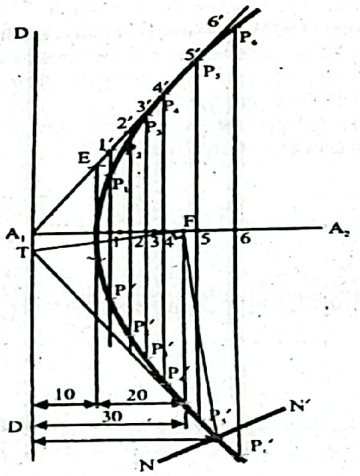
2018
Engineering Graphics

Answer all six questions :

Q1. Distance between focus and directrix of a hyperbola is 30 mm. If eccentricity is 3/2. Draw Hyper bola.

Ans.



OR

Q1. Construct a cycloid for a generating circle of diameter 50 mm.

Ans.

Q2. Top view of a st. line AB parallel to VP and inclined at 45° to HP is 50 mm. One end of the straight line is 12 mm above HP and 25 mm inform of VP. Draw the projection of straight line AB and determine its true length.

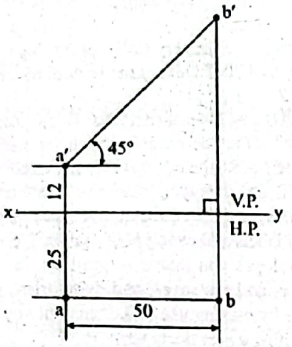
Ans. Data given :

ab = 50 ab ‖ to xy $\theta = 45°$

a' 12 ↑ xy a 25 ↓ xy

True length

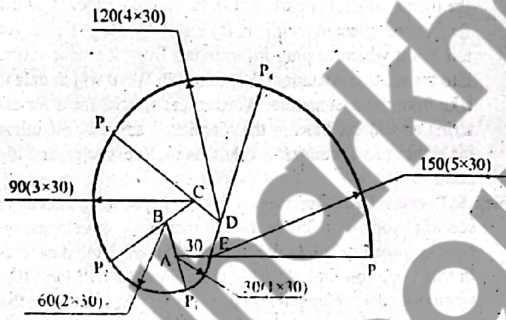
AB=a'b'=70.7



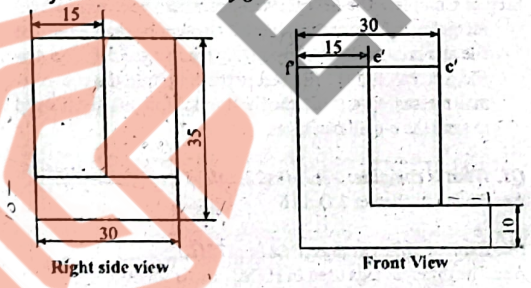
OR

Q2. Draw an invalute of a regular pentagon of 30 mm side.

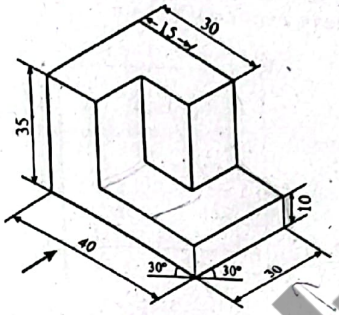
Ans.



Q3. Draw isometric view of the object whose orthographic projections are shown in figure.

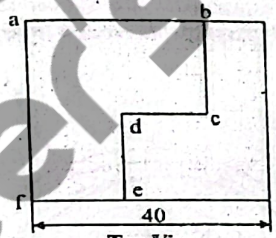


Ans.



OR

Q3. A straight line PQ is parallel to VP. Its front view is 70 mm long and makes an angle of 30° with xy line. The mid-point of the fromt view is on xy line. If the line is 20 mm behind VP. Draw its projections.

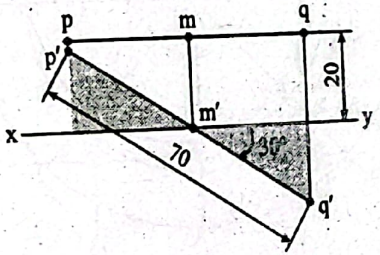


Top View

All dimensions in mm

Ans. Write data given in the box provided

m' is the mid point of the line p'q' and is on xy-line

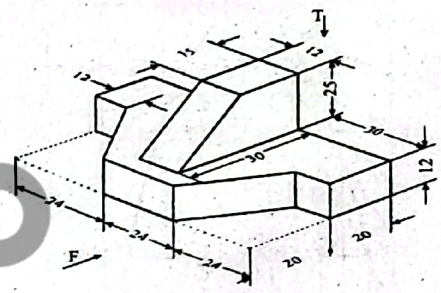


Line parallel to V.P. and inclined to H.P. (Second and third quadrant)

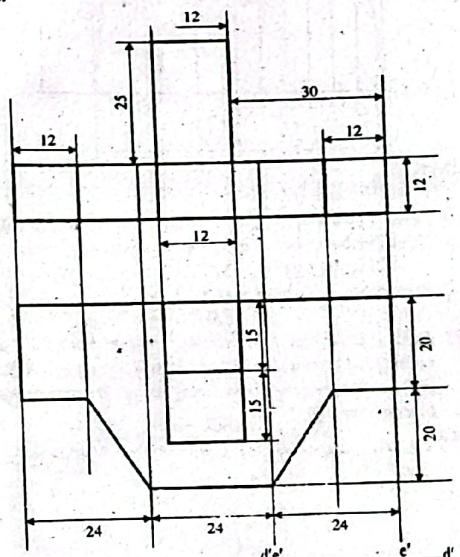
Q4. Pictorial view of an object is given in figure. Draw the following views.

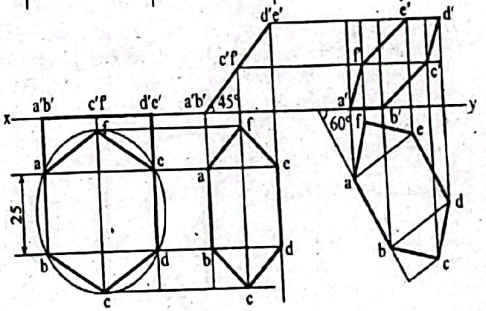
(a) Elevation from F

(b) Plan from T



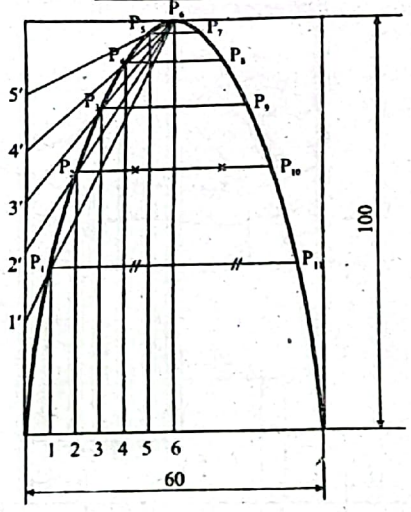
Ans.





Q5. A ball is thrown in air which attains a height of 50 metres and drop on the earth at a horizontal distance of 30 metres. Assuming the path as parabolic. Draw the locus of the ball.

Ans. Scake → 5m = 10 mm



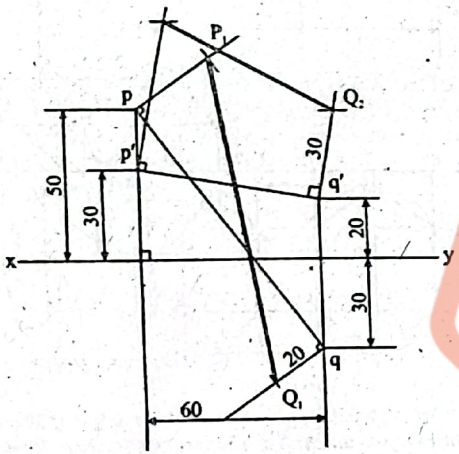
Given,

P → 30 above HP
→ 50 behind VP
Q → 20 above HP
→ 30 infront VP
Projection → 60 mm aparts

OR

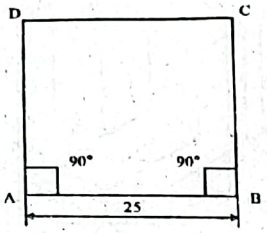
Q5. Point P is 30 mm above HP and 50 mm behind VP and point Q is 20 mm above HP and 30 mm in front of VP. If the distance between the projectors is 60 mm. Draw the projections of line PQ.

Ans.



Q6. Draw an involute of a square 30 mm side.

Ans. Construct a square of side 25 mm



Construction :

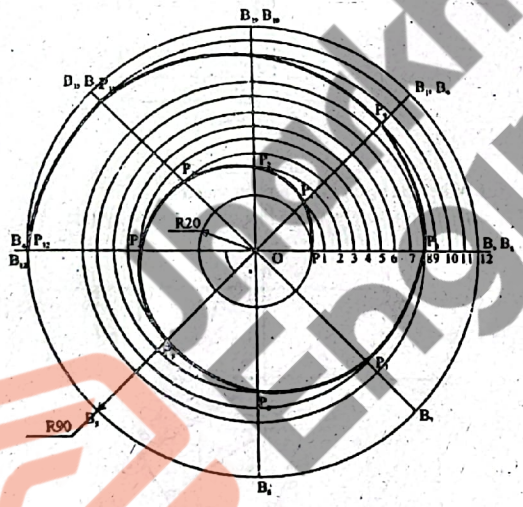
With the aid of a Protractor

1. Draw an 25 mm long straight line AB.
2. From A and B, draw lines at 90° with the aid of protractor to AB and mark the side 25 mm on them to get C and D.
3. Join CD, then ABCD is the required square.

OR

Q6. Draw an archimedian spiral of one convolution of greatest radius 90 mm and smallest radius as 20 mm.

Ans.

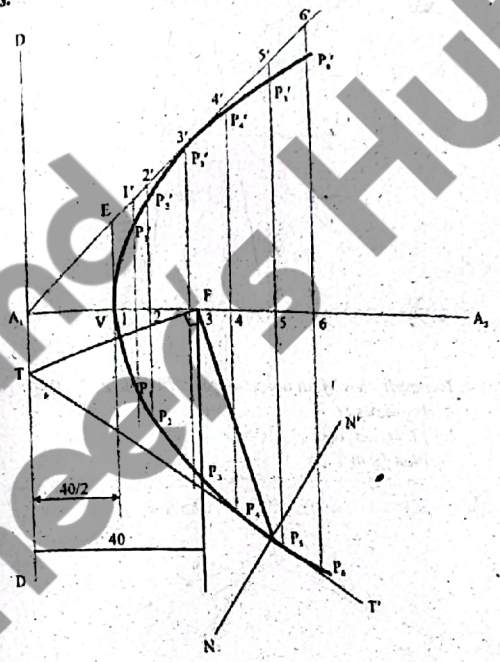


Practice Set -1
Engineering Graphics

Answer all six questions :

Q1. Draw parabola when distance between focus and directrix is 40 mm. Draw tangent and normal at any point of the curve.

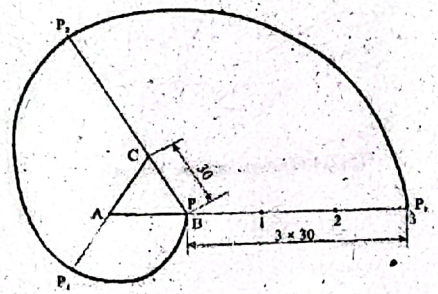
Ans.



OR

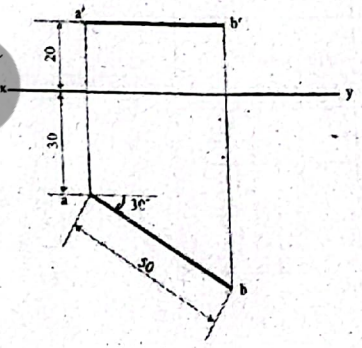
Q1. Draw an involute of an eluilateral triangle of 30 mm side.

Ans.



Q2. 50 mm long straight line AB is parallel to HP and inclined at 30° to V.P. the end A is 20 mm above H.P. and 30 mm infront of V.P. Draw projection of straight line AB.

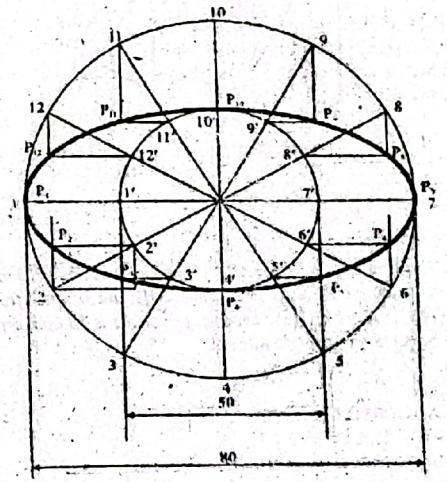
Ans. Given AB → 50mm(TL)
f → 30°
A → 20 mm above H.P.
→ 30mm infront V.P.



OR

Q2. The major axis and minar axis of an ellipse are 80 mm and 50 mm respectively. Draw an ellipse and draw tangent and normal at any point of the curve.

Ans.



Q3. Draw isometric view of the object whose ortho graphic projections are shown in figure (1).

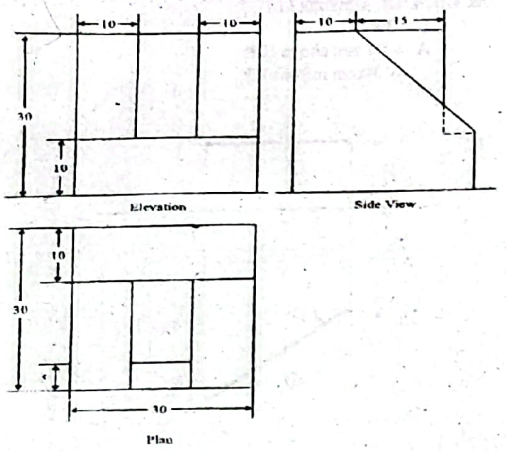
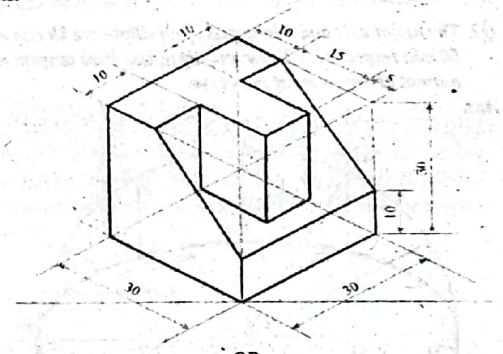


Fig.(1)All Dimensions are in mm

Ans.



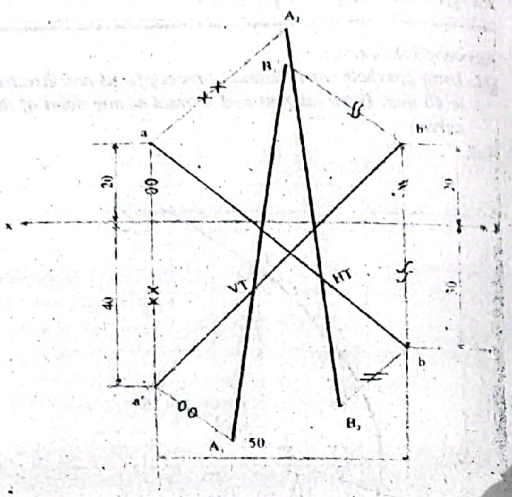
OR

Q3. End A of a straight line AB is 40 mm below HP and 20 mm behinding V.P. End is 20 mm above HP and 30 mm infront of V.P. If the distance between projectors is 50 mm, draw projection of straight line AB.

Ans.

Given,

A → 40mm below HP.
→ 20mm behind VP.
B → 20mm above HP.
→ 30mm infront VP.
Projection → 50 mm aparts



Q4. Isometric view of an object is given in figure (2). Draw following views :
(a) Elevation from F
(b) Plan from T

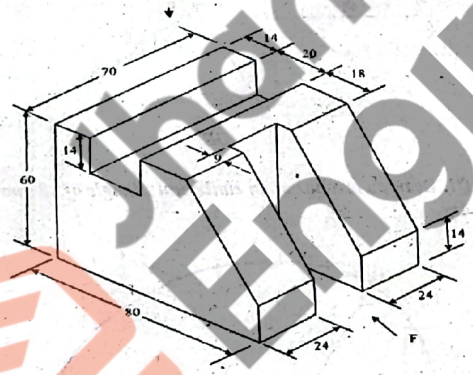
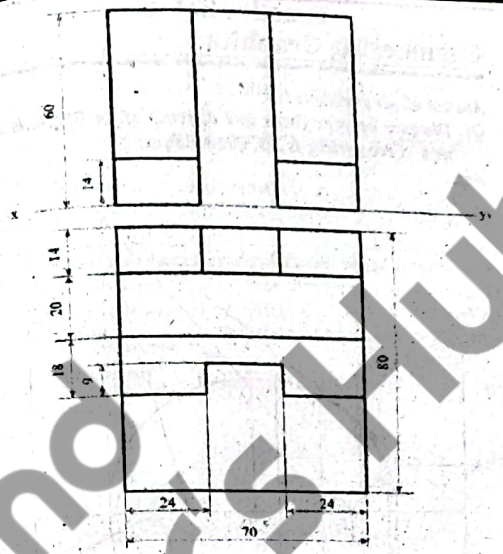


Fig.(2)All Dimensions are in mm

Ans.

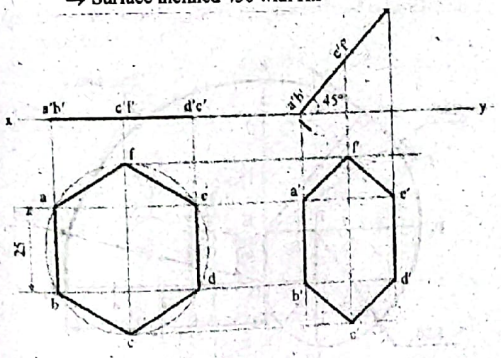


OR

Q4. Draw projections of a regular hexagonal plane of 25 mm side having one of its sides in HP and its surface making 45° with HP.

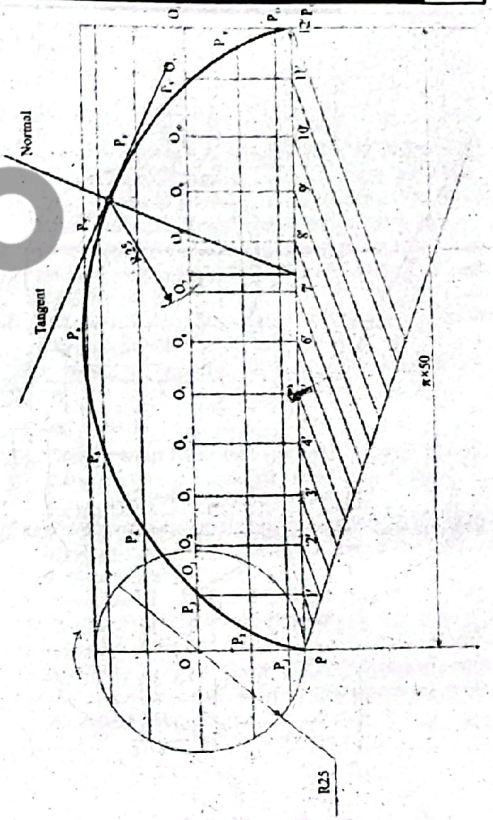
Ans.

Hexagonal Plane
→ Side, 25°
→ Surface inclined 450 with H.P



Q5. Construct a cycloid when the radius of rolling of rolling circle is 25 mm. Draw tangent and normal at any point of the curve.

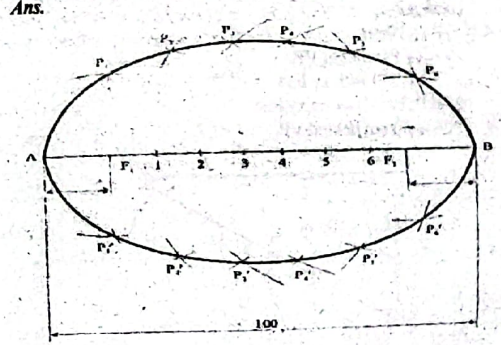
Ans.



OR

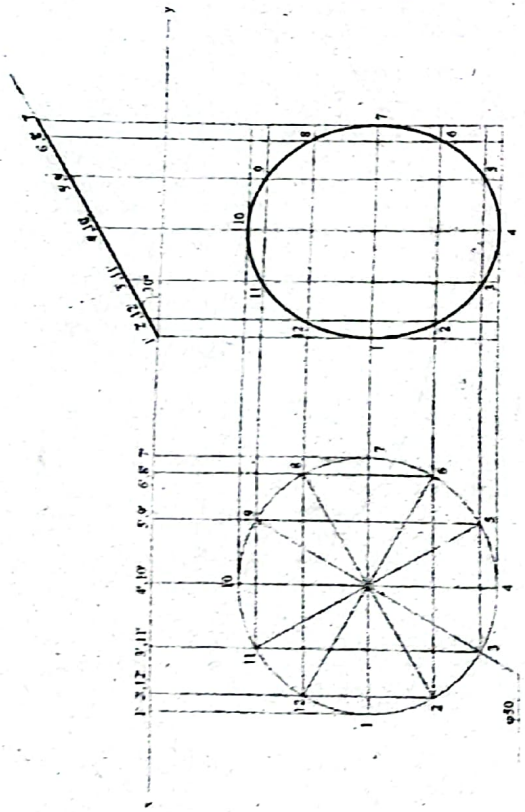
Q5. The major axis of an ellipse is 100 mm long and the focus are at a distance of 15 mm from its ends. Construct an ellipse.

Ans.



Q6. A circular lamina of 50 mm diameter rests on HP such that surface of lamina inclined at 30° to HP. Draw its projections.

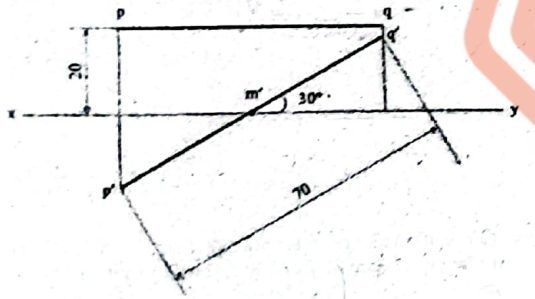
Ans.



OR

Q6. Front view of a straight line PQ is 70 mm and is parallel to V.P. at makes 30° with xy line the mid point of the front view is on xy line. If the line is 20 mm behind V.P. Draw its projections.

Ans. F.V → 70mm
→ Parallel to VP
→ 300 with xy line
Mid Point(M) → on xy line
PQ → 20mm behind VP



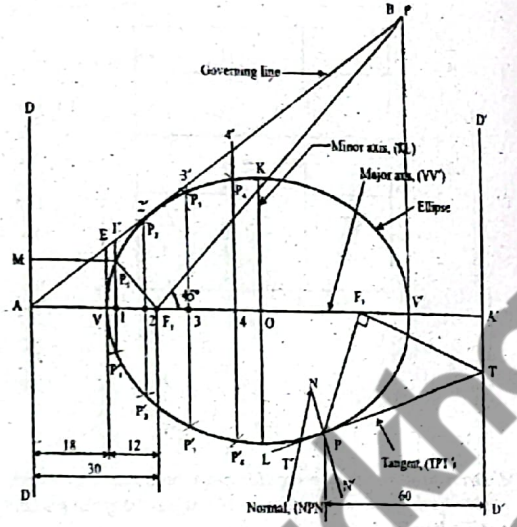
Practice Set -2

Engineering Graphics

Answer all six questions :

Q1. Distance between focus and directrix of an Ellipse is 30 mm. If eccentricity is 2/3. Draw Ellipse.

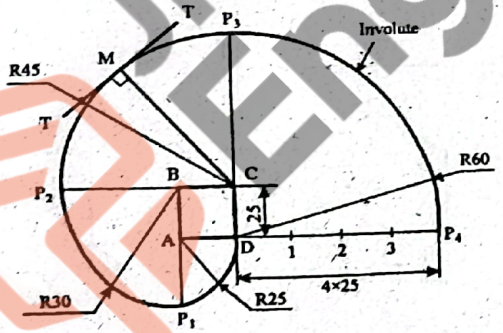
Ans.



OR

Q1. Draw an involute of a square of side 25 mm.

Ans.



1. Draw the square ABCD of side 15 mm.
2. Assuming D as the starting point.
3. With A as centre and radius AD (=1×25), draw an arc to cut BA extended at P_1.
4. With B as centre and radius BP_1 (=2×25), draw an arc to cut CB extended at P_2.
5. With C as centre and radius CP_2 (=3×25), draw an arc to cut DC extended at P_3.
6. With D as centre and radius DP_3 (=4×25), draw an arc to cut AD extended at P_4.
7. Join D, P_1, P_2, P_3, P_4 to obtained required involute.

Tangent and Normal

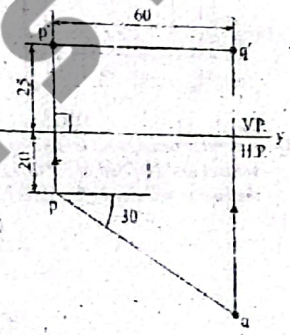
8. Mark ay point M on the curve and join it to its respective center (i : e c).
9. The line MC is required normal.
10. Draw a line TMT perpendicular to the MC is the required tangent to the curve.

Q2. The length of elevation of at line AB, which is parallel to HP and inclined 30° to VP is 60 mm. The end A of straight line AB is 20 mm above HP and 25 mm infront of VP. Draw the projection of straight line AB end. Find it true length.

Ans. Write data given in the box provide 1

Data given:
PQ = pq = 60
ϕ = 30°
p 20 ↓ xy
p' 25 ↑ xy
p'q' ∥ to xy

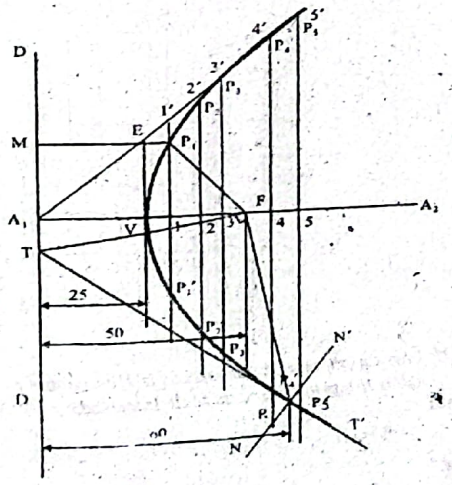
Answers:
True length
PQ = pq = 69.3



OR

Q2. Distance between focus and directrix of a parabola is 30 mm. Draw parabola.

Ans.

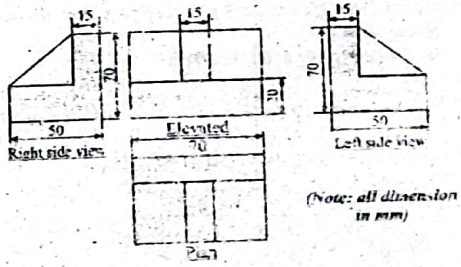


1. Draw the axis A_1A_2 and the directrix DD, at perpendicular to each other.
2. Mark Focus F on the axis, such that A_1F = 50 mm
3. Locate the vertex V at mid point of A_1F (i.e.25 mm) because, eccentricity, $e = \frac{VF}{AV} = 1$
4. At V, draw a line to A_1A_2 such that VE = VF, then join, A_1E ane extend it to any length.
5. Mark a number of point 1, 2, 3, ...etc to the right side of point V on the axis. These point need not be equidistance.
6. Draw a perpendicular line through these points 1, 2, 3,.....etc to the axis and to meet the line A_1B extended at 1', 2', 3'....etc. respectively.
7. With centre F and radius equal to 11'. Draw on arcs cut the perpendicular line 11' at points P_1 and P_1'.
   P_1 and P_1' are the points on the parabola, because ratio,
   $\frac{FP_1}{MP_1} = \frac{11'}{A1-1} = \frac{1}{1} = 1$ (*the eccentricity*)
8. Similarl obtain points P_2 and P_2', P_3 and P_3' , P_4 and P_4'.....etc.
9. Draw a smooth curve passing through V_1, P_1, P_2, P_3....P_3'P_2', P_1'.....etc.

Tangent and Normal

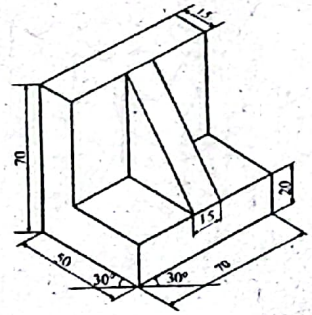
10. Locate a point R on the parabola at a given distance 60 mm from the directrix DD and join RF.
11. Draw a line FT to RF, meeting the directrix at T.
12. Join TR and extend it to some point 'T'. 'TT' is required tangent.
13. At point R, draw a line NN' to TT'. NN' is required normal.

Q3. Draw isometric view of the object whose orthotopic projections are shown in figure.



(Note: all dimension in mm)

Ans.

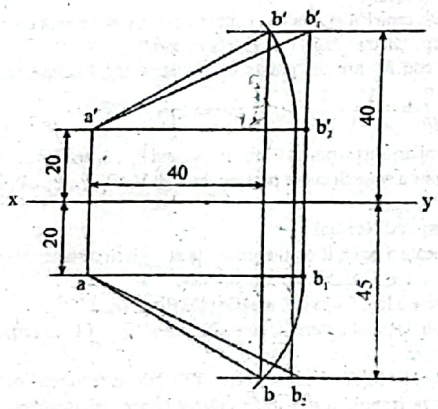


Q3. End A of straight line AB is 20 mm above HP & 20 mm infront of VP. End B is 40 mm above HP & 45 mm infront of VP. If distance between projectors is 40 mm. Draw projection of straight line AB.

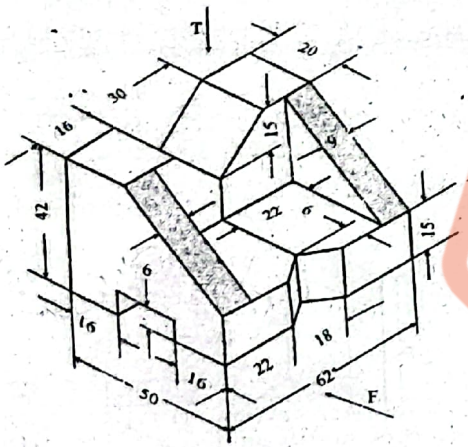
Ans.

Given,

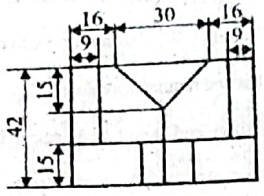
A → 40mm below HP.
→ 20mm behind VP.
B → 20mm above HP.
→ 30mm infront VP.
Projection → 50 mm aparts

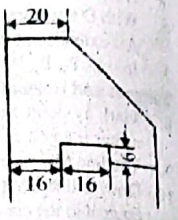


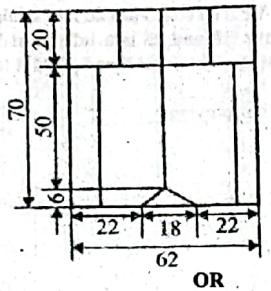
Q4. Pictorial view of an object is given in figure. Draw the following views.
(a) Elevation from F (b) Plan from T



Ans.



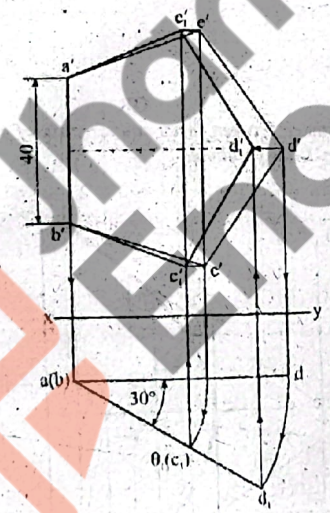




OR

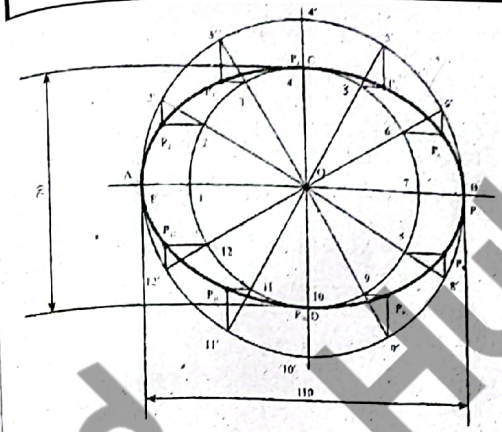
Q4. A regular pentagonal lamina of 40 mm side has its plane vertical and inclined at 30° to VP. Draw the projection of the lamina when one of its sides is perpendicular to the HP.

Ans.



Q5. Draw an ellipse whose major axis is 110 mm and minor axis is 70 mm using concentric circle method.

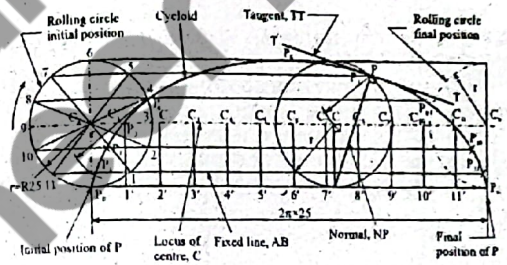
Ans.



OR

Q5. Construct a cycloid when radius of rolling circle is 25 mm.

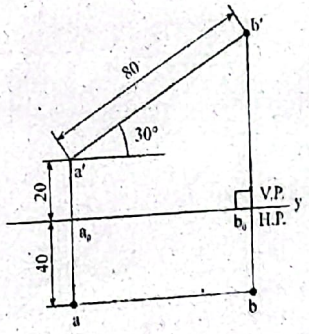
Ans.



Q6. Draw the projection of straight line AB 80 mm long inclined 30° to H.P. and parallel to V.P. The line is 40 mm infront of V.P. The lower end A is 20 mm above HP.

Ans. Here, none of the points rests either on H.P or V.P

Data given:
AB = 80 = a'b'
ϕ = 30°
ab ∥ to xy
ab 40 ↓ xy
a' 20 ↑ xy



Line parallel to V.P and inclined to H.P(In first quadrant)

OR

Q6. A square lamina ABCD of side 40 mm rest on the ground on its corner A in such a way that the diagonal AC is inclined at 40° to HP, if edges containing corner A are equally inclined to HP. Draw the projection of square lamina ABCD.

Ans.