2. Use miter line



Views too close



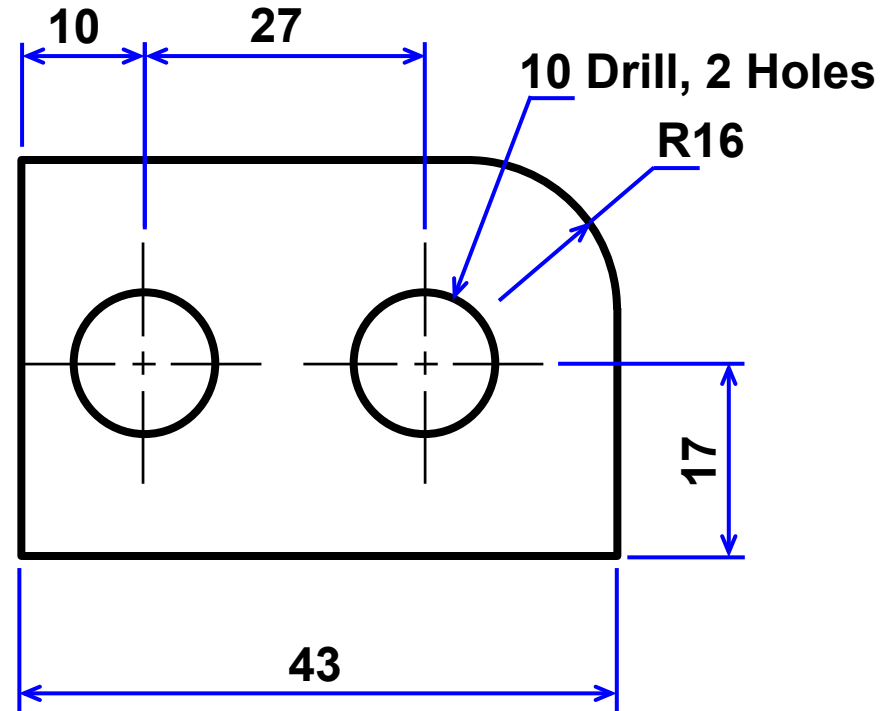
Basic Dimensioning



<https://civinnovate.com/civil-engineering-notes/>

COMPONENTS

1. Extension lines
2. Dimension lines
3. Leader lines
4. Dimension numbers
5. Local notes





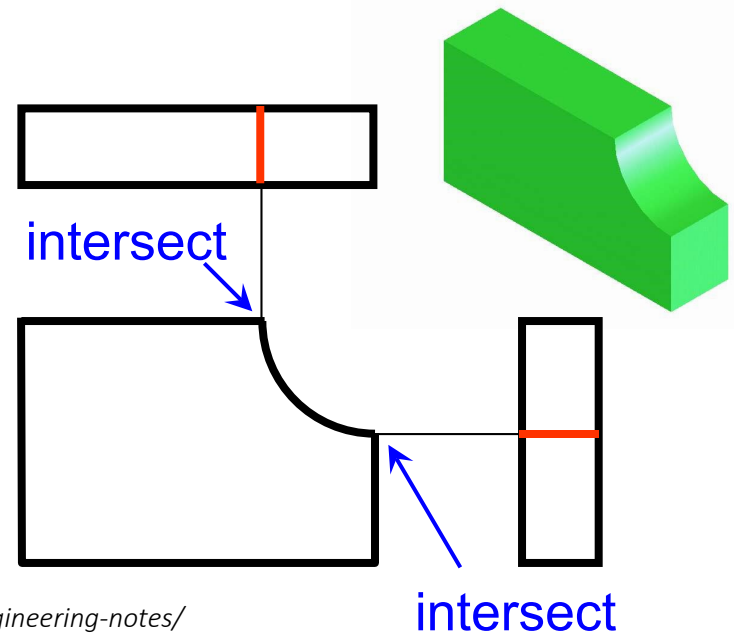
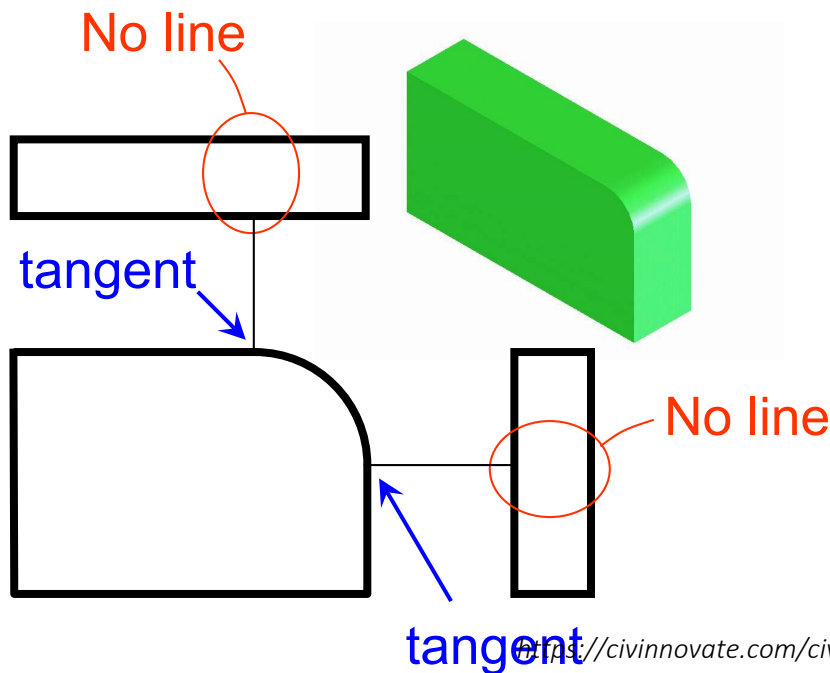
Tangencies and Intersections



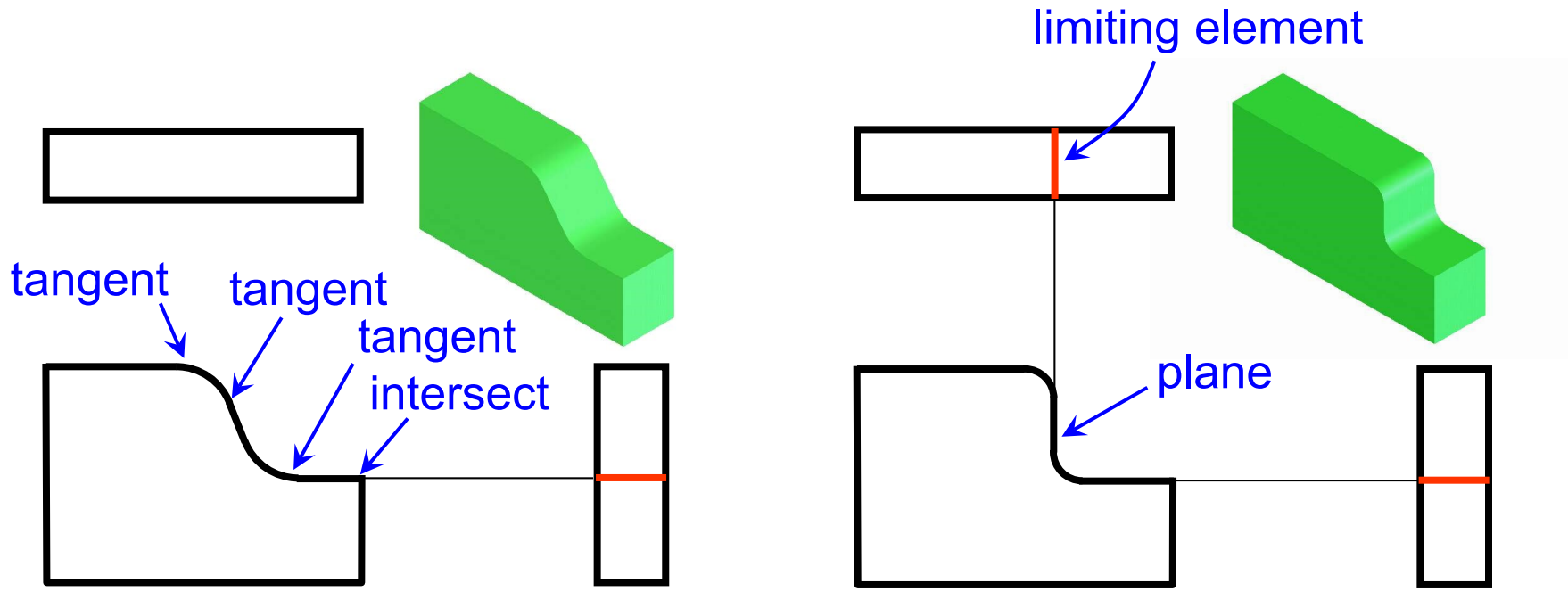
<https://civinnovate.com/civil-engineering-notes/>

TANGENT & INTERSECTION

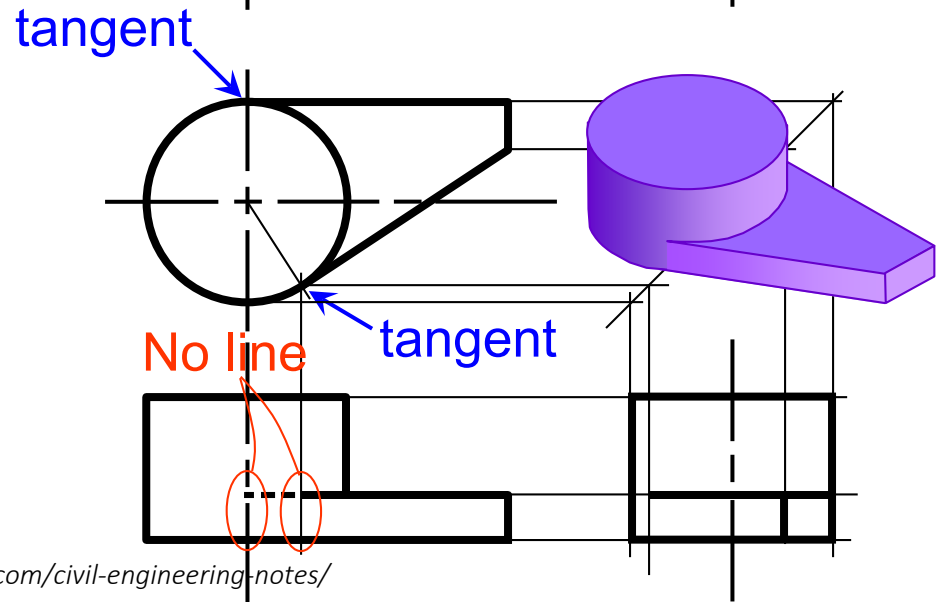
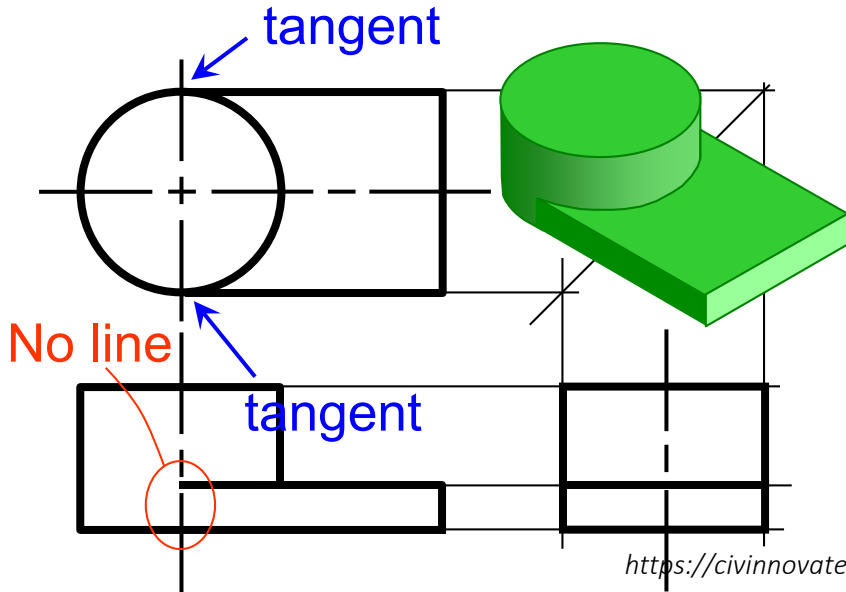
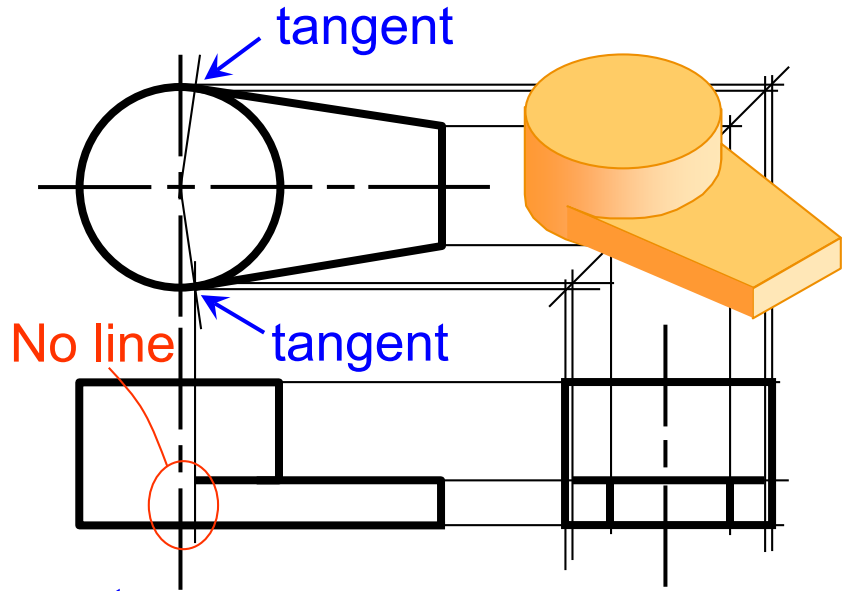
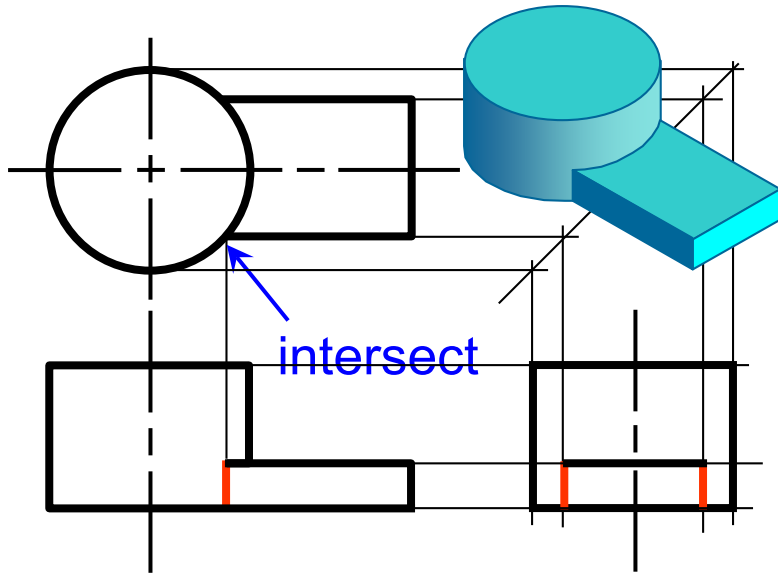
- No line is formed when curved surface *tangent* to a plane surface.
- Line is formed when curved surface *intersects* a plane surface.



TANGENT & INTERSECTION



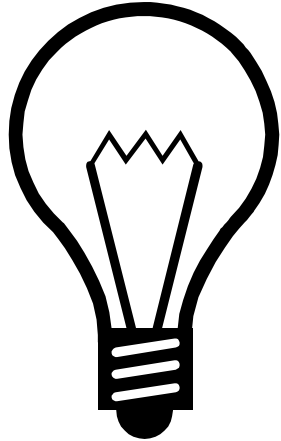
TANGENT & INTERSECTION



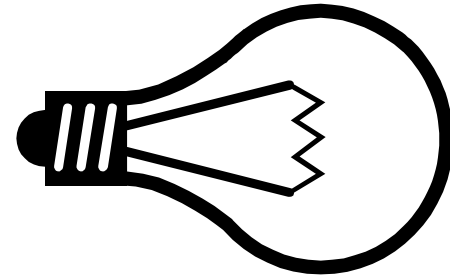
QUIZ

1. Which should be the **natural position** of the light bulb ? (20 sec)

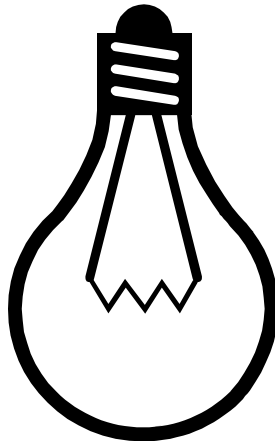
a



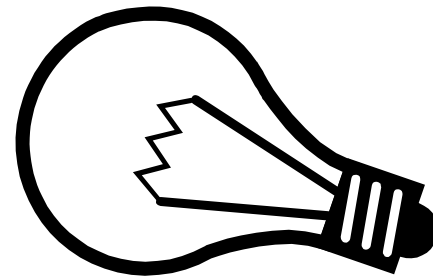
b)



c)



d)



0 5 10 15 20



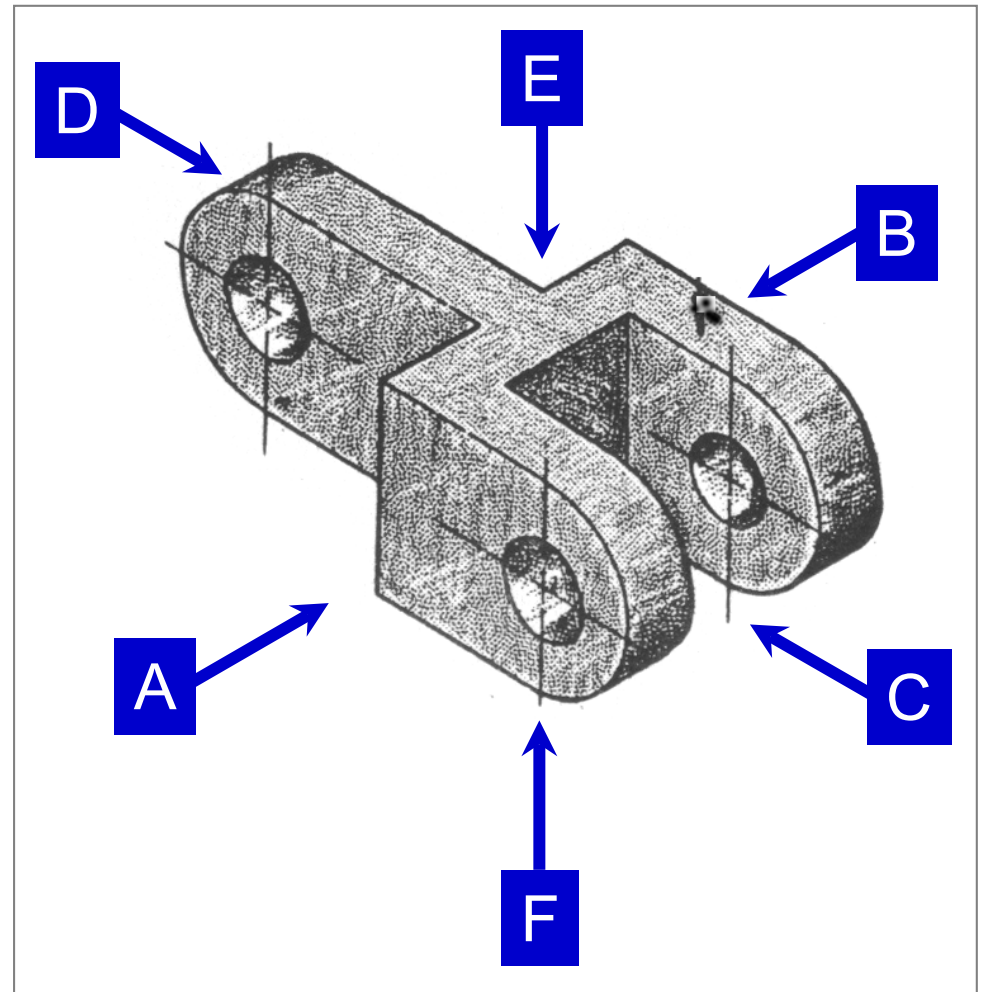
2. Which are the **necessary views** ? (60 sec)

a) A-C-E

b) E-B-D

c) E-A

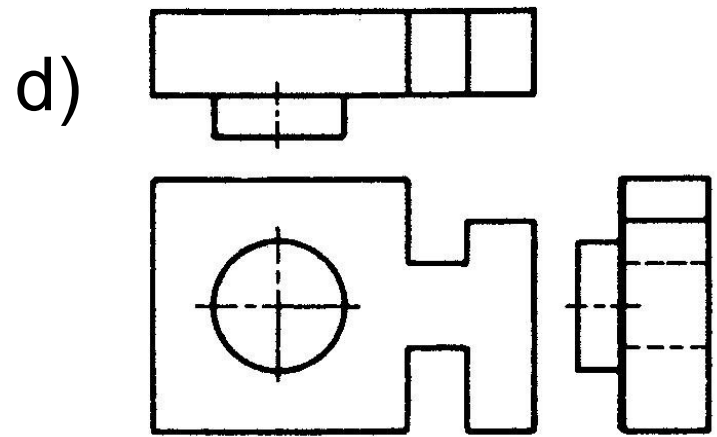
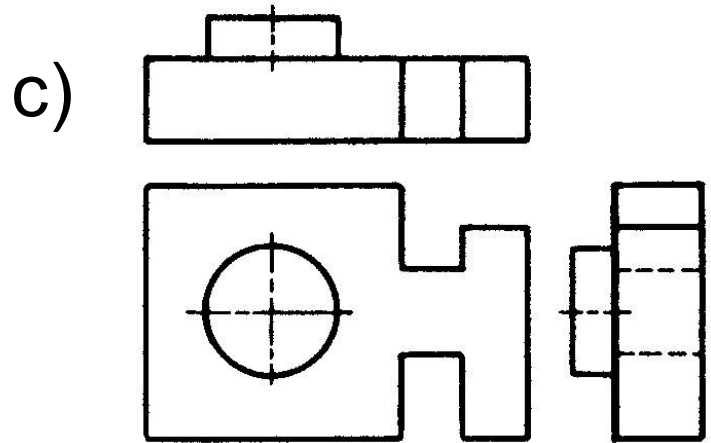
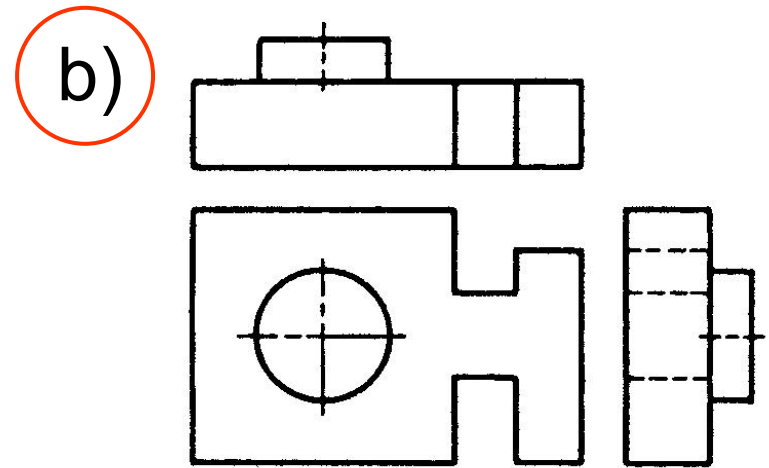
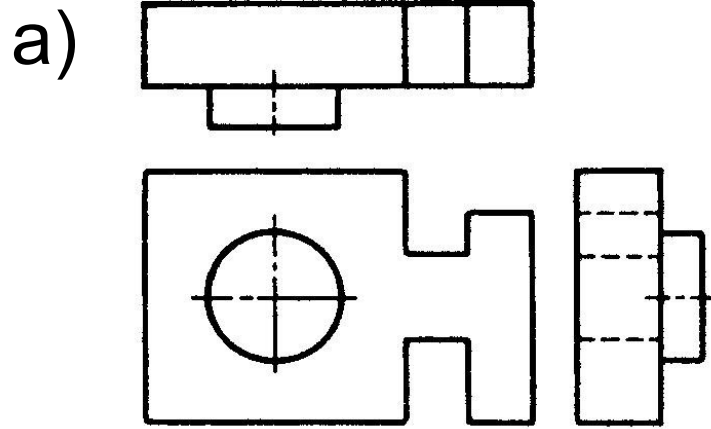
d) E-C



0 15 30 45 60

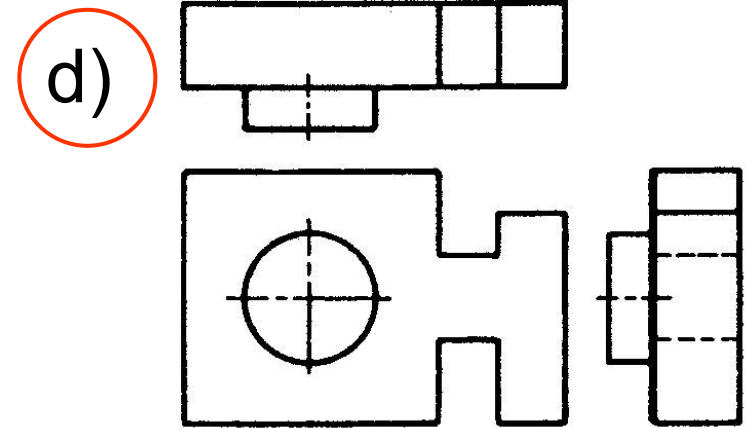
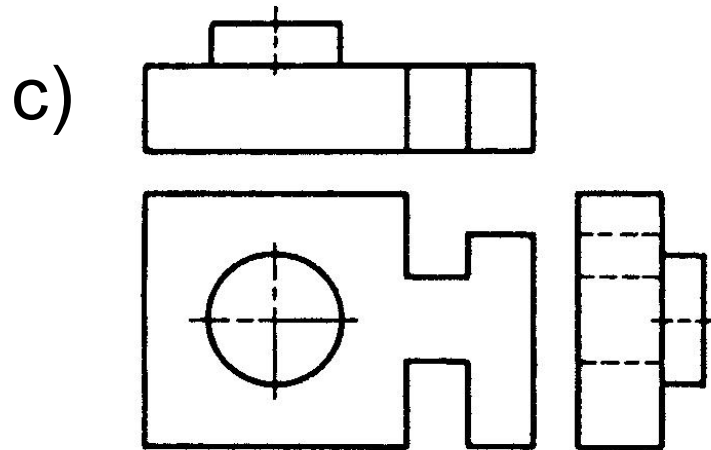
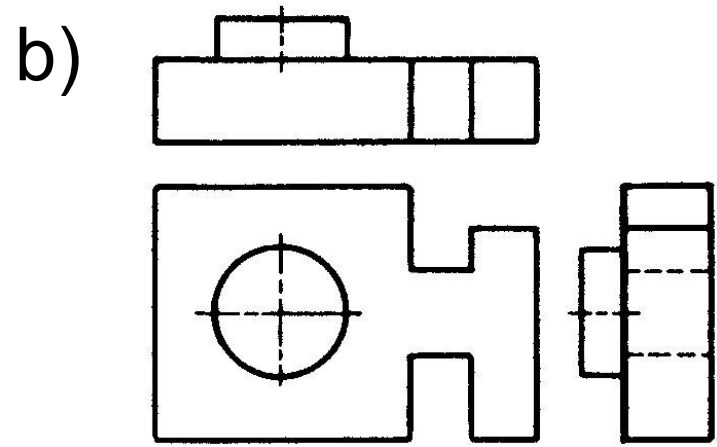
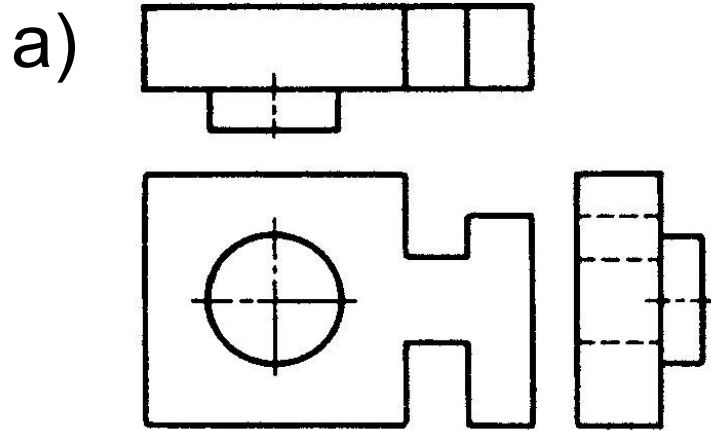


3. Which is in correct **first** angle projection ? (180 sec)



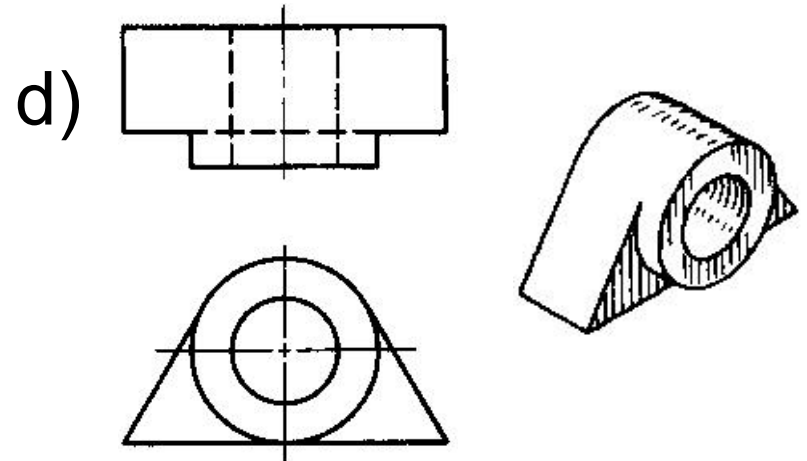
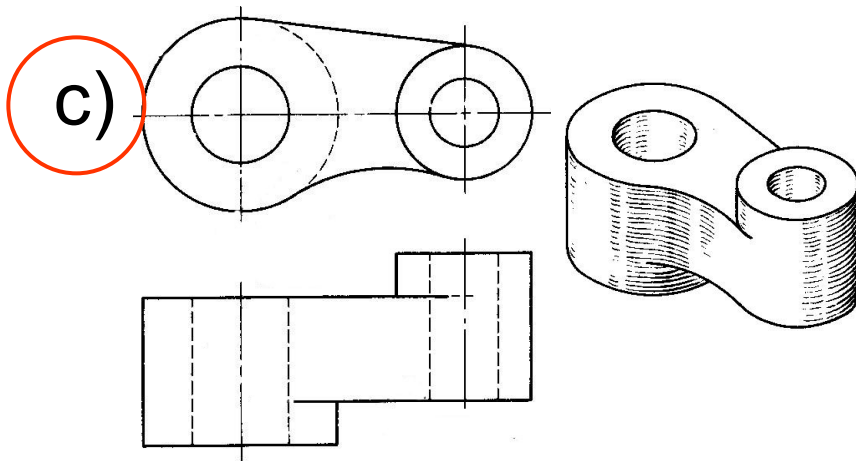
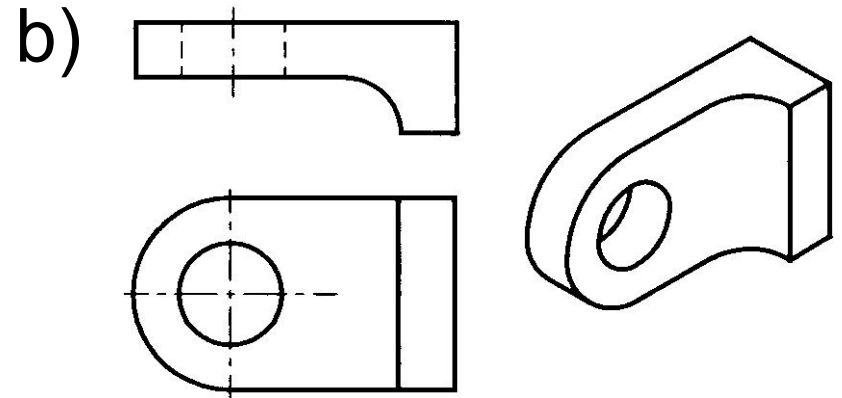
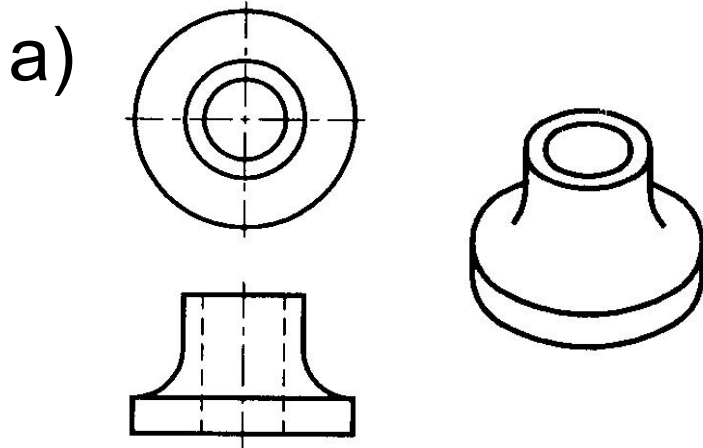
0 45 90 135 180

4. Which is in correct **third** angle projection ? (180 sec)



0 45 90 135 180

5. Which is a **wrong** 3rd angle orthographic views ?
(180 sec)



0 45 90 135 180