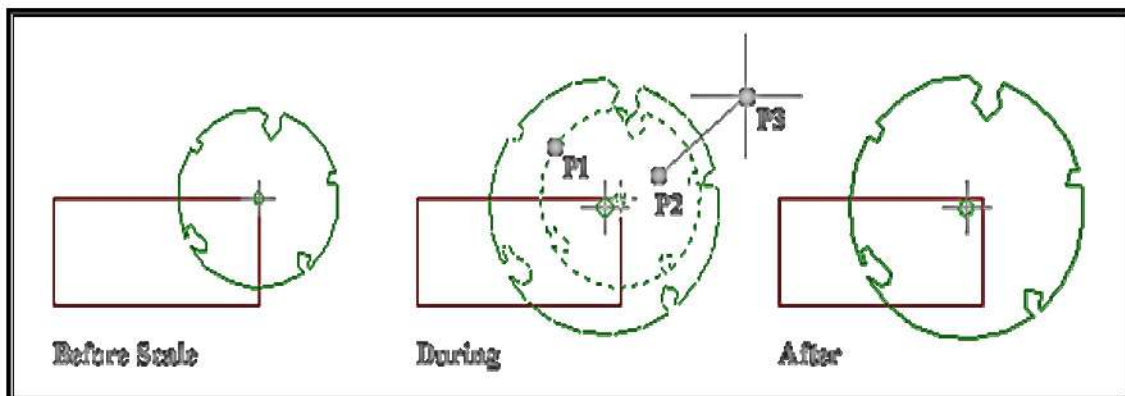


### How to use scale command in AutoCAD?

- Scale:- To scale an object, specify a base point and a scale factor. A scale factor is greater than 1 enlarges the object. On the other hand the scale factor lies between 0&1 then the object shrinks.
  - Keyboard Command: SC
  - Command: SCALE
- Select objects: (pick objects to be scaled, P1)  
 Select objects: (to end selection)  
 Specify base point: (pick base point, P2)  
 Specify scale factor or [Reference]: (pick second point, P3 or enter scale factor)



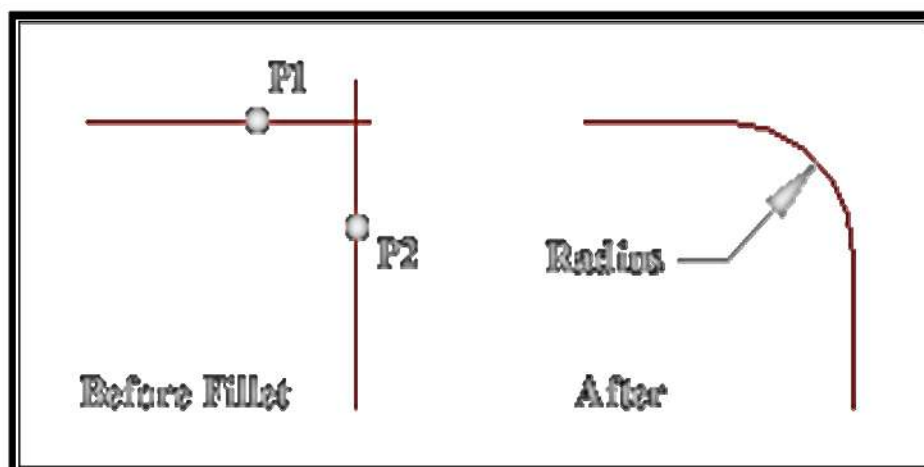
### How to use chamfer command in AutoCAD?

- Chamfer:-a chamfer options connects two objects with an angled line. The chamfered corners help to convert sharp corners into uniform angled corners.
- Keyboard Command: CHA
- Command: CHa \_CHAMFER
- (TRIM mode) Current chamfer Dist1 = 25.0000, Dist2 = 25.0000
- Select first line or [Undo/Polyline/Distance/Angle/Trim/mEthod/Multiple]: d
- Specify first chamfer distance <25.0000>: 50 Specify second chamfer distance <50.0000>: 50
- Select first line or [Undo/Polyline/Distance/Angle/Trim/mEthod/Multiple]:
- Select second line or shift-select to apply corner or [Distance/Angle/Method]:



### How to use fillet command in AutoCAD?

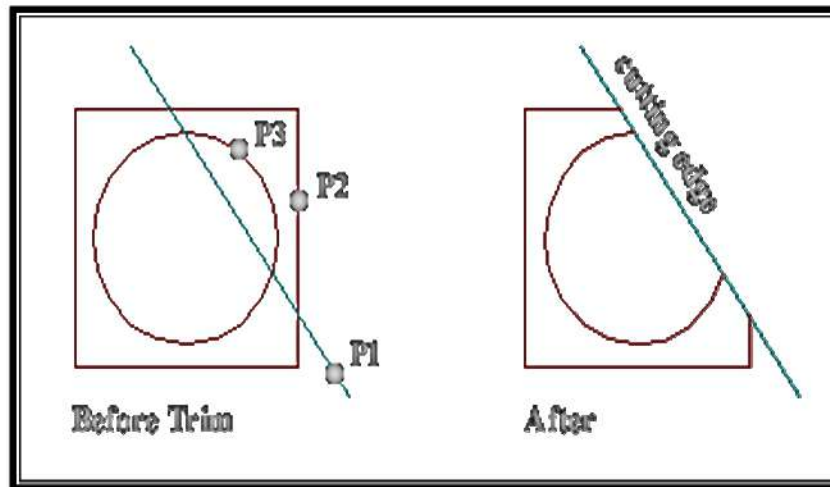
- Fillet: A fillet connects two objects with an arc that is tangent to the objects & has a specified radius. Filleting produces a rounded corner effect.
- Keyboard Command: F
- Command: F\_ FILLET  
Current settings: Mode = TRIM, Radius = 10.0000  
Select first object or [Polyline/Radius/Trim]: R  
Specify fillet radius <10.000>: 25  
Select first object or [Polyline/Radius/Trim]: (pick P1)  
Select second object : (pick P2)



### How to use trim command in AutoCAD?

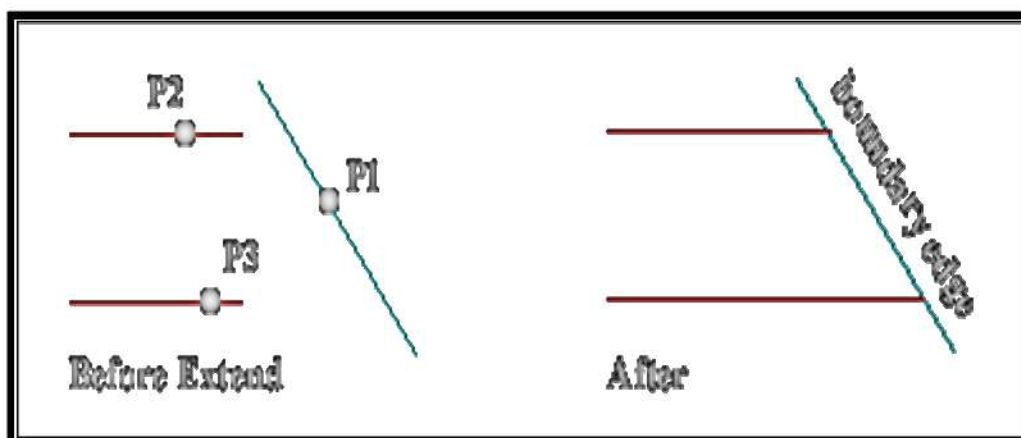
- Trim:- The Trim command can be used to trim a part of an object. In order to trim an object one must draw a second object which forms the "cutting edge". Cutting edges can be lines, xlines, rays, polylines, circles, arcs or ellipses. Blocks and text cannot be trimmed or used as cutting edges.
- The command's alias. Command: Tr
- Command: TRIM  
Current settings: Projection=UCS Edge=None  
Select cutting edges ...  
Select objects: (select the cutting edge, P1)  
Select objects: (to end cutting edge selection)  
Select object to trim or shift-select to extend or [Project/Edge/Undo]:(pick the part of the square which you want to trim, P2)

Select object to trim or shift-select to extend or [Project/Edge/Undo]: (pick the circle, P3)  
 Select object to trim or shift-select to extend or [Project/Edge/Undo]: (to end)



### How to use extend command in AutoCAD?

- Extend:-This command extends a line, polyline or arc to meet another drawing object (known as the boundary edge)
  - Keyboard Command: Ex
  - Command: EXTEND
- Current settings: Projection=UCS Edge=None  
 Select boundary edges ...  
 Select objects: (select the boundary edge, P1)  
 Select objects: (to end boundary edge selection)  
 Select object to extend or shift-select to trim or [Project/Edge/Undo]: (pick the object which you want to be extended, P2)  
 Select object to extend or shift-select to trim or [Project/Edge/Undo]: (pick another object which you want to be extended, P3)  
 Select object to extend or shift-select to trim or [Project/Edge/Undo]: (to end)



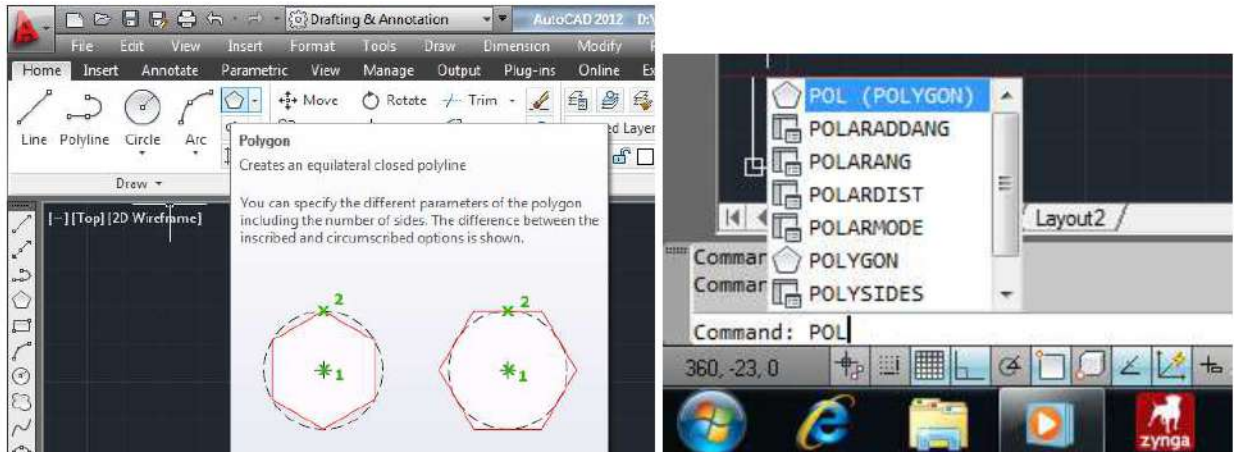
**Problem 1:** Draw the projections of a hexagonal prism of side of base 25mm and height 50mm resting with its base on H.P. such that one of its rectangular faces is perpendicular to V.P.

### PLAN

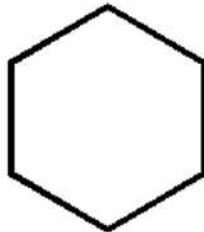
1. Select polygon in ribbon bar

OR

Write pol in command window and press Enter

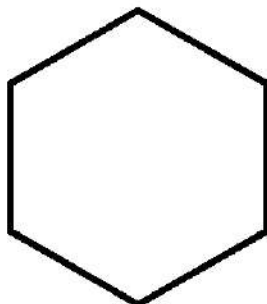


2. POLYGON ENTER NUMBER OF SIDES <4>: 6
3. SPECIFY CENTRE OF POLYGON OR [EDGE] : E SPECIFY FIRST ENDPOINT OF EDGE:  
SPECIFY SECOND ENDPOINT OF EDGE: 25

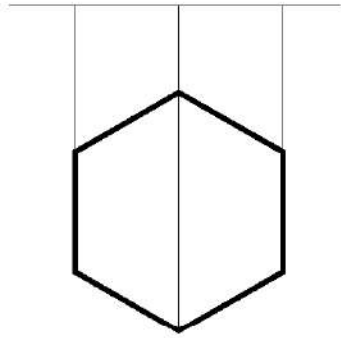


### ELEVATION

1. Create a horizontal line.



2. Then use Line command to draw perpendicular to horizontal line

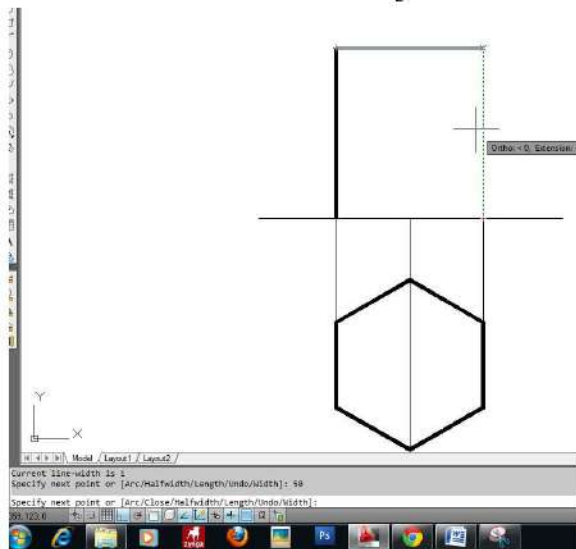


3. COMMAND: PLINE

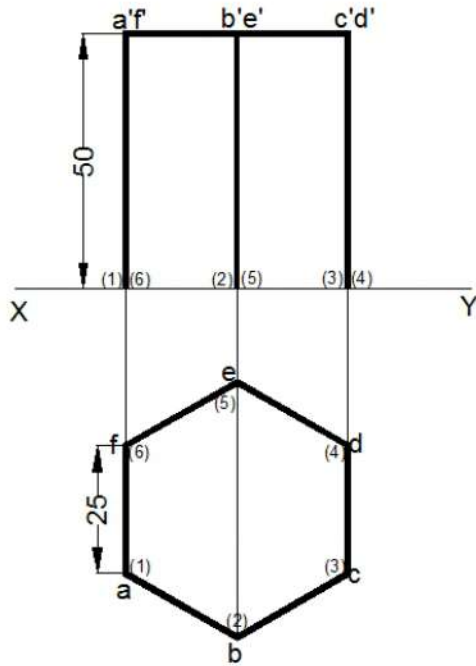
SPECIFY START POINT:

CURRENT LINE-WIDTH IS 1

SPECIFY NEXT POINT OR [ARC/HALFWIDTH/LENGTH/UNDO/WIDTH]: 50



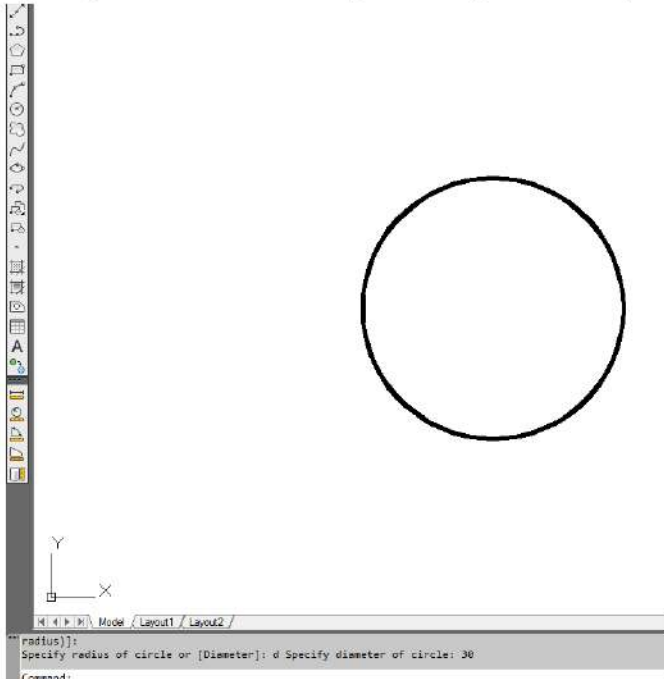
4. Then text & dimension commands are used to obtain the required plan and elevation as shown below.



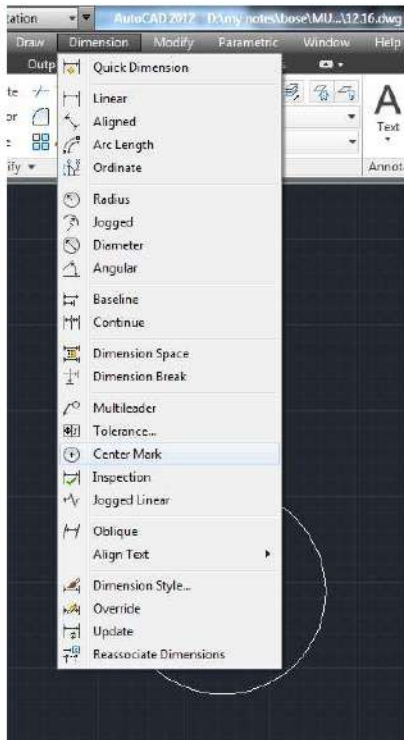
**Problem 2:** Draw the projection of a cylinder of base 30mm diameter and axis 50mm long resting with its base on H.P. and axis 25 mm in front of V.P.

### PLAN

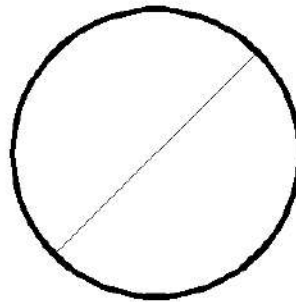
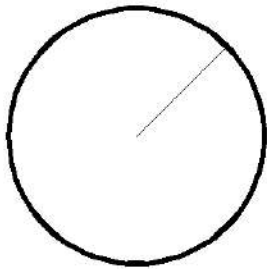
4. Command: C or CIRCLE
5. Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:  
Specify radius of circle or [Diameter] <15>: d Specify diameter of circle <30>: 30



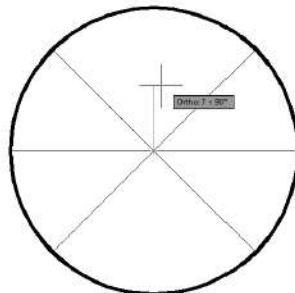
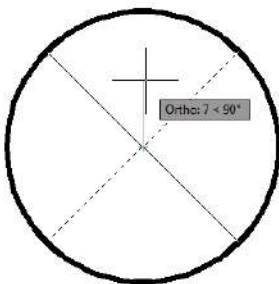
6. Then go to dimension in menu bar & click centre mark



7. Command: l
8. LINE Specify first point:  
Specify next point or [Undo]: @15<45  
& extend the line

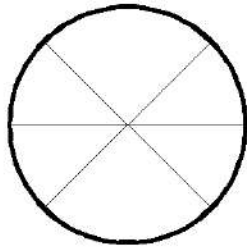


9. Mirror the angle line & create perpendicular line horizontal & vertical

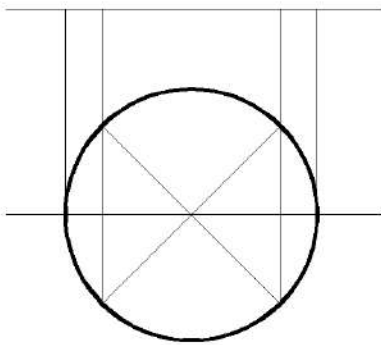


**ELEVATION**

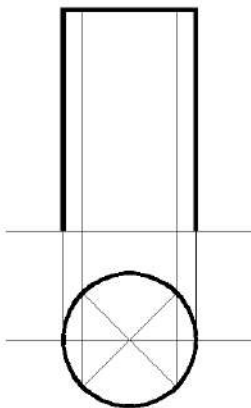
5. Create a line of horizontal



6. Then use command L and press ENTER  
7. Draw perpendiculars from the points on circle to horizontal line

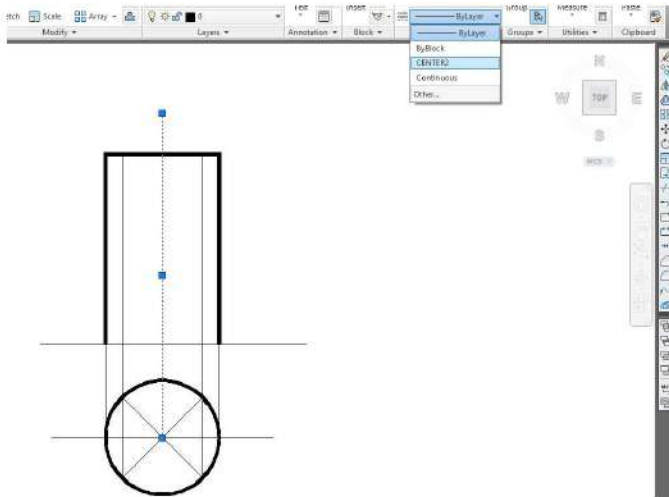


8. COMMAND: PLINE  
SPECIFY START POINT:  
CURRENT LINE-WIDTH IS 1  
SPECIFY NEXT POINT OR [ARC/HALFWIDTH/LENGTH/UNDO/WIDTH]: 50

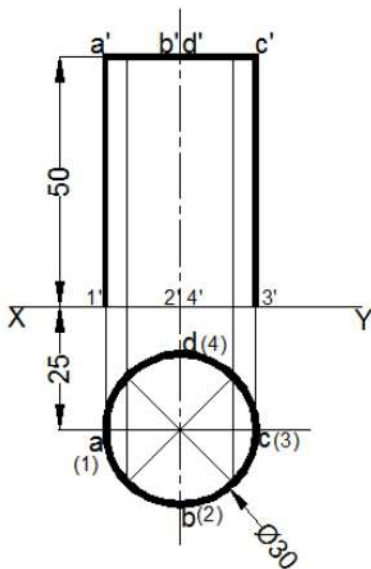


9. Create a centre line & change the centre line type





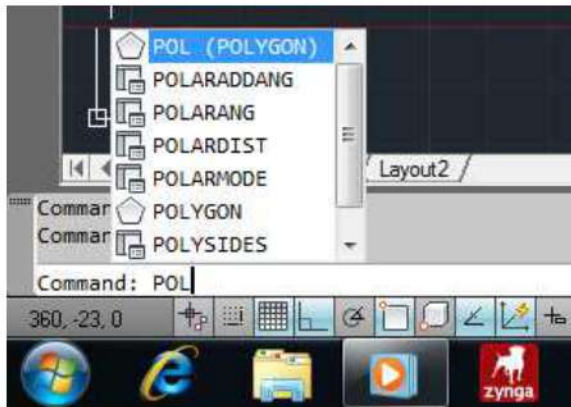
10. Then text & dimension commands are used to obtain the required plan and elevation as shown below.



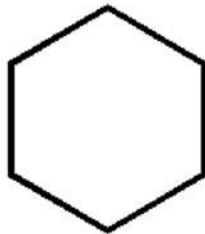
**Problem 3:** Draw the projections of pentagonal pyramid side of base 30mm and height 60mm resting with its base on H. P. such that one of the edge of the base is perpendicular to V.P.

### PLAN

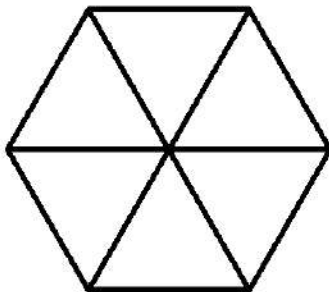
1. Select polygon in ribbon bar  
OR  
Write pol in command window and press Enter



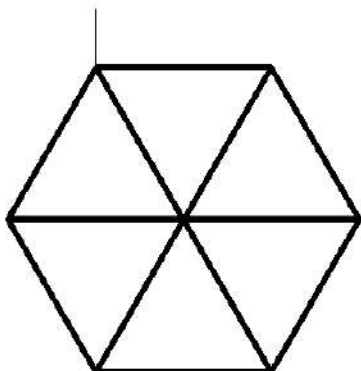
2. POLYGON ENTER NUMBER OF SIDES <4>: 6
3. SPECIFY CENTRE OF POLYGON OR [EDGE] : E SPECIFY FIRST ENDPOINT OF EDGE:  
SPECIFY SECOND ENDPOINT OF EDGE: 30



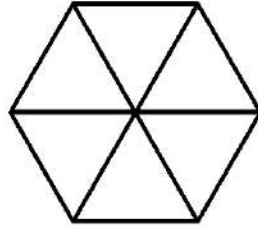
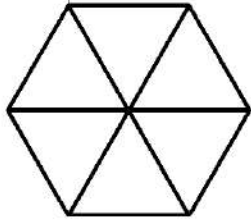
4. All points joins in endpoint to end point in Line command



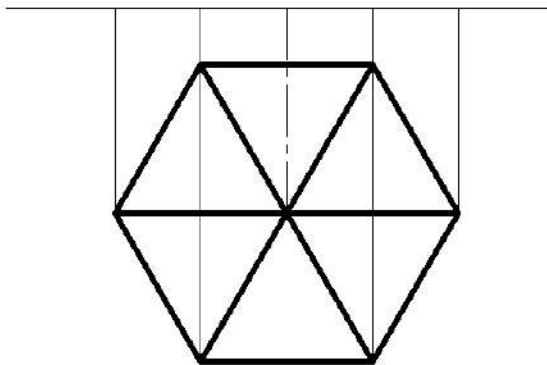
5. Command: l  
LINE Specify first point:  
Specify next point or [Undo]: 10



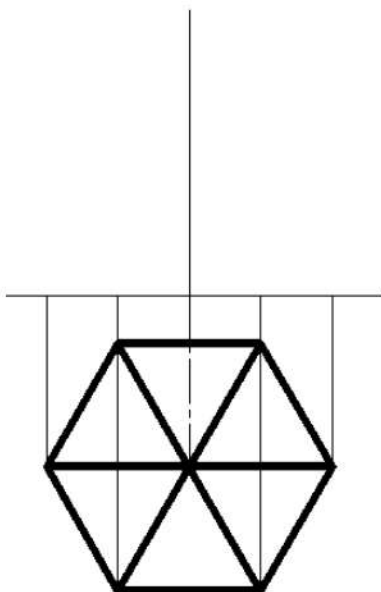
6. Create a line & delete the perpendicular line



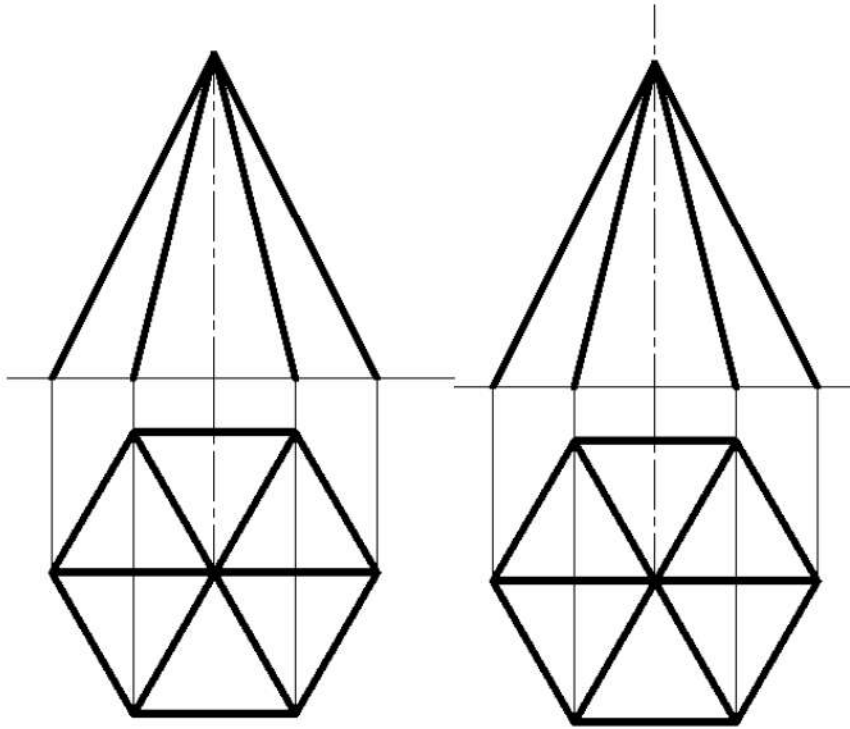
7. Then use command L and press ENTER  
Draw perpendiculars from the points on circle to horizontal line



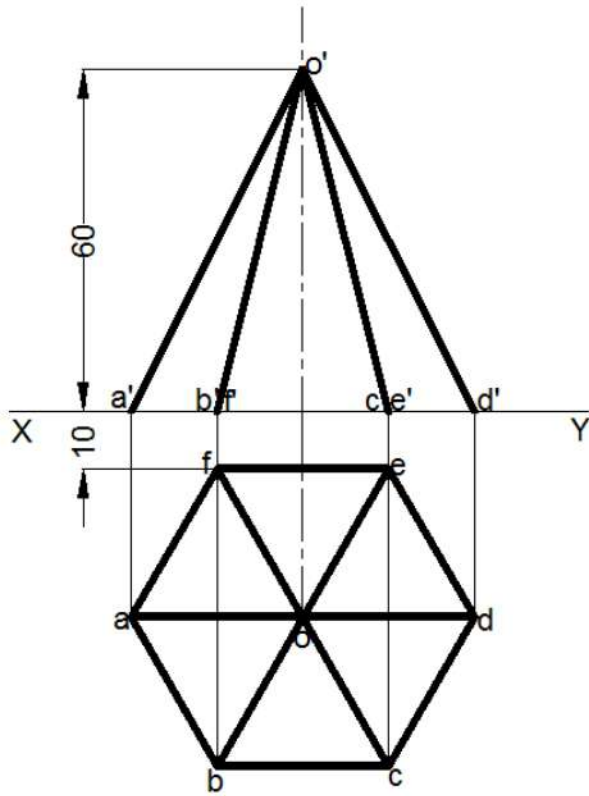
8. Command: I LINE Specify first point:  
Specify next point or [Undo]: 60



9. Join the line end point to end point & stretch the centre line



10. Then text & dimension commands are used to obtain the required plan and elevation as shown below.



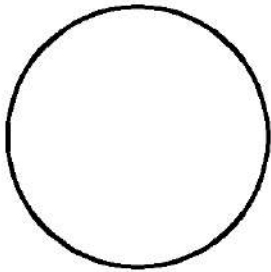
**Problem 4:** Draw the projection of a right circular cone of base 40mm and height 60mm when resting with its base on H.P.

PLAN

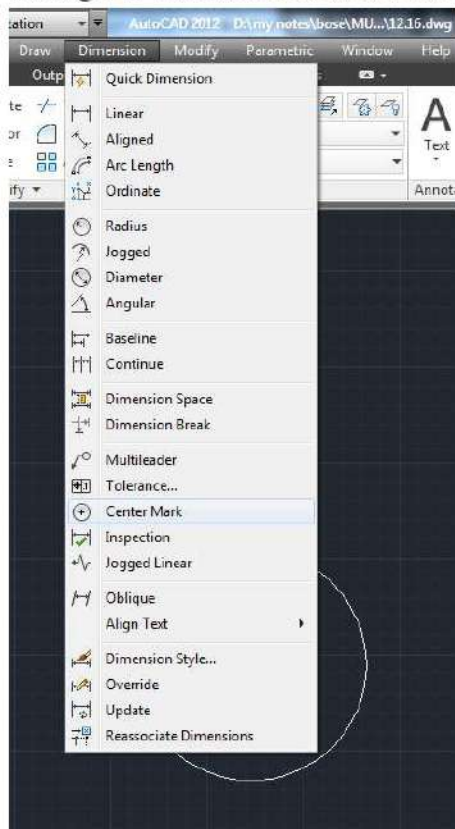
10. Command: C or CIRCLE

Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:

Specify radius of circle or [Diameter] <15>: d Specify diameter of circle <30>: 40



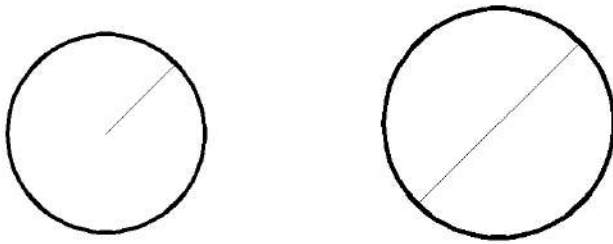
11. Then go to dimension in menu bar & click centre mark



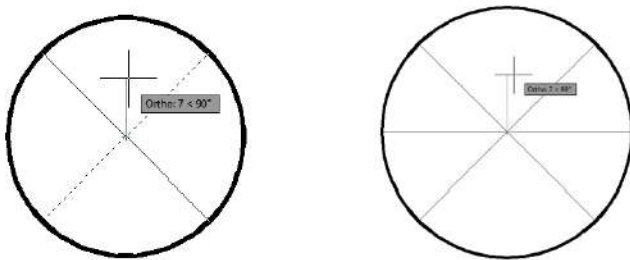
12. Command: l LINE Specify first point:

Specify next point or [Undo]: @15<45

& extend the line

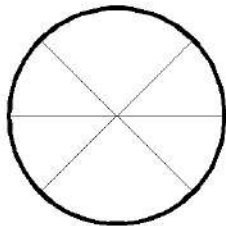


13. Mirror the angle line & create perpendicular line horizontal & vertical

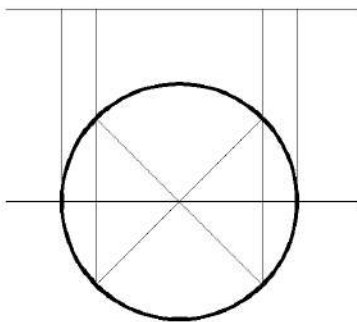


**ELEVATION**

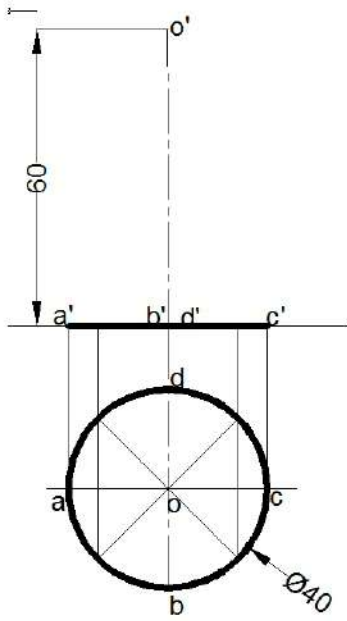
11. CREATE A LINE OF HORIZONTAL



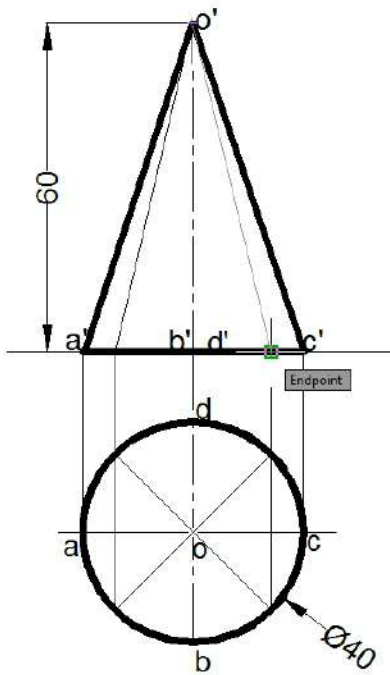
12. THEN L ENTER POINT TO PERPENDICULAR TO HORIZONTAL LINE



13. Command: 1 LINE Specify first point:  
Specify next point or [Undo]: 60

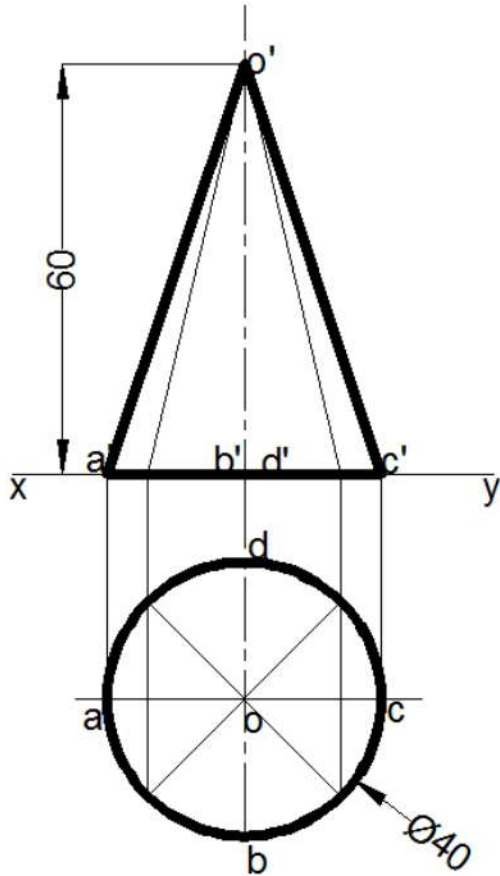


14. Join the line end point to end point





10. Then text & dimension commands are used to obtain the required plan and elevation as shown below.



**Problem 5:** Draw the isometric view of a hexagonal prism side of base 25mm and height 60mm resting on the ground in vertical position and one of the side of the hexagon is parallel to V.P.

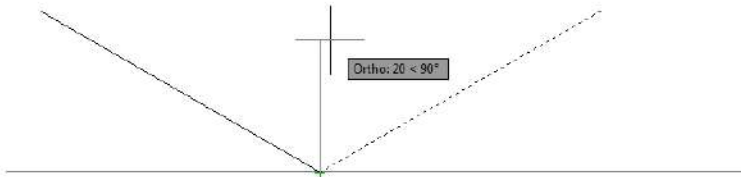
1. Command: l LINE  
Specify first point:



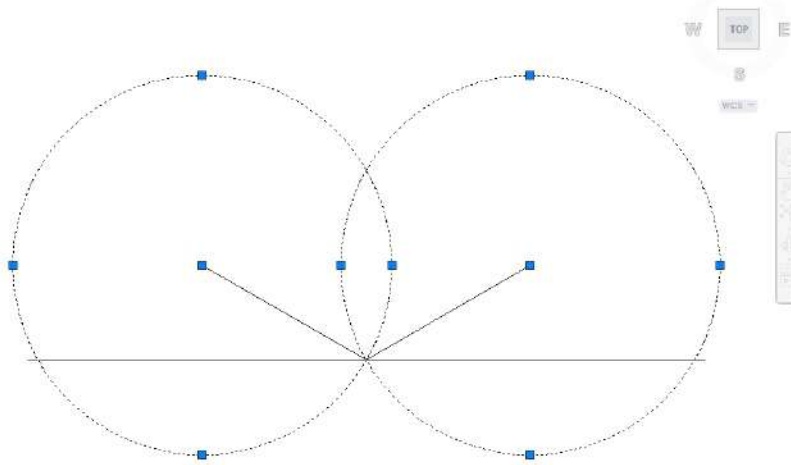
2. Command: l  
LINE Specify first point:  
Specify next point or [Undo]: @50<30



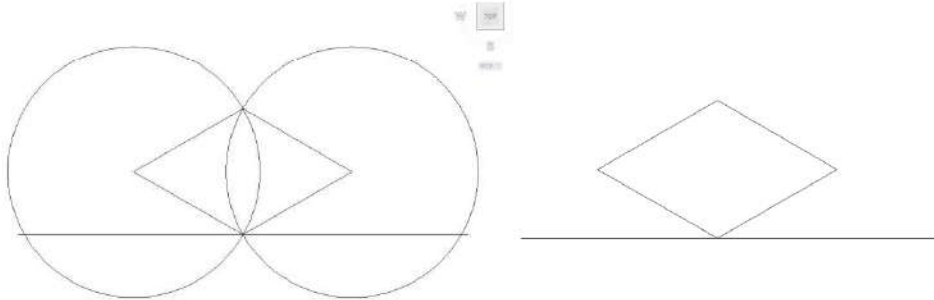
3. Mirror to opposite side



4. Command: c CIRCLE  
Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:  
Specify radius of circle or [Diameter] <25>: 50



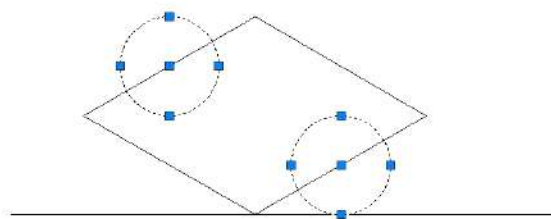
5. Then join the lines circles intersection point & delete the circle



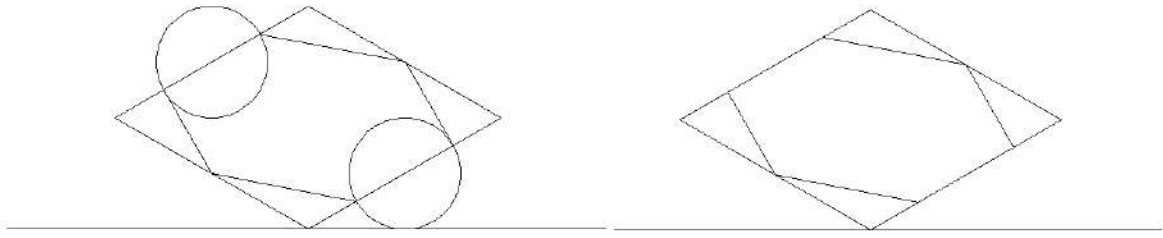
6. Draw a circle in the midpoint of line

Command: CIRCLE Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:

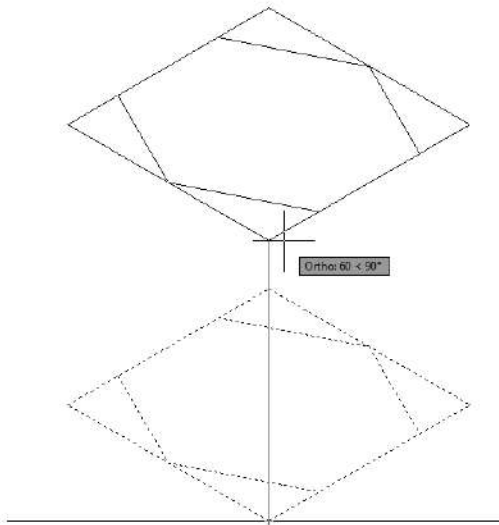
Specify radius of circle or [Diameter] <25>: d Specify diameter of circle <50>: 25



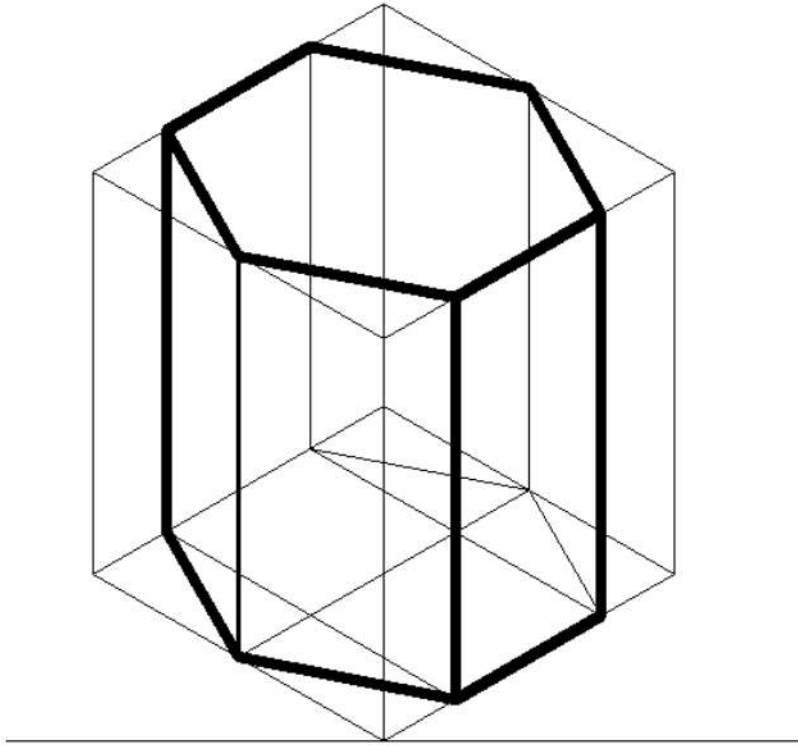
7. Join the line & delete the circle



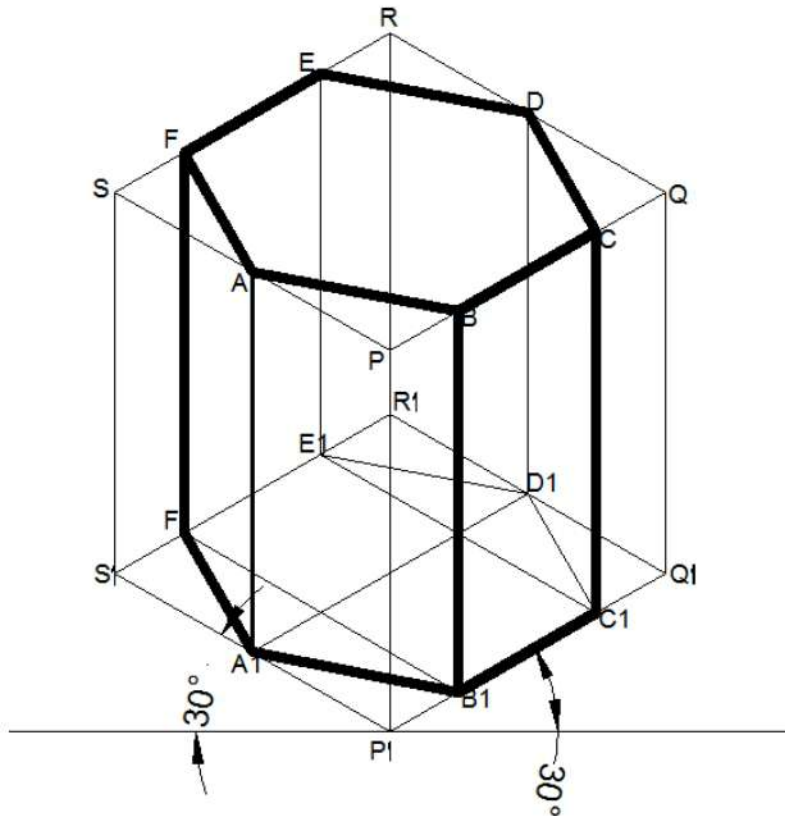
8. Then copy the object from perpendicular distance 60



9. Then join the line endpoint to endpoint



10. Then text & dimension commands are used to obtain the required plan and elevation as shown below.



**Problem 6:** Draw the isometric view of a hexagonal pyramid of side 30mm and height 75mm, when it is resting on H. P. such that an edge of base is parallel to V.P.

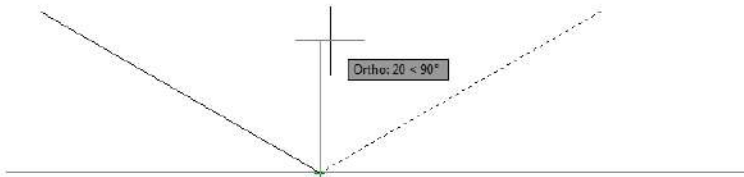
1. Command: l LINE Specify first point:



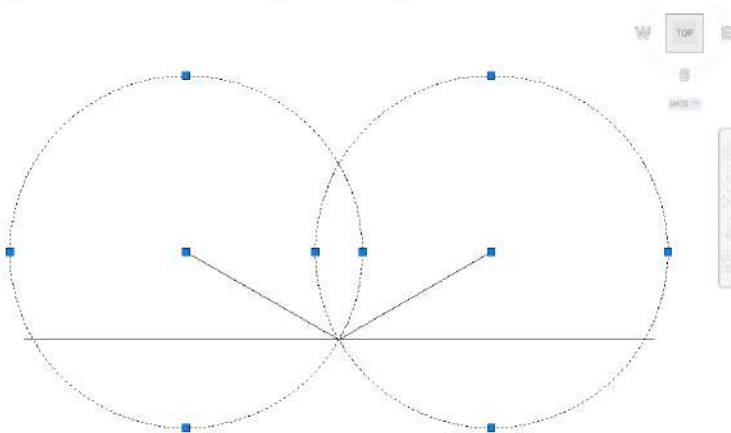
2. Command: l LINE Specify first point:  
Specify next point or [Undo]: @60<30



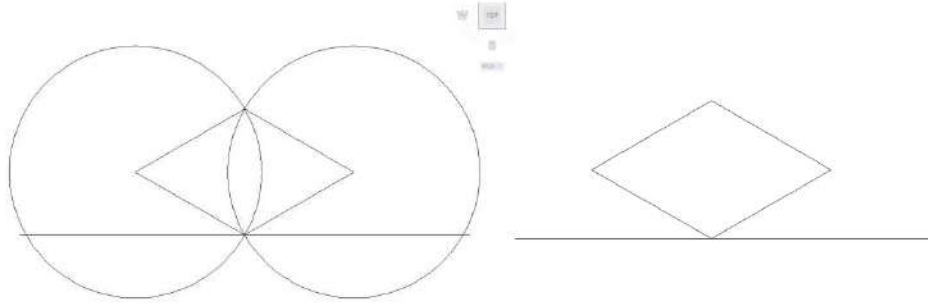
3. Mirror to opposite side



4. Command: c CIRCLE Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:  
Specify radius of circle or [Diameter] <25>: 60



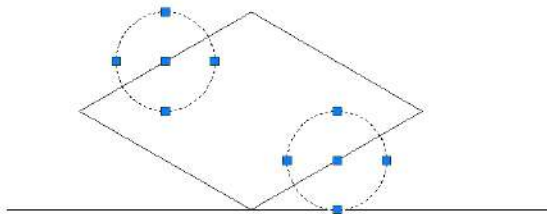
5. Then join the lines circles intersection point & delete the circle



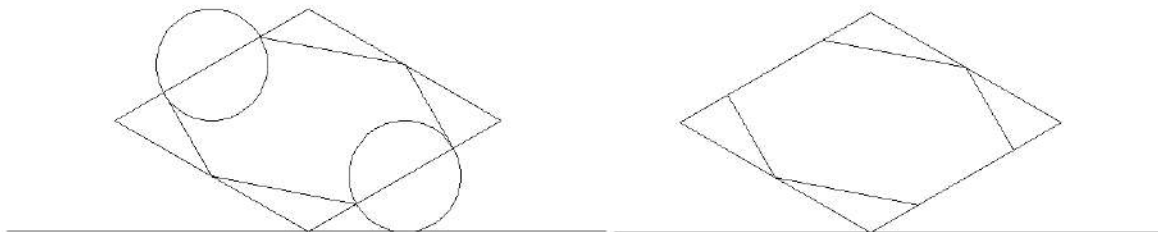
6. Draw a circle in the midpoint of line

Command: CIRCLE Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:

Specify radius of circle or [Diameter] <25>: d Specify diameter of circle <50>: 30

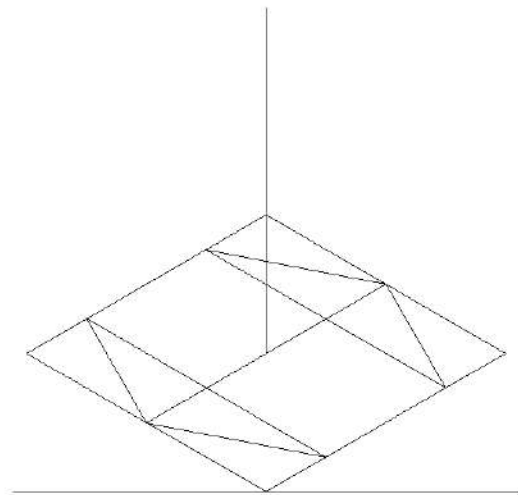


7. Join the line & delete the circle

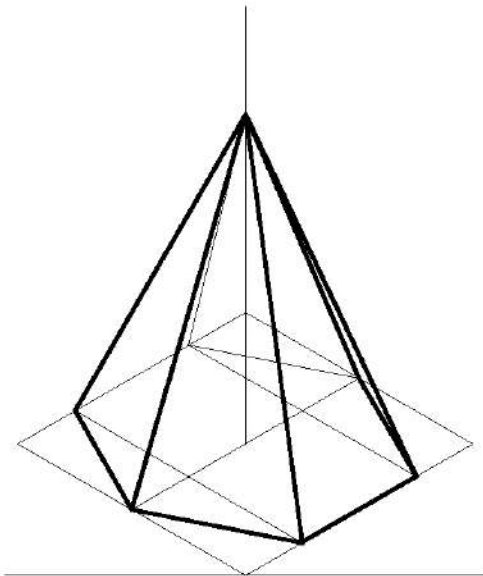


8. Line enter centre point distance 75

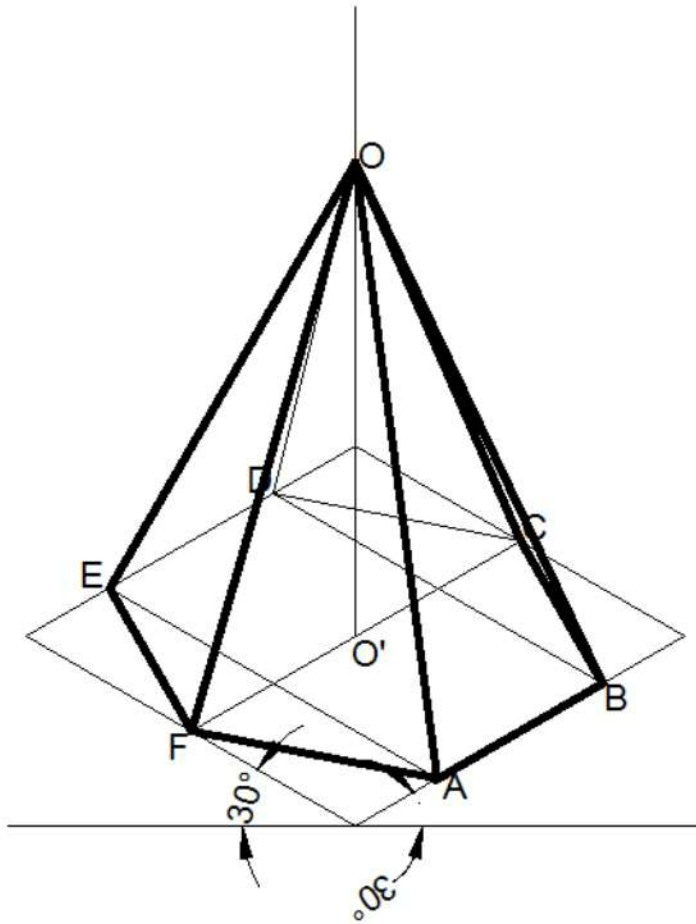




9. Then join the line endpoint to endpoint



10. Then text & dimension commands are used to obtain the required plan and elevation as shown below.



**Problem 7:** Draw the isometric view of a cylinder of base 50mm diameter and 70 mm height is resting with its base on H.P.

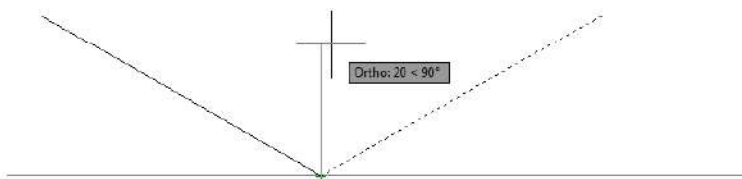
1. Command: l LINE Specify first point:



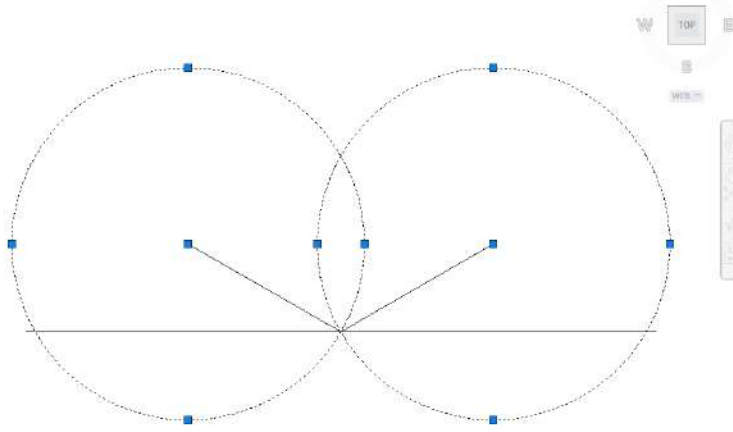
2. Command: l LINE Specify first point:  
Specify next point or [Undo]: @50<30



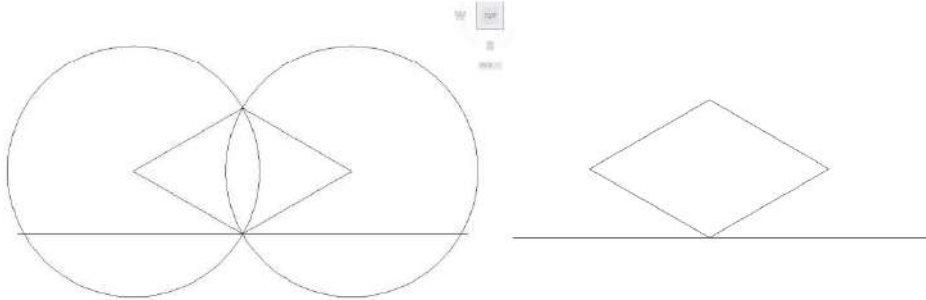
3. Mirror to opposite side



4. Command: c CIRCLE Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:  
Specify radius of circle or [Diameter] <25>: 50



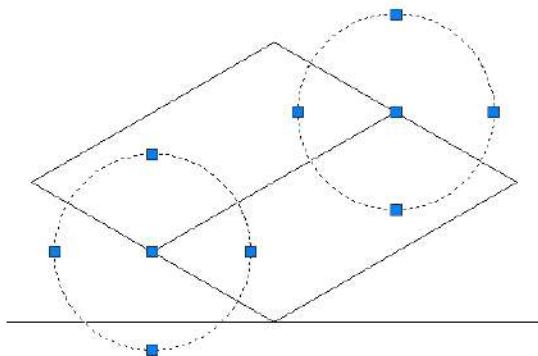
5. Then join the lines circles intersection point & delete the circle



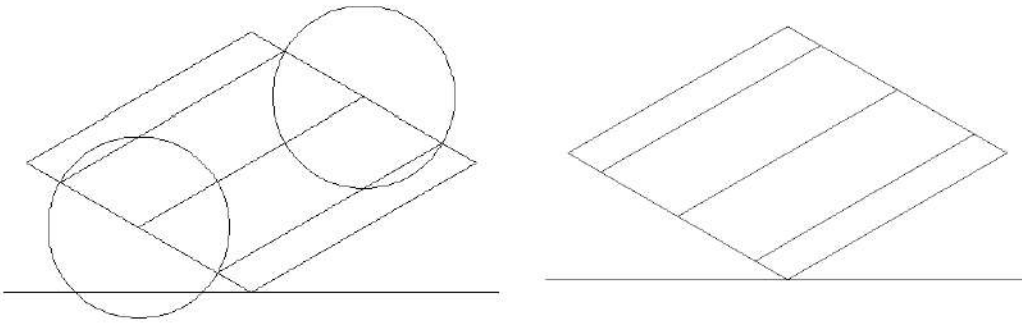
6. Draw a circle in the midpoint of line

Command: CIRCLE Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:

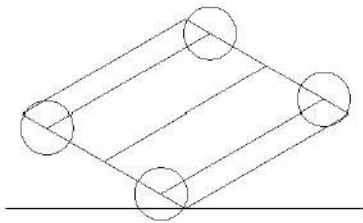
Specify radius of circle or [Diameter] <25>: d Specify diameter of circle <50>: 35



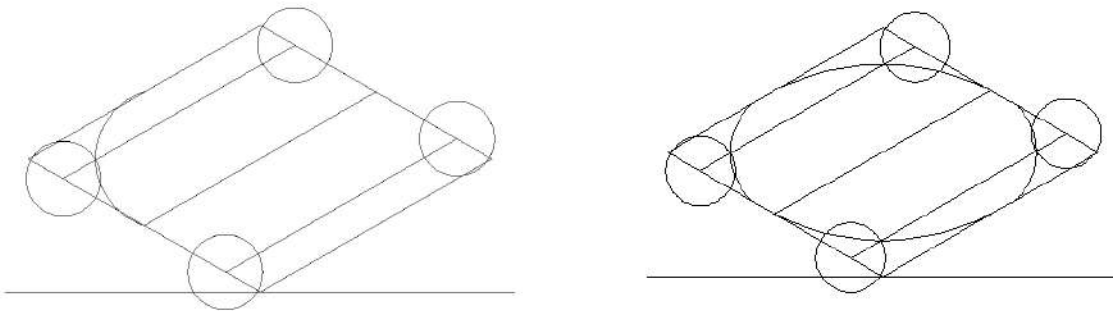
7. Join the line intersection point to intersection point & delete the circle



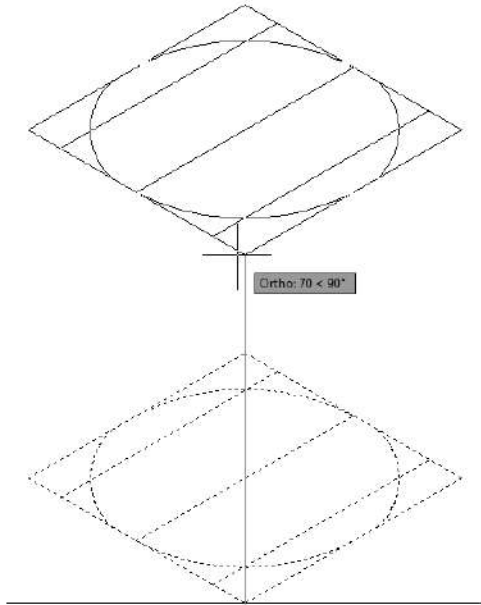
8. Command: c CIRCLE Specify center point for circle or [3P/2P/Tr (tan tan radius)]:  
Specify radius of circle or [Diameter] <18>: 7



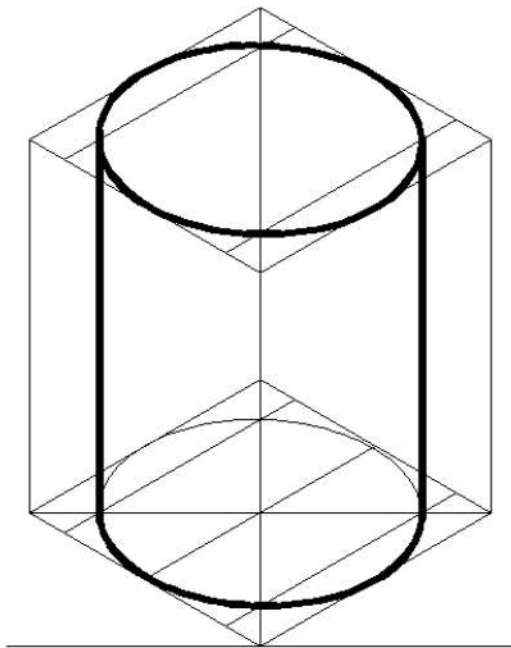
9. Then create arc in 3points



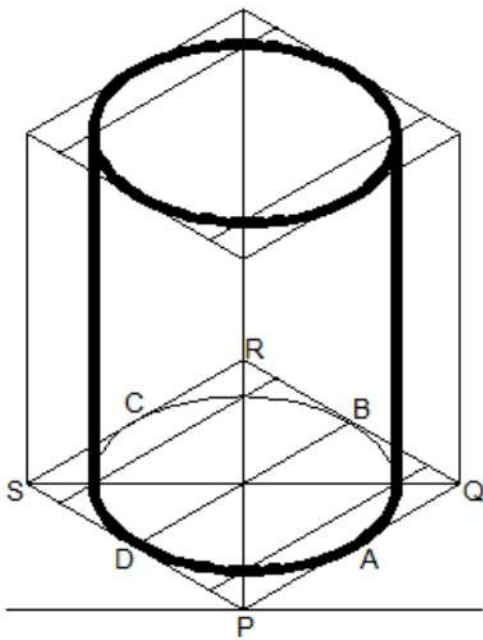
10. Then copy the object in perpendicular distance



11. Join line from end point to end point



12. Add text on the drawing



**Problem 8:** Draw the isometric view of a cone of base 40mm diameter and height 58mm when it rests with its base on H.P.

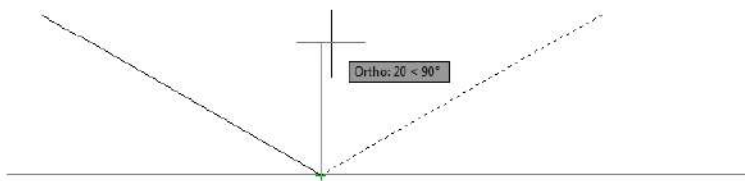
1. Command: 1 LINE Specify first point:

---

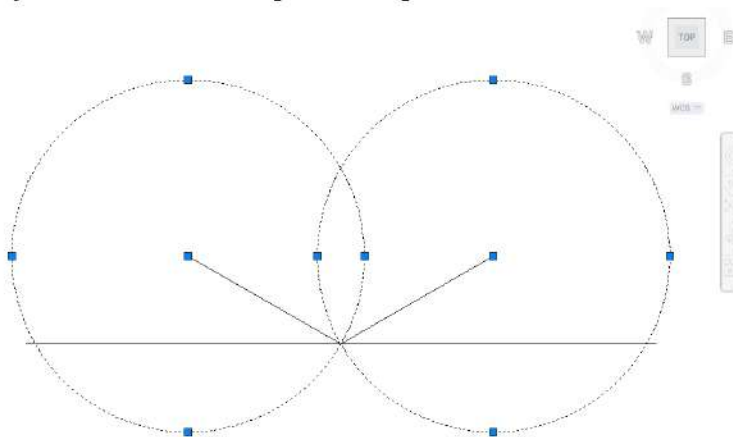
2. Command: 1 LINE Specify first point:  
Specify next point or [Undo]: @40<30



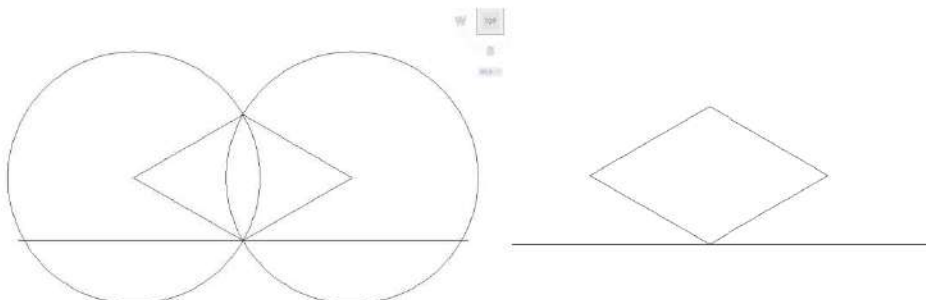
3. Mirror to opposite side



4. Command: c CIRCLE Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:  
Specify radius of circle or [Diameter] <25>: 40

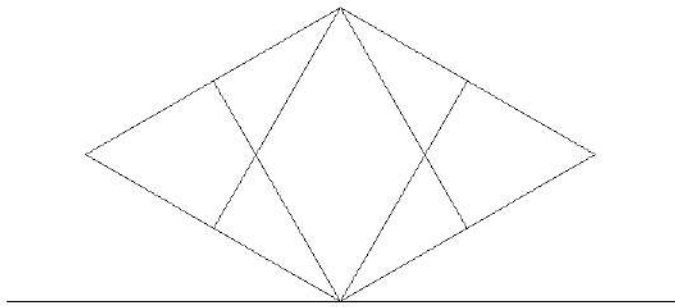


5. Then join the lines circles intersection point & delete the circle

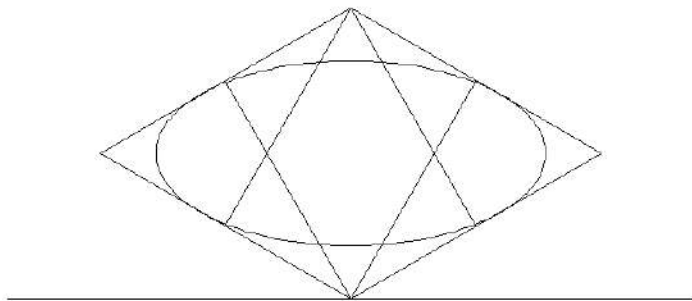


6. Join the line from midpoint to corner point

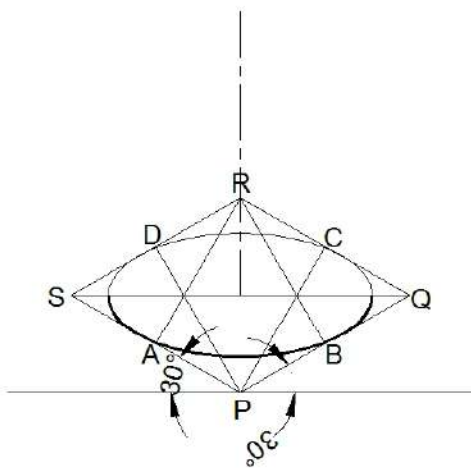




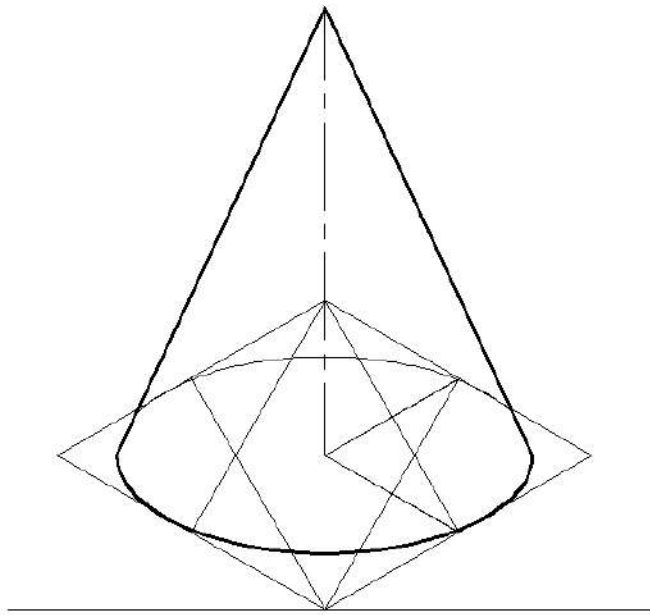
7. Then create ellipse



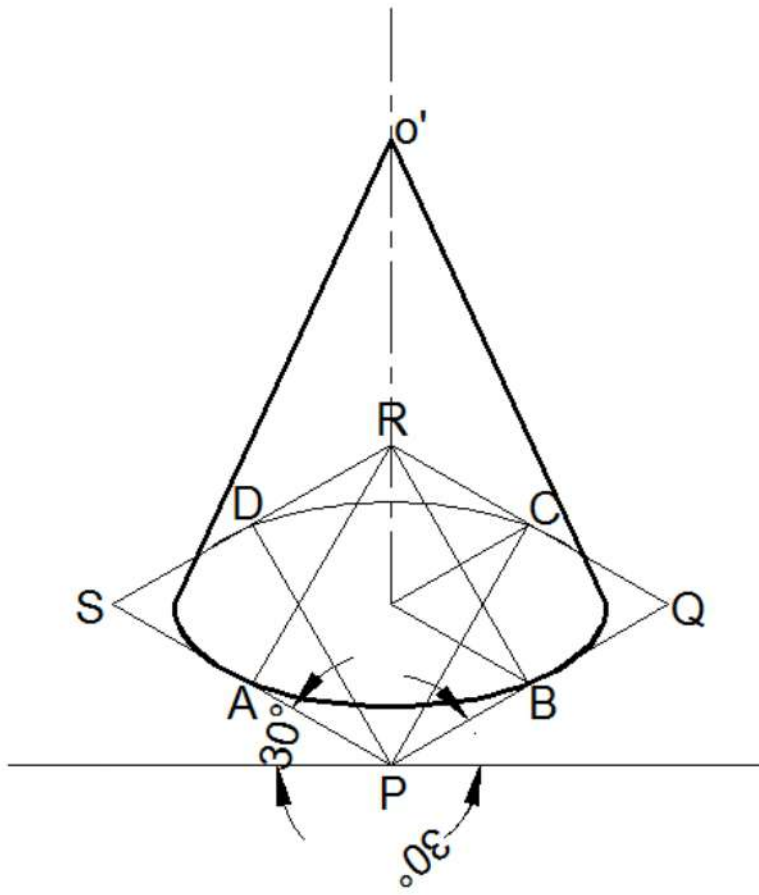
8. Command: 1 LINE Specify first point:  
Specify next point or [Undo]: 58



9. Line join from end point to end point



10. Add text on the drawing



## EXERCISES

1. A line CD 80mm long is inclined at an angle of  $30^\circ$  to H.P. and  $45^\circ$  to V.P. The point C is 20mm above H.P. and 30mm in front of V.P. Draw the projection of the straight line CD.
2. Draw the projection of a circle of 5cm diameter having its plane vertical and inclined at  $30^\circ$  to V.P. Its centre is 3cm above the H.P. and 2cm in front of the V.P.
3. Draw the projection of a pentagonal pyramid base 45mm edge and axis 65mm long, having its base on the H.P. and an edge of the base parallel to the V.P.
4. Draw the projection of a regular pentagonal prism side of base 30mm and axis 60mm long resting with its base on H.P. such that one of its rectangular faces is parallel to and 10mm in front of V.P.
5. Draw the isometric view of a pentagonal pyramid base 35mm edge and axis 65mm long, having its base on the H.P. and an edge of the base parallel to the V.P.
6. Draw the isometric projection of a regular pentagonal prism side of base 30mm and axis 60mm long resting with its base on H.P. such that one of its rectangular faces is parallel to V.P.