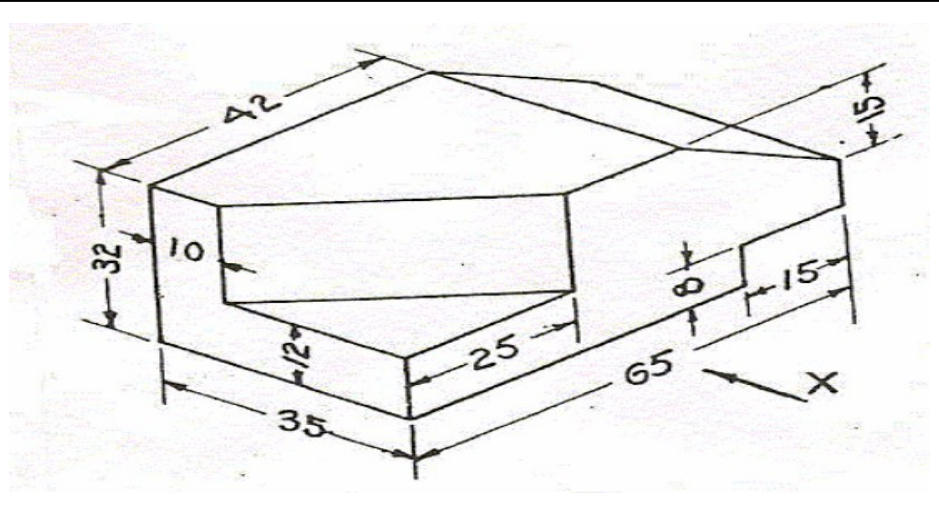


Alpha College of Engineering & Technology
Department of Mechanical Engineering
Frequently Asked Questions
SUB: ENGINEERING GRAPHICS (2110013)
BE 1ST YEAR

SR. NO	QUESTIONS	YEAR	MARKS
1	Define representative fraction. Construct a plain scale of R:F = 1:50 to show meter and decimeter and long enough up to 8 meter. Indicate 6.7 m distance on scale.	SEPT-2009	4
2	Construct a plain scale to show kilometer and hectometer when 25 mm is equal to 1 km and long enough to measure up to 6 km. Find RF and show a distance of 3 km and 4 hectometer on scale. Draw an isometric scale and show a measurement of 46 mm of the scale	MARCH-2009 JUNE-2009	4
3	The length of khandala tunnel on Mumbai-Pune express way is 330 m on the road map; it is shown by 16.5 cm long line. Construct a scale to show meters and to meter and to measure up to 400m. Show the length of 289 meter long on the express way.	MARCH-2010	7
4	A circle of 30 mm diameter rolls along a straight line without slipping. Draw the curve traced out by the point P on the periphery of the circle. Take the initial position the point at the bottom on vertical centre line of the circle. Name the curve and also draw tangent and normal to the curve at suitable point on the curve	(Nov/ Dec. 2010, SUMMER 2013, June-July-2011)	7
5	Construct the parabola if the base is 105 mm and the axis length is 98 mm using rectangle method. Locate focus, vertex and directrix of the parabola.	WINTER 2013	7
6	Draw an ellipse having major axis 120 mm and minor axis 80 mm. Use Concentric circle method.	.(Jan-09,July-2011)	7
7	A line PQ, 60 mm long has its end P on VP and end Q on HP. Line is inclined to HP by 60° and VP by 30° and it is 20 mm away from the profile plane. Draw the projections of the line.	May 2013	7
8	The top view of 75 mm long line AB measures 65 mm and the length of front view is 50 mm. It's one end A is in HP and 12 mm in front of VP. Draw the projections of line AB and measure its inclinations with HP and VP.	Dec 2011	7
9	Draw the projections of the following points on the same X-Y line. (a) Point 'A' 40 mm below HP & 40 mm in front of VP. (b) Point 'B' 35 mm above HP & 45 mm in front of VP. (c) Point 'C' on VP and 30 mm above HP. (d) Point 'D' on HP & VP both.	June 2010	7

10	The front view of a line AB, 90 mm long, measures 65 mm. Front view is inclined to XY line by 45° . Point A is 20 mm below HP and on VP. Point B is in third quadrant. Draw the projections and find inclinations of the line with HP and VP.	June 2009	7
11	A regular pentagonal plate of 45 mm sides has one of its corners on HP. The plane of the pentagon is inclined at 45° to the H.P. The side of pentagon which is opposite of the corner, which is on H.P. is inclined at 30° to the V.P. Draw the projections of the plane	SEPT-09, JAN-09, JUNE-09, JUNE-13	7
12	A Circular plane of 60 mm diameter is resting on H.P. on a point A of its circumference. The plane is inclined at 30° to the H.P. The diameter AB of the plane makes an angle of 45° with the V.P. Draw the projection of the circular plane.	MARCH-09, JAN-13	7
13	A thin rectangular plate of 60 x 30 mm has its shorter side in the V.P. and inclined at 30° to the H.P. project its top view, its front view is a square of 30 mm long sides.	SEPT-09	7
14	A hexagonal pyramid, side of the base 25 mm long and height 70 mm resting on HP on its side, has one of its triangular faces perpendicular to the HP and inclined at 60° to VP. Draw its projections	SUMMER-2014	7
15	A tetrahedron of 70 mm long edges is lying on Horizontal Plane on one of its faces with an edge of that face perpendicular to the Vertical Plane. It is cut by a section plane perpendicular to both the reference plane in such a way that the true shape of section is an isosceles triangle of 45 mm height. Draw elevation, plan and side view when smaller cut piece of the object is assumed to be removed	WINTER-2013	7
16	A cube of 50 mm long edges has its vertical faces equally inclined to VP. It is cut by a section plane perpendicular to VP so that the true shape of the section is a regular hexagon. Determine the inclination of the cutting plane with the HP and draw the sectional top view and true shape of the section	SUMMER-2014	7
17	Refer the object shown in figure. Draw the following orthographic views using the FIRST angle projection method. Use the Aligned System of dimensioning. (i) Front View from the direction X (ii) Top View (iii) Left Hand Side View	March-2009	14

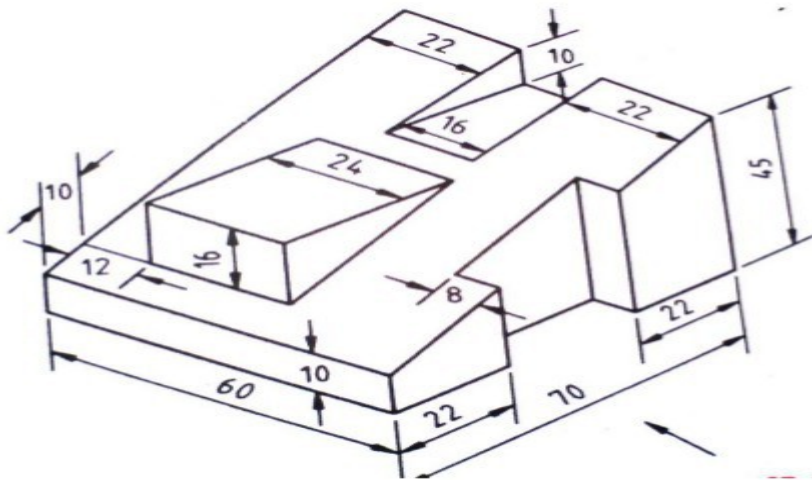


Draw the front view, top view and left hand side view of the object given in figure. Use first angle projection method.

Jan.-2010

14

20

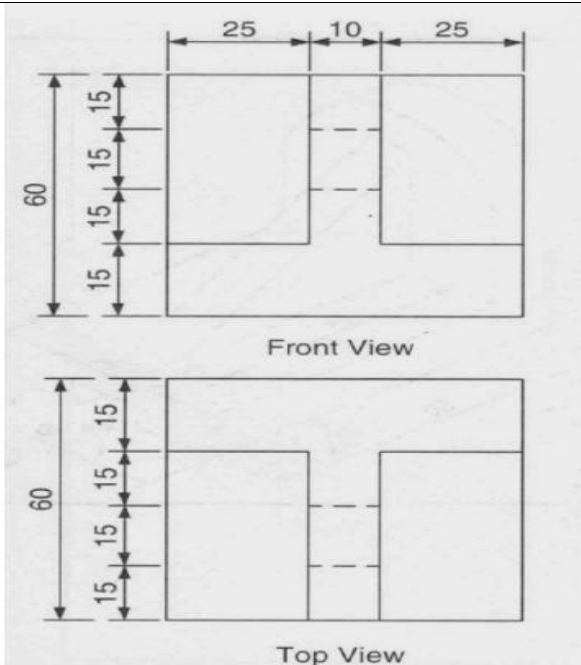


21

Fig. shows the Front View and Top View of the object. Draw the

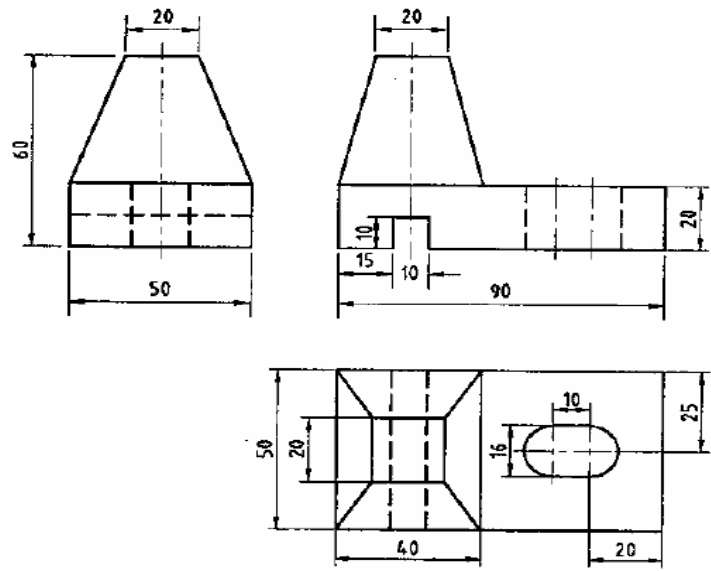
May-2013

11



Isometric View

Draw Isometric view for the object shown below











22

June-2009

7

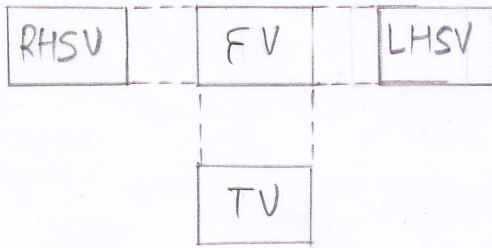
SUBJECT IN CHARGE
H.O.D.

TYPES OF LINES (FOR M.C.Q.)

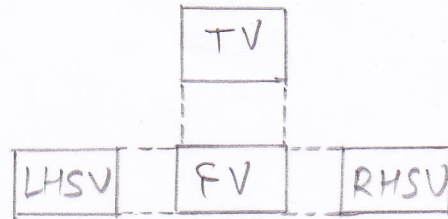
TYPE	ILLUSTRATION	APPLICATION.
Continuous Thick		Visible outline
Continuous Thin		Dimension line, leader Line, extension line Construction line, outline of adjacent part, hatching and revolved sections
Continuous thin wavy		Irregular boundary line, short break line
short dashed medium		Hidden outline and edges.
Long chain thin		Centre line, locus line extreme position of movable parts - parts situated in front of cutting planes and pitch circle
Long chain thick at end		cutting plane line
Long chain thick		To indicate surface which are to receive additional treatment
Ruled line and short zig-zig		Long break line

Difference between 1st & 3rd Angle Projection System

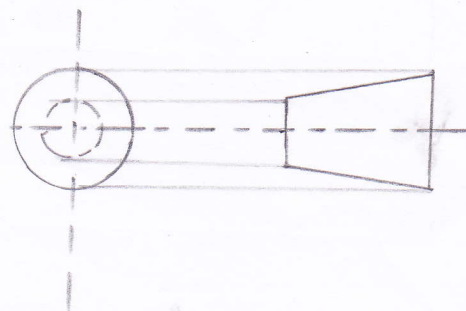
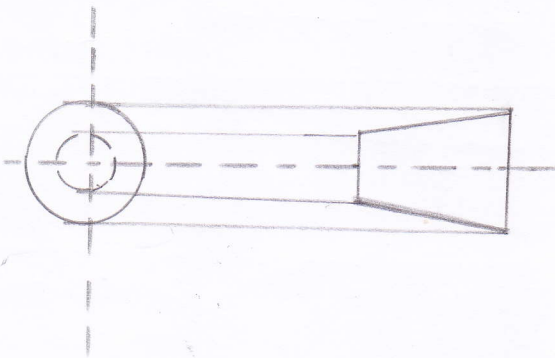
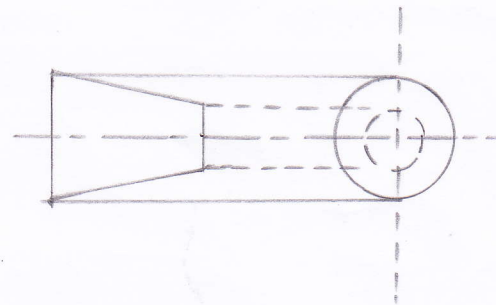
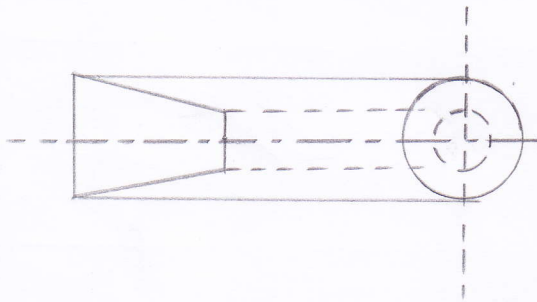
1st Angle Projection System



3rd Angle Projection System



Alpha College of
Engg. & Tech.,
Khatraj
Department of
Mechanical
Engineering
BE First Sem
(Engineering
Graphics-2110013)



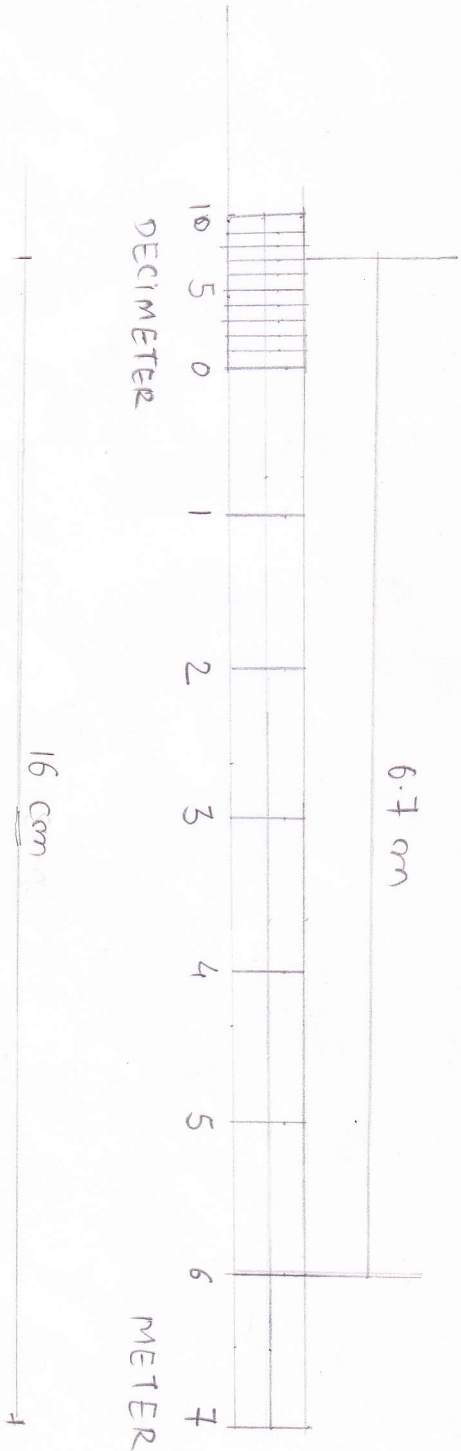
ANSWER : 1

$$RF = 1:50$$

Actual length of scale = $RF \times 8 \times 10^2$

$$= \frac{1}{50} \times 8 \times 10^2$$

$$= 16 \text{ cm}$$

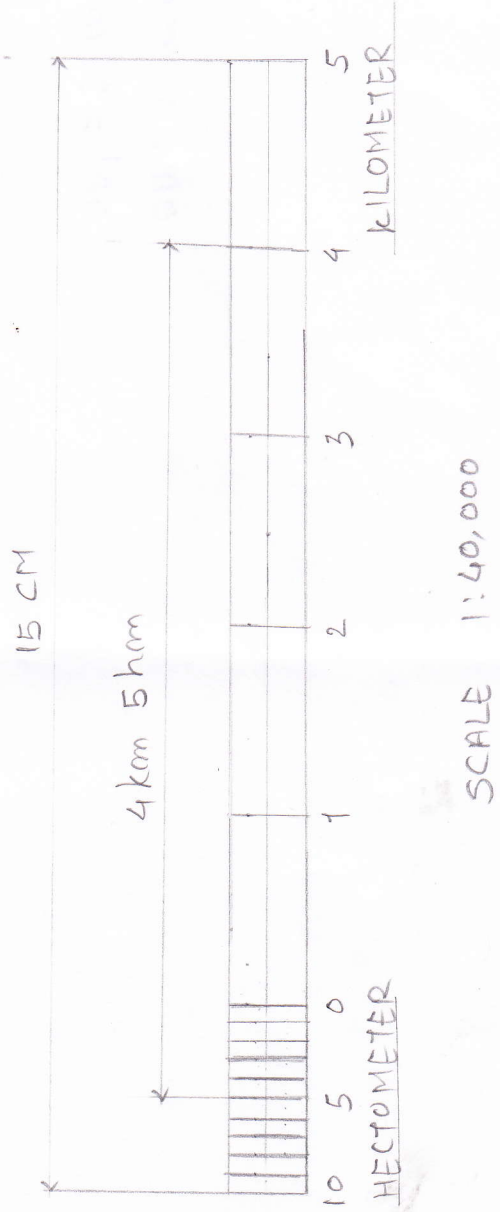


G.T.U. :- MARCH :- 09
JUNE :- 09
(04 MARKS)

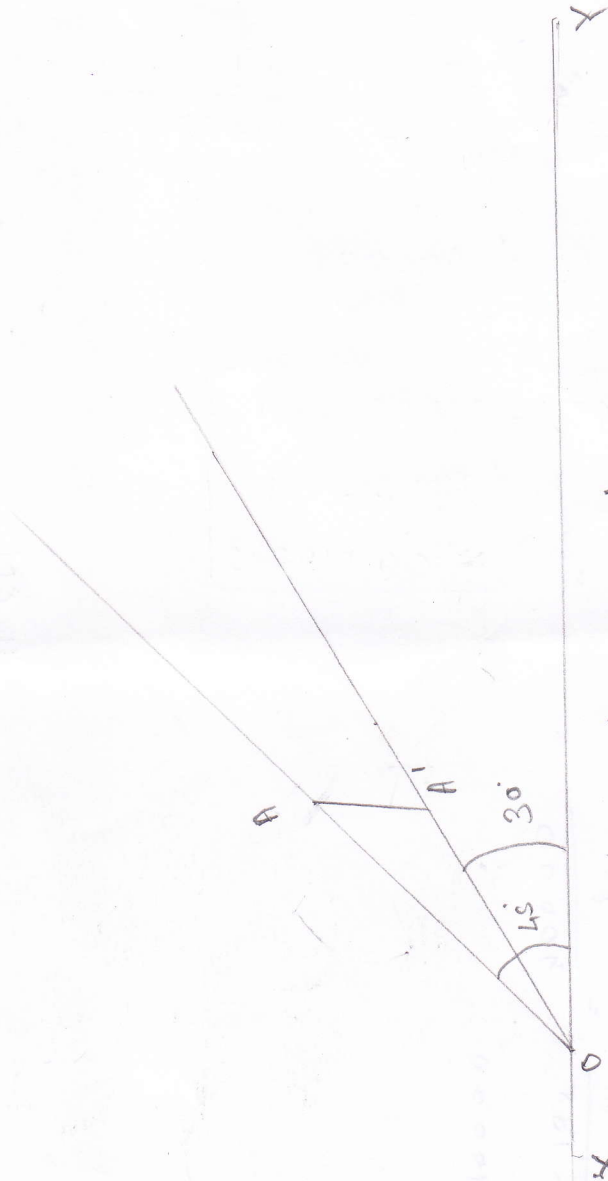
$$R.F. = \frac{2.5}{1 \times 10^5} = \frac{1}{40000}$$

$$= 1 : 40000$$

Answer: 2



$OA = 46 \text{ mm}$
 $OA' = 37 \text{ mm}$



isometric scale of $OA = 37 \text{ mm}$

ANANDA

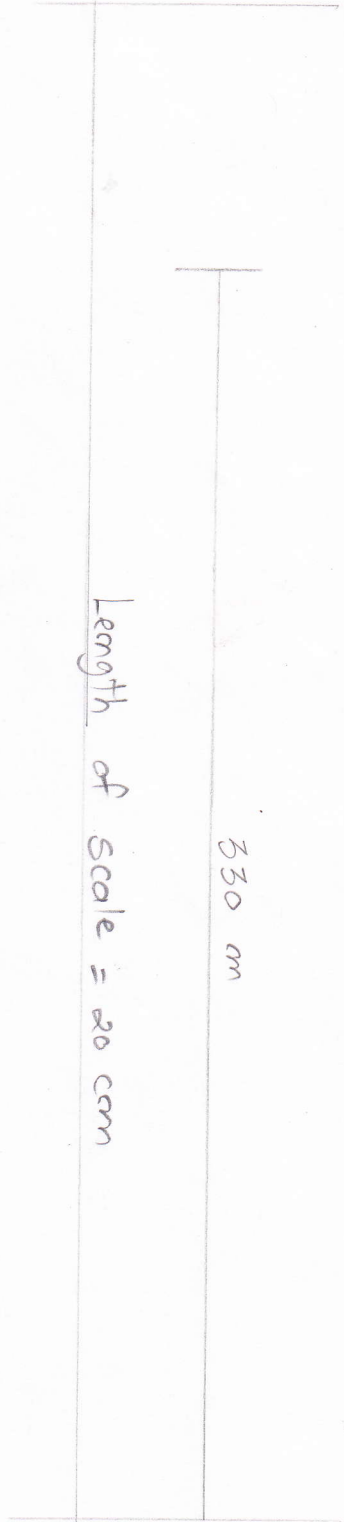
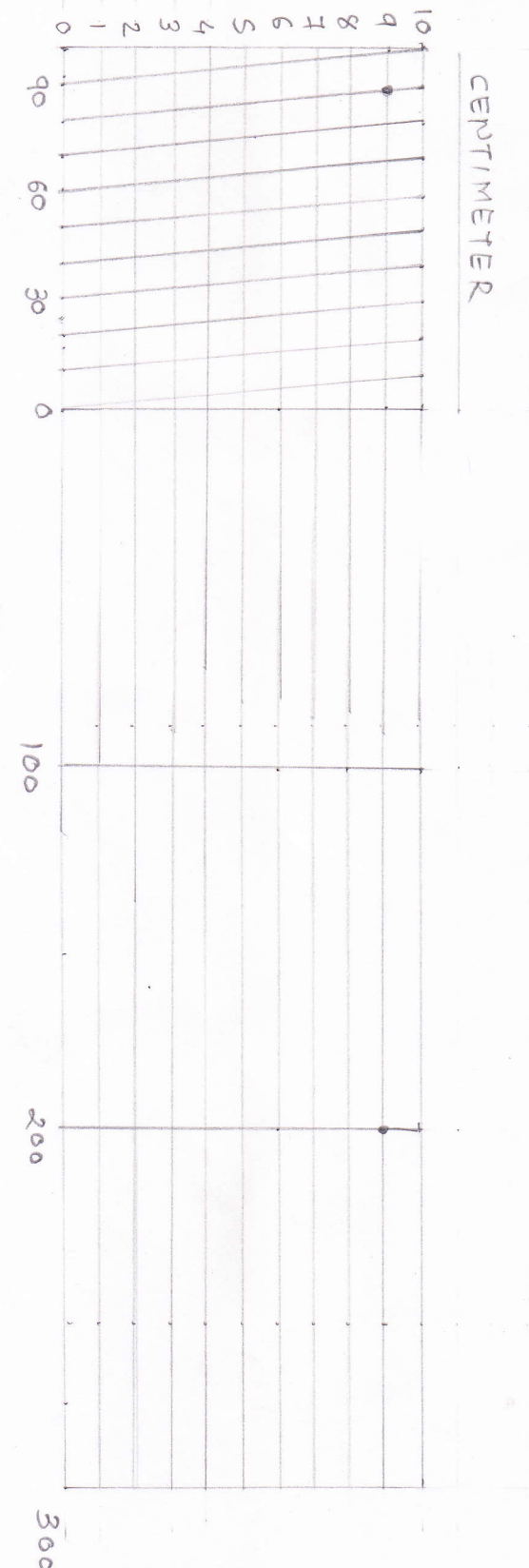
Answer: 37

$$RF = \frac{16.5}{3.3 \times 10^4} = 5 \times 10^{-4}, \text{ Actual length of scale} = RF \times 400 \times 10^2$$

$$= 5 \times 10^{-4} \times 400 \times 10^2 = 20 \text{ cm}$$



GTV - MARCH
 7 MARKS

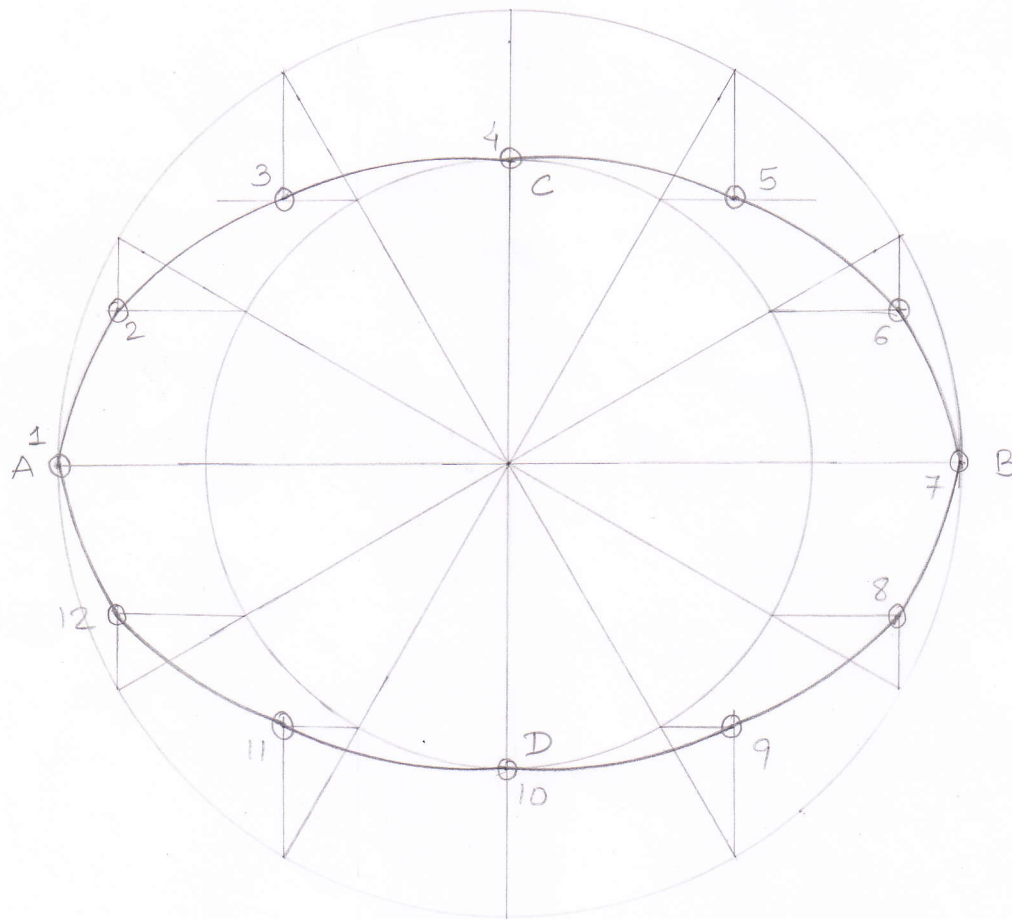


Answer: 4

Ellipse by "Concentric
circle Method"

CD = Minor axis = 80 mm

AB = Major axis = 120 mm

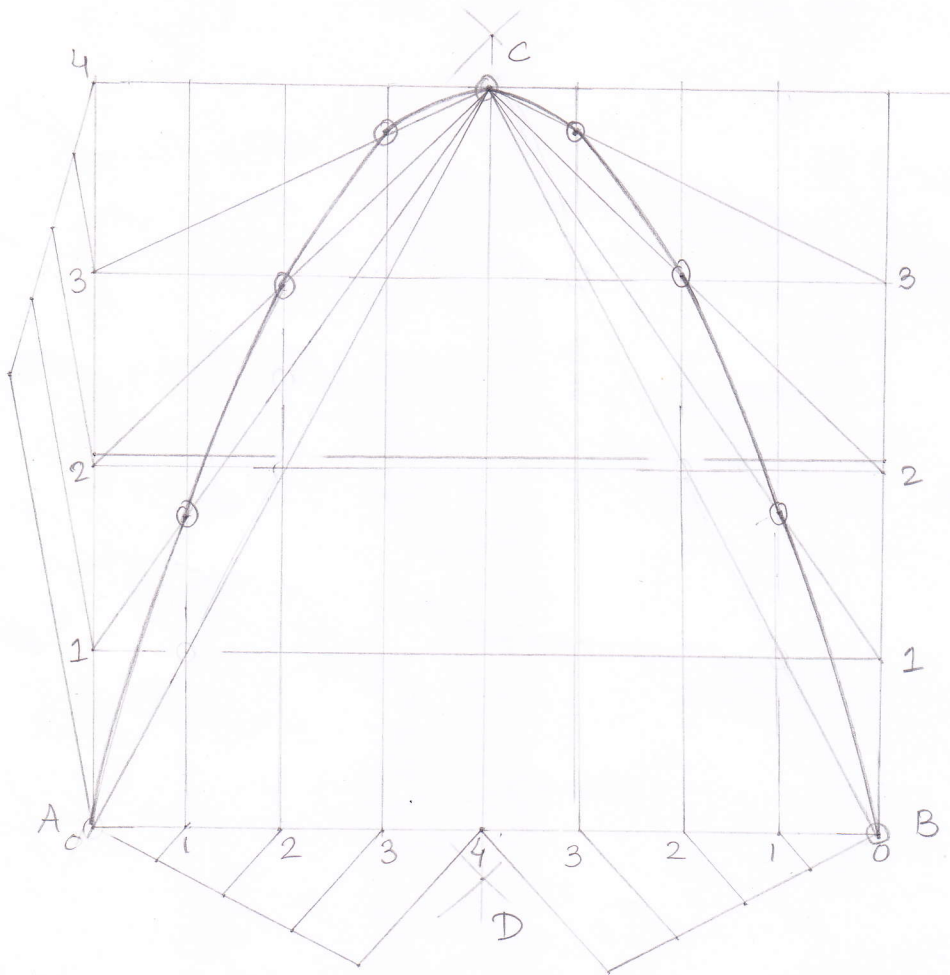


Answer: 5

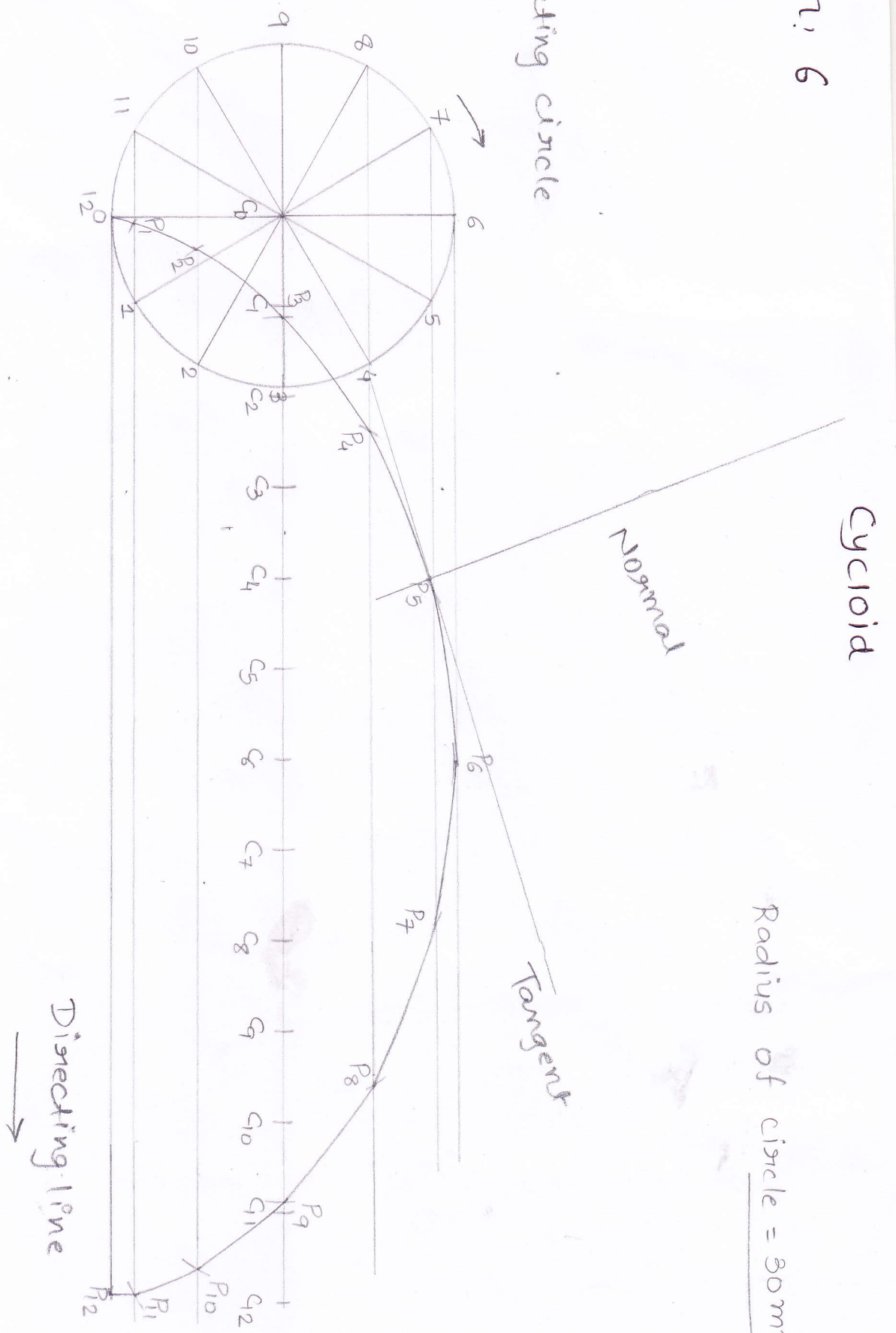
base = 105 mm

Axis = 98 mm

Parabola by "Rectangle Method"



Answer: 6



Cycloid

Radius of circle = 30mm

Generating circle

Normal

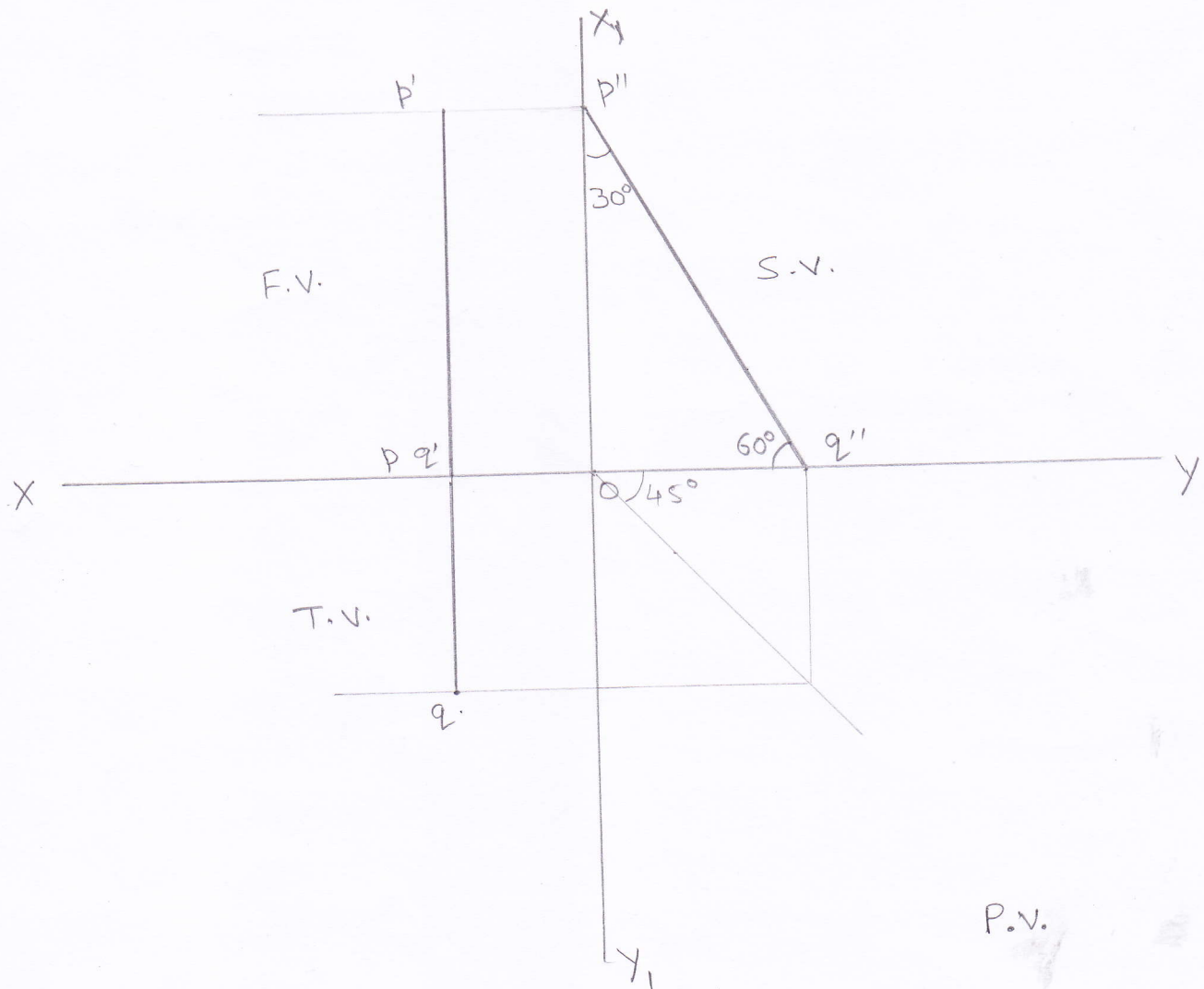
Tangent

Directing line

Projections of Lines

Prob. 7:- A line PQ, 60mm long has its end P on VP and end Q on HP. Line is inclined to HP by 60° and VP by 30° and it is 20mm. away from the profile plane. Draw the three projections of the line. [May 2013]

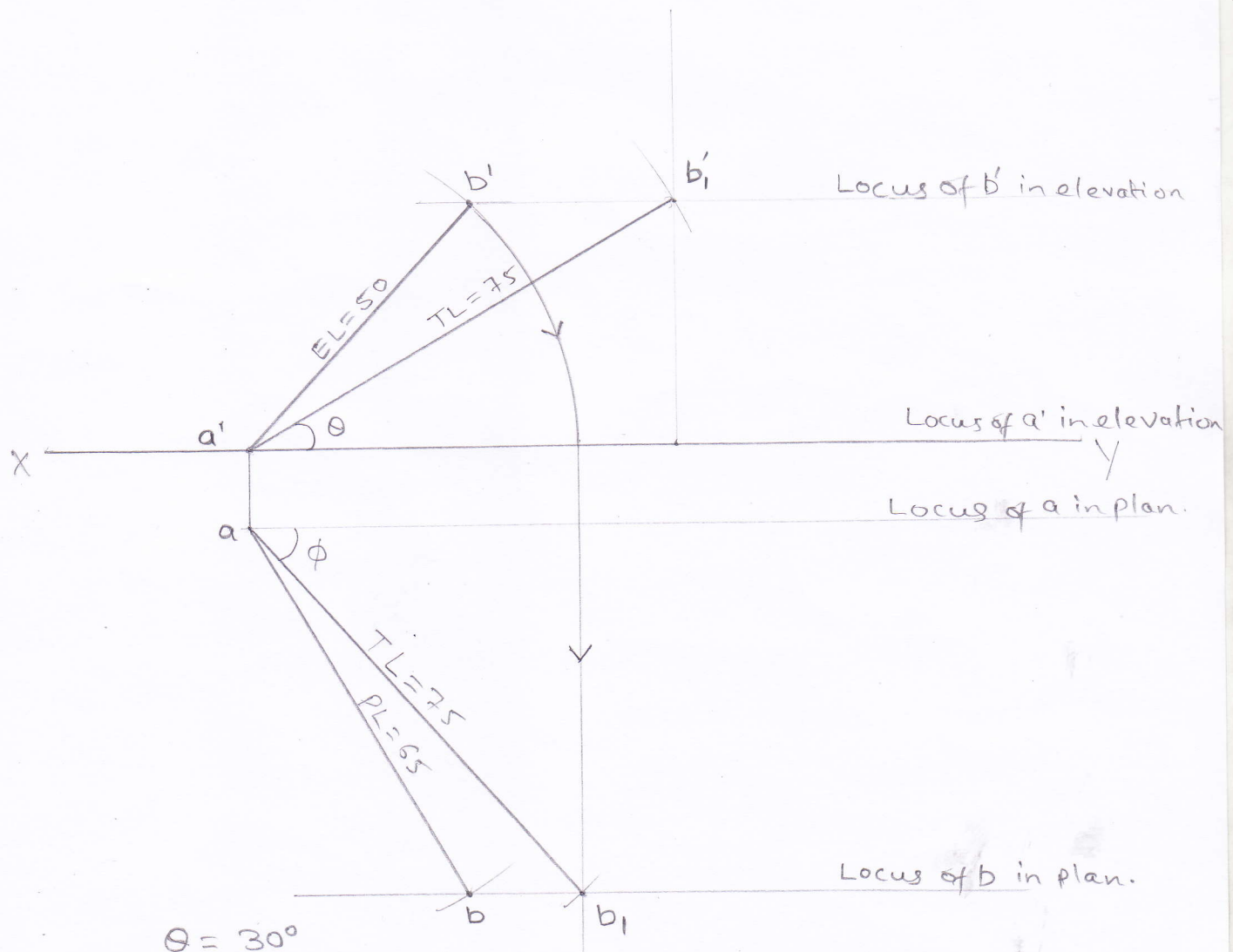
Ans: 7 Assume line PQ in 1st quadrant.



[Dec 2011]

Prob. 8 :- The top view of 75 mm long line AB measures 65 mm and the length of its front view is 50 mm. Its one end A is in HP. and 12 mm in front of V.P.
 Draw the projections of line AB and measure its inclinations with HP. and V.P.

Ans! 8



$\theta = 30^\circ$
 $\phi = 49^\circ$

P.V.

Projections of Points

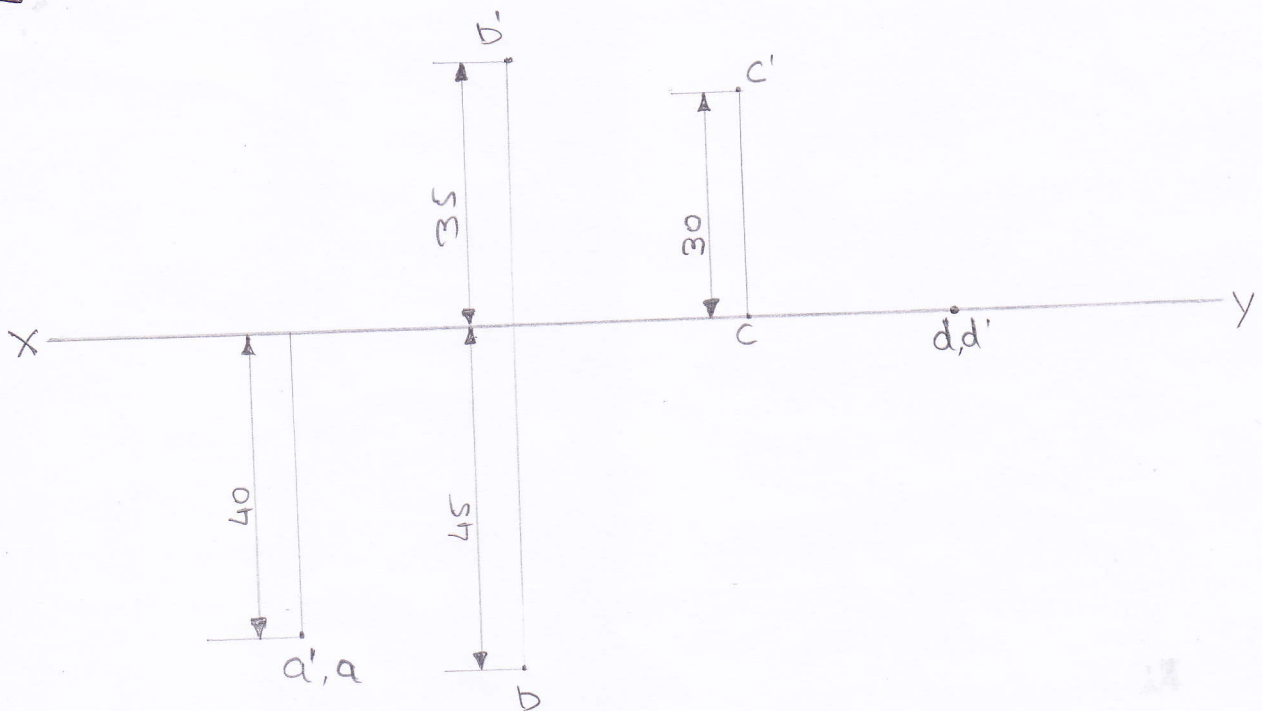
Alpha College of Engg. & Tech., Khatraj
Department of Mechanical Engineering
BE First Sem (Engineering Graphics-2110013)

[June 2010]

Prob. 9:- Draw the projection of the following points on the same X-Y line.

- A point 'A' 40mm below HP and 40 mm in front of VP.
- A point 'B' 35 mm above HP. and 45 mm in front of VP.
- A point 'C' on VP and 30 mm above HP.
- A point 'D' on HP. and VP. both.

Ans: 9



NOTE:-

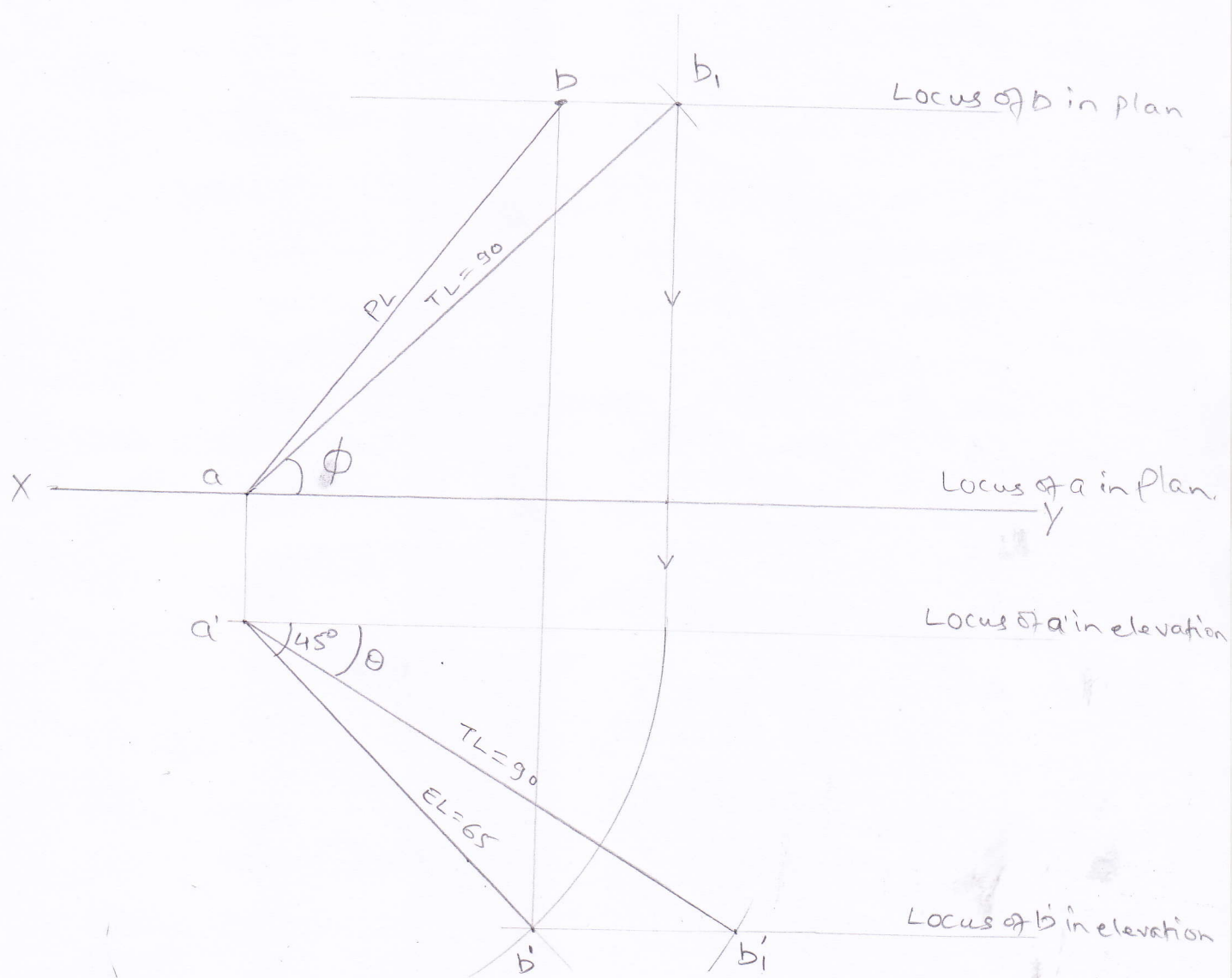
- Use only small letters of english alphabets to mark top view and front view.
- For front view use a' , b' , c' , - - - - -
- For top view use a , b , c , - - - - -
- Do not forget to draw arrow heads.

P.V.

[June 2009]

Prob. 10:- The front view of a line AB, 90 mm long, measures 65 mm. Front view is inclined to XY line by 45° . Point A is 20 mm below HP and on VP. Point B is in third quadrant. Draw the projections and find inclinations of line with HP and V.P.

Ans: 10

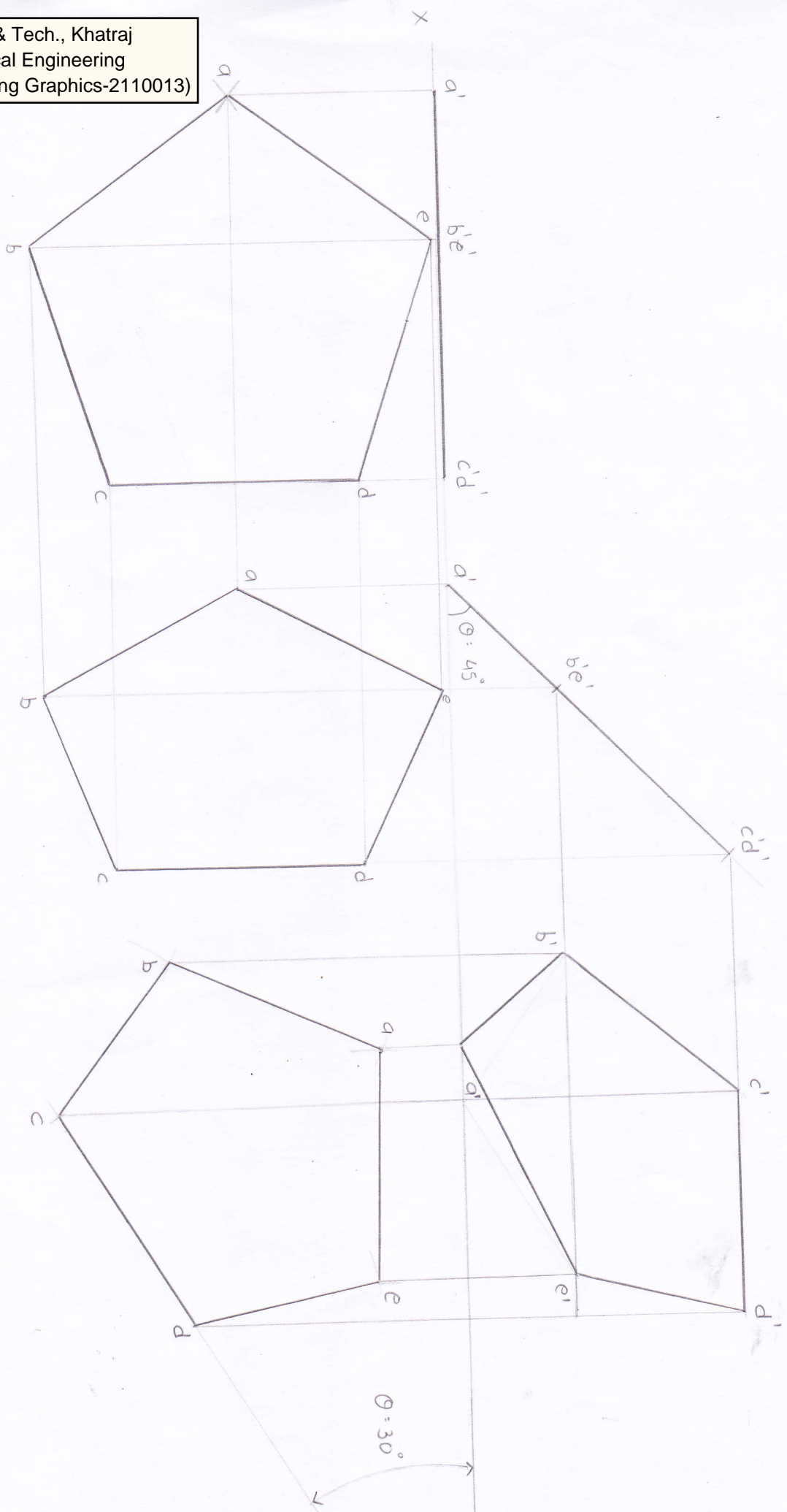


$\theta = 31^\circ$
 $\phi = 44^\circ$

Since it is a problem of 3rd quadrant so θ (angle of line AB with HP) is shown in HP. and in the same way ϕ is shown in V.P.

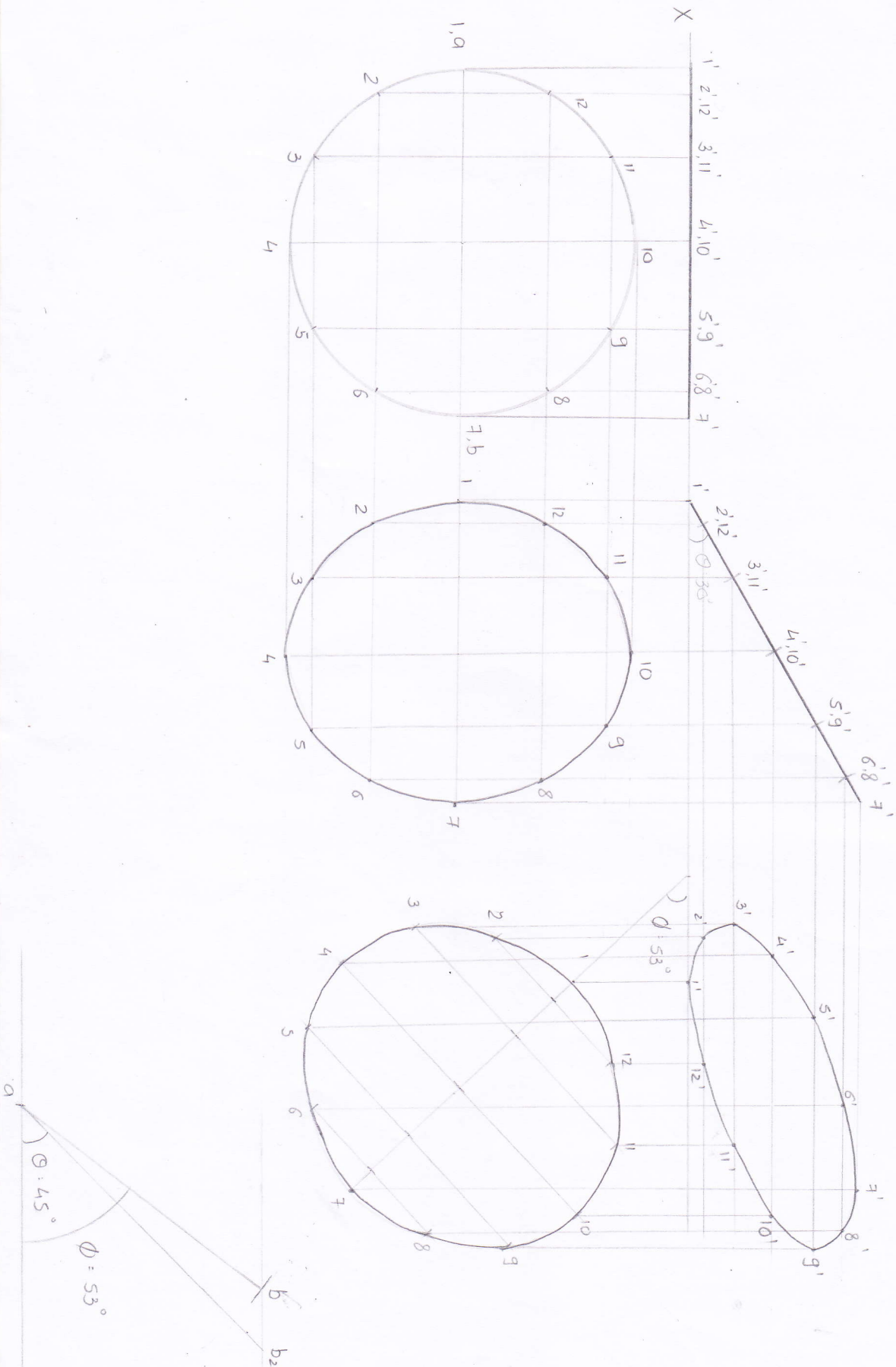
Answer: 11

Projection of Pentagonal Plane



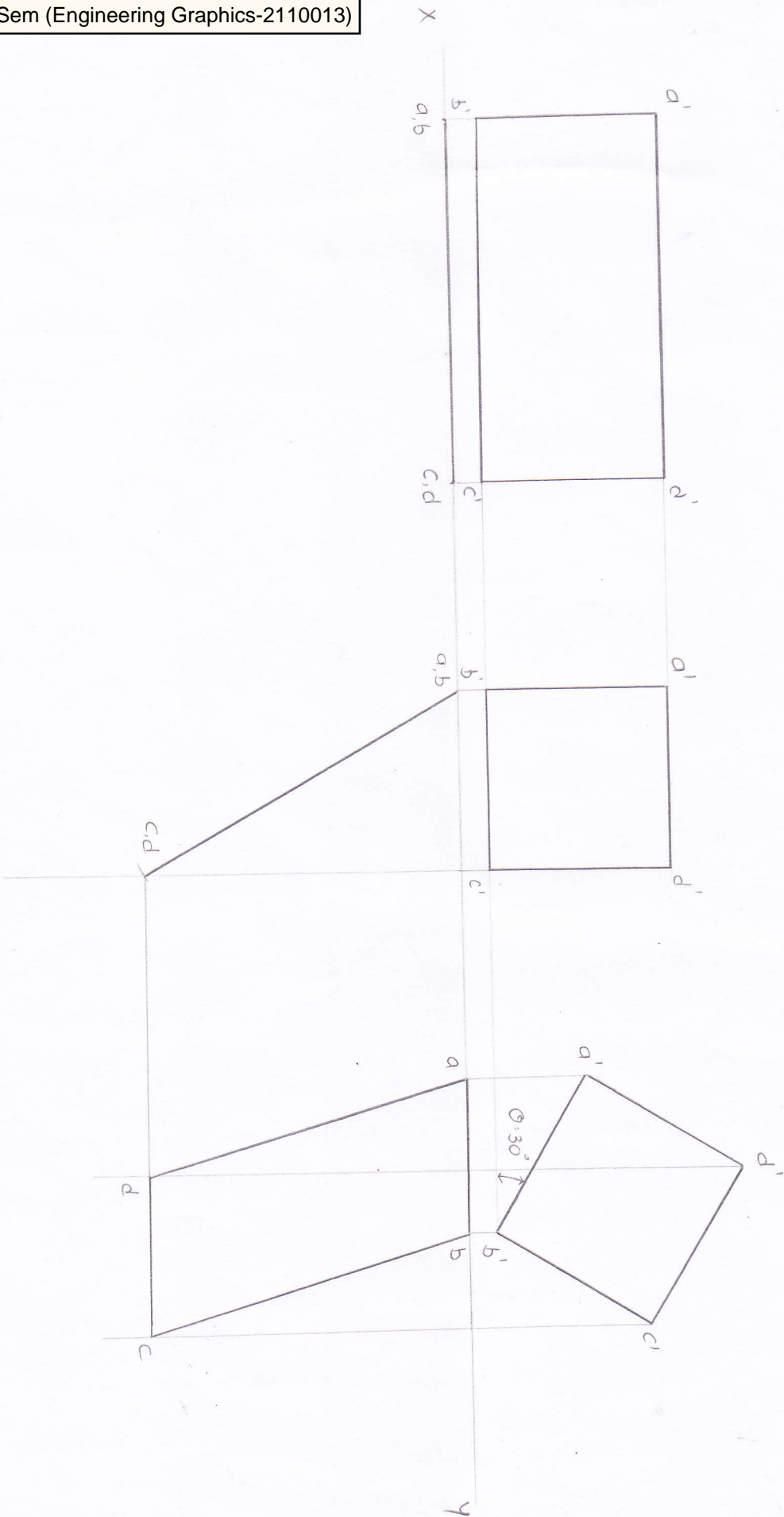
Answer: 12

Projection of Circular Plate



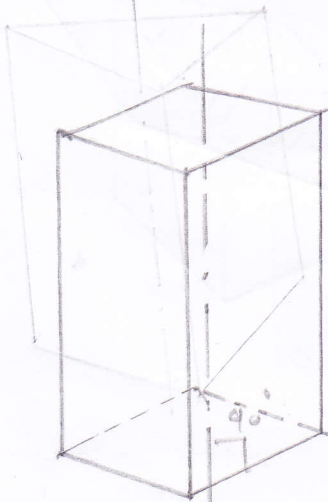
Answer: 13

Projection of Rectangle



CLASSIFICATION OF SOLIDS

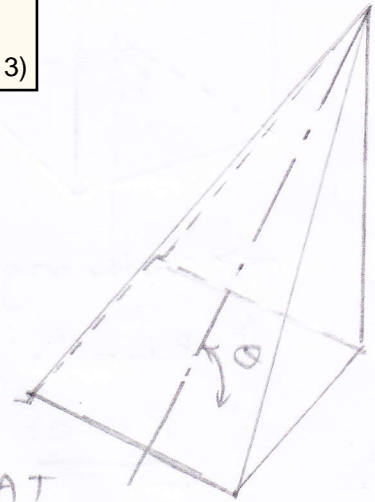
1. Right Solids



AXIS AT
 90°

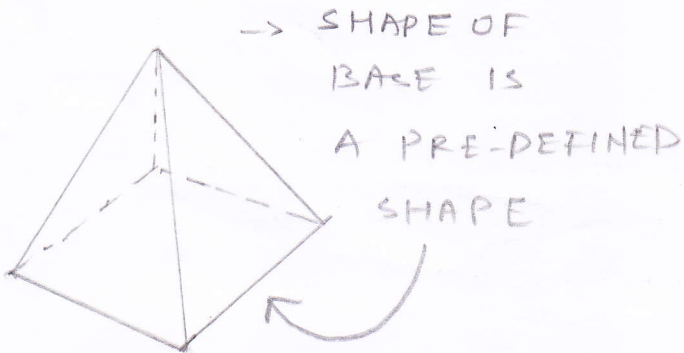
Alpha College of Engg. & Tech., Khatraj
Department of Mechanical Engineering
BE First Sem (Engineering Graphics-2110013)

Oblique Solids



AXIS
NOT AT
 90°

2. Regular Solids



→ SHAPE OF
BASE IS
A PRE-DEFINED
SHAPE

Irregular Solids



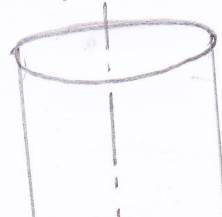
→ SHAPE OF
BASE IS
IRREGULAR

3. Polyhedra



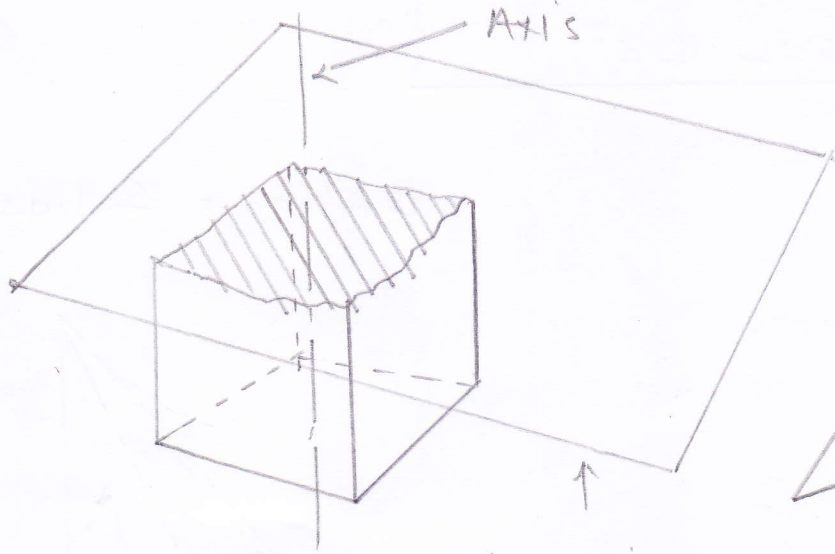
→ 4-EQUI-
TRIANGULAR
FACES CREATES
POLYHEDRA

Solids of Revolution
→ CYLINDER → SPHERE

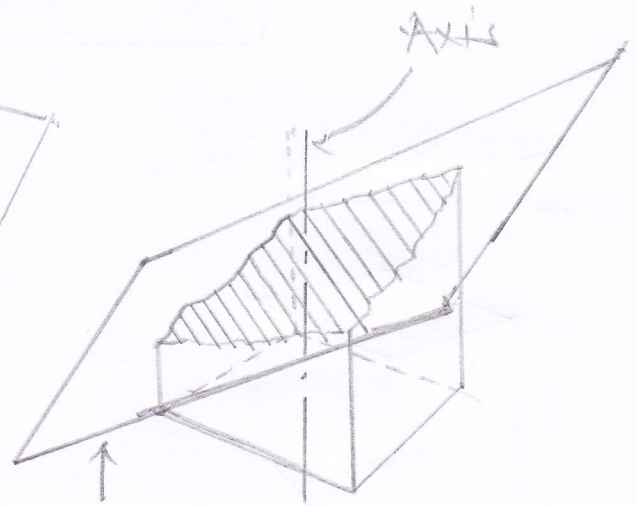


4. FRUSTOM OF SOLIDS

TRUNCATED FRUSTOM OF SOLIDS,



→ Cutting plane is parallel with Base.



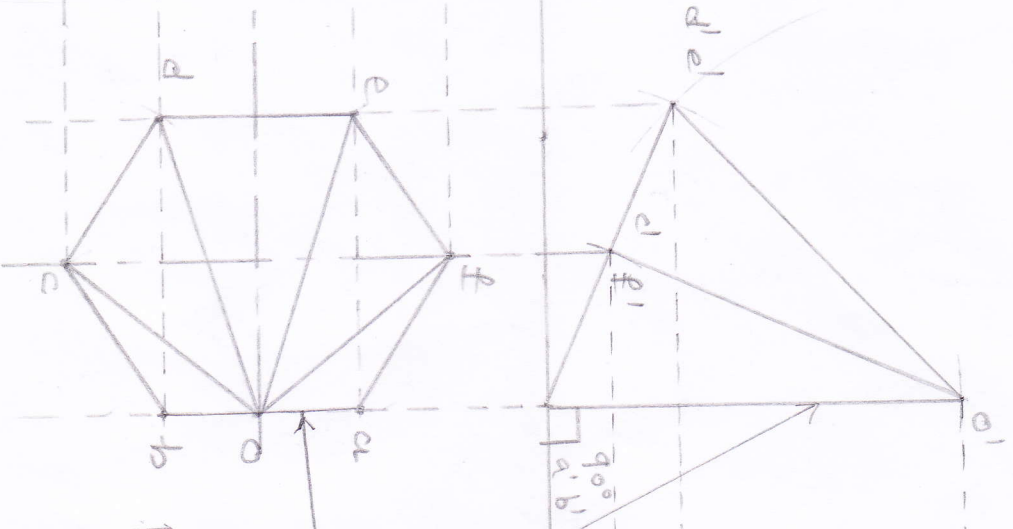
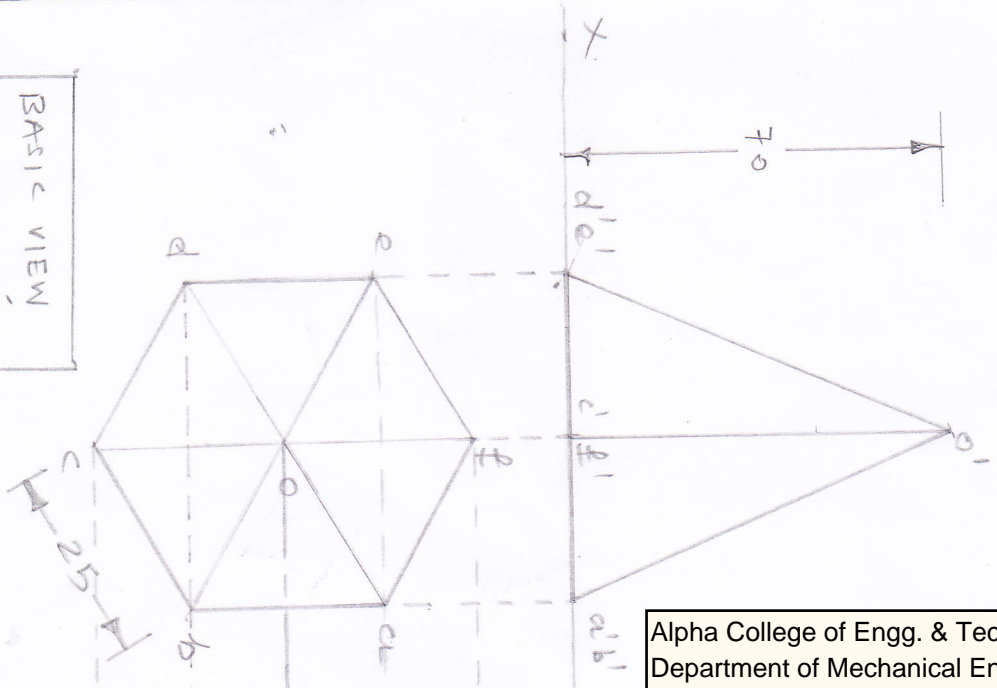
Cutting Plane is inclined with respect to Base

PROBLEM OF PROJECTION OF SOLIDS WHEN AXIS IS INCLINED WITH BOTH H.P. & V.P.

Answer: 14

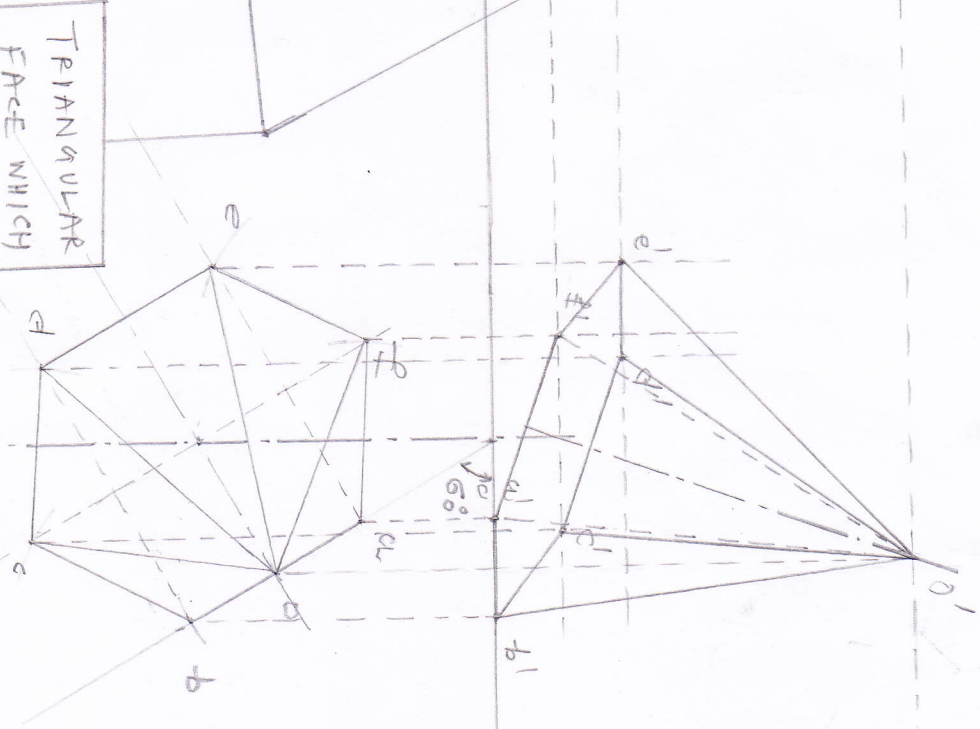
Alpha College of Engg. & Tech., Khatraj
 Department of Mechanical Engineering
 BE First Sem (Engineering Graphics-2110013)

BASIC VIEW WHEN SOLID RESTS ON H.P.



TRIANGULAR FACE WHICH IS AT 30° TO H.P.

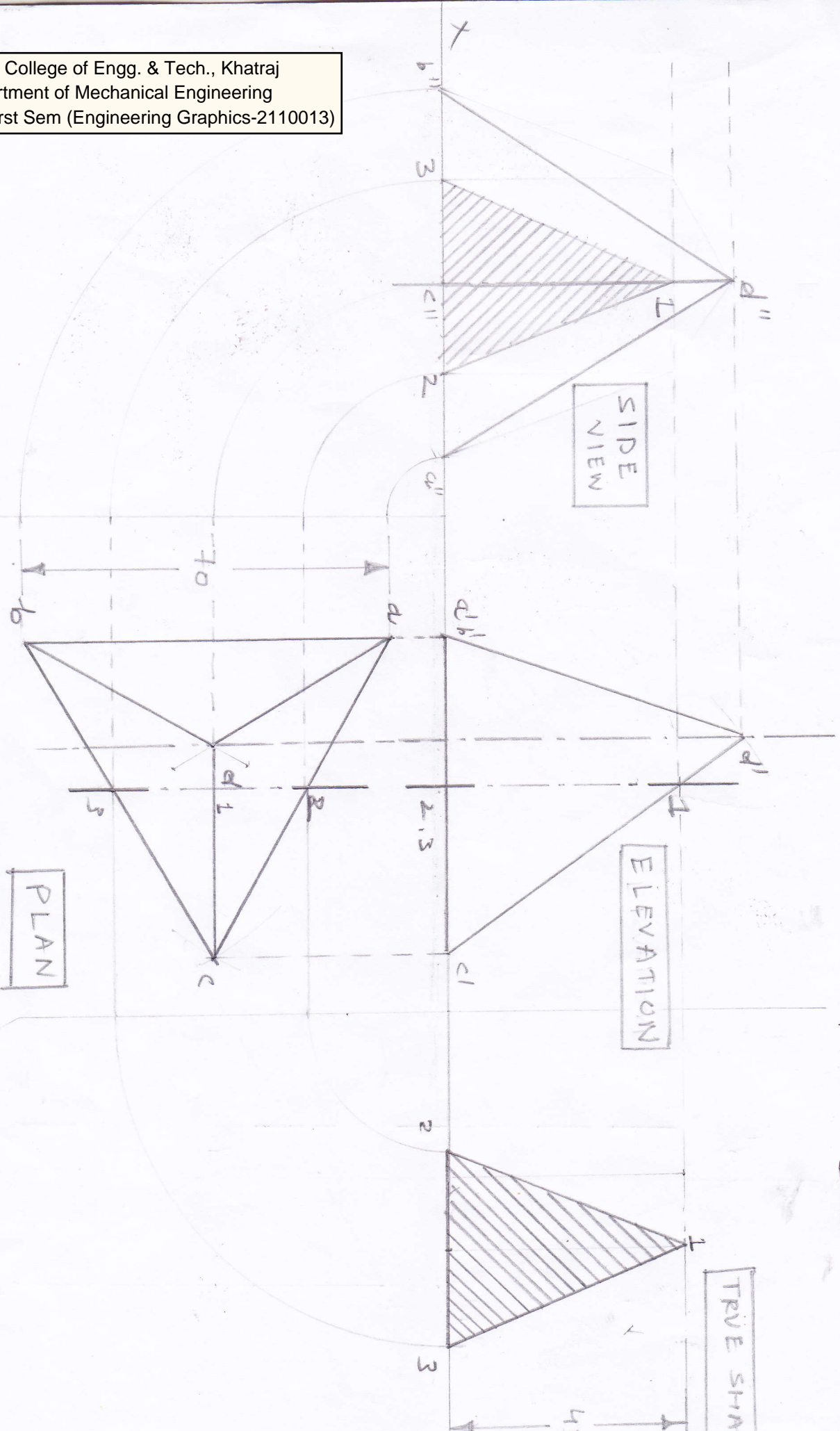
INCLINATION WITH V.P.



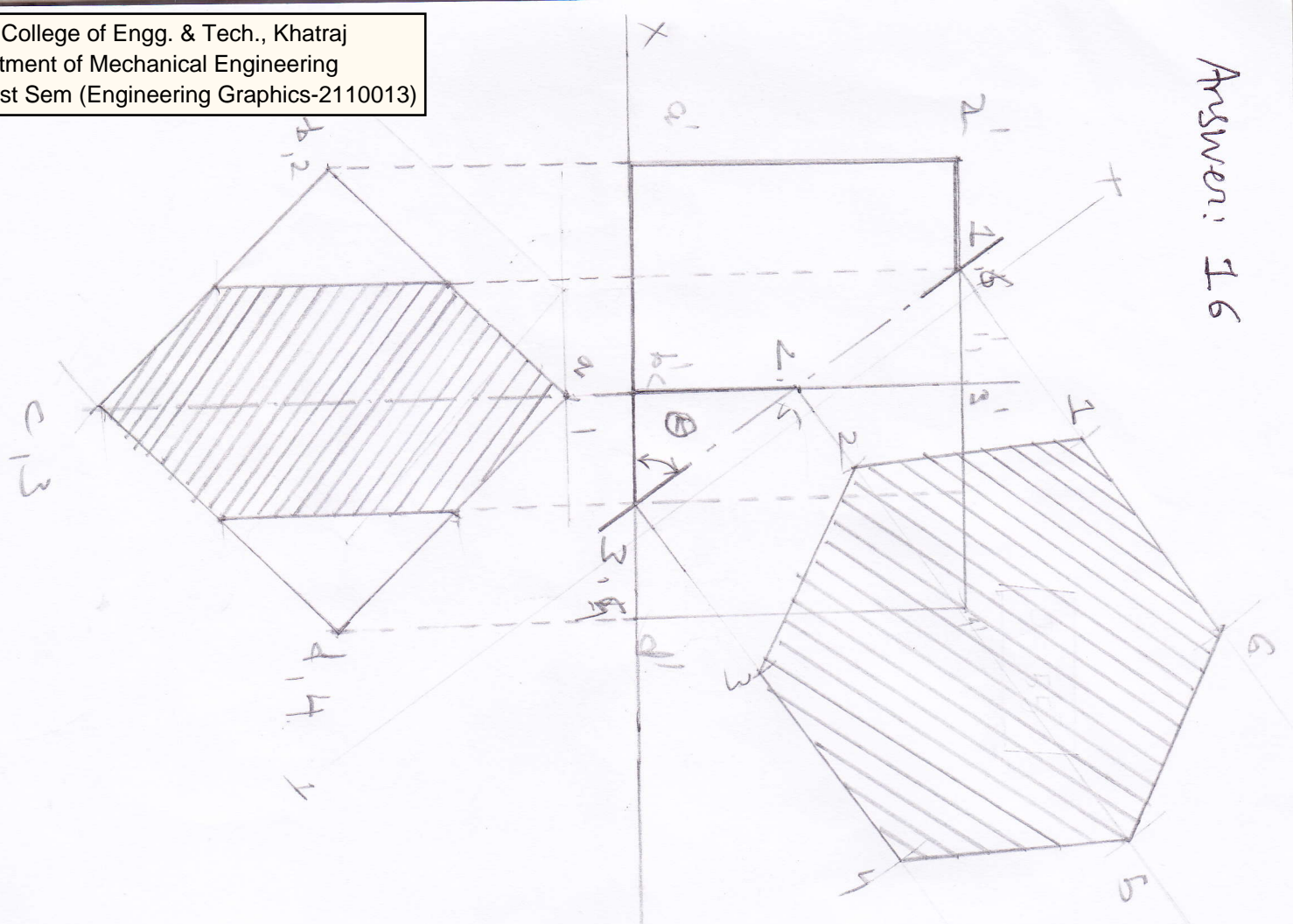
T.M
 S.M

A PROBLEM ON SECTION OF SOLIDS :-

Answer: 15



Answer: I 6

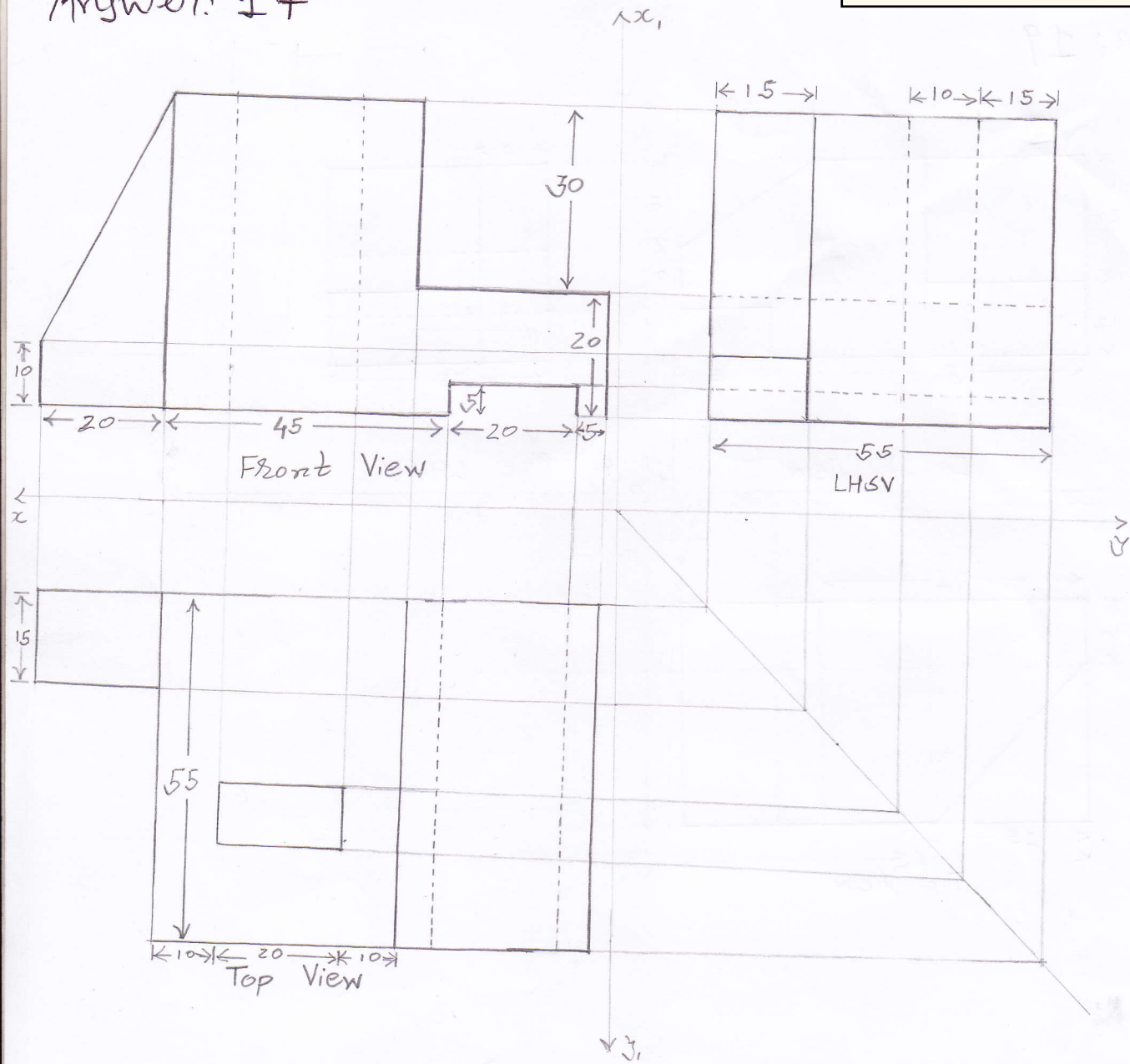


A PROBLEM ON
SECTION OF SOLIDS

Orthographic Projection

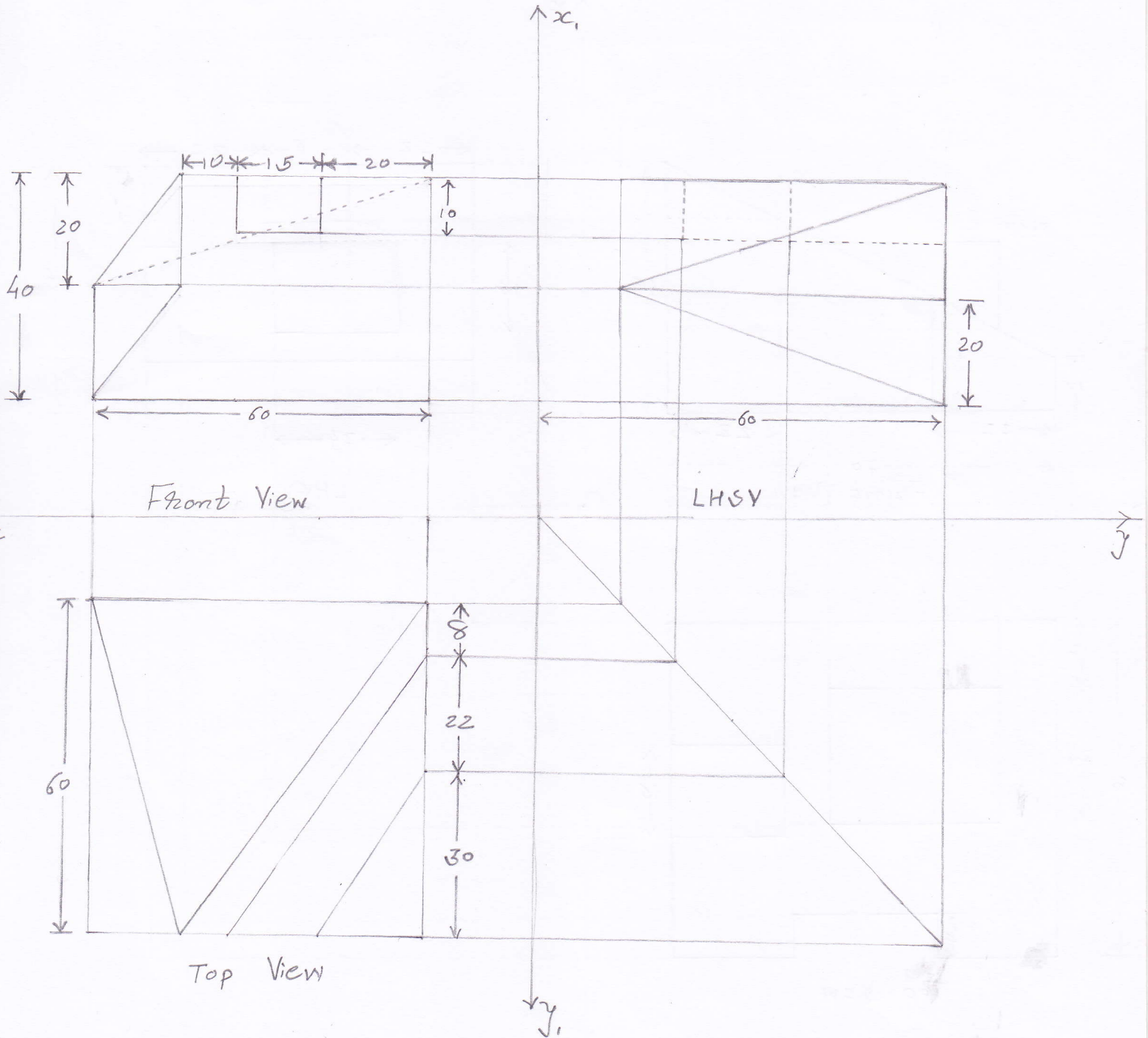
Alpha College of Engg. & Tech., Khatraj
Department of Mechanical Engineering
BE First Sem (Engineering Graphics-2110013)

Answer: 17



Orthographic Projection

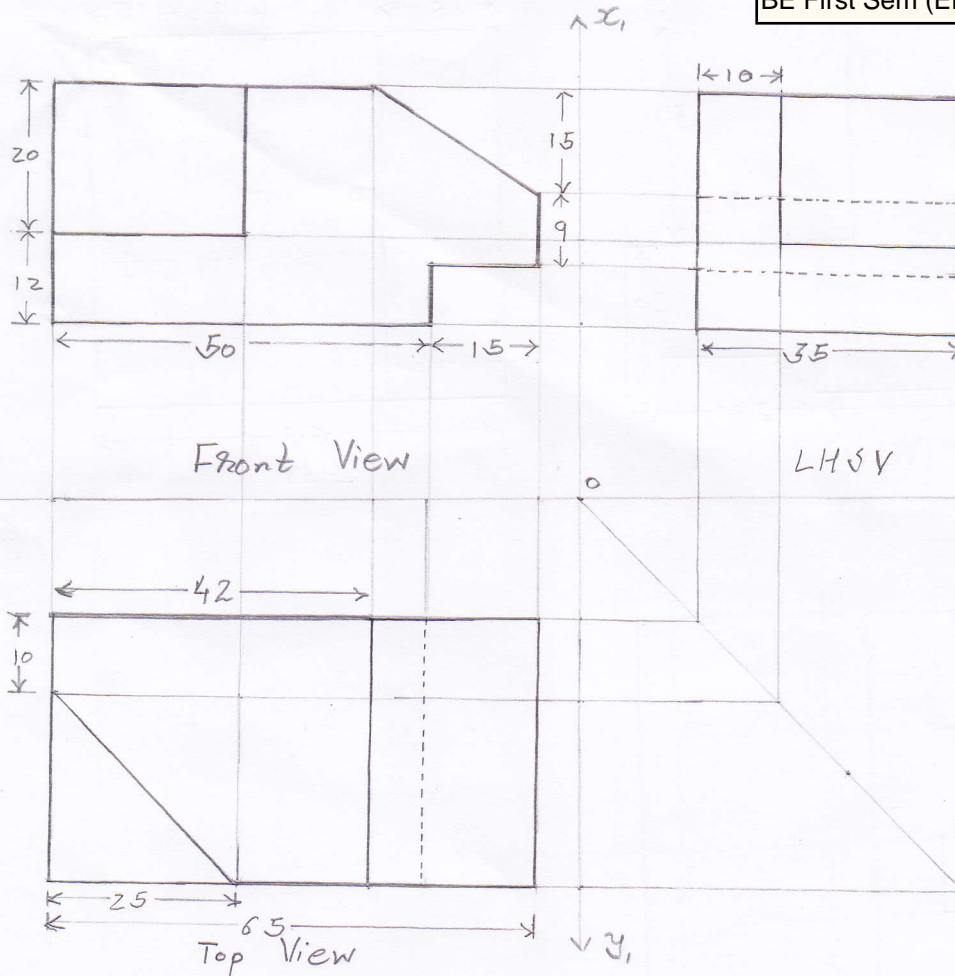
Ans: 18



Orthographic Projection

Answer: 19

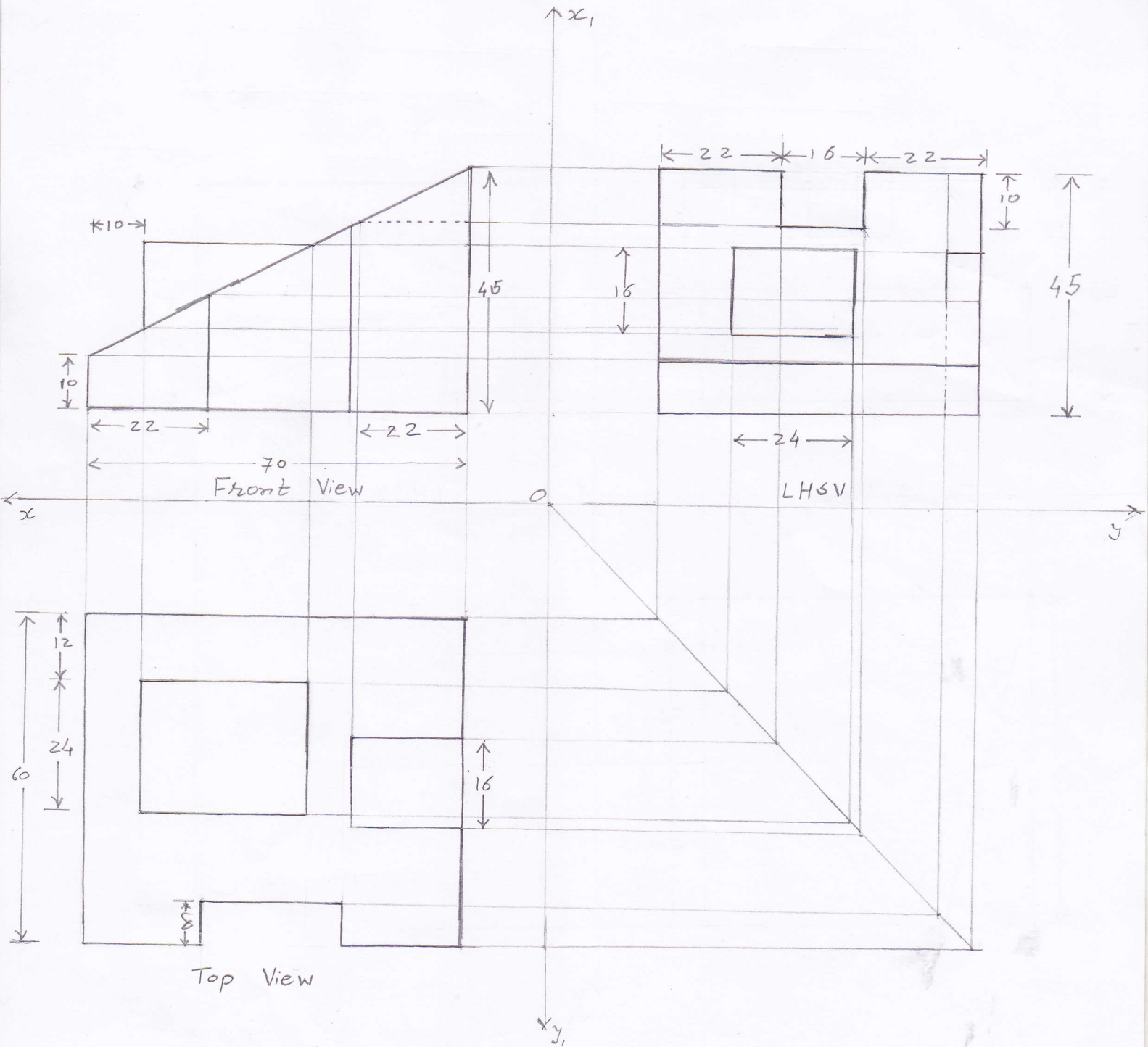
Alpha College of Engg. & Tech., Khatraj
Department of Mechanical Engineering
BE First Sem (Engineering Graphics-2110013)



Orthographic Projection

Answer: 20

Alpha College of Engg. & Tech., Khatraj
Department of Mechanical Engineering
BE First Sem (Engineering Graphics-2110013)

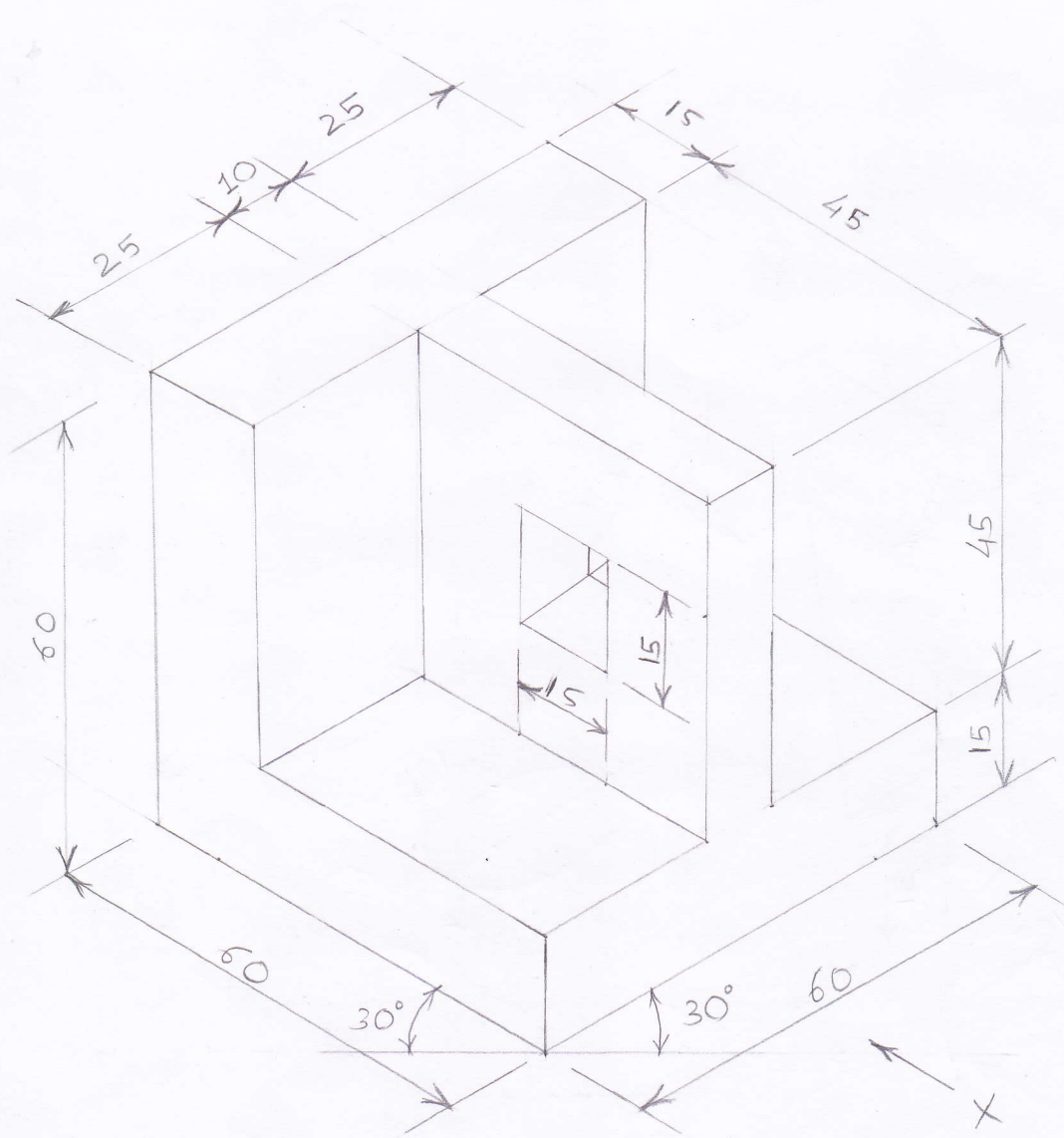


ISOMETRIC VIEW / PROJECTION

Prob.-1 May-2013

Alpha College of Engg. & Tech., Khatraj
Department of Mechanical Engineering
BE First Sem (Engineering Graphics-2110013)

Answer: 21



Answer: 22

Isometric view

