

Republic of Iraq  
Ministry of Higher Education  
and Scientific Research  
Al-Mustaqbal University College  
Computer Engineering Techniques Department



# Automatic Aided Design

## "AUTOCAD"

Stage: 1

*Lecture Six*

**Dr. Ammar Kareem Obayes**

Engineering Drawing

Projections

مساقط الاجسام الهندسية

Lecture 6

المسقط:

هو المنظر المُشاهد من اتجاه معين من خلال تسطيح المجسمات وفك أبعادها الثلاث، ويتم إنشاء المسقط لشكلٍ ما بتخيل رؤيته من اتجاهات مختلفة ورسمه على مستويات مختلفة:

1. المستوى الرأسي: وفيه تتم رؤية المجسم من الأمام.
2. المستوى الأفقي: وفيه تتم رؤية المجسم من الأعلى.
3. المستوى الجانبي: وفيه تتم رؤية المجسم من الجانب.

وتعتمد عملية إنشاء المساقط على القدرة التخيلية البصرية لزوايا رؤية مختلفة، وفهم دقيق للمستويات البصرية. فمثلاً:

تخيل المنظر أمامك غرفة:

- \* كل ما يمكنك مشاهدته على ( الأرض ) وأنتِ (فوق) يدخل ضمن المستوى الأفقي.
- \* كل ما يمكنك مشاهدته على (الجدار الجانبي الأيمن) وأنتِ (واقفة في الجهة اليسرى) يدخل ضمن المستوى الجانبي.
- \* كل ما يمكنك مشاهدته على ( الجدار أمامك ) وأنتِ (في المقدمة ) يدخل ضمن المستوى الرأسي.

ولأي شكل في الفراغ أحد الوضعين التاليين:

- 1- معلق في الهواء.
- 2- موضوع على الأرض.
- 3- ركني.

المساقط اتبع الخطوات التالية:

1- ارسم خط التقاطع بين المستويات: وهو خطان متعامدان ينصفان المستوى إلى أربعة أقسام:

- . الأيسر العلوي: المستوى الرأسي.
- . الأيسر السفلي: المستوى الأفقي.
- . الأيمن العلوي: المستوى الجانبي.
- . الأيمن السفلي: مساحة لنقل الأطوال بواسطة الفرجار.

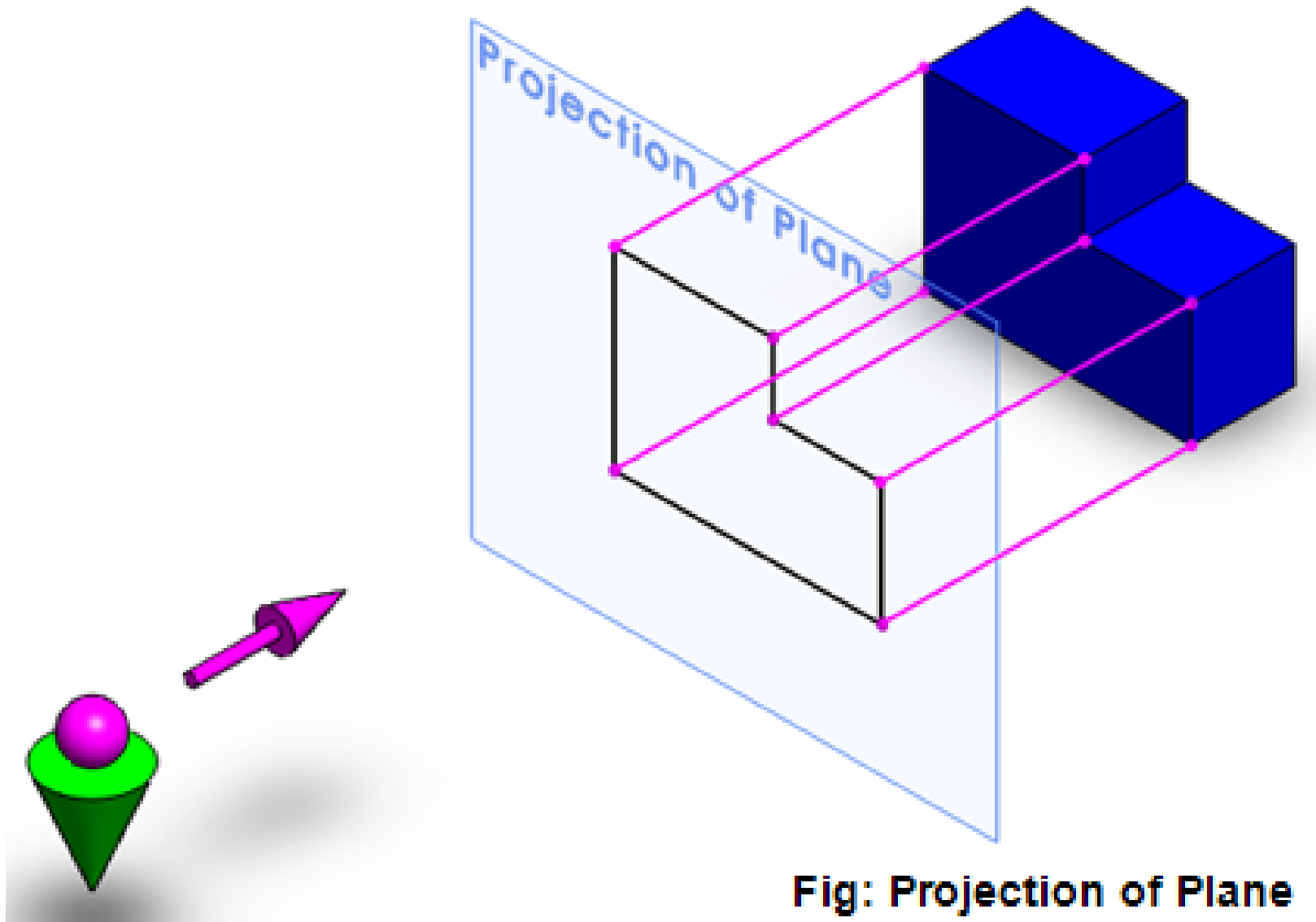
2- حدد نوع الشكل المطلوب رسمه وأبعاده طولاً وعرضاً ارتفاعاً.

3- حدد وضعة في الفراغ:

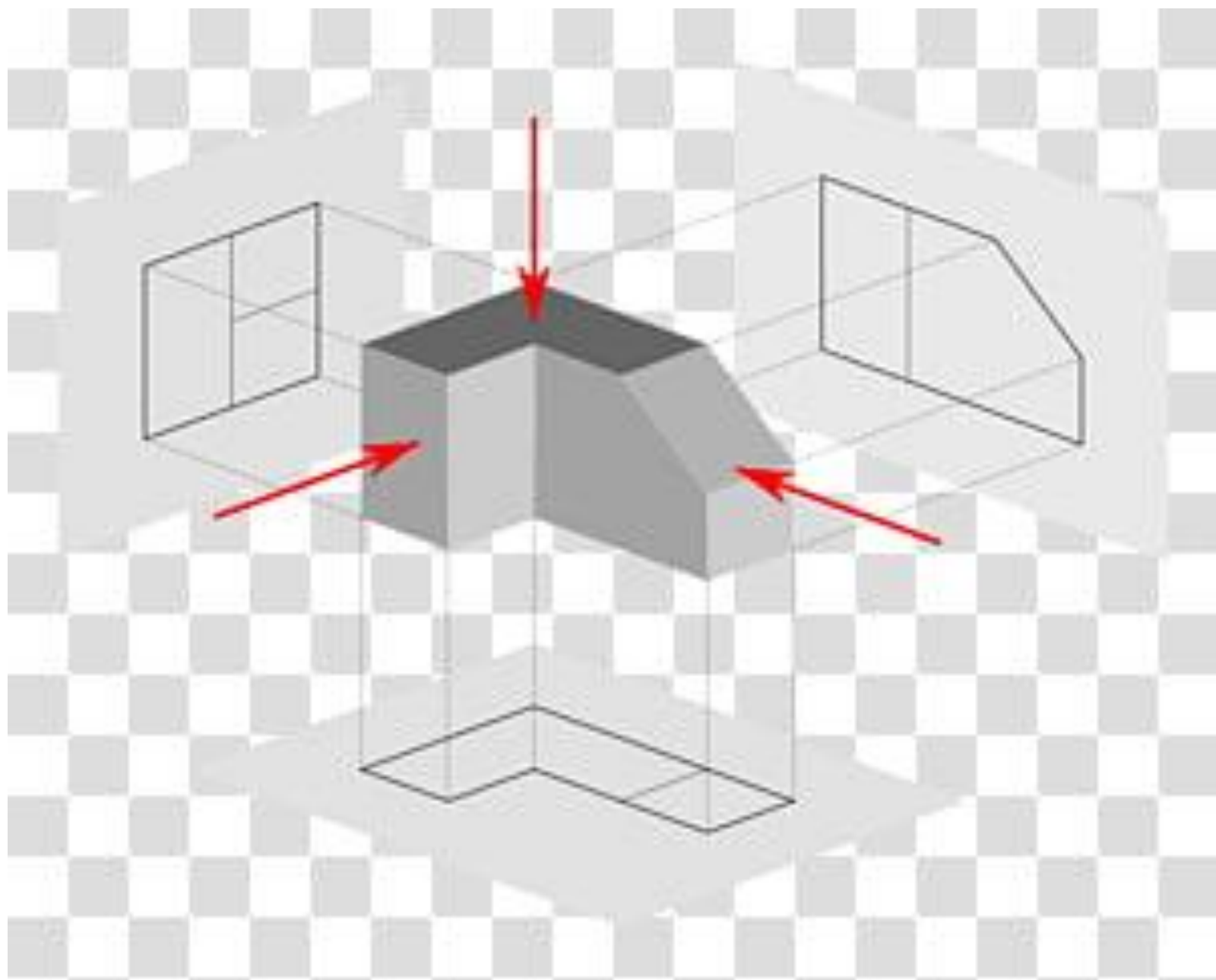
- . معلق في الهواء.
- . موضوع على الأرض (على المستوى الأفقي).

4- حدد وضعه بالنسبة للمستويات الأخرى:

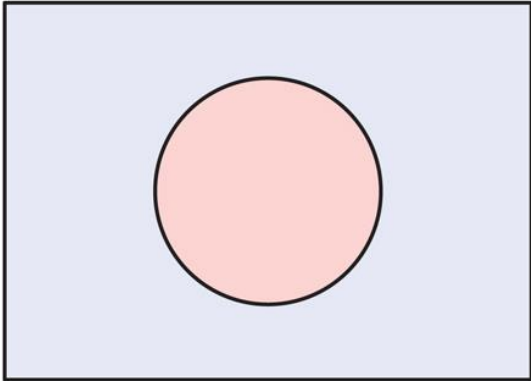
- 1- ركني.
- 2- ملاصق للمستوى الرأسي.
- 3- ملاصق للمستوى الجانبي.
- 4- حسب المساحة المطلوبة.



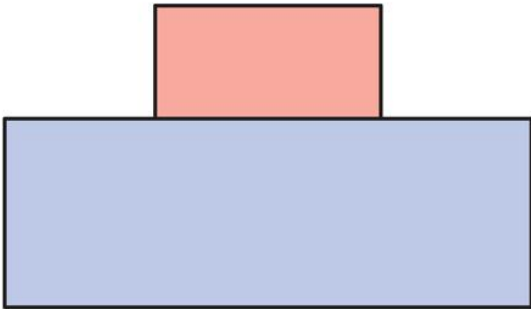
**Fig: Projection of Plane**



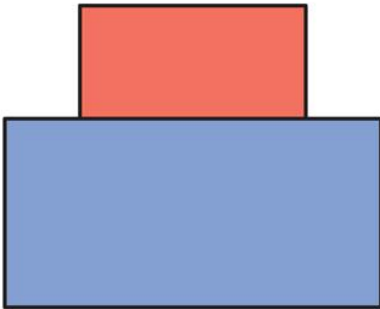
# Orthographic and isometric projections of an object



top view

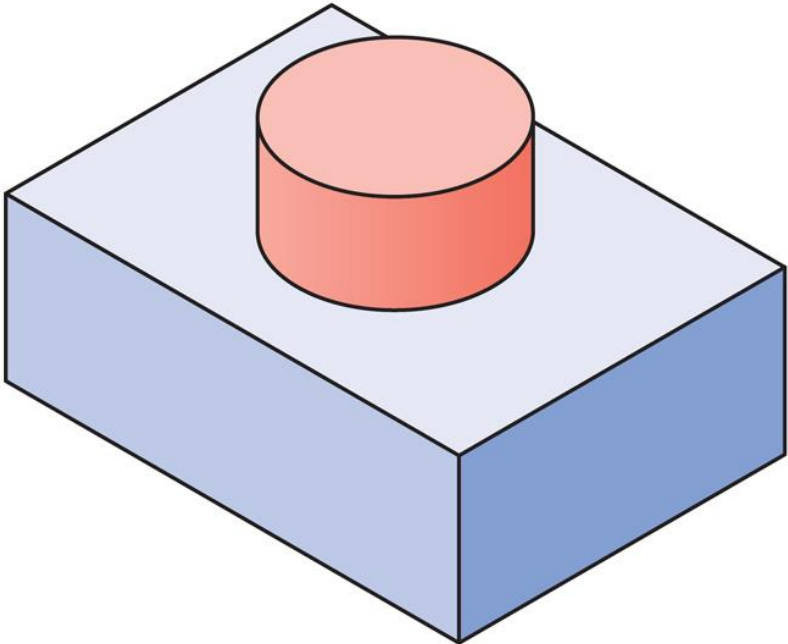


front view



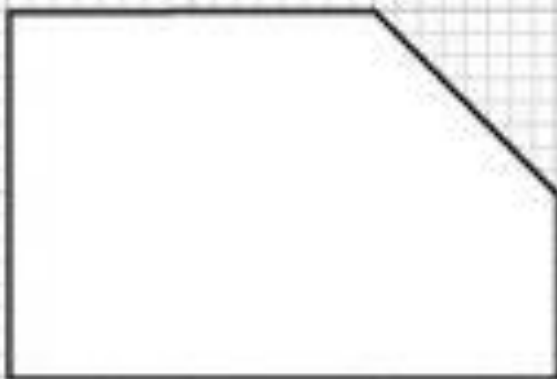
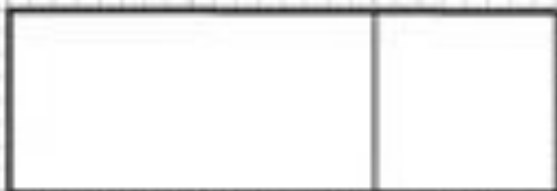
side view

2-dimensional orthographic projection



3-dimensional isometric projection

*Top*

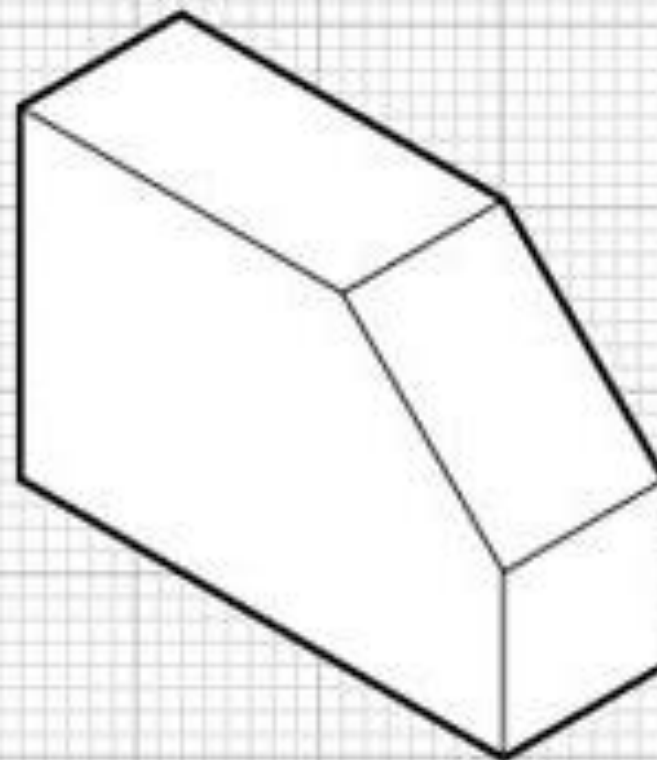


**Front View**

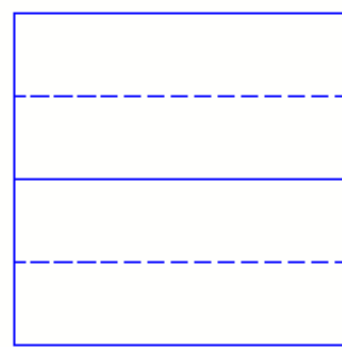
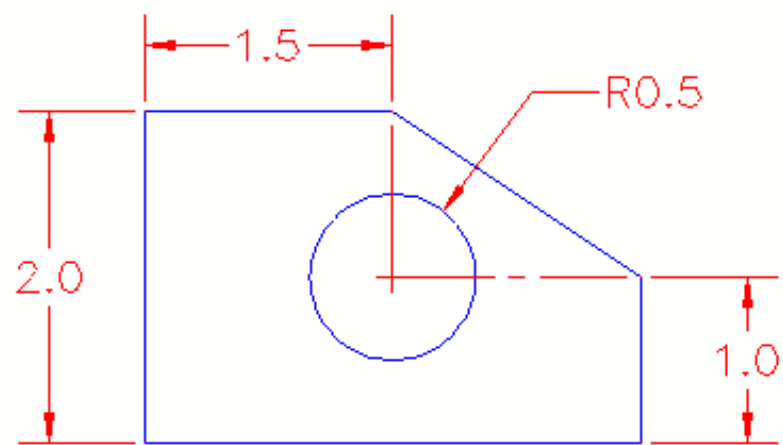
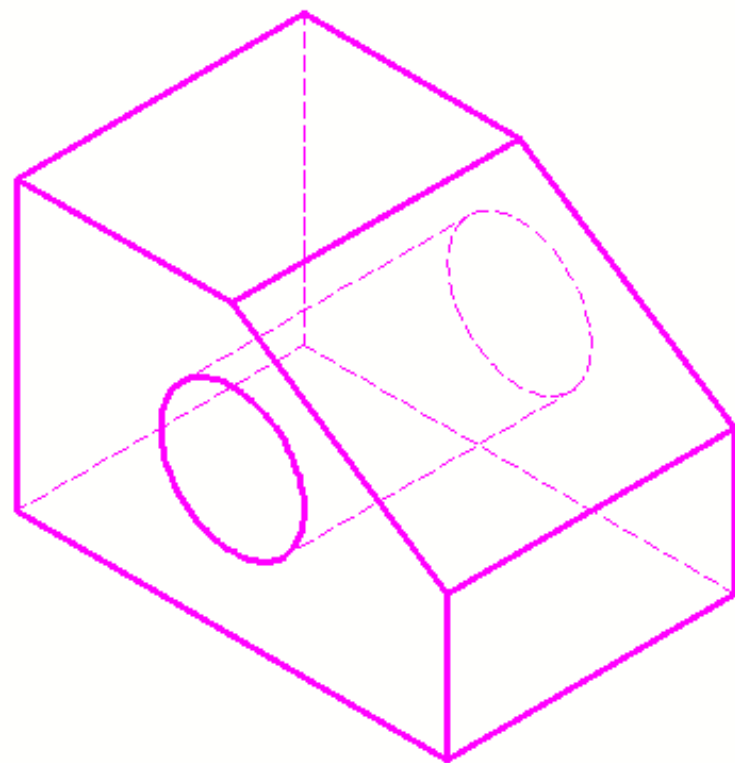
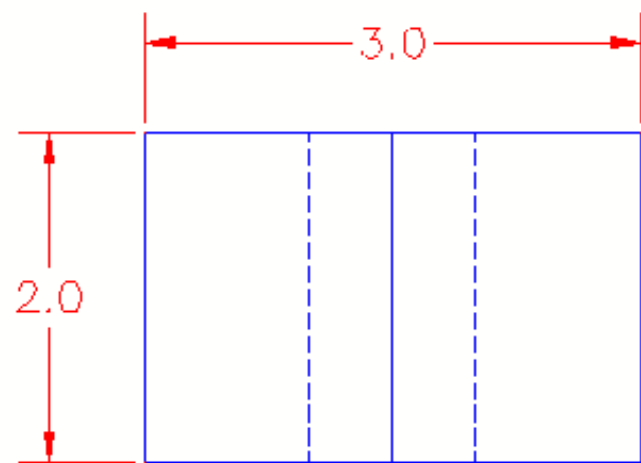


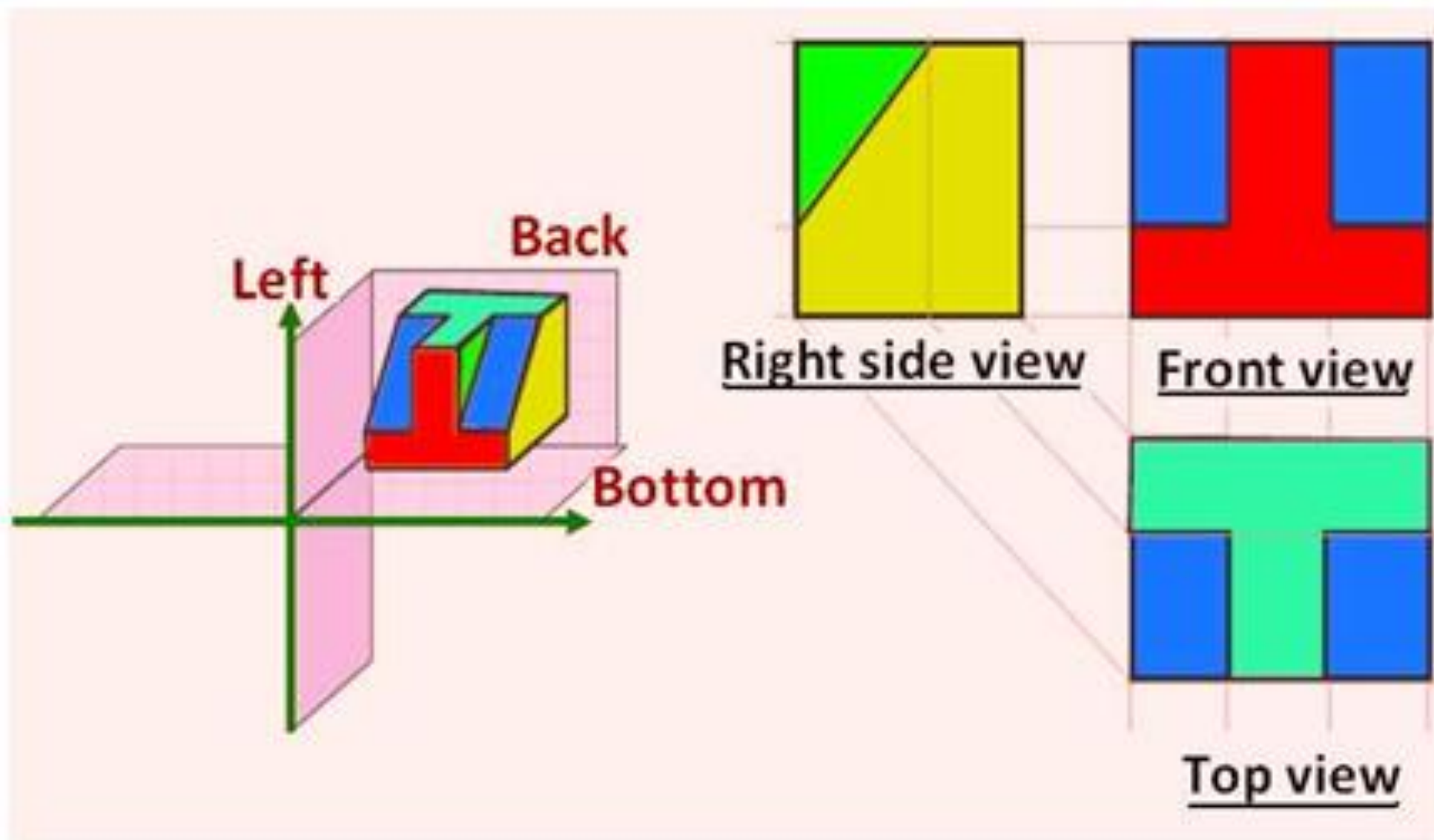
**Side View**

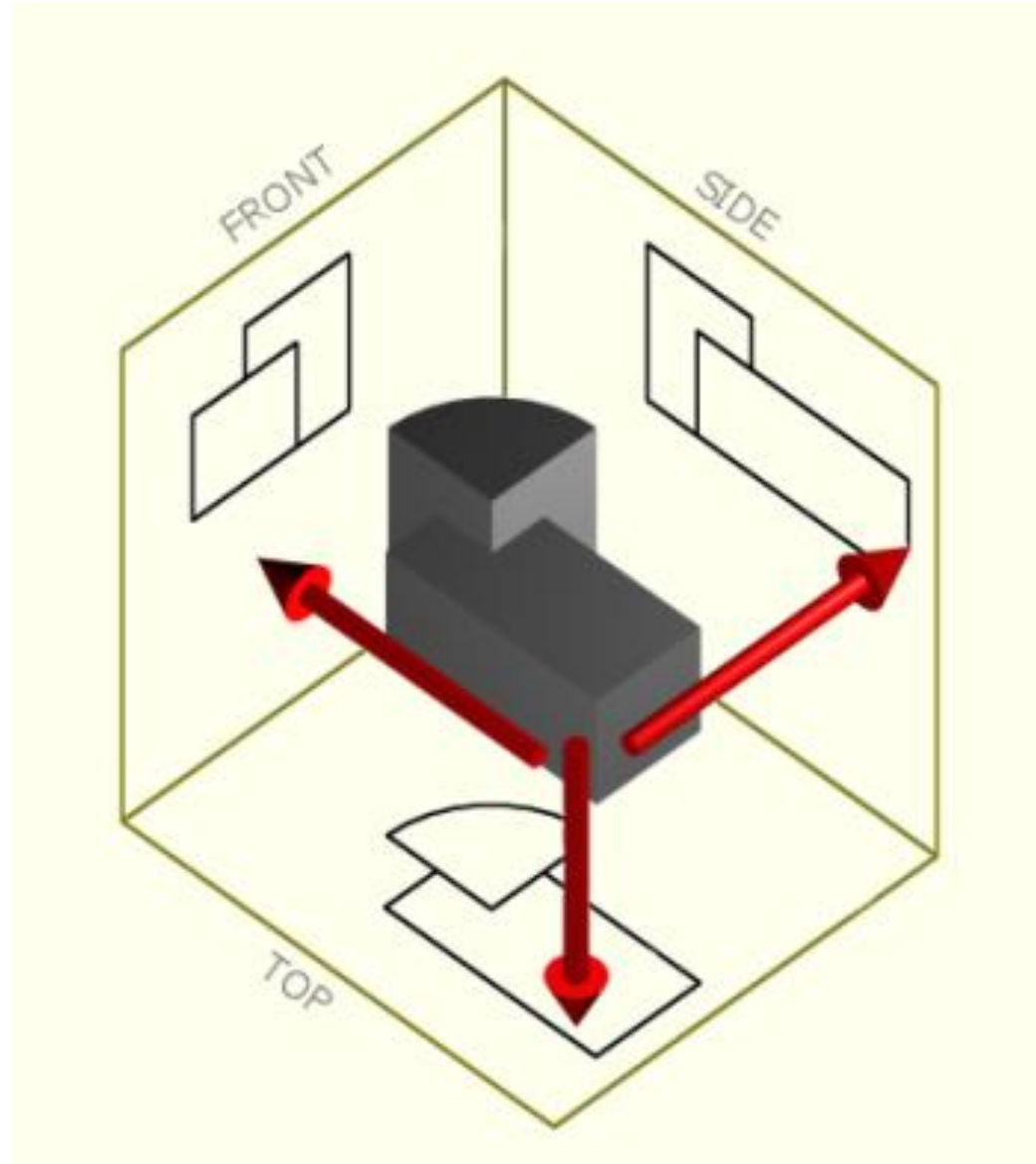
**=**

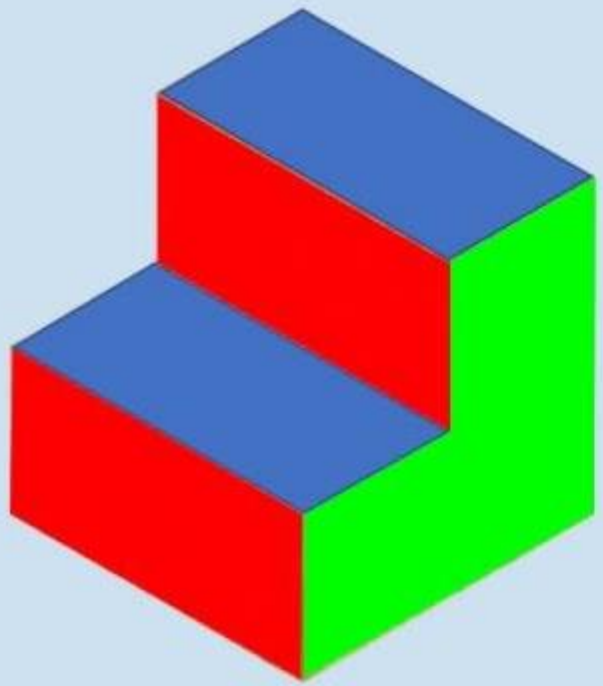












First Angle Isometric Projection  
ISOMETRIC 3D BOX / CUBE

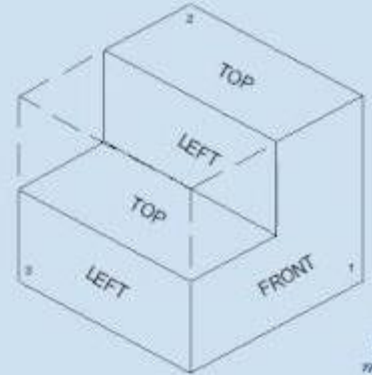


Fig. 1

2D ORTHOGRAPHIC VIEWS

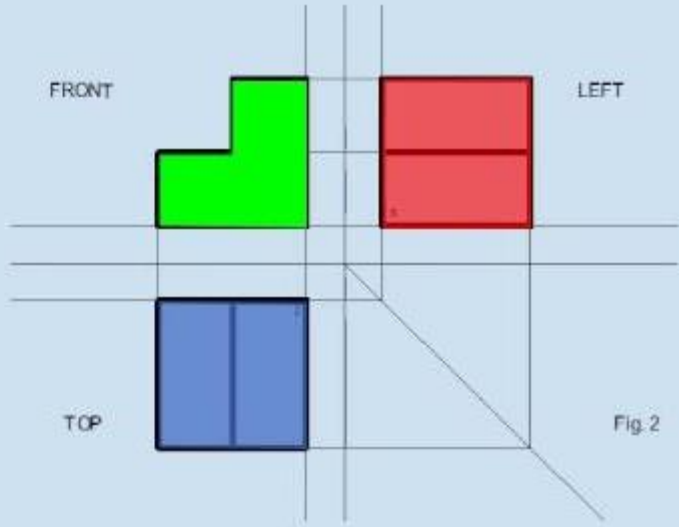
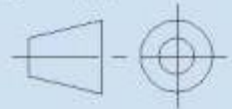
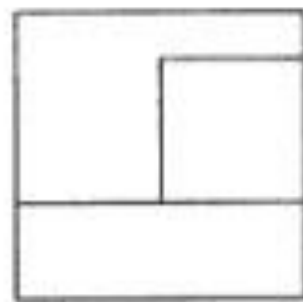
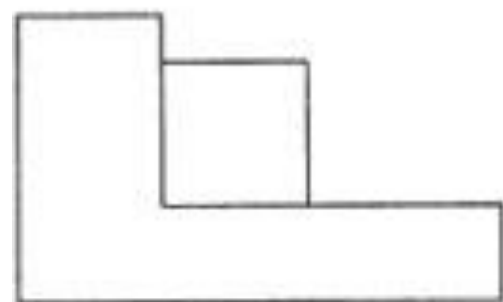
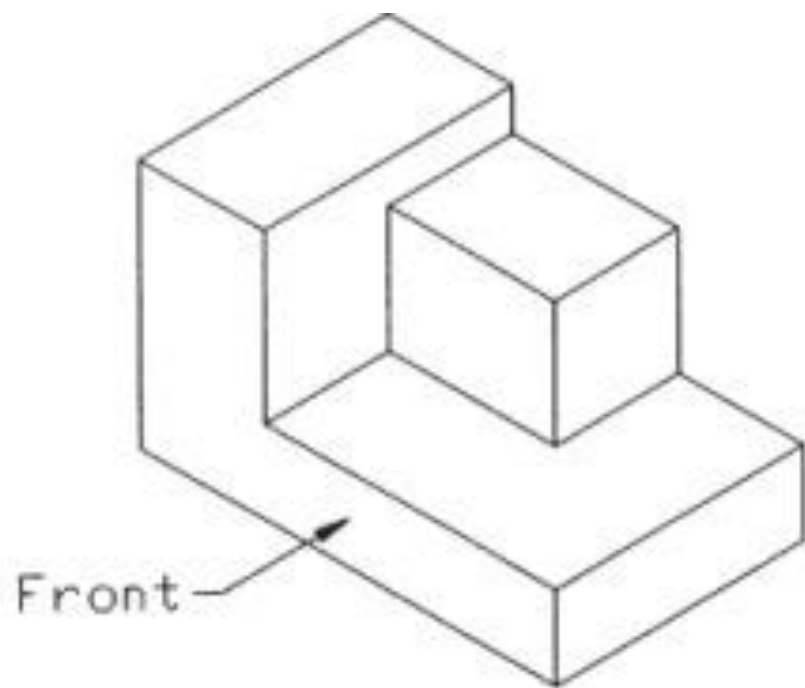
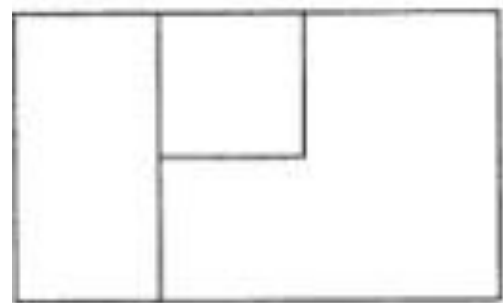


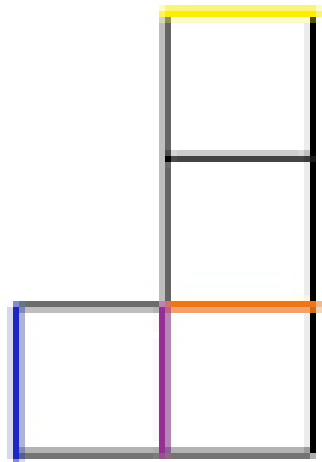
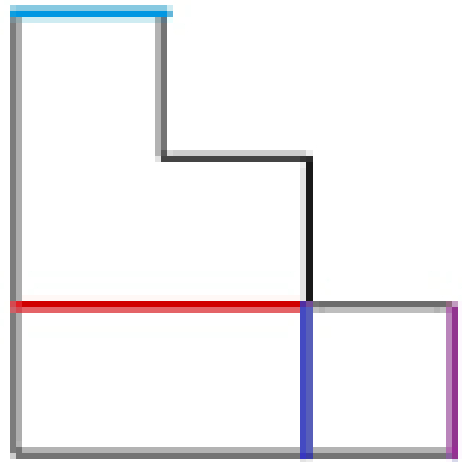
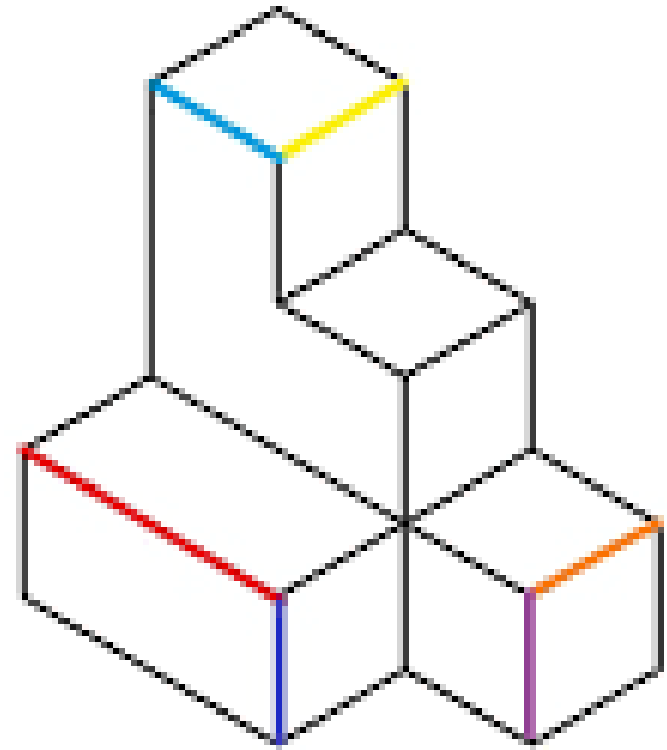
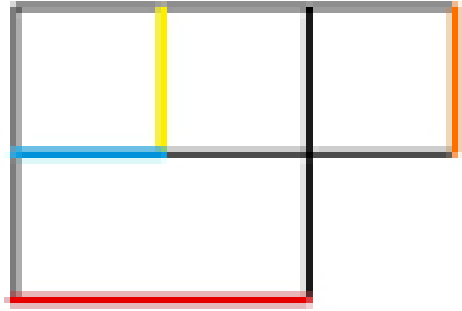
Fig. 2

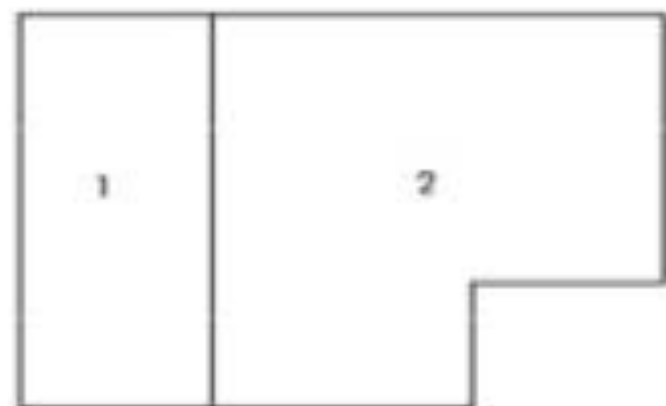
First Angle Orthographic Projection Symbol



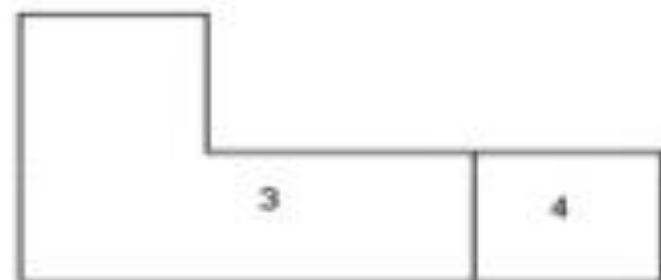


Front

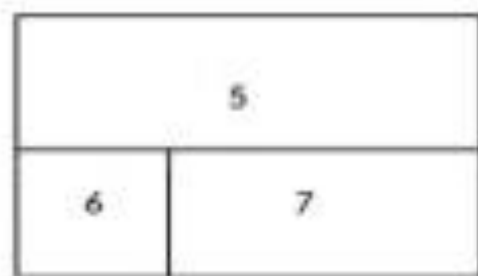




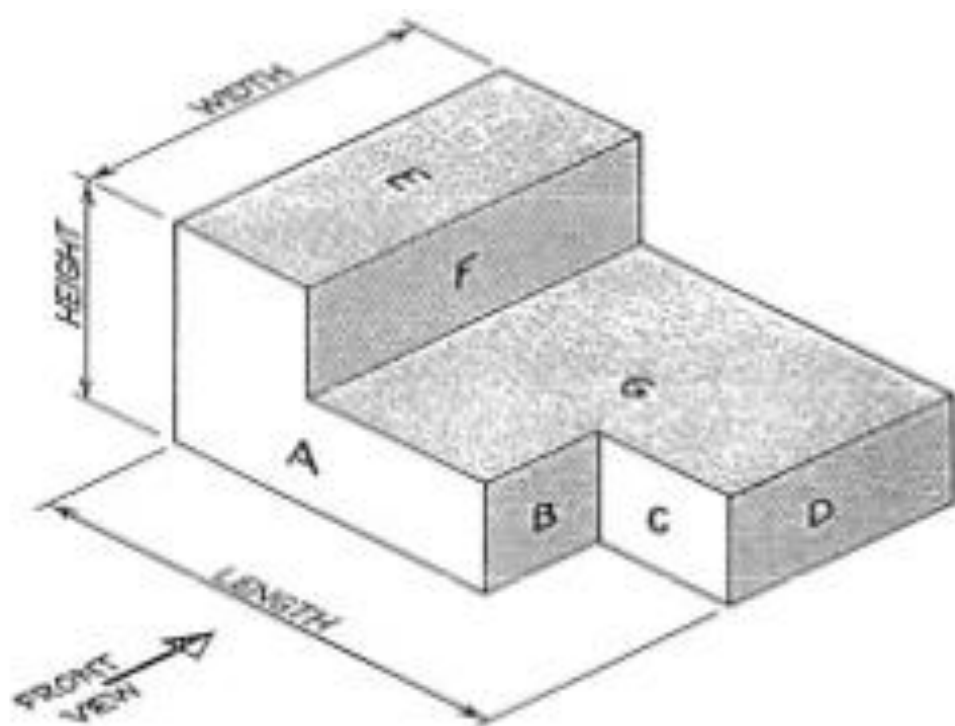
TOP VIEW



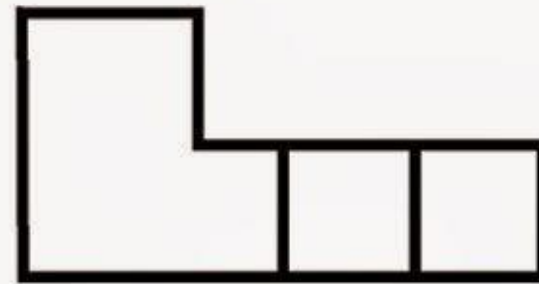
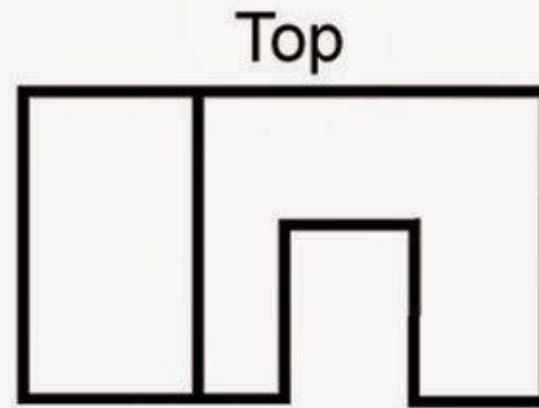
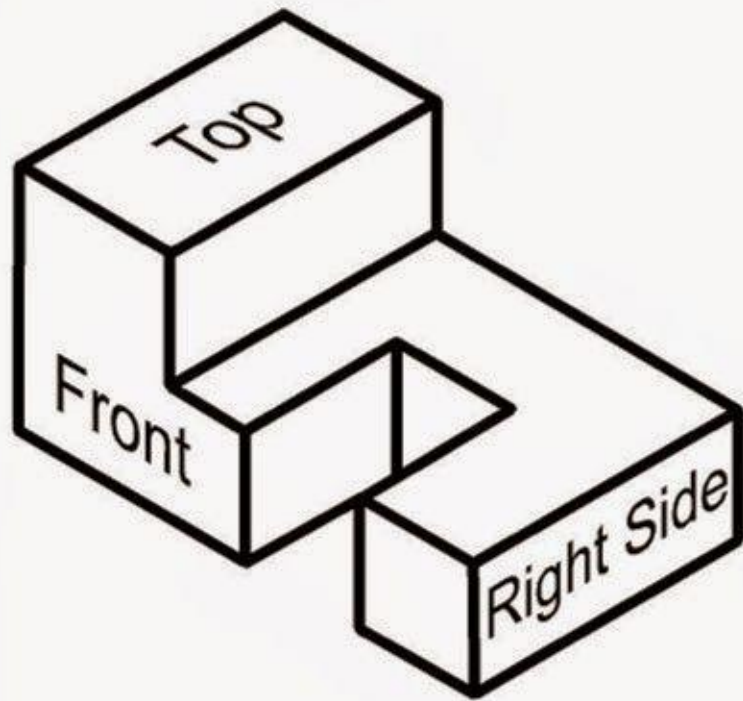
FRONT VIEW



SIDE VIEW



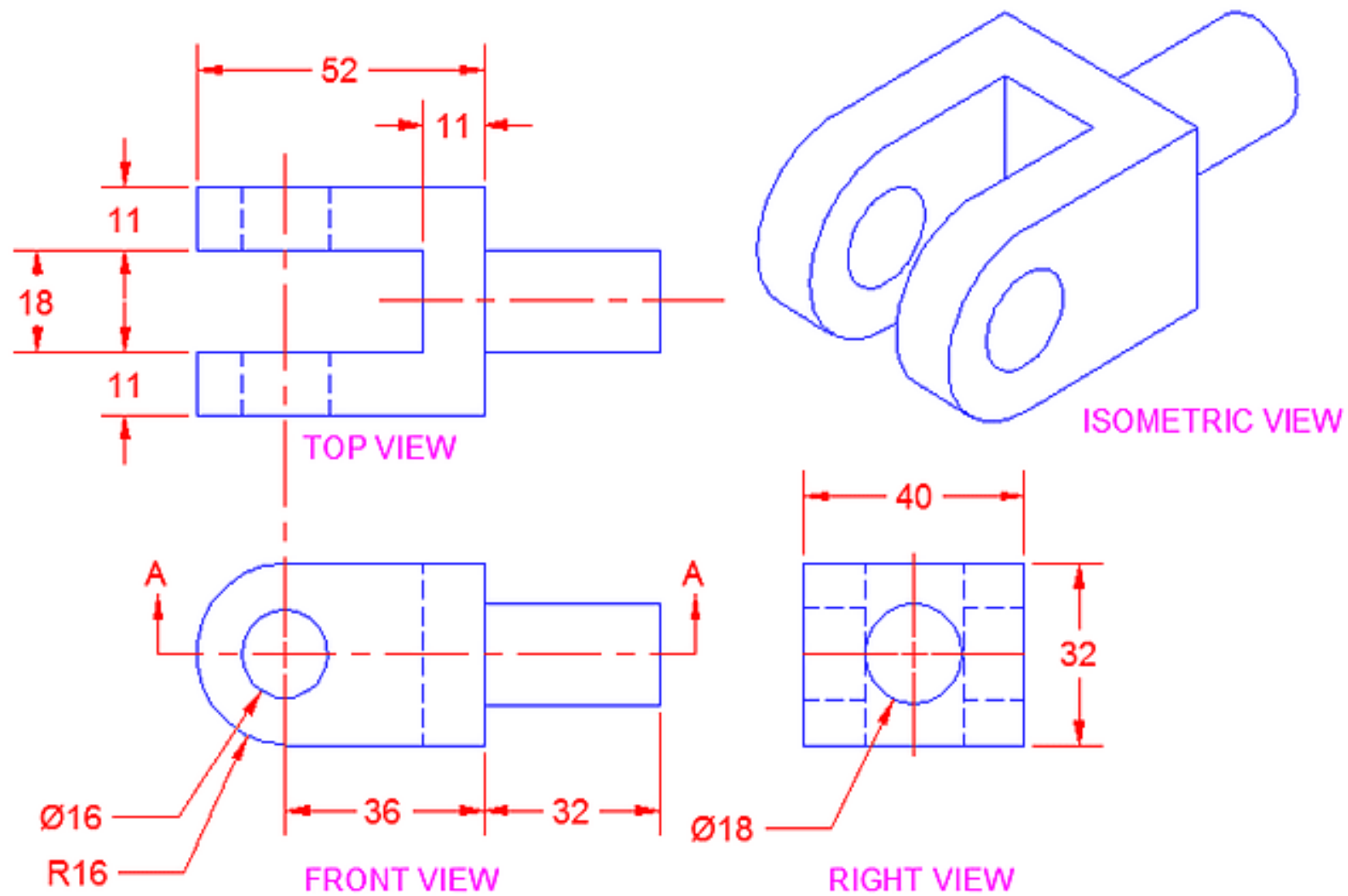
A	B	C	D	E	F	G



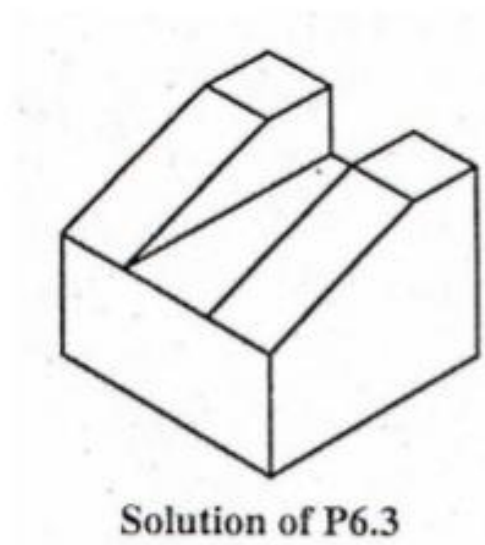
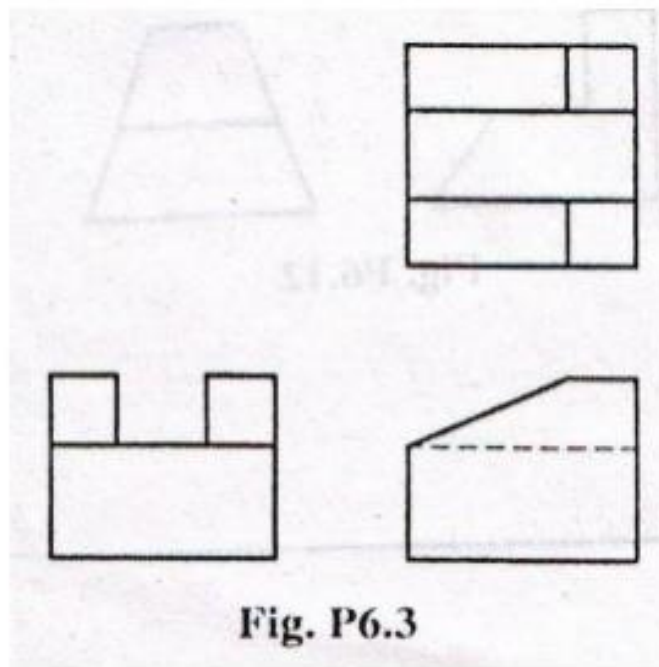
Front

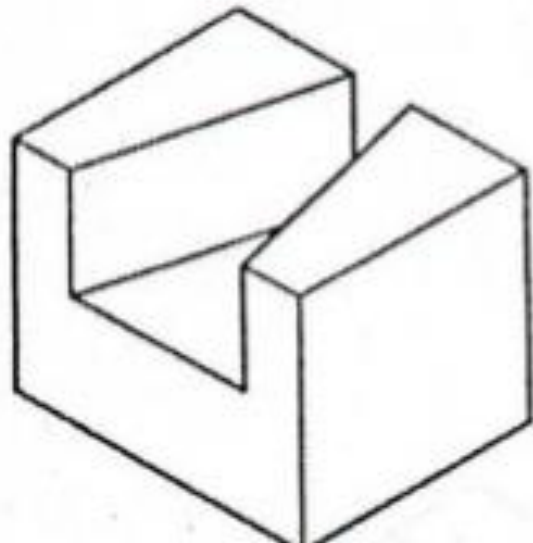
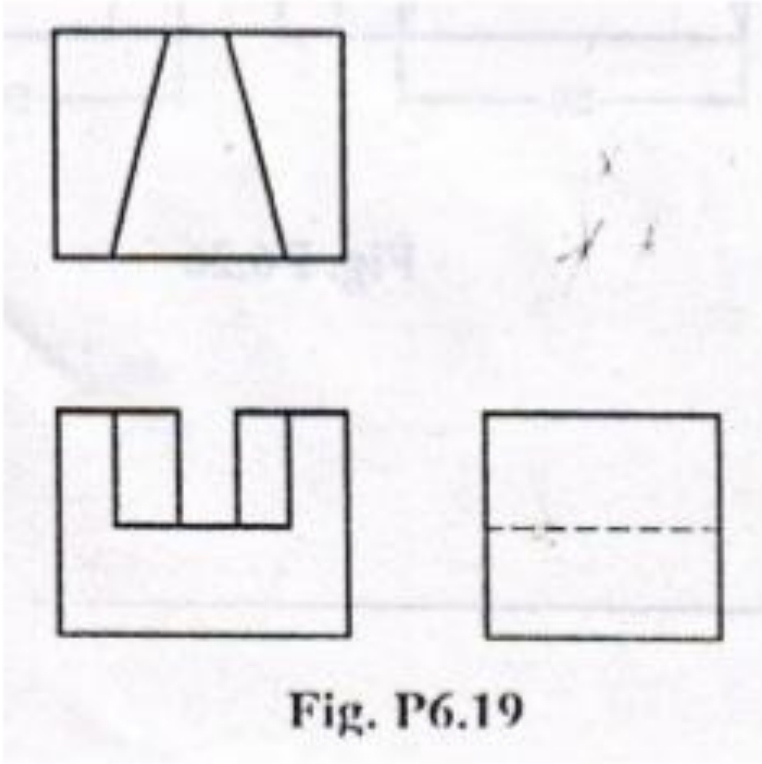
Right Side

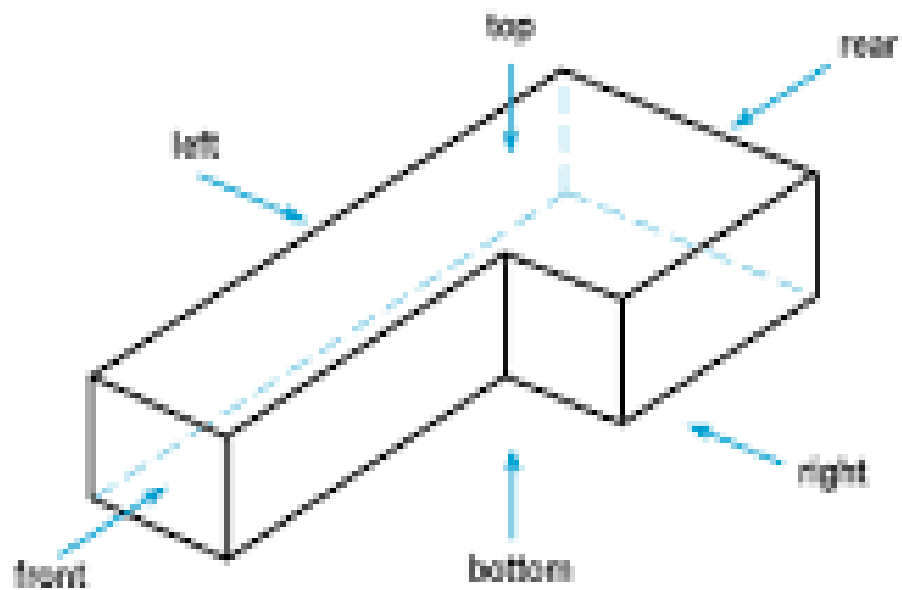




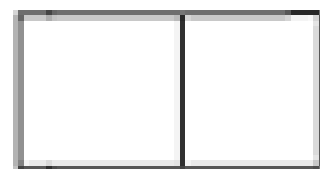
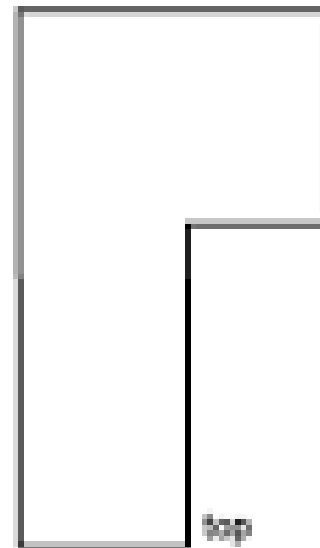
## Isometric Drawing



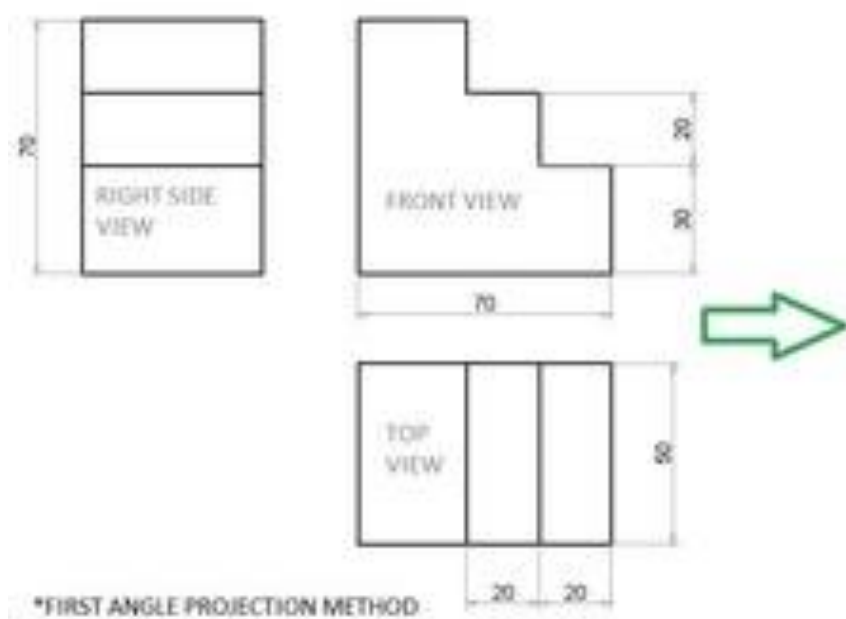




ISOMETRIC VIEW

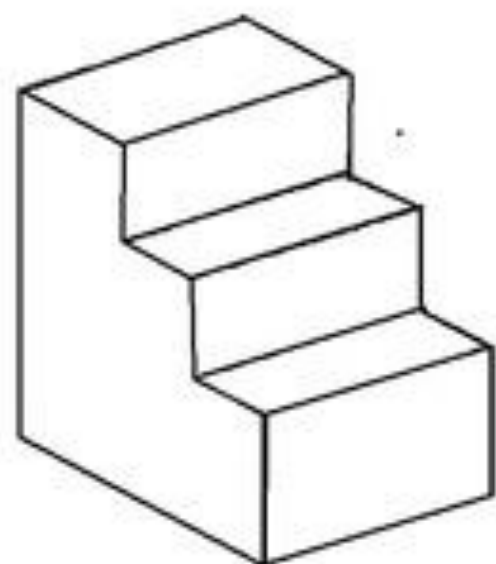


ORTHOGRAPHIC VIEW



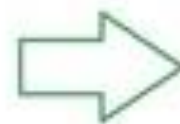
Orthographic Views

Multiple 2D Views



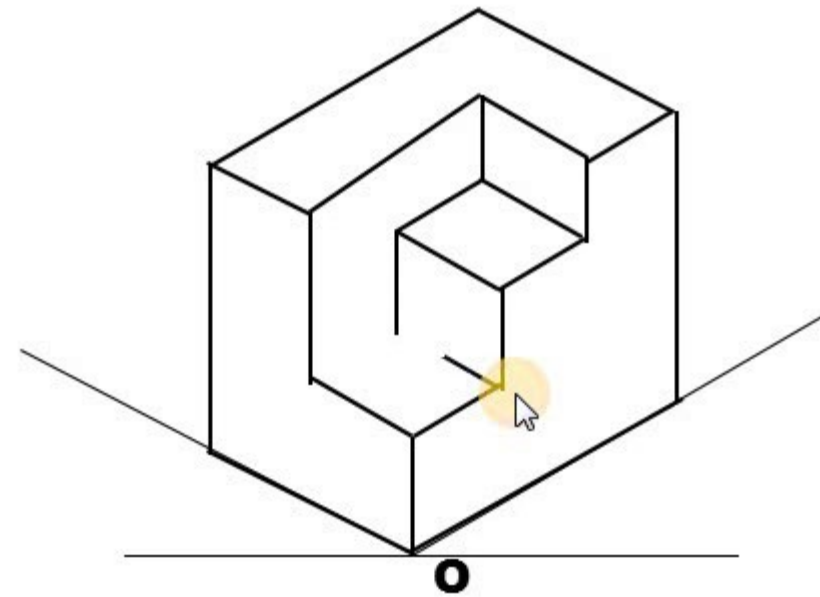
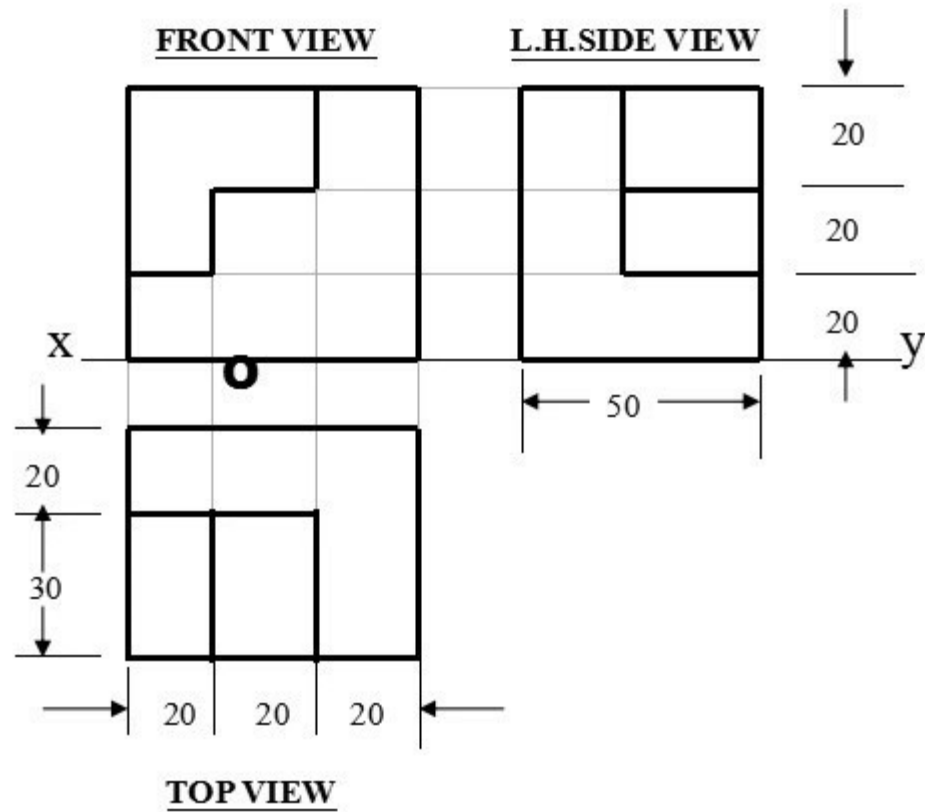
Isometric View

One 3D View



Realistic View

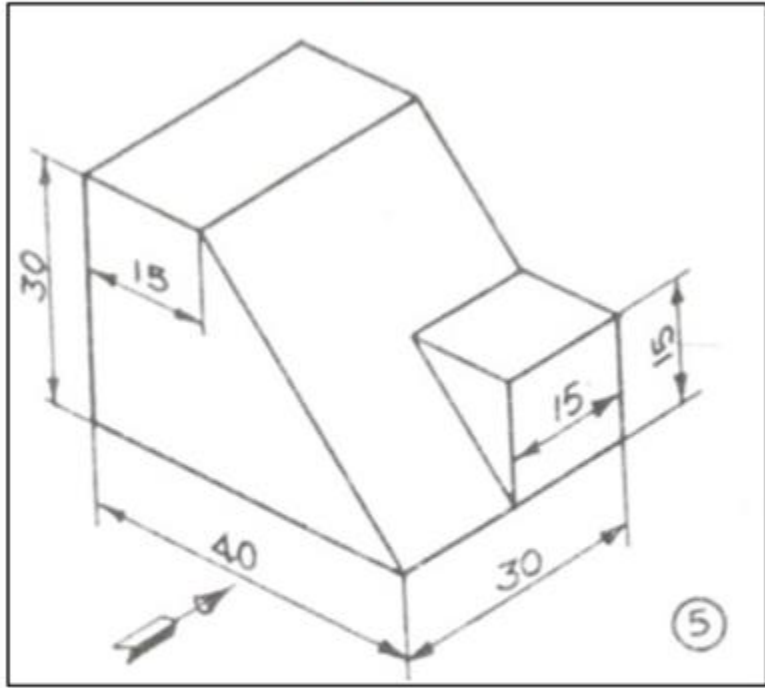
F.V. & T.V. and S.V.of an object are given. Draw it's isometric view.



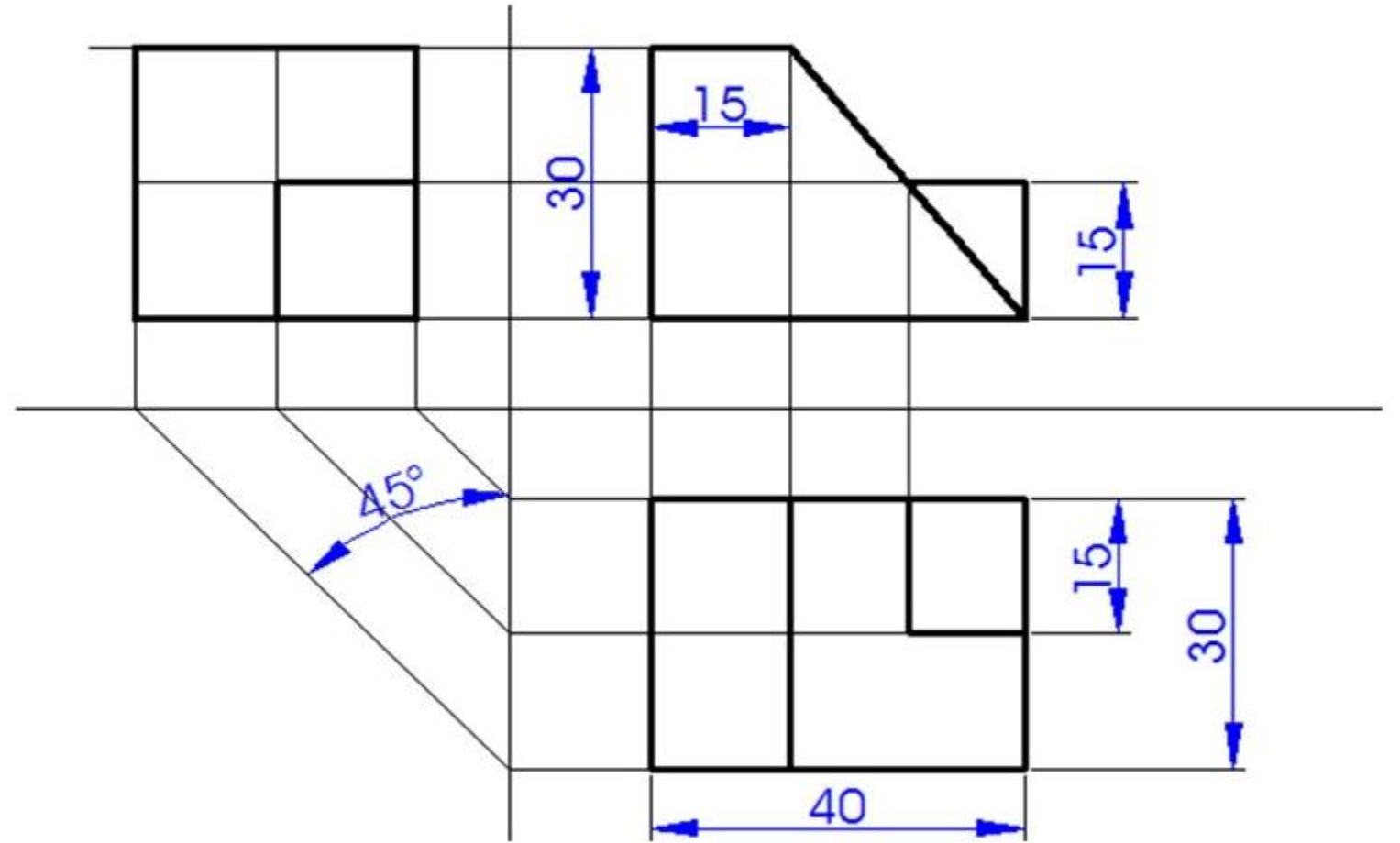
ISOMETRIC VIEW

ORTHOGRAPHIC PROJECTIONS

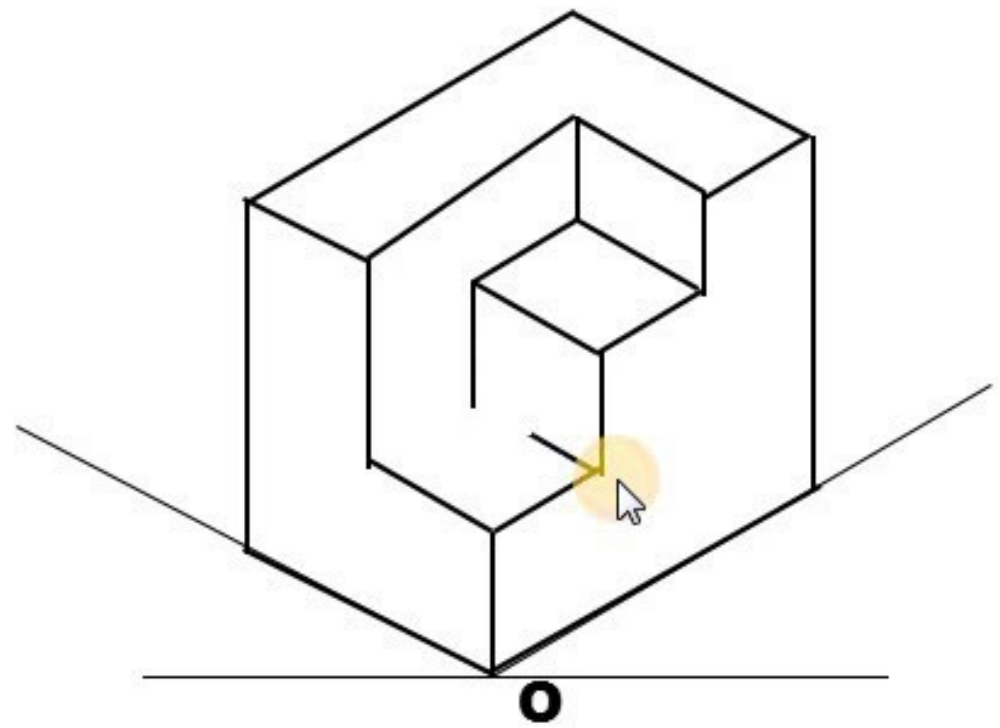
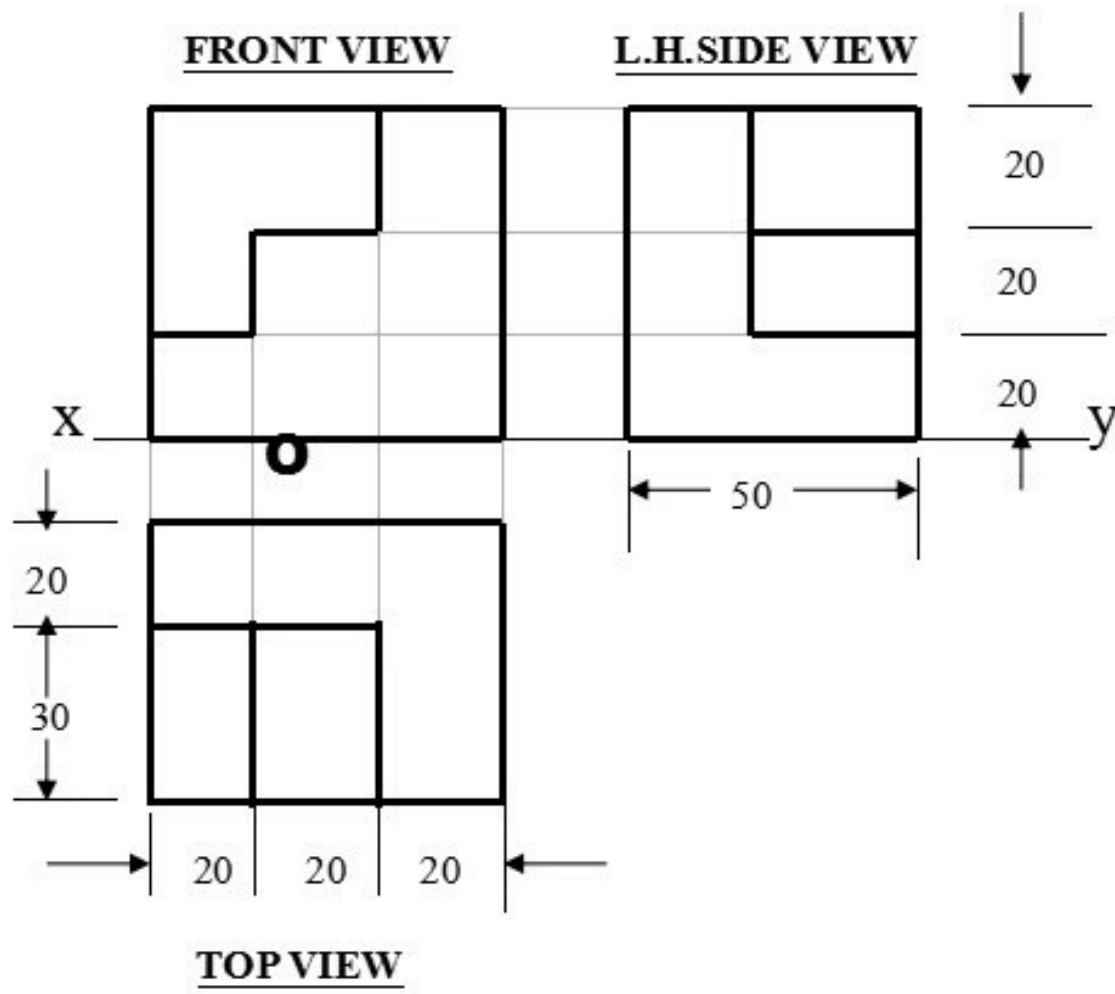
## Pictorial Representation



## Orthographic Projection (I Angle)



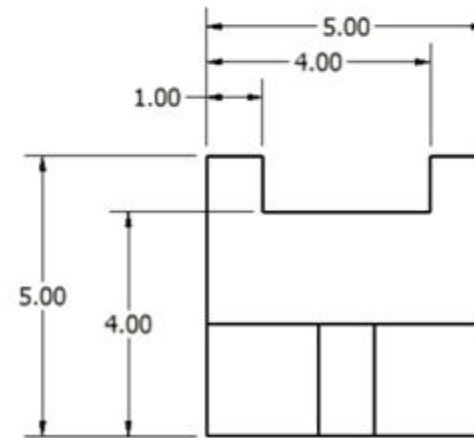
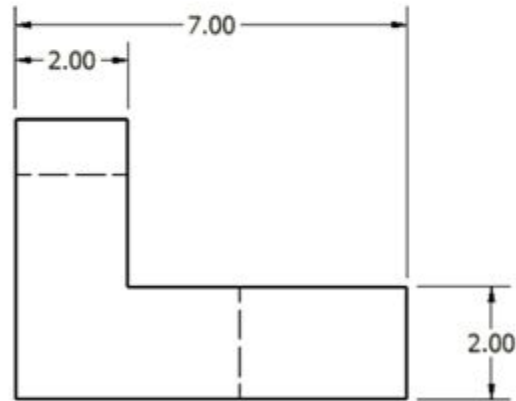
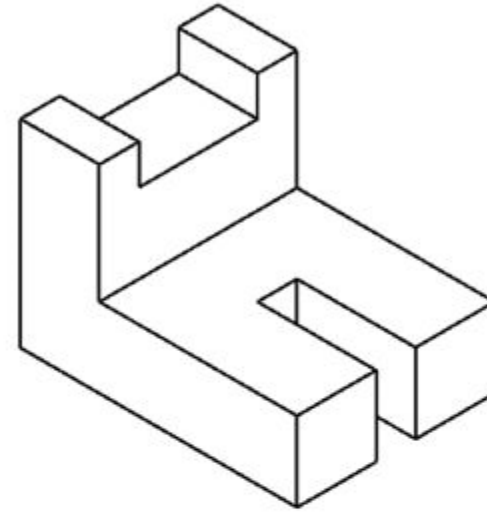
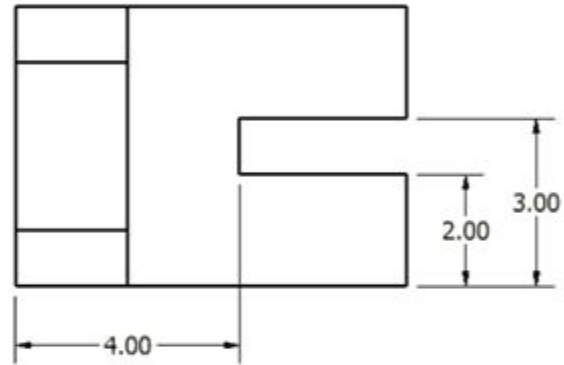
**Problem 1**

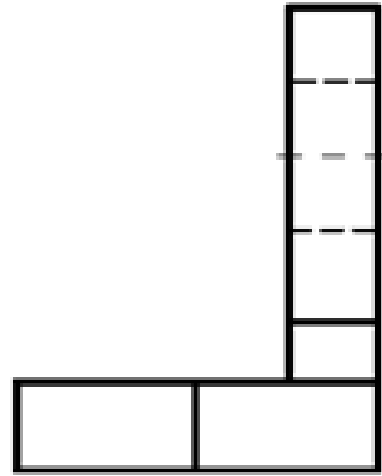


**ISOMETRIC VIEW**

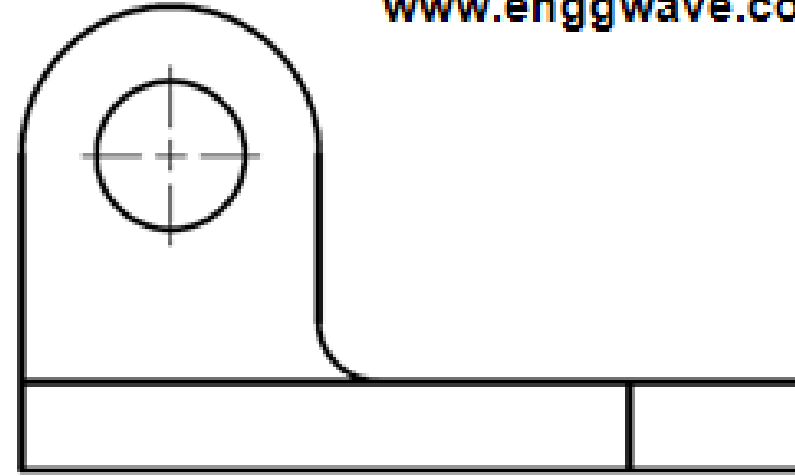


# Multi-View Drawing

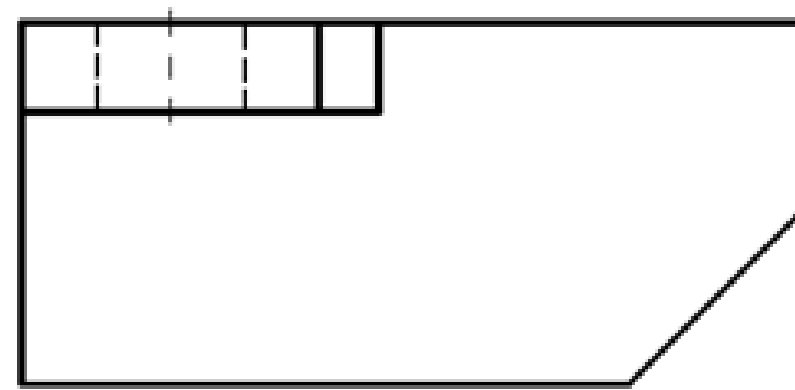
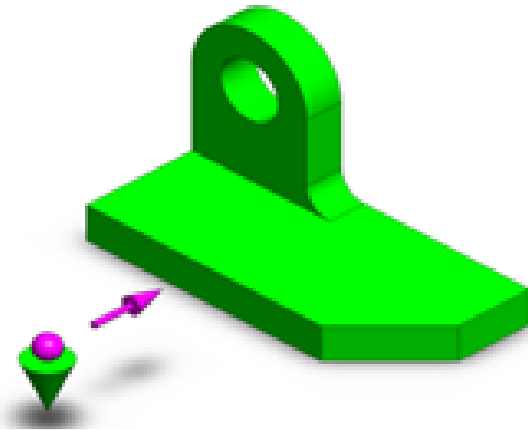




**RIGHT SIDE VIEW**

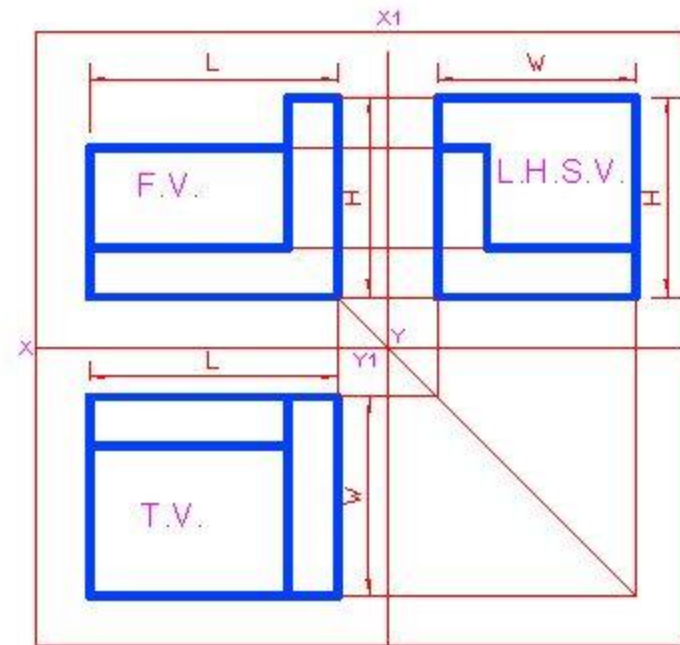
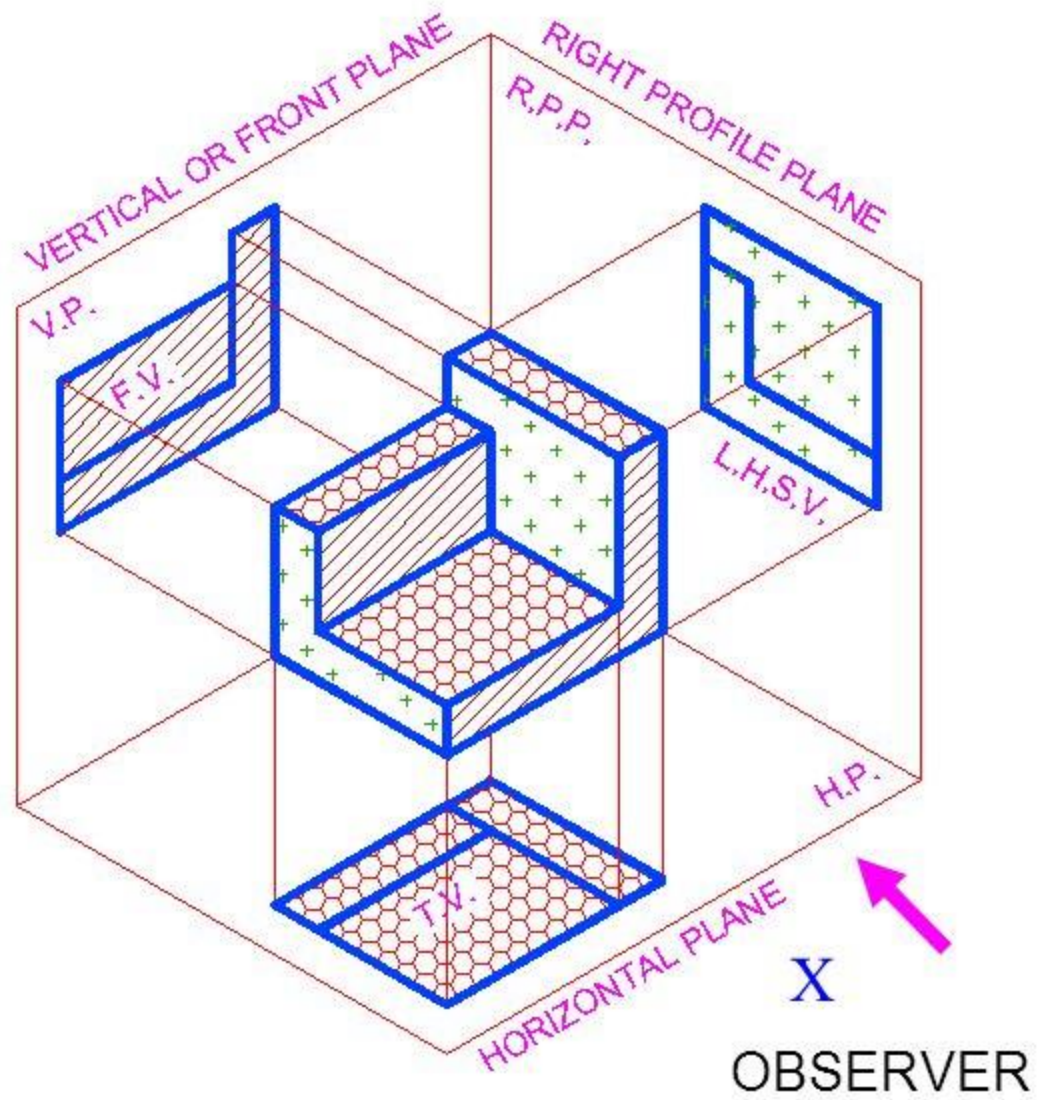


**FRONT VIEW**

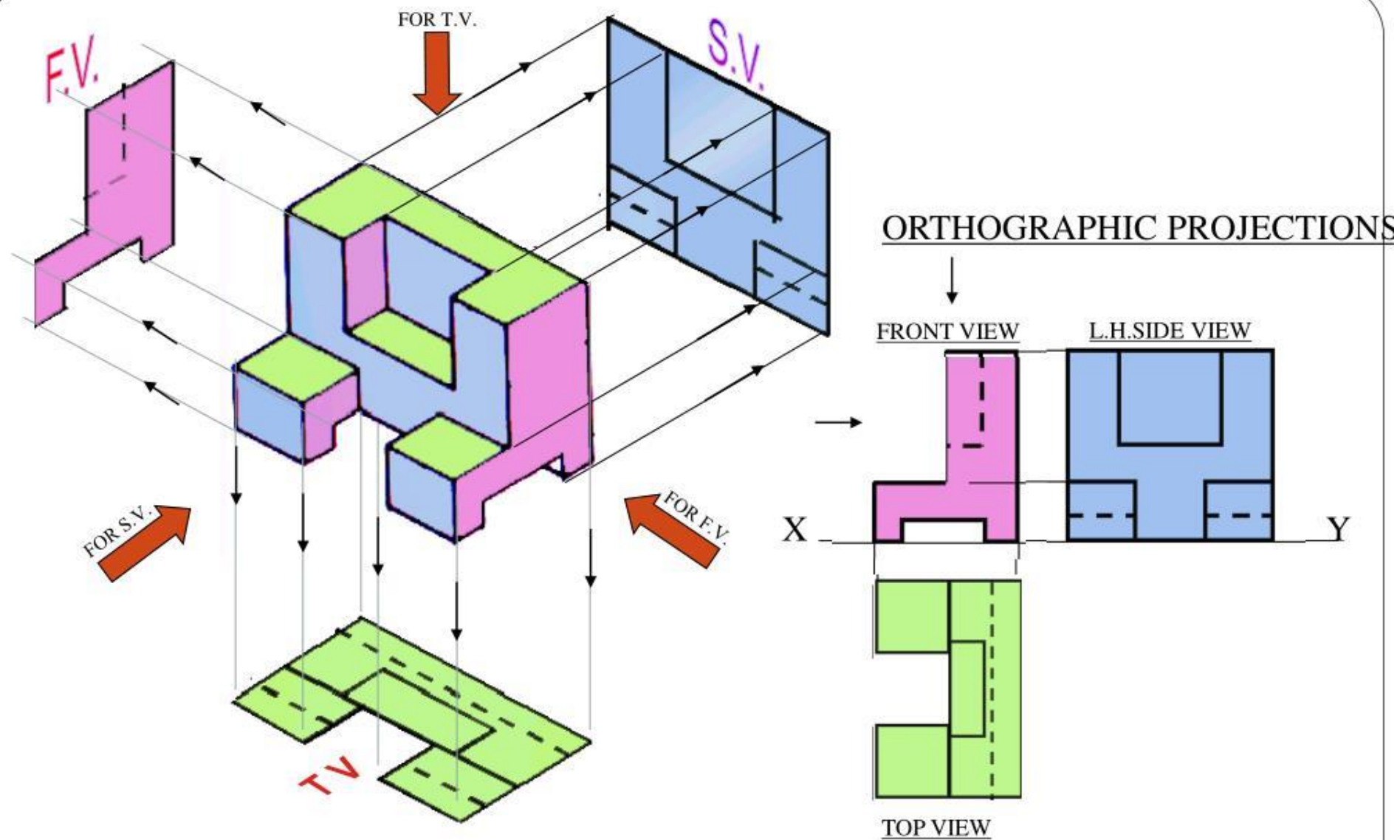


**TOP VIEW**

**Fig: Projection of Views**

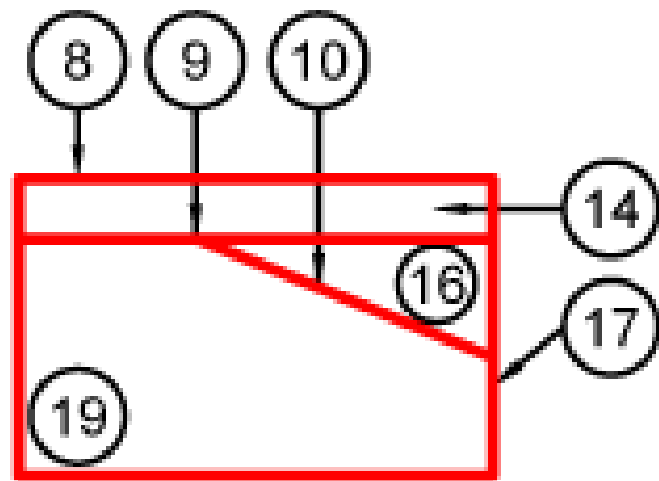
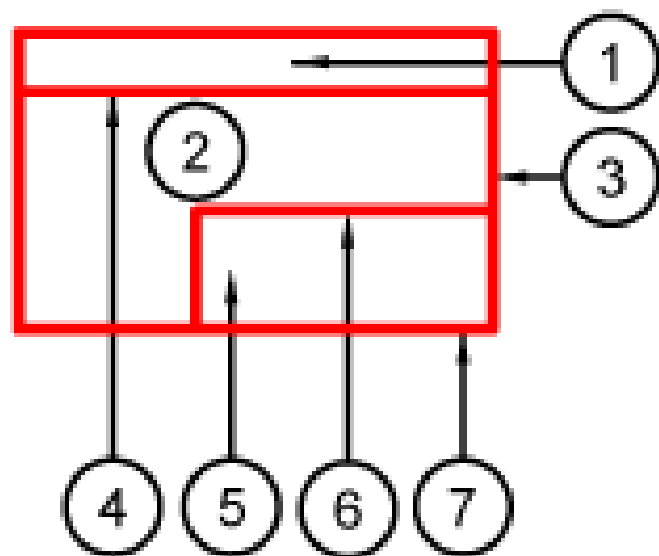


ARRAY OF VIEWS IN 1 ST ANGLE

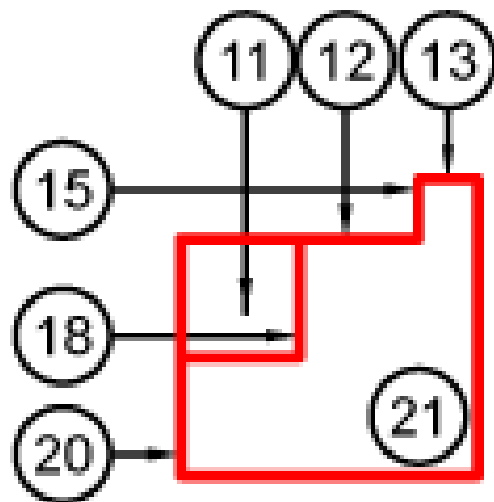


**PICTORIAL PRESENTATION IS GIVEN**  
**DRAW THREE VIEWS OF THIS OBJECT**  
**BY FIRST ANGLE PROJECTION METHOD**

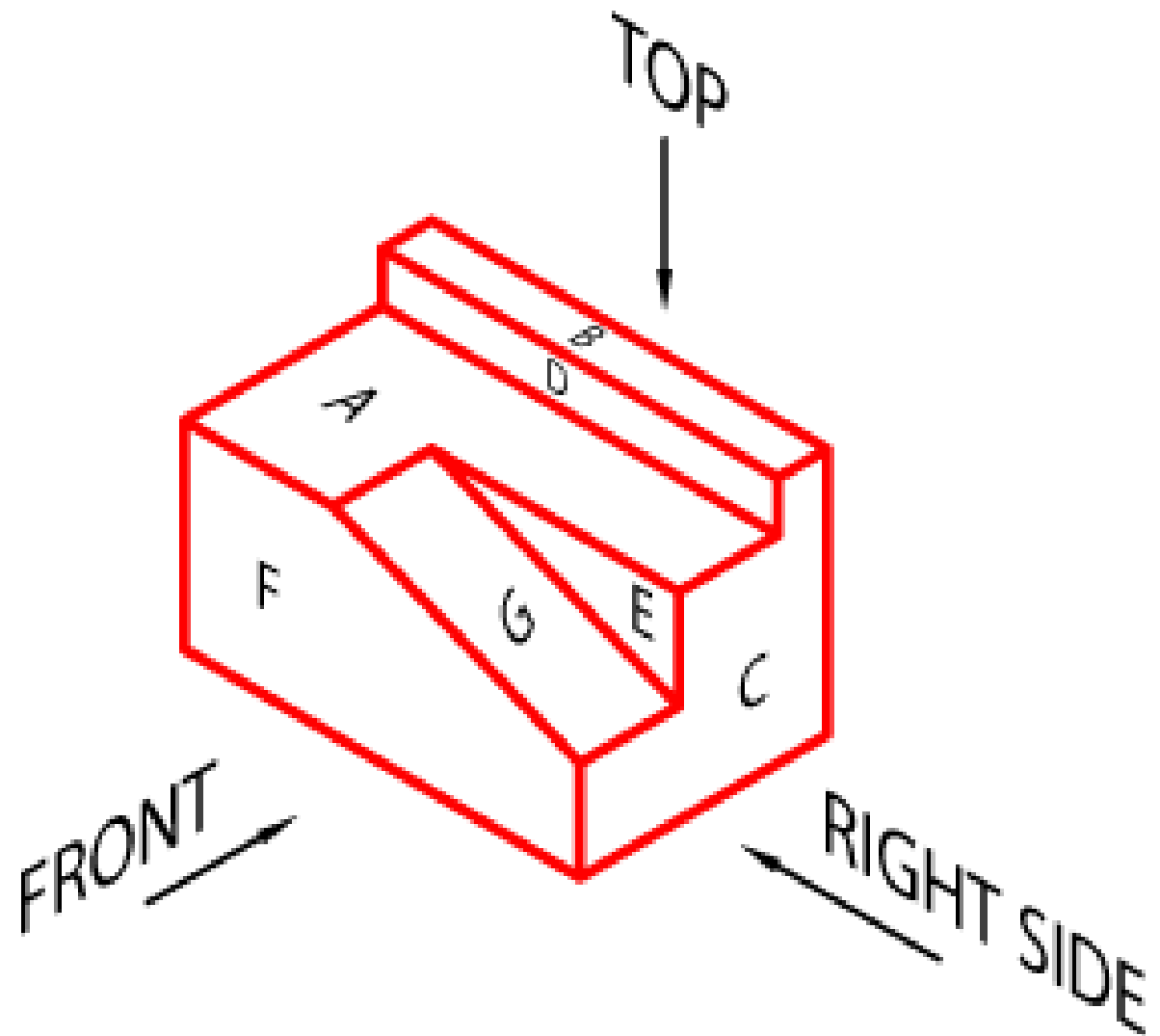
TOP VIEW

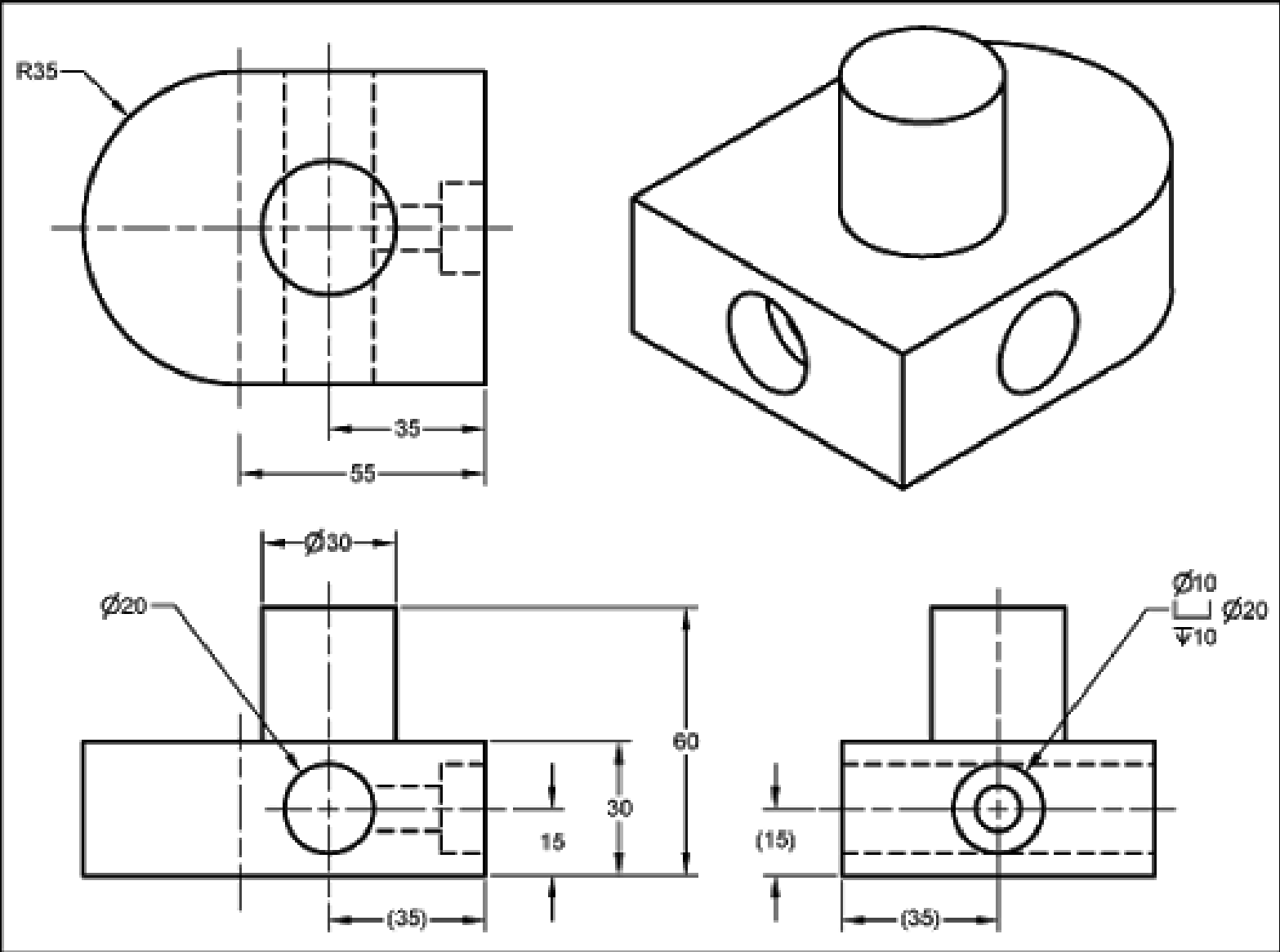


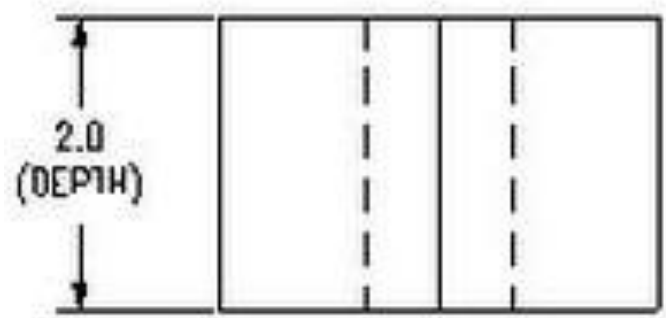
FRONT VIEW



RIGHT SIDE VIEW

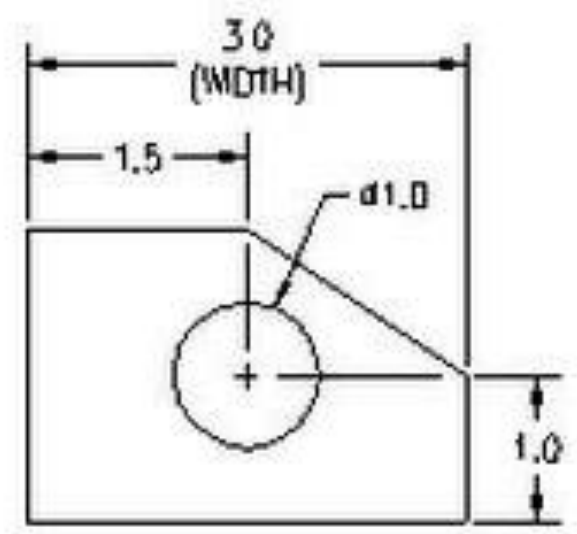
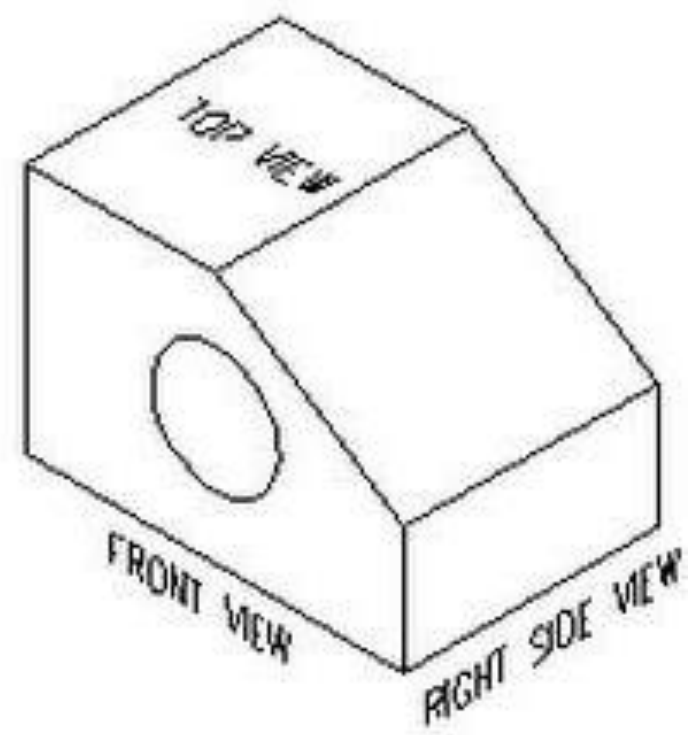






2.0  
(DEPTH)

TOP VIEW



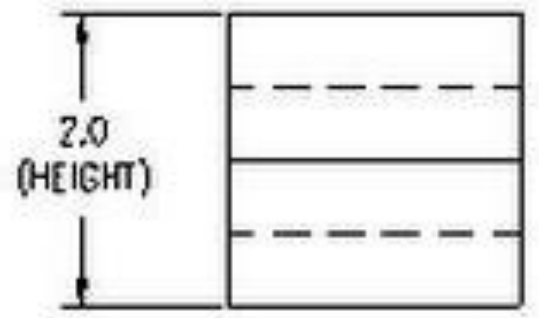
3.0  
(WIDTH)

1.5

d1.0

1.0

FRONT VIEW



2.0  
(HEIGHT)

RIGHT SIDE VIEW