

Lecture 12

# ISOMETRIC PROJECTIONS :: BASICS



TA 101 : Engineering Graphics

2007-08 Semester II

January – May 2008

# OUTLINE

- Isometric Projections
- Isometric Drawing *versus* Isometric Views
- Examples



ISOMETRIC  
PROJECTIONS

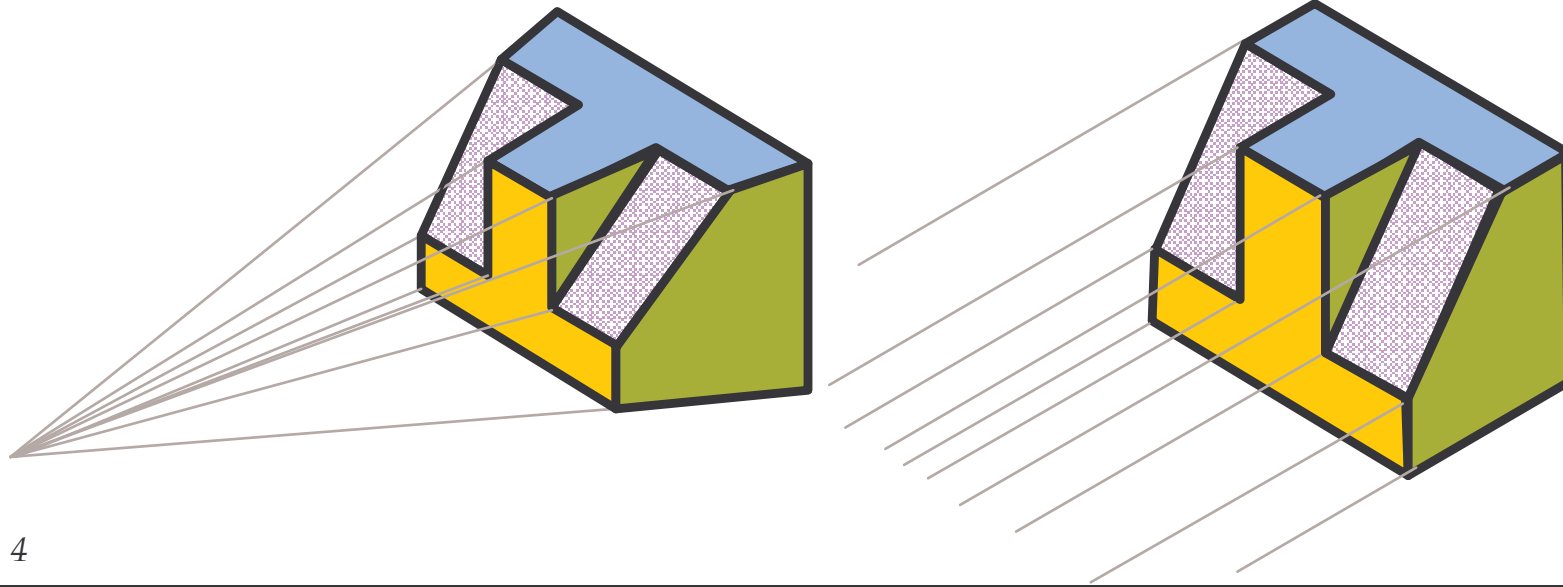
# CLASSIFICATION

- Pictorial views

## Pictorial Views

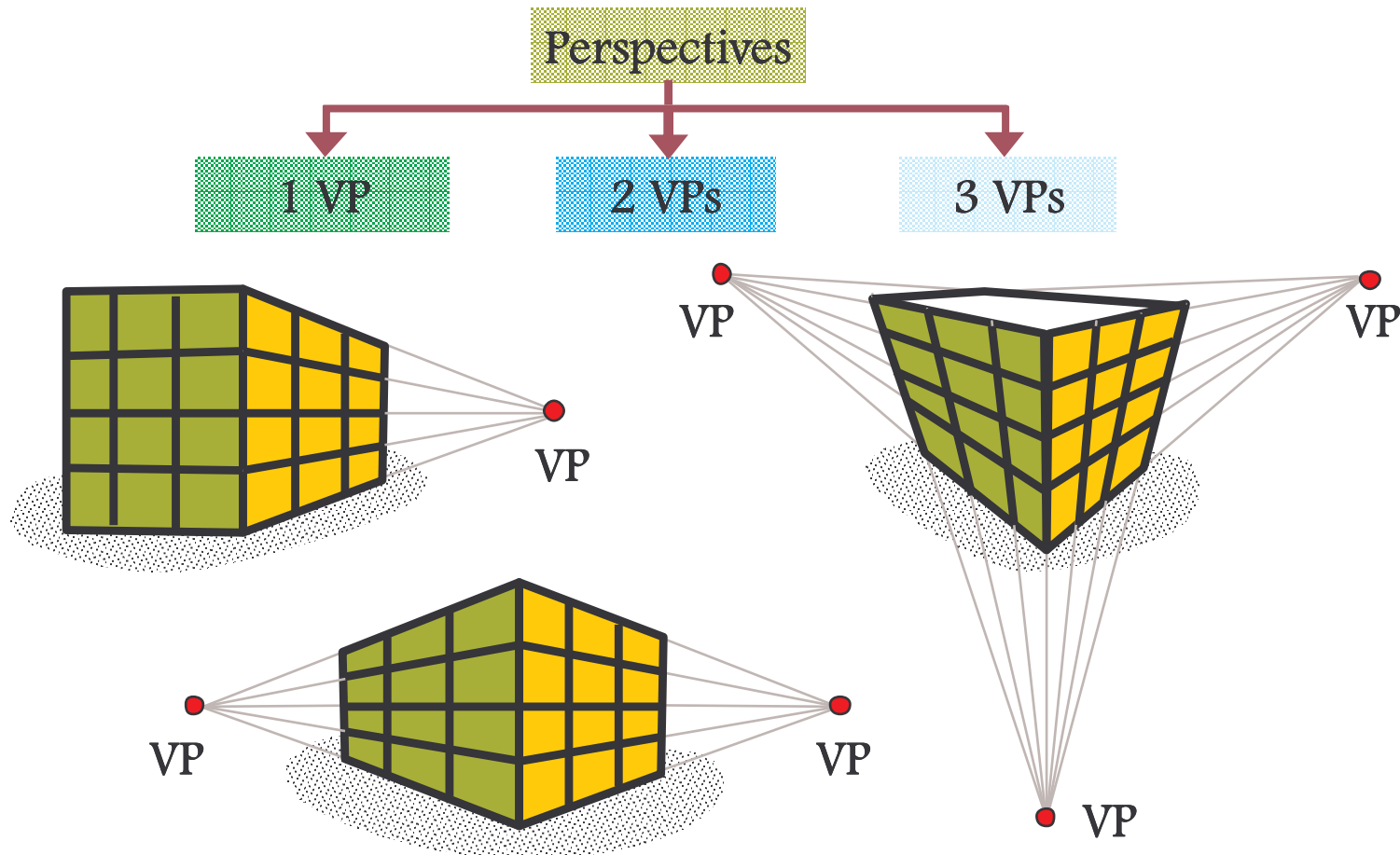
Viewing lines converge  
at a point  
*(Perspectives)*

All viewing lines  
are parallel  
*(Projections)*



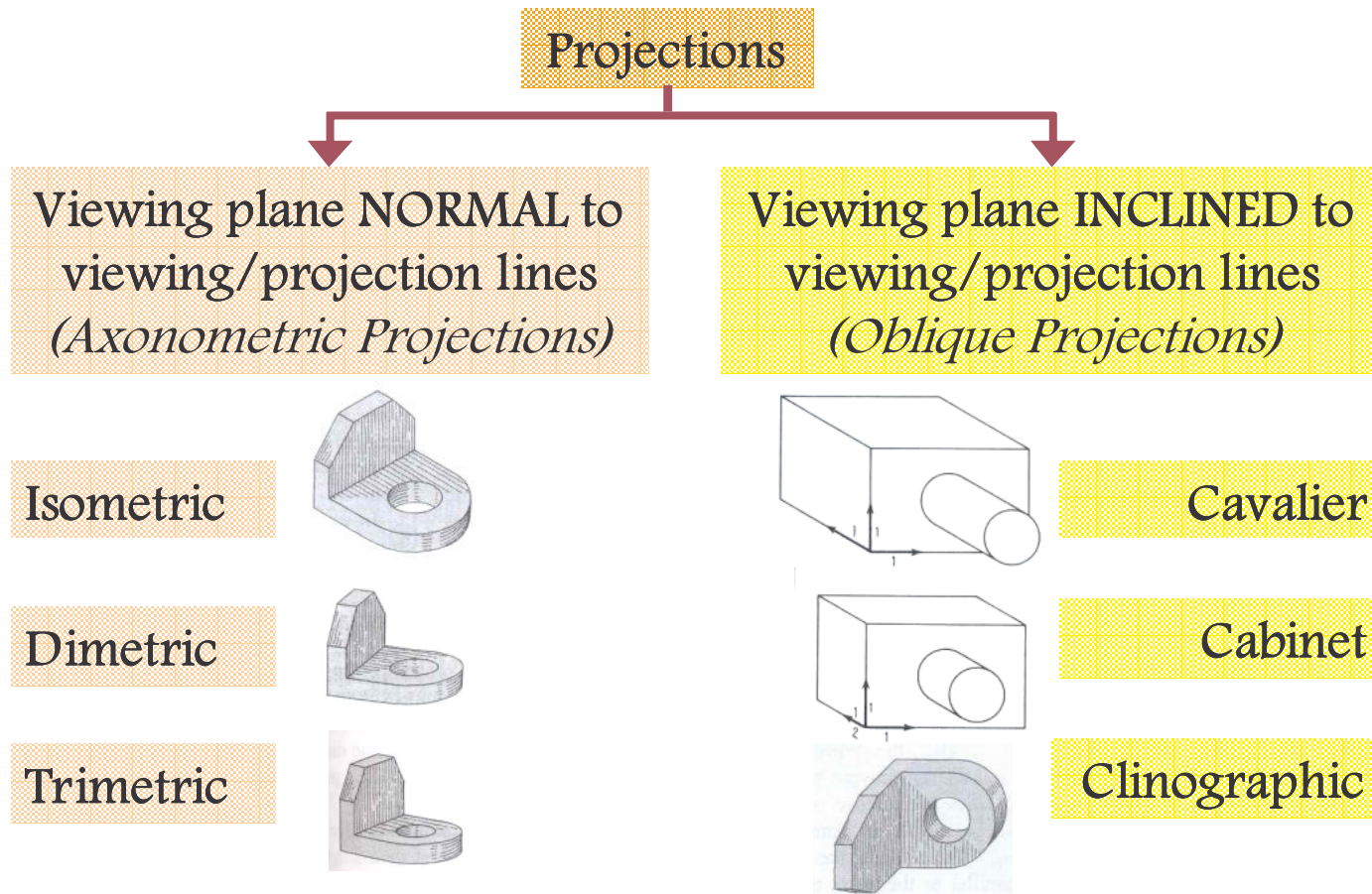
# CLASSIFICATION

- Perspective Views



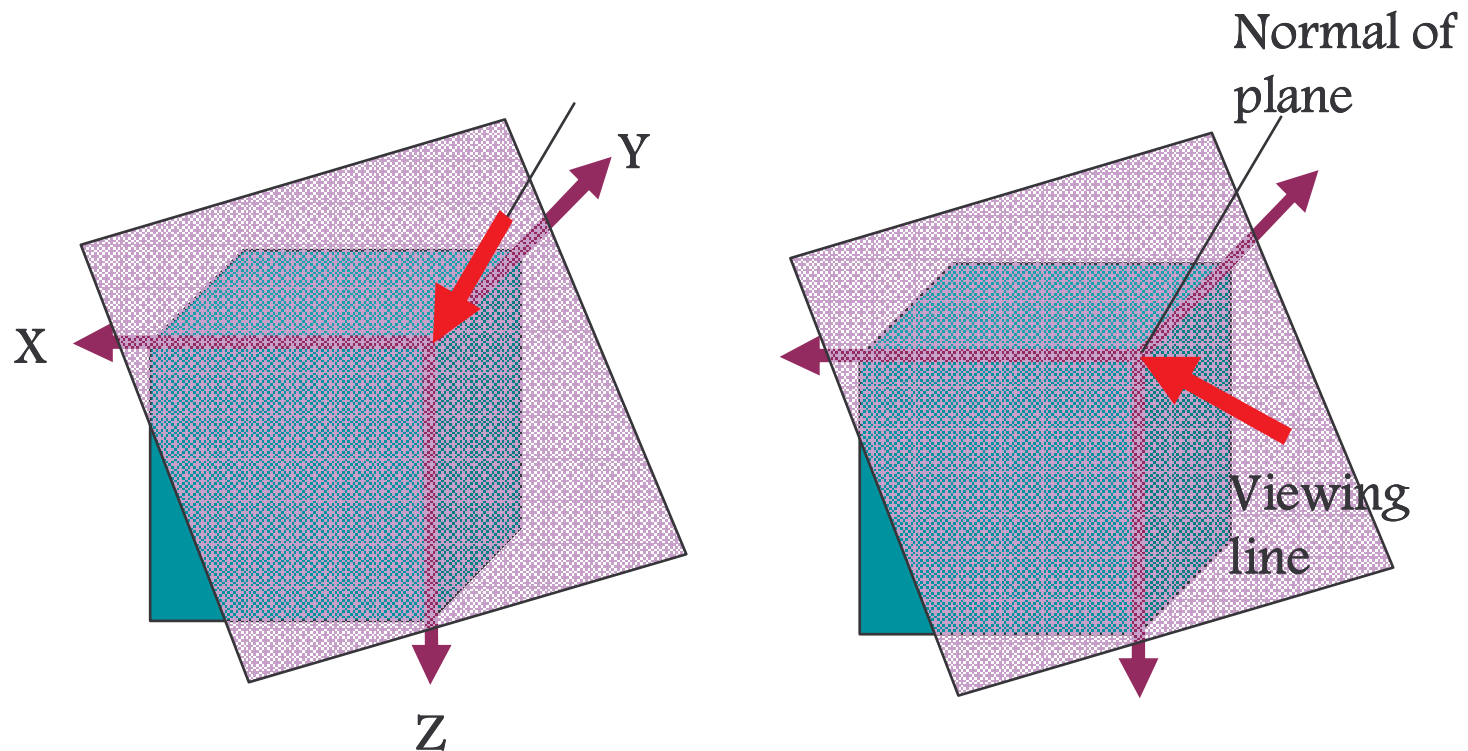
# CLASSIFICATION

- Projections



# AXONOMETRIC VS OBLIQUE

- Viewing lines versus Viewing plane



- **Three dimensional clarity**
  - Relative proportioning of overall size
  - Relative positioning & sizing of constituent parts
- **Realistic feel**
  - Assembly of parts to make a bigger object

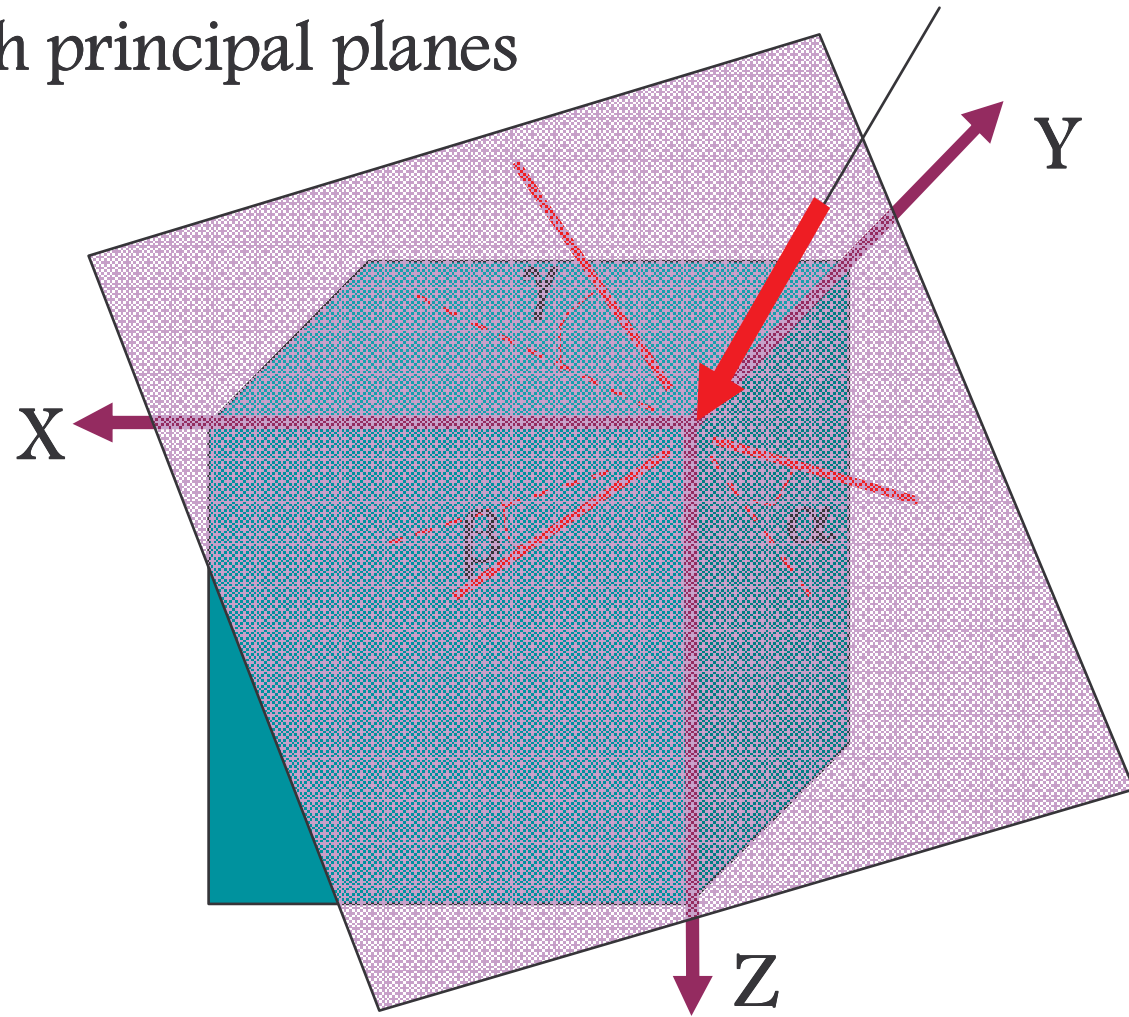


# ISOMETRIC VIEW

- Angles with principal planes

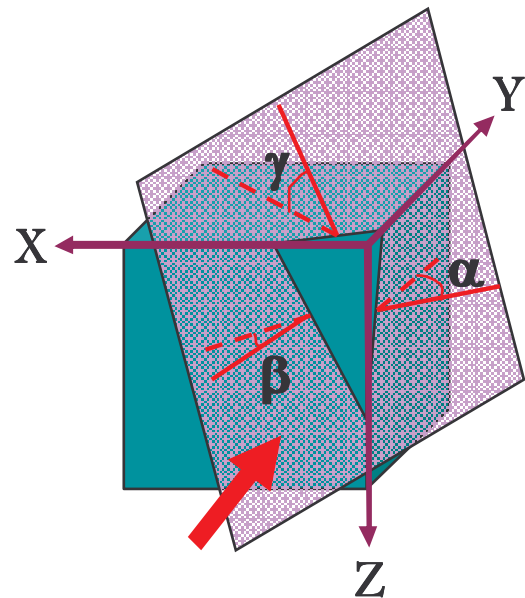
– Trimetric

$$\alpha \neq \beta \neq \gamma$$



# ISOMETRIC VIEW

- Axonometric Projections
  - Viewing plane NORMAL to viewing/projection lines



Isometric

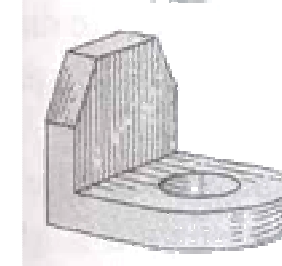
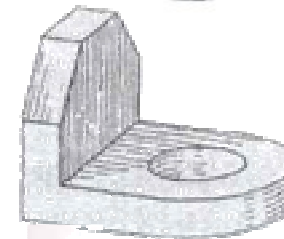
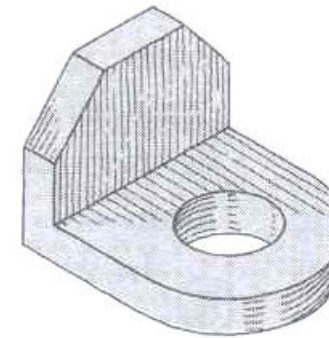
$$\alpha = \beta = \gamma$$

Dimetric

$$\alpha = \beta \neq \gamma$$

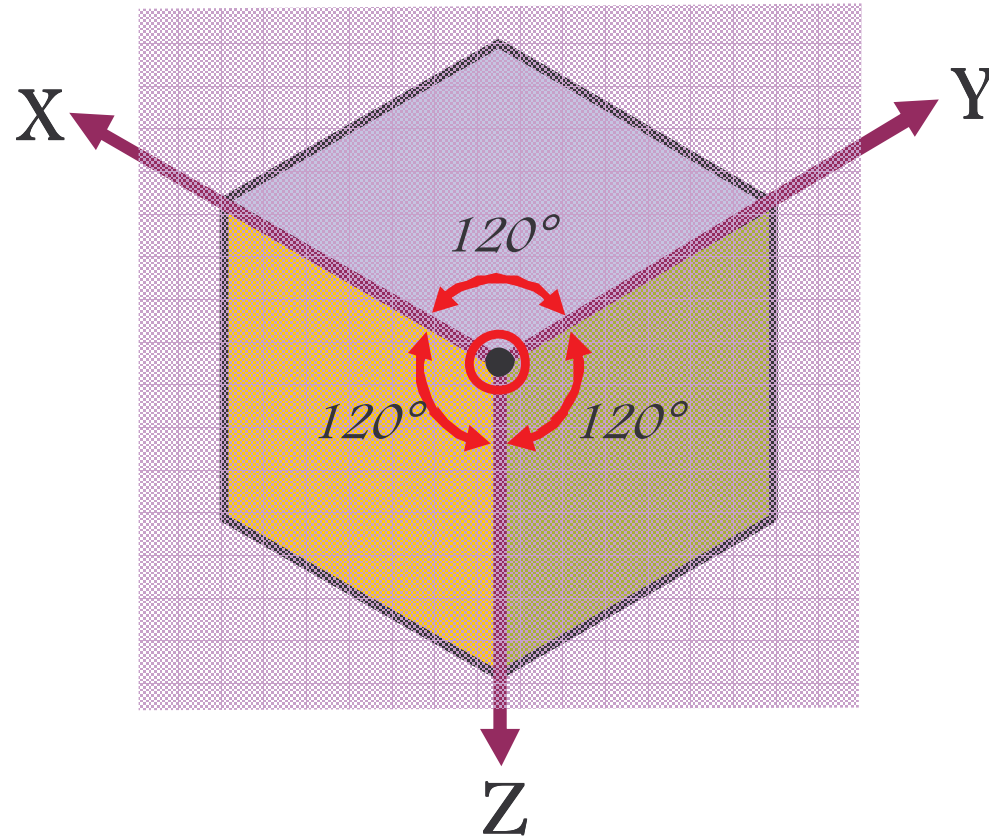
Trimetric

$$\alpha \neq \beta \neq \gamma$$



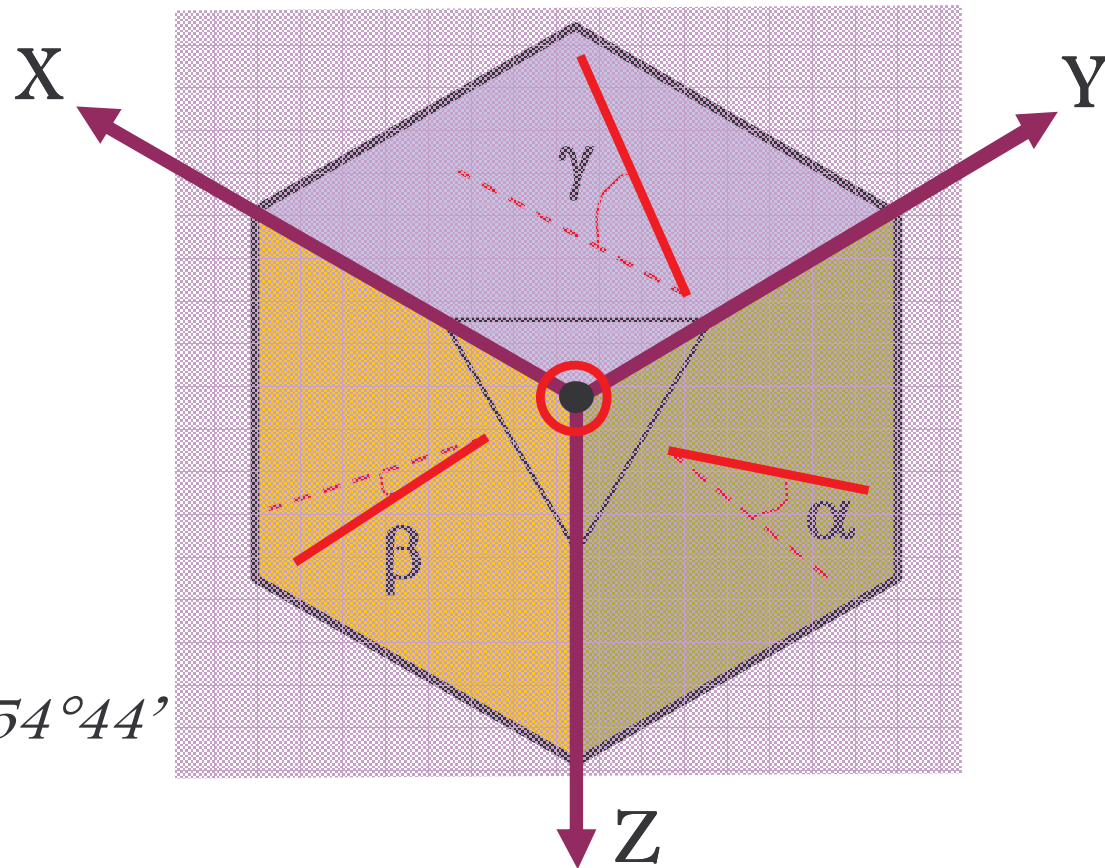
# ISOMETRIC VIEW

- Cube in Isometric View



# ISOMETRIC VIEW

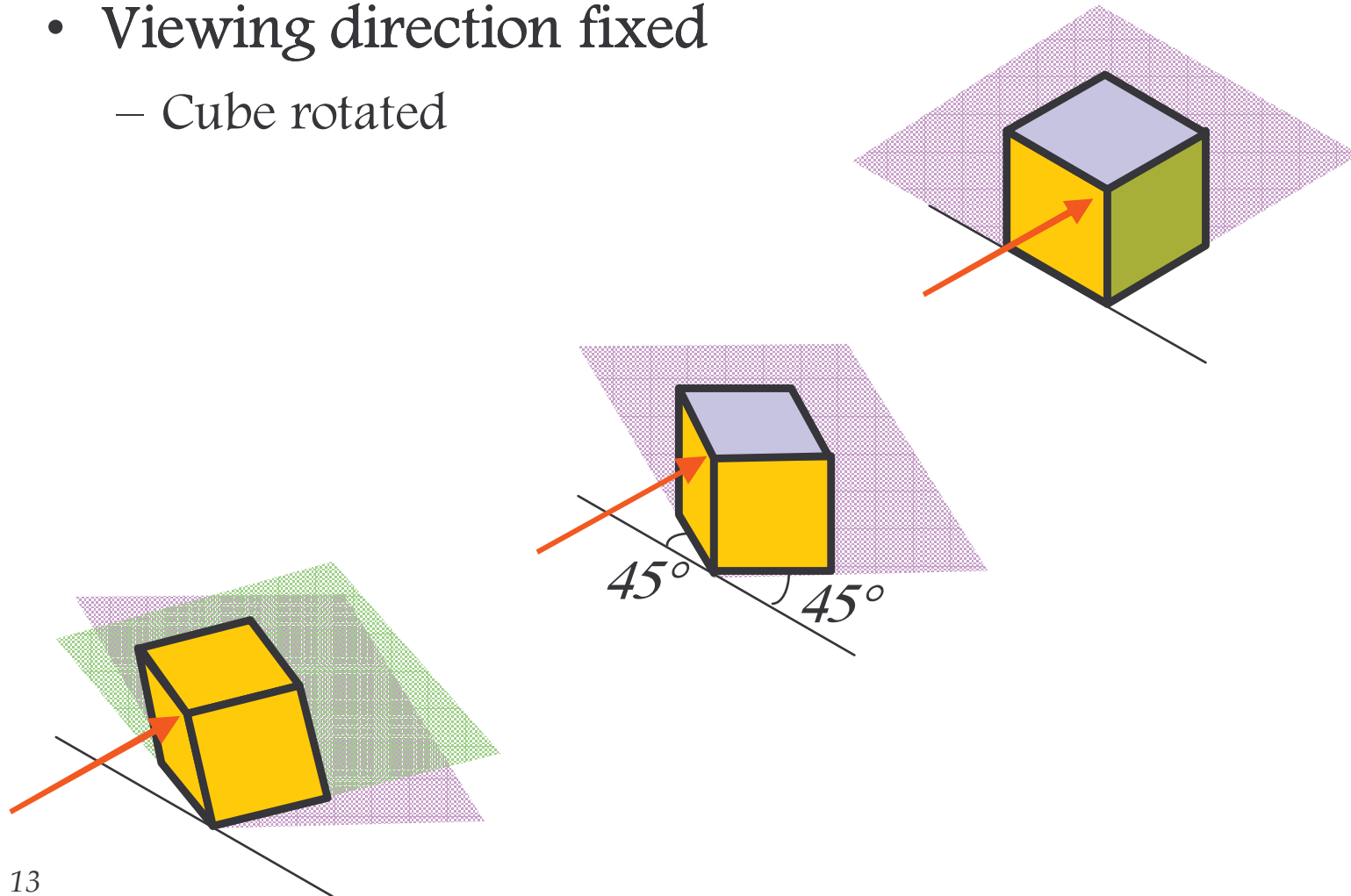
- Cube in Isometric View



$$\alpha = \beta = \gamma = 54^{\circ}44'$$

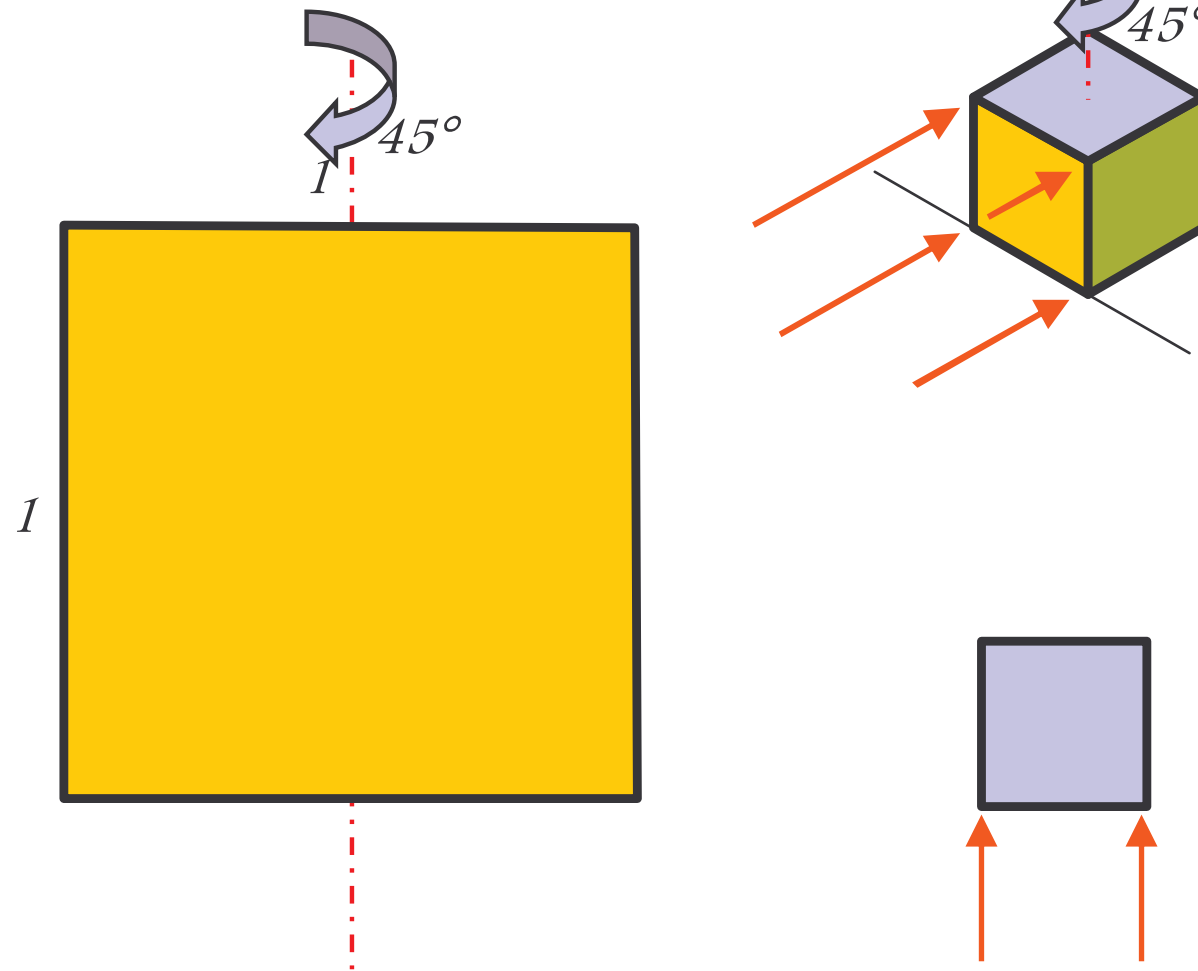
# ISOMETRIC VIEW

- Viewing direction fixed
  - Cube rotated



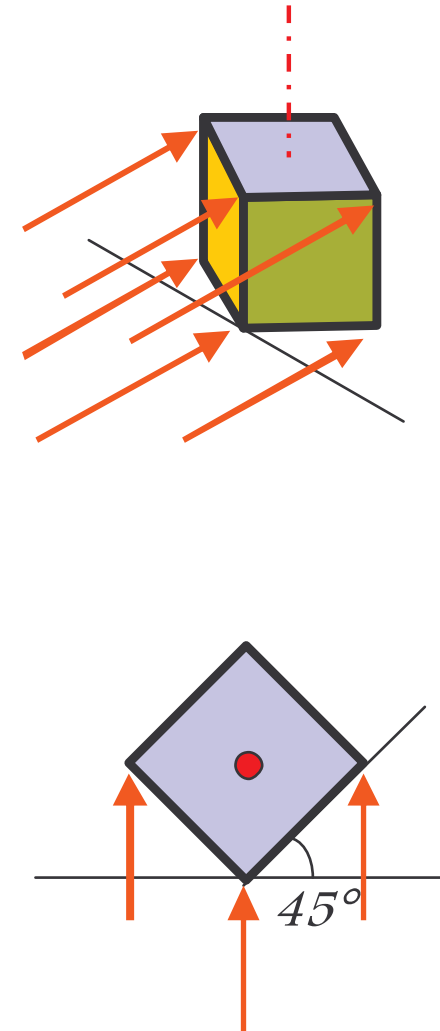
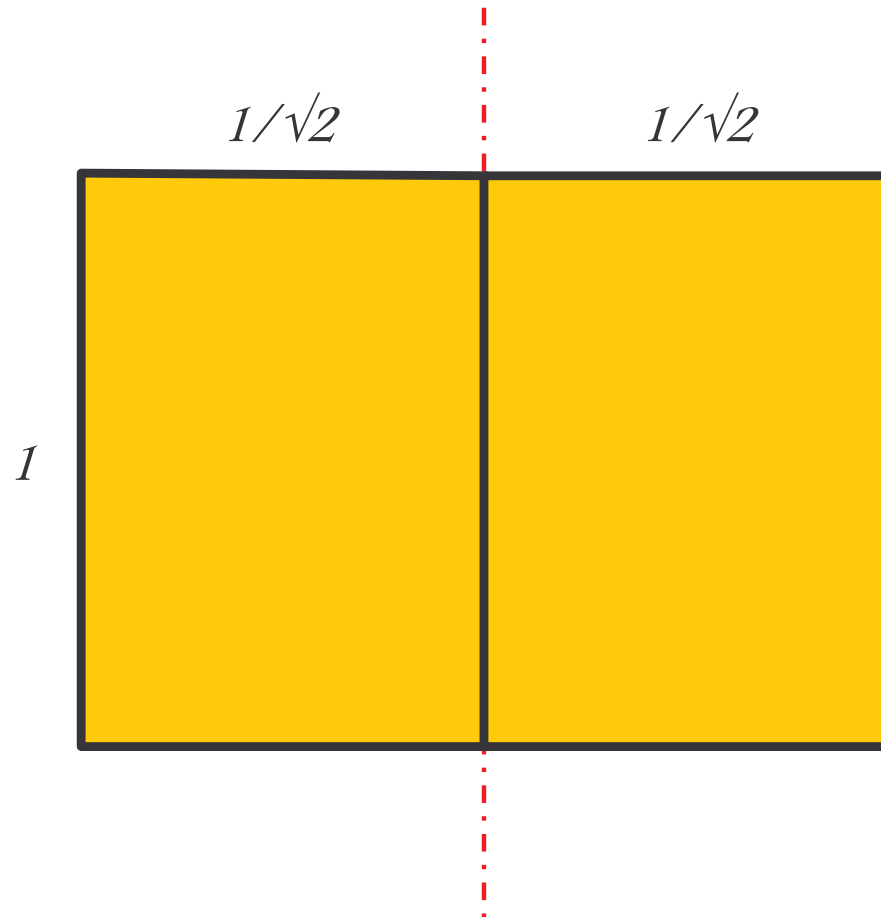
# ISOMETRIC VIEW

- Step 1



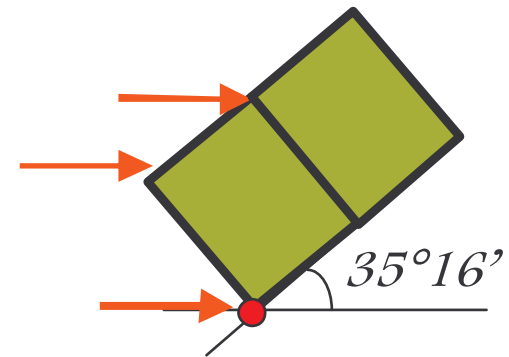
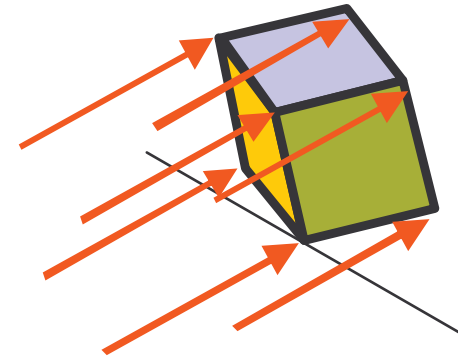
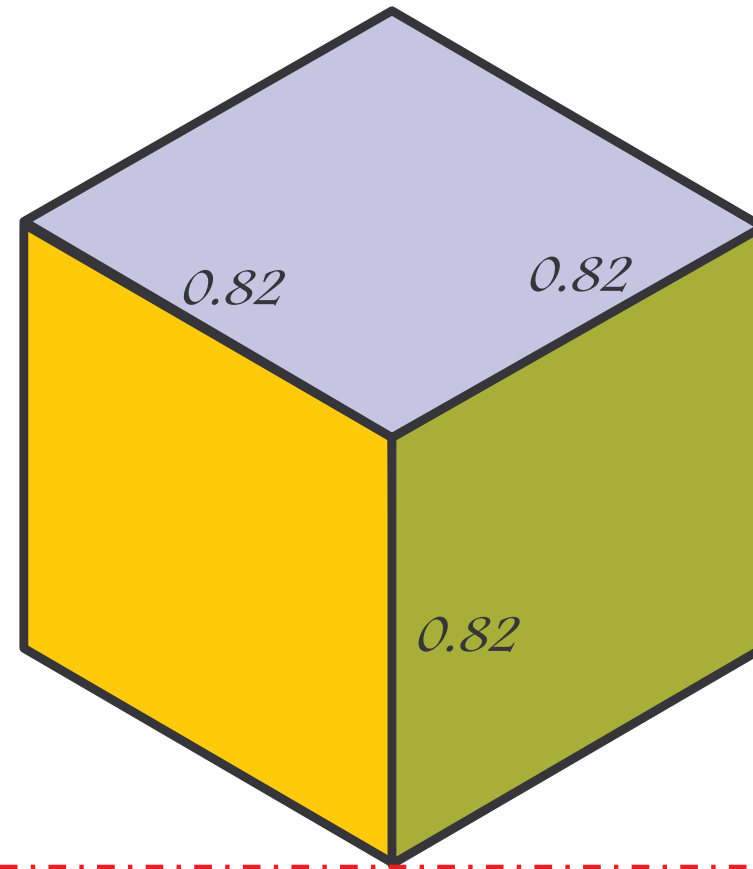
# ISOMETRIC VIEW

- Step 2



# ISOMETRIC VIEW

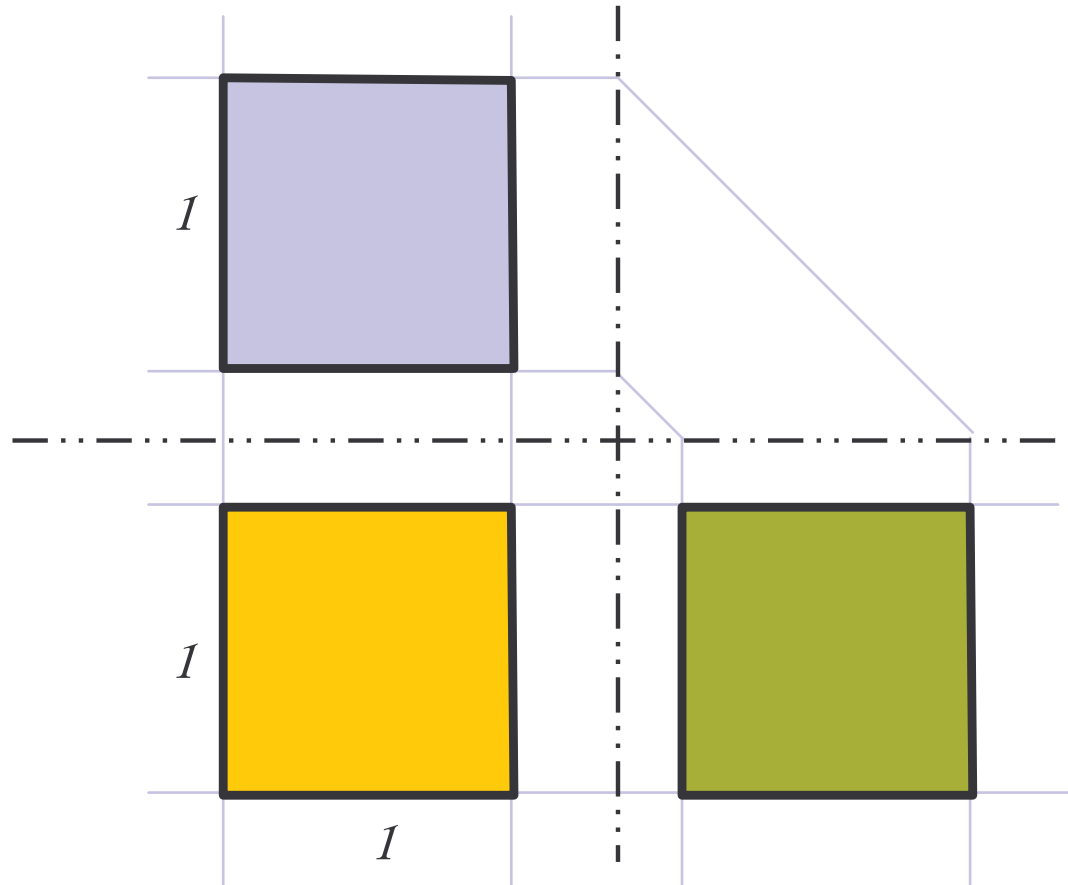
- Step 3





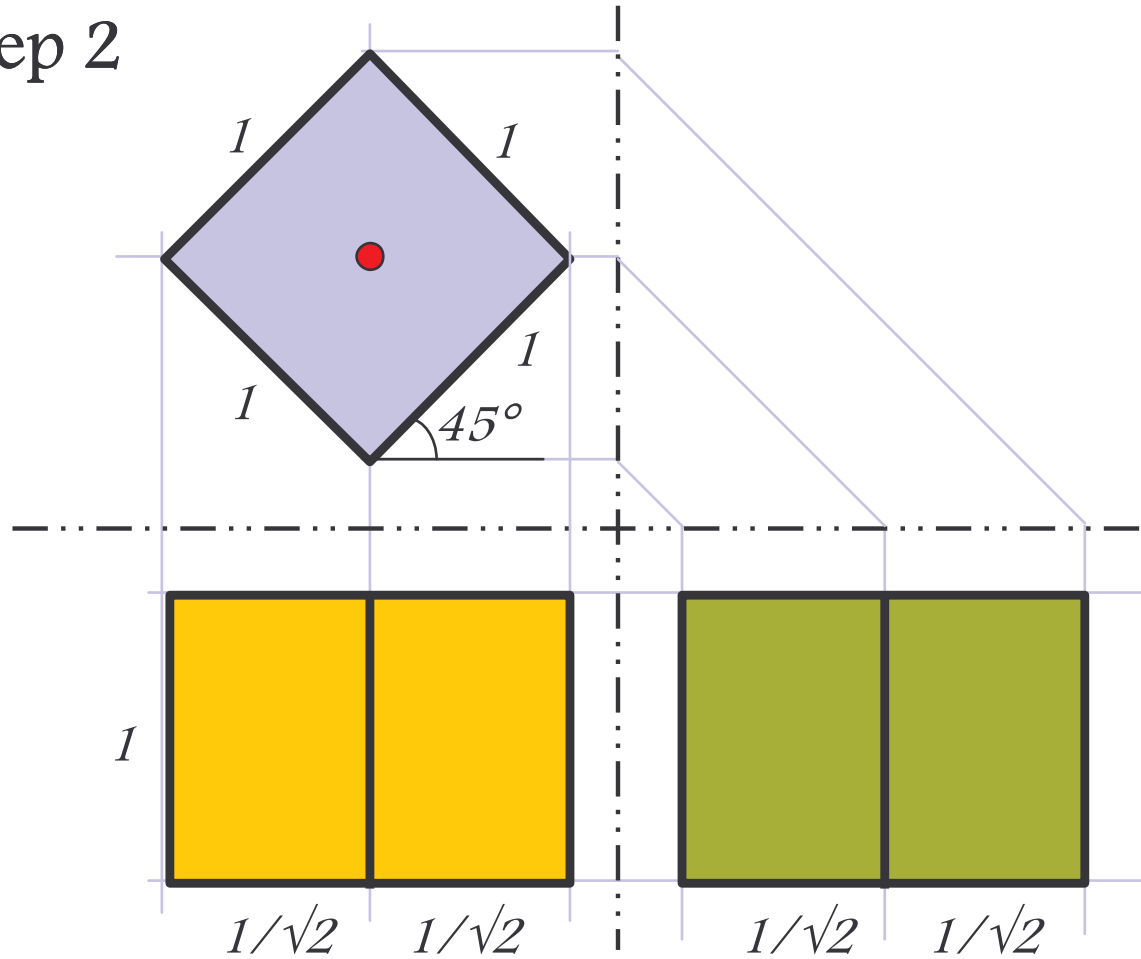
# ISOMETRIC VIEW

- Step 1



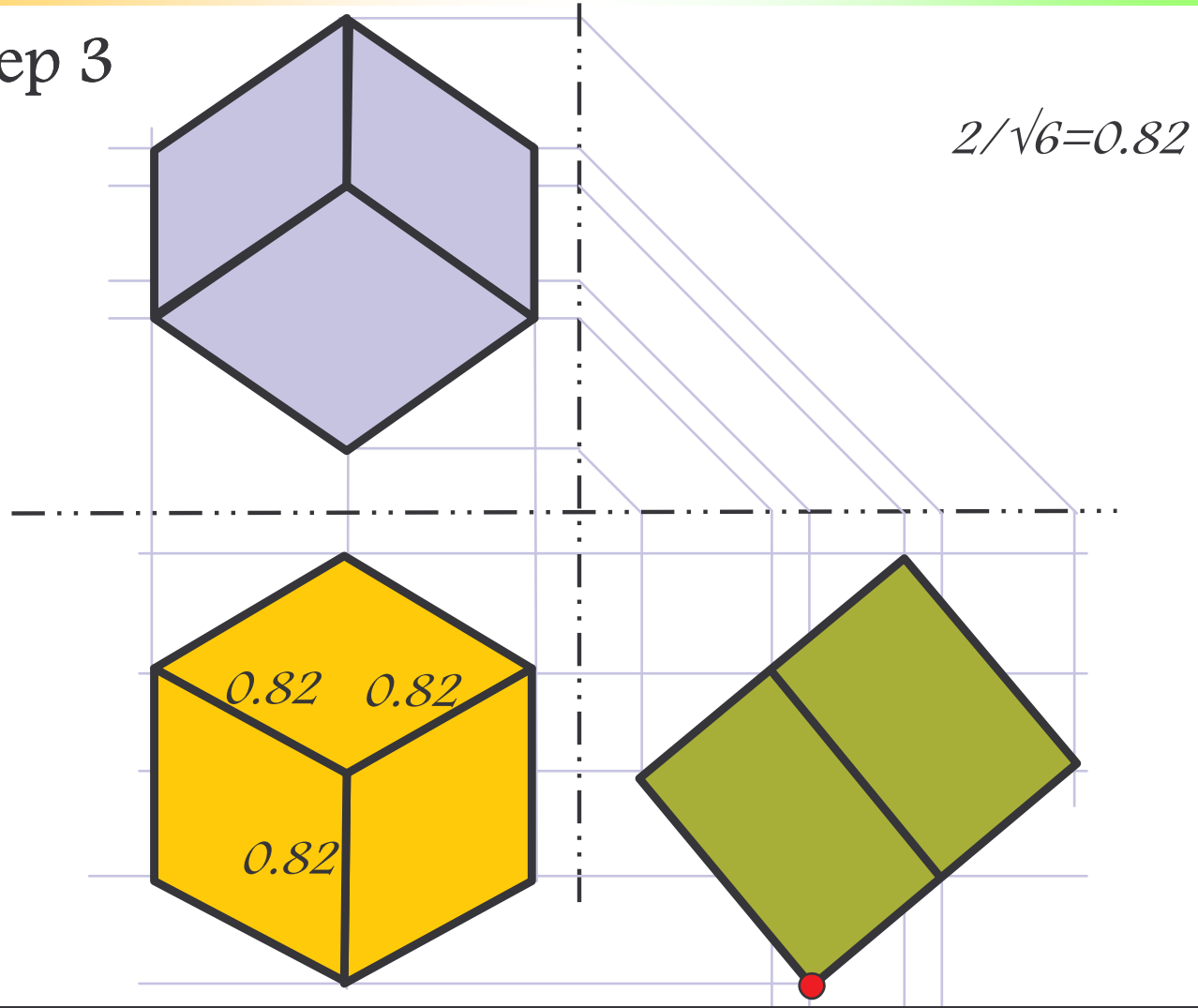
# ISOMETRIC VIEW

- Step 2



# ISOMETRIC VIEW

- Step 3

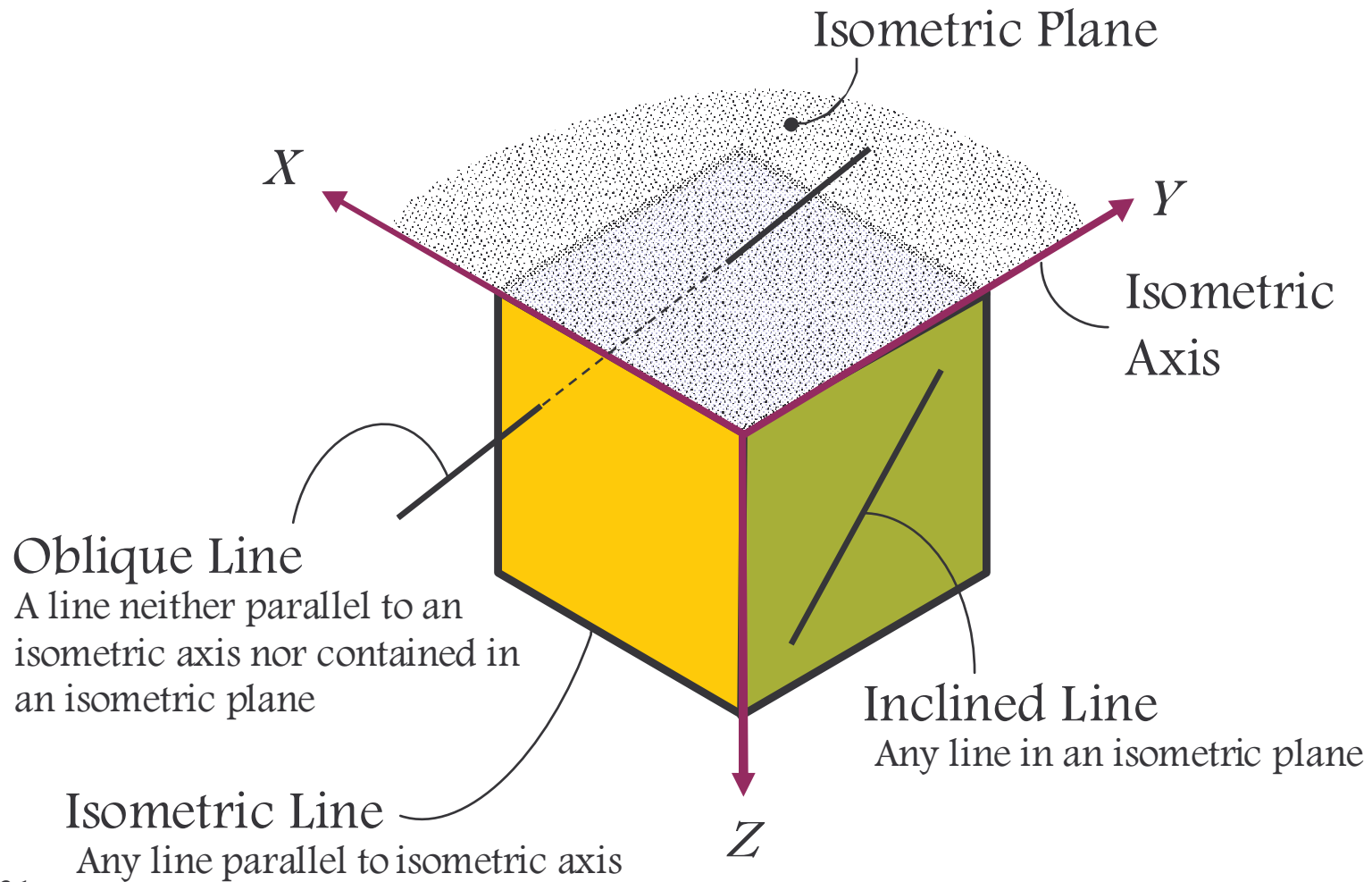


ISOMETRIC ::

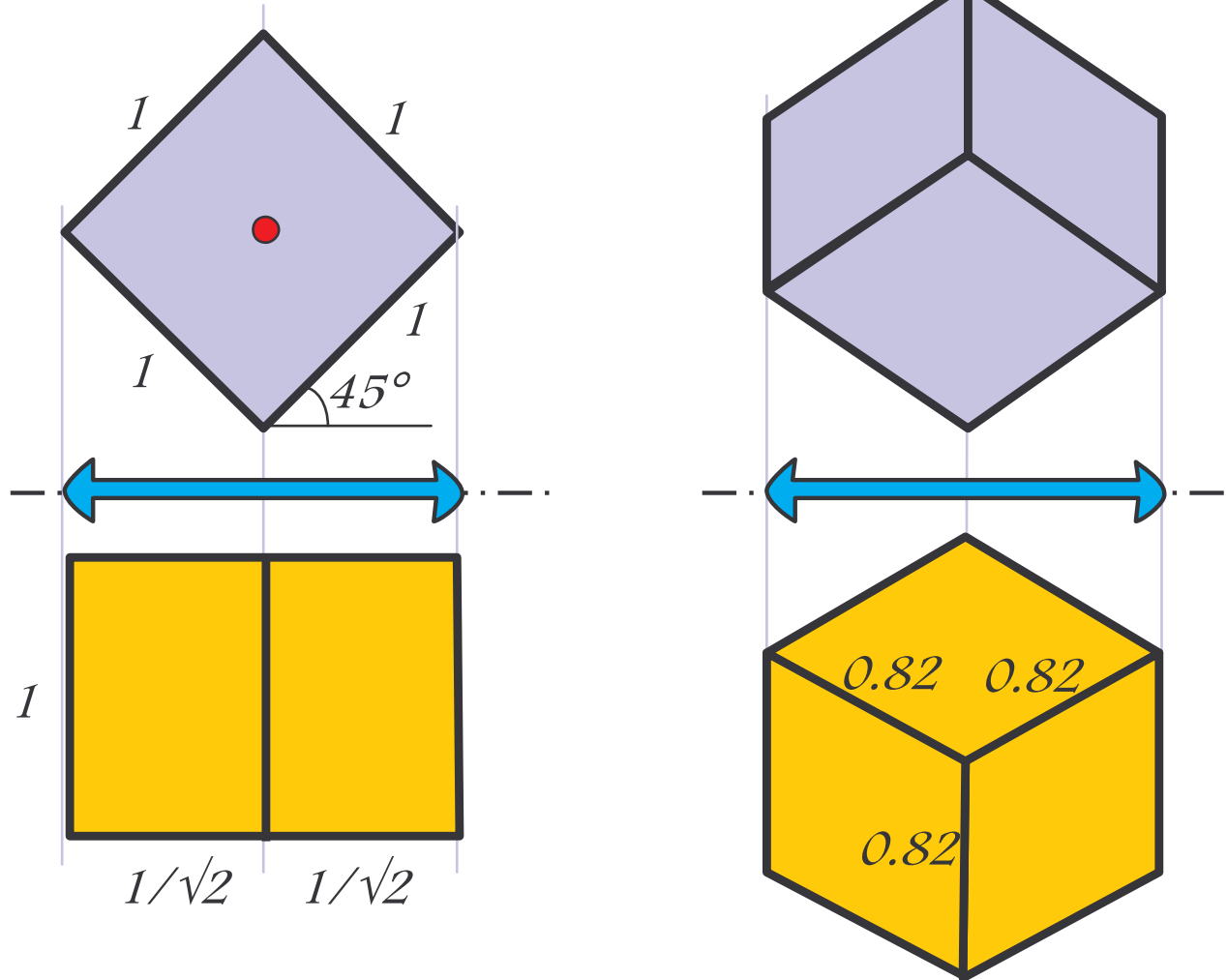
PROJECTION vs

DRAWING

# DEFINITIONS



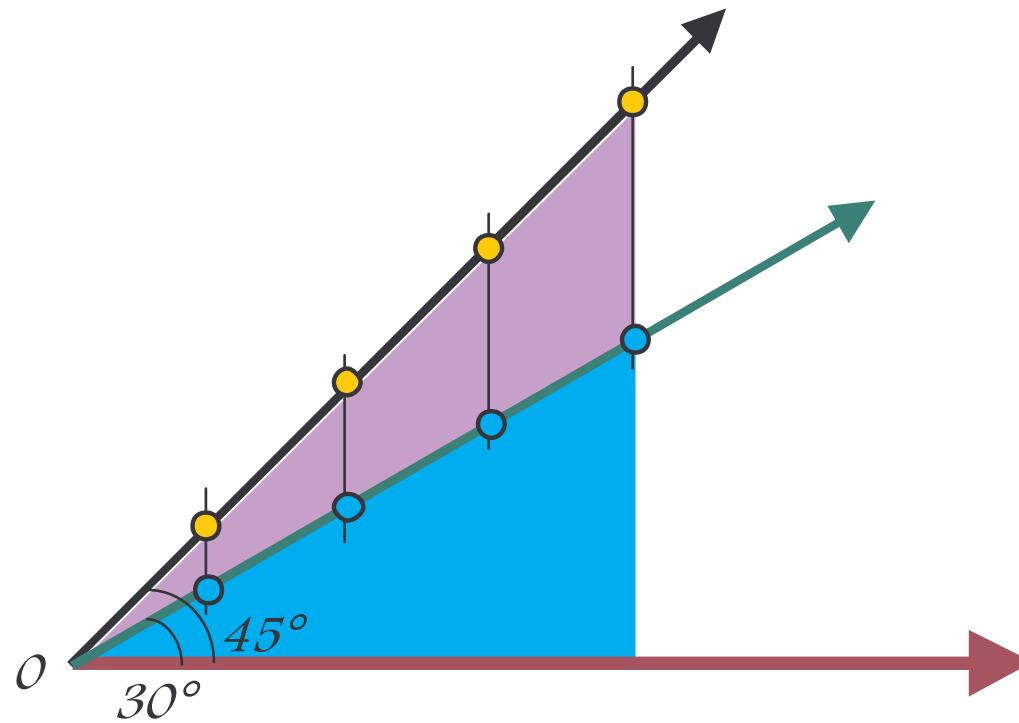
# REDUCED SIZE





## REDUCED SIZE

- Scale for measuring the reduced size
  - 0.82 ( $=2/\sqrt{6}$ )

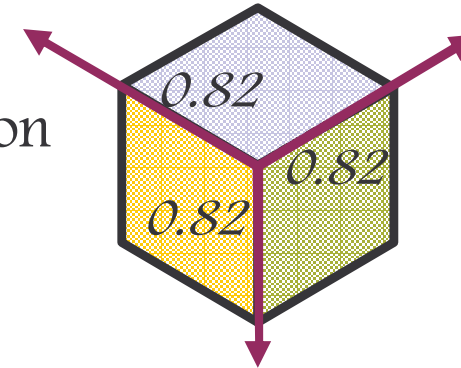




# ISOMETRIC PROJECTION vs DRAWING

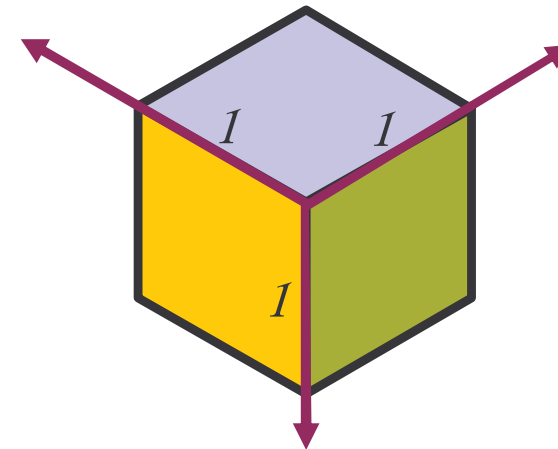
- Isometric Projection

- Drawn to fore-shortened dimension
- Reduced by 0.82 (=  $1/1.224$ )



- Isometric Drawing

- Drawn to full given dimension
  - Since all dimensions fore-shortened by same amount

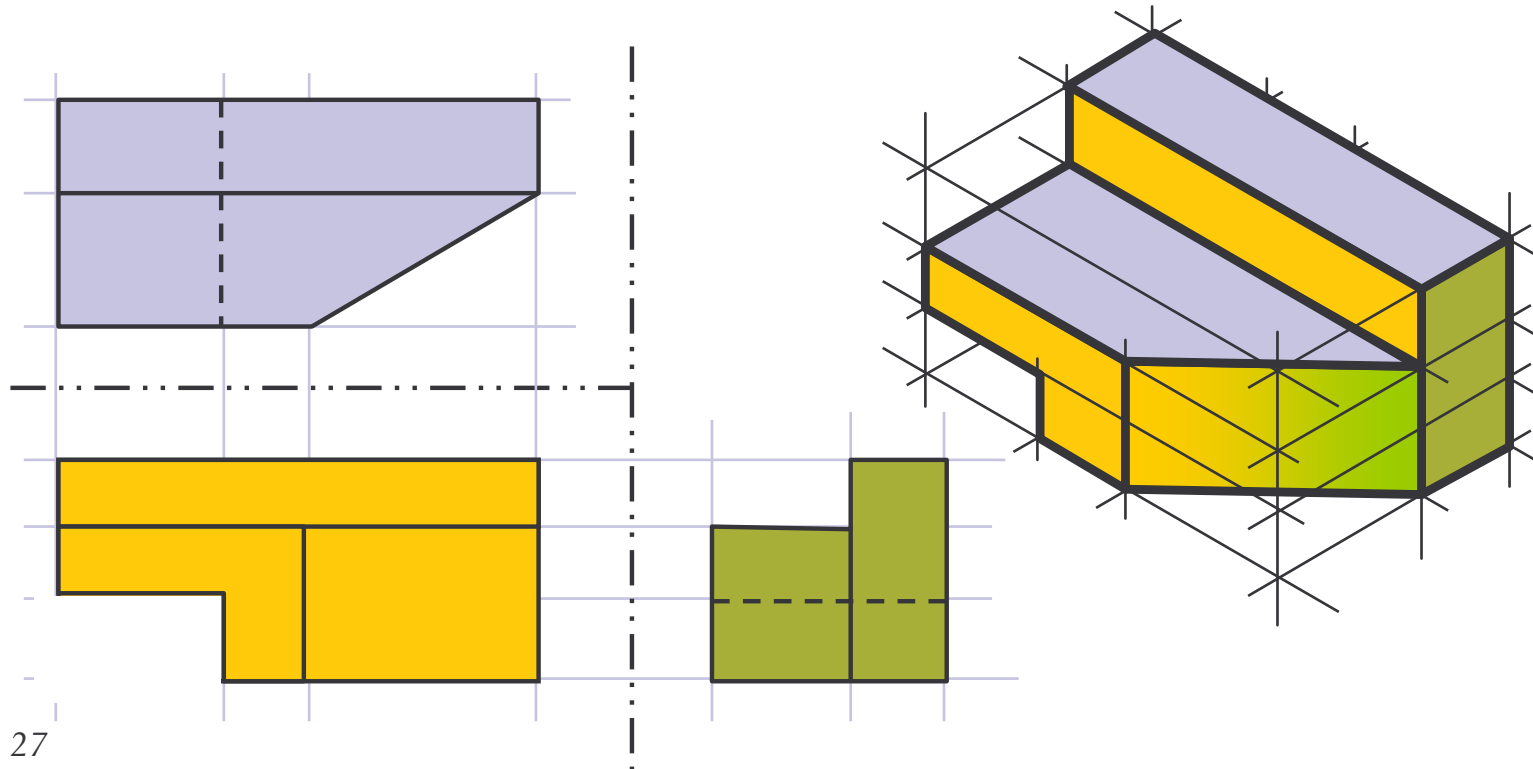




# EXAMPLES

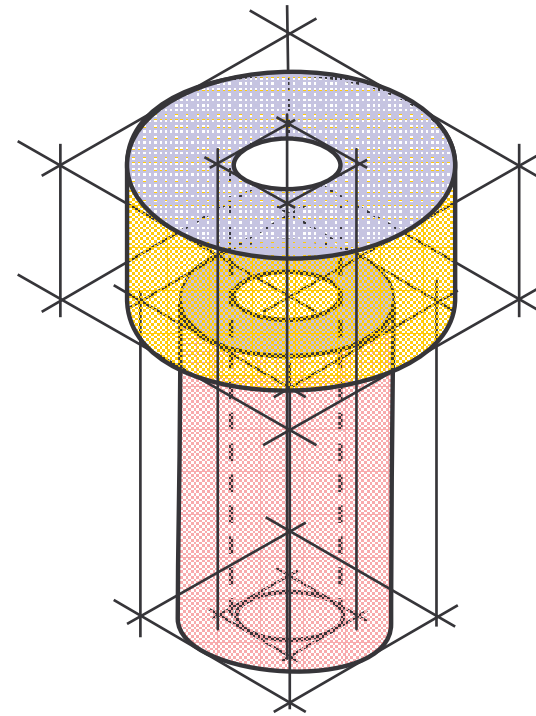
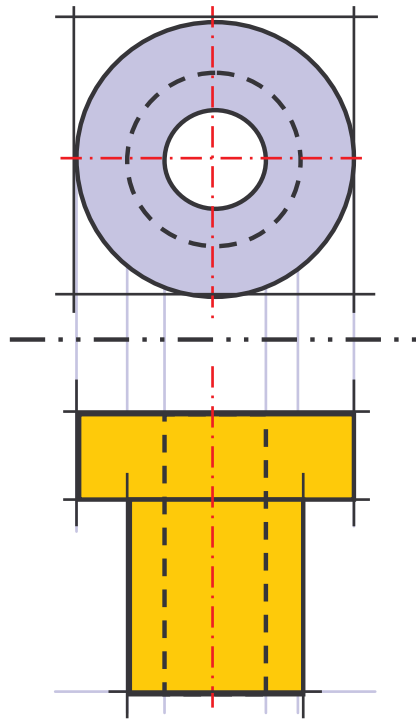
# DRAWING AN ISOMETRIC VIEW

- Enveloping Box Method
  - Outer envelope of the object
  - All important points connected by isometric lines



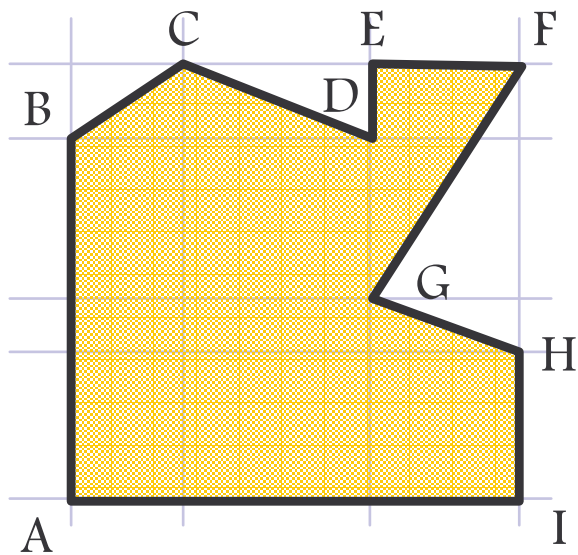
# DRAWING AN ISOMETRIC VIEW

- Centerline Method
  - Only for cylindrical portions

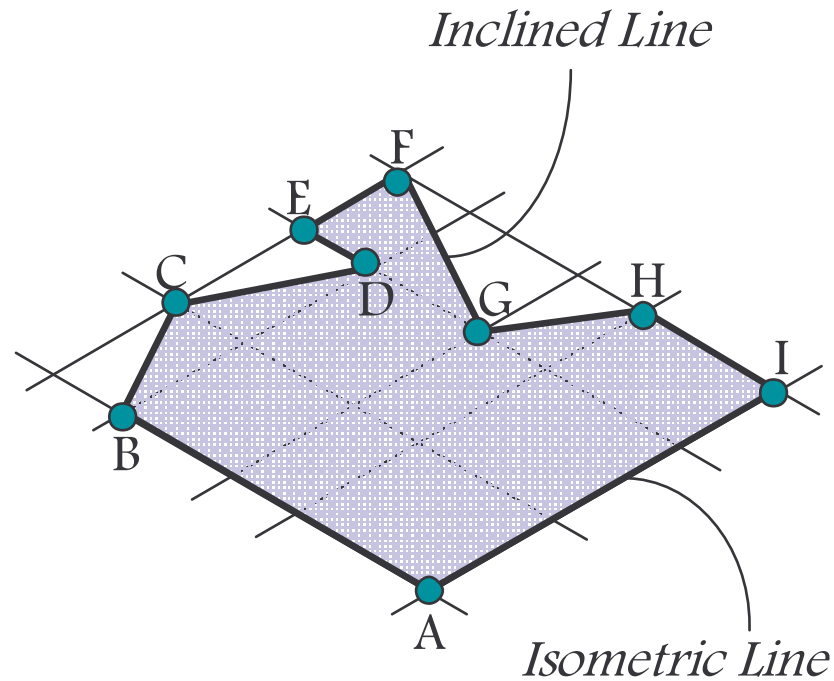


# EXAMPLE 1

- Lamina
  - Planar Object



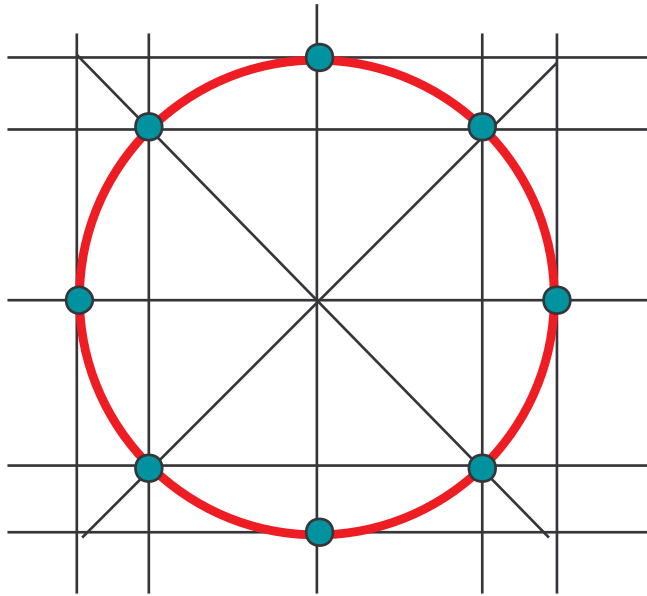
Orthographic View



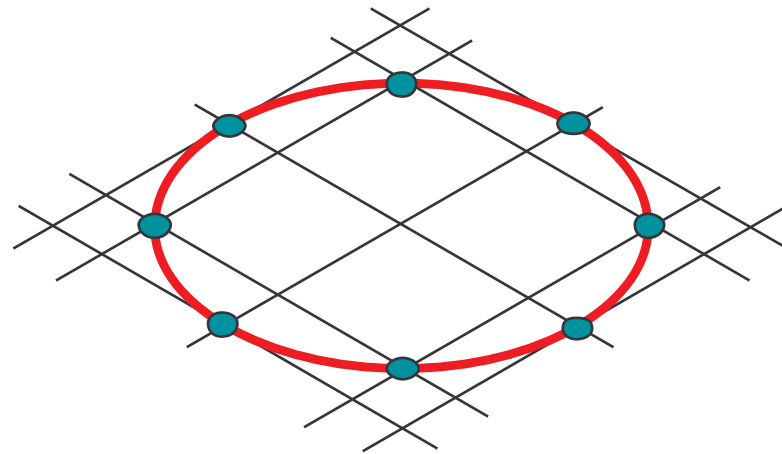
Isometric View

## EXAMPLE 2

- Circle
  - Distorted in the plane



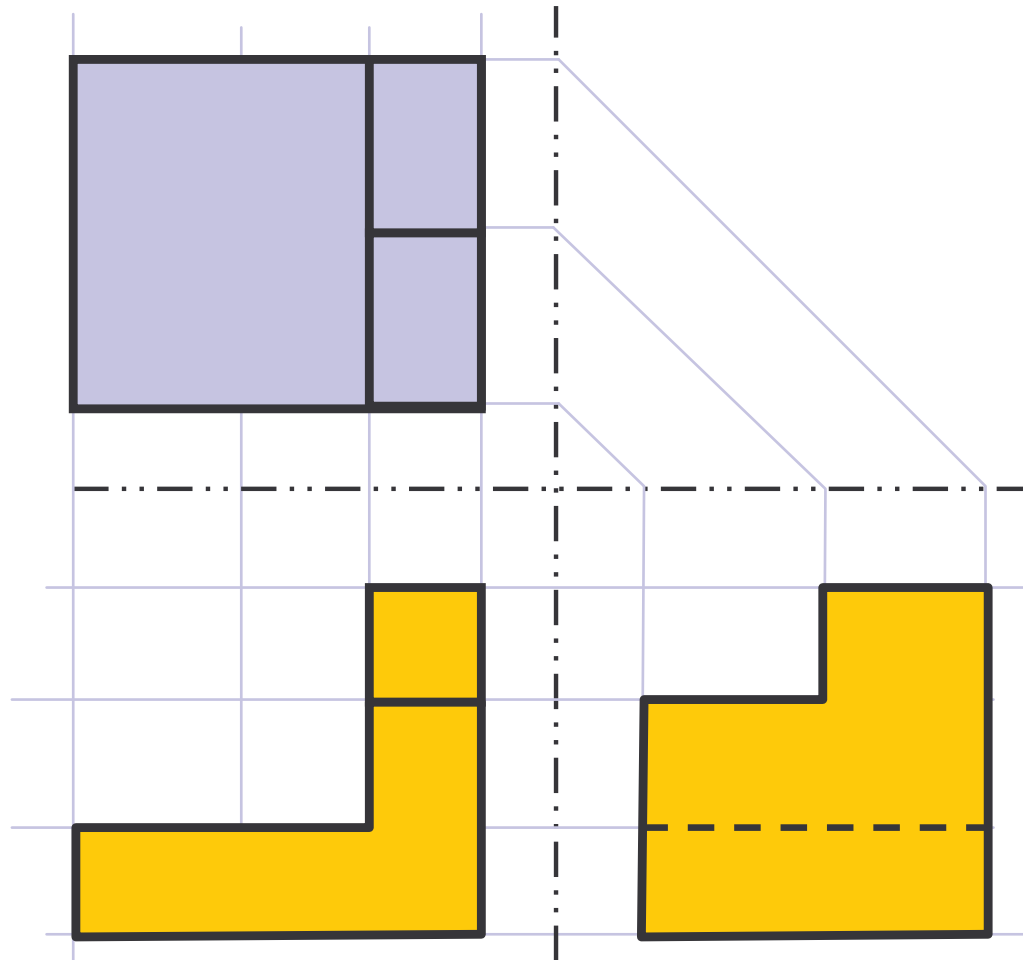
Orthographic View



Isometric View

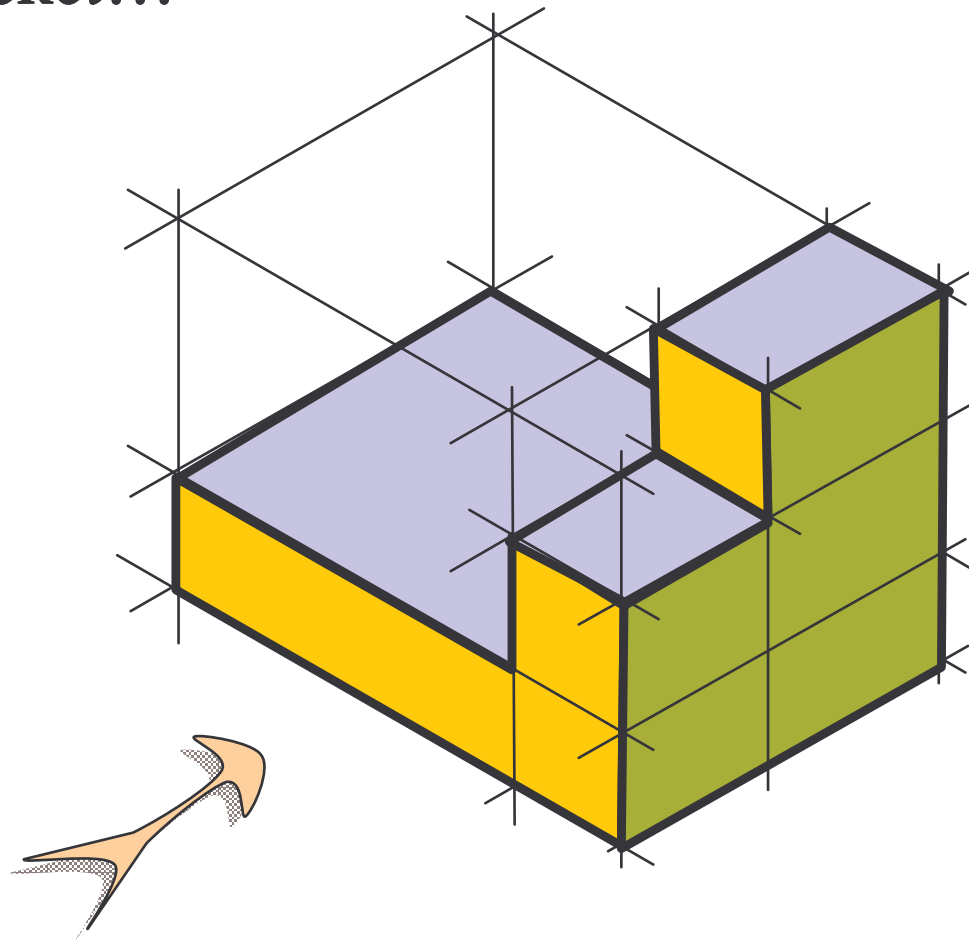
# SIMPLE OBJECTS

- Bracket



# SIMPLE OBJECTS

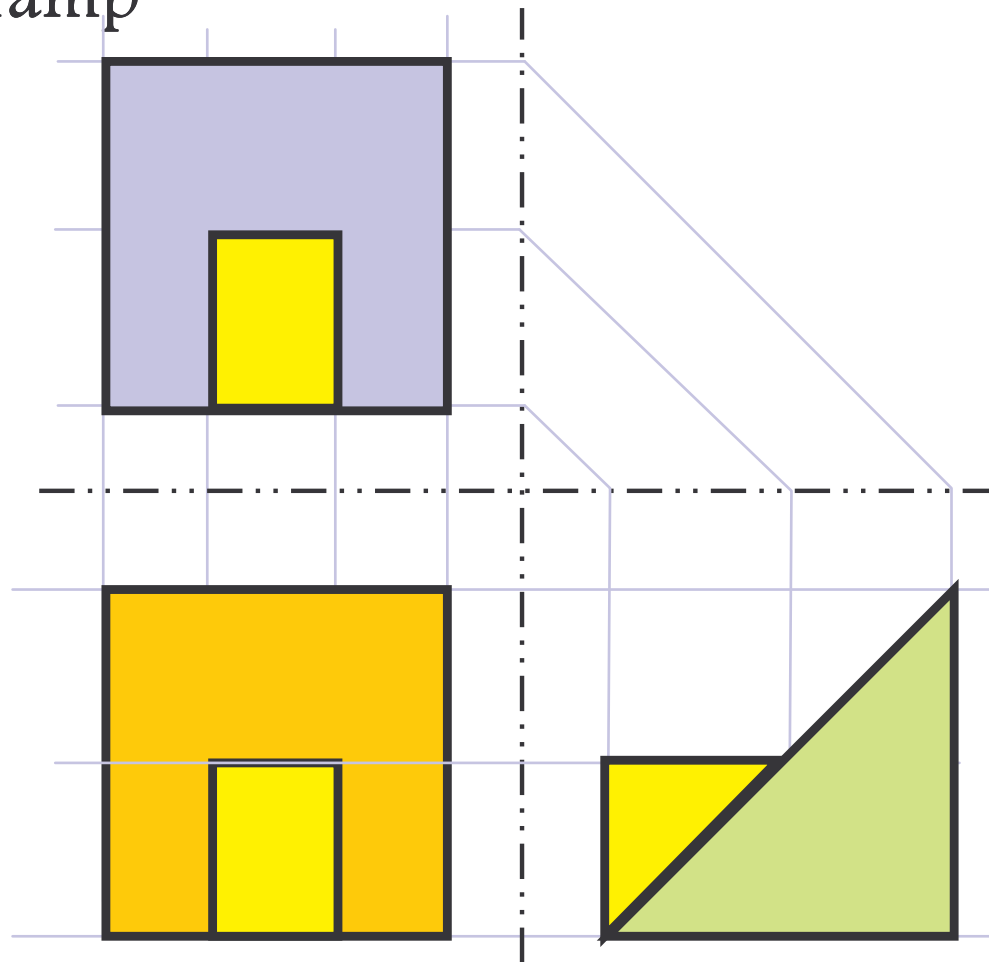
- Bracket...





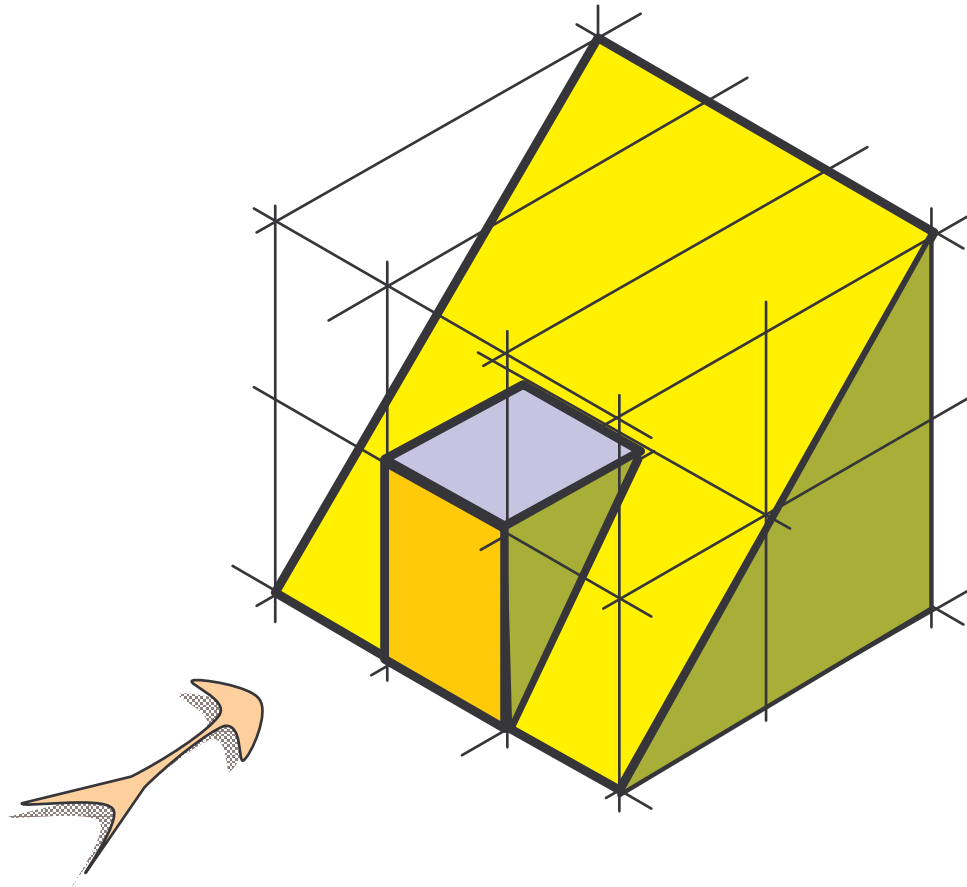
# SIMPLE OBJECTS

- Notched ramp



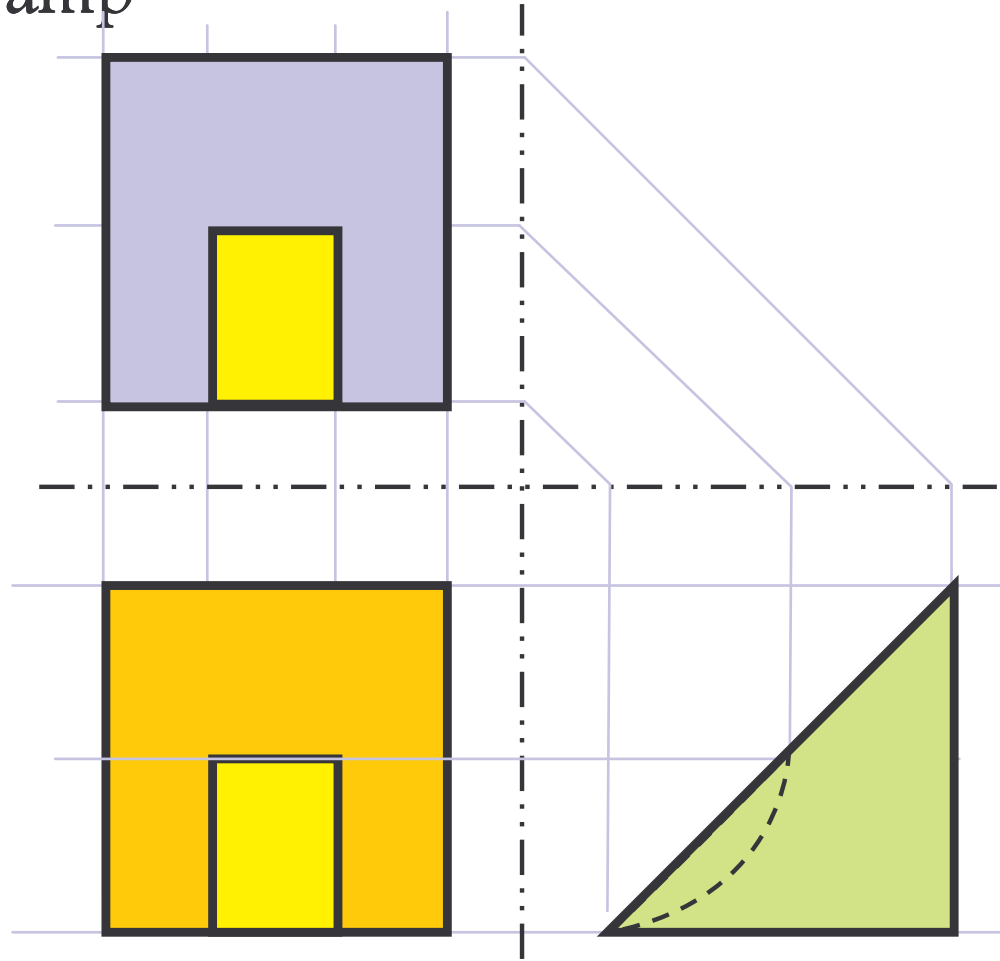
# SIMPLE OBJECTS

- Notched ramp...



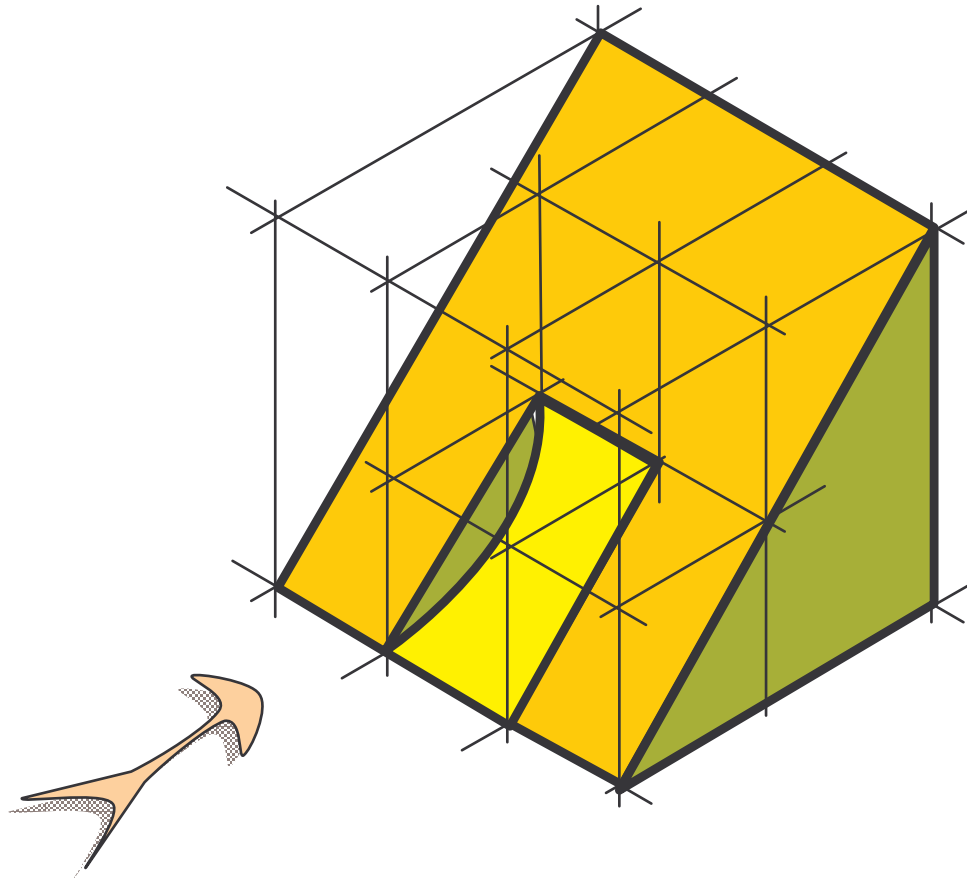
# SIMPLE OBJECTS

- Scooped ramp



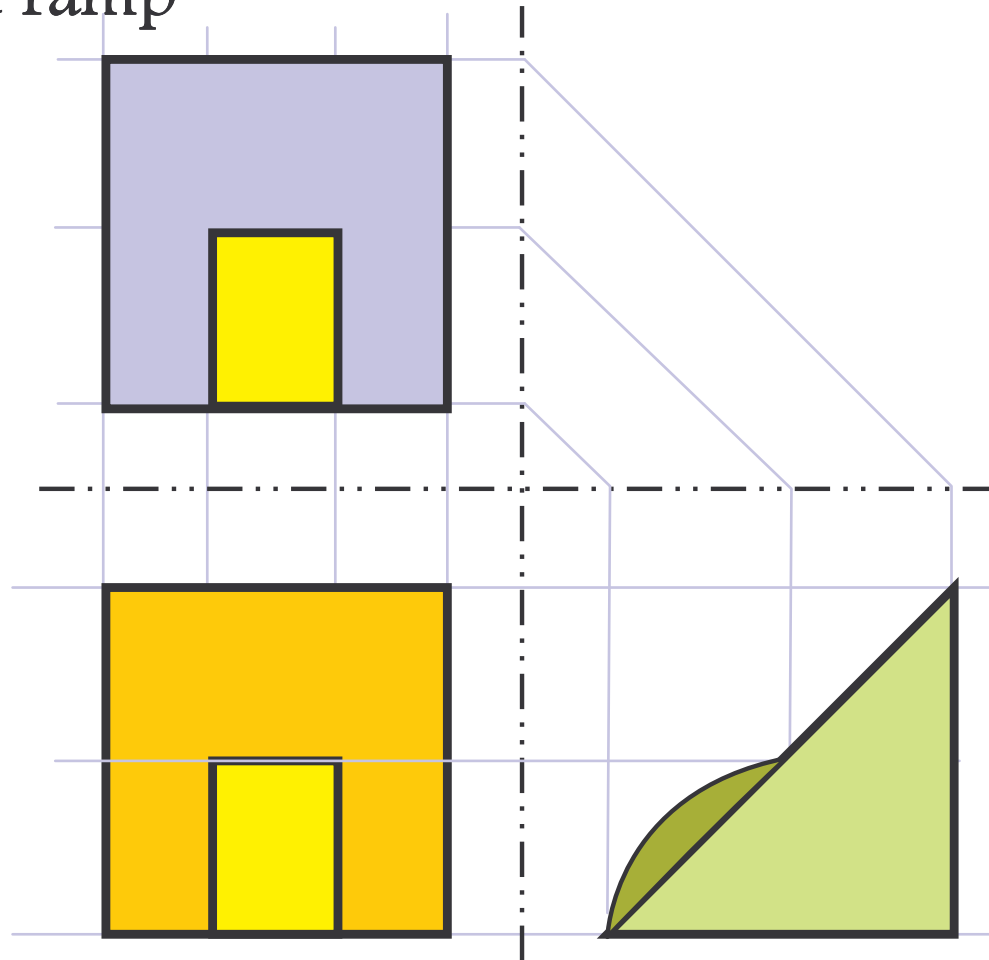
# SIMPLE OBJECTS

- Scooped ramp...



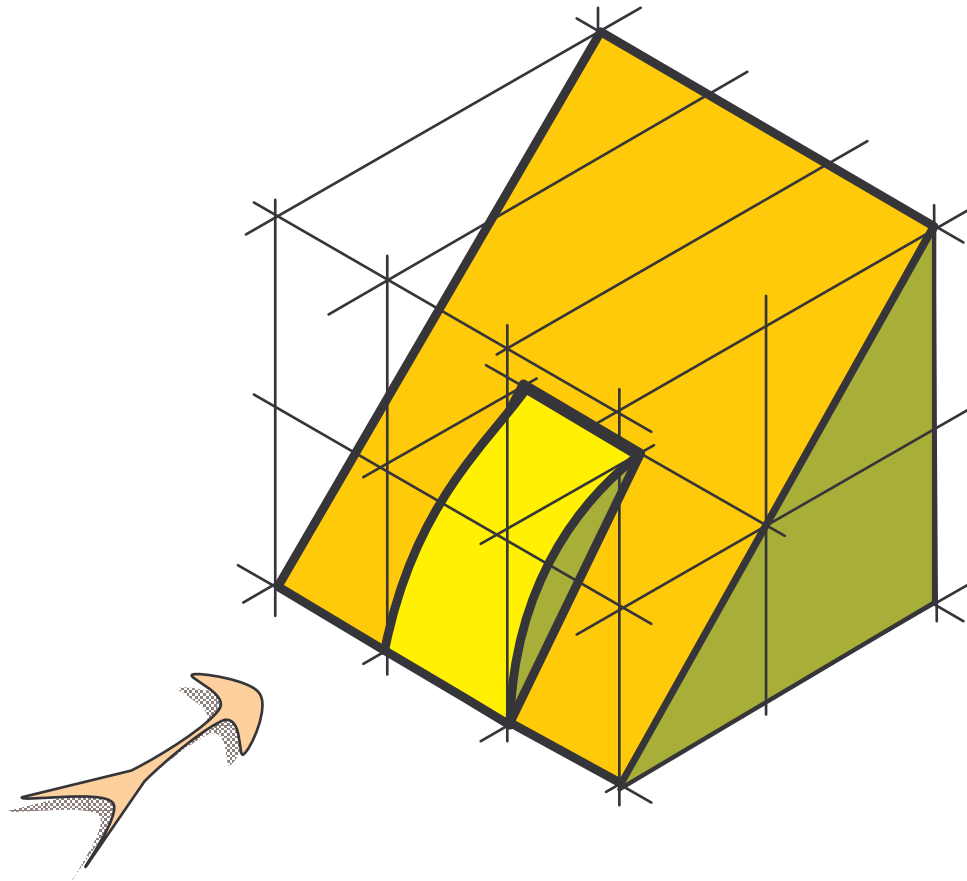
# SIMPLE OBJECTS

- Embossed ramp



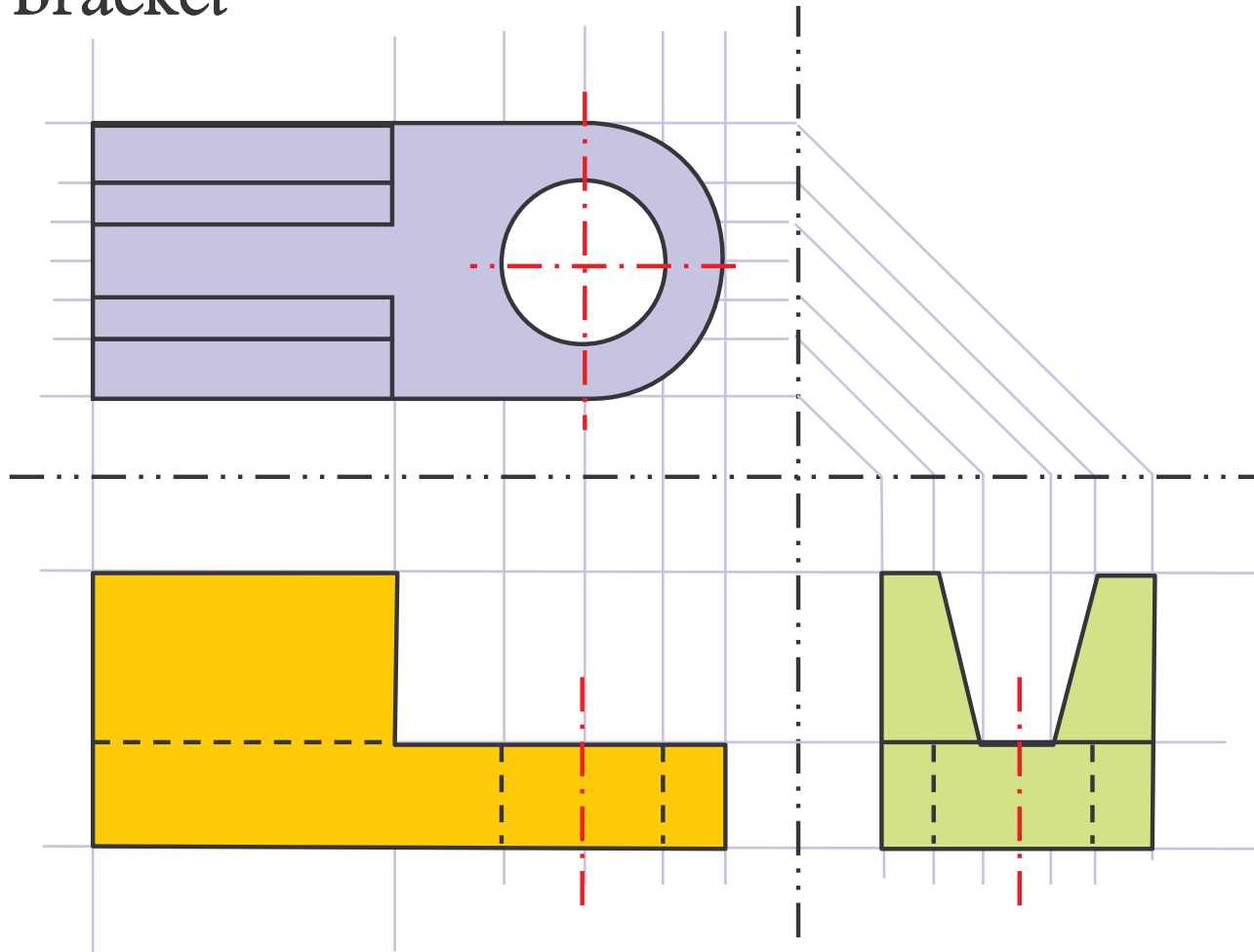
## SIMPLE OBJECTS

- Embossed ramp...



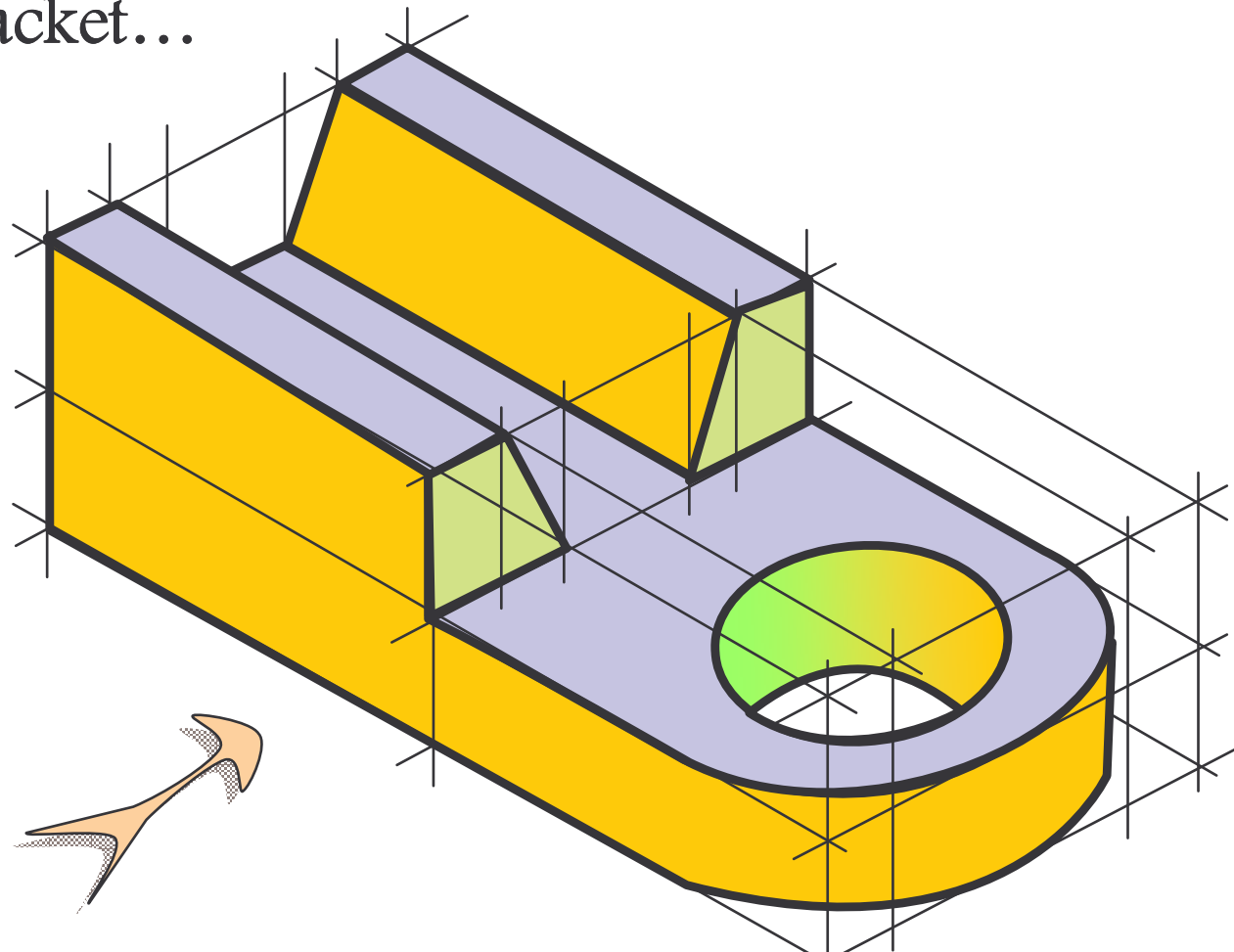
# SIMPLE OBJECTS

- Bracket

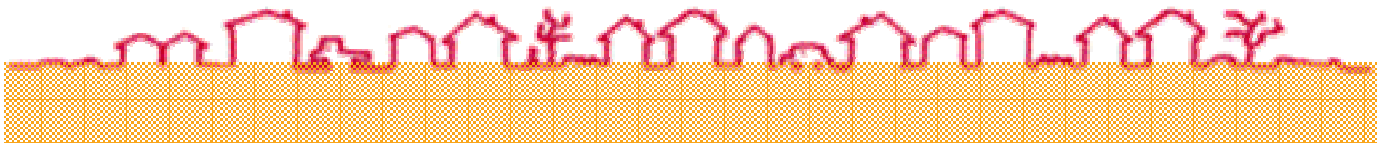


# SIMPLE OBJECTS

- Bracket...







Have a Great Day!!

