Page-2

Date- 01/10/2024

Line

Type of lines:

(i) outline: Lines drawn to a surface boundraies of an object called outlines on principle lines.

(ii) Margine lines: They are continuies thike lines along which prints are trimmed.

(iii) Dimension lines: These are continuese thin lines and they are terminated at the outer and by pointed arrow edge touring the outlines and extension lines.

iv) Extension lines: These are also continues thin lines they are extended by 3mm beyond the diamension line and these line are also called projection line.

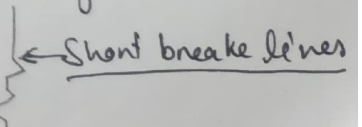
v) Center line: They are drawn to indicate the exceurs of cylindrical, Ponicaln spherical object and also to show the centers of the surface.

vi) Section line: These lines are drawn to make the section inedent. They are continues thin lines and are generally drawn at ∠45°. These lines are also called velsing line.

Vii) Leader on pointer lines: Leader line is drawn to conect a note with features to which it applyes.

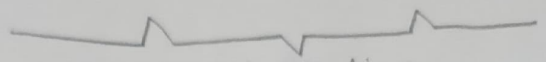
Vii) Hidden lines: Inserion on Hidden Surface are shown by hidden lines on doted lines. they are also called dashed line.

ix) Short break lines: These lines are continuies thin lines and drawn by freehand and use to so short breakes on eregular boundraies.



Date- 01/10/2024

⑧ Long break lines :- These lines are continius thin and use to so long breaks and are drawn by zig-zag shape.

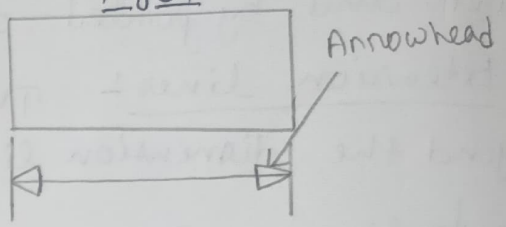


Long break lines.

Dimansions :-

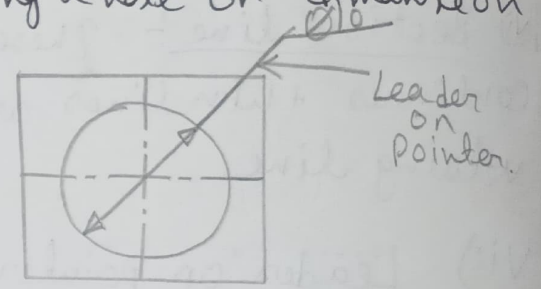
① Annowhead :- An annowhead is placed at the end of an ~~object~~ dimension line the length of annowhead shald be 3times to maximum wiwch. Fig 0.1

Fig 0.1



② Note :- A note gives infonfmation regarding sparific operation relating to each features it is so wnitten that may be read when the drawing is viwed from bottom edge.

③ Leader :- A Leader on pointer is a continues thin line connecting a note on dimansion with the features to which it applyes.

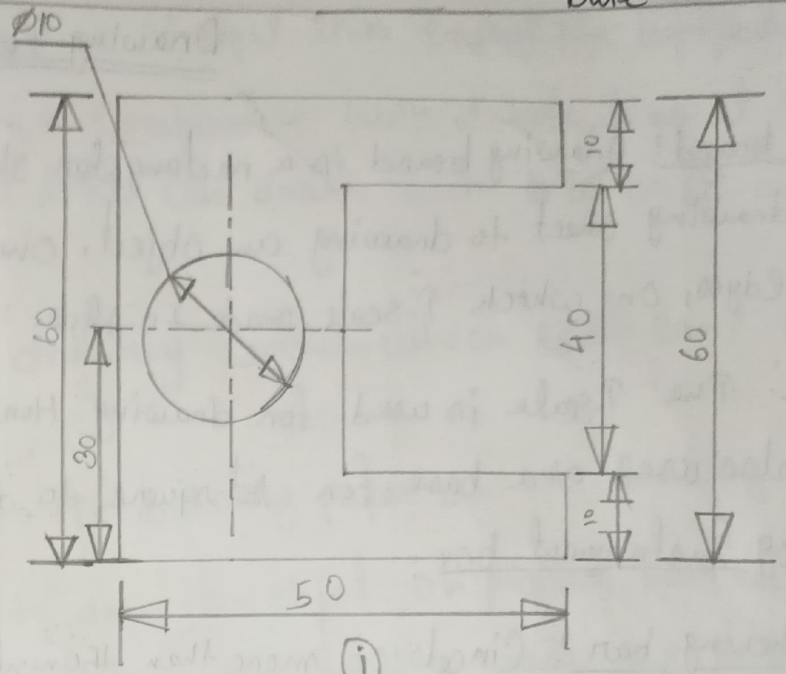


Date- 01-10-2024

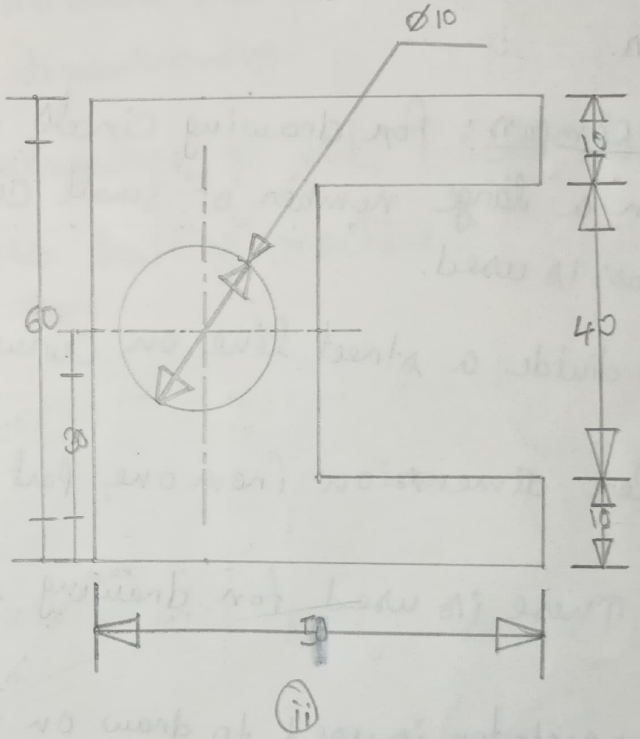
Placing of Dimensions

① **Alinged system** :- In the Alinged system dimensioning dimension is placed perpendicluled to the dimension line in such away that it may be read from the bottom edge or rightheand of the object. The dimension should be placed near and above the dimension line.

② **Unidirectional system of dimensional** :- In Undirectional system of dimensional are placed so that, thate can be read from the ~~buttoum~~ bottom ~~of~~ edge of the drawing sheet. The dimensions are placed at the broken on middle portion of the dimension line.



(i)



(ii)

Date – 02/10/2024

Drawing Instruments

1) Drawing board: Drawing board is a rectangular shape of wodden board which is use for Plasing a drawing sheet to drawing an object. one of the edges of the board is used as working edges, on which T-scale made to slide.

2) T-Scale: The T-Scale is used for drawing Horizentals lines. The working edge of the T-scale is also used as a base for set-squere to draw vertical, Horizental and inclined lines.

3) Drawing Instrument box:

i) Lengthening bar: Cincels of more than 150mm radius are drawen withe the half of lengthening bar.

ii) Small bow compass: For drawing cincels and arc of less then 25mm radius and Particularly when a large nomber of small cincles of the same diameter are to drawn Small bow compass is used.

iii) Divider: To divide a street line on curved into desired no. of equal parts we have used divider.

TO transfer dimension from one part of the drawing to another we have used divider.

iv) Inking pin: There is used for drawing small cincels, straight lines with the help of inking pin.

v) Protecton: The protecton is used to draw on mesure of an angle which can't be drawn by ~~actun~~ setsqure.

Date- 02-10-2024

vi) Setsqure: Setsqure ~~are~~ are used for drawing straight lines expact the Horizental lines which are ureaty drawen by T-Scale. In a Combination with t-Scale, line at 30° or 60° Angle with the vertical or Horizental line can drawn with 30° or 60° angels setsqure or 45° or 45° setsqure.

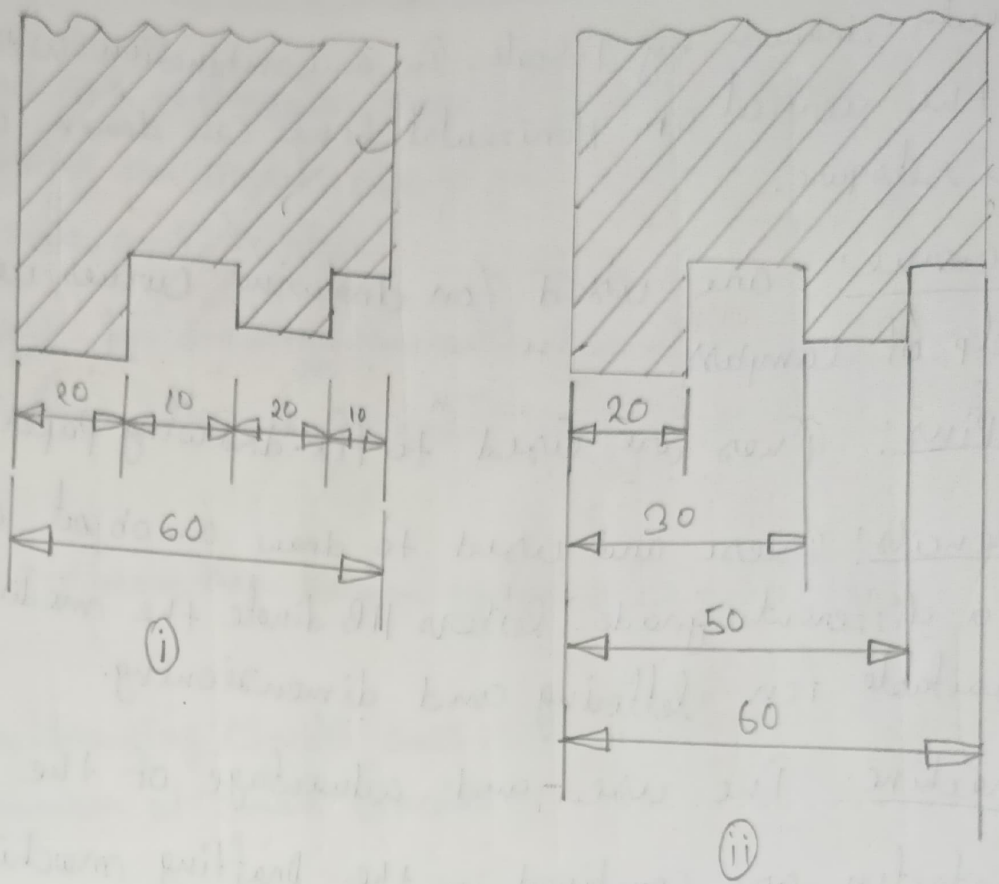
vii) French curve: are used for drawing curves which can't be drawen with the help of compass.

viii) Drawing Pins: These are used to fix drawing paper on the drawing board.

ix) Drawing pencils: These are used to draw an objed on pictures. The pencil leed are classify a different grade. letters HB dinote the medium grade. and letter H and HB are more suitable for lettering and dimensioning.

X) Drafting machine: The used and advantage of the T-scale, setsquer, and Scal and the protecton are combined in the Drafting machine.

System of Dimensions:



i) Chain Dimensioning -

In chain dimensional system the dimension are arenge in a streat line. There is also called continious dimensional

(ii) Progressive Dimensional :- In there dimensioning the dimensiones are taken from a common based line. there is also called parellal dimensioning.

Date- 05/10/2024

Lettering

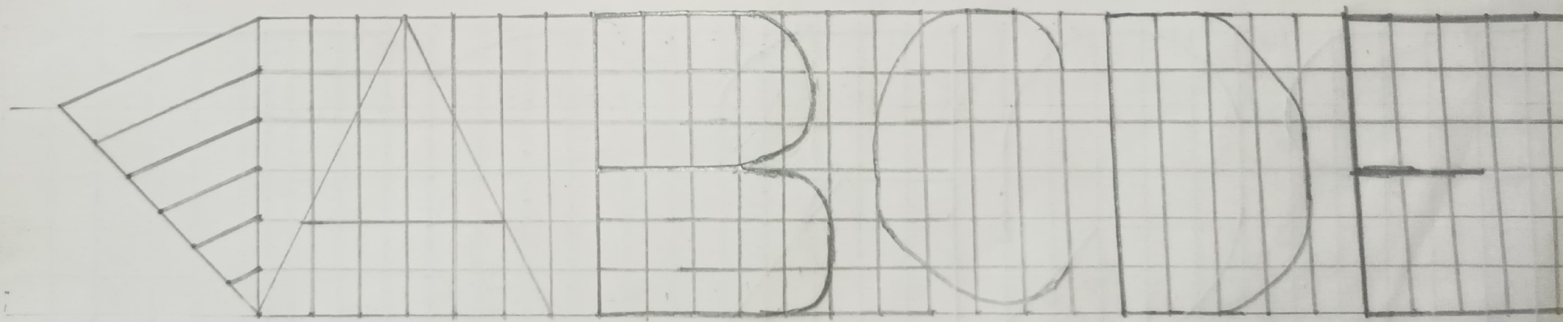
writing a letter, notes, titel, of an objed with a proper scale and dimension is known as lettering.

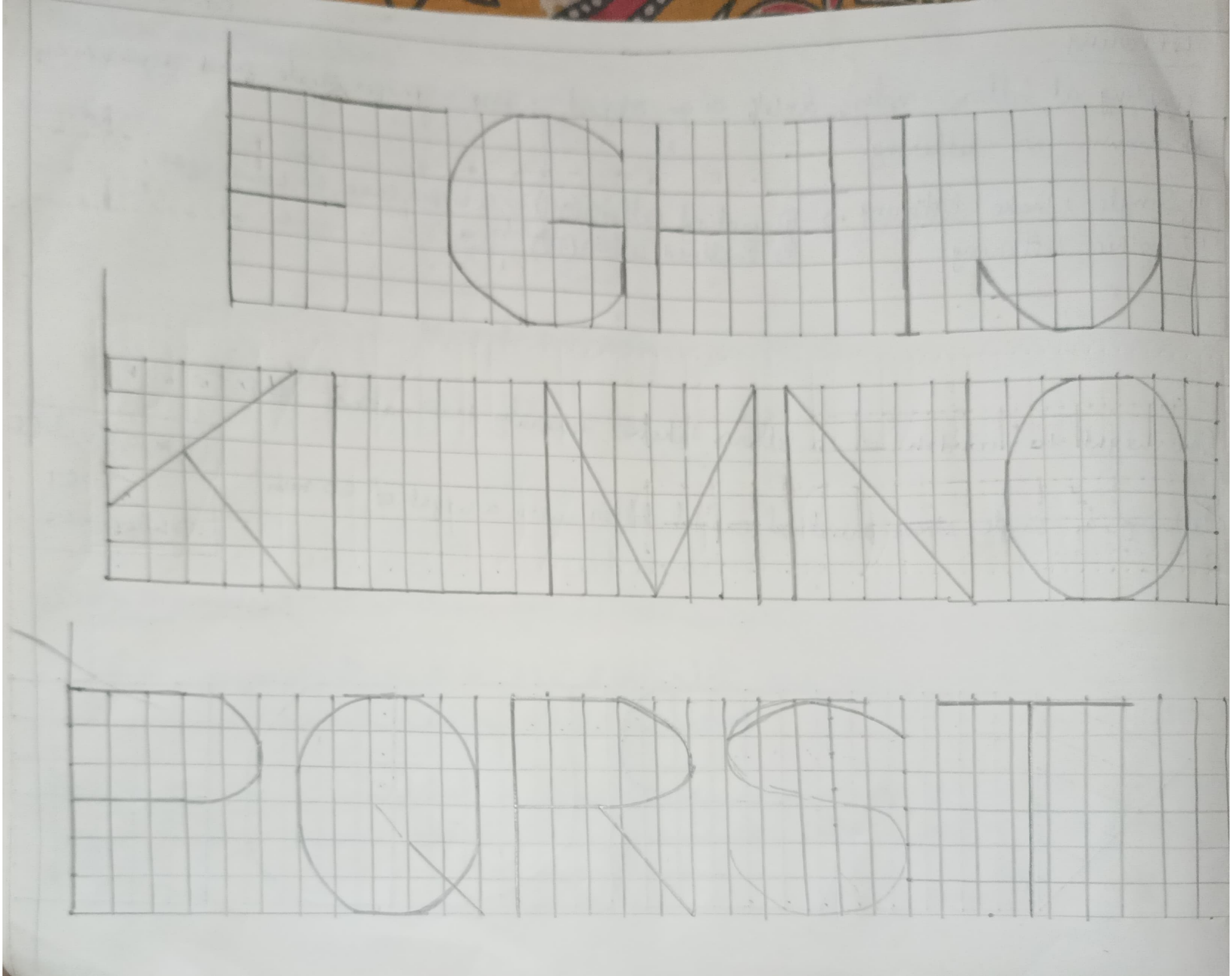
i) Single stroke lettering → (i) vertical Letters (90°) → (i) upper case, (ii) Lower case.
ii) Grothic Lettering (ii) Inclined Letters (75°)

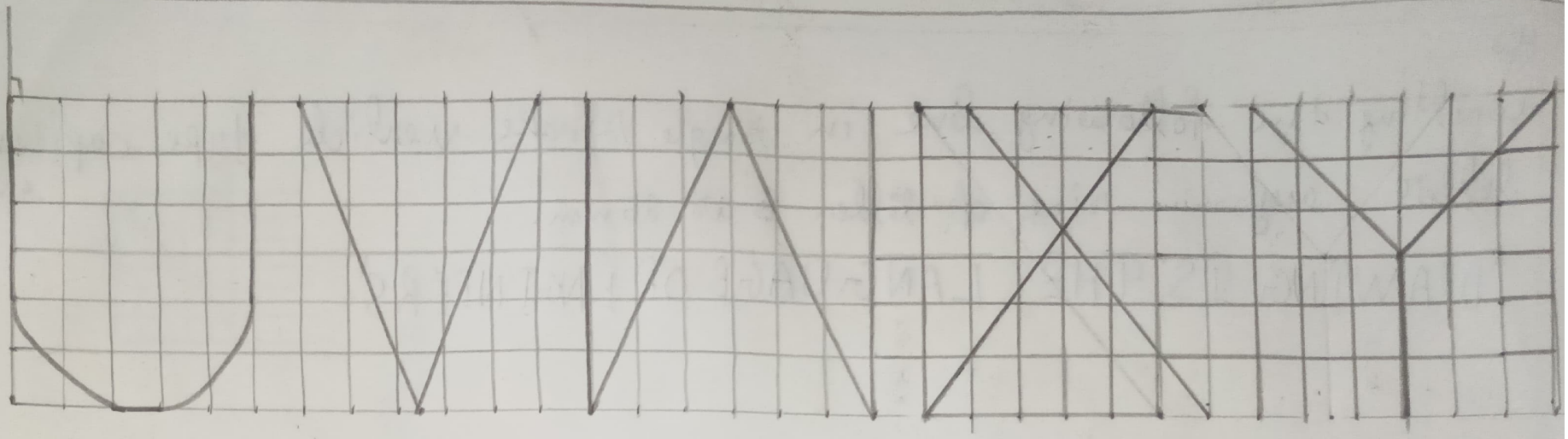
The hight to width of a letters taken generaly the ratioof 6:5

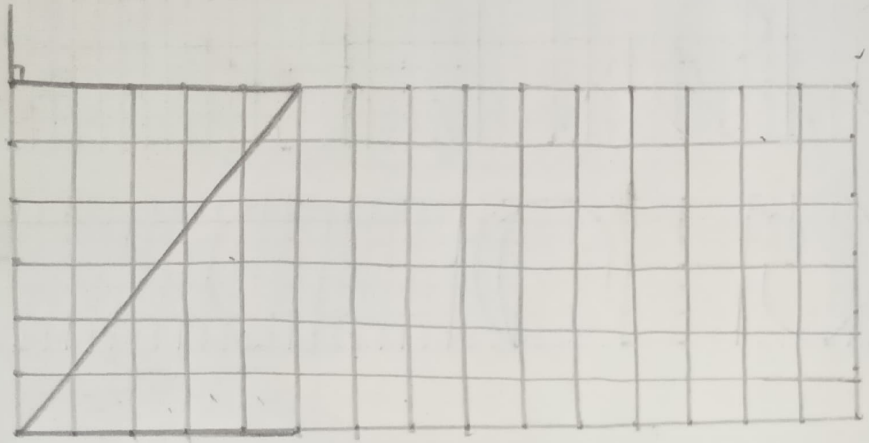
(A, M, O, Q, V, W) = 6
I → 6:1
19 Letters → 6:5

Q/ Lettering a single stroke vertical capital letter with a hight of 60 mm.




FGHIJ
KLMNO
PQRSTU





Scale

A Scale is difine as the ratio of the linner dimension of element of the object as representant in a drawing to the actual dimension of the same element.

1m = 100cm
1dm = 10cm

Types of Scale :

i) Plane Scale.
ii) Digonal Scale.
iii) vernier Scale.
iv) Comparative Scale.
v) Scale of Chords.

Representative fecton(RF): The Ratio of Length of drawing to the actual length of the object as Representant is called Representative fecton(RF).

Methematically,

$$RF = \frac{\text{Length of the drawing}}{\text{Actual Length of the drawing}}$$

Q Construct a plane Scale of 1:4 to showed cm and dm and to mesure upto 5dm. mesured onit 3.7dm.

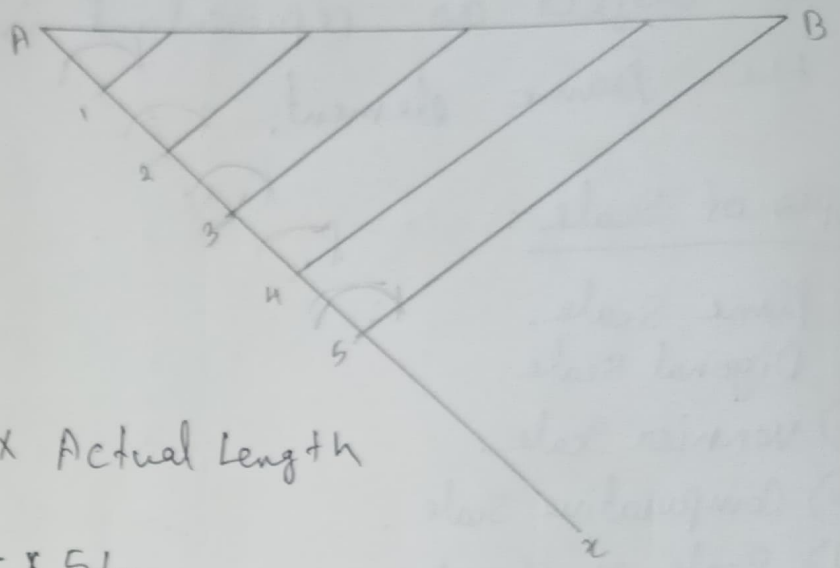
Soln

Given,

R.f = 1:4, $\frac{1}{4}$

Unit to be read = 1cm, 1dm

Maximum Length = 5dm



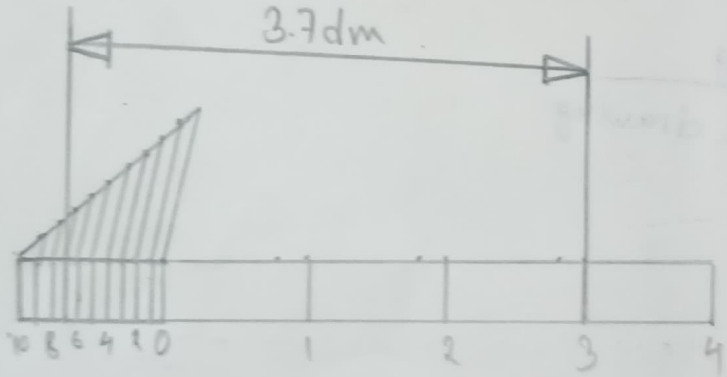
∴ Length of the drawing = Rf x Actual Length

$= \frac{1}{4} \times 5dm$

$= \frac{1}{4} \times 50cm$

$= 12.5cm$

*)



Date - 07/10/2024

Q Construct a Plane Scale of $\frac{1}{60}$ to read meter and decimeter and along enought to mersure upto 6 meters. measure on it a distance of 5.4 meter.

Soln

Given,

$$R.F = \frac{1}{60}$$

Unit to be read = 1m, 1dcm

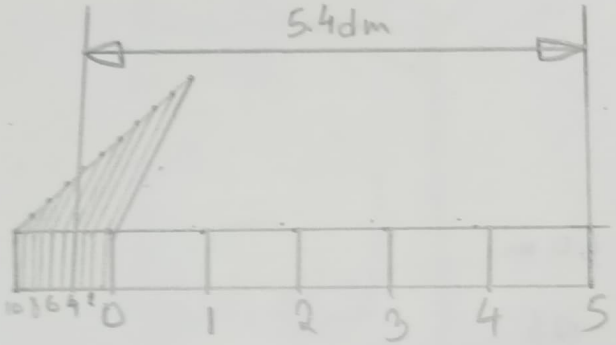
Maximum Length = 6m

∴ Length of the drawing = RF x Actual Length

$$= \frac{1}{60} \times 6m$$

$$= \frac{1}{60} \times 600$$

$$= 10cm$$



dm

$$R.F = \frac{1}{60}$$

Given, R.F = 1:4

Unit to be read = 1cm, 1dm

maximum length = 5dm

∴ Length of the drawing = RF x Actual length

$$= \frac{1}{4} \times 5dm$$

$$= \frac{1}{4} \times 50cm$$

$$= 12.5cm$$

Q. If 1cm long line on a map represence a real length of 4m canclate R.F. Draw a plane scale long enough to measure upto 50m and a length of 44m on it.

Sol^n

Given,

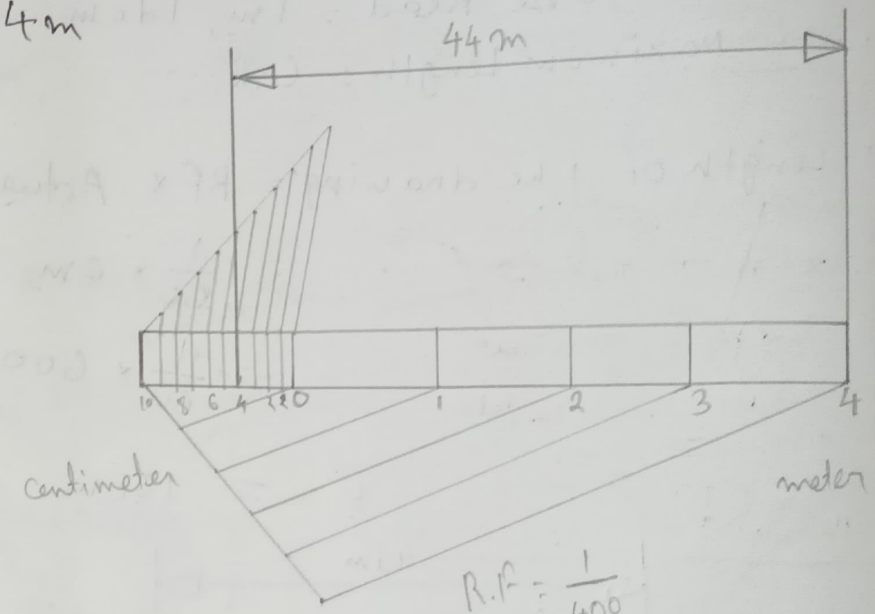
acutal length of the line = 4m

lnggth of the line = 1cm

$\therefore$ R.F = $\frac{1cm}{4m}$

= $\frac{1cm}{400cm}$

R.F = $\frac{1}{400}$



maximum length = 50m

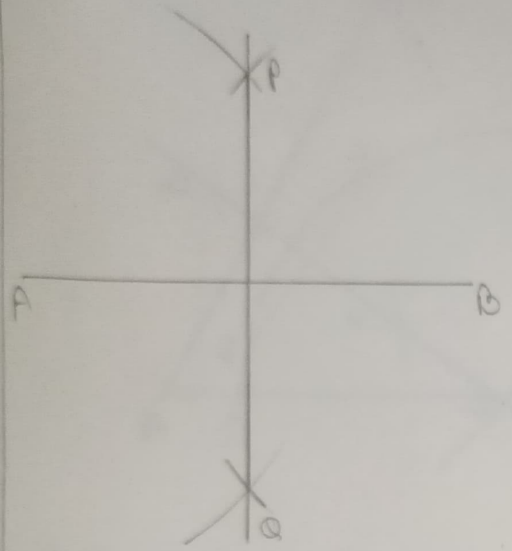
$\therefore$ Actual length of Scale = $\frac{1}{400} \times 50m$

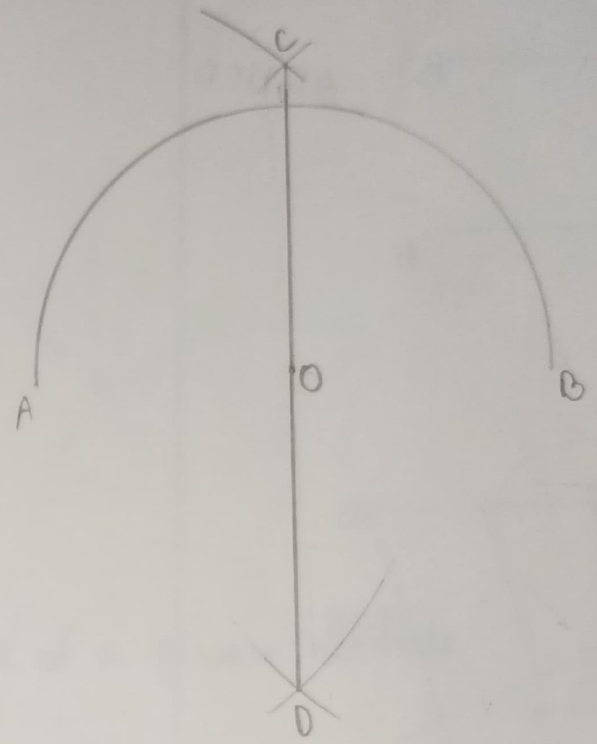
= $\frac{1}{400} \times 5000^{12.5}$

= 12.5cm

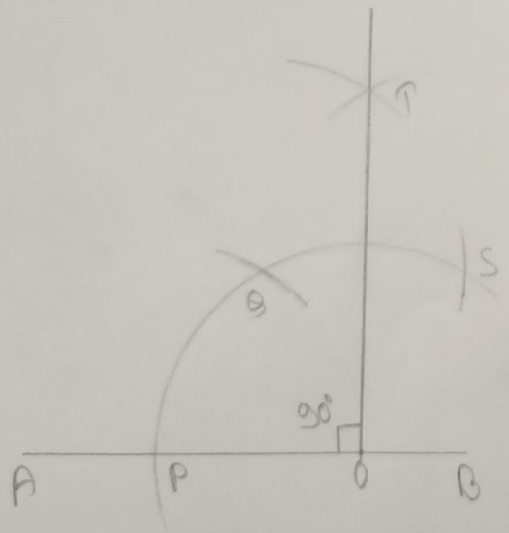
Geometrical Construction

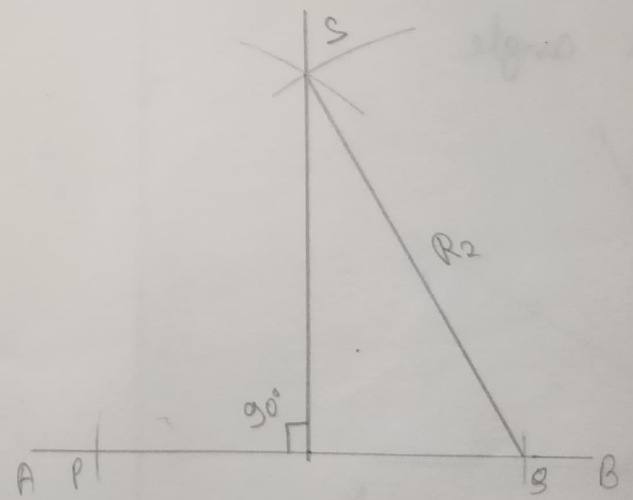
① Bisecting a line or an arc:



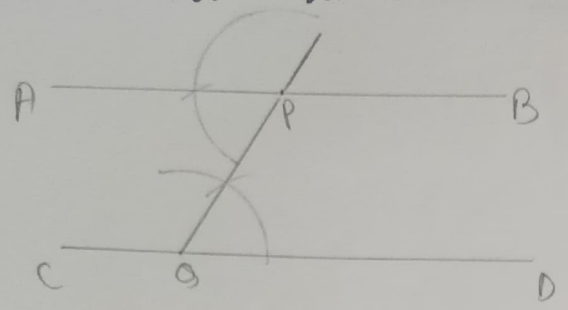


② To draw Perpendicular



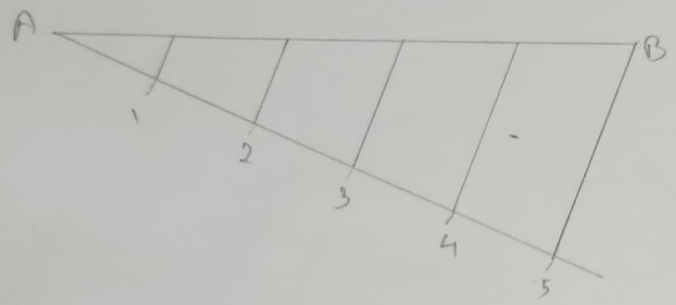


③ To Draw Parallel lines

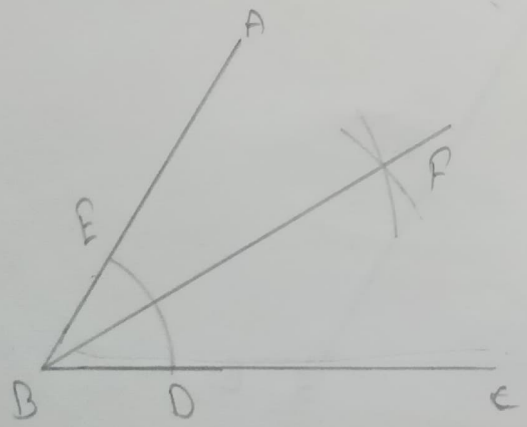


AB || CD

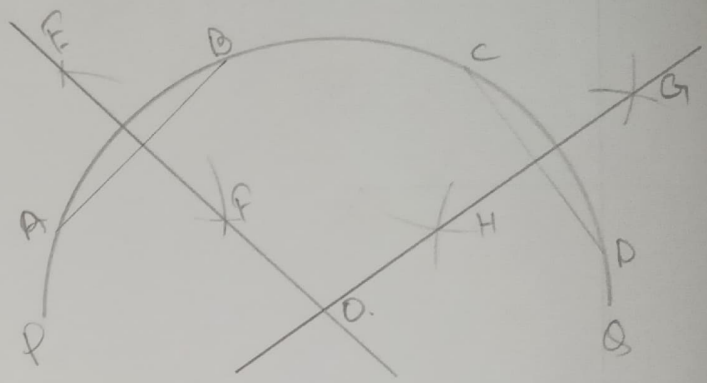
④ To Divide a line



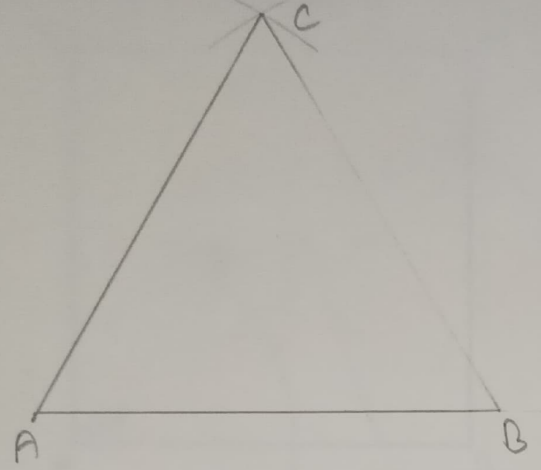
⑤ To Bisect an angle



⑥ To Find the center of an arc



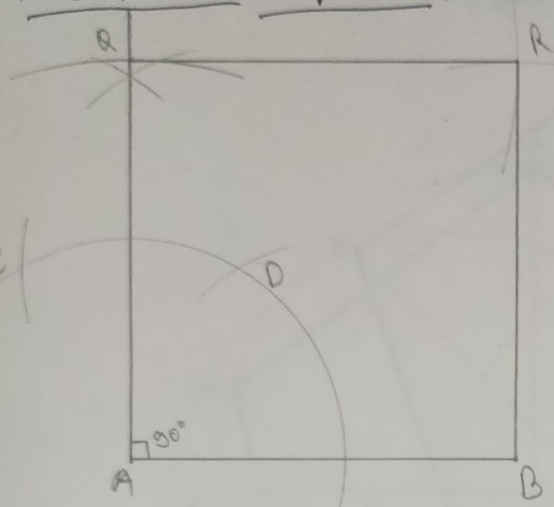
⑦ To construct Equilateral triangle



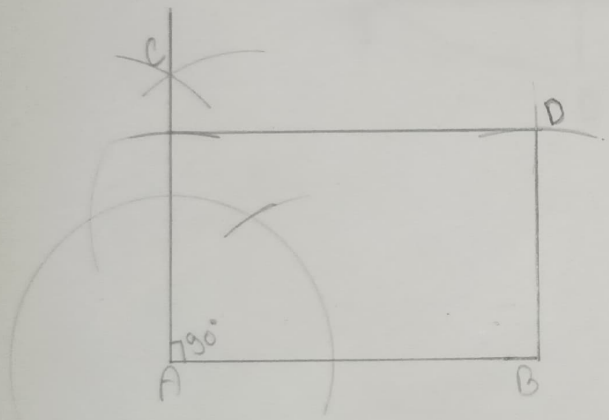
⑧ To construct equilateral triangle of a given altitude

Date - 15/10/2024

⑩ To construct squares :

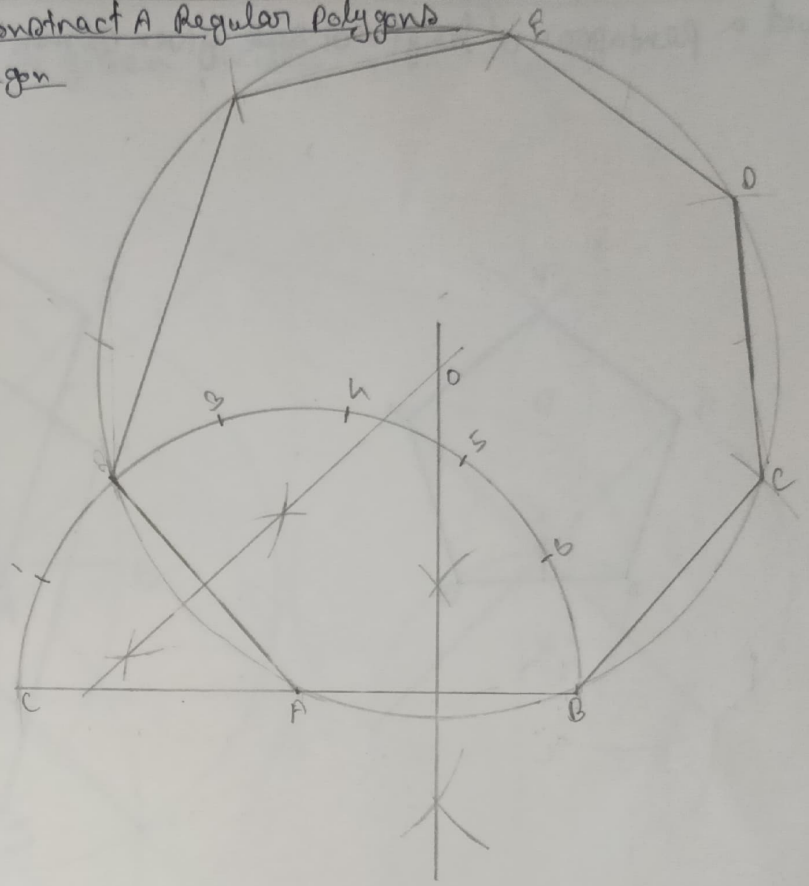


⑪ Construct a Rectanglee of sides 65 m and 40mm long. ⑤ 2022

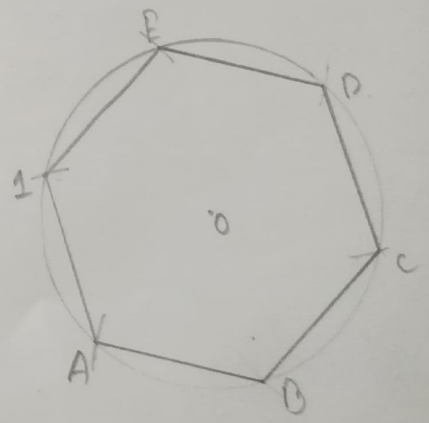


⑫ To constract A Regular polygons

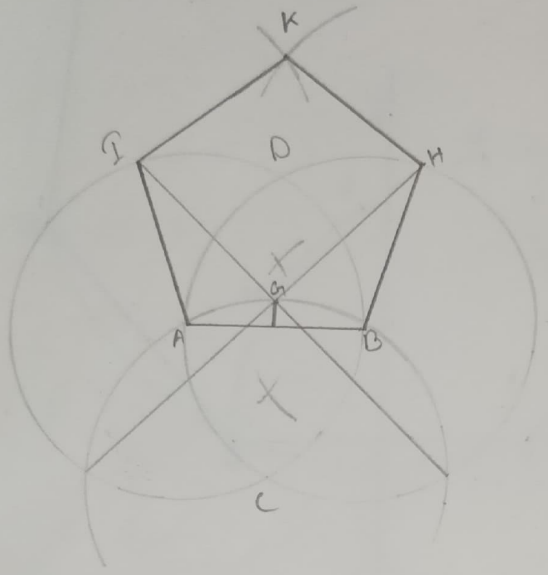
Heptagon

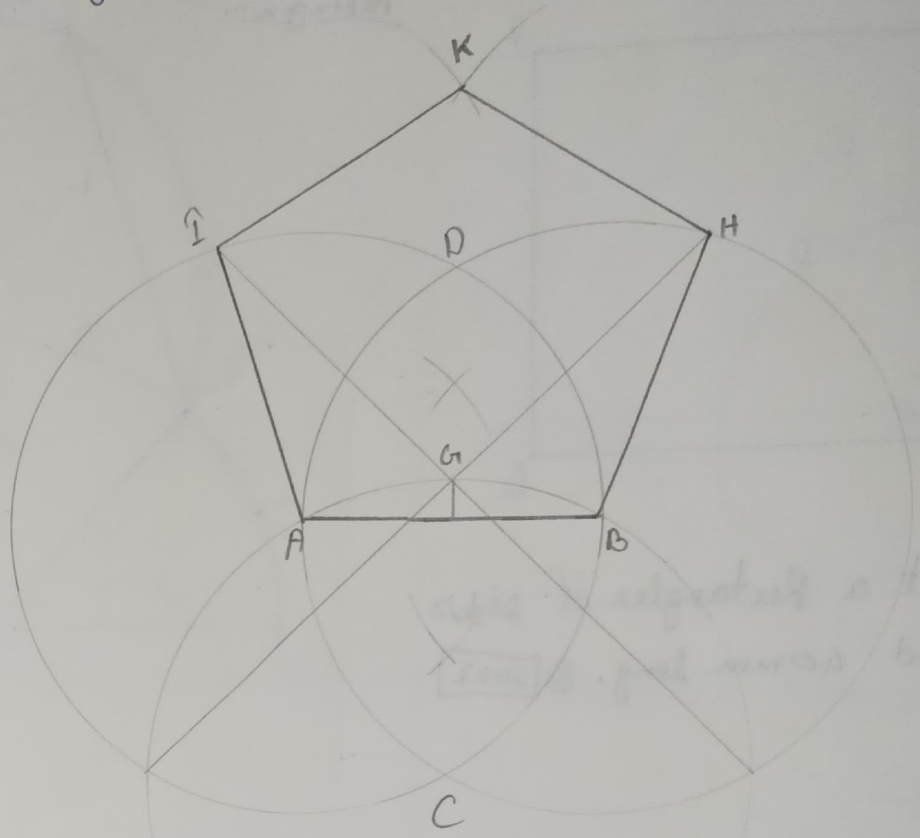


⑬ To constract a Hexagon of length of side given 30mm

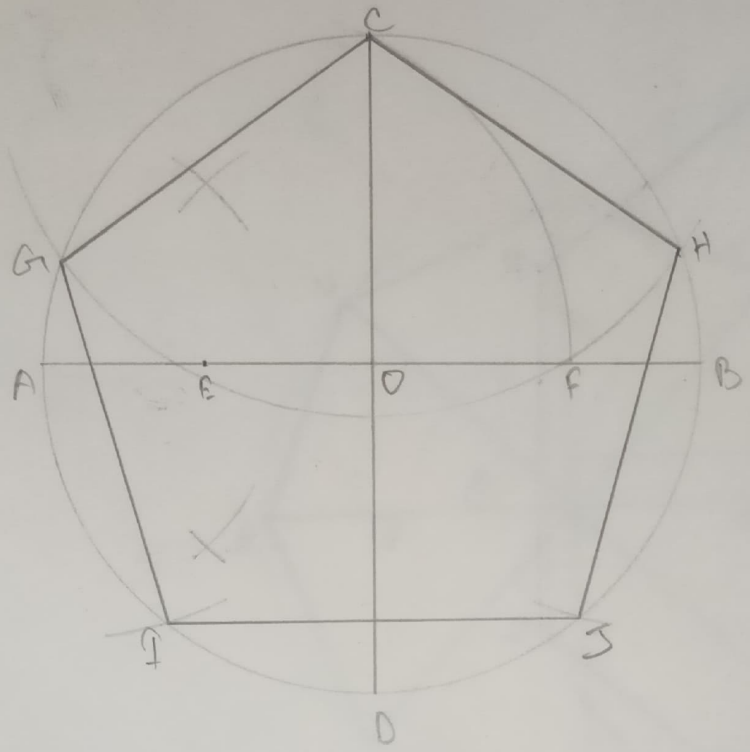


(14) To construct a pentagon of length of side given 30mm

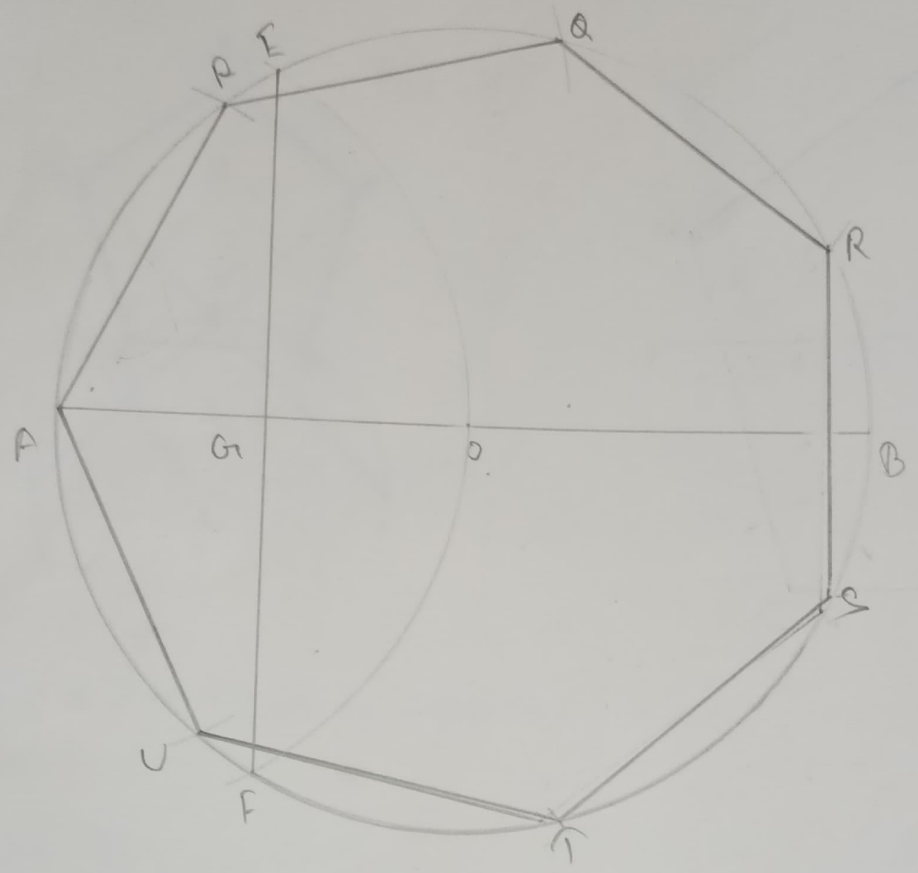




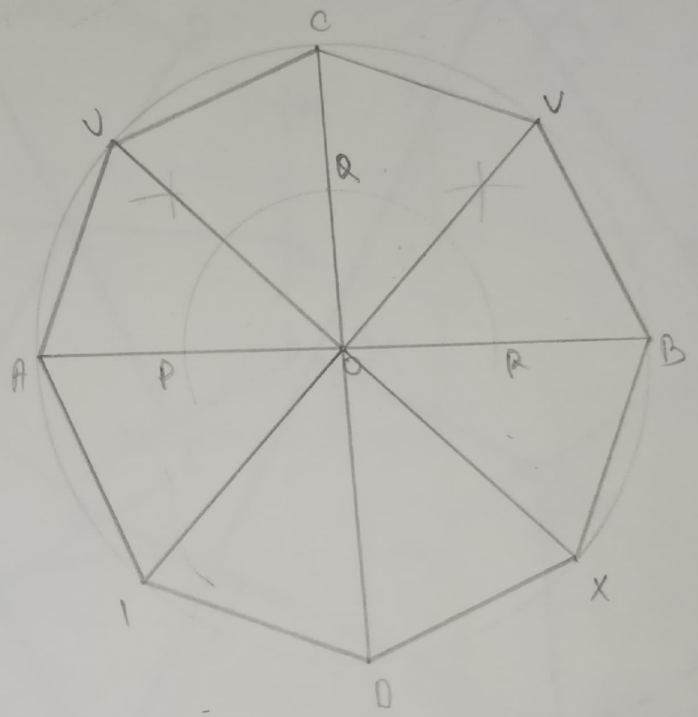
(15) To Inscribe a Regular Pentagon in a given Circle.



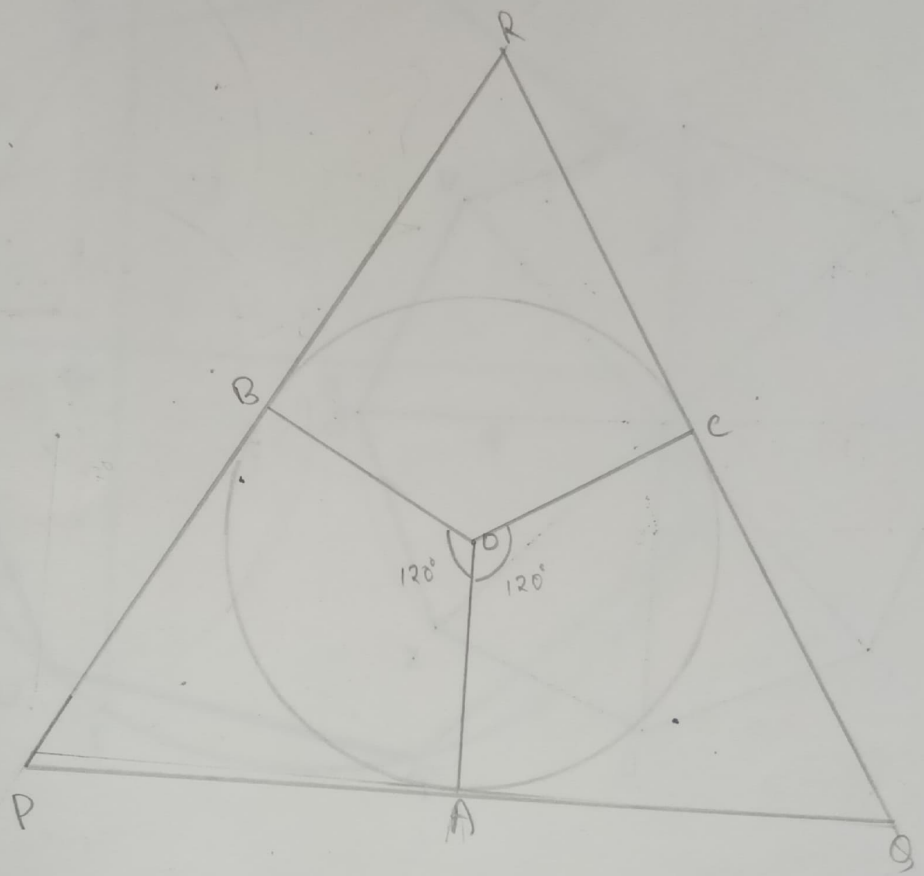
(16) To Inscribe a Regular Heptagon in a given circle.



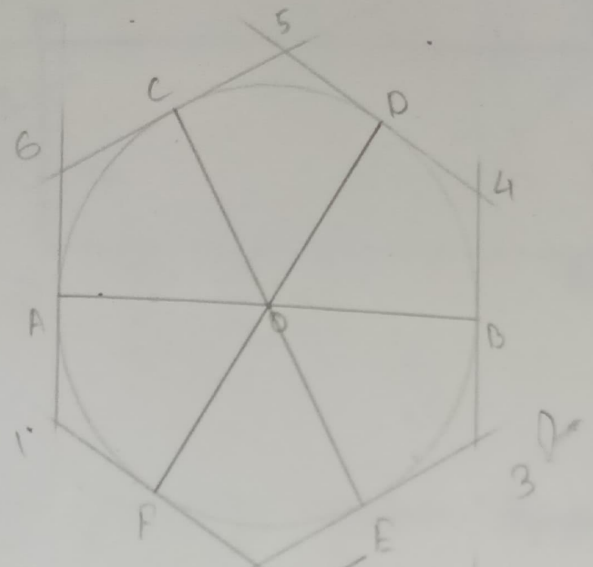
(3) To Inscribe a Regular Octagon in a given circle



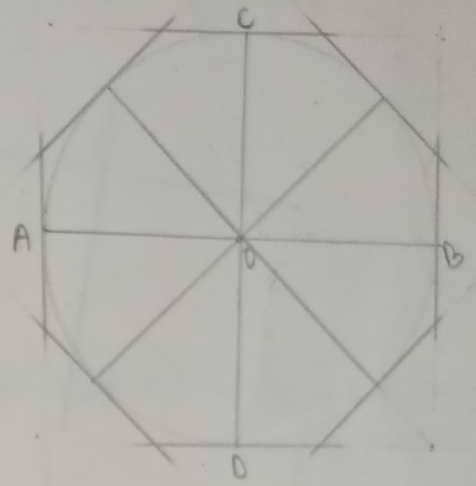
Q(18) To Describe a ~~Regular~~ equilateral triangle in given circle.

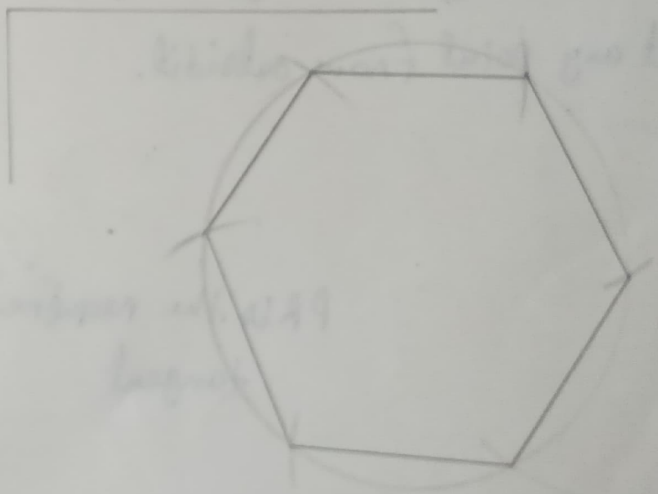


(19) To describe a Regular Hexagon in a given circle



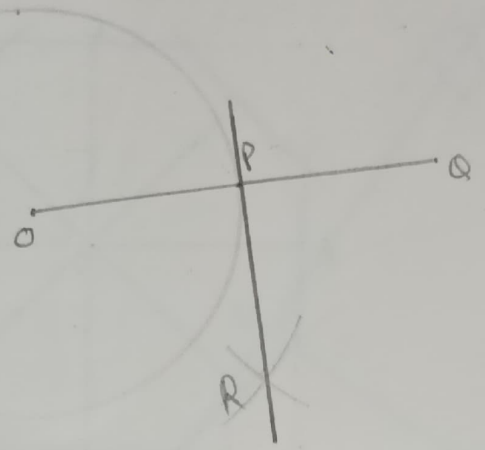
(20) To describe a Regular octagon in given circle.



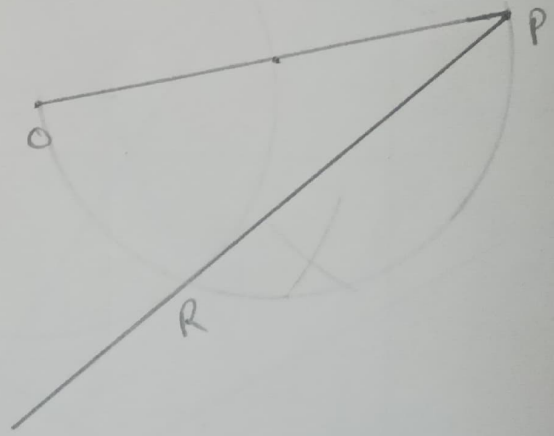


(21) To Draw a tangent to a given circle at any point on it.

PR is the required tangent

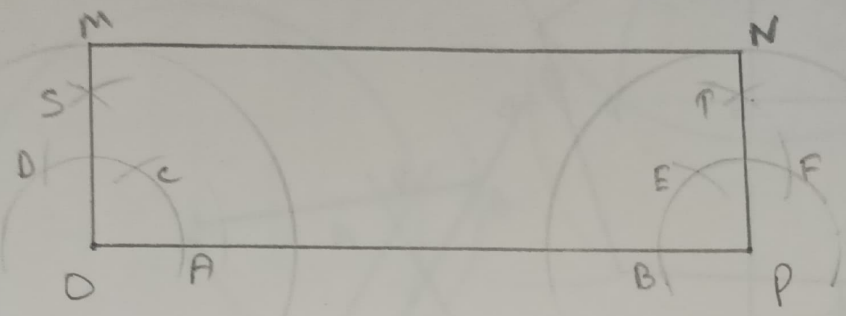


(22) To Draw a tangent to a given circle at any point from outside it.



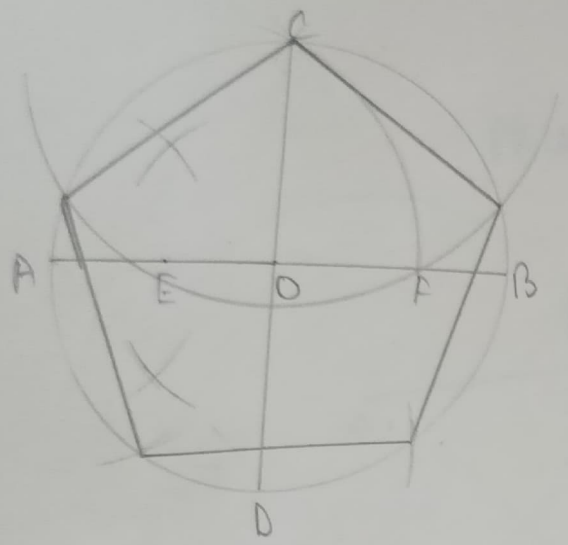
PR is the required tangent

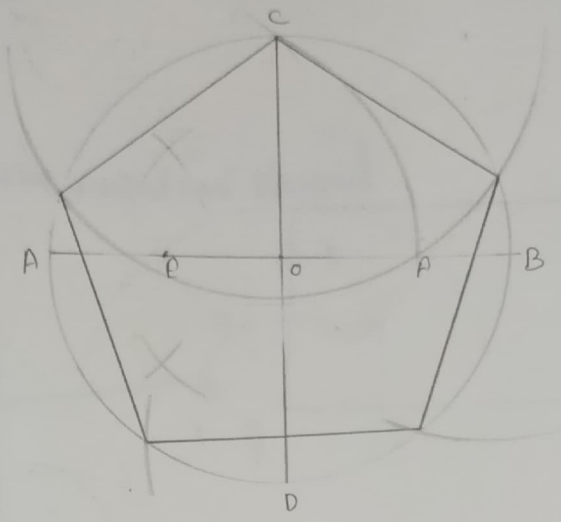
(23) To Draw a common tangent to two given circle of equal radius of 50 mm



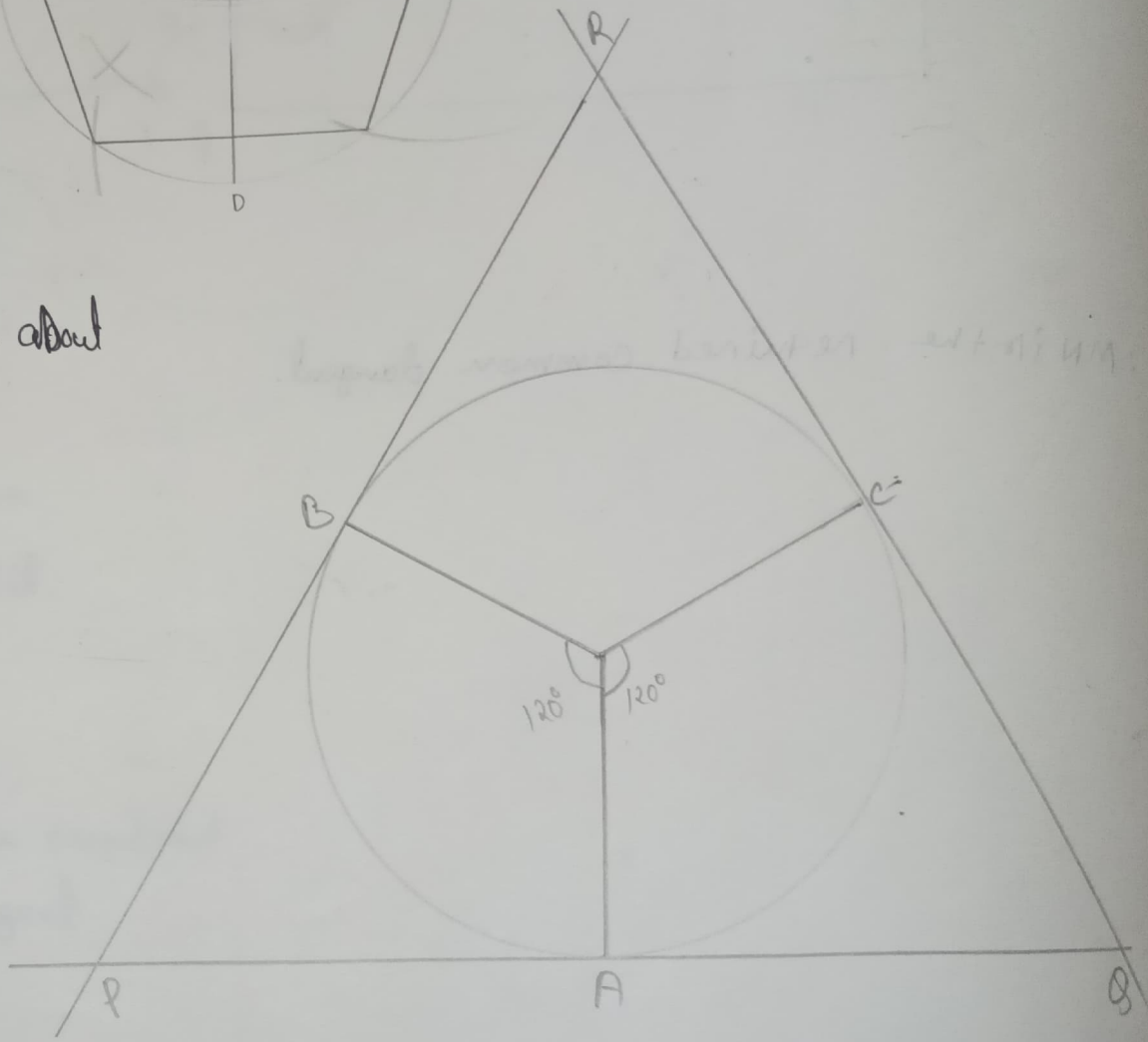
∴ MN is the required common tangent.

(9) Describe a Regular Pentagon in a circle of 40mm diameter.

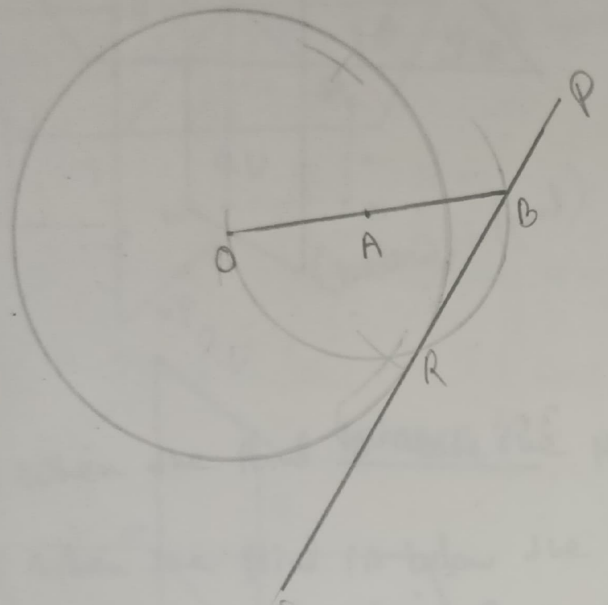




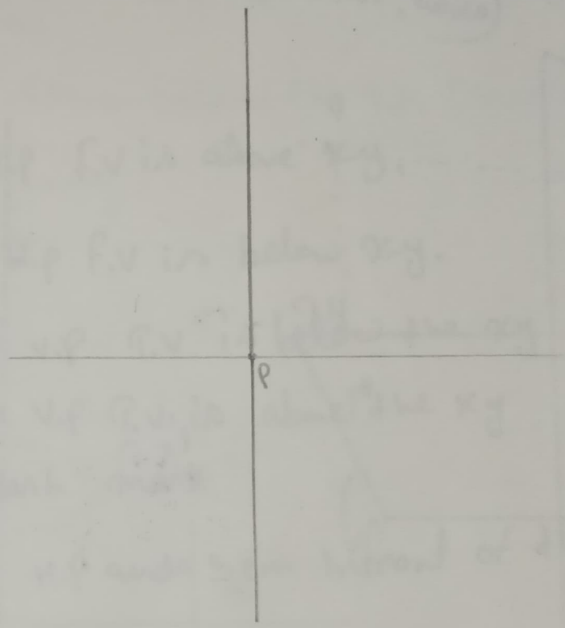
(9) Describe an equilateral triangle about a circle of 50mm diameter.



Q Draw a tangent to a circle of 40mm diameter from a point 50mm away from its center.



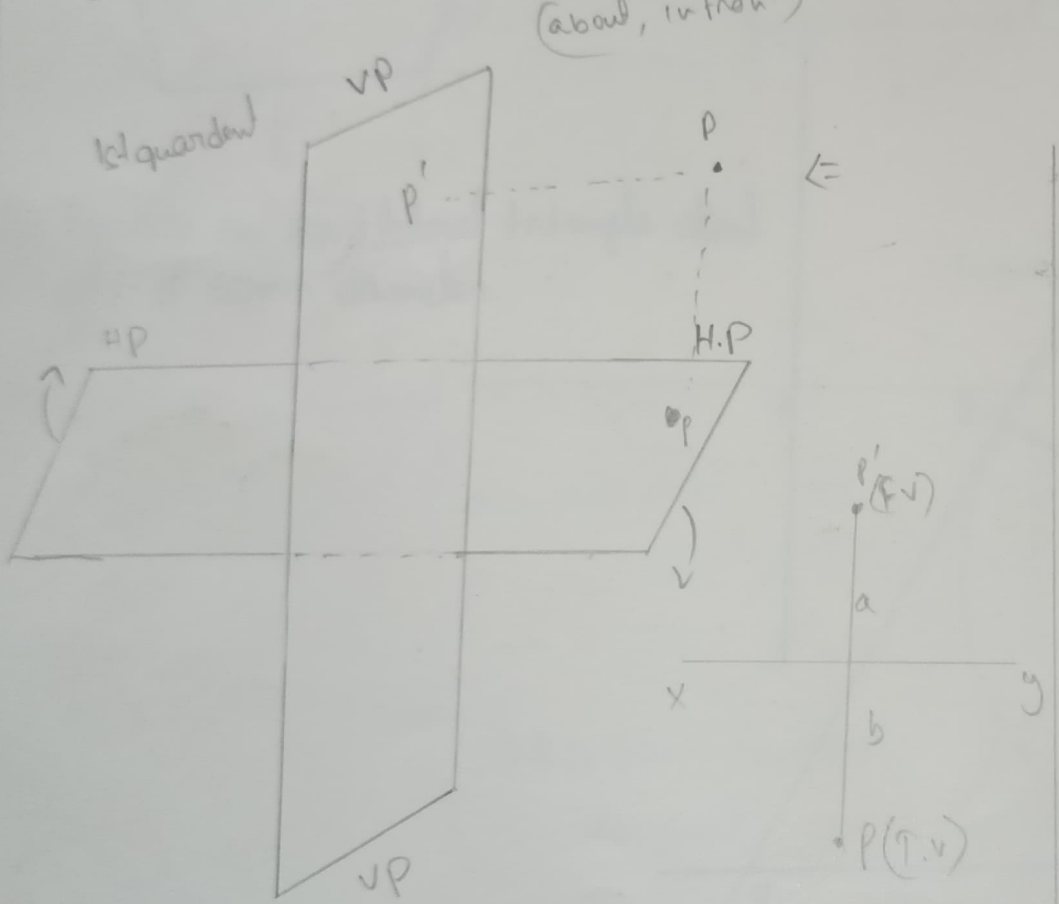
PR is the required tangent.

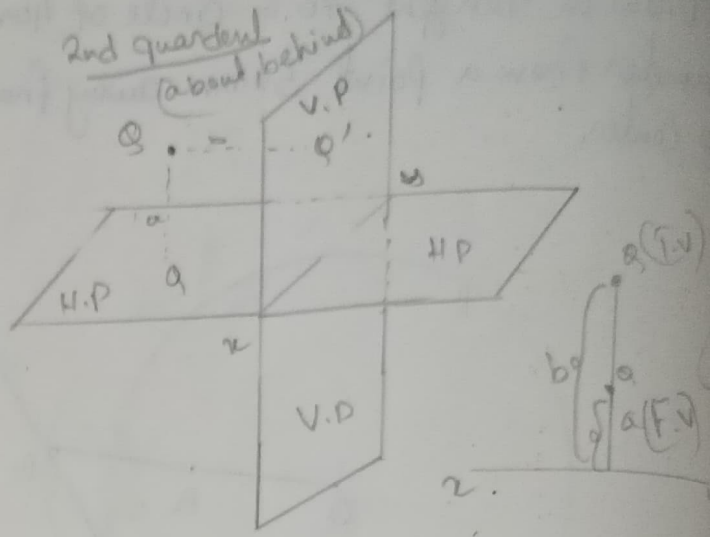


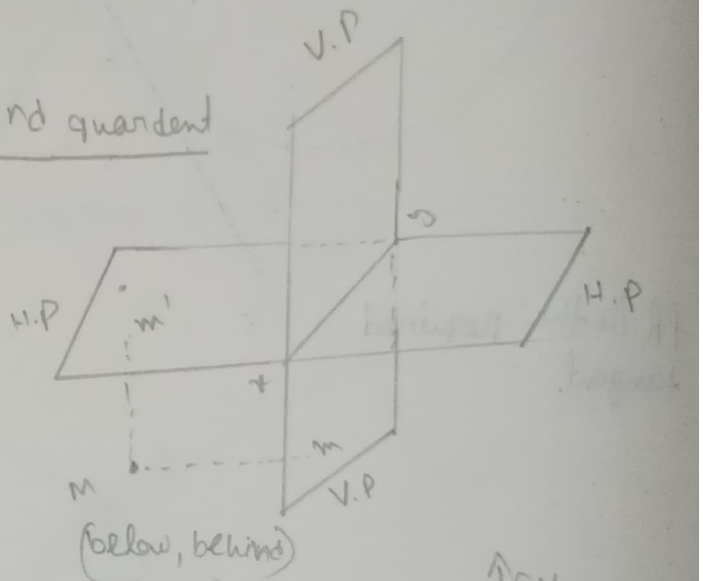
Projection

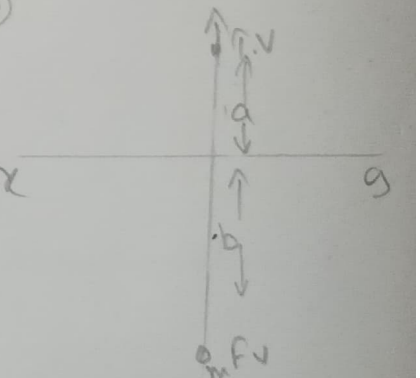
(i) Projection of Points
(ii) Projection of Straight lines
(iii) Projection of Inclined lines

(i) Projection of Points:

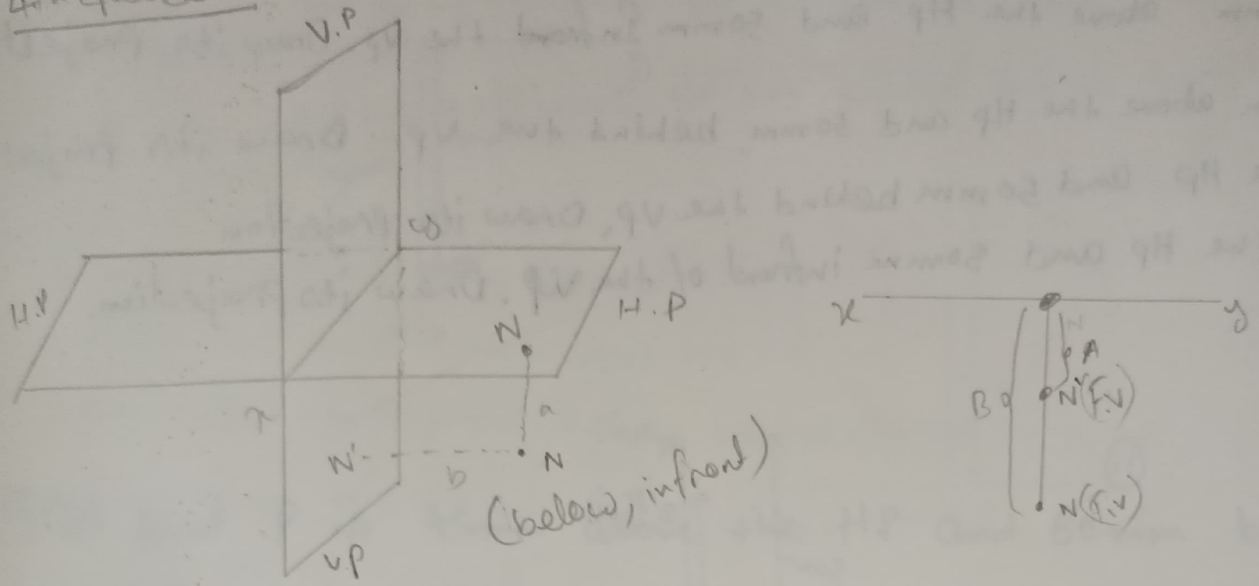








4th quardent



Note:

(i) When the point is above the H.P F.V is above xy.

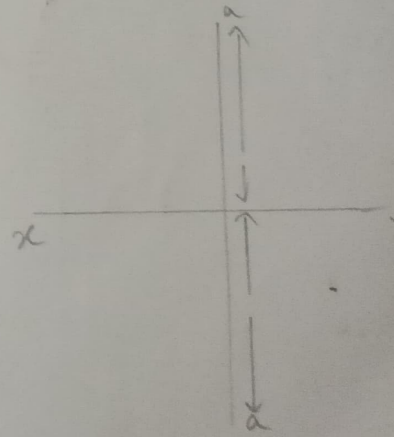
(ii) When the point is below the H.P F.V is below xy.

(iii) when the point is infront of V.P F.V is below the xy

(iv) when the point is behind the V.P F.V is above the xy

(v) Front veiw (F.V) denotes with dash mark

(Q) a point A is 2.5cm above the H.P and 3cm infront of the V.P

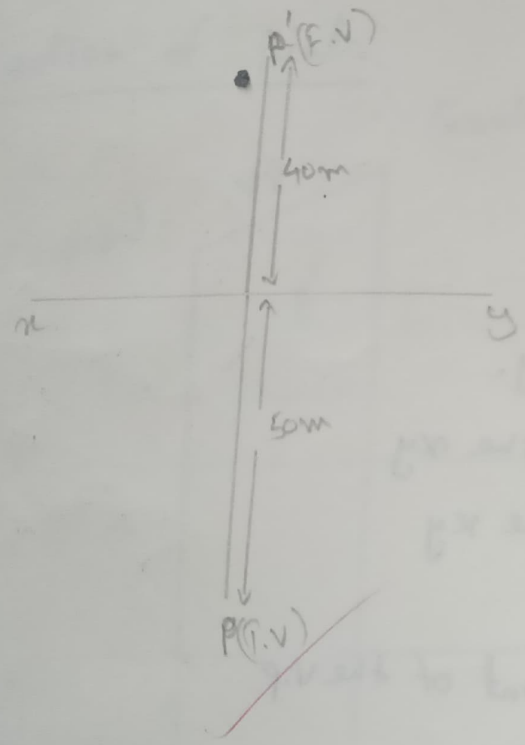


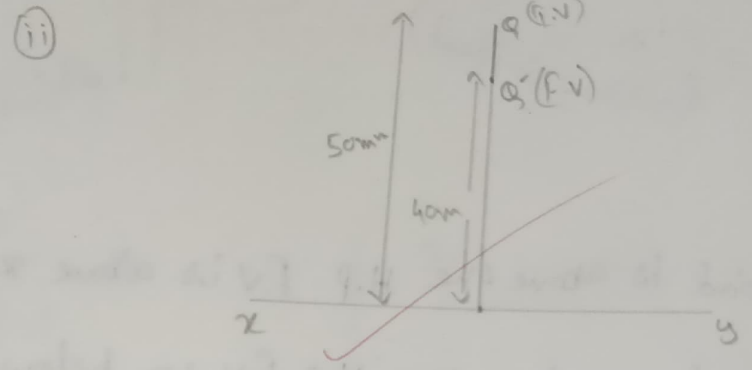
(i) a point P is situate 40mm above the Hp and 50mm Infront the vp. Draw its Projec

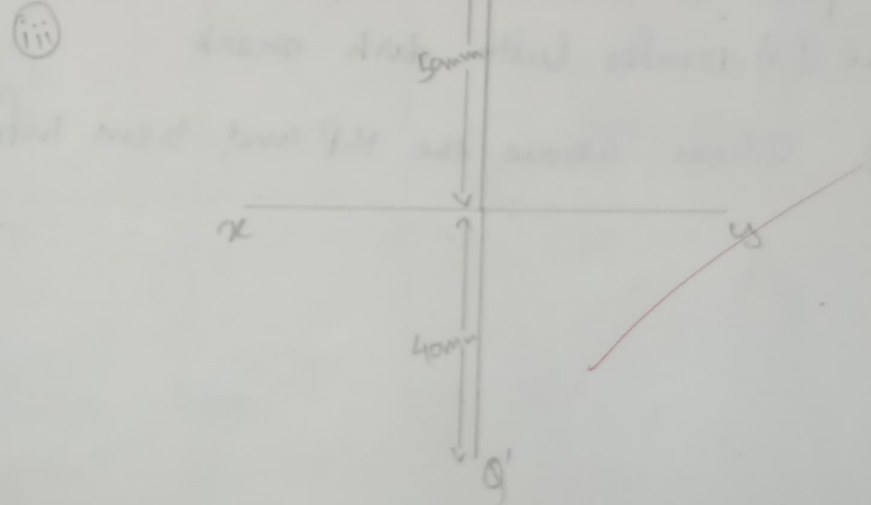
(ii) A point Q is ~~sit~~ 40mm above the Hp and 50mm behind the vp. Draw its Projec

(iii) A point Q is 40mm below the Hp and 50mm behind the vp. Draw its projection

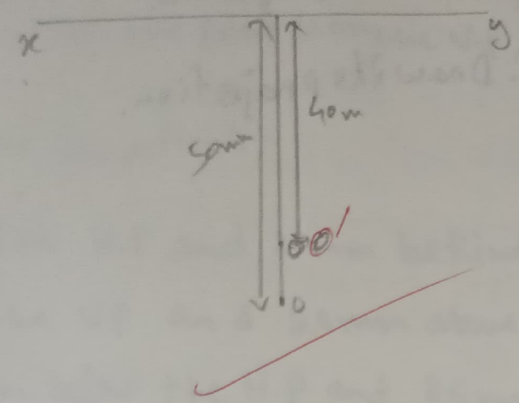
(iv) A point O is situate 40mm below the Hp and 50mm infront of the vp. Draw its projection.







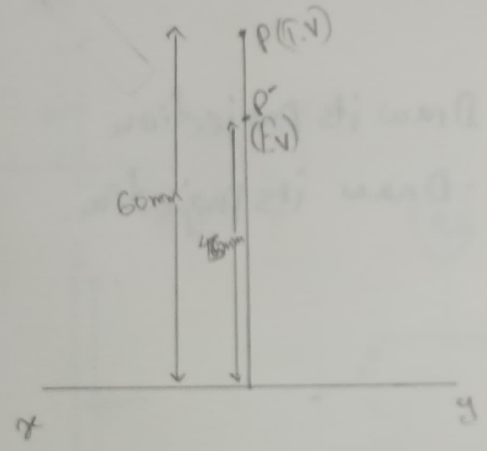
(iv)



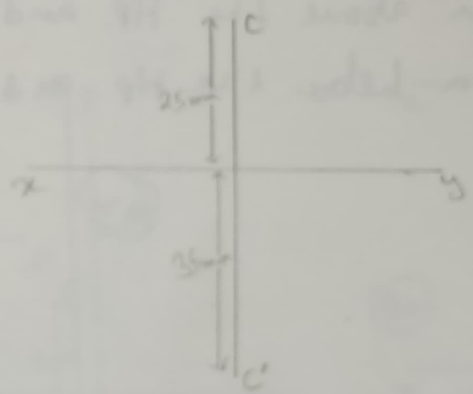
(9) (i) A point P is 45mm above the H.P and 60mm behind the V.P. Draw is projectio

(ii) A point C is 35mm below the H.P and 25mm behind the V.P. Draw is projection

(i)

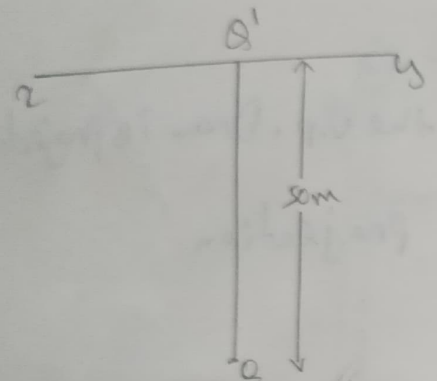


(ii)

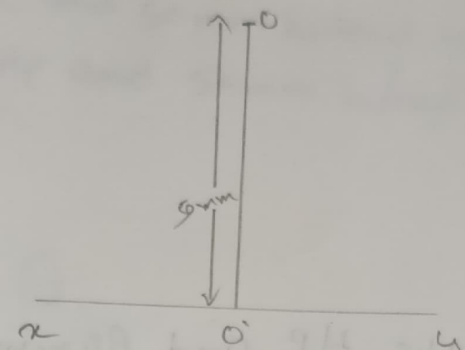


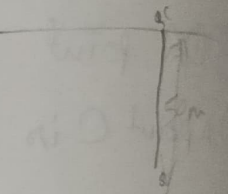
(i) The point Q is on the H.P and 50mm Infront the VP. Draw its projection.
(ii) The point O is on the H.P and 50mm behind the V.P. Draw its projection.

(i)



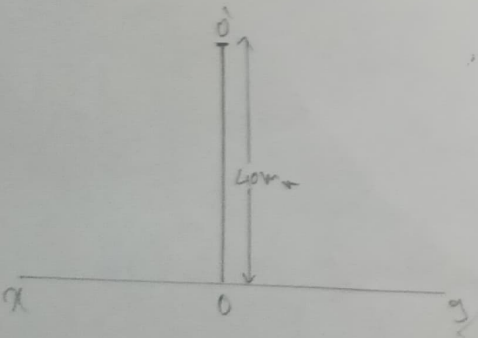
(ii)



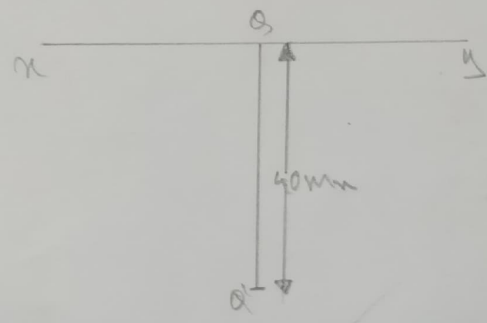


(iii) The point O is 40mm above the HP. and on the VP. Draw its projection
(iv) The point Q is 40mm below the HP and on the VP. Draw its projection.

(iii)



(iv)



Note:-

(i) When the point is on the HP, the F.V is on the 'xy'

(ii) When the point is on the V.P, then T.V is on the 'xy'

Q) Draw the projections:-

(a) In the H.P and 20mm behind the V.P

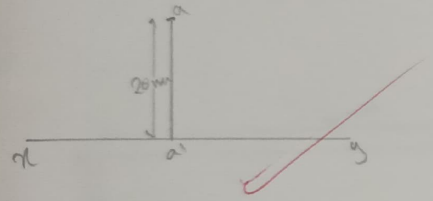
(b) In the V.P and 20mm above the H.P

(c) 25mm below the H.P and 25mm behind the V.P

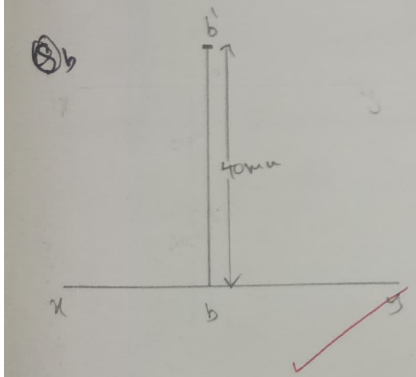
(d) 15mm above the H.P and 50mm behind the V.P

(e) In both the V.P and H.P

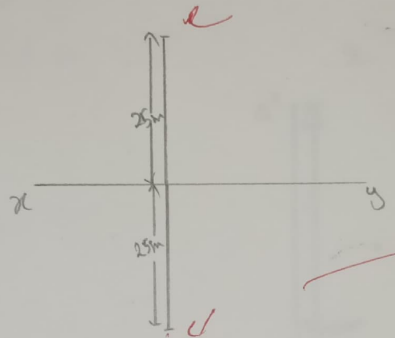
Q.a



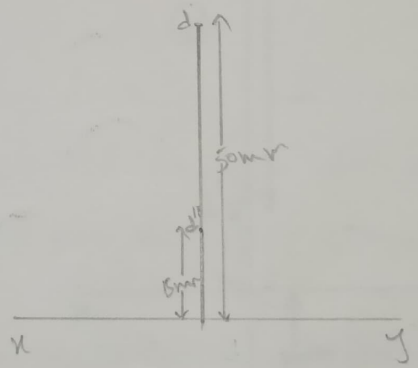
Q.b



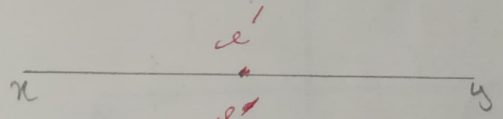
Q.c

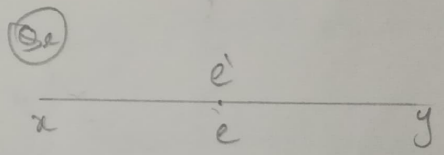


Q.d



Q.e

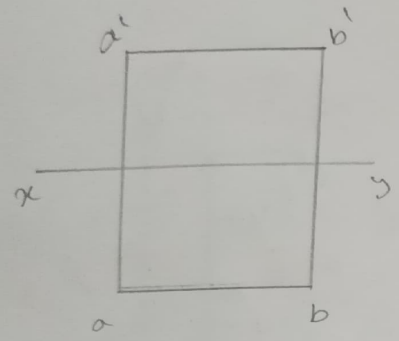




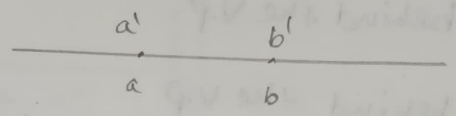
Projection of Straight line

(i) Line is parallel to both V.P and H.P.
(ii) Line is on both H.P and V.P.
(iii) Line is perpendicular to H.P and parallel to V.P.
(iv) Line is perpendicular to V.P and parallel to H.P.

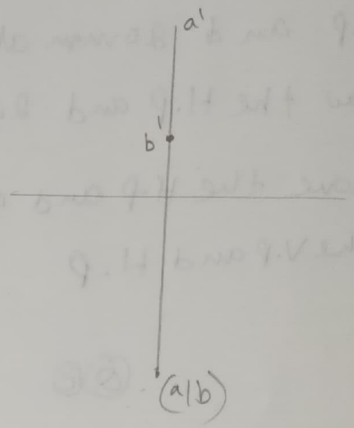
(i)

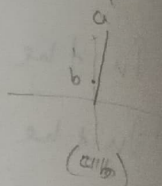


(ii)

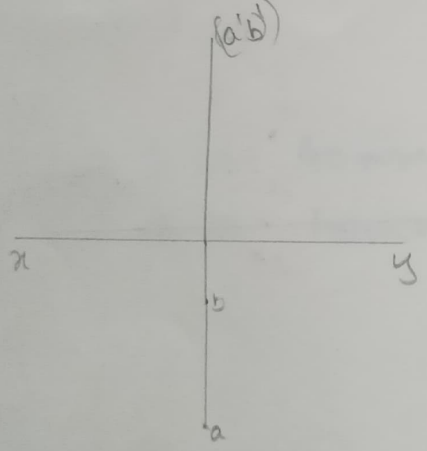


(iii)





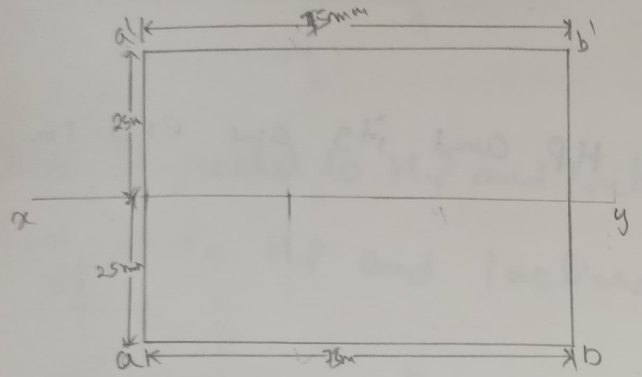
(iv)



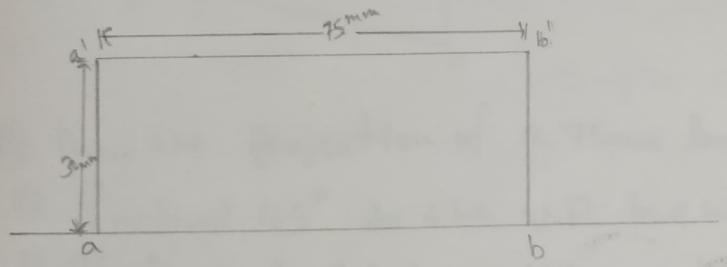
Draw the projection of 70mm long Straight lines

(a) Parallel to both the HP and V.P and 25mm from each
(b) Parallel to and 30mm above the H.P and in the V.P.
(c) Parallel to 40mm infront of the V.P and in the H.P
(d) Perpendicular to the HP 20mm infront of V.P and its one end 15mm above the H.P.
(e) Perpendicular to the HP in the V.P and its one end in the H.P.

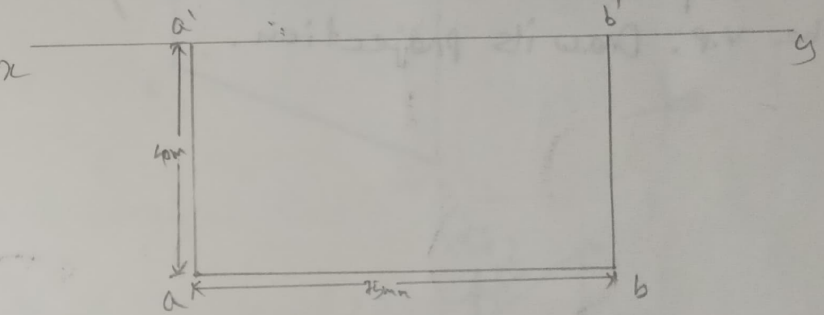
(a)



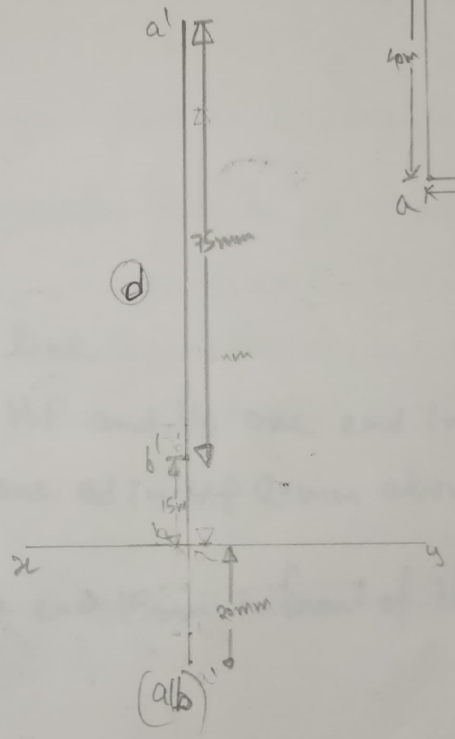
(b)



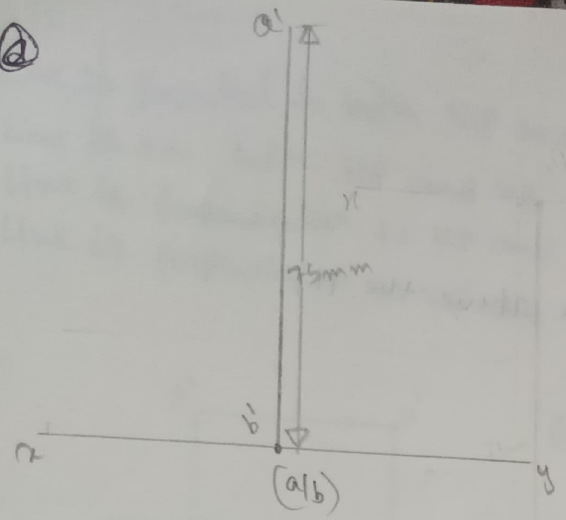
(c)



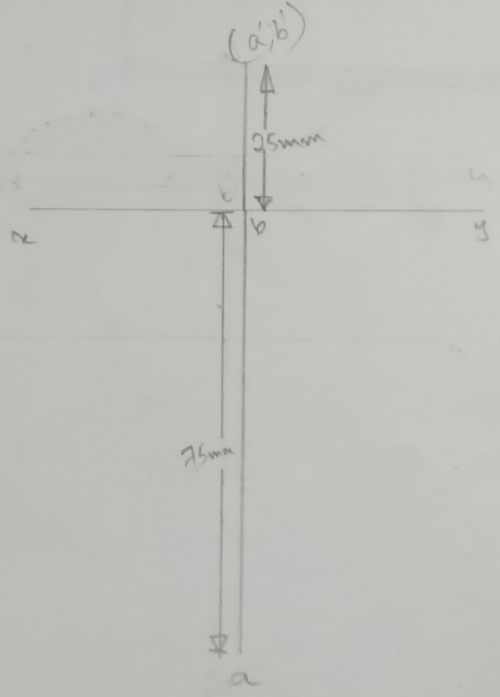
(d)



(a)



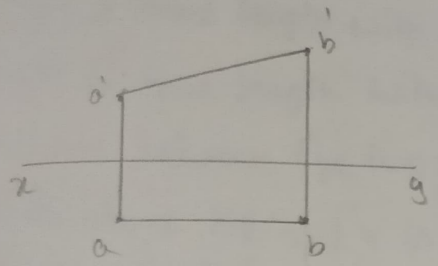
(b) Perpendicular to the V.P, 25mm above the H.P and its one end in the V.P. Draw its projection.



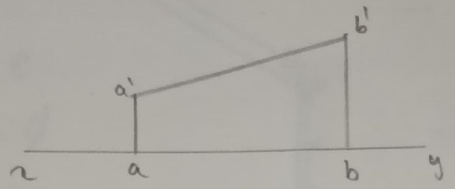
(i) Line is Inclined to HP and Parallel to V.P

(ii) Line is Inclined to HP and in the V.P

(i)



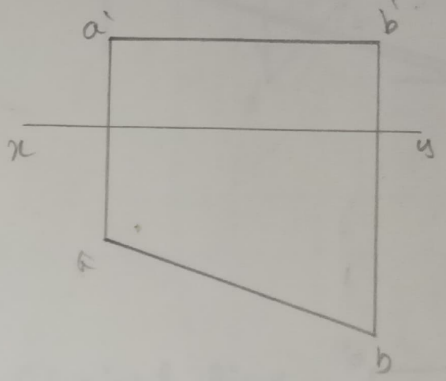
(ii)



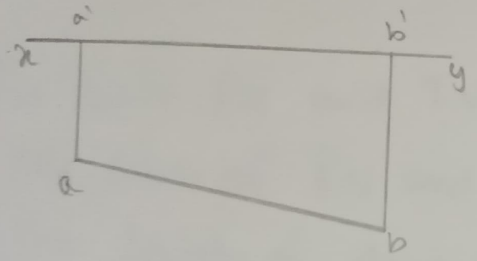
(iii) Line is parallel to H.P and inclined to V.P

(iv) Line is in H.P and inclined to V.P

(iii)



(iv)

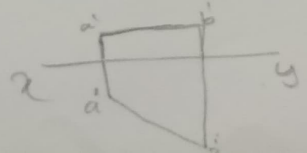


(5) Draw the projection of a 75mm long line

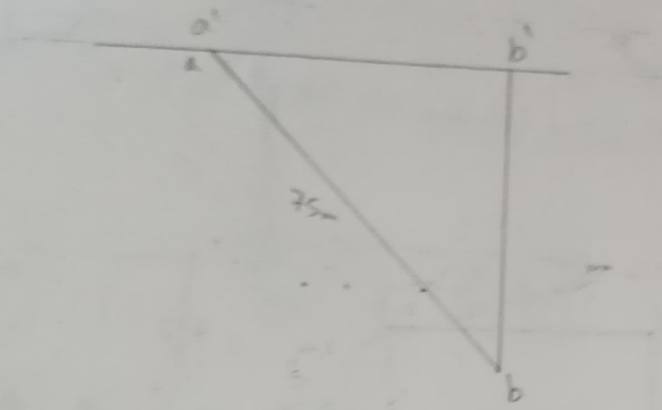
(a) Inclined 45° to the V.P, in the H.P and its one end in V.P

(b) Inclined at 30° to the H.P, and its one end in V.P 20mm above it, Parallel to and 30mm in fro of the V.P.

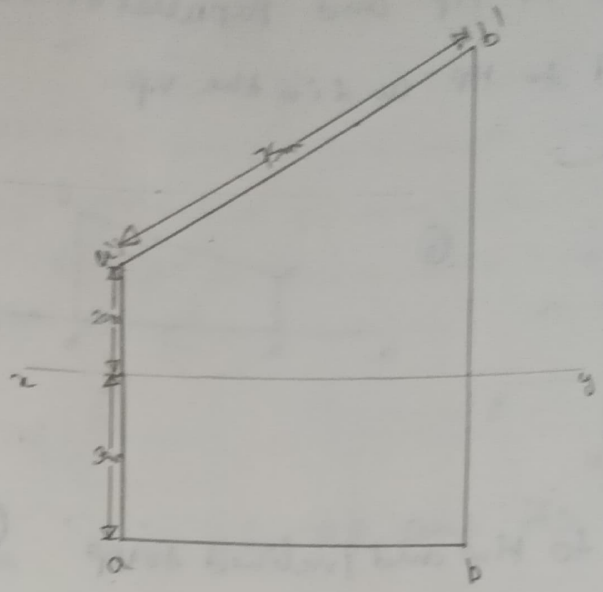
(c) Inclined at 60° to the H.P, its one end 15mm infront of it, Parallel to and 25mm above H.P.



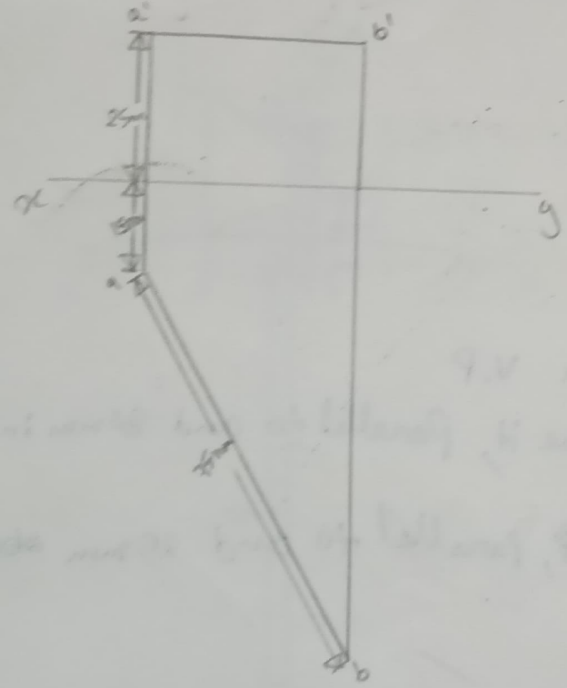
(a)



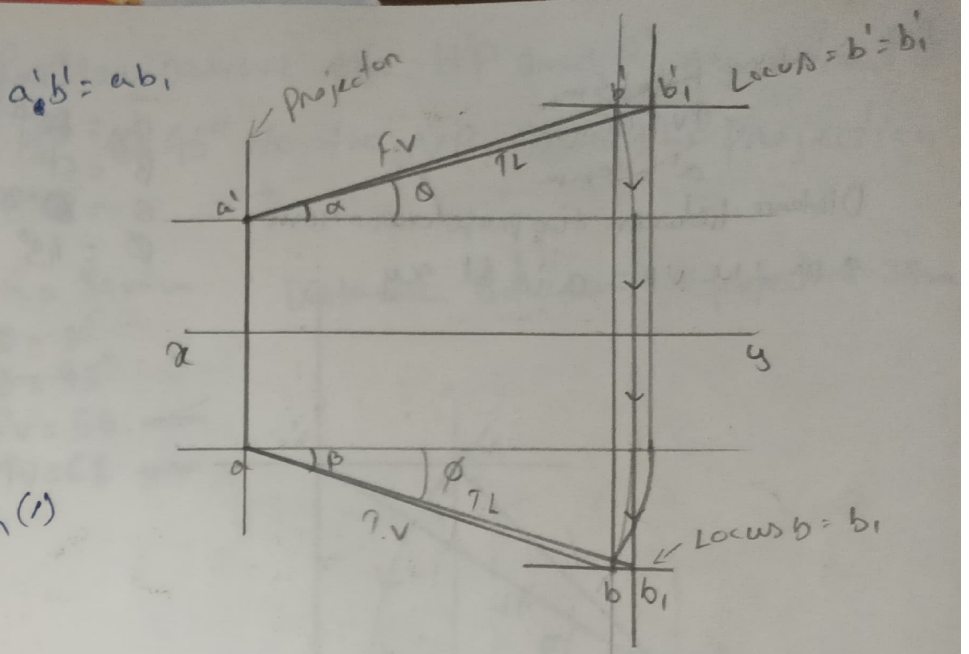
(b)



(c)



1. Angle of FV = α
2. Angle of TV = β
3. Length of Line = True Length
4. Angle of true Length with FV = θ
5. Angle of true Length with TV = ϕ
6. Distance between the two projectors = end projectors.
7. Points above HP = FV is above and with dash (')
8. Points infront of VP = TV is below and no dash
9. A point in (on/in) HP = with dash
10. A point in (on/in) VP = No dash



Rules:

(i) The points F.V and T.V are always lies in a Straight line.

(ii) The points of F.V and True Length pointes lies on a horizental level known as Locus.

(iii) The Length of true Length are always same above on below the xy Line.

(iv) The Length of F.V and T.V are always ~~less~~ Lessdeen the true length. F.V, T.V < TL

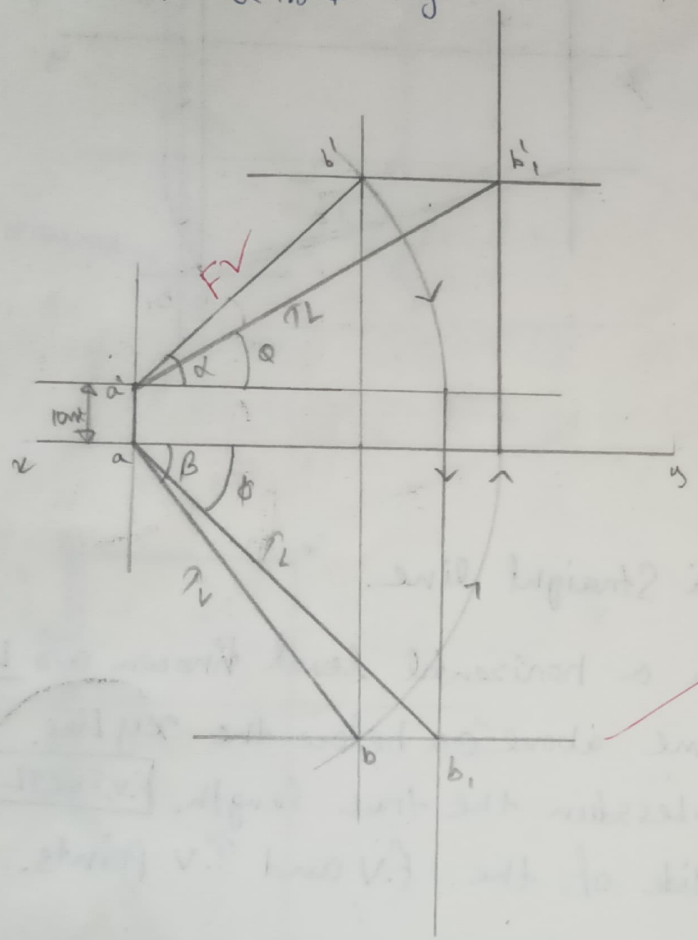
(v) True Length points is always on the right side of the F.V and T.V points.

(6) The F.V and T.V of a line measures 55mm and 65mm respectively. There end projector are 40mm apart and one of the line is 10mm above the HP and in the VP. Draw the Projection and find the true length and true length inclination.

Ans

Given, FV = 55mm
TV = 65mm
a' = 10mm
Distance between two projetoners = 40m
a in the VP = a is on xy

True Length = 75mm
α = 43°
β = 51°
θ = 20°
ϕ = 43°

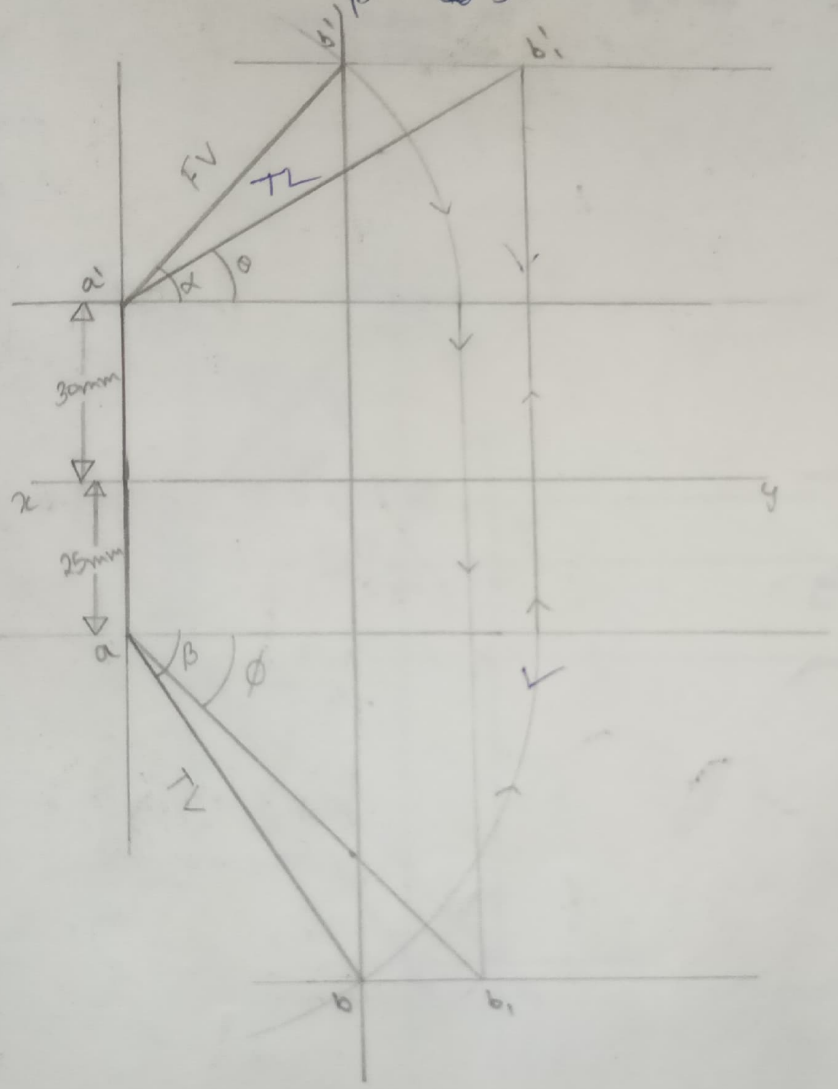


(5) A line PQ 80mm length as its end P 30mm above the HP and 25mm infront of the VP. Line makes an angle of 30° to HP 45° to the VP Draw the projection of line.

Ans: Given,

a' = 30mm , True length = 80mm
a = 25mm
α = 47.5°
β = 56°
θ = 30°
ϕ = 45°
Fv = 56 mm
Tv = 68 mm

Distance between two projectors = 38mm



Top view of 80mm long line AB measures 55mm while the length of its front view is 70mm. its one end is 15mm above the HP and 15mm infront of the VP. Draw its projection and inclination with HP and VP.

Ans

Given,

$TL = 80mm$

$fV = 70mm$

$TV = 55mm$

$a' = 15$ mm above HP

$a = 15$mm fo VP

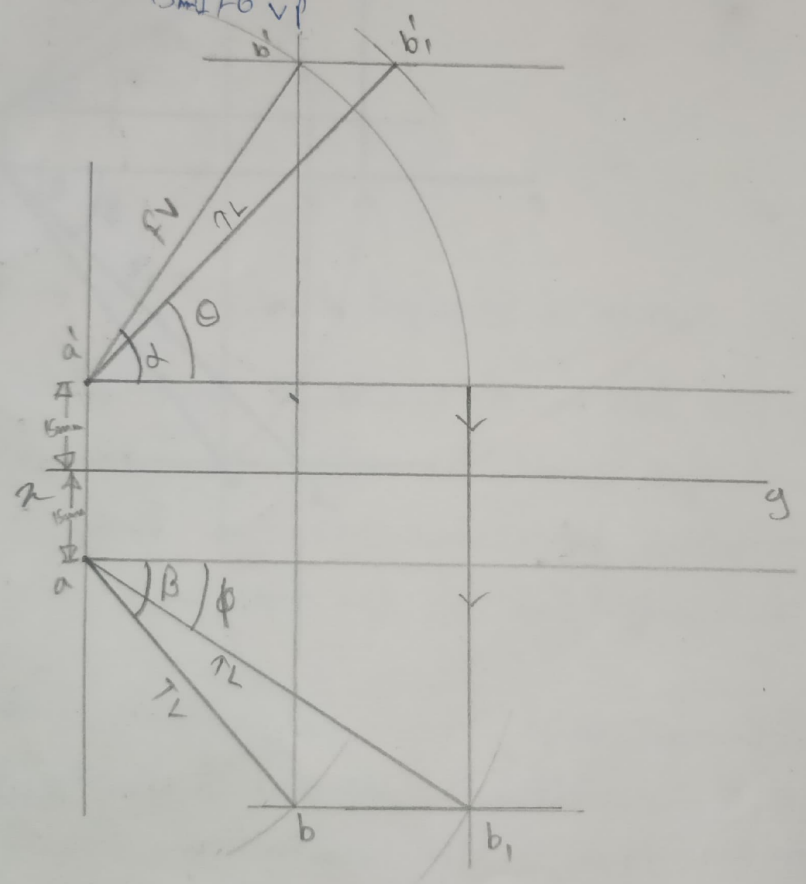
$\alpha = 56°$

$\beta = 47°$

$\phi = 31°$

$\theta = 45°$

Distance between two projecton = 37mm



(9) A line AB 70mm long is inclined at an angle of 30° to the HP. Its end A is 10mm above the HP and 15mm infront the VP. The front view of the line is 50mm Draw the projection of line AB.

Ans

Given,

TL = 70mm
FV = 50mm
Φ = 30°
a' = 10mm above HP
a = 15mm IFO VP

TV = 60mm
B = 55°
Ø = 45°
α = 45°

Distance between two projection = 34mm

TL = 80m
FV = 58mm
TV = 69mm

Φ = 30°
Ø = 45
α = 44°
B = 56°

a' = 30mm
a = 25mm