COURSE PORTFOLIO

ME 107 ENGINEERING GRAPHICS

Course Philosophy

Write what you understand from the course.

This course is designed for manufacturing or supply chain management professionals who want to better understand engineering drawings. The course covers various topics like projection of points, lines, planes, solid and many more topics with its application. This is the creation of engineering drawings. In this course we learnt to transfer ideas and information needed for construction of technical devices and systems. I really enjoyed the course.

Its relevance in engineering from your perspective.

It is relevance because it is representations of physical objects to locations on paper i.e. in 3d and 2d . And it includes drawings , sketches , plans , schedules , diagrams , notes and instructions which help us in day to day life .

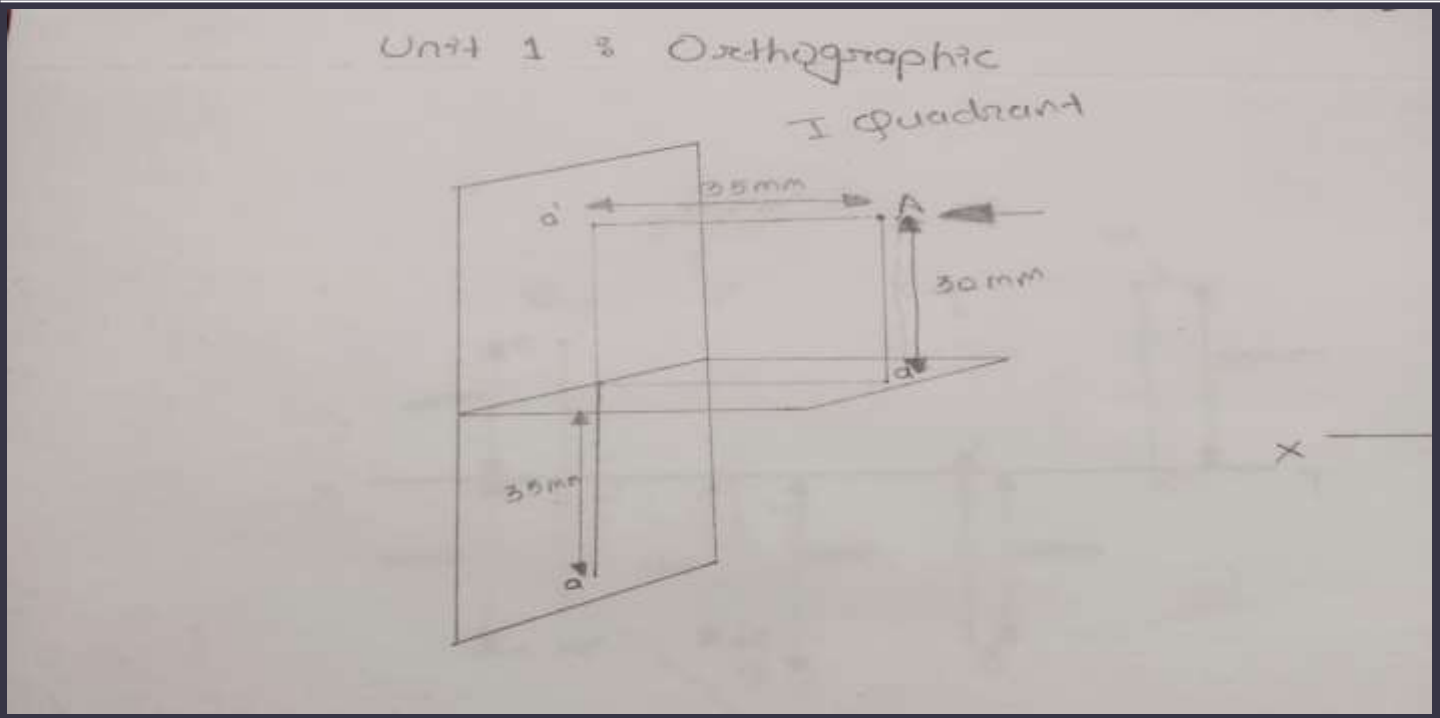
Course Teachers-Student Details

Students Name	Riddhi Dethe
Roll No	157
PRN No	202201040158
Division	A
Batch	A3

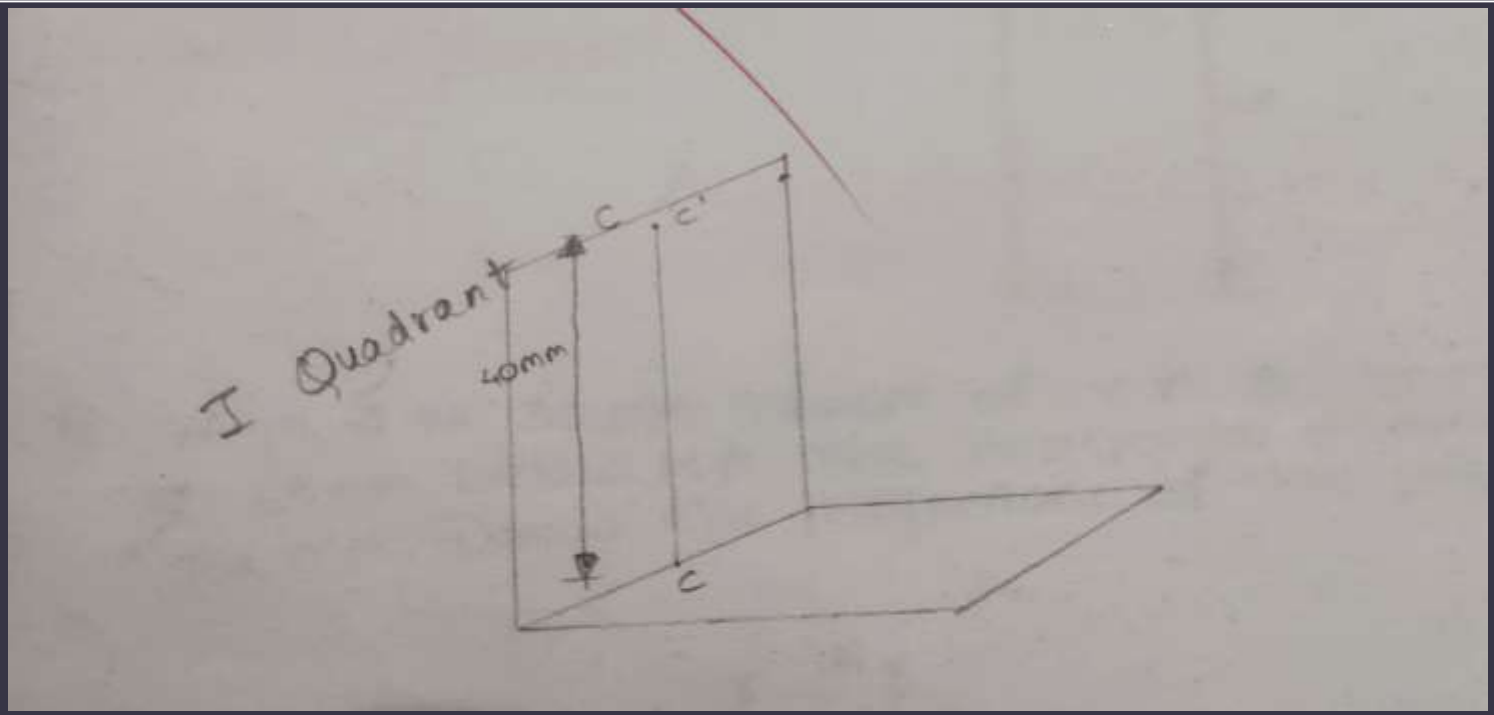
Theory class Teacher	Renu Shastri
Drawing Hall Teacher	Renu Shastri
CAD Lab Teacher	Renu Shastri

Drawing Hall Work

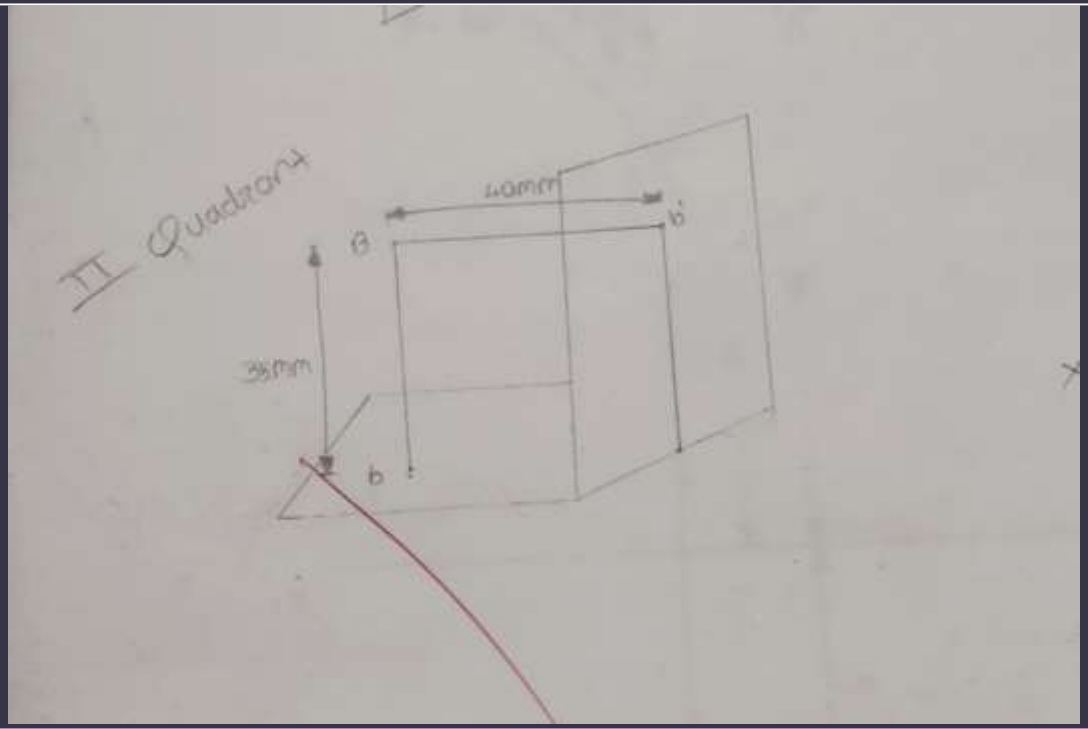
- # MODULE 1- QUADRANT SYSTEM



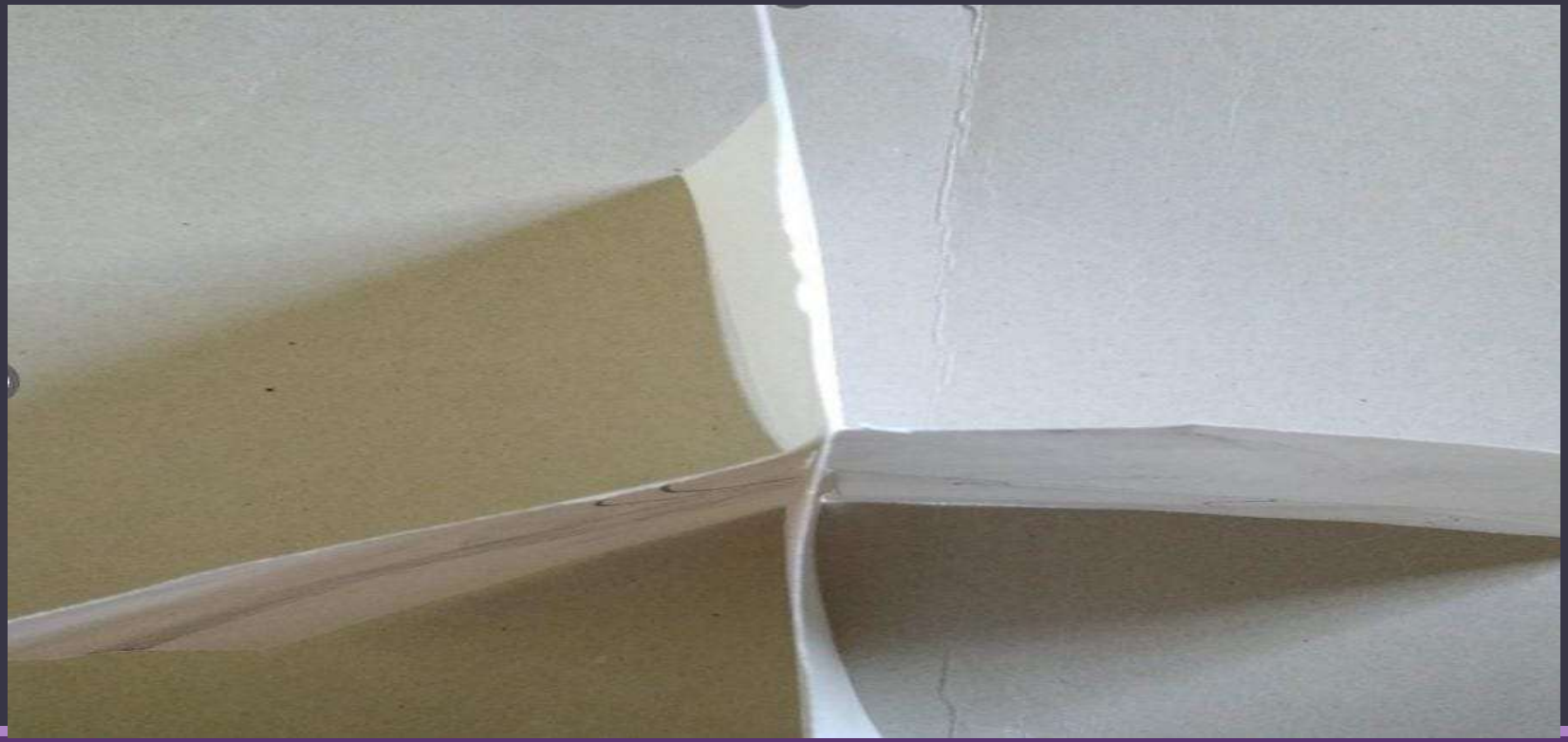
- 1ST Quadrant's Question



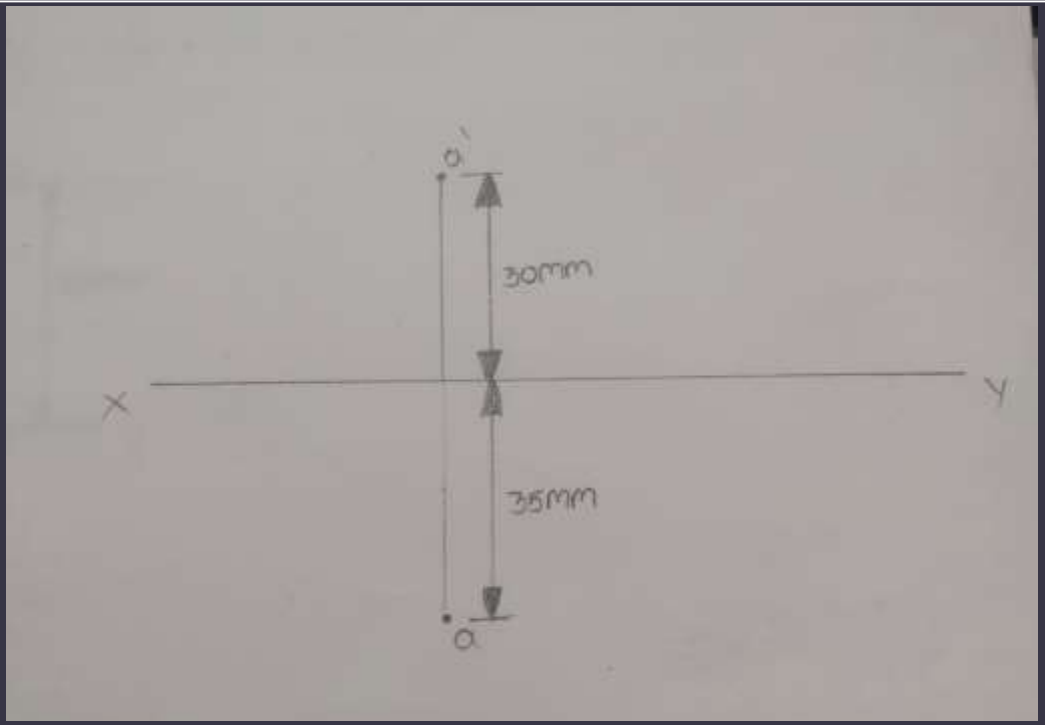
- 2ND Quadrant's Question



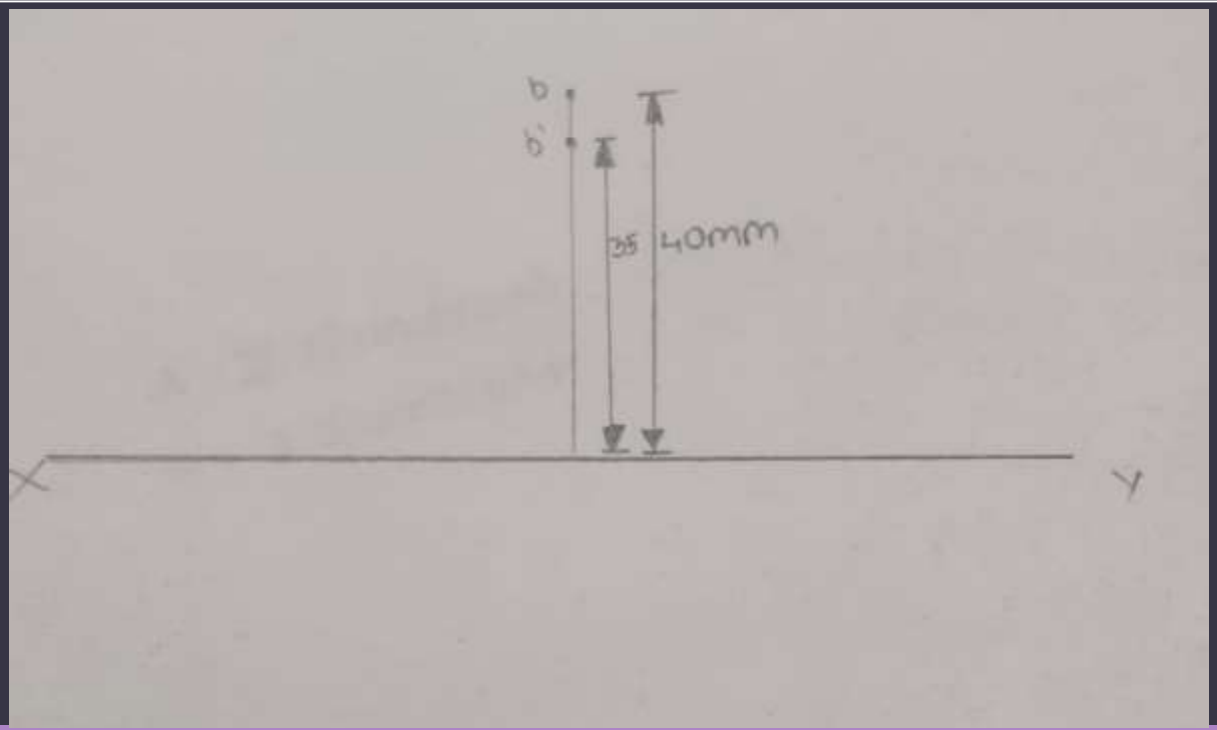
Activity carried under above Module



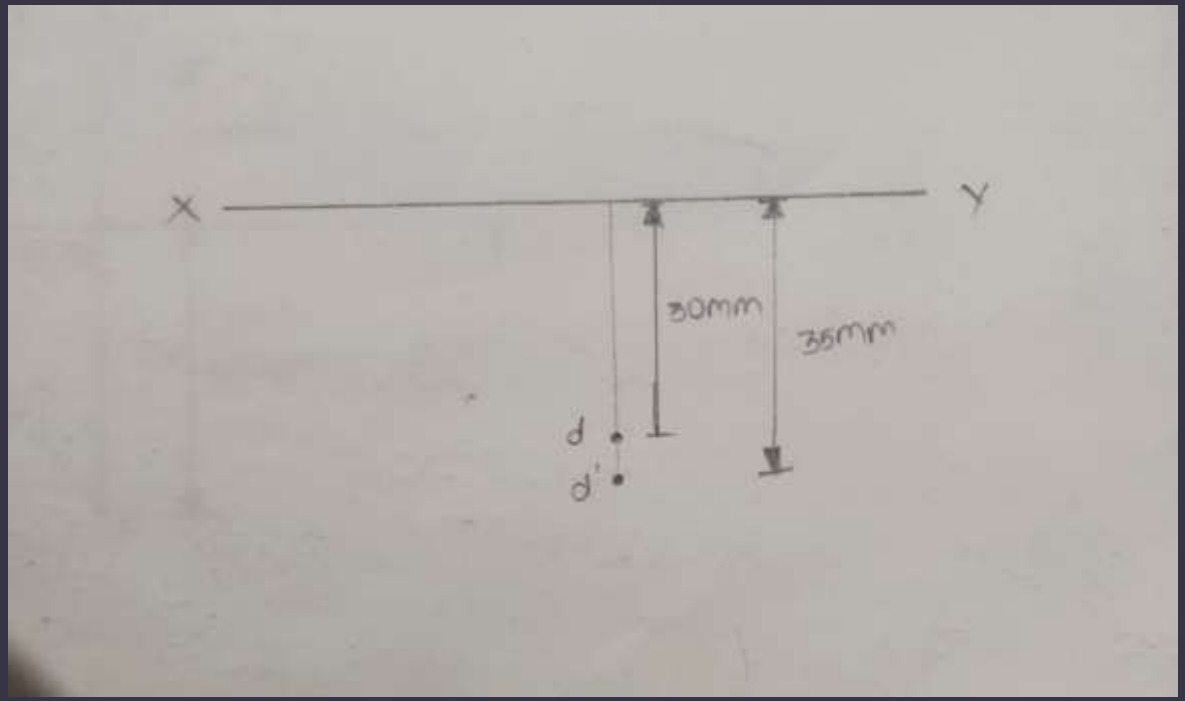
1st Quadrant's

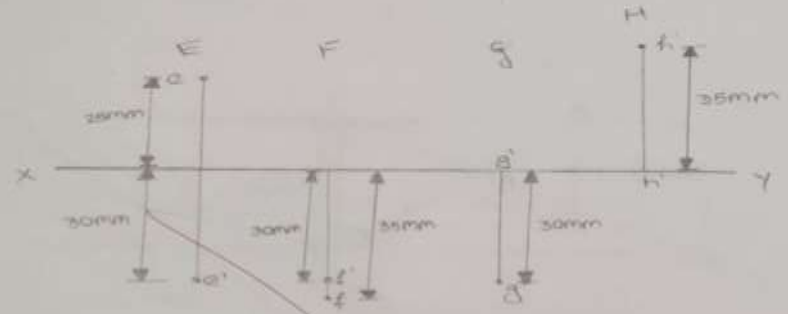


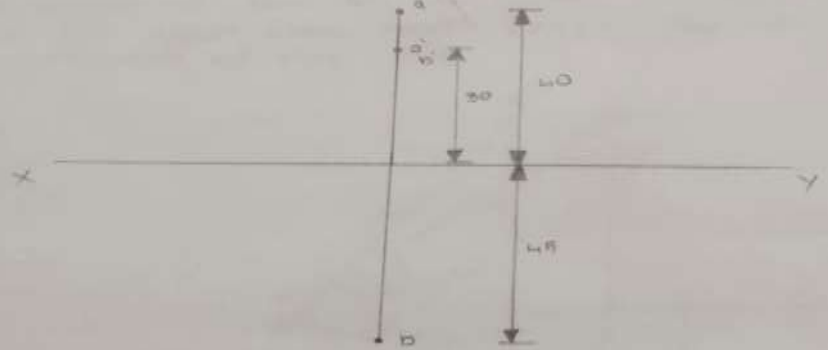
2nd Quadrant's



4th Quadrant's

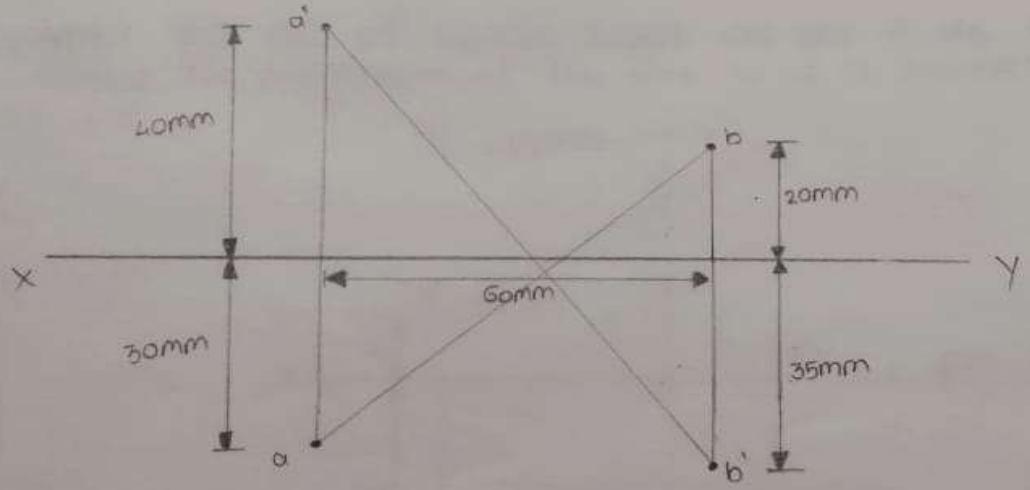






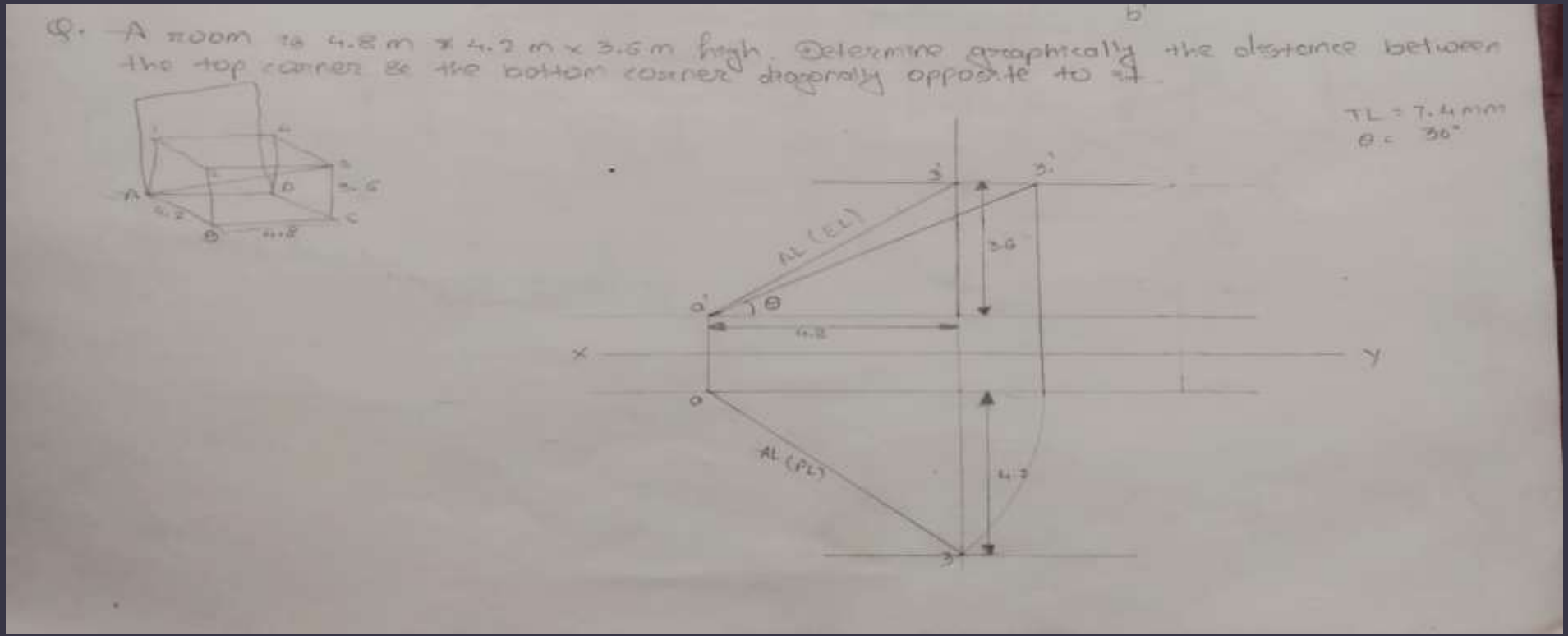
A - II Quadrant
B - I Quadrant

Q A pt A is 30 mm infront of V.P & 40 mm above H.P. Another pt B is 20 mm behind V.P & 35mm below H.P The horizontal distance bet^n the pts measured || to XY line is 60 mm. Draw the projections of the pts & join their front & Top views.



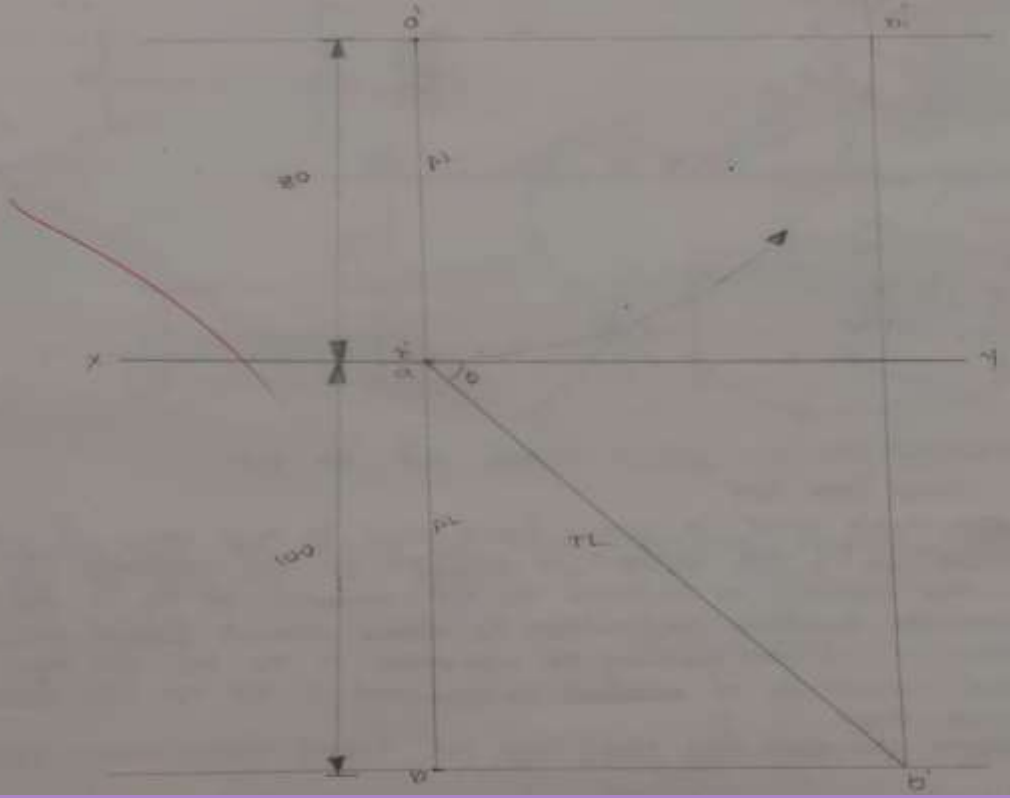
A - I Quadrant
B - III Quadrant

MODULE 2 Projection of Lines



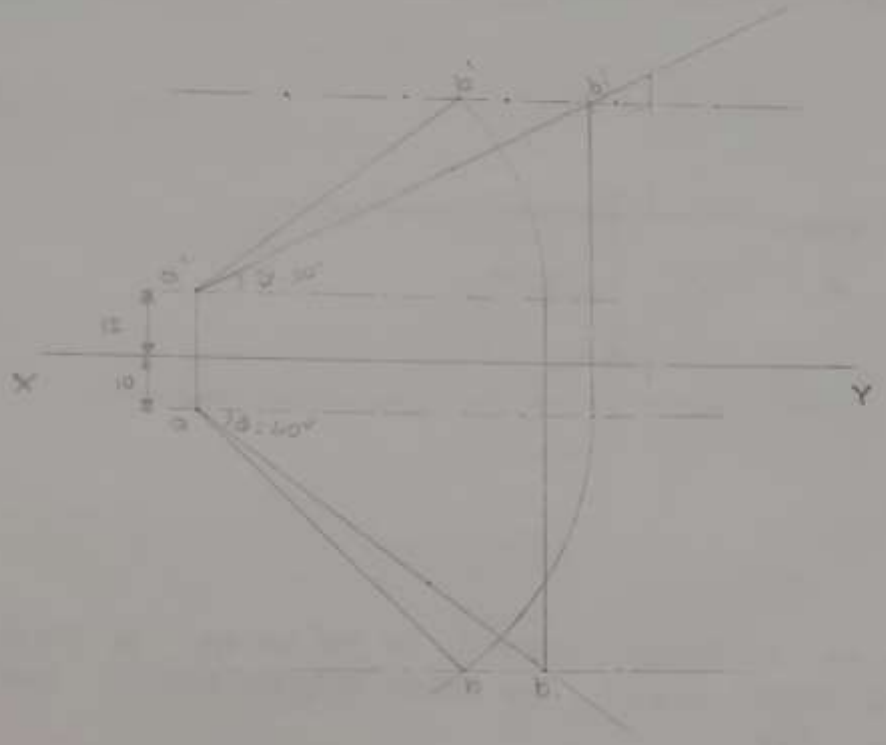
Application of projection of line

Q. top center corner of stick is 80cm above the floor & on the wall and the other corner is 100cm in front of the wall & on the floor find the true length of stick.

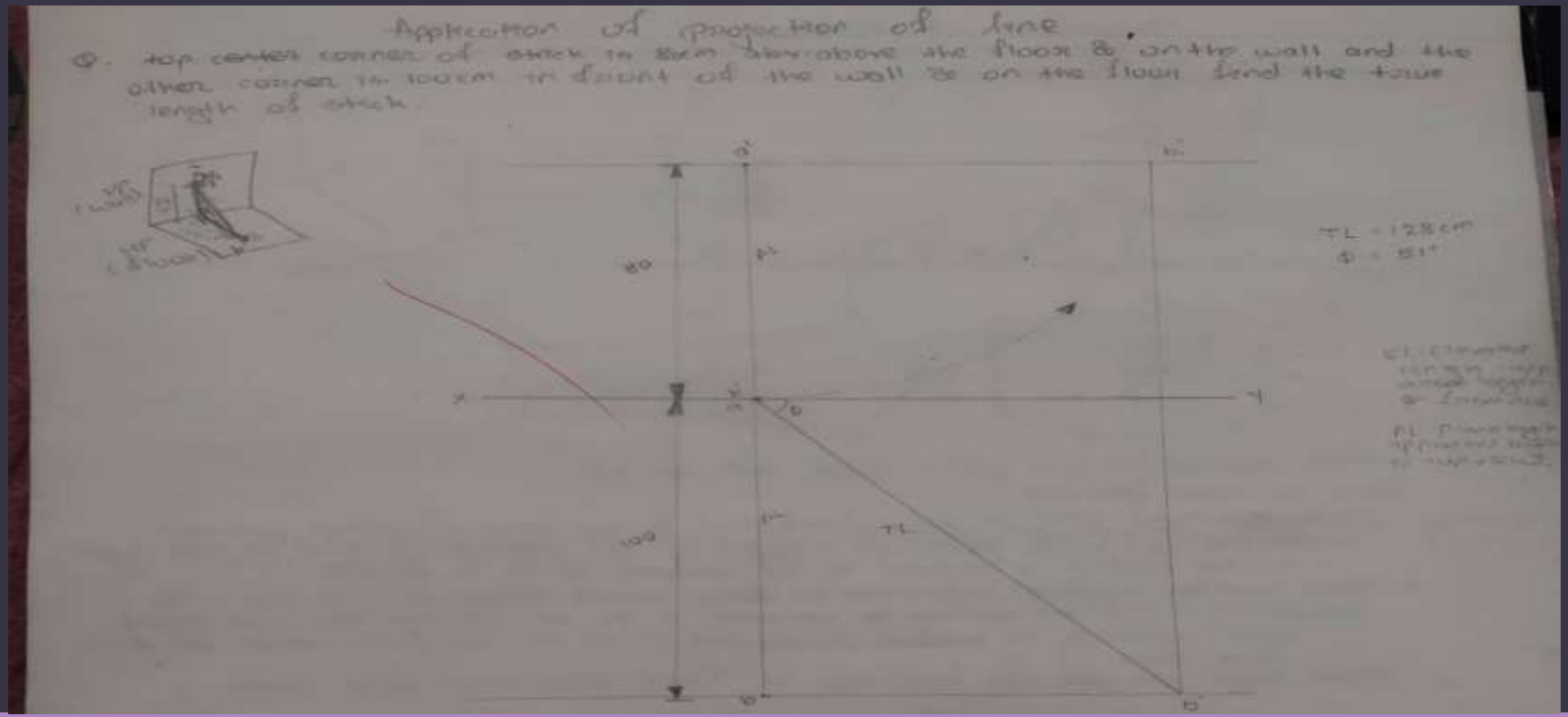


TL = 128cm
Φ = 51°

Q. Line AB is 75mm long & is at 30° & 40° incline to HP & VP. A is 12mm above HP & 10mm infront of VP. Draw the projections of the line.



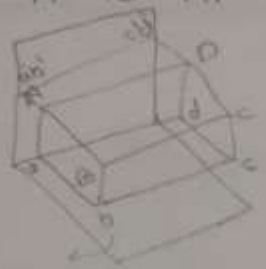
Activity carried under above Module

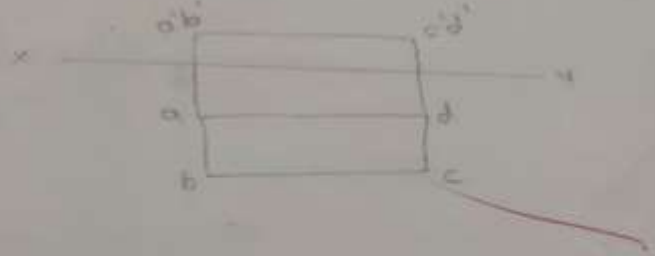


MODULE 3 Projection of planes

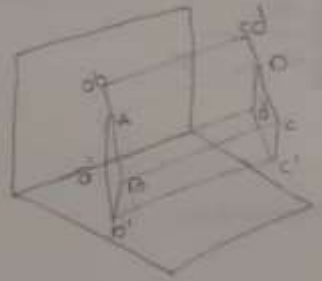
Projection of Planes

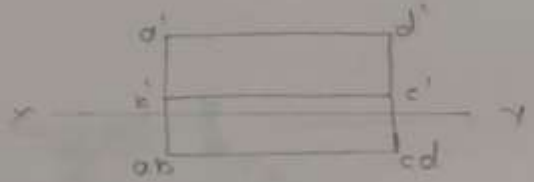
1) Surface || to HP





2) Surface || to VP





3) Surface inclined to one plane either HP or V.P

Steps to draw the sol^n

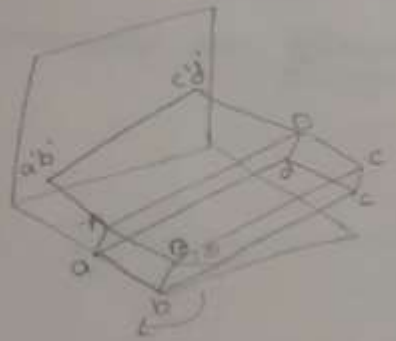
1. Assume suitable cond^n & draw front view & top view of initial position

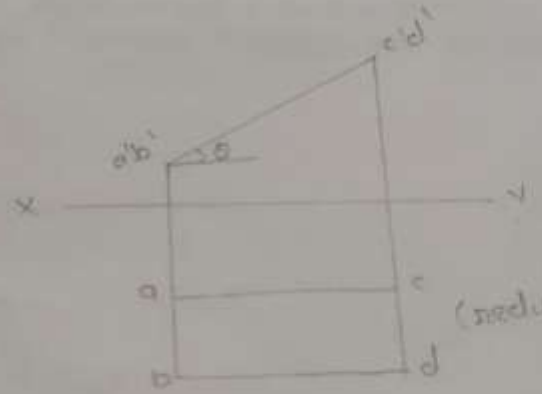
   Assumptions - If the surface is inclined to HP assume it is ∥ to HP or if the surface is inclined to VP assume it is ∥ to VP

2. Now consider surface inclination & draw second front view & top view

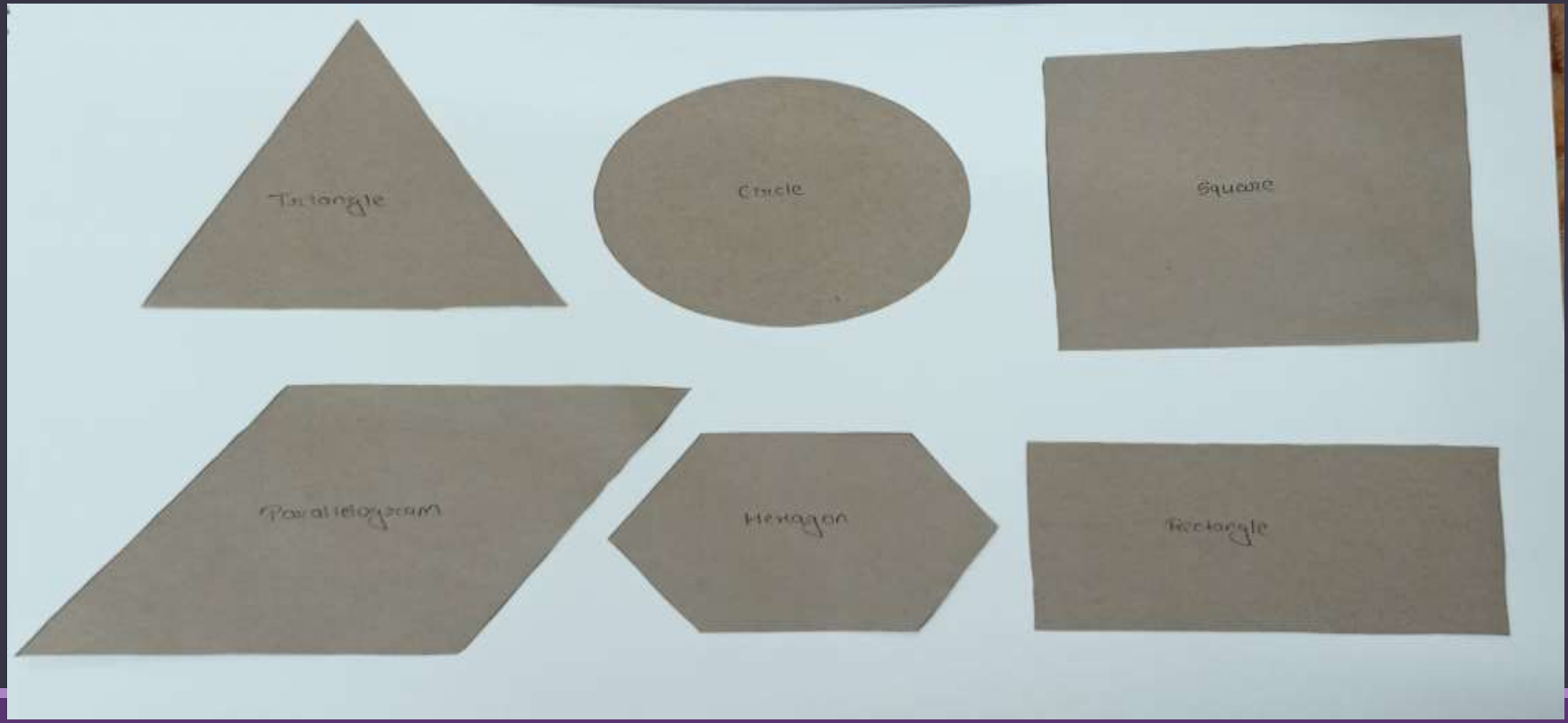
   Assumptions - If the surface is assumed ∥ to HP its top view will show true shape & if surface is assumed ∥ to VP its front view will show true shape

Hence, begin the drawing top view or front view as a true shape

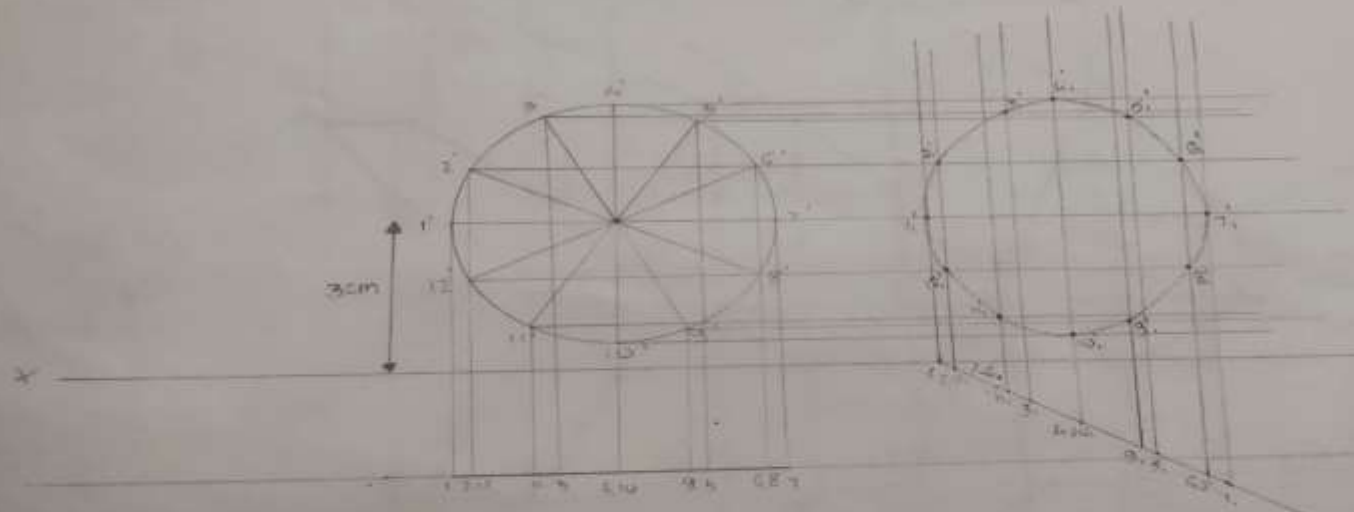




Activity carried under above Module

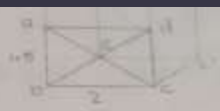


Q. Draw the projection of the circle of 5 cm diameter having its plane vertical & inclined at 30° to the V.P. Its centre is 3 cm above the H.P 2 cm infront of V.P



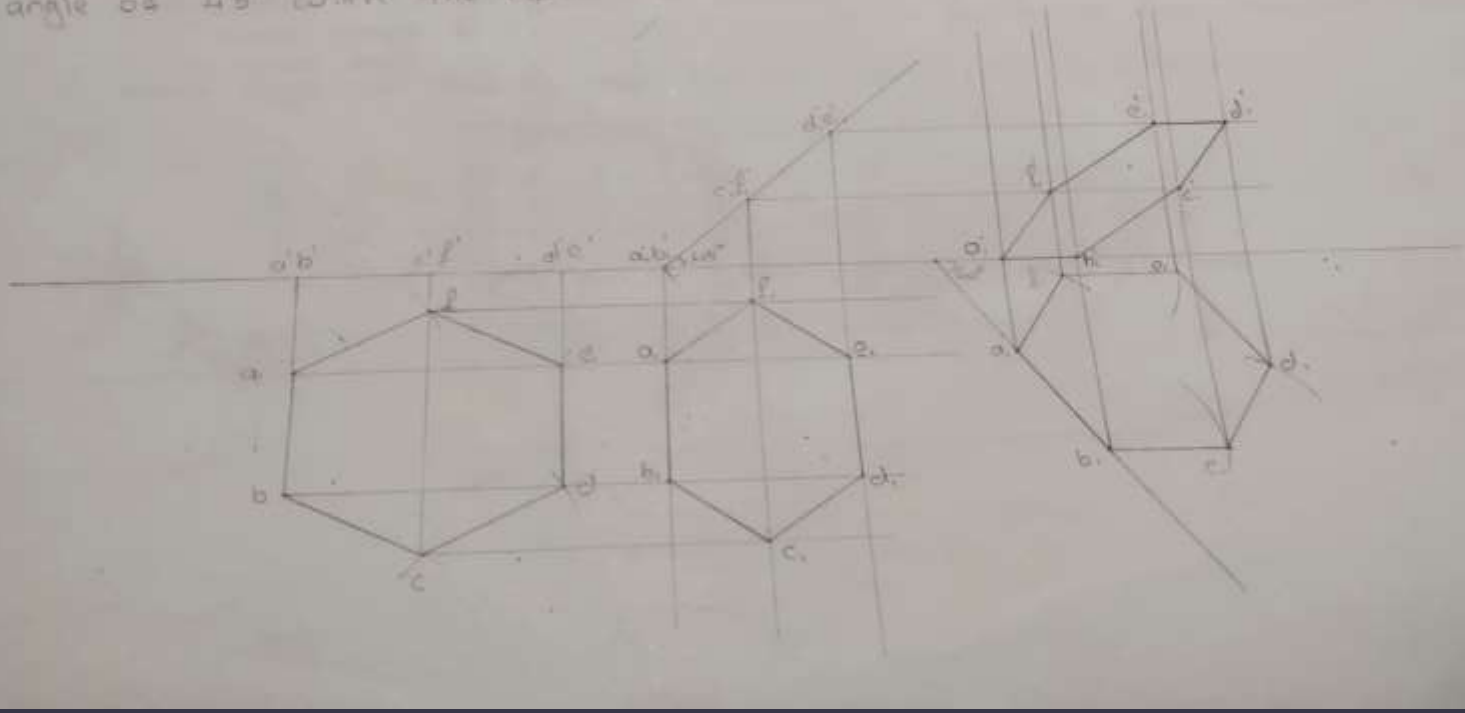
① A horizontal wooden platform 2m long & 1.5m wide is supported by four chains from its corners & chains are attached to hook 5m above the centre of the platform. Draw projection of the object & determine length of each chain along with its inclination with ground.

both HP & V.P

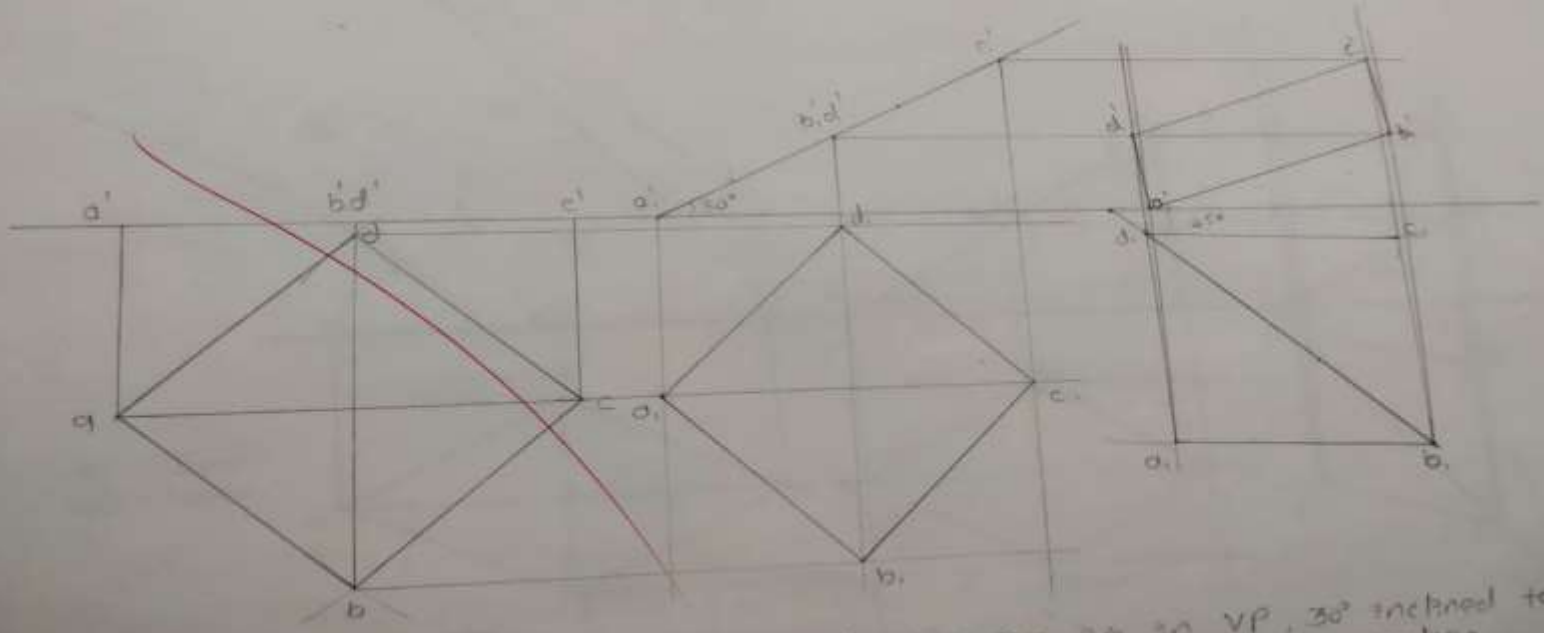


Plane inclined to both HP & VP

Q Draw the projection of regular hexagon of 25 mm side having one of its sides in the HP & inclined at 60° to the VP & its surface making an angle of 45° with the HP

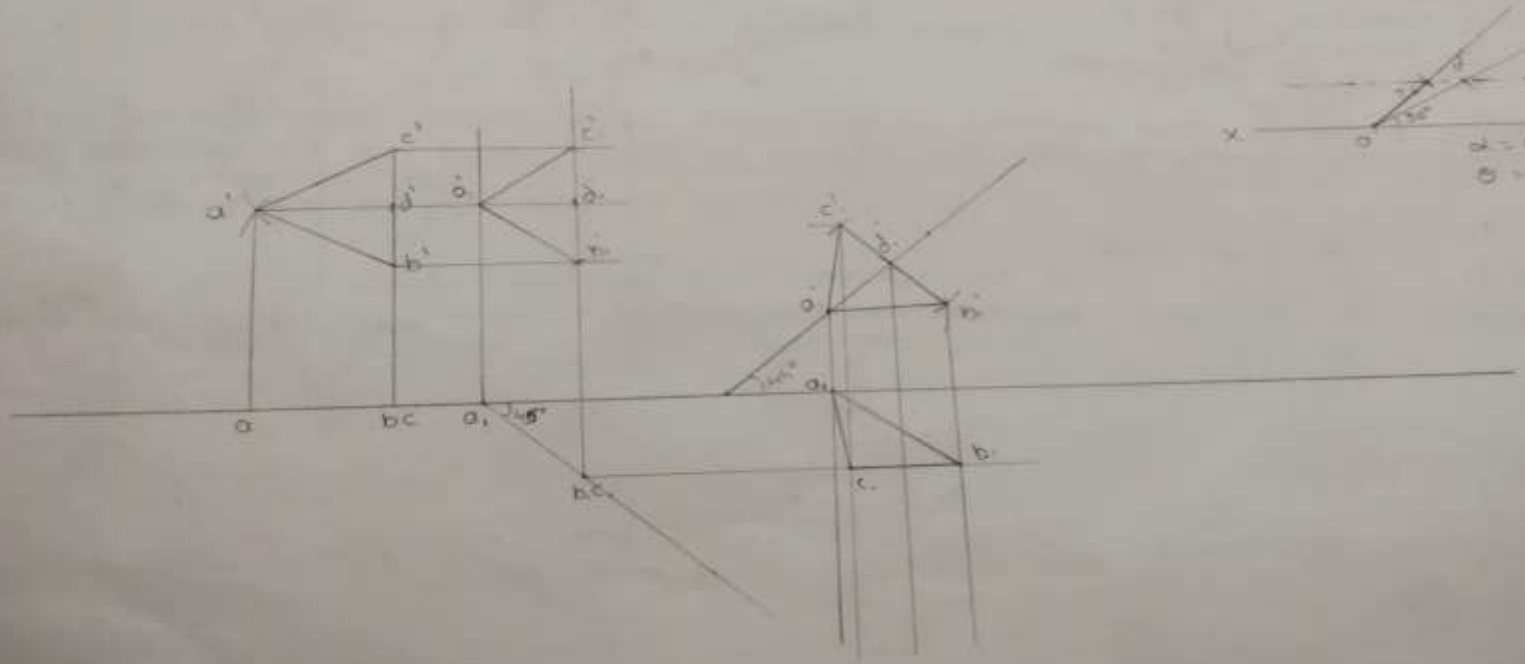


Q. A square ABCD of 50 mm side as its corner A in the HP, its diagonal AC is inclined at 30° to the HP & the diagonal BD inclined at 45° to the VP & ll to the HP. Draw its projections.

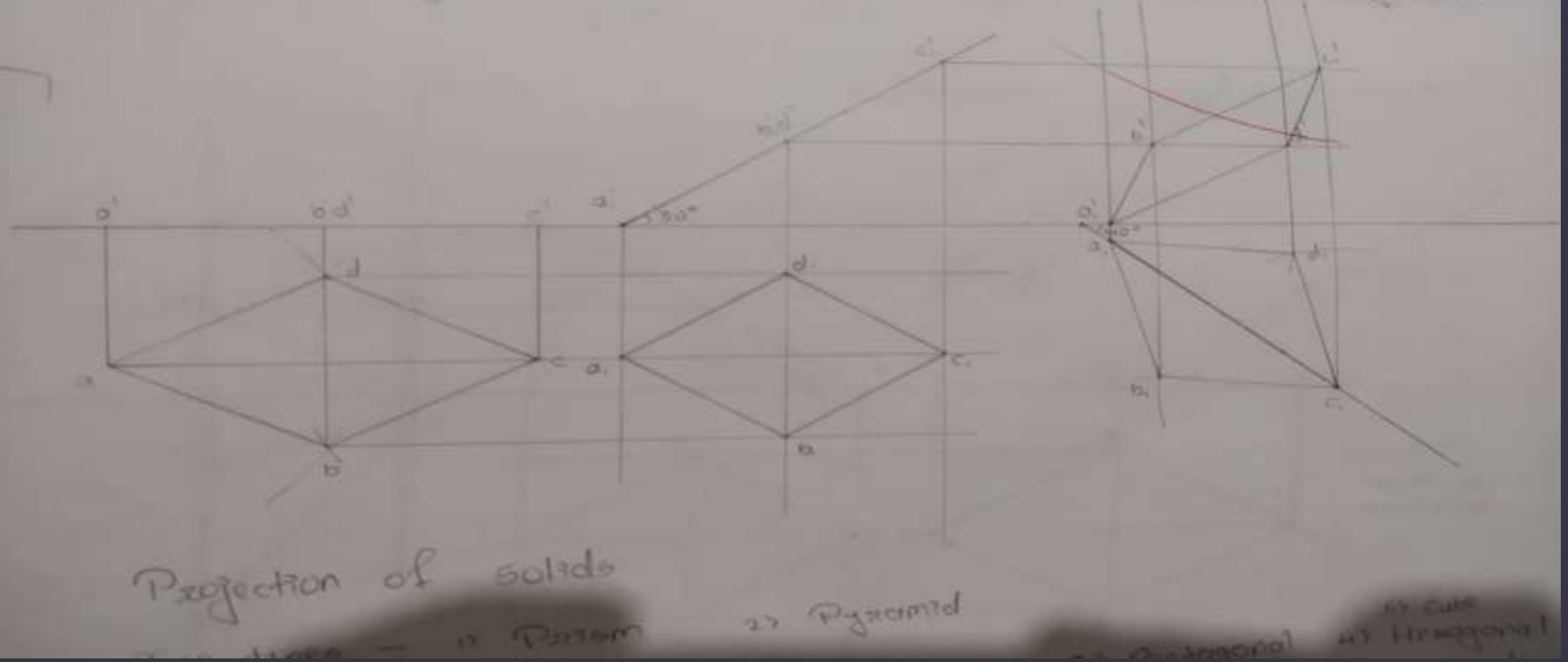


100 mm to its VP, 30° inclined to
projection.

Q. A triangular lamina (plane) of 25 mm size rest on one of its corners or vertices plane such that median passing through the corner on which it rests is inclined at 30° to HP & 45° to VP draw the projections



Q. A rhombus of diagonals 40mm & 70mm long resp. having one end of its longer diagonal in HP while that diagonal is 30° inclined to HP. If the top view of the same diagonal makes 60° inclination with VP draw its projection.



Projection of solids

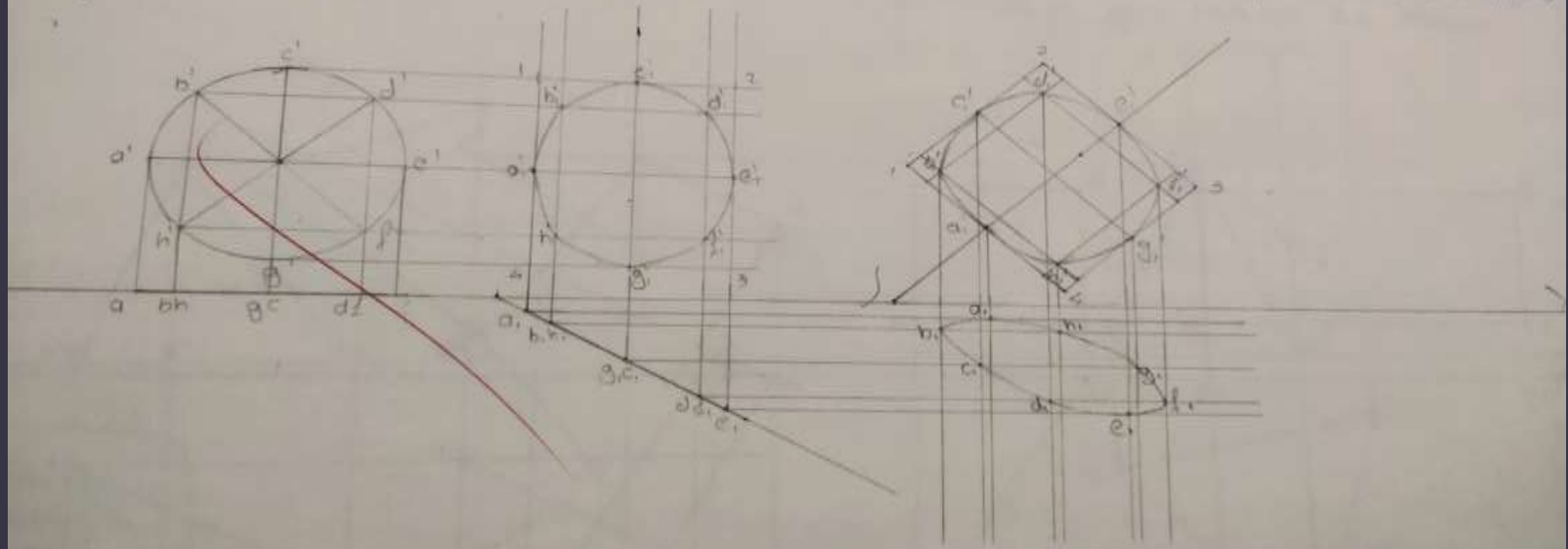
1) Prism

2) Pyramid

3) Cube

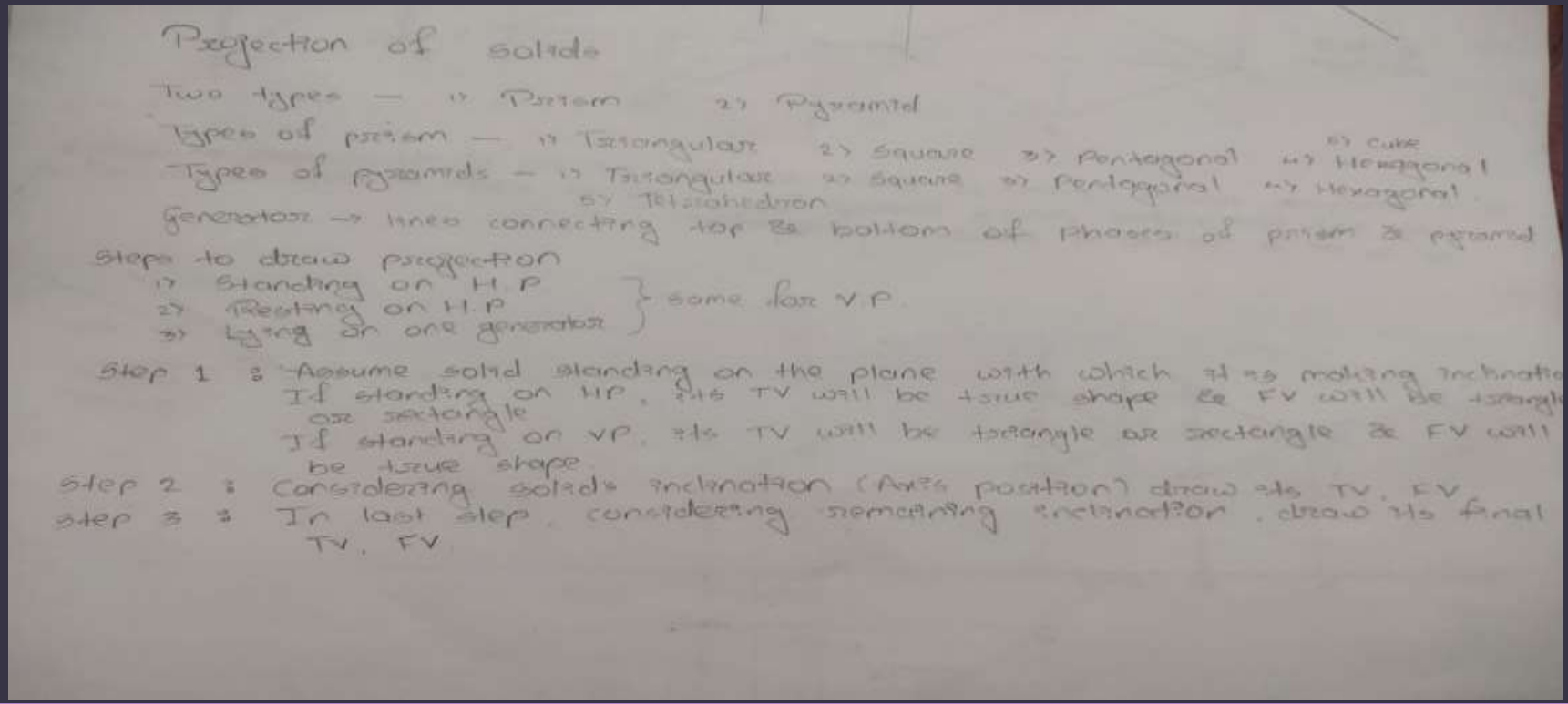
4) Hexagonal

Q. A circular lamina of 40 mm diameter rests on VP such that one of its diameter is inclined at 30° to VP & 45° to HP. Draw its top and front view in this position.



A square plate of 40 mm side rest on HP such that one of the

MODULE 4 Projection of Solids



Projection of solids

Two types — 1) Prism 2) Pyramid

Types of prism — 1) Triangular 2) Square 3) Pentagonal 4) Hexagonal 5) Cube

Types of pyramids — 1) Triangular 2) Square 3) Pentagonal 4) Hexagonal 5) Tetrahedron

Generator → lines connecting top & bottom of phases of prism & pyramid

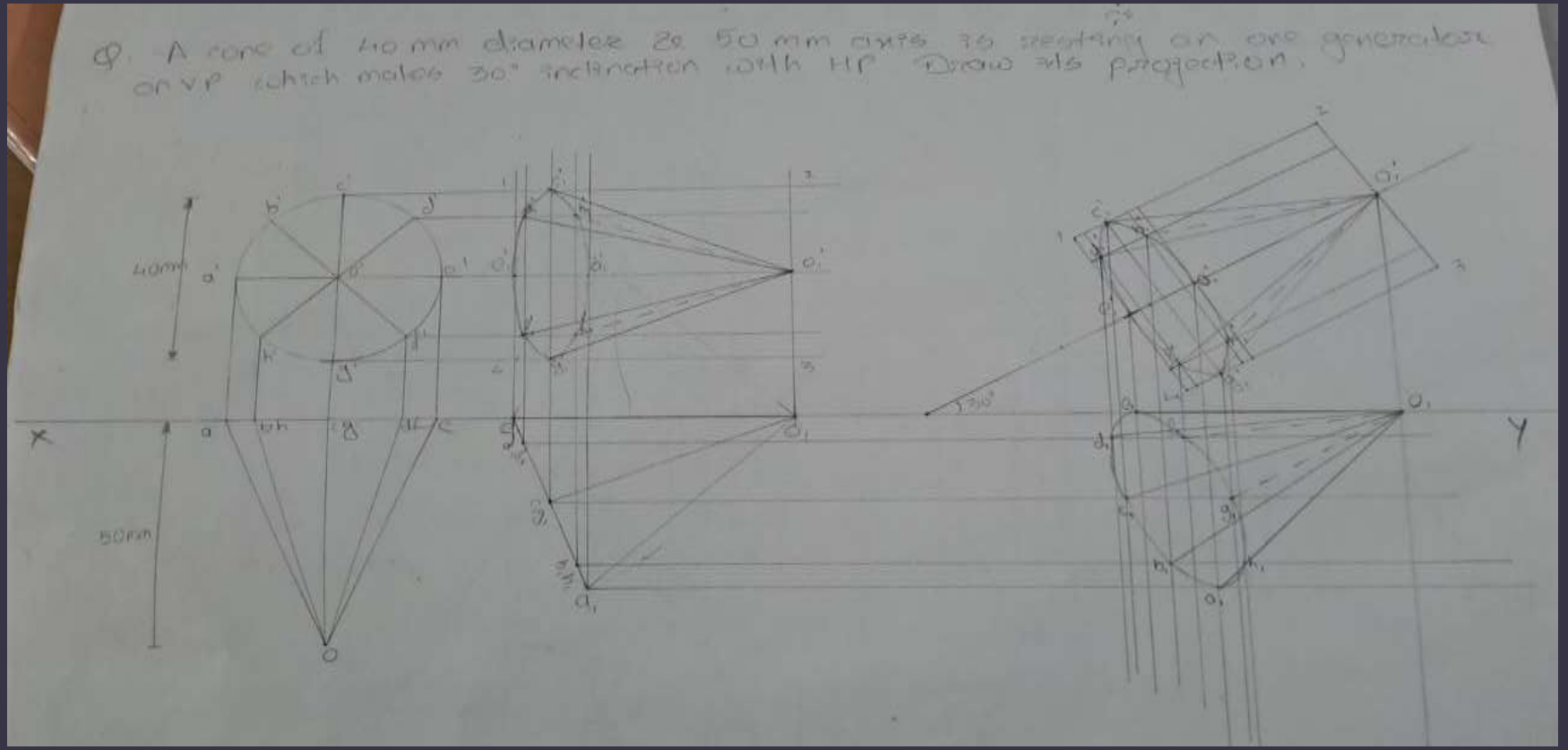
Steps to draw projection
1) Standing on H.P
2) Resting on H.P } same for V.P
3) Lying on one generator

Step 1 : Assume solid standing on the plane with which it is making inclination
If standing on HP, its TV will be true shape & FV will be triangle or rectangle
If standing on VP, its TV will be triangle or rectangle & FV will be true shape.

Step 2 : Considering solid's inclination (Axis position) draw its TV, FV

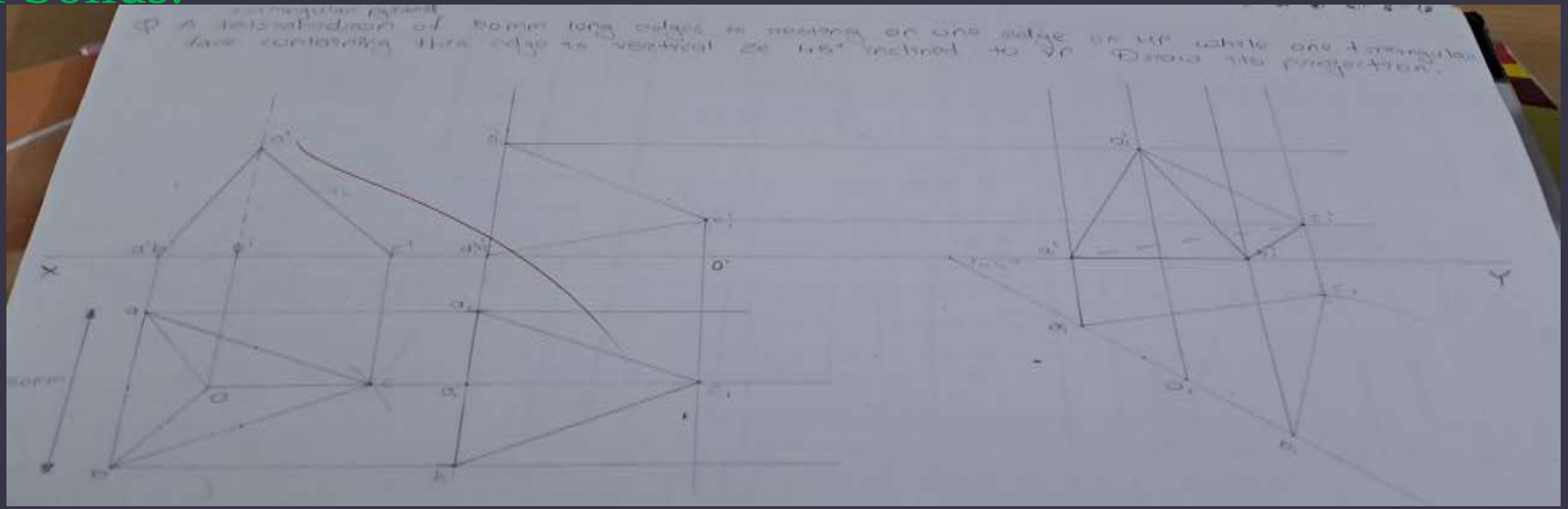
Step 3 : In last step, considering remaining inclination, draw its final TV, FV

Q. A cone of 40 mm diameter and 50 mm axis is standing on one generator on V.P which makes 30° inclination with H.P. Draw its projection.

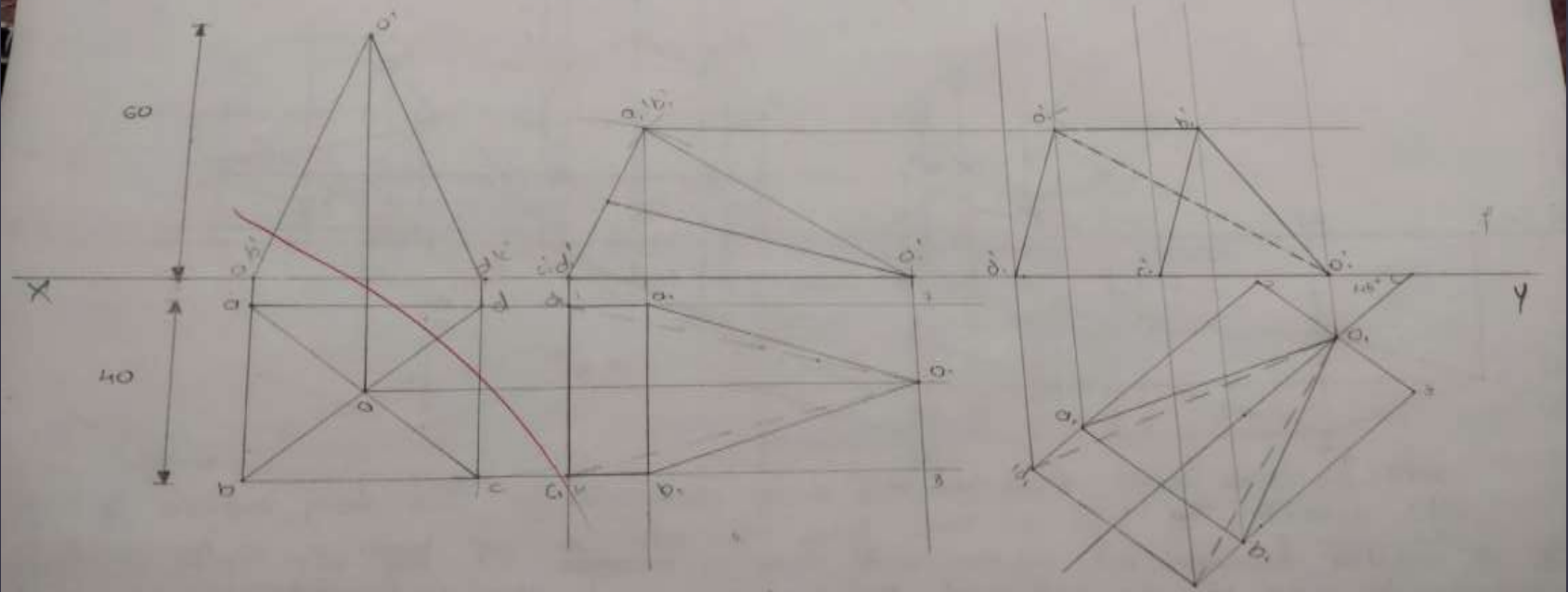


Activity carried under above Module

Name of Activity : Practising and solving problems on projections of Solids.

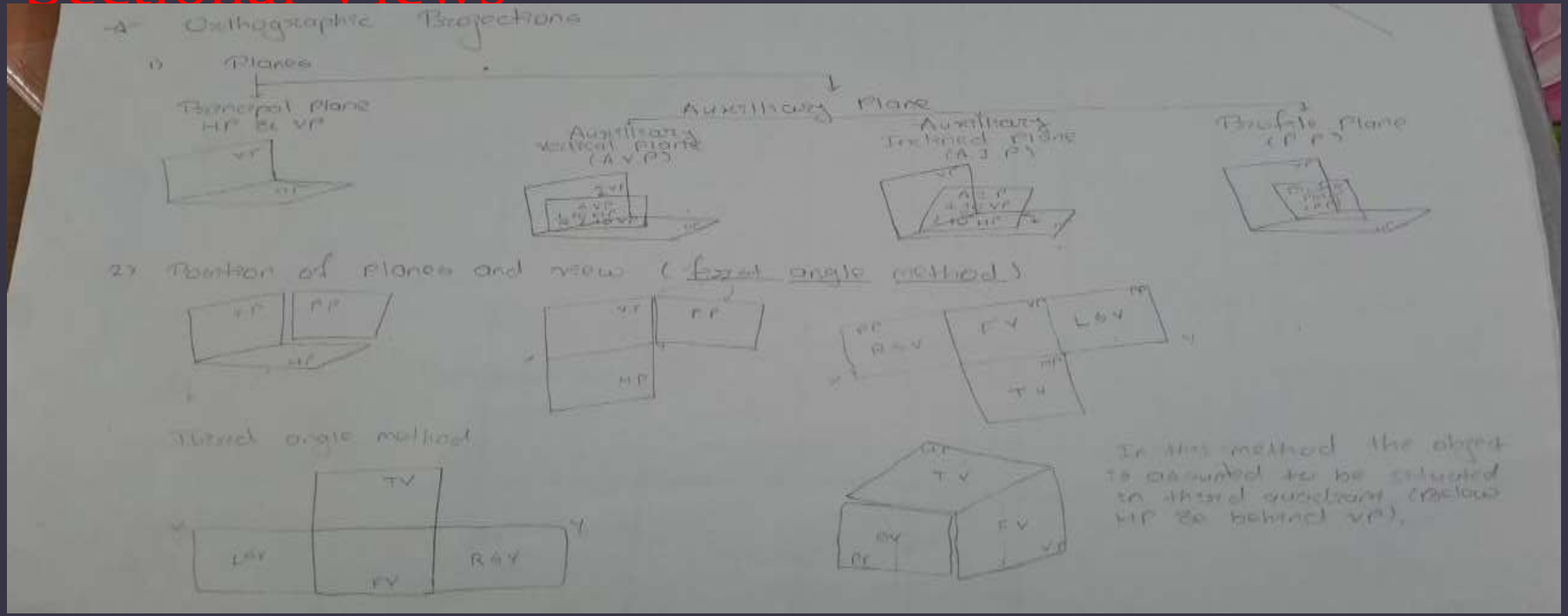


Q A square pyramid 40 mm base sides & axis 60mm long has a triangular face on the ground. & the vertical plane containing the axis makes an angle of 45° with the V.P. Draw the projections & take apex nearer to V.P

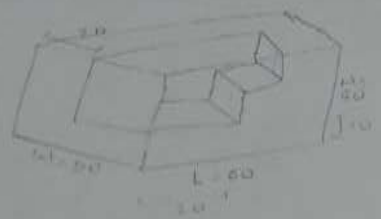


Q A cone of 40 mm diameter & 50 mm axis is resting on one generator

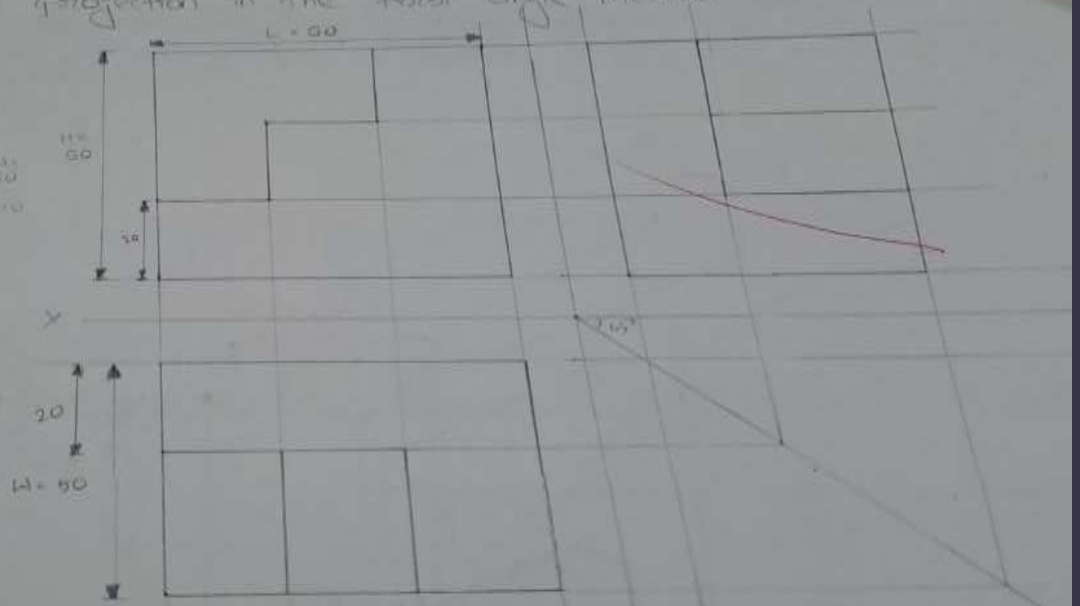
MODULE 5- Orthographic Projections and Sectional Views



Q Draw the orthographic projection in the fastest angle method.

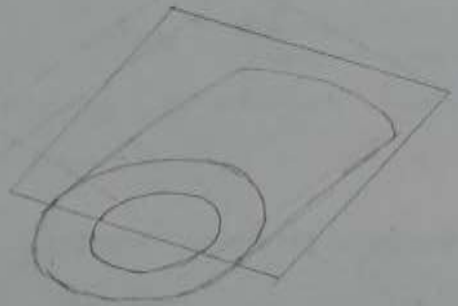


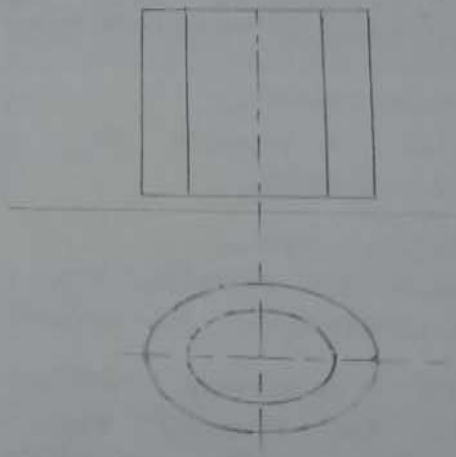
Take 45° inclination from centre to get perfect 90° projection



Sectional Orthographic Projections

1) To understand inner details of complex object
2) To understand the materials of object.





Types of cutting plane

1) Cutting plane ⊥ to principal vertical plane
2) Cutting plane ⊥ to principal horizontal plane
3) Cutting plane ⊥ to profile plane

Type of the sectional views

1) Full section view
   The view is made by passing the straight cutting plane completely through the part

2) Offset section view
   The view is made by passing the bended cutting plane completely through the part

3) Half section view
   The view is made by passing the cutting plane half way through an object to remove a quarter of it

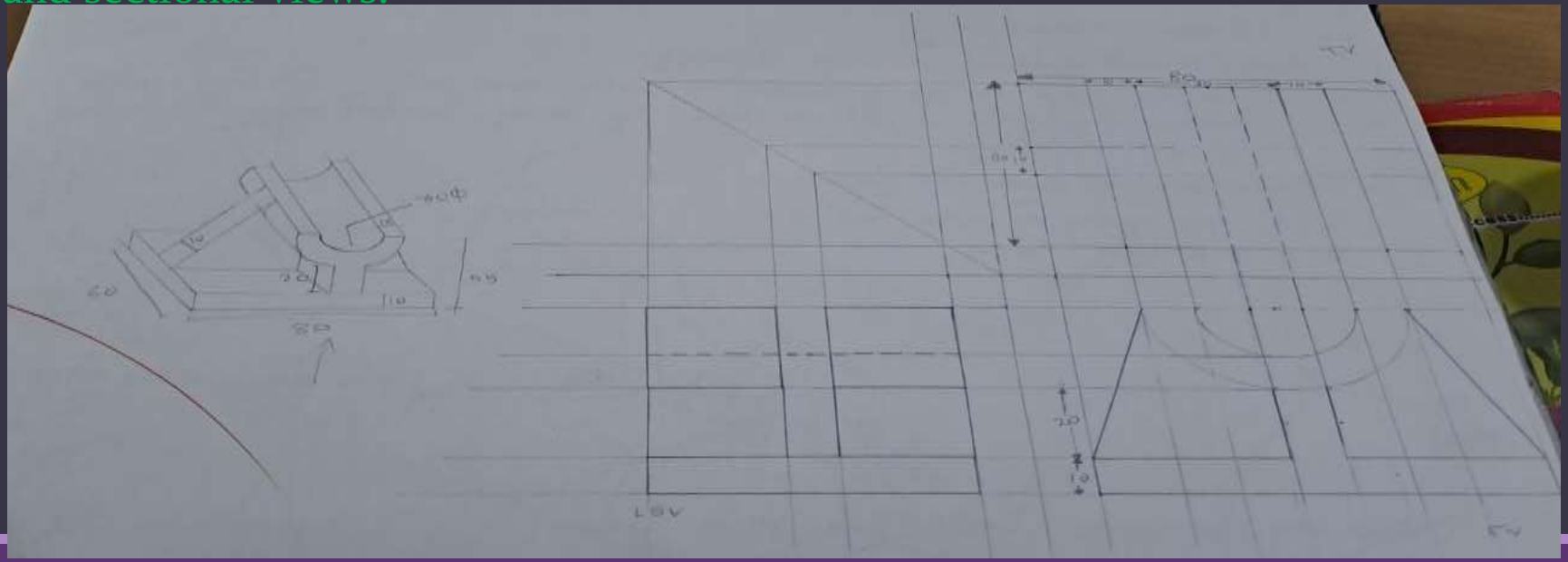
4) Broken-out section view.
   The view is made by passing the cutting plane normal to the viewing direction & removing the portion of an object in front of

5) Revolved section view.
   It is used to draw cross-sectional part

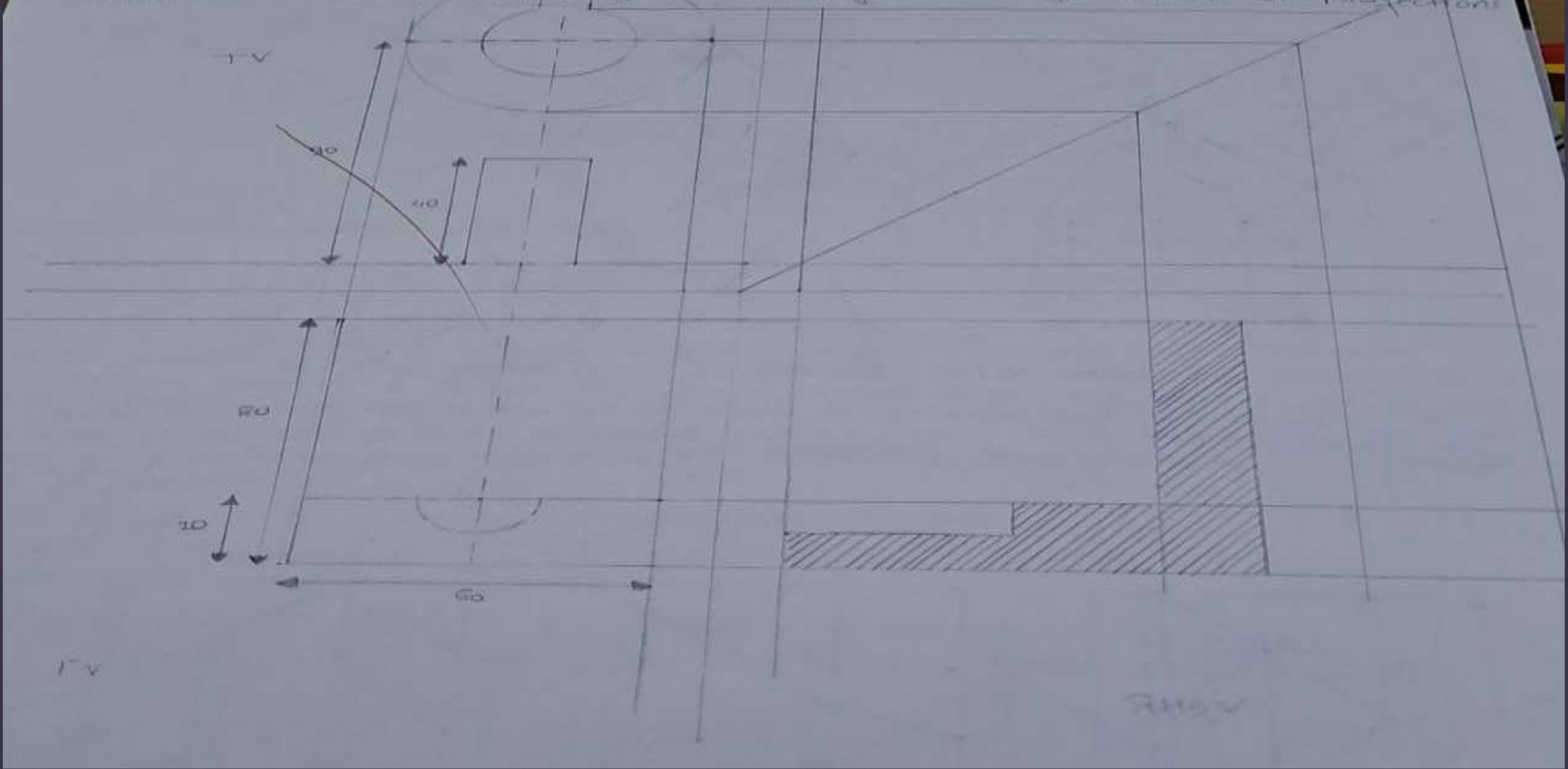
6) Removed section view

Activity carried under above Module

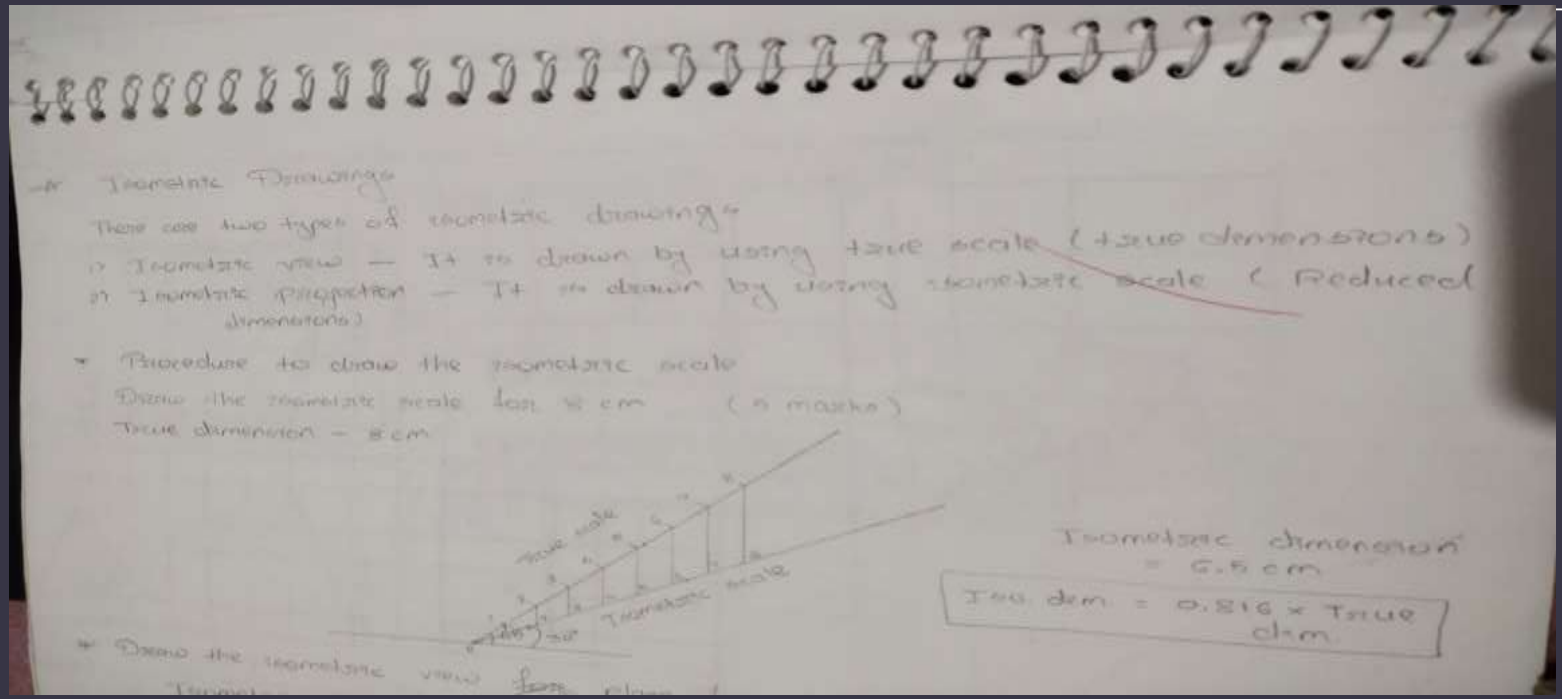
Name of Activity : Practising and solving problems on orthographic projections and sectional views.



Q Draw the sectional view. Figure shows the pictorial view of a machine component. Draw the following views using 3rd angle method of projections



MODULE 6 Isometric Proection



A Isometric Drawings

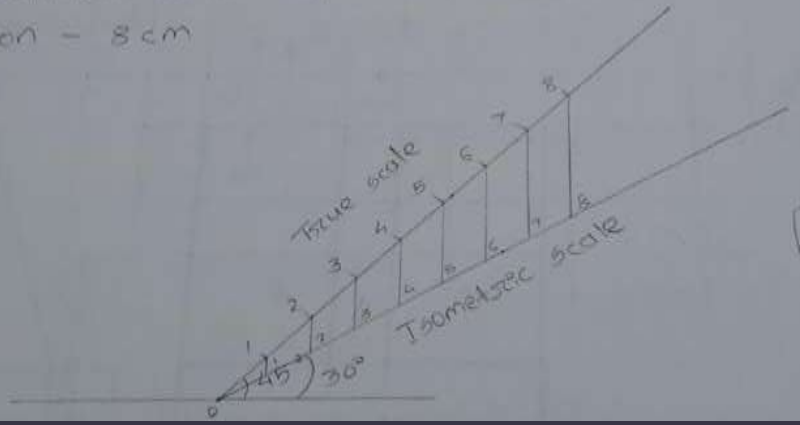
There are two types of isometric drawings.

1) Isometric view — It is drawn by using true scale (true dimensions)
2) Isometric projection — It is drawn by using isometric scale (Reduced dimensions)

* Procedure to draw the isometric scale

Draw the isometric scale for 8 cm (5 marks)

True dimension = 8 cm

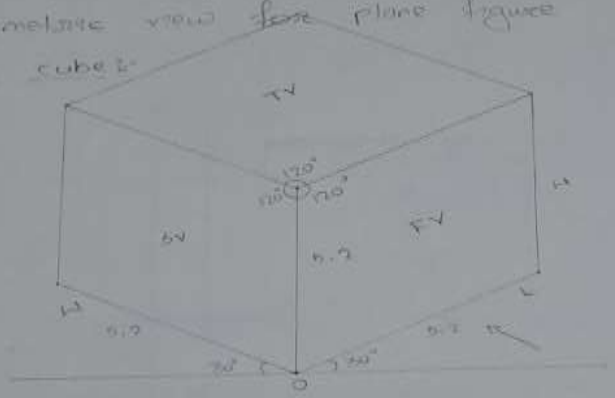


Isometric dimension = 6.5 cm

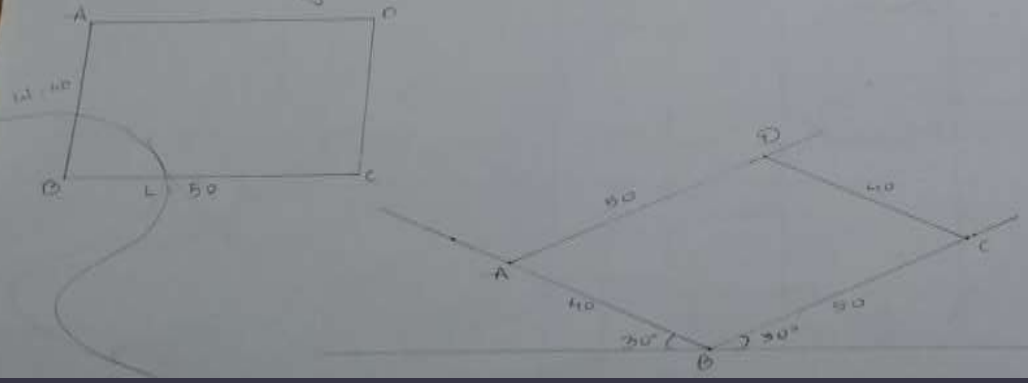
Iso. dim. = 0.816 × True dim.

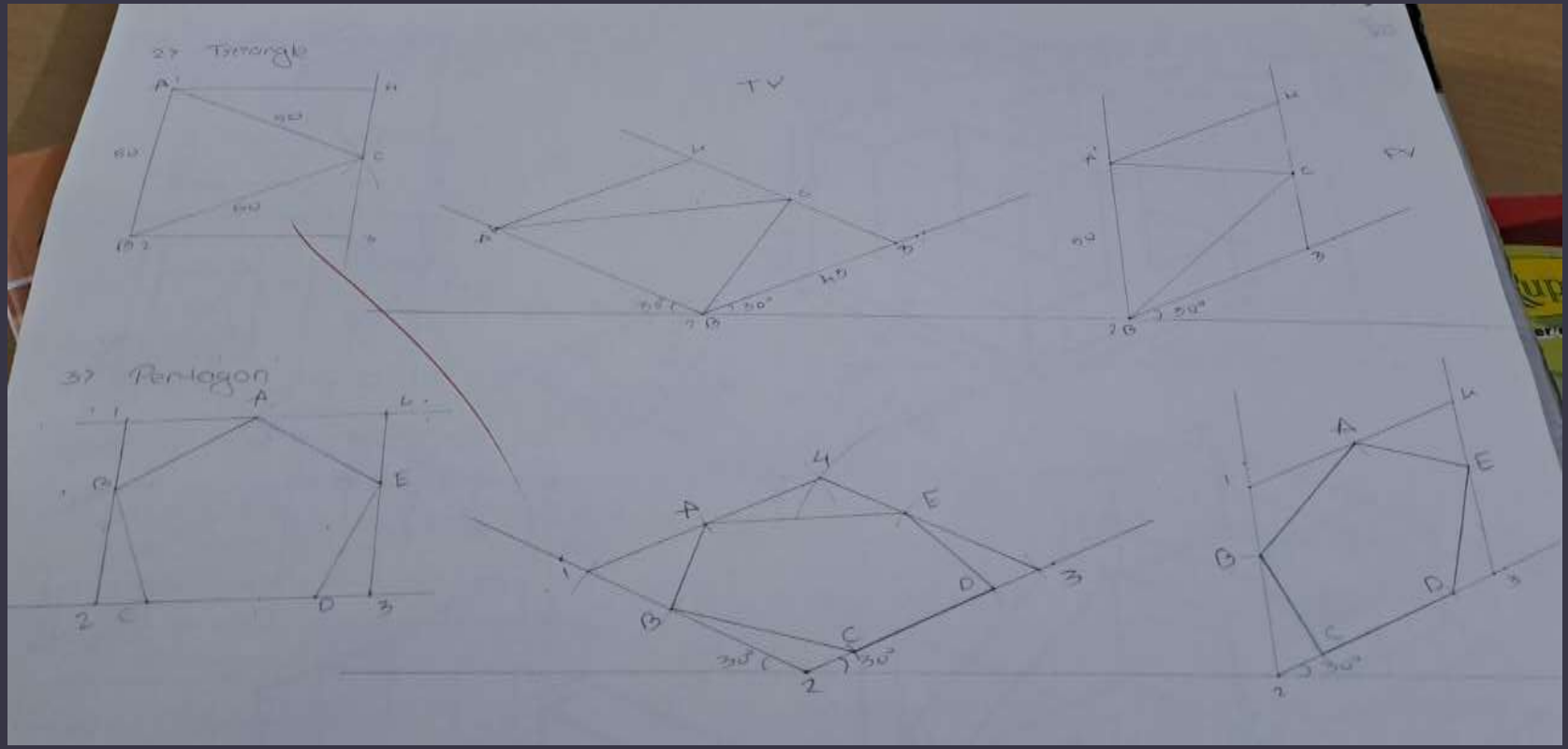
* Draw the isometric view of plane figure

Isometric cube :-



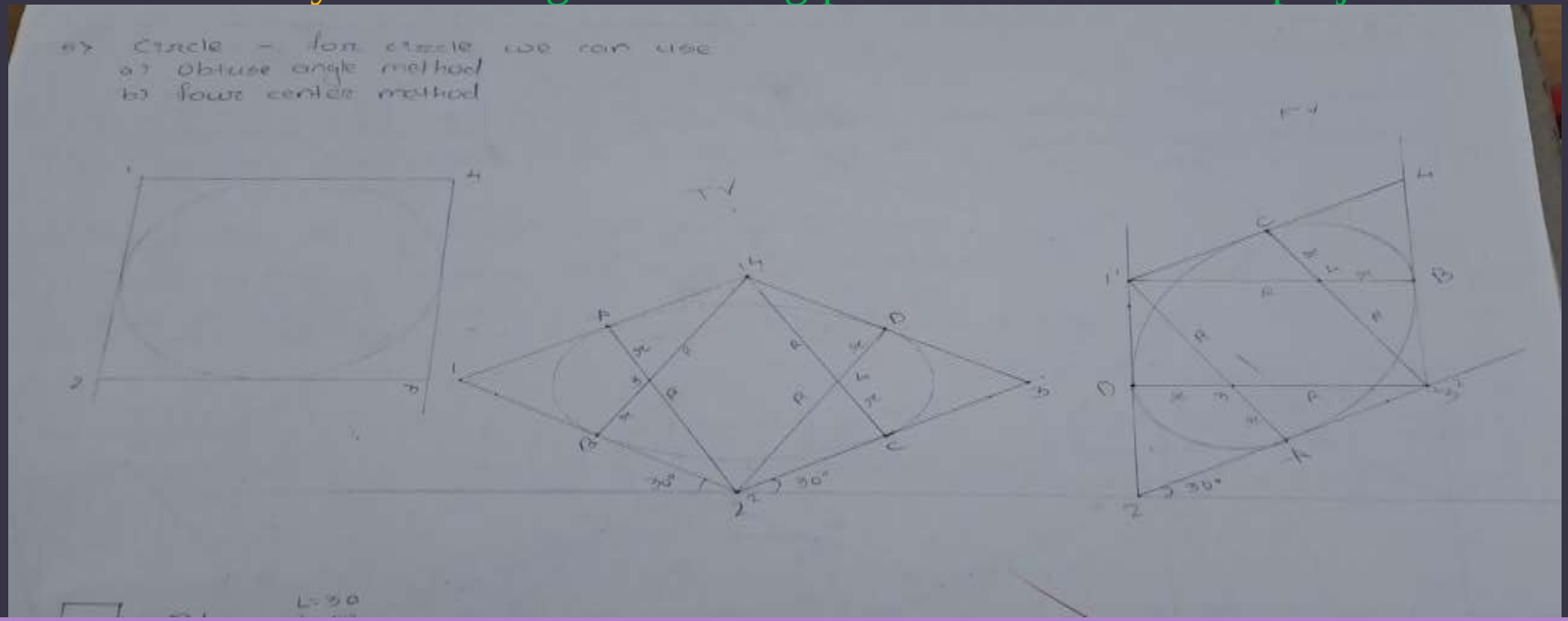
1) Rectangle : L = 50 ; W = 40

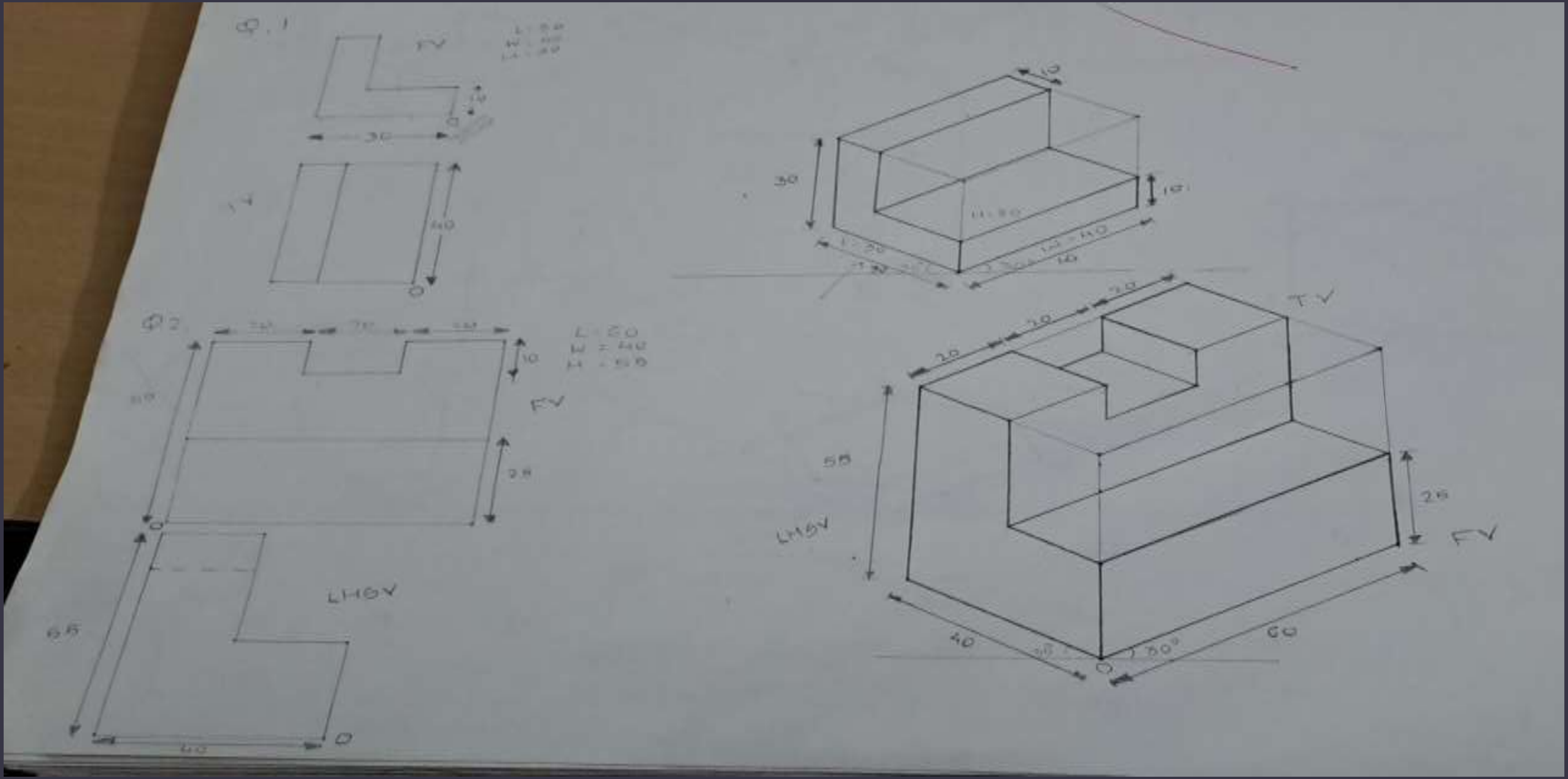


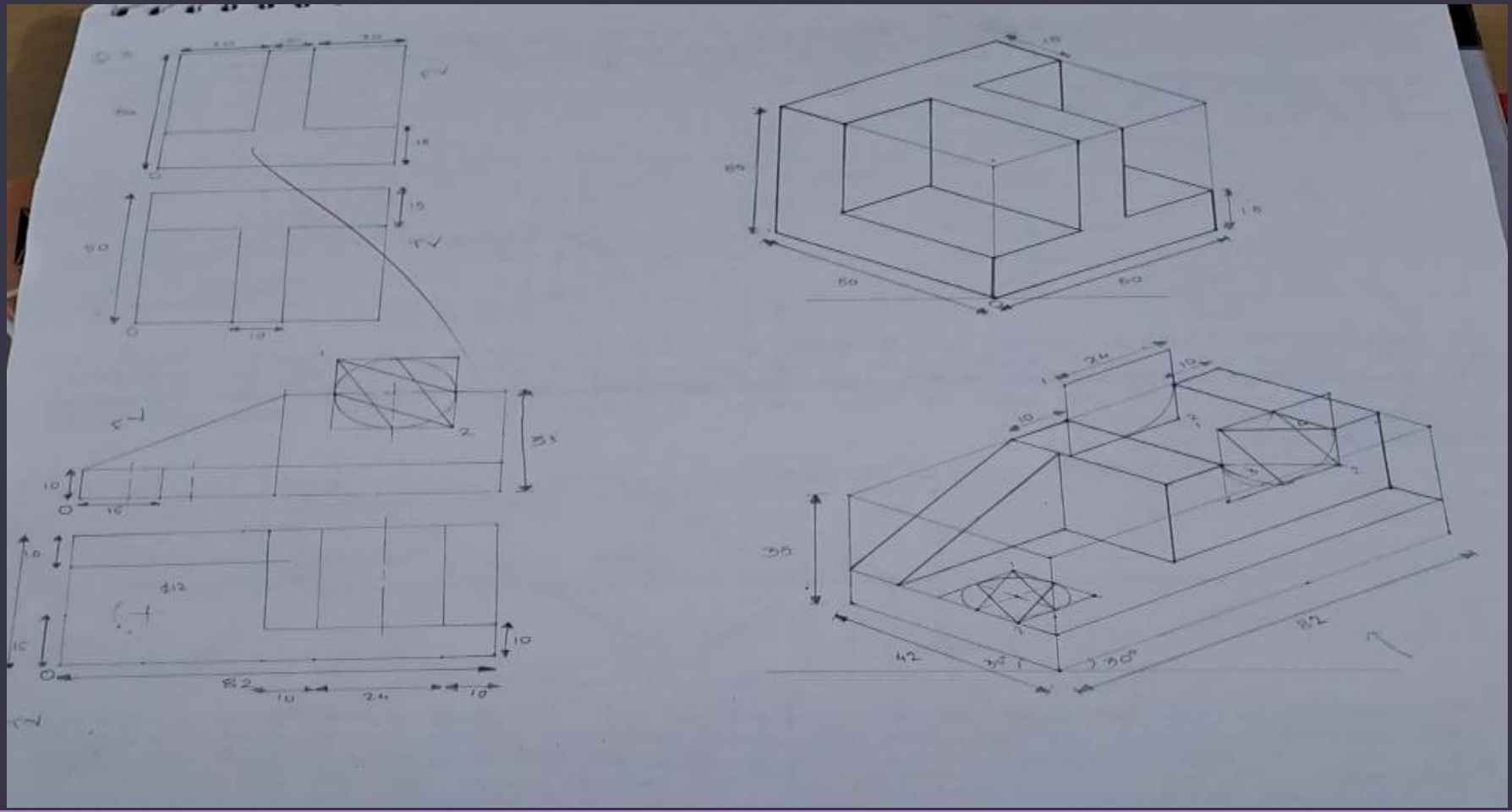

3? Triangle
TV
3? Pentagon

Activity carried under above Module

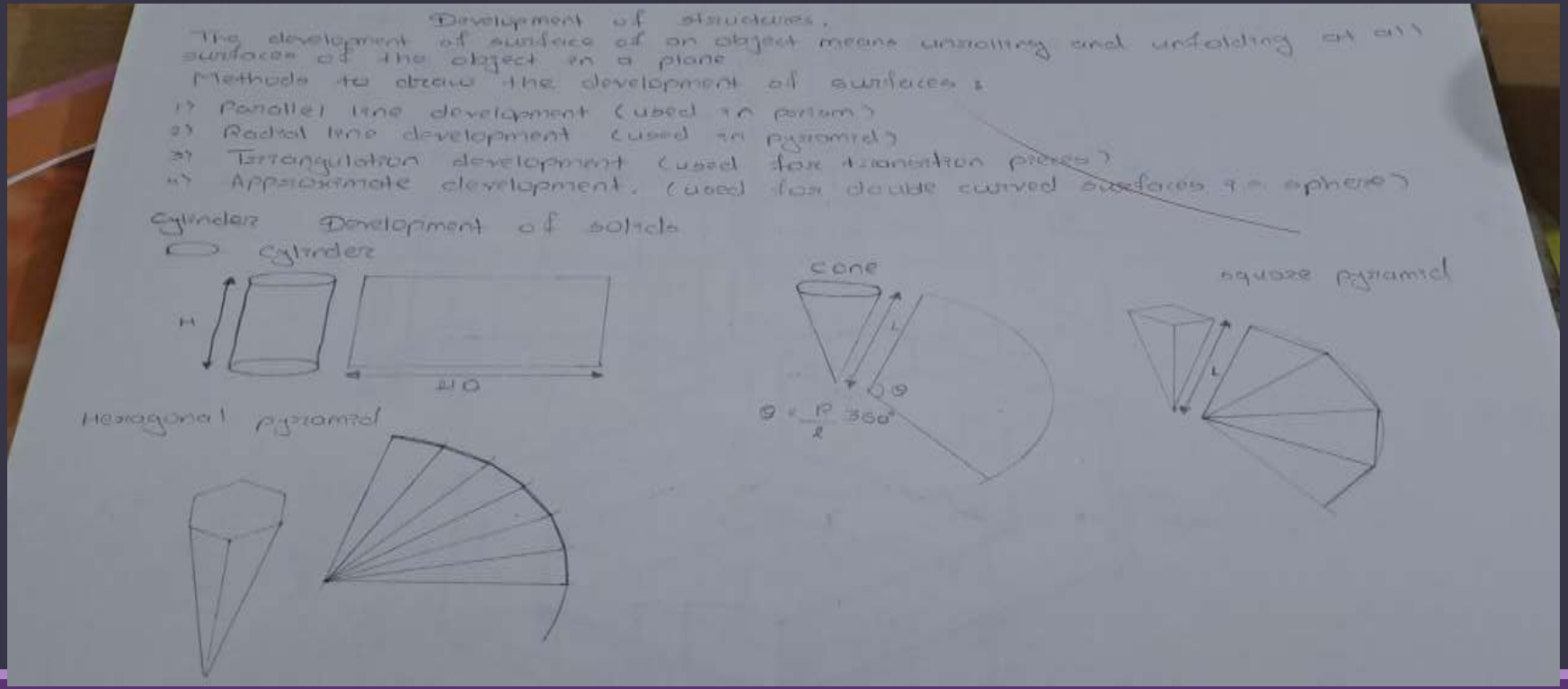
Name of Activity : Practising and solving problems on isometric projections.



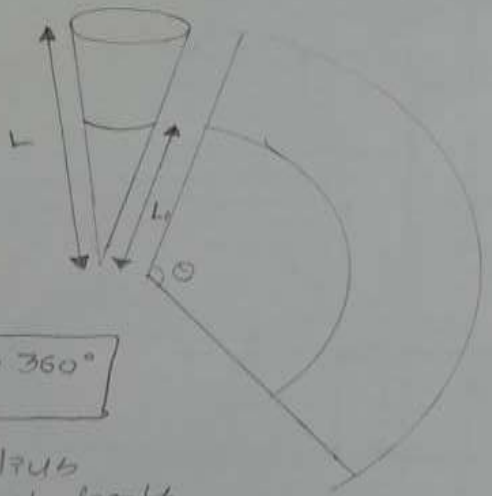

Q.1
FV
TV
30
40
Q2
FV
LHSV
10
25
55
60
40
30°
TV
FV
LHSV



MODULE 7- Section of Solids and Development of Surfaces

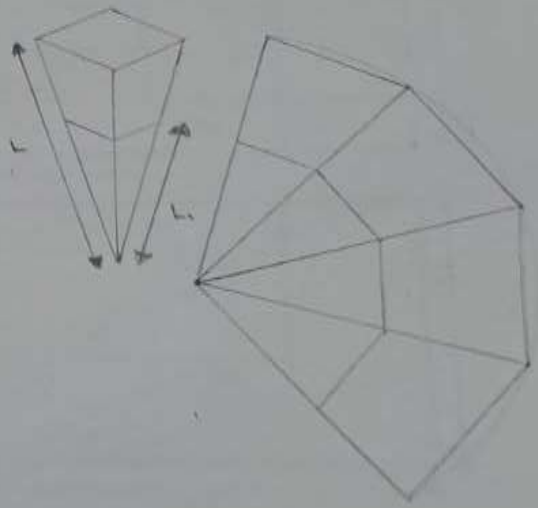


Frustrum (section)

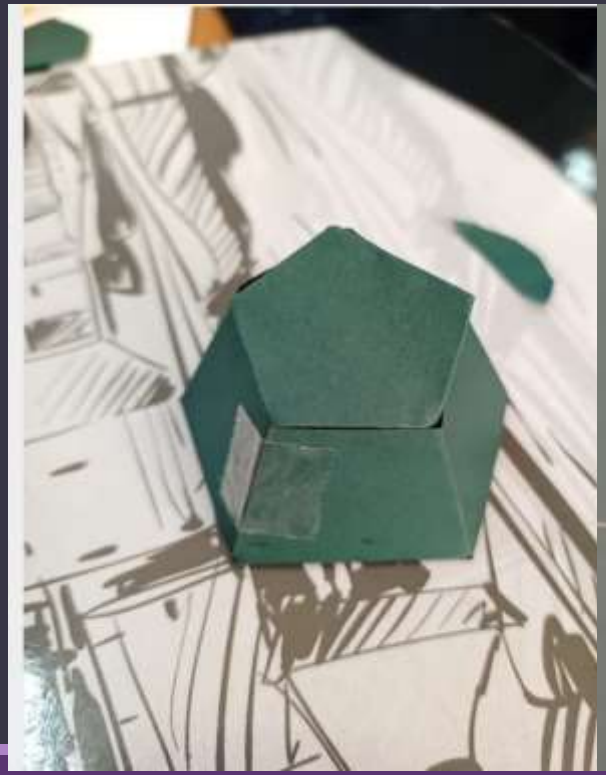


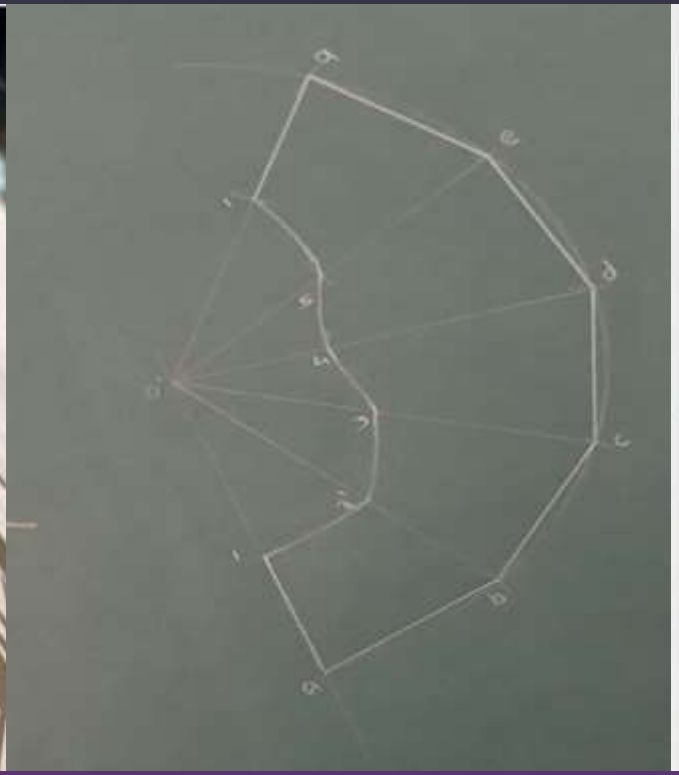
$$\theta = \frac{R}{L} \times 360°$$

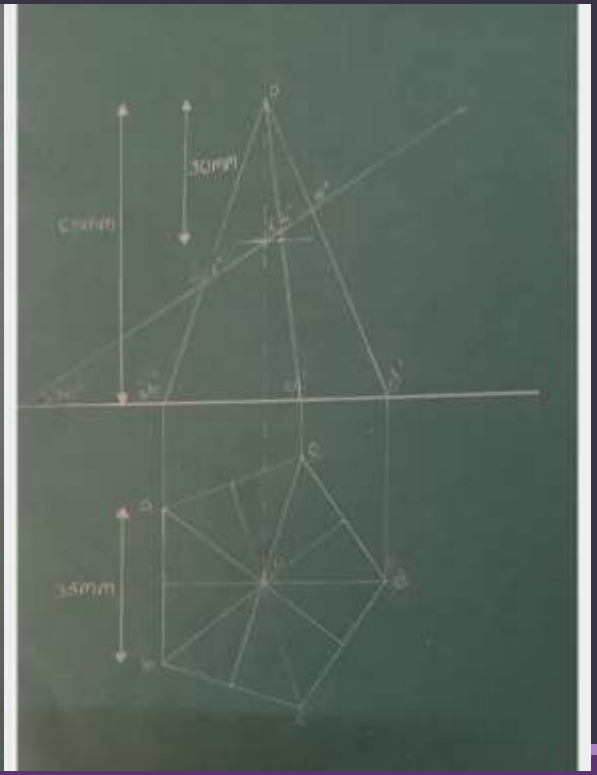
R - Radius
L - Slant length
L_1 - ~~Length~~ Slant length of cut part



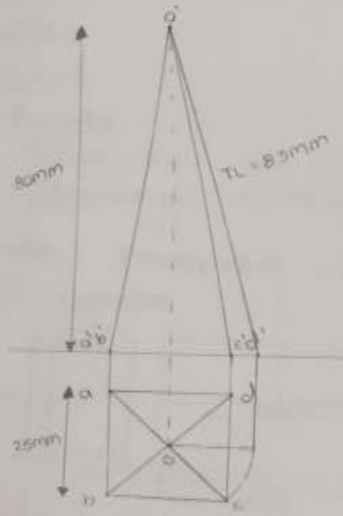
Activity carried under above Module

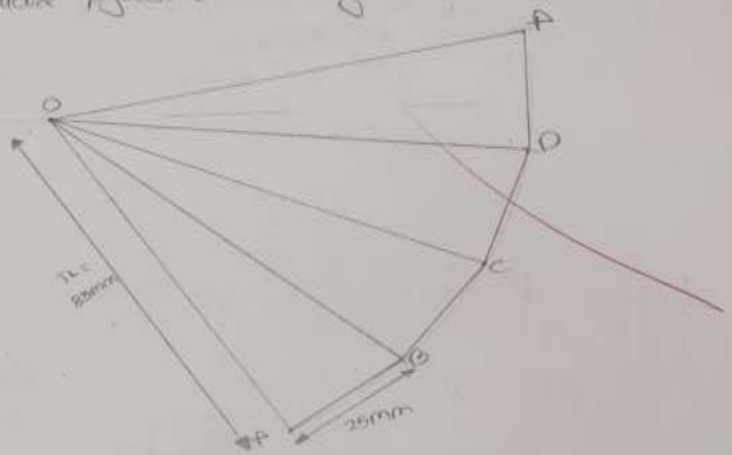




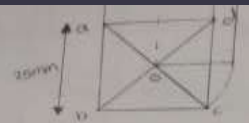


Q Draw the development of square Pyramid having side 25mm and axis 80mm which is standing on HP.

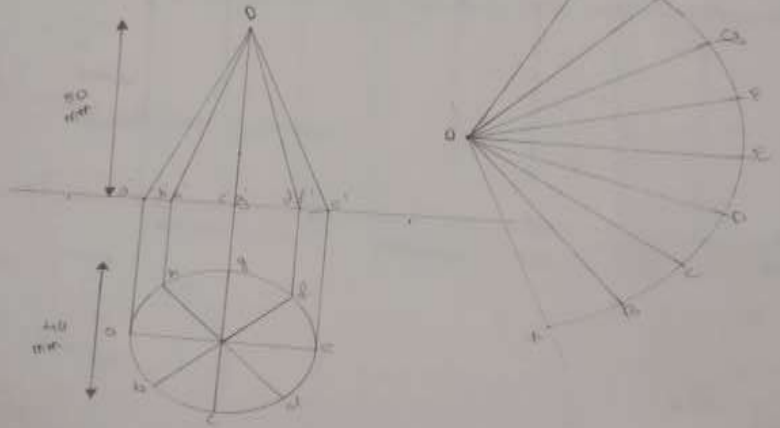




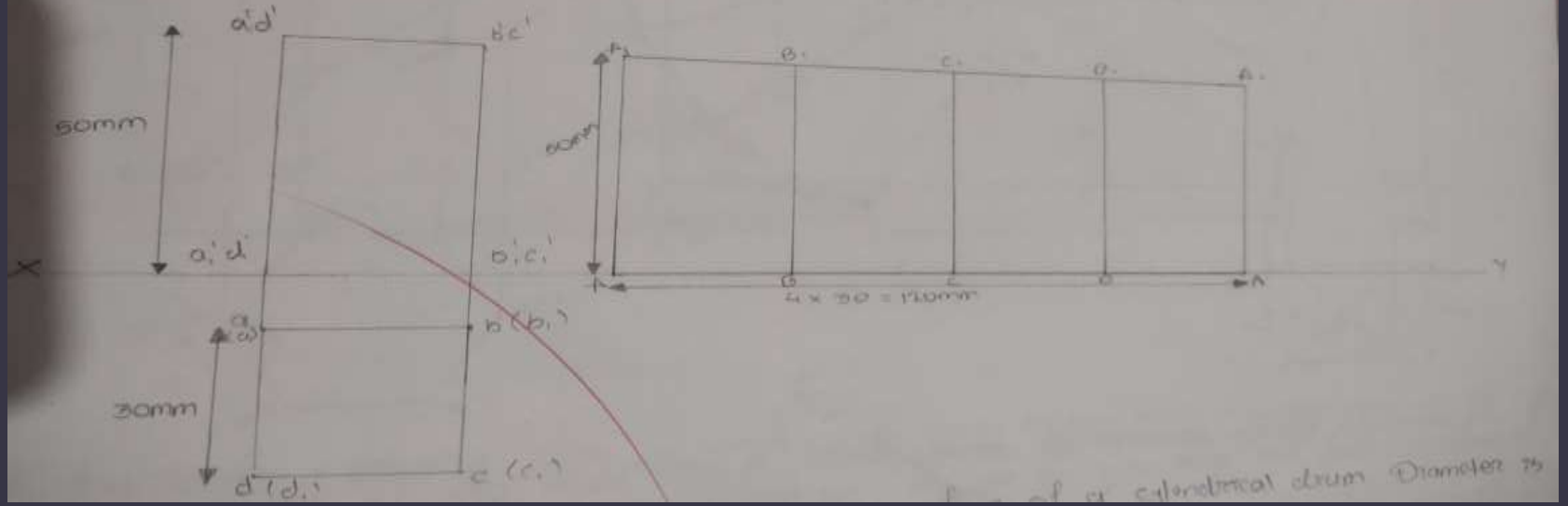
Q. A cone of 40mm diameter & height 50mm is resting on its base. Draw the development of the cone.



Q. A cone of 40mm diameter & height 50mm is resting on its base. Draw the development of the cone.

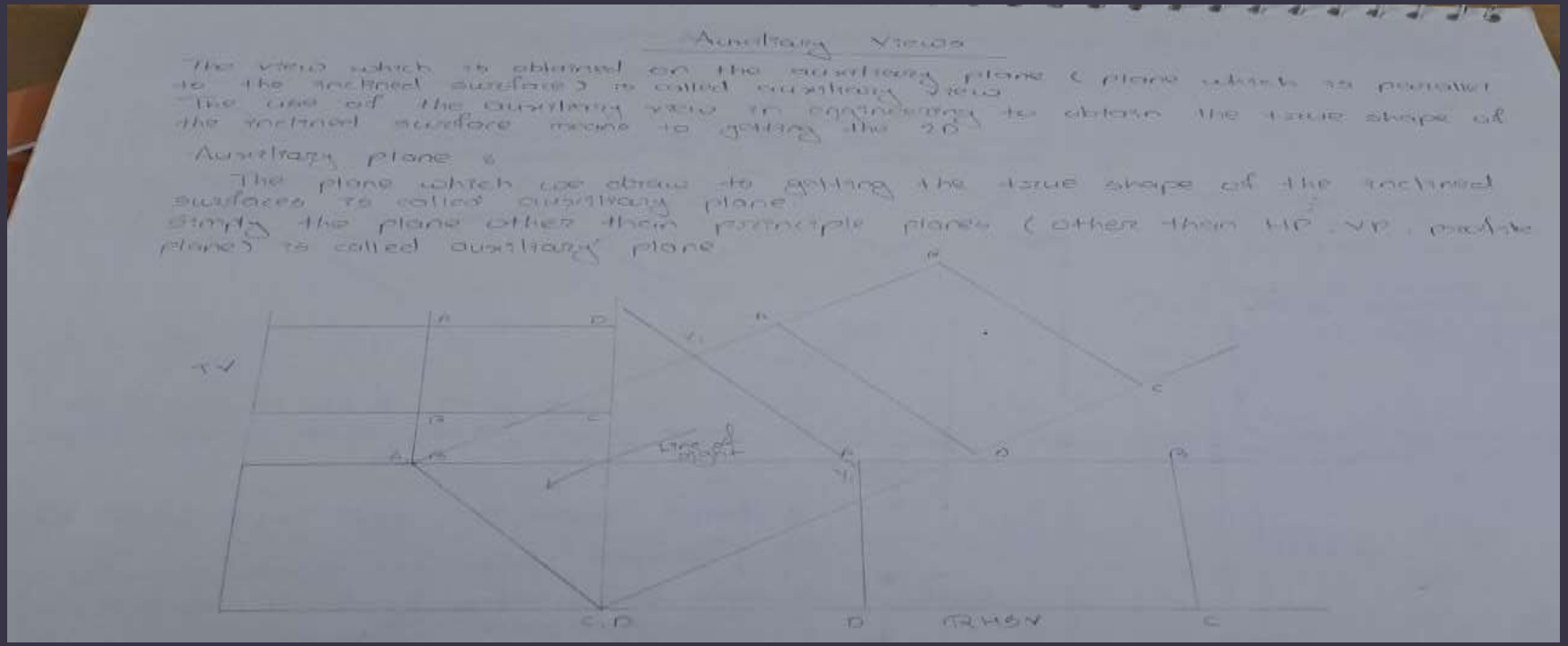


Q Draw the development of the lateral surfaces of a right square prism of edge of base 30mm and axis 50mm long.



cylindrical drum Diameter 75

MODULE 8 -Auxiliary Views

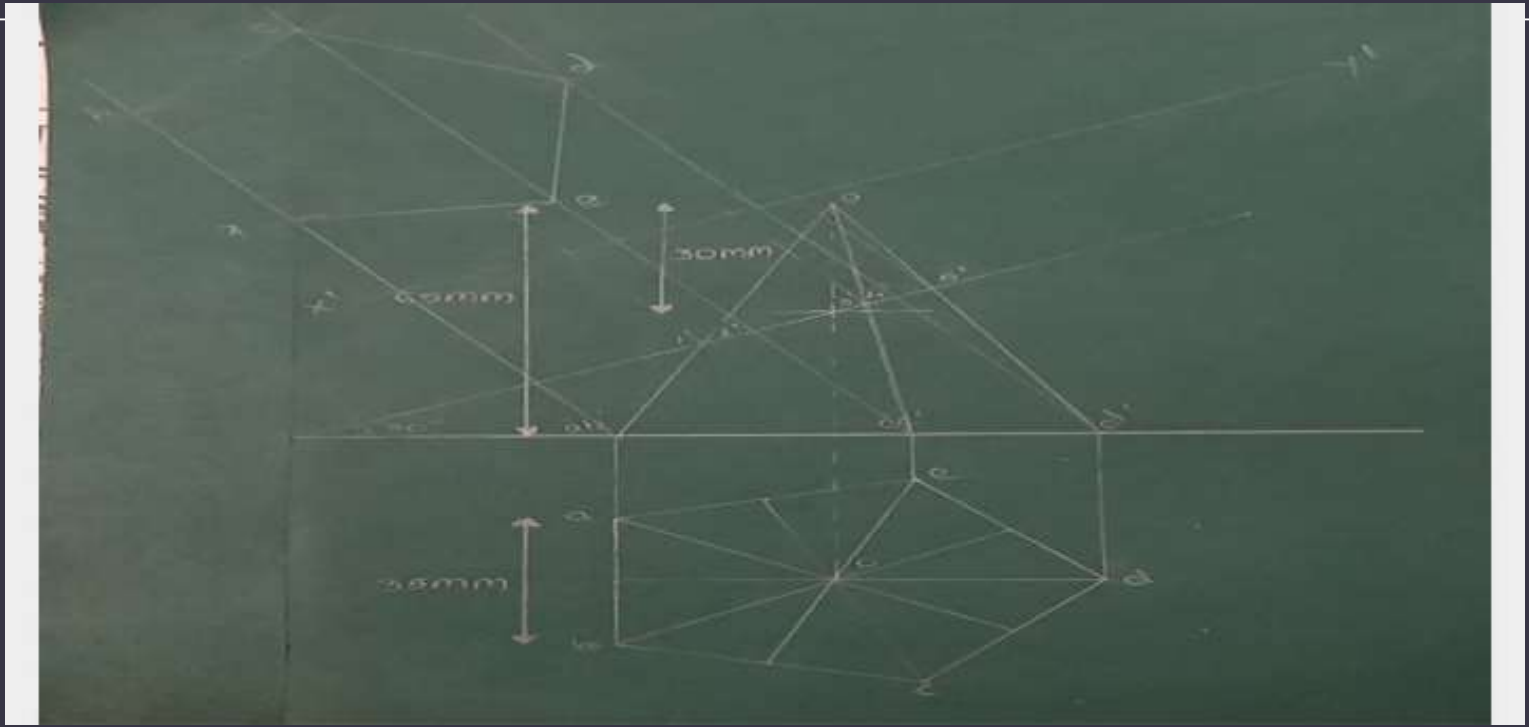


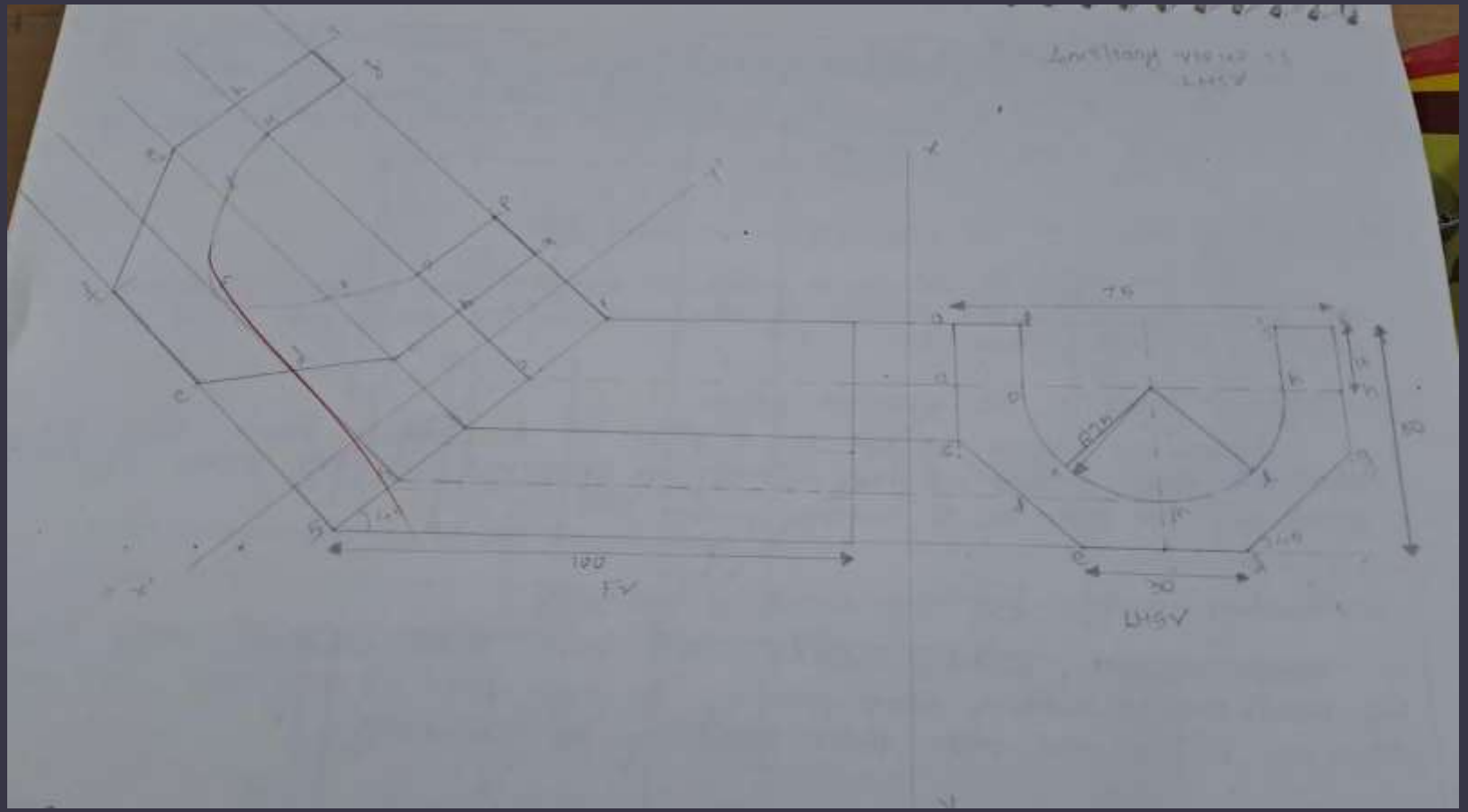
Types of Auxiliary plane

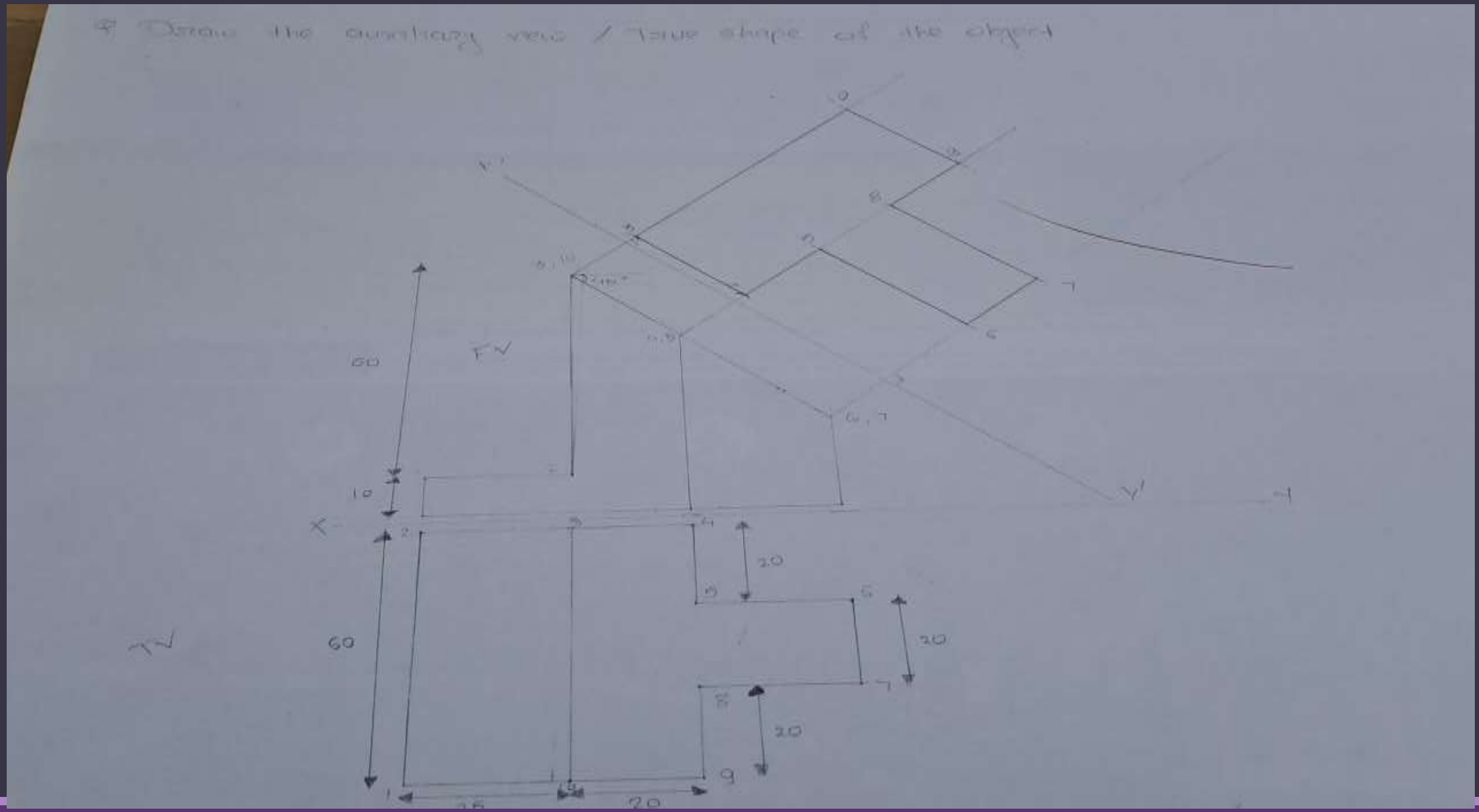
1. Auxiliary vertical plane :- Plane which is $\perp^{to}$ to HP & inclined to the VP is called auxiliary vertical plane. It gives an auxiliary front view

2. Auxiliary Inclined plane :- Plane which is $\perp^{to}$ to VP & inclined to the HP is called auxiliary inclined plane. It gives an auxiliary top view

Activity carried under above Module




100
F.V
75
50
50
L.H.S.V


Draw the auxiliary view / True shape of the object
FV
TV
60
10
60
20
20
20
X
Y
Y1
X1

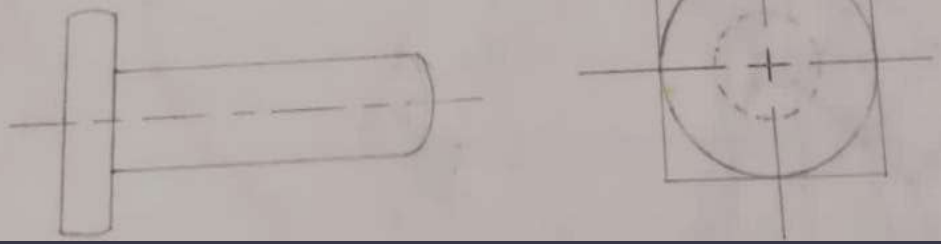
MODULE 9- Freehand Sketching

Free Hand Sketches

1) Square Headed Bolt

It is used for aesthetic purposes to provide a rustic look on a new structure or to match existing fasteners in an older structure

Crossarm or machine bolts are commonly supplied for the utility industry & included an added cone point



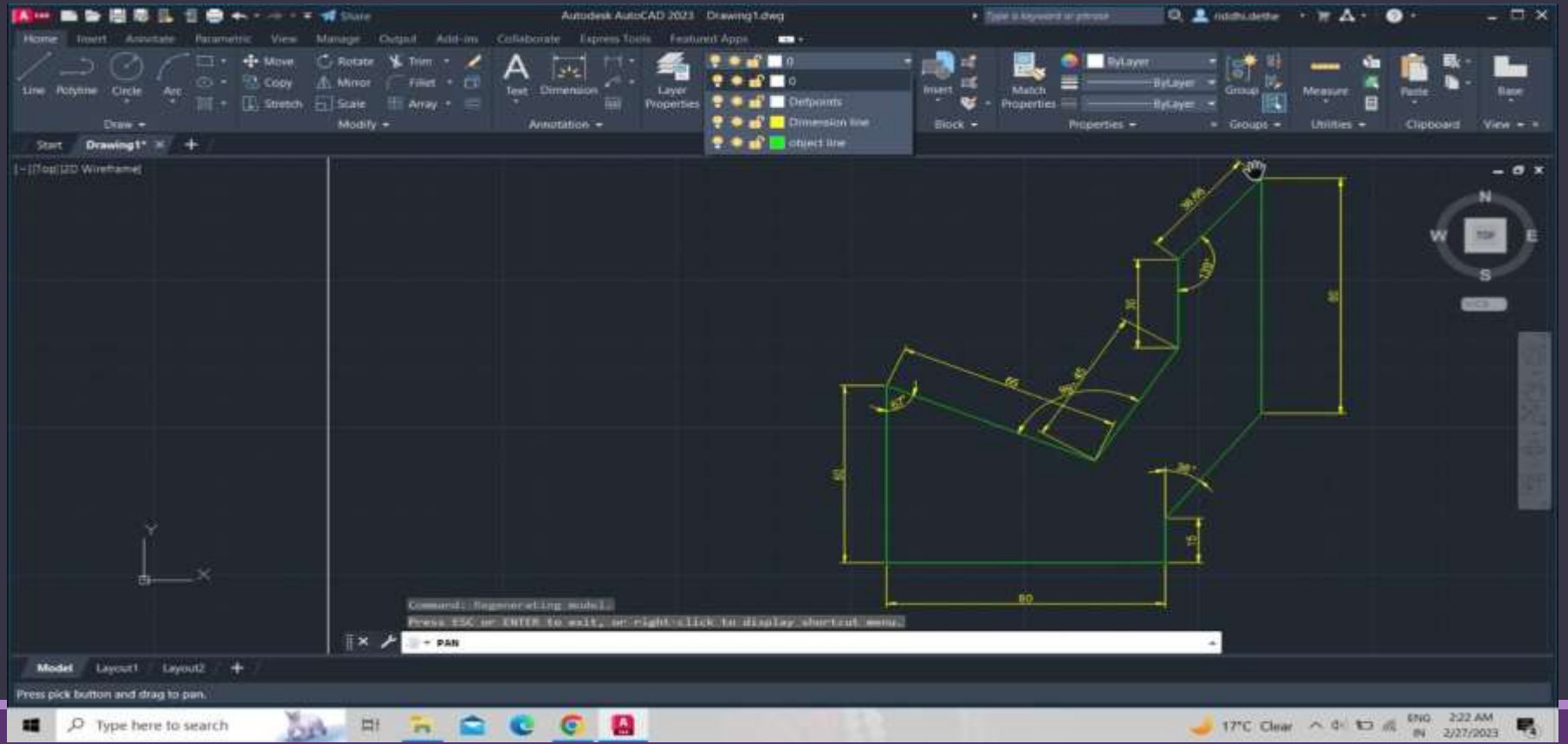
Activity carried under above Module

Visit to science park

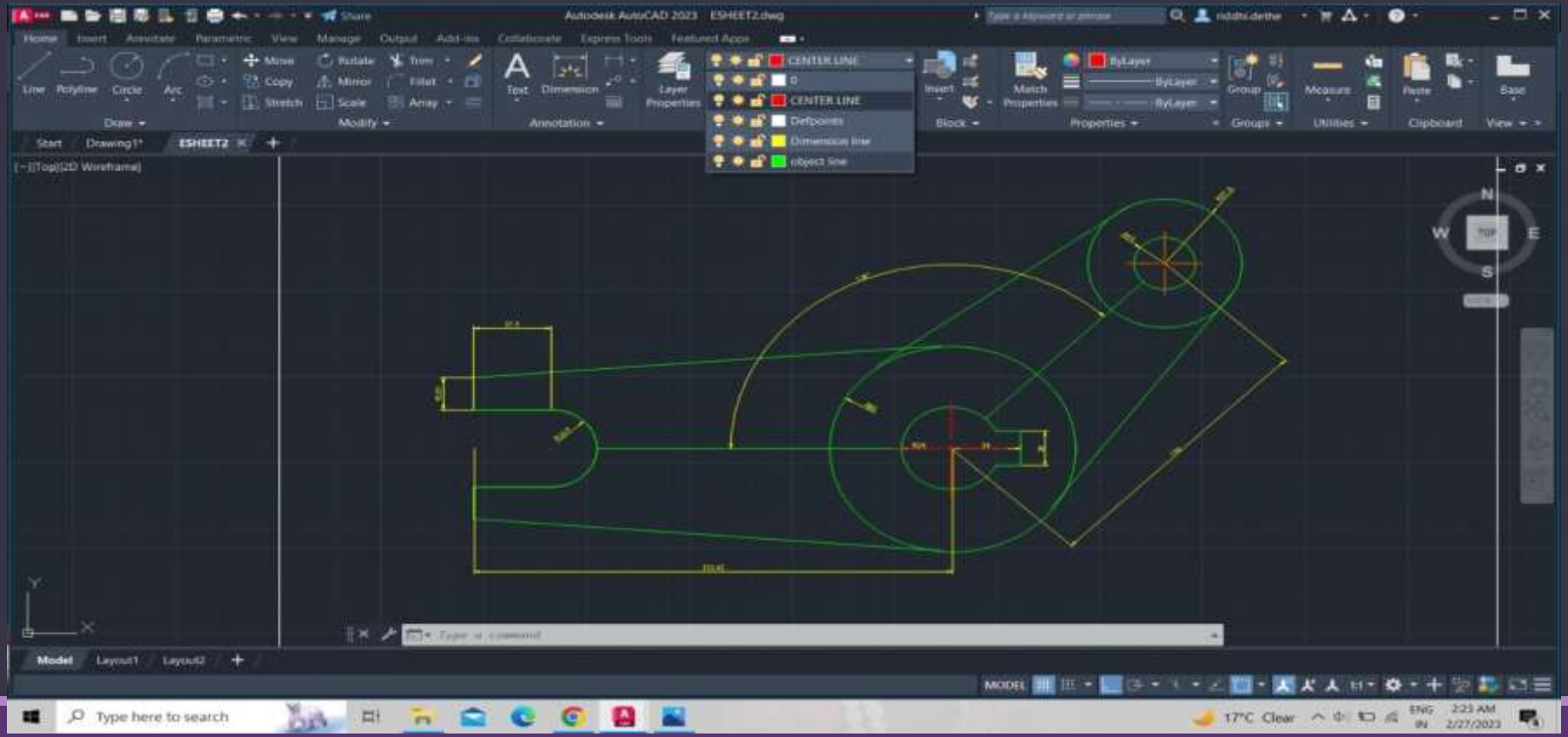
https://docs.google.com/presentation/d/1BOETduvf9BAovXqzMfoVwU-2UPjPFDxm/edit?usp=sharing&ouid=112590358980089960496&rtpof=true&sd=true

2D Drafting Work

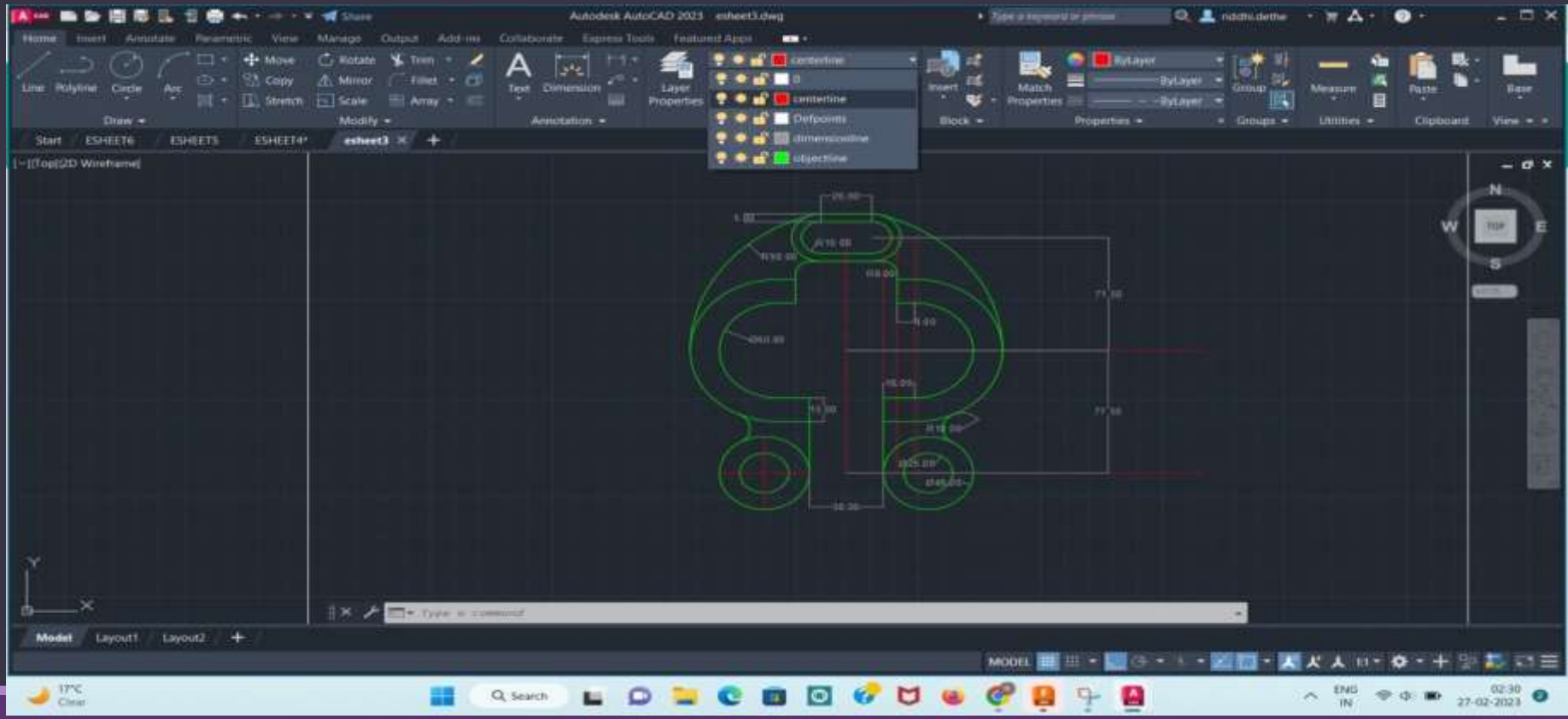
eSheet 1


Autodesk AutoCAD 2023 Drawing1.dwg
Home Insert Annotate Parametric View Manage Output Add-ins Collaborate Express Tools Featured Apps
Line Polyline Circle Arc
Move Copy Stretch Rotate Mirror Scale Trim Fillet Array
Text Dimension
Layer Properties
Insert
Match Properties
ByLayer
Group
Measure
Paste
Base
Draw
Modify
Annotation
Block
Properties
Groups
Utilities
Clipboard
View
Start
Drawing1*
[-][Top][2D Wireframe]
Defpoints
Dimension line
object line
80
Command: Regenerating model.
Press ESC or ENTER to exit, or right-click to display shortcut menu.
PAN
Model
Layout1
Layout2
Press pick button and drag to pan.
Type here to search
17°C Clear
ENG
IN
2:22 AM
2/27/2023

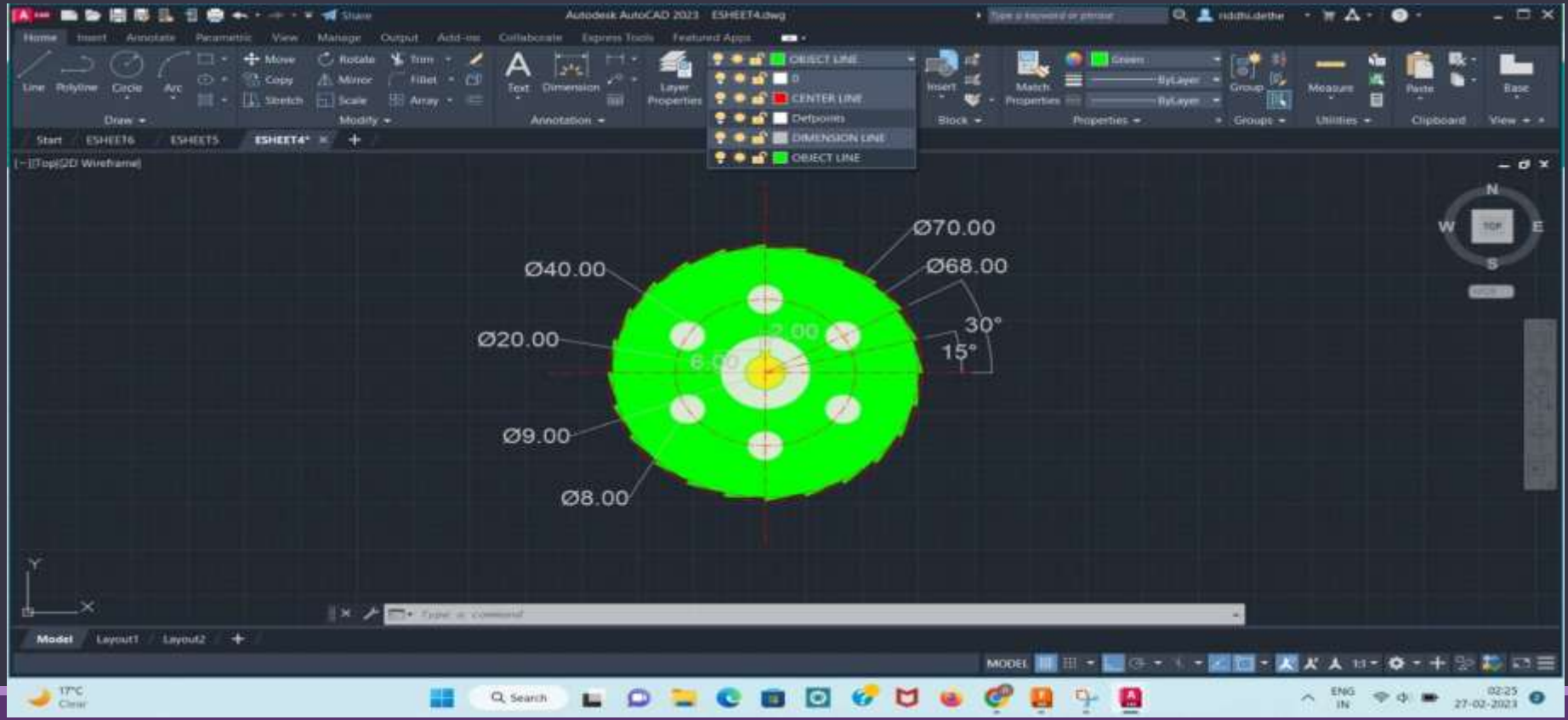
eSheet 2


Autodesk AutoCAD 2023 ESHEET2.dwg
Start
Drawing1*
ESHEET2
[-][Top][2D Wireframe]
Model
Layout1
Layout2
Type here to search
17°C Clear
2:23 AM
2/27/2023

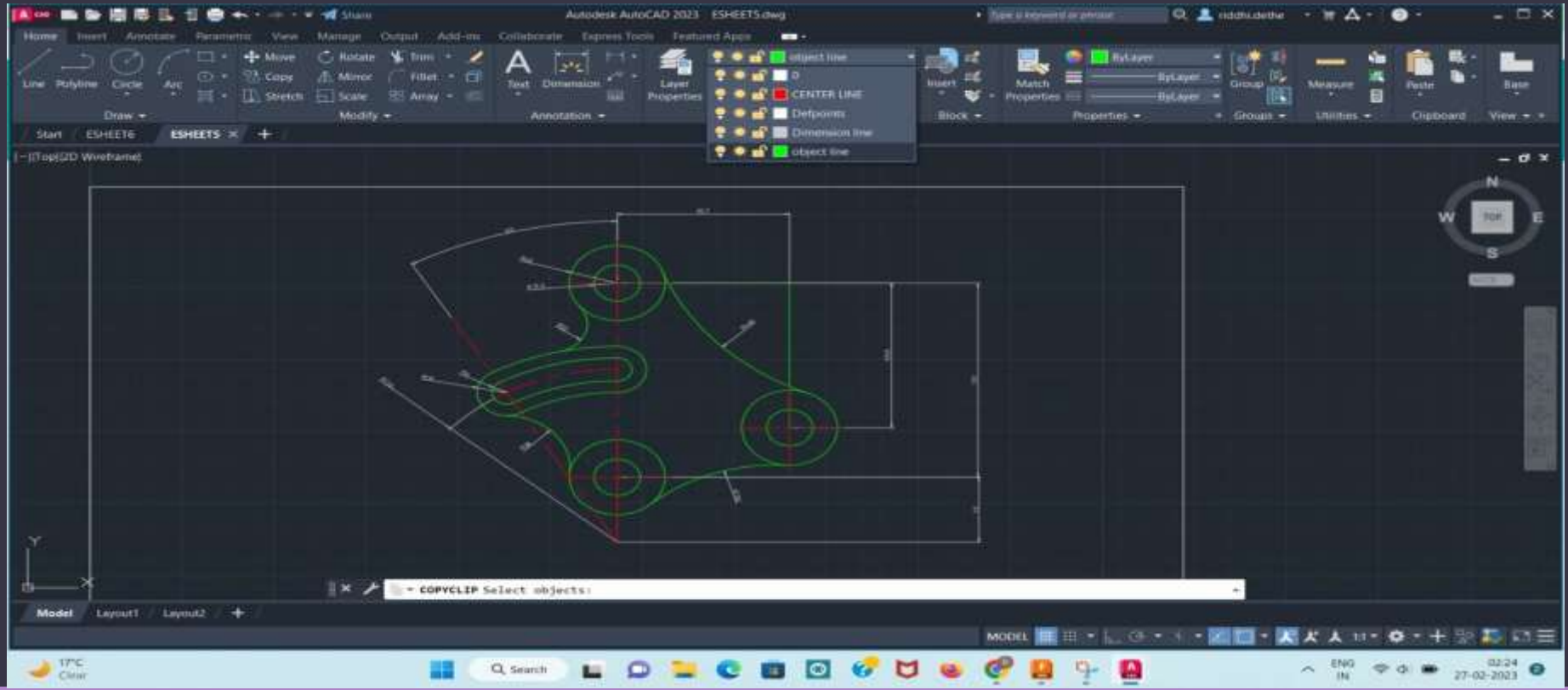
eSheet 3


Autodesk AutoCAD 2023 esheet3.dwg
Start
ESHEET6
ESHEET5
ESHEET4*
esheet3
[-][Top][2D Wireframe]
Model
Layout1
Layout2
MODEL

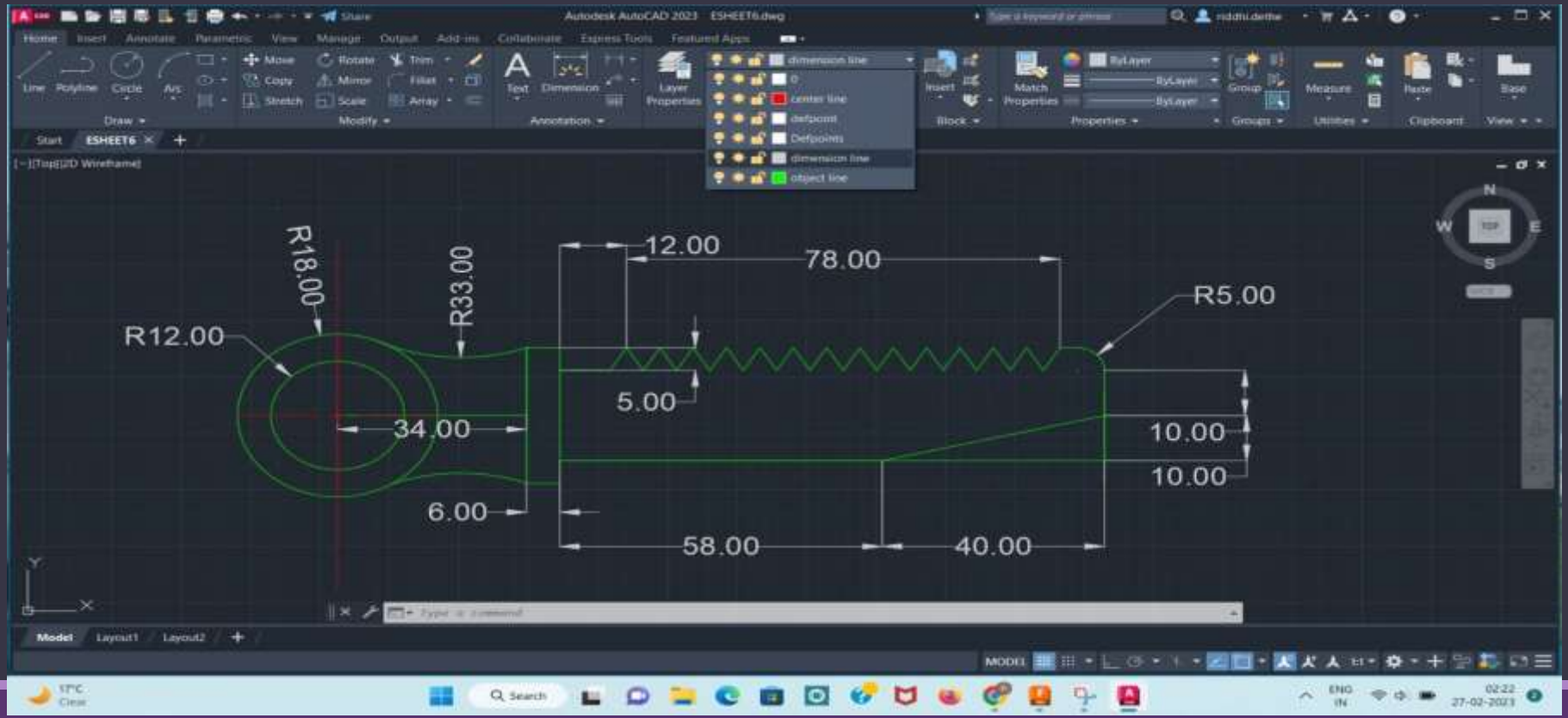
eSheet 4


Autodesk AutoCAD 2023 ESHEET4.dwg
Ø70.00
Ø68.00
Ø40.00
Ø20.00
Ø9.00
Ø8.00
30°
15°
Model
Layout1
Layout2

eSheet 5

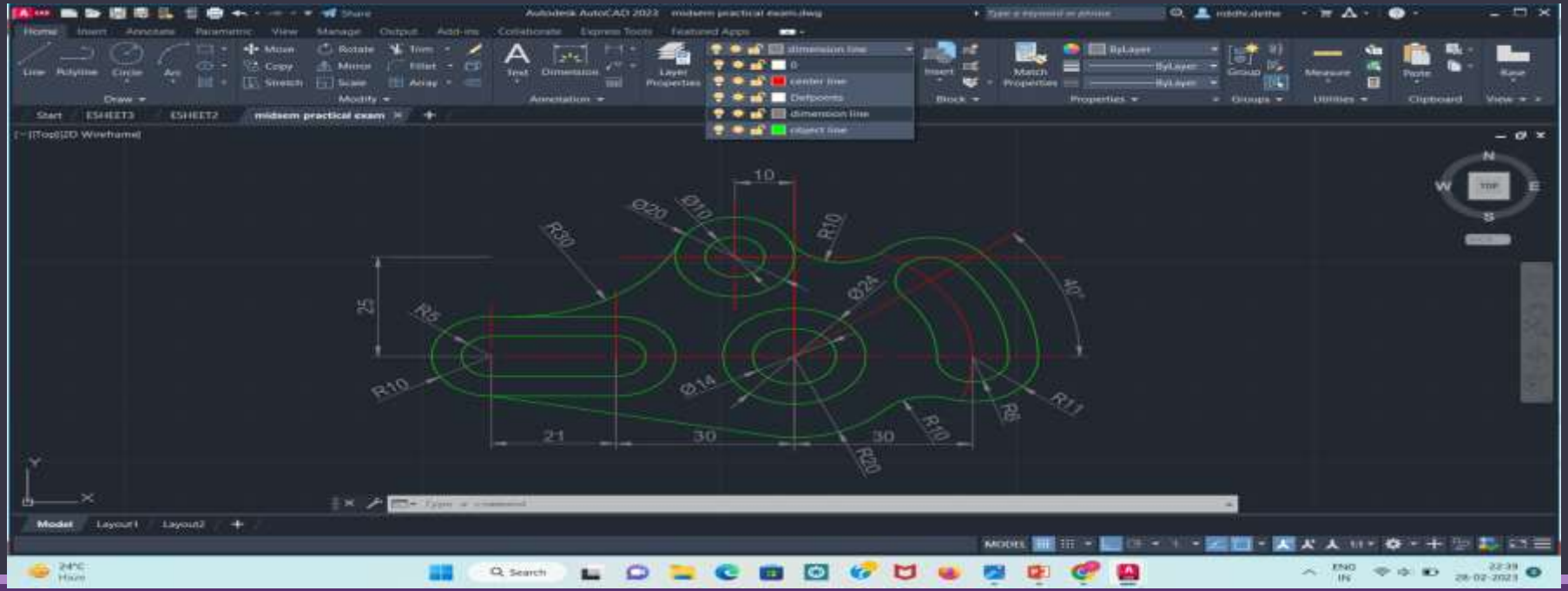

Autodesk AutoCAD 2023 ESHEET5.dwg
Home
Insert
Annotate
Parameteric
View
Manage
Output
Add-ins
Collaborate
Express Tools
Featured Apps
Line
Polyline
Circle
Arc
Move
Copy
Stretch
Rotate
Mirror
Scale
Trim
Fillet
Array
Text
Dimension
Layer Properties
object line
0
CENTER LINE
Defpoints
Dimension line
object line
Insert
Match Properties
ByLayer
Group
Measure
Paste
Base
Draw
Modify
Annotation
Block
Properties
Groups
Utilities
Clipboard
View
Start
ESHEET6
ESHEET5
[-][Top][2D Wireframe]
N
W
E
S
TOP
COPYCLIP Select objects:
Model
Layout1
Layout2
MODEL
17°C
Clear
Search
ENG
IN
02:24
27-02-2023

eSheet 6


Autodesk AutoCAD 2023 ESHEET6.dwg
R18.00
R33.00
R12.00
12.00
78.00
R5.00
5.00
34.00
10.00
10.00
6.00
58.00
40.00
Model
Layout1
Layout2

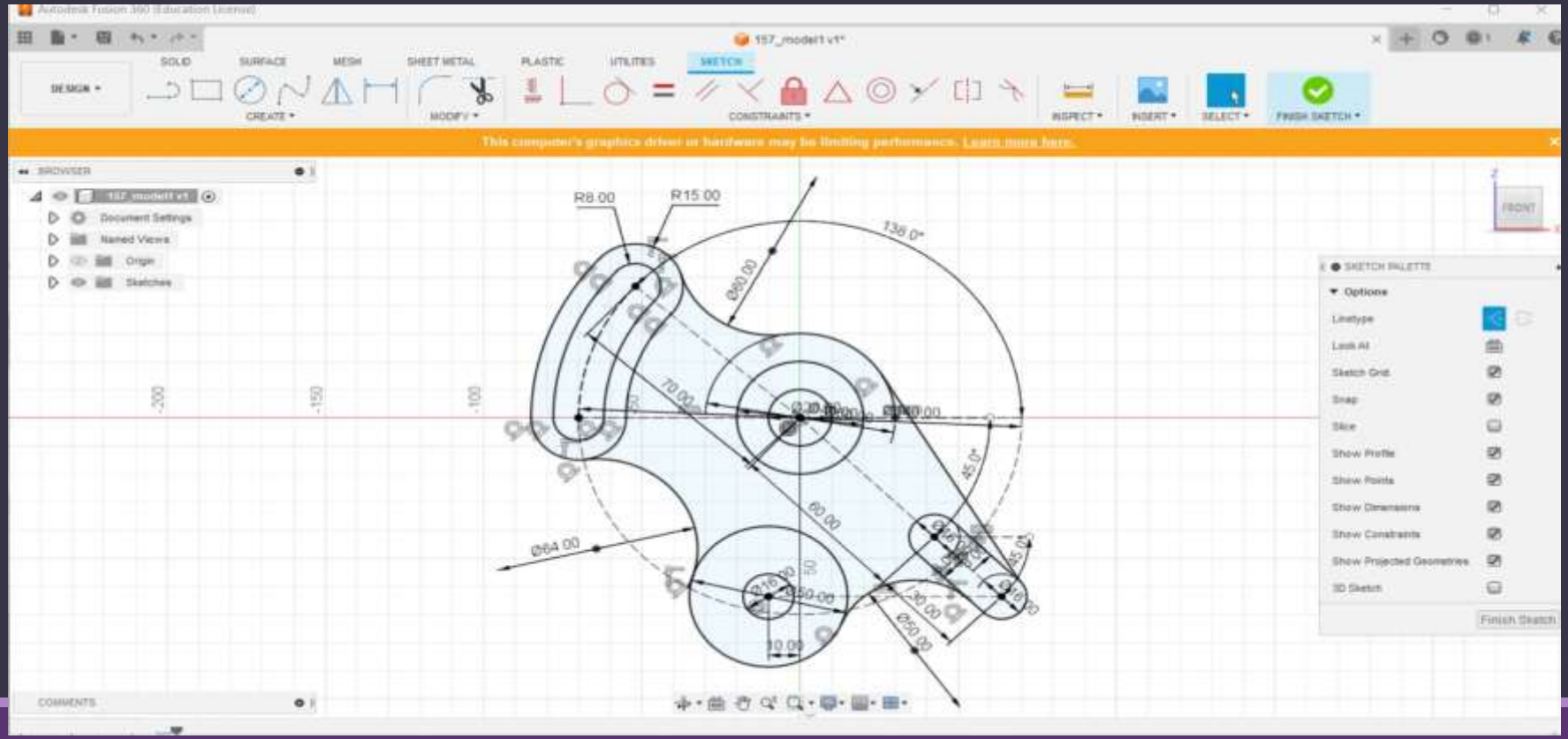
Any Project work carried

Midsem practical exam esheet

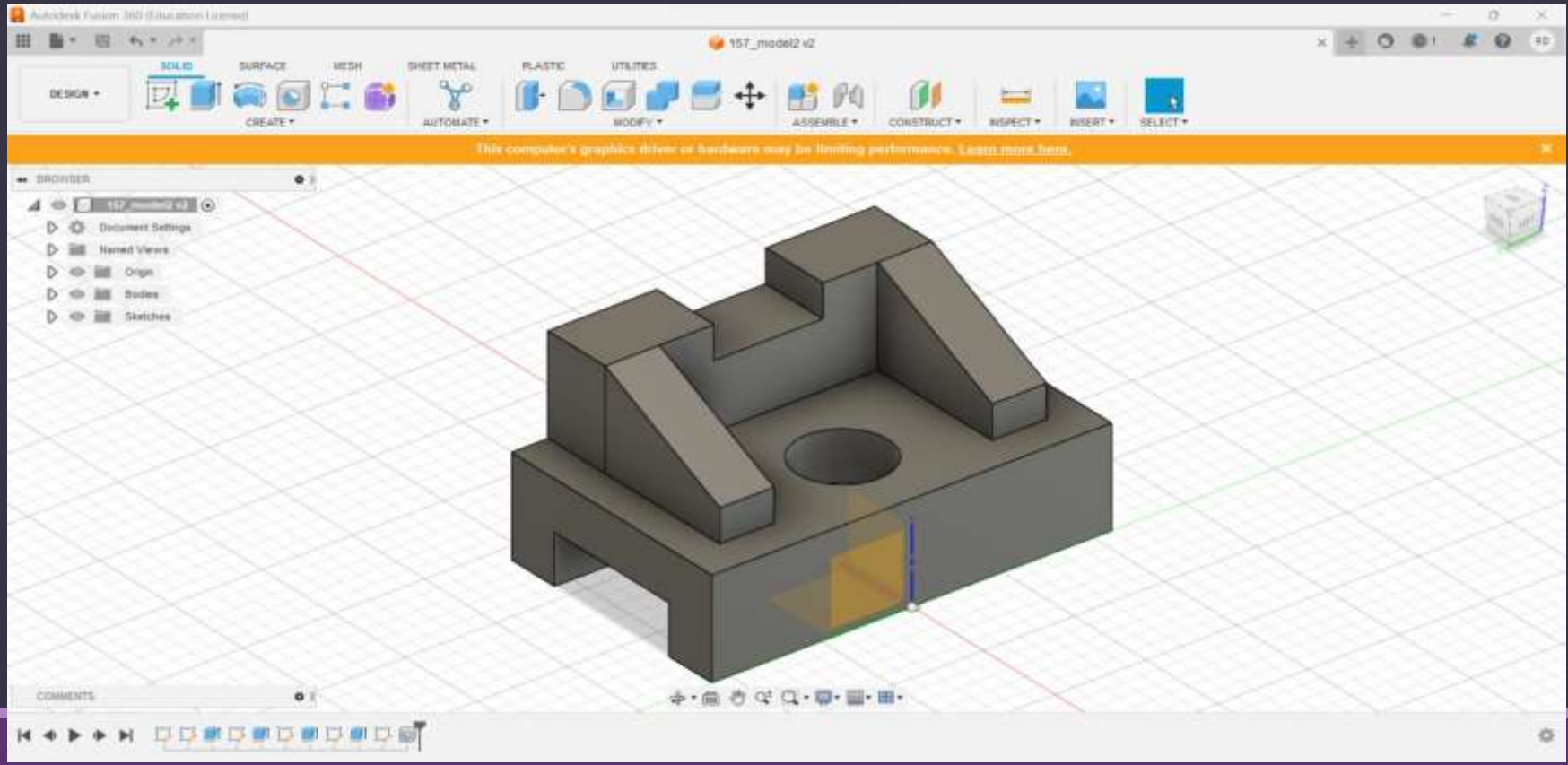


3D Modeling Work

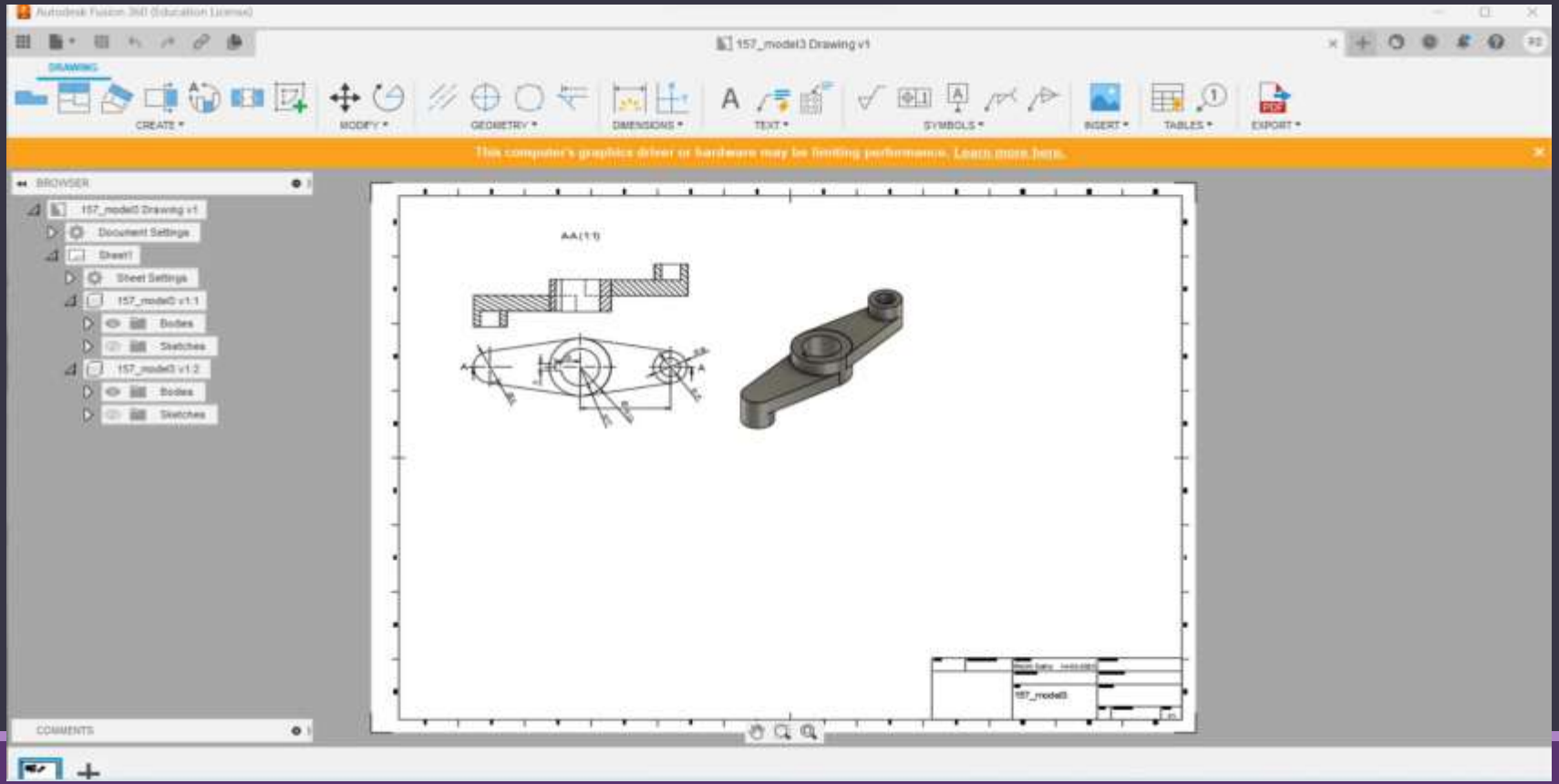
Model 1


R8.00
R15.00
136.0°
Ø80.00
70.00
45.0°
60.00
Ø64.00
Ø250.00
SKETCH PALETTE
Options
Linetype
Look At
Sketch Grid
Snap
Slice
Show Profile
Show Points
Show Dimensions
Show Constraints
Show Projected Geometries
3D Sketch
Finish Sketch

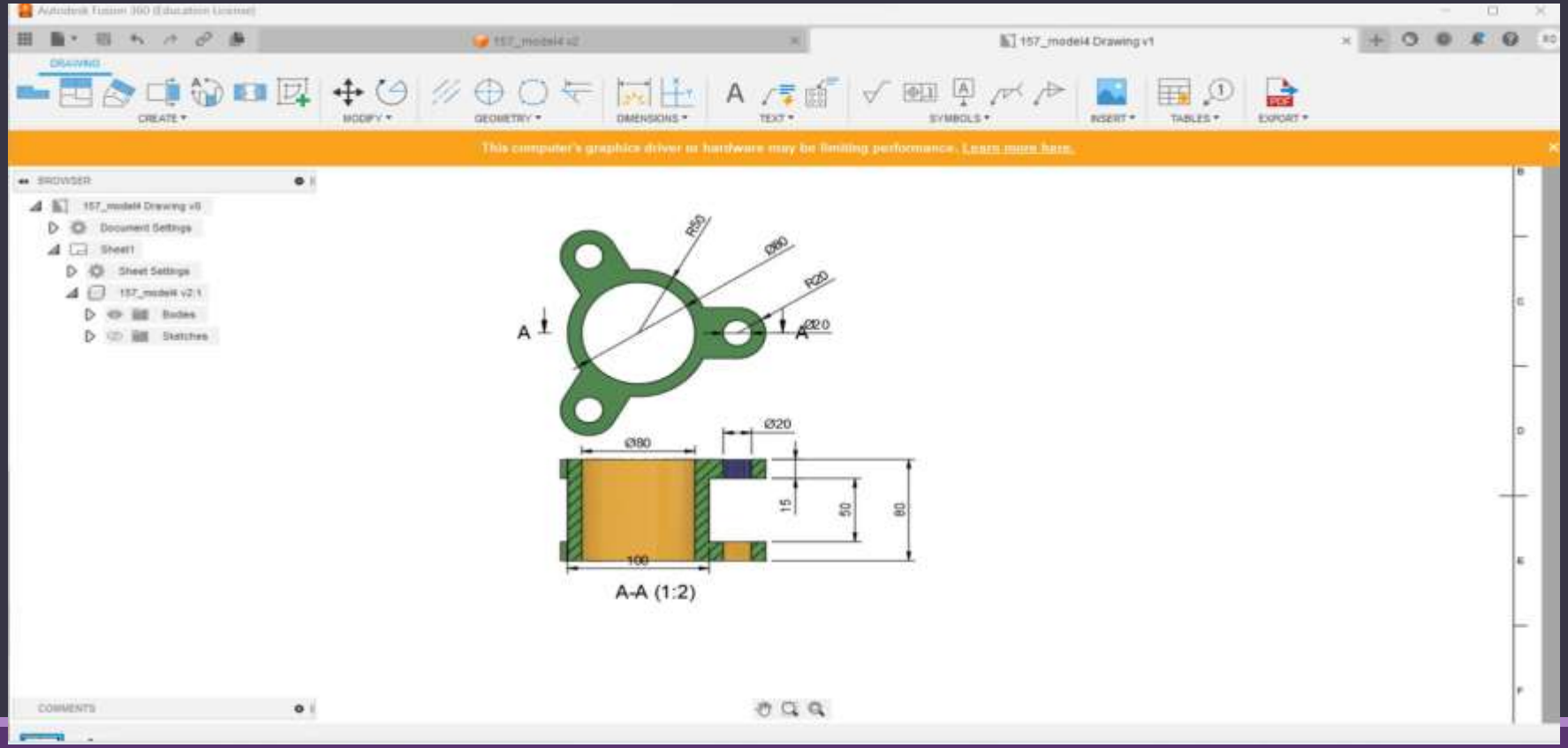
Model 2


157_model2 v2
DESIGN
SOLID
SURFACE
MESH
SHEET METAL
PLASTIC
UTILITIES
CREATE
AUTOMATE
MODIFY
ASSEMBLE
CONSTRUCT
INSPECT
INSERT
SELECT
This computer's graphics driver or hardware may be limiting performance. Learn more here.
BROWSER
Document Settings
Named Views
Origin
Bodies
Sketches
COMMENTS

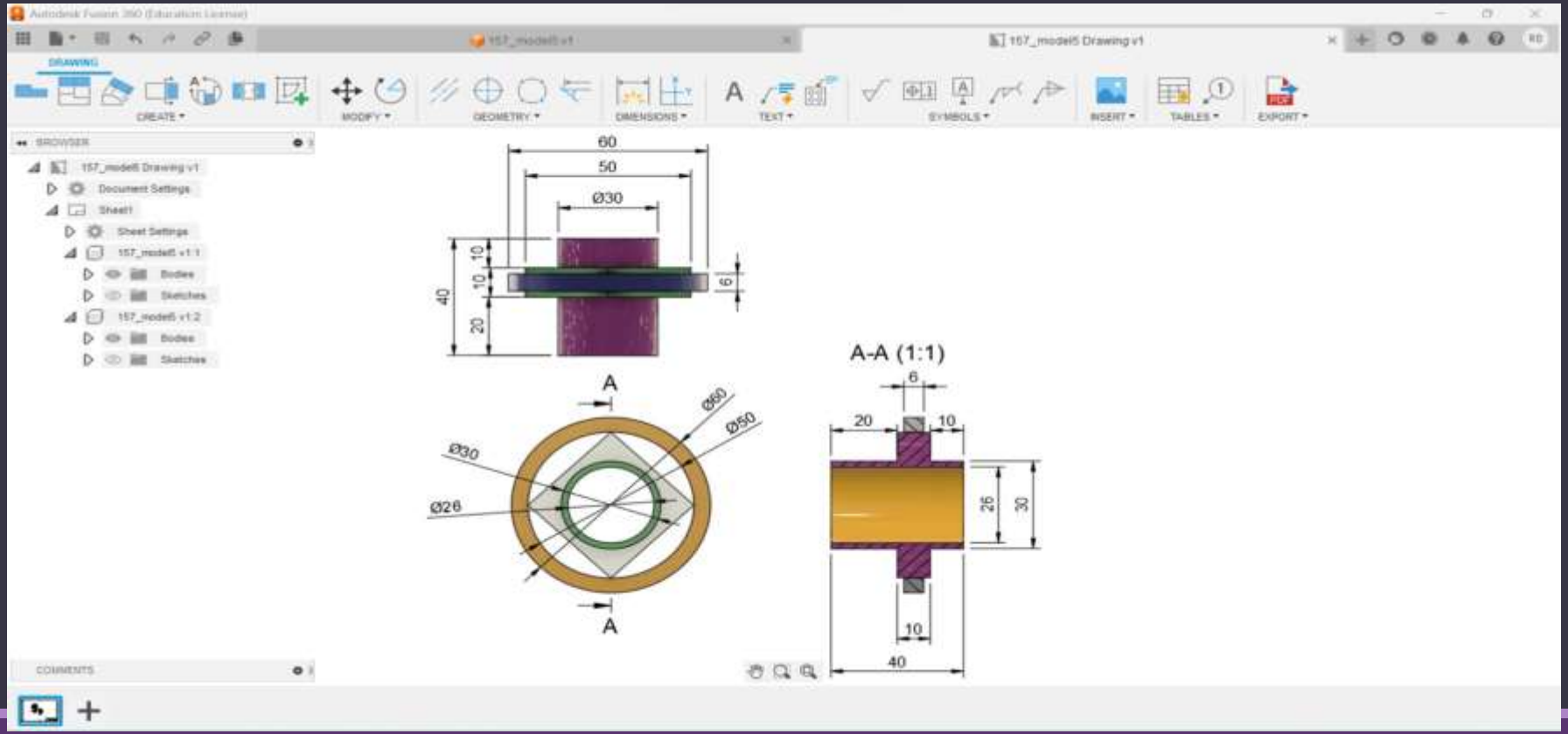
Model 3


157_model3 Drawing v1
CREATE
MODIFY
GEOMETRY
DIMENSIONS
TEXT
SYMBOLS
INSERT
TABLES
EXPORT
This computer's graphics driver or hardware may be limiting performance. Learn more here.
BROWSER
157_model3 Drawing v1
Document Settings
Sheet1
Sheet Settings
157_model3 v1:1
Bodies
Sketches
157_model3 v1:2
Bodies
Sketches
COMMENTS
AA(1:1)
157_model3

Model 4


157_model4 Drawing v1
CREATE
MODIFY
GEOMETRY
DIMENSIONS
TEXT
SYMBOLS
INSERT
TABLES
EXPORT
This computer's graphics driver or hardware may be limiting performance. Learn more here.
BROWSER
157_model4 Drawing v0
Document Settings
Sheet1
Sheet Settings
157_model4 v2:1
Bodies
Sketches
COMMENTS
R50
Ø80
R20
Ø20
A
A
Ø80
Ø20
15
50
80
100
A-A (1:2)

Model 5



Any project work carried out

Endsem practical exam model

https://drive.google.com/file/d/18wdLT0ABhj6uPaGS_gWf-D0-0e2R8q5T/view?usp=sharing

Major Learnings and Outcomes

- LEARNED ABOUT DIFFERENT VIEWS OF OBJECT
- LEARNED ABOUT DIFF. TYPES OF OBJECT IN DETAIL
- LEARNED HOW TO MAKE 3D MODELS
- LEARNED HOW TO DRAW DIFFERENT SIDES OF 3D MODEL
- LEARNED HOW TO CONVERT 2D DRAFTING INTO 3D MODELS

Major outcomes from drawing work

1. Add at least 6 points in full statement e.g. I learned identification of line types
2. I learned to transfer 2D to 3D as well as 3D to 2D .
3. I learned different types of solids with it’s projections.
4. I learned application of projection of lines.
5. I learned auxiliary view
6. I learned about free hand sketching

Outcomes from Software work

1. Add at least 5 points I learned how to use draw commands in Autocad
2. I learned how to create 2D drawing in Autocad
3. I learned how to create 3D drawing in Fusion 360
4. I learned how to make changes easily and reduce the risk of error
5. I learned how to store and transfer data safely