

AREd: Engg Graphics

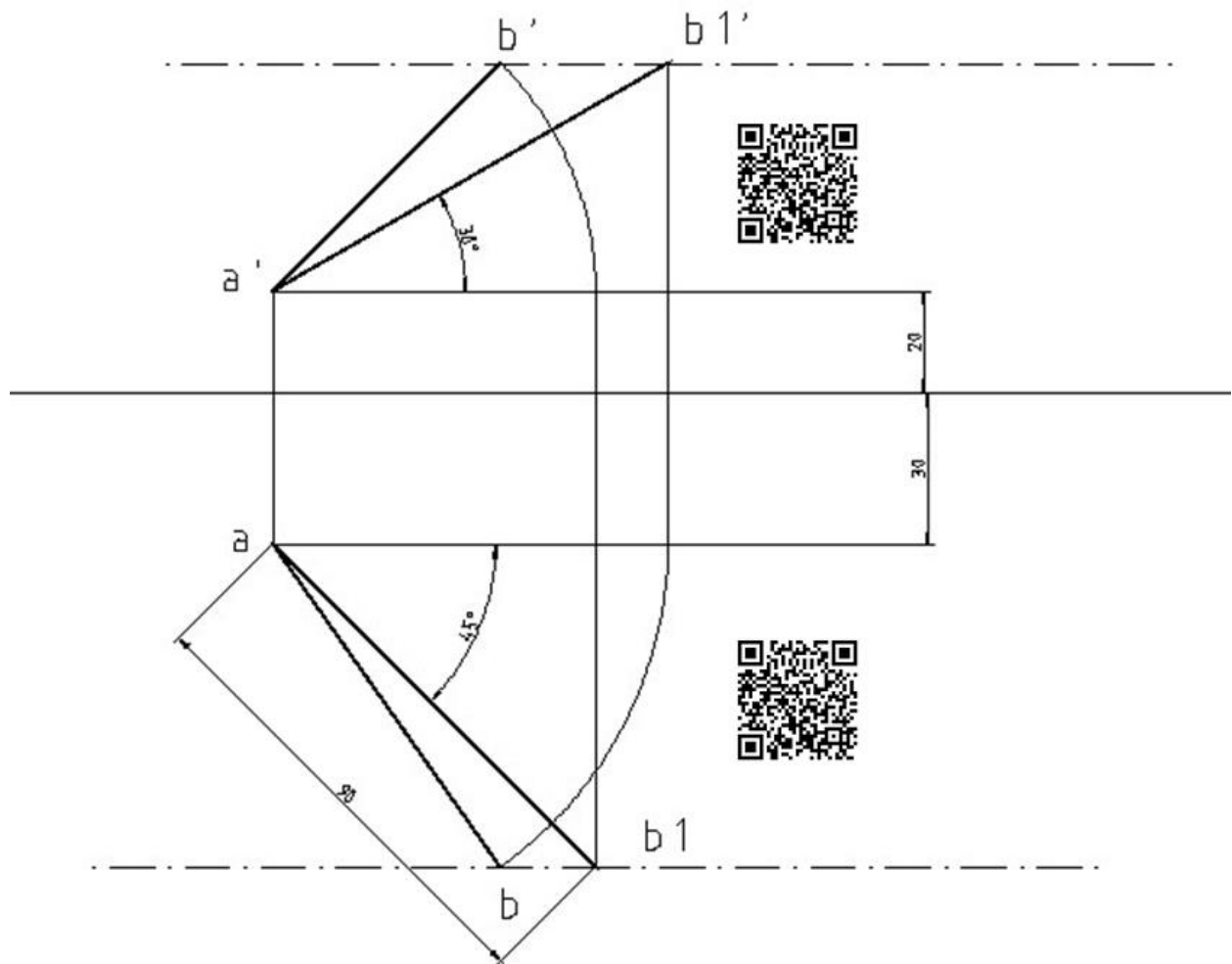
Textbook



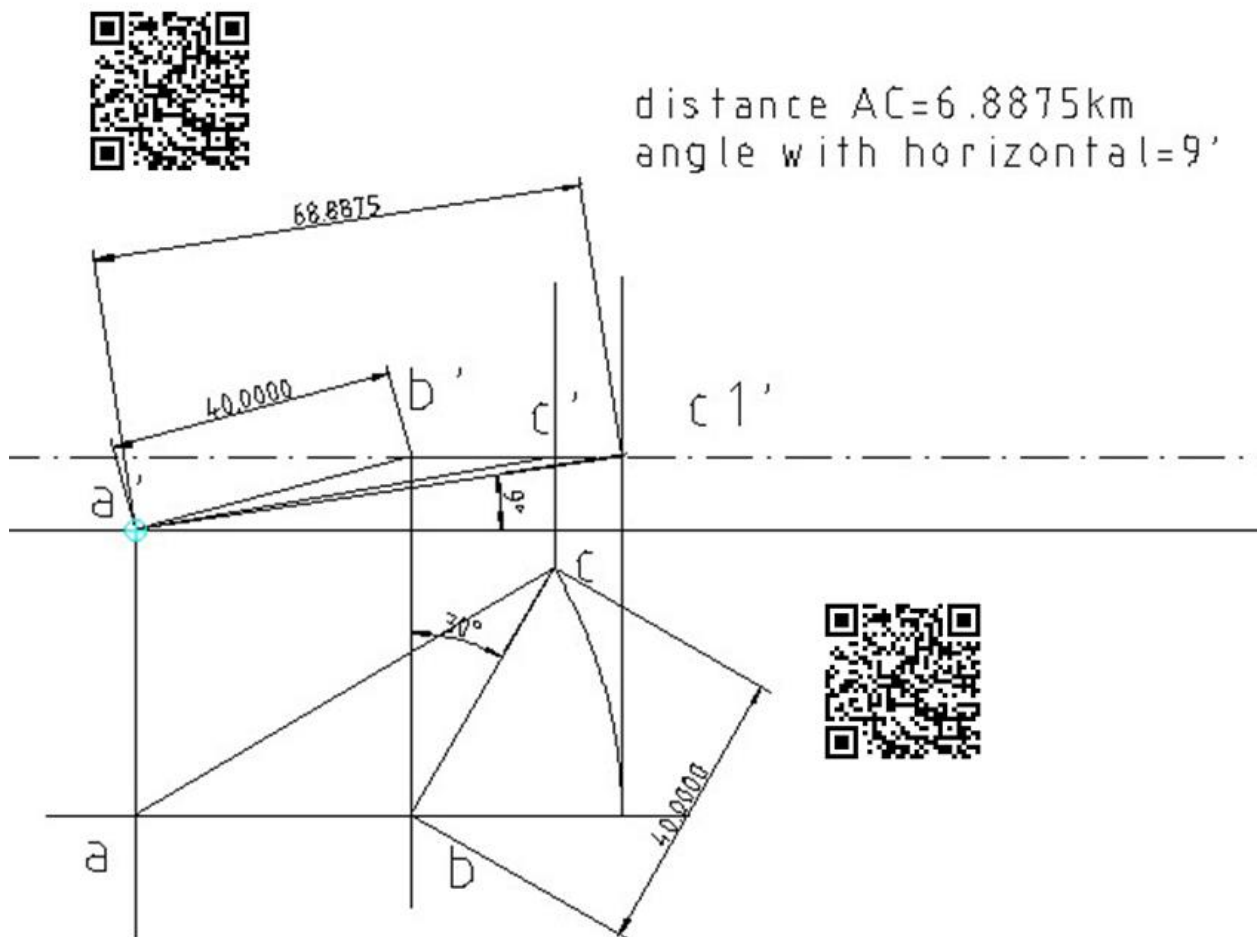
By
Team Radicals

LINES

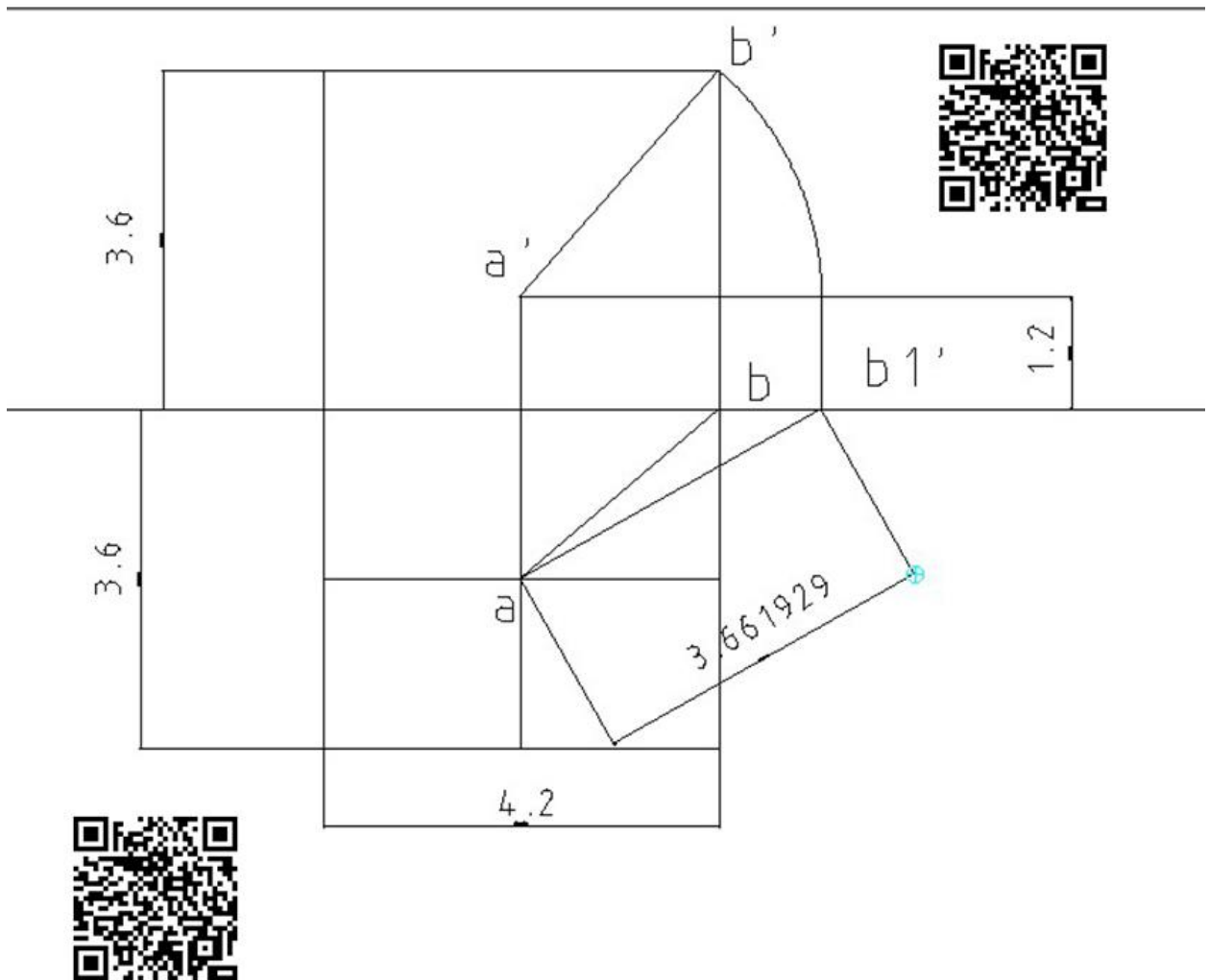
1. A line 90mm long is inclined at 45° to HP and 30° to VP. Draw its projections if A is 20mm above and 30mm in front of VP. (given TL, EP1-Full, θ , ϕ)



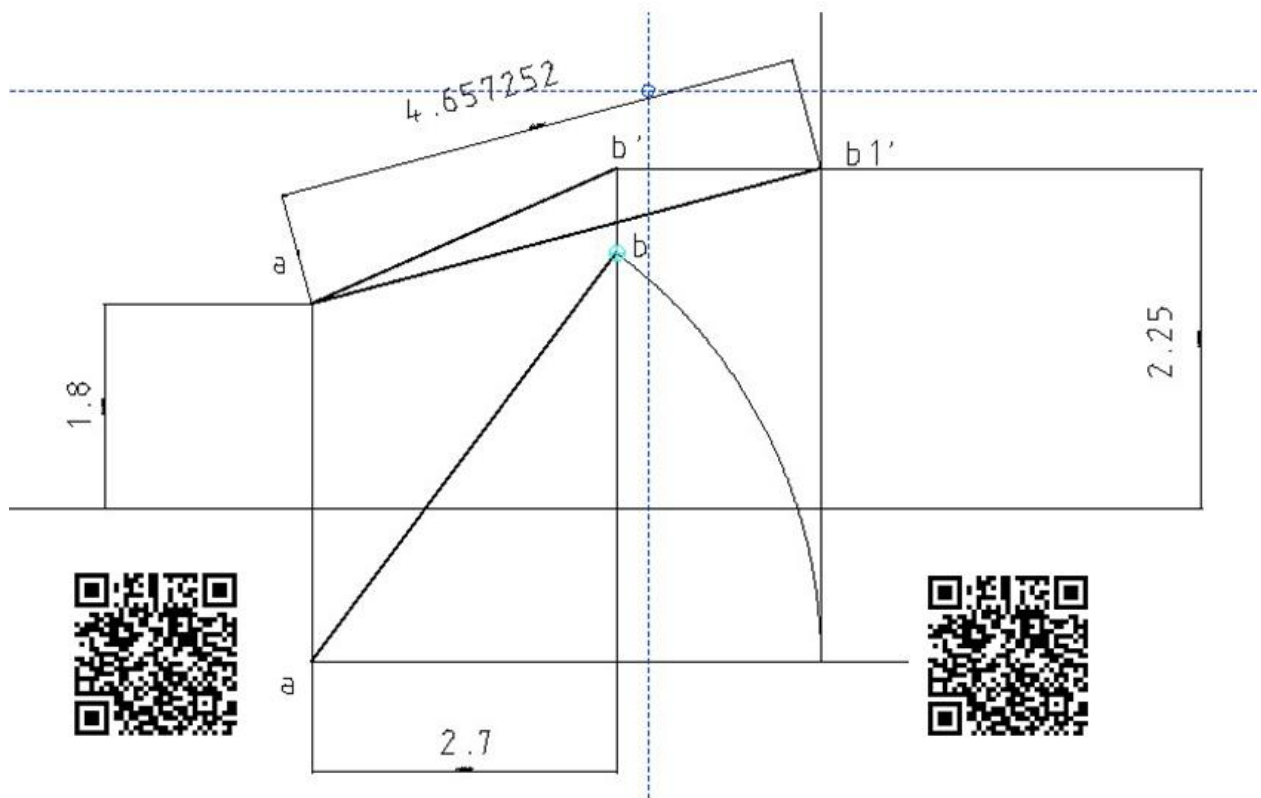
2. A straight road going uphill from a point A due east to another point B is 4km long and has a slope of 15° another straight road from B due 30° east of north to a point C is also 4km long and is parallel to the line ground. Find the length and slope of the straight road joining point A and C.



3. An object is placed 1.2m above the ground and at the center of the room $4.2 \times 3.6 \times 3.6$ m. Find graphically its distance from one of the corners between roof and two adjacent walls.

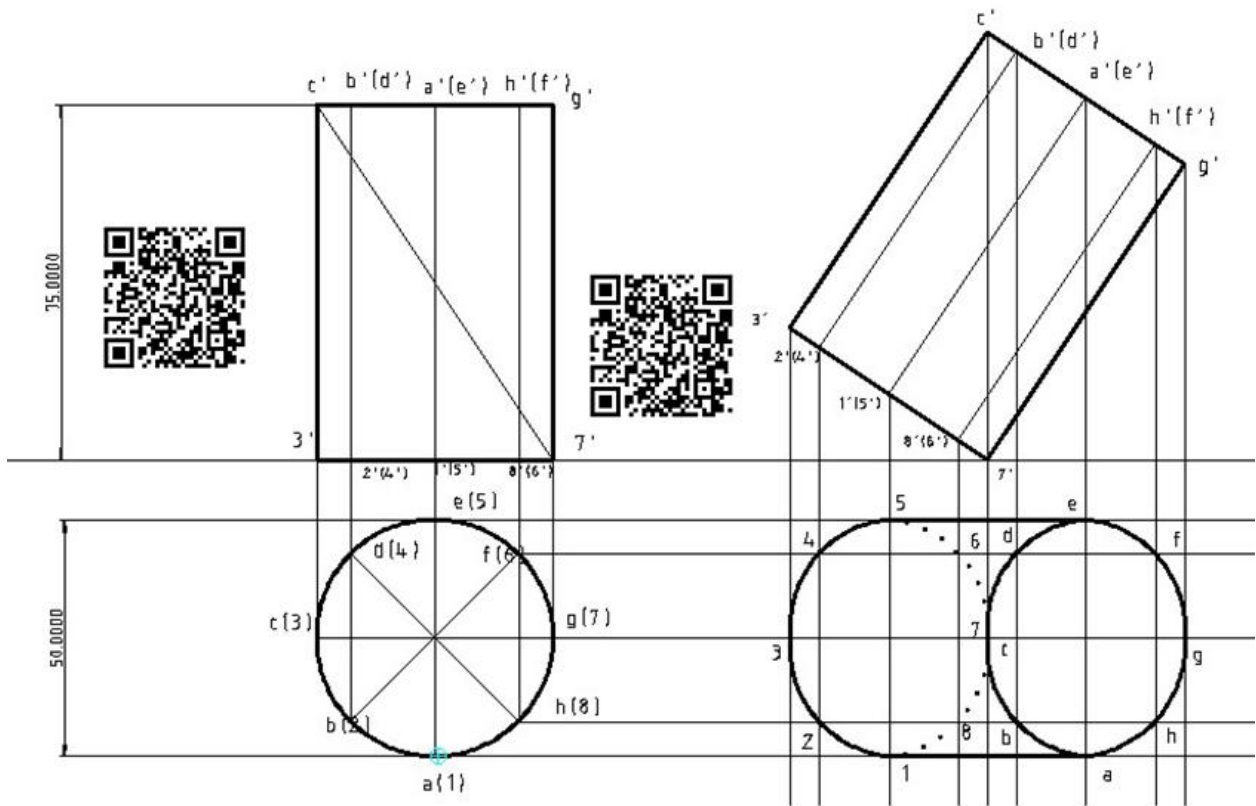


4. Two oranges on a tree 1.8m and 3m above the ground and 1.2m and 2.1m from a 0.3m thick wall but on opposite side of the wall. The distance between oranges measured along the ground and parallel to a wall is 2.7m. Find the real distance between the oranges.

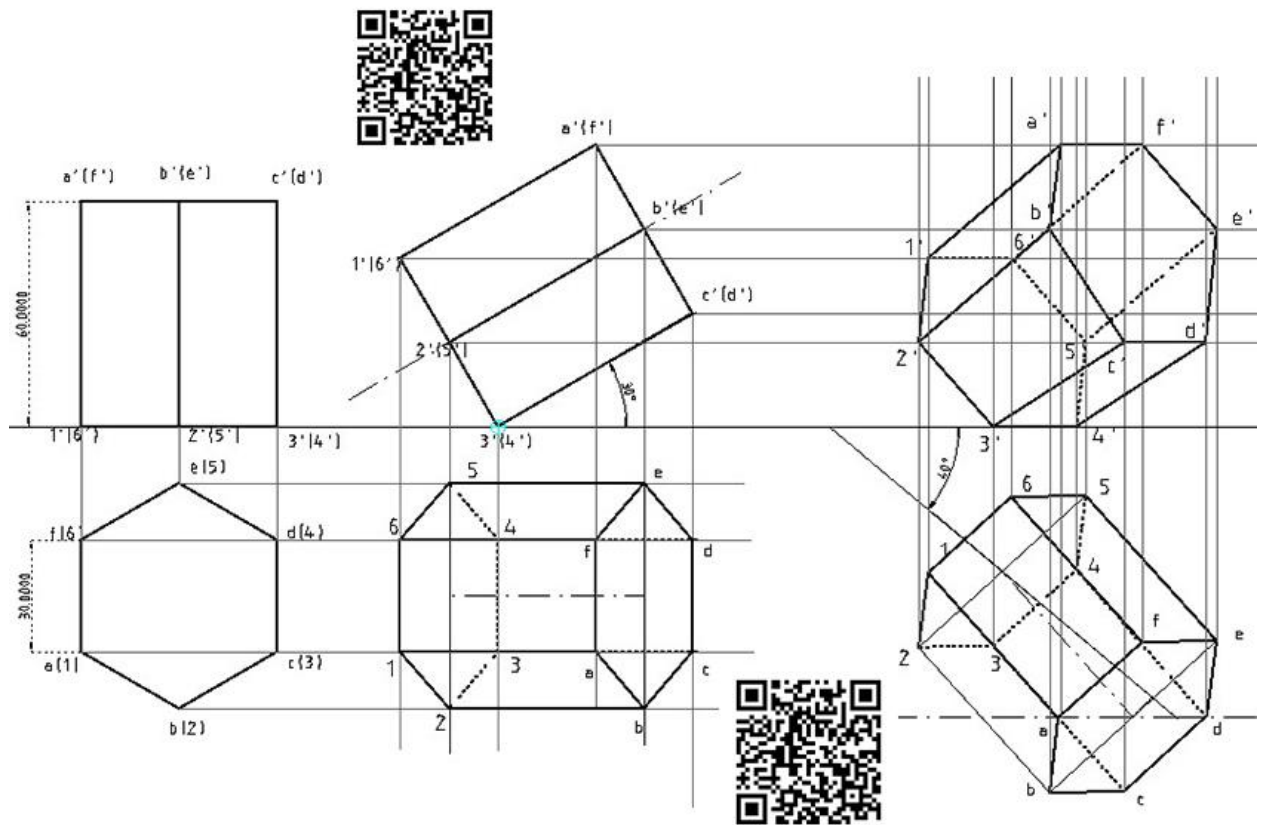


SOLIDS

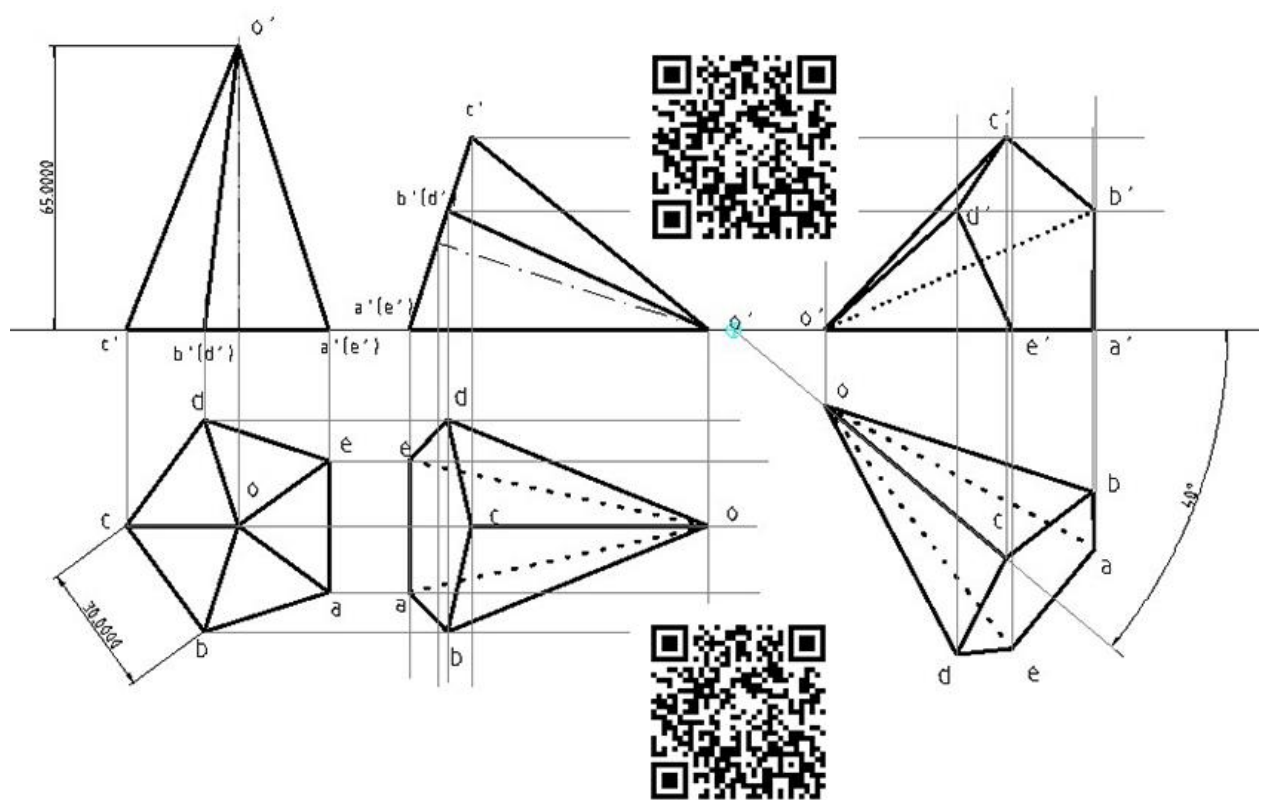
5. A cylinder of 50 mm diameter and 75mm length is freely suspended from a point on its top edge with its axis parallel to the V.P draw its projections.



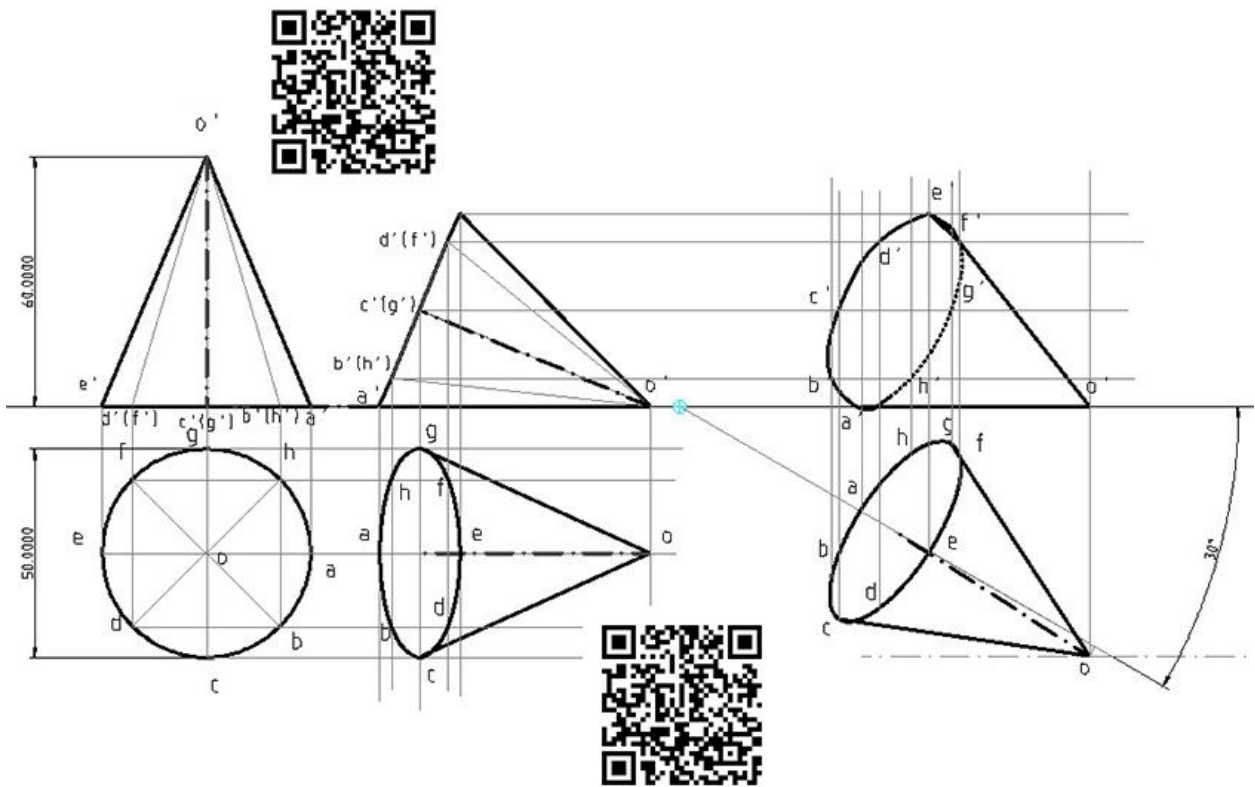
6. A hexagonal prism is resting on one of its base edges with the axis at 30° with HP and 40° to VP. Draw its projections. The base side of prism is 30mm and length of the prism is 60mm.



7. A pentagonal pyramid of side of base 30 mm and axis 65 mm long is lying with one of its triangular faces on the ground. Draw the projections when the slant edge opposite to the face on the ground is inclined 40° to the XY line in top view with base nearer to the observer.

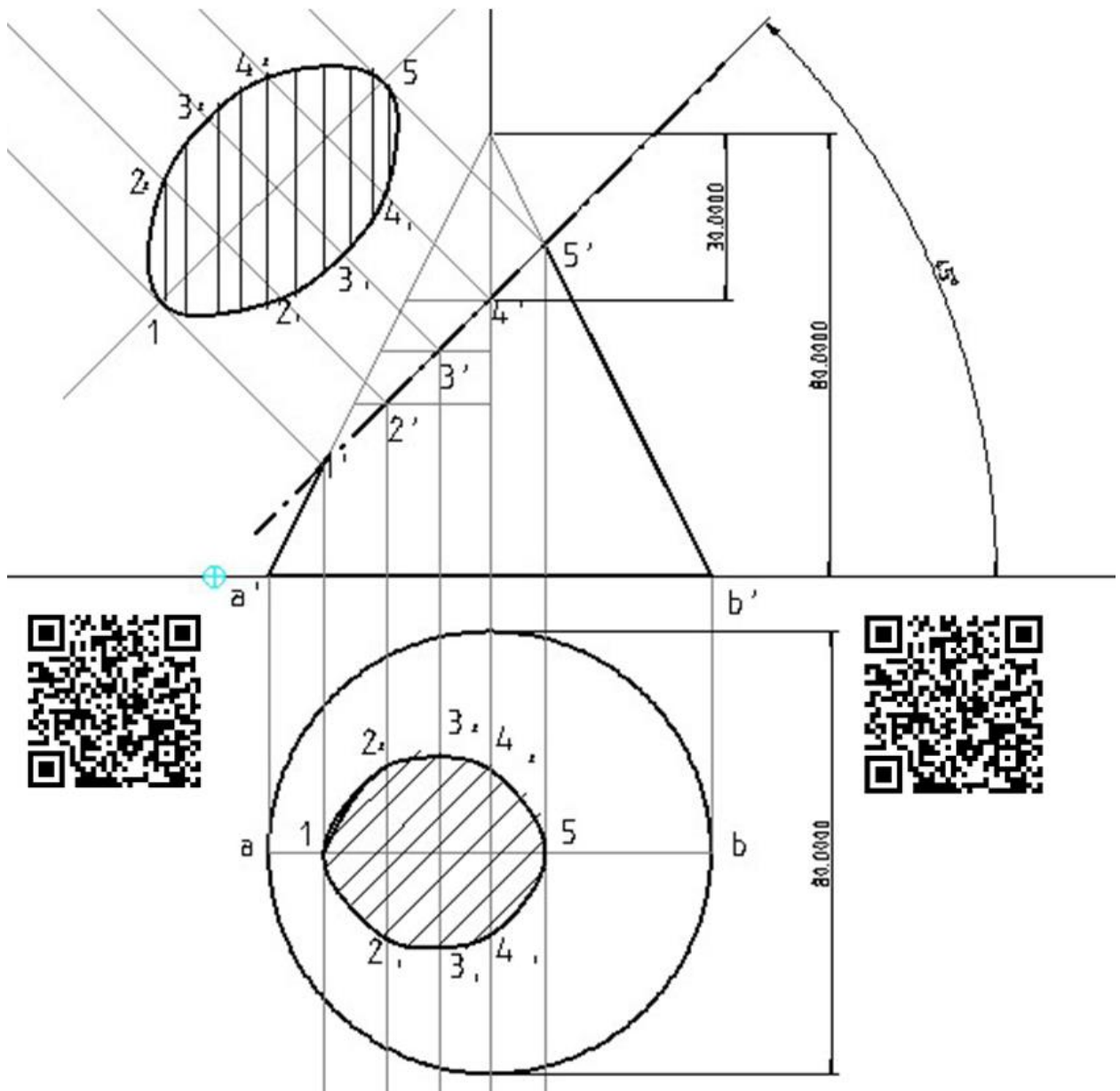


8. Draw the 2 views of cone of base 50mm diameter and the altitude 60mm, lying on one of its generators on HP when the axis makes an angle of 30° with the VP.

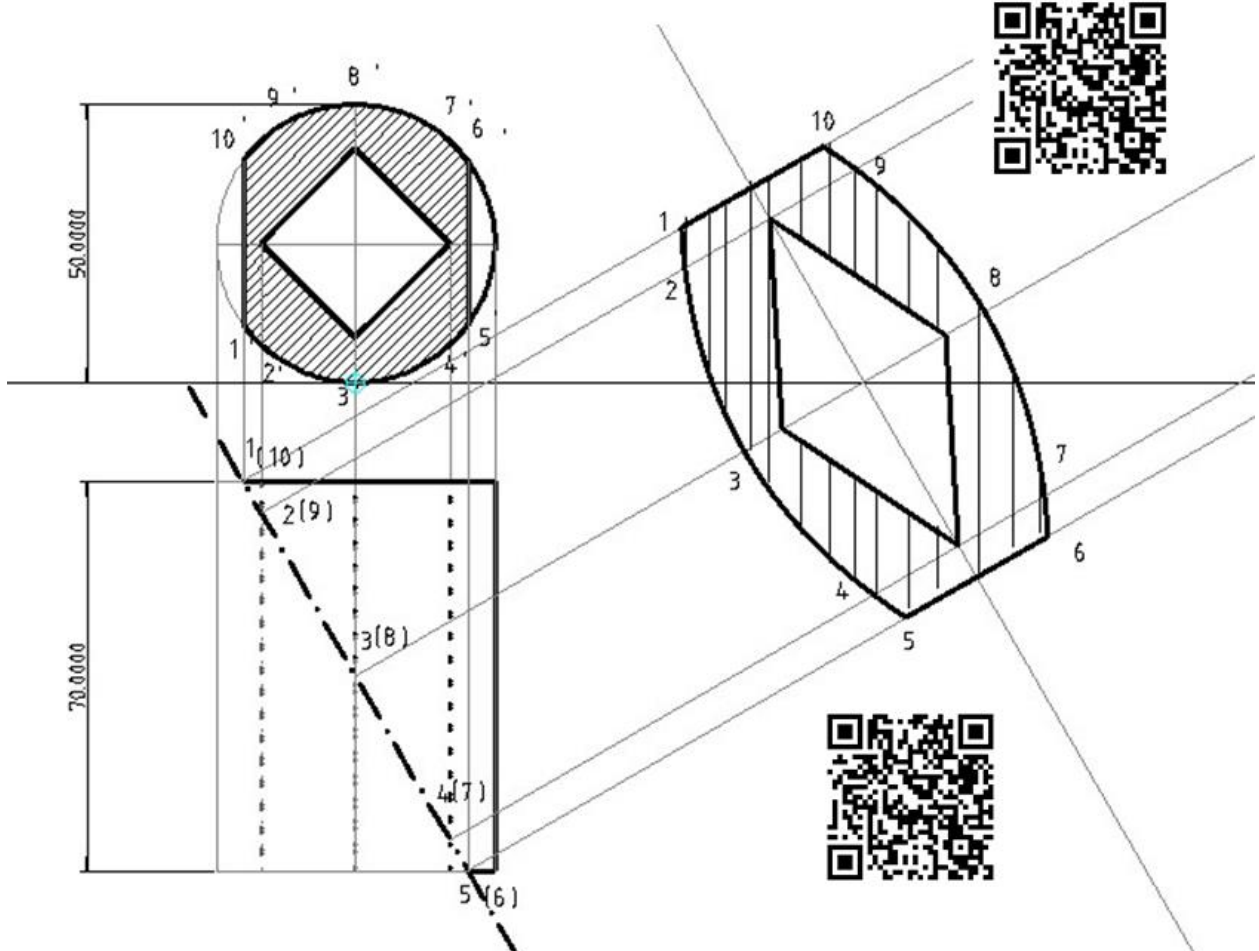


SECTIONS OF SOLIDS

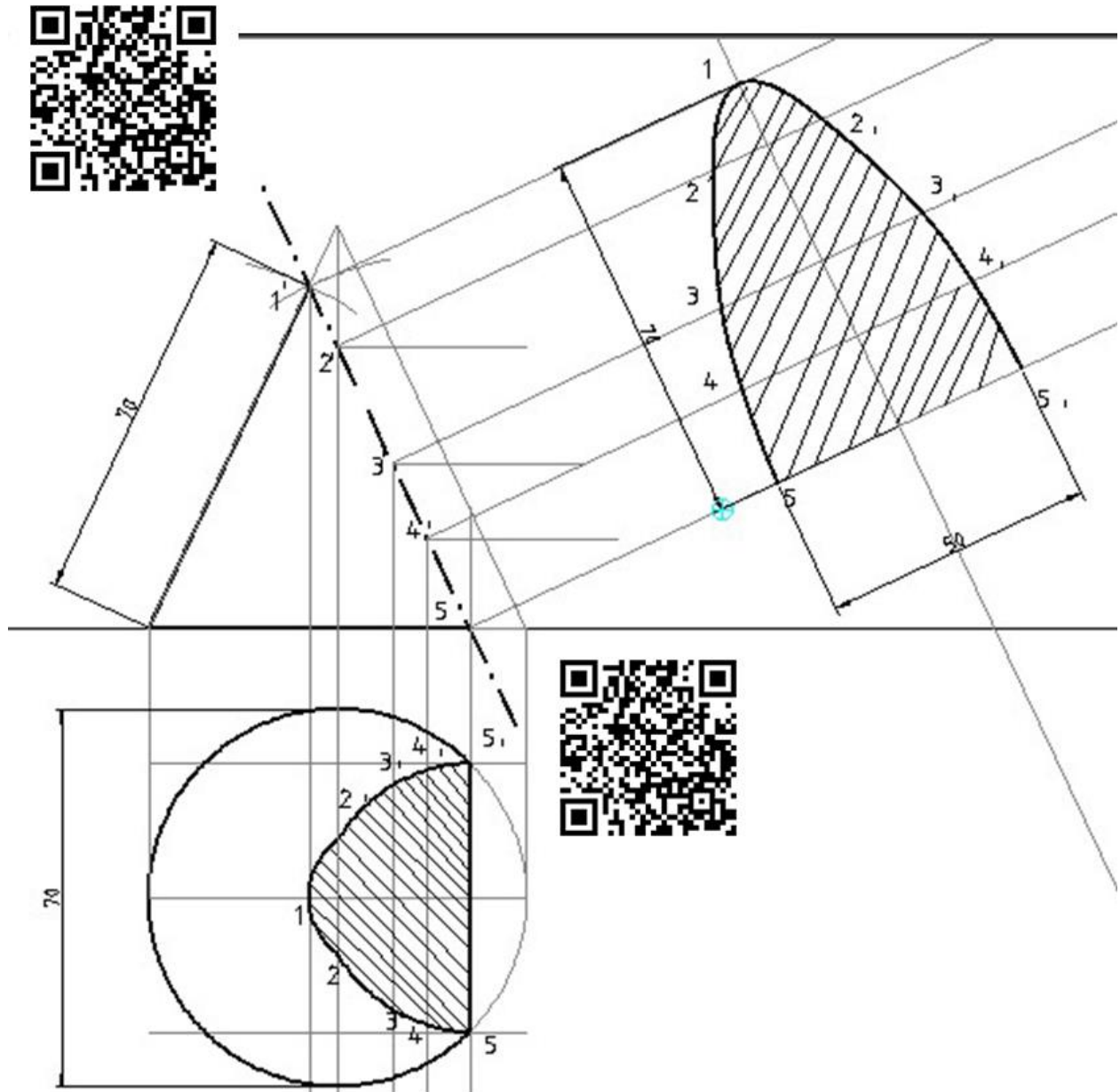
9. A cone resting on its base on HP, is cut by a plane inclined 45° to HP and perpendicular to VP. The cutting plane cuts the axis of the cone at a point 30mm below the apex of the cone. Draw the front view, sectional top view and true shape of the section. The cone diameter is 80 mm and height is 80 mm.



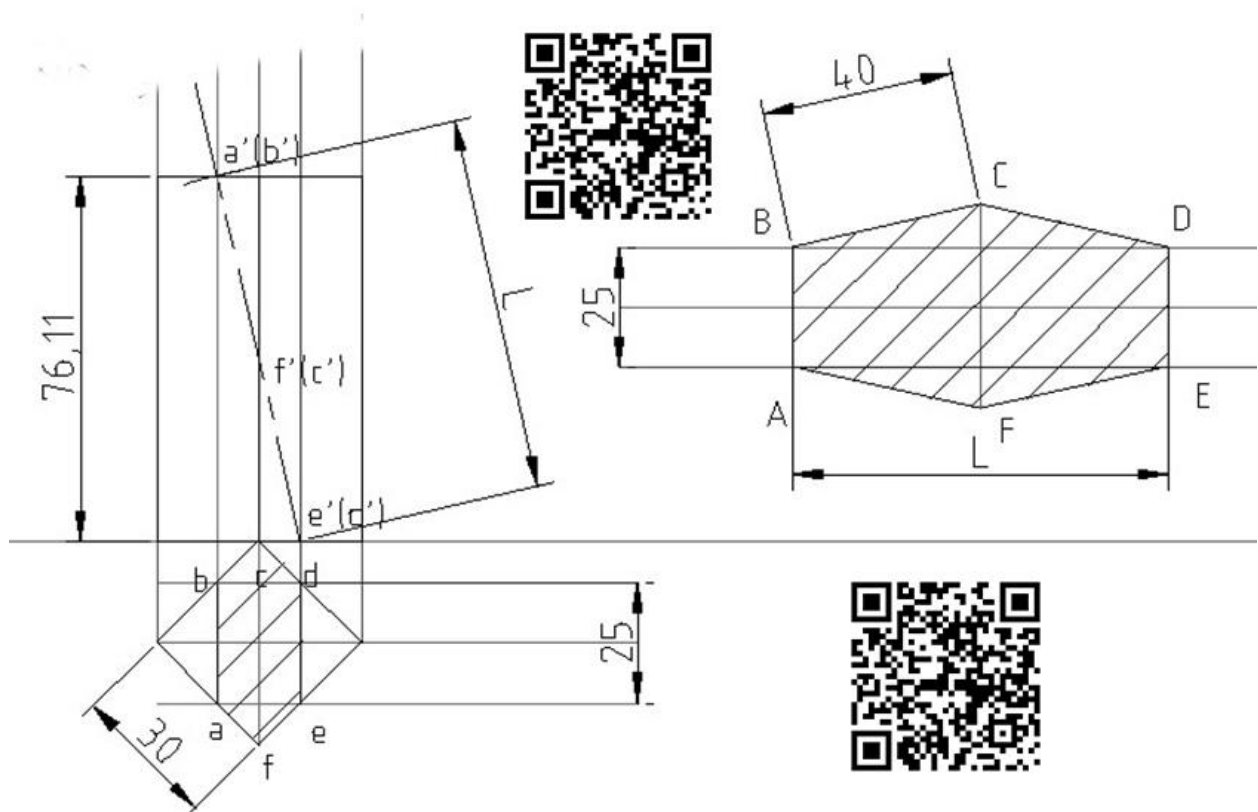
10. A cylinder of base 50 mm diameter and axis 70mm long has a square hole of side 24mm cut through it, so that the axis of the hole coincides with that of the cylinder. The cylinder is lying on ground with its axis perpendicular to VP and faces of the hole are equal inclined to HP. A vertical section plane, inclined 60° to VP, cuts the cylinder into two equal halves. Draw the sectional views of the cylinder and true shape of the section.



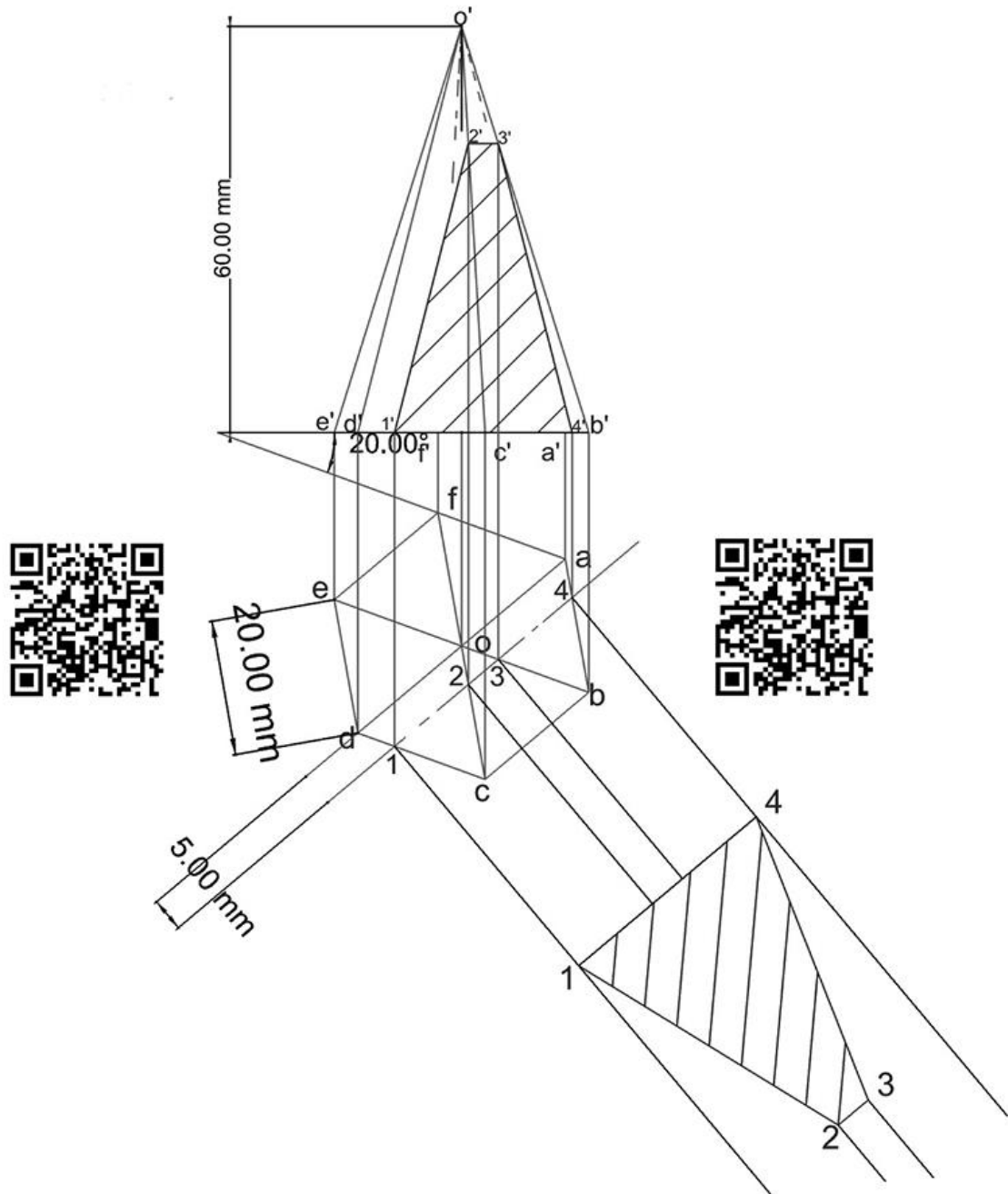
11. A cone of base diameter 70 mm, standing upright is cut by a section plane such that, the true shape is a parabola of maximum double ordinate 50 mm and the vertex is 70 mm away from this ordinate. Draw the front view, top view and true shape of section.



12. A square prism, base side 30 mm, is cut by a section plane such that true shape is a hexagon having two opposite sides 25mm and 40 mm long. Draw the top view, front view and true shape of section. Also determine the height of the prism.

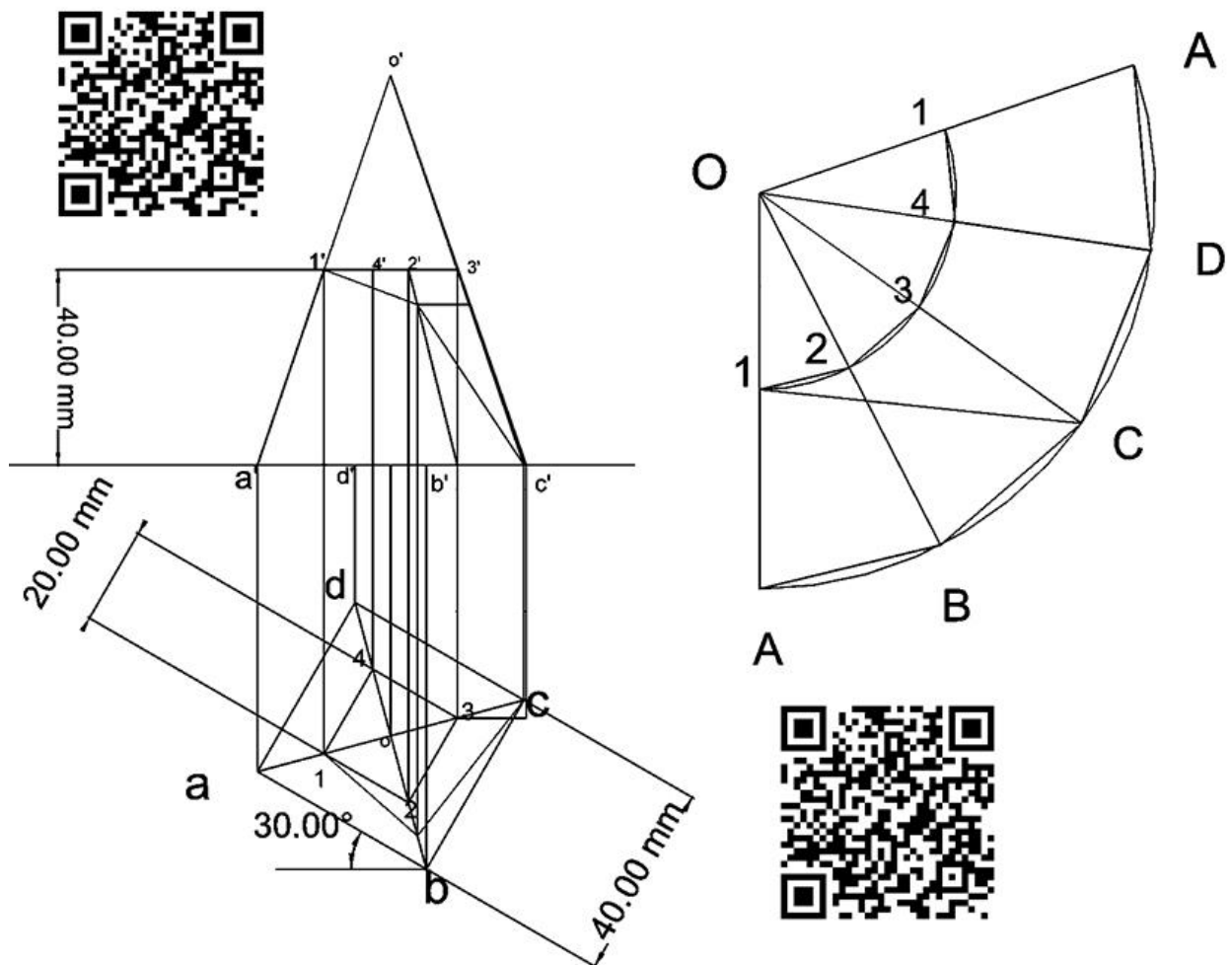


13. A hexagonal pyramid of side of the base 20mm and height 60mm is resting on its base on the ground with one of the base edges making 20° with the VP. An auxiliary vertical plane parallel to any one of the base edges and 5mm from the axis cuts the object. Draw the sectional view from the front, sectional view from above and trueshape of the section.

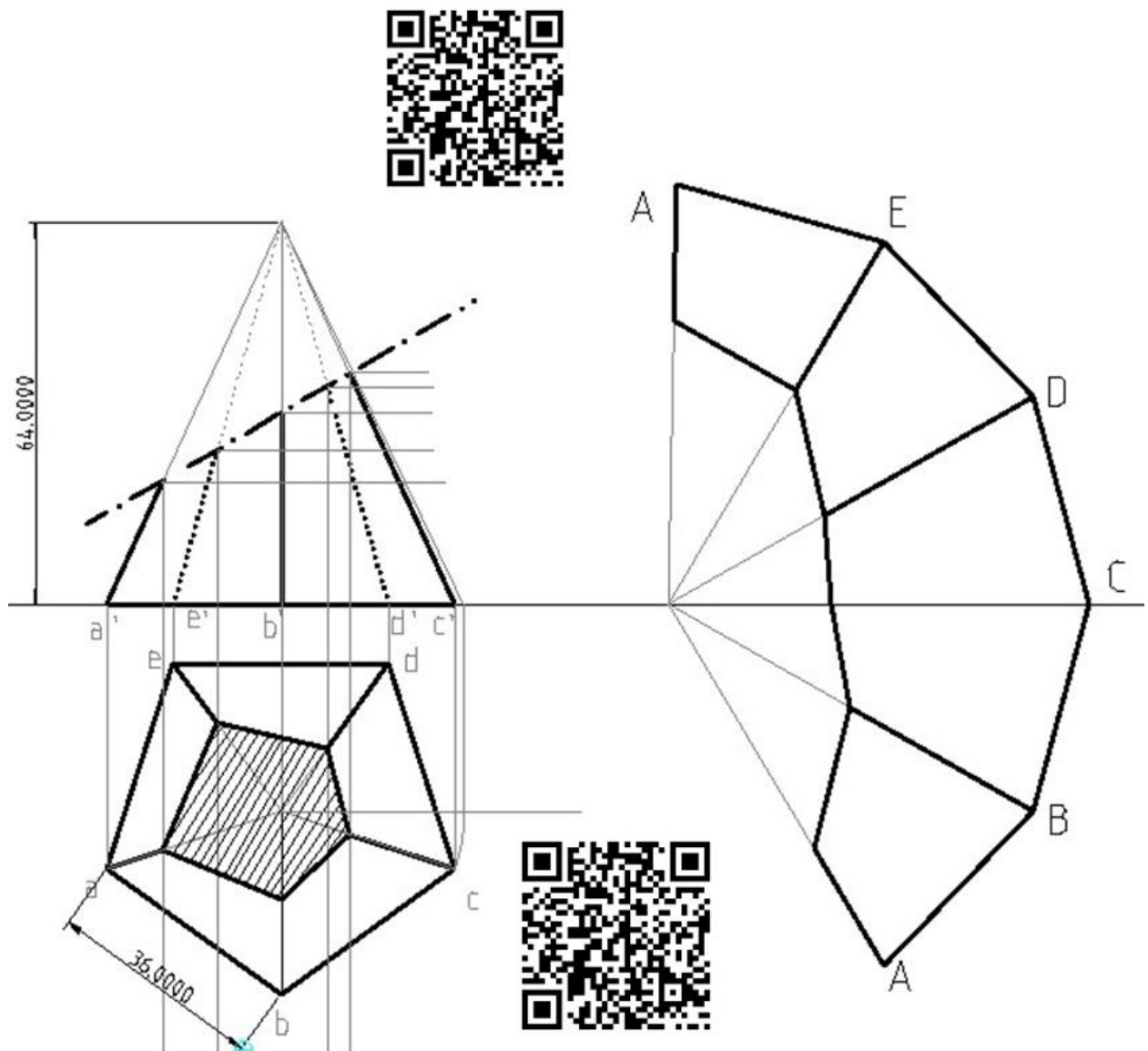


DEVELOPMENTS OF SURFACES

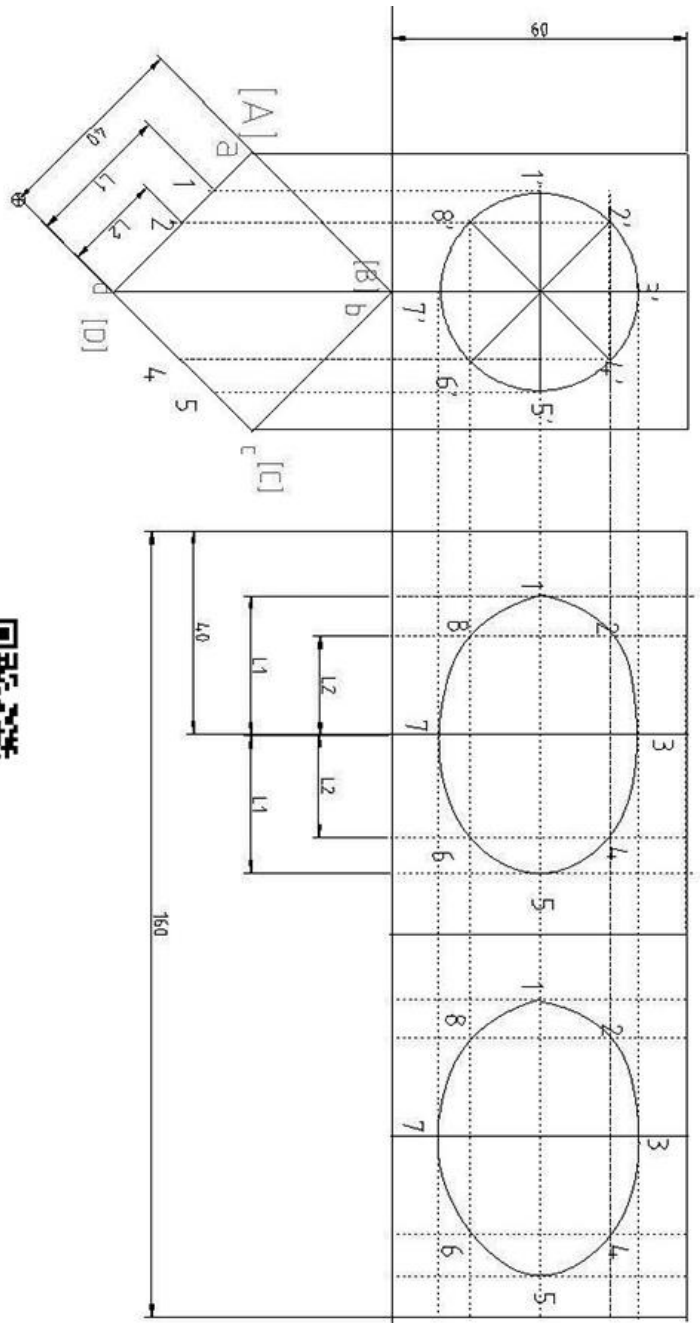
14. The frustum of a square pyramid has its base 40mm, top 20mm and height 40mm and is resting on HP with base edges 30° inclined to VP. Find the shortest distance a spider has to travel from top corner to the diametrically opposite bottom corner of the frustum. Also mark the line in the top and front views.



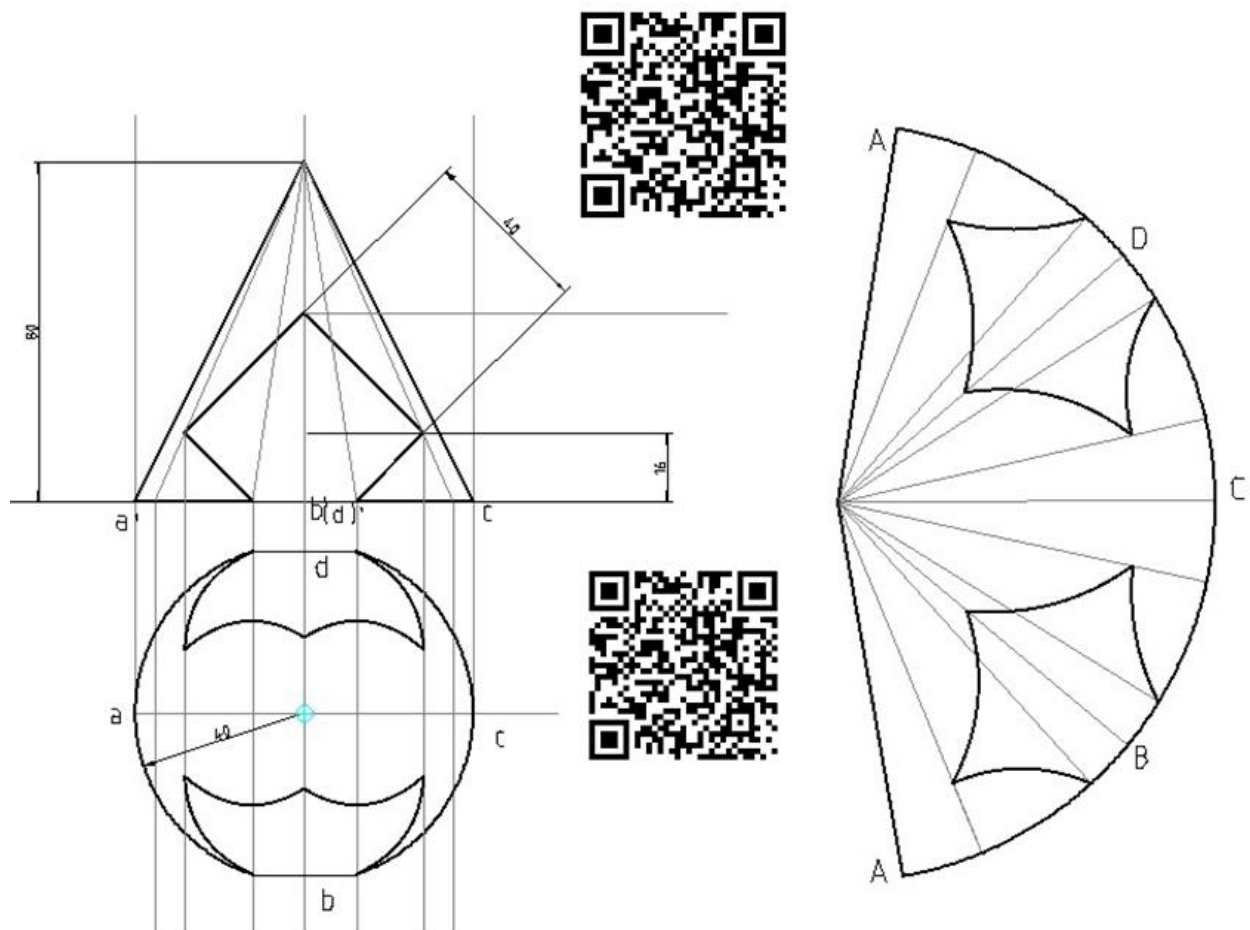
15. A right regular pentagonal pyramid, side of base 36mm and height 64mm, rests on its base with one of its base sides parallel to VP. A section plane perpendicular to VP and inclined 30° to HP cuts the pyramid bisecting the axis. Draw the development of the truncated pyramid.



16. A square prism of 40 mm side length and 60 mm height rests on its base upon HP, such that the vertical faces are equally inclined to VP. A horizontal hole, 40mm diameter is drilled through the geometrical center of the prism with the axis perpendicular to VP. Develop the lateral surface of the prism.

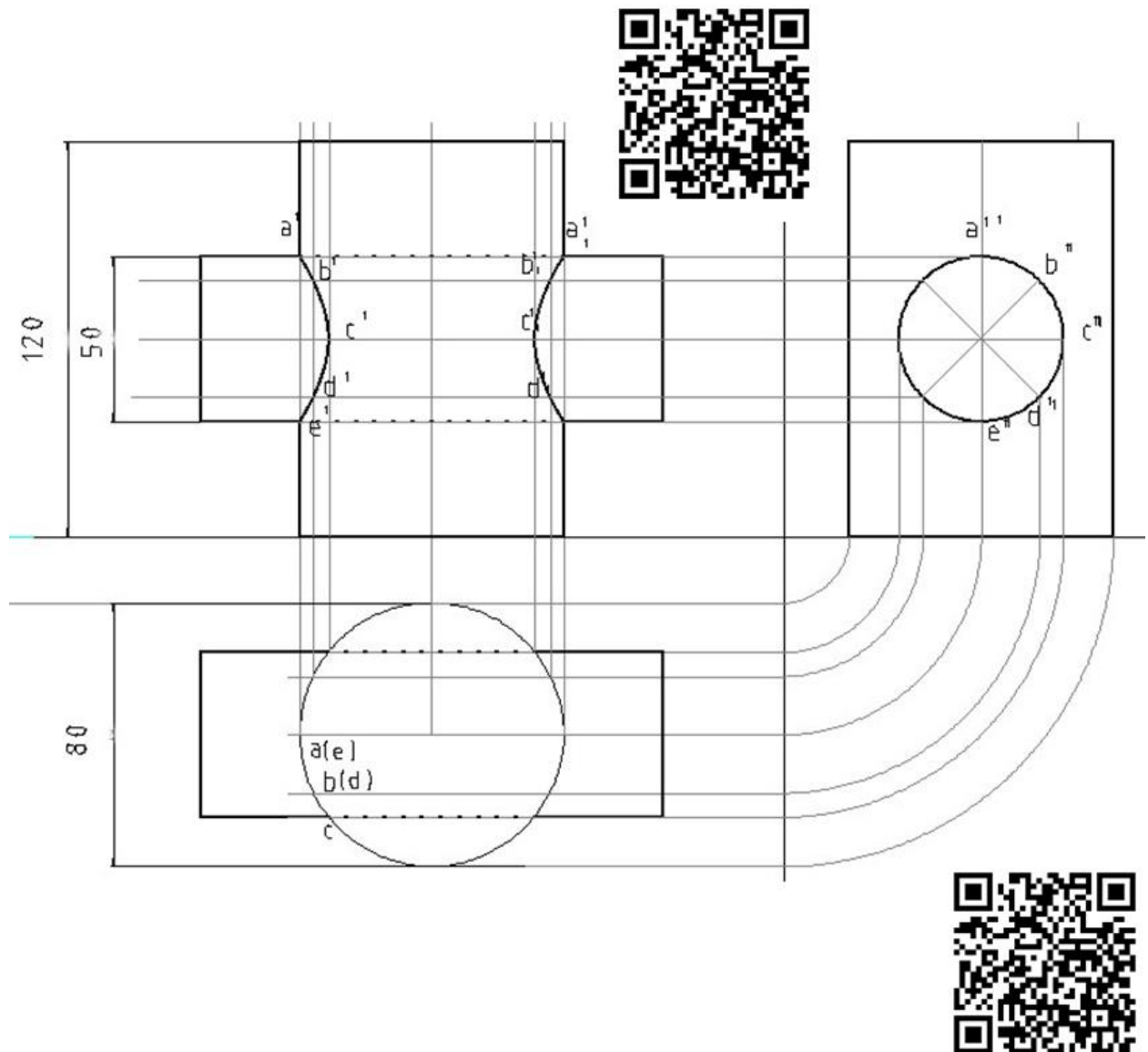


17. A cone of base diameter 80 mm and height 80 mm is resting upon HP on its base. A horizontal square through hole of 40 mm side is cut in the cone in such a way that axis of the hole intersects the axis of the cone at a height of 16 mm from the base and four sides of the hole are equally inclined to HP. Draw the development of the lateral surface of the cone.

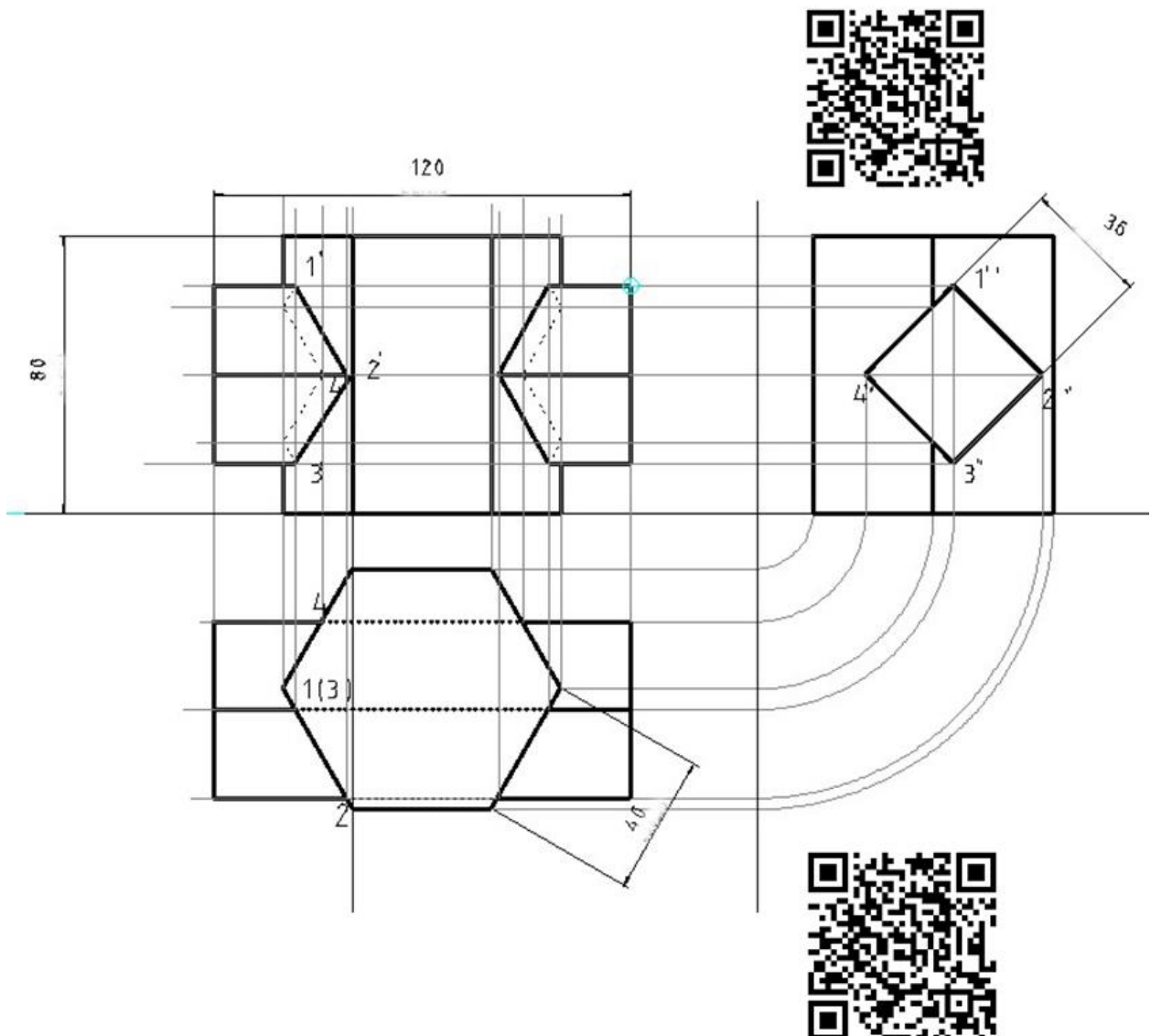


INTERSECTIONS OF SOLIDS

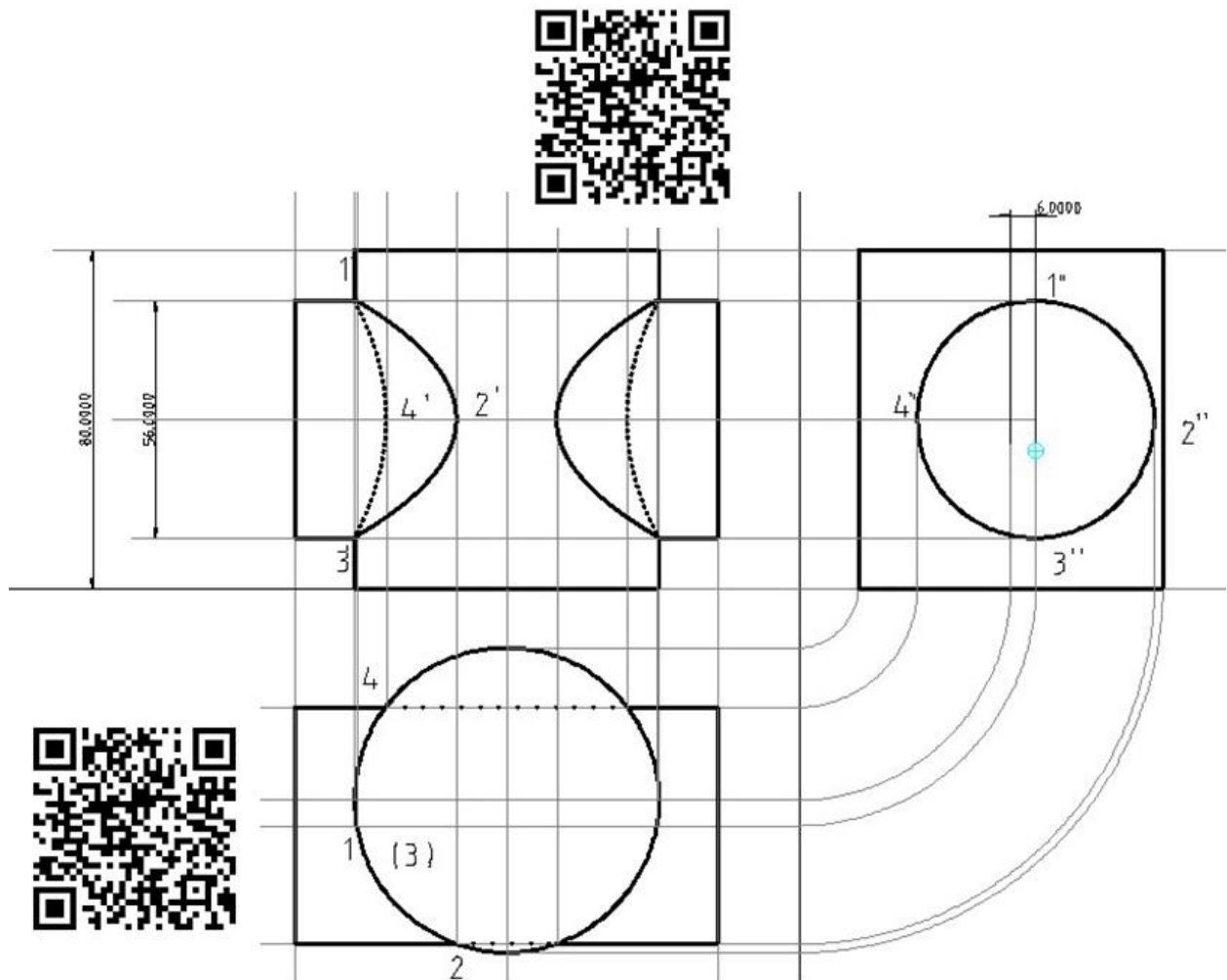
18. A horizontal cylinder of 50 mm diameter penetrates a vertical cylinder of 80 mm diameter and 120mm length resting on HP. The two axes are co-planar . The axis of the horizontal cylinder is 60 mm above HP. Draw the projection showing the curves of intersection.



19. A vertical hexagonal prism, side of base 40mm and 80mm long, is completely penetrated by a horizontal square prism of 36mm side and 120mm length. The axis of the horizontal prism is parallel to VP and 6mm in front of the axis of the hexagonal prism. If one rectangular face of the hexagonal prism is parallel to VP and all the faces of the square prism are equally inclined to HP, draw the projections of the prisms showing the lines of intersections.

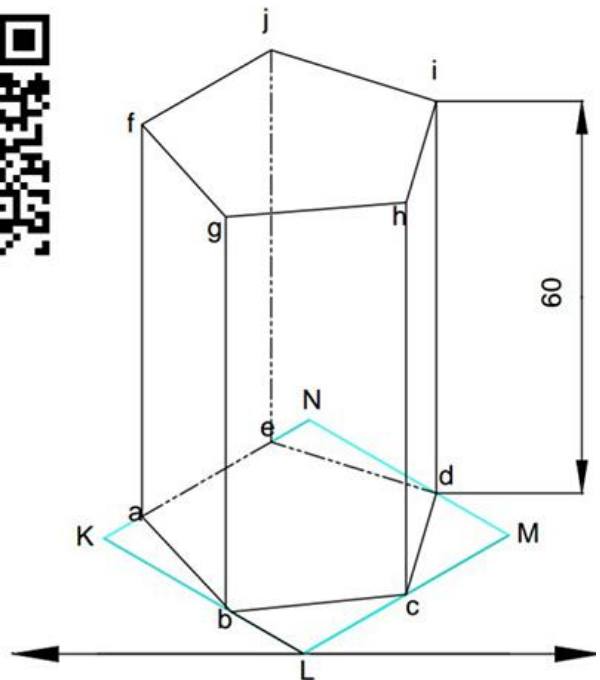
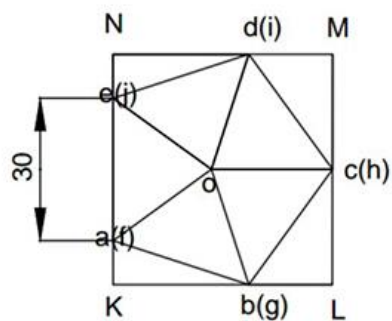
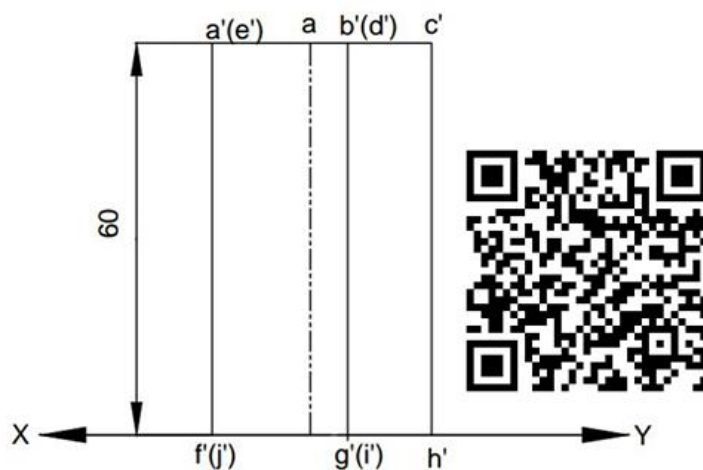


20. A vertical cylinder of 72mm diameter and 80mm length is penetrated by another horizontal cylinder of 56mm diameter 100mm long. The axis of the horizontal cylinder is parallel to VP and 6 mm in front of the axis of the vertical cylinder. Draw the projections showing the curves of intersection.

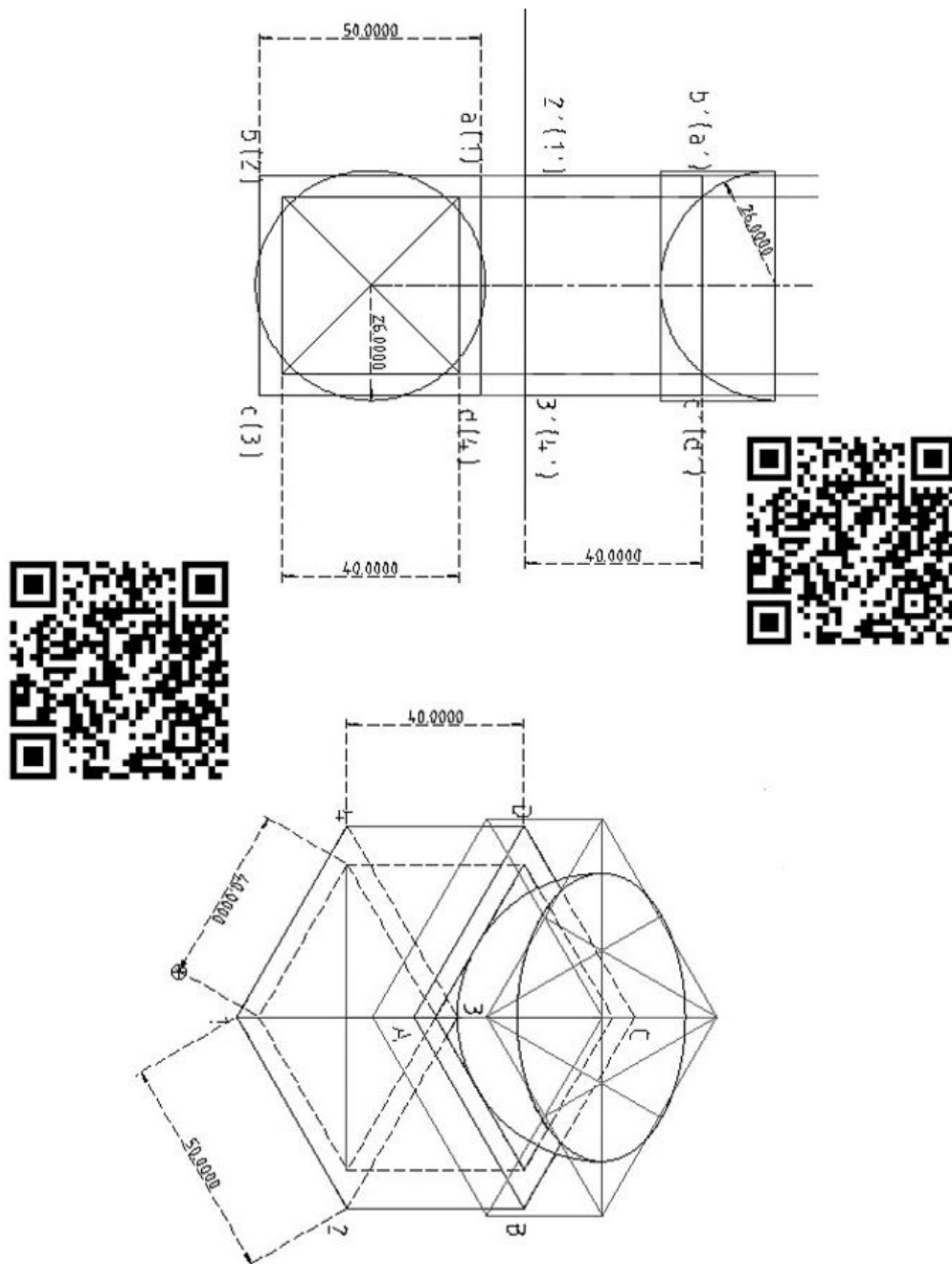


ISOMETRIC PROJECTIONS OF SOLIDS

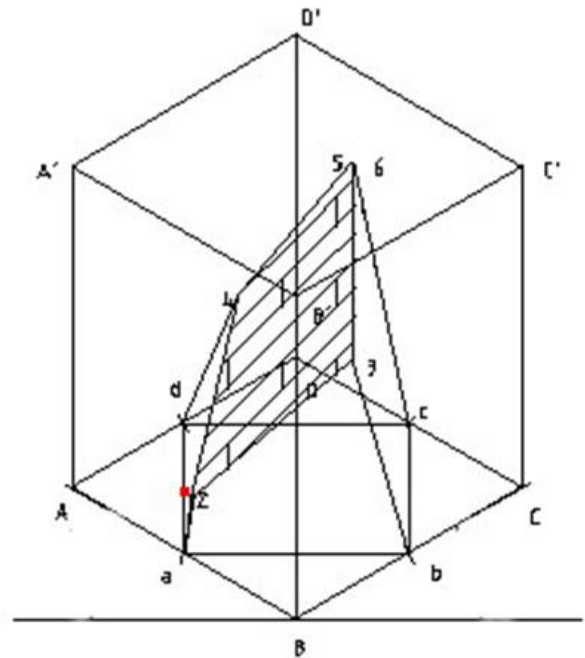
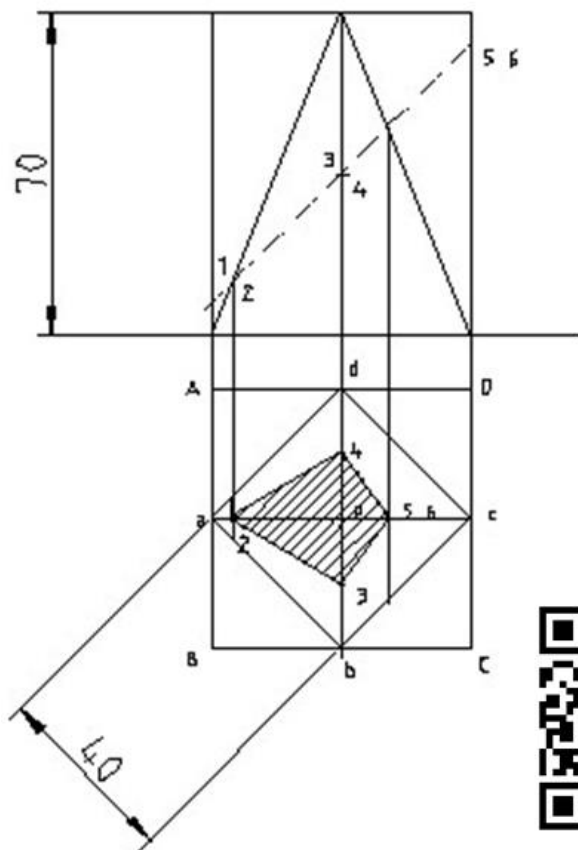
21. Draw the isometric view of a pentagonal prism of base edge 30 mm and height 60mm, resting on its base on HP with a rectangular face perpendicular to VP.



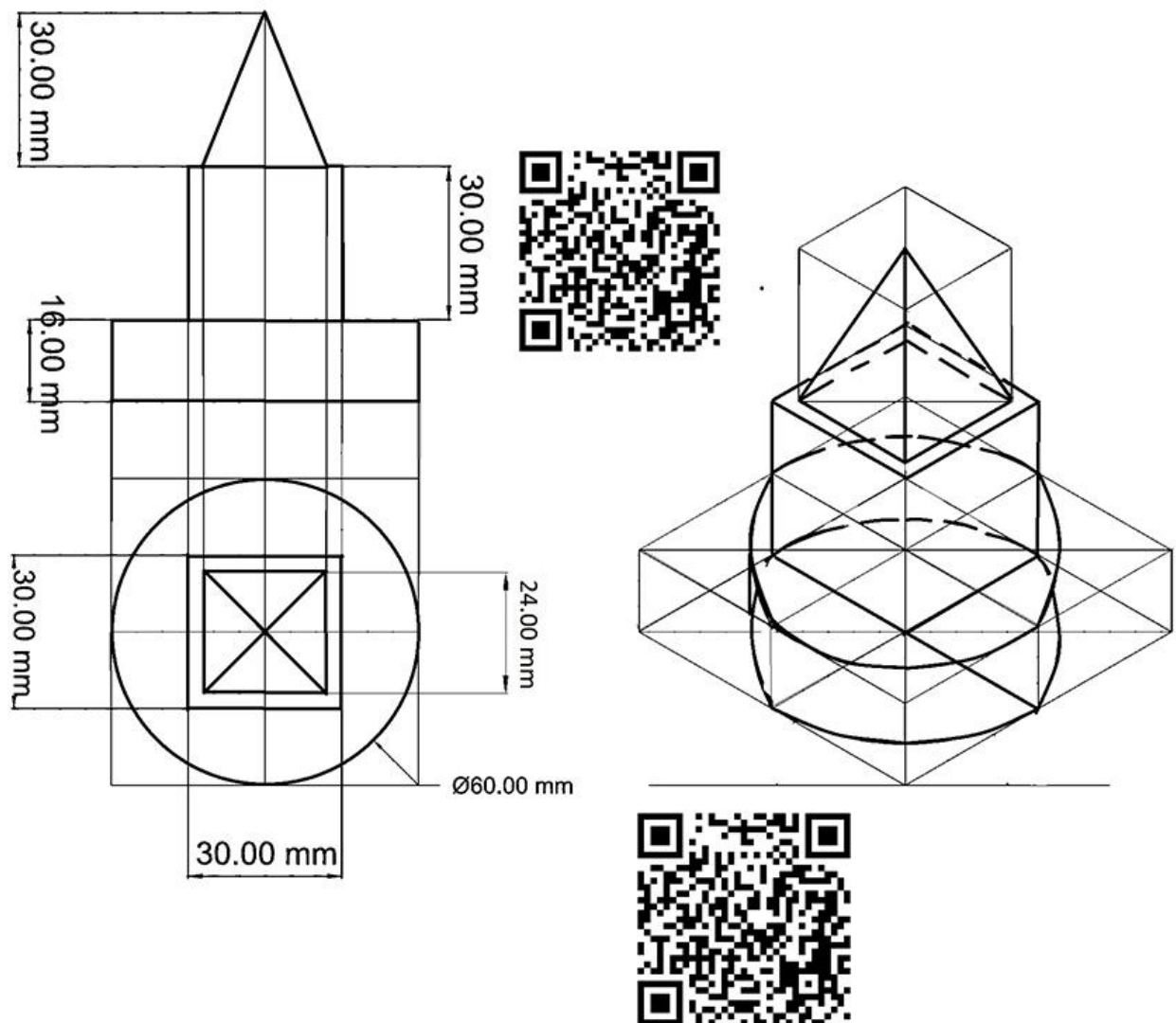
22. A hollow square prism, standing upright, has outside faces measuring 50 mm X 40 mm high, four inside faces measuring 40mmX40 mm high. A hemisphere of radius 26mm is resting with its curved surface on the prism and flat face horizontal. Draw the isometric view of the combination.



23. A square pyramid of side of base 40 mm and height 70 mm is resting on its base upon HP, keeping the base edges equally inclined to VP. The pyramid is cut by a section plane, 45° inclined to HP and passing through the midpoint of the axis. Draw the isometric view of the pyramid showing the section.

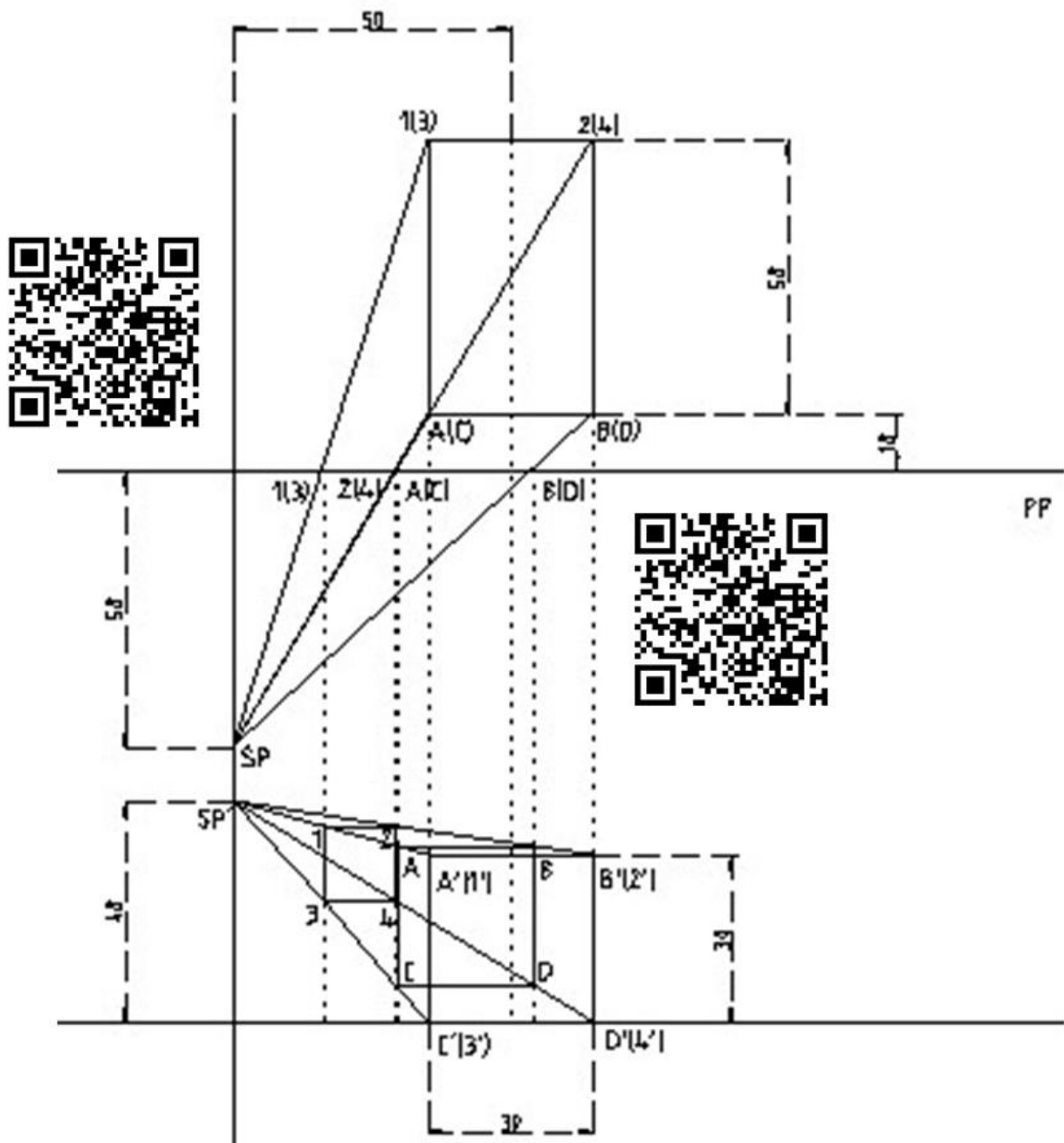


24. A cylindrical slab , 60 mm in diameter and 16 mm thick, is surmounted by a cube of 30 mm side . On the top of the cube rests a square pyramid of altitude 30 mm and base side 24mm. The axes of the solids are in the same straight line. Draw the isometric view of the solids.

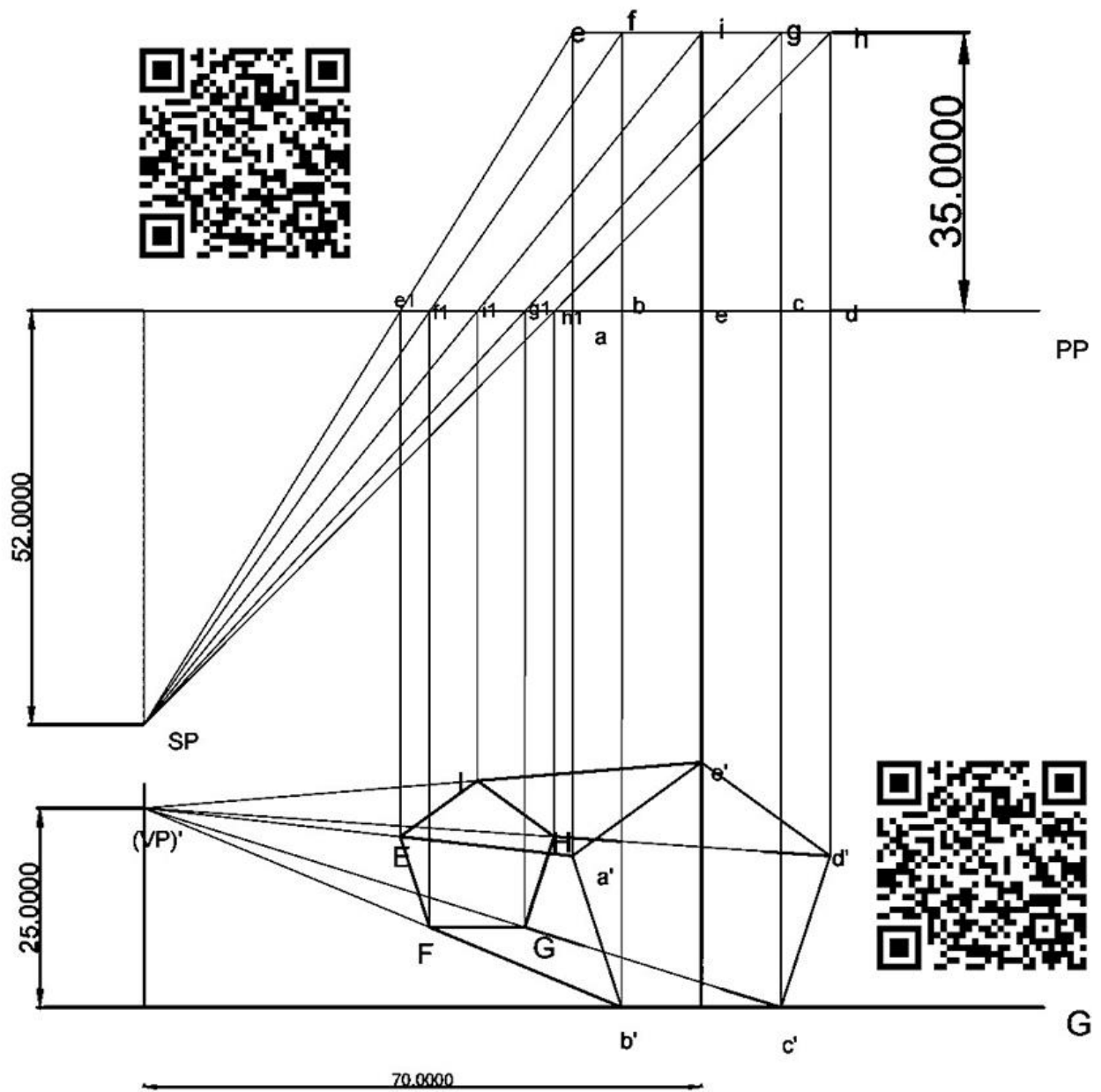


PERSPECTIVE PROJECTION

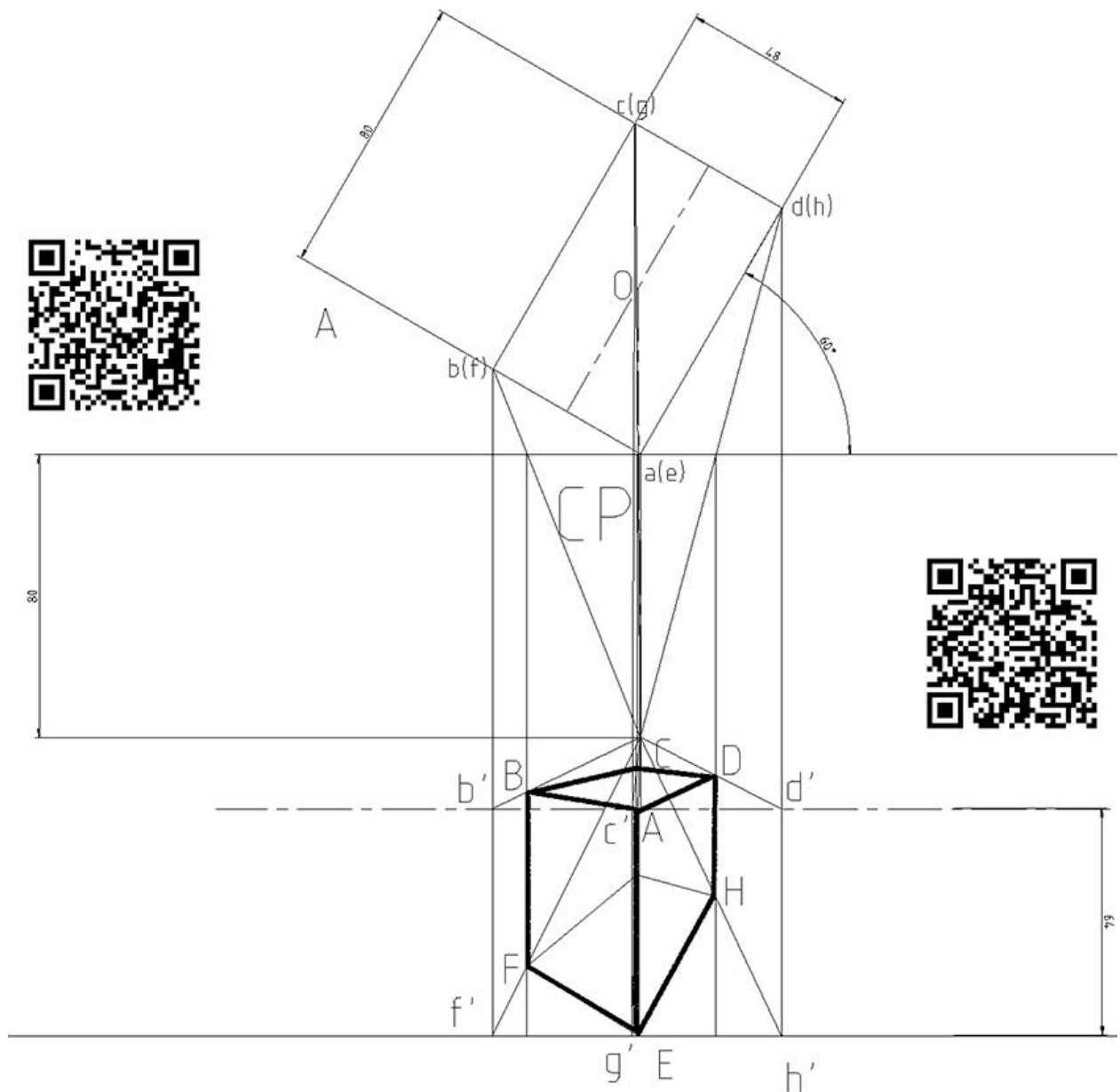
25. A square prism of 30mm side and 50 mm length is lying on the ground plane on one of its rectangular faces , in such a way that one of the square faces is parallel to and 10mm behind picture plane. The station point is located 60 mm in front of PP and 40 mm above ground plane. The central plane is 50 mm away from the axis of the prism towards the left. Draw the perspective view of the prism.



26. Draw the perspective view of a pentagonal prism, 20 mm base side and 35 mm long, lying on one of its rectangular faces on ground plane. One of its pentagonal faces touches the picture plane and the station point is 52 mm in front of PP, 25 mm above GP and lies in the central plane, which is 70 mm to the left of centre of the prism.



27. Draw the perspective view of a rectangular prism of 80mmX48mmX36mm size, lying on its 80X48mm rectangular face on the ground plane, with a vertical edge touching the picture plane and the end faces inclined 60° with the PP. The SP is 80 mm in front of PP, 64mm above GP and it lies in a central plane with the axis through the center of prism.



28. A circular lamina of 64mm diameter is kept vertical on GP and is inclined 45° To PP. The station point is positioned 80 mm in front of PP and 80 mm above GP. The central plane containing the station point passes 38mm away to the centre of the circular lamina. Draw the perspective view of the lamina, if the periphery is in contact with the PP. Employ vanishing point method.

