

PROJECTION OF POINTS

Problem 1 Draw the projections of the following Points on the same XY line, keeping convenient distance between each projectors. Name the Quadrants in which they lie.

- A – 30 mm above HP & 35 mm in front of VP.
- B – 35 mm above HP & 40 mm behind VP.
- C – 40 mm above HP & on VP.
- D – 35 mm below HP & 30 mm in front of VP.

Problem 2 Draw the projections of the following Points on the same XY line, Keeping convenient distance between each projectors. Name the Quadrants in which they lie.

- E – 30 mm below HP & 25 mm behind VP.
- F – 35 mm below HP & 30 mm in front of VP.
- G – On HP & 30 mm in front of VP.
- H - On HP & 35 mm behind VP.

Problem 4 A point 30mm above XY line is the front view of two points A&B .The top view of A is 40 mm behind VP & The top view of B is 45 mmin front of VP. Draw The projections of the points & state the quadrants in which the points are situated.

Problem 8 Two Points R and S are on HP. The point R is 35 mm in front of VP, while S is 50mm behind VP .The line joining their top views makes an angle of 40deg with XY. Find the horizontal distance between the two projectors.

Problem 12 A point R is 25 mm above HP & 20 mm in front of VP. Another point S is on HP and 30 mm behind VP. The distance between their projectors measured parallel to the line of intersection of VP and HP is 50mm. Find the distance between the top views of points R and S.

Problem 18 A point is 30 mm in front of VP 20 mm above HP & 25 mm in front / behind / from LPP. Draw its Projections and name the side view.

Problem 24 A point A is 20 mm above HP & 25 mm in front of VP. Another point B is 25 mm behind VP and 40 mm below HP. Draw their projections when the distance between their projectors parallel to XY line is zero mm. Add the right side view only to point B.

Problem 28 A point 30 mm above XY line is the front view of three points P,Q and R. The top view of R is 40 mm behind VP, the top view of Q is on XY line and top view of point P is 45 mm in front of VP. Draw the projections of the points & state the quadrants in which the points are situated.

Problem 32 Two Points P and Q are on HP. The point P is 30 mm behind VP, while Q is 50 mm in front of VP .The line joining their top views makes an angle of 40deg with XY. Find the horizontal distance between their projectors parallel to XY line.

PROJECTION OF STRAIGHT LINES

Problem 1 A line AB 80 mm long has its end A 20 mm above the HP and 30 mm in front of VP. It is inclined at 30° to HP and 45° to VP. Draw the projections of the line and find apparent lengths and apparent inclinations.

Problem 2 A line AB 80 mm long is inclined to HP at 30° and inclined to VP at 45° . Draw front and top views of line and determine their lengths. Also measure the perpendicular distance of end B from both HP and VP.

Problem 7 A line has its end A 10 mm above HP and 15 mm in front of VP. The end B is 55 mm above HP and line is inclined at 30° to HP and 35° to VP. The distance between the end projectors is 50 mm. draw the projections of the line. Determine the true length of the line and its inclination with VP.

Problem 9 A line AB 60 mm long has one of its extremities 20 mm in front of VP and 15 mm above HP. The line is inclined at 25° to HP and 40° to VP. Draw its top and front views.

Problem 10 A line AB measuring 70 mm has its end A 15 in front of VP and 20 mm above HP and the other end B is 60 in front of VP and 50 mm above HP. Draw the projections of the line and find the inclinations of the line with both the reference planes of projection.

Problem 14 The point B of a line AB is on the horizontal plane, the top view of the line makes an angle of 30° with XY line, being 80 mm. The point A is on the vertical plane and 50 mm above the horizontal plane. Draw the top and front views of the line and obtain the true length of the line. Also find the inclinations of the line with the two planes.

Problem 20 A point P is 40 mm above HP and 20 mm in front of VP another point Q is 20 mm above HP and 50 mm in front of VP. The top view of line PQ is inclined at 30° to XY. Draw the projections.

Problem 30 Draw the projections of a line AB 100 mm long inclined at 45° to VP and 30° to HP. One end of the line is 20 mm above the HP and in the VP. Also determine the apparent length and inclinations.

Problem 33 A line AB 65 mm long, has its end A 25 mm above HP and 30 mm in front of VP. The other end is 45 mm above HP and 50 mm in front of VP! Draw the projections and determine its inclinations.

Problem 48 The top view of a line AB, 80mm long measures 65mm and the length of the front view is 50mm. The end A is on HP and 15mm in front of VP. Draw the projections

PROJECTION OF PLANES

Problem 1 An equilateral triangular lamina of 25mm side lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 60° . The edge on which it rests is inclined to VP at 60° . Draw the projections.

Problem 2 An equilateral triangular lamina of 25mm side lies on one of its sides on HP. The lamina makes 45° with HP and one of its medians is inclined at 40° to VP. Draw its projections.

Problem 6 A $30^\circ\text{-}60^\circ$ setsquare of 60mm longest side is so kept such that the longest side is in HP, making an angle of 30° with VP. The set square itself is inclined at 45° to HP. Draw the projections of the setsquare.

Problem 7 An isosceles triangular plate of negligible thickness has base 25mm long and altitude 35mm. It is so placed on VP such that in the front view it is seen as an equilateral triangle of 25mm sides with the side that is parallel to VP is inclined at 45° to HP. Draw its top and front views. Also determine the inclination of the plate with the reference plane.

Problem 8 A square lamina of 40mm side rests on one of its sides on HP. The lamina makes 30° to HP and the side on which it rests makes 45° to VP. Draw its projections.

Problem 10 A square lamina ABCD of 40mm side rests on corner C such that the diagonal AC appears to be at 45° to VP. The two sides BC and CD containing the corner C make equal inclinations with HP. The surface of the lamina makes 30° with HP. Draw its top and front views.

Problem 14 A rectangular lamina of 35mm x 20mm rests on HP on one of its shorter edges. The lamina is rotated about the edge on which it rests till it appears as a square in the top view. The edge on which the lamina rests is inclined 30° to VP. Draw its projections and find its inclination to HP.

Problem 19 A pentagonal lamina of edges 25mm is resting on HP with one of its sides such that the surface makes an angle of 60° with HP. The edge on which it rests is inclined at 45° to VP. Draw its projections.

Problem 24 A pentagonal lamina of sides 25mm is having a side both on HP and VP. The corner opposite to the side on which it rests is 15mm above HP. Draw the top and front views of the lamina.

Problem 28 A regular pentagonal lamina of 25mm side is resting on one of its sides on HP while the corner opposite to this side touches VP. If the lamina makes an angle of 60° with HP and 30° with VP, draw the projections of the lamina.

Problem 36 A regular hexagonal lamina of sides 25mm is lying in such a way that one of its sides on HP while the side opposite to the side on which it rests is on VP. If the lamina makes 60° to HP, Draw the projections of the lamina.

Problem 40 A hexagonal lamina of sides 25mm rests on one of its sides on HP. The lamina makes 45° to HP and the side on which it rests makes 30° to VP. Draw its projections.

Problem 46 Draw the projections of a circular plate of negligible thickness of 50mm diameter resting on HP on a point A on the circumference, with its plane inclined at 45° to HP and the top view of the diameter passing through the resting point makes 60° with VP.

Problem 49 A circular lamina inclined to the VP appears in the front view as an ellipse of major axis 30mm and minor axis 15mm. The major axis is parallel to both HP and VP. One end of the minor axis is in both the HP and VP. Draw the projections of the lamina and determine the inclination of the lamina with the VP.

PROJECTION OF SOLIDS

Problem 1 A square prism 35 mm sides of base and 65 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the prism when the axis is inclined to HP at 45° .

Problem 2 A square prism 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and appears to be inclined to VP at 45° .

Problem 5 A pentagonal prism 25 mm sides of base and 60 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the prism when the axis is inclined to HP at 40° .

Problem 7 A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and appears to be inclined to VP at 45° .

Problem 9 A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its edges. Draw the projections of the prism when the axis is inclined to HP at 45° and appears to be inclined to VP 40° .

Problem 16 A square pyramid 35 mm sides of base and 65 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the pyramid when the axis is inclined to HP at 45° .

Problem 17 A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and appears to be inclined to VP at 45° .

Problem 22 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and appears to be inclined to VP at 45° .

Problem 39 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

Problem 43 A cube of 40 mm sides rests on HP on an edge which is inclined to VP at 30° . Draw the projections when the lateral square face containing the edge on which it rests makes an angle of 50° to HP.

Problem 44 A tetrahedron of 55 mm sides rests on one of its corners such that an edge containing that corner is inclined to HP at 50° and VP at 30° . Draw its projections.

Problem 45 A cone of 50 mm base diameter and 60 mm axis length rests on HP on one of its generators. Draw its projections when the axis is inclined to VP at 30° .

ISOMETRIC PROJECTIONS

Problem 1 A sphere of diameter 50 mm rests centrally on top of a cube of sides 50 mm. Draw the Isometric projections of the combination of solids.

Problem 6 The frustum of a square pyramid of sides 40mm and height 60mm rest on the centre of the top of a square block of side 60mm and height 20mm. The base edges of the pyramid are parallel to the top edges of the square block. Draw the isometric projection of the combination of the solids.

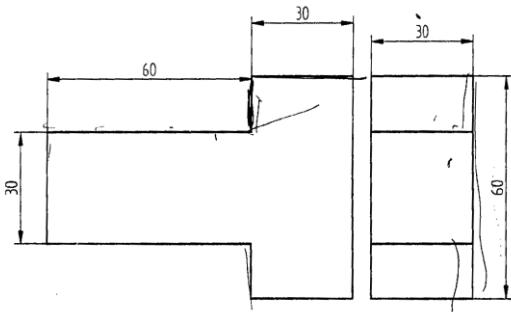
Problem 12 A cone of base diameter 30mm and height 40mm rests centrally over a cube of side 50mm. Draw the isometric projection of the combination of solids

Problem 15 A hemisphere of diameter 50mm is centrally resting on top of a square prism of base side 60mm and height 30mm such that the curved surface of hemisphere is touching the top face of the prism. Draw its isometric projections

Problem 21 A square prism base side-40mm, height50mm is placed centrally on a rectangular slab sides-100mmx60mm and thickness-20mm. Draw the isometric projection of the combination

Problem 22 A frustum of cone base diameter 50mm, top diameter 25mm and height50mm is placed centrally on a cylindrical slab of diameter 100mm and thickness-30mm. Draw the isometric projection of the combination

Problem 27 Following figure shows the front and side views of solid. Draw the Isometric projection of the solid.



Problem 41 A cube of side-25mm is resting centrally on a rectangular slab 100mmx40mm and 30mm thick. Draw the isometric projection of the combination

Problem 34 A sphere f60mm is placed centrally on the top face of a hexagonal prism side-35mm and height 50mm. Draw the isometric projection of the combination

Problem 44 A triangular prism base side-30mm and length-70mm is resting on its rectangular face on top of a square slab side-70mm and 25mm-thick. Draw the isometric projection of the combination

Problem 46 Three rectangular slabs (lxbxh) 100mmx60mmx20mm 100mmx40mmx20mm and 100mmx20mmx20mm are placed one above the other in the ascending order of their width-b, such that their longer axes are co-planar. Draw the isometric projection of the combination

Problem 47 Three cubes of sides 60mm, 40mm and 20mm are placed centrally one above the other in the ascending order of their side. Draw the isometric projection of the combination

DEVELOPMENT OF LATERAL SURFACES

Problem 2 A square prism of base side 30 mm and axis length 60 mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 60° to HP and perpendicular to VP and is passing through a point on the axis at a distance 50 mm from the base. Draw the development of the lower portion of the prism.

Problem 7 A rectangular prism of base 40mm x 25mm and height 65mm rests on HP on its base with the longer base side inclined at 30° to VP. It is cut by a plane inclined at 40° to HP, perpendicular to VP cuts the axis at its mid height. Draw the development of the remaining portion of the prism.

Problem 11 A regular pentagonal prism of height 60mm and base edge 30mm rests with its base on HP. The vertical face closest to VP is 30° to it. Draw the development of the truncated prism with its truncated surface inclined at 60° to its axis and bisecting it.

Problem 15 A hexagonal prism of base side 20mm and height 50mm is resting on HP on its base, such that one of its base edge is parallel to VP. The prism is cut in this position as shown in the following front view. Draw the development of the lateral surface of the prism.

Problem 18 A square pyramid of side of base 45mm, altitude 70mm is resting with its base on HP with two sides of the base parallel to VP. The pyramid is cut by a section plane which is perpendicular to the VP and inclined at 40° to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces the truncated pyramid.

Problem 20 A frustum of a square pyramid has its base 40 mm sides, top 16 mm sides and height 60mm, its axis is vertical and a side of its base is parallel to VP. Draw the projections of the frustum and show the development of the lateral surfaces of it.

Problem 28 A hexagonal pyramid of sides 35mm and altitude 65mm is resting on HP on its base with two of the base sides perpendicular to VP. The pyramid is cut by a plane inclined at 30° to HP and perpendicular to VP and is intersecting the axis at 30mm above the base. Draw the development of the remaining portion of the pyramid.

Problem 31 A vertical cylinder of base diameter 45mm and axis length 60mm is cut by a plane perpendicular to VP and inclined at 50° to HP, is passing through the centre point of the top face. Draw the development of the lateral surface of the cylinder.

Problem 33 A vertical cylinder of base diameter 50mm and axis length 60mm is cut by a two planes which are perpendicular to VP and inclined at 45° to HP and passing through either side the centre point of the top face. Draw the development of the lateral surface of the cylinder.

Problem 41 A right cone of 55mm diameter of base and 75mm height stands on its base on HP. It is cut to the shape of a truncated cone with its truncated surface inclined at 45° to the axis lying at a distance of 40mm from the apex of the cone. Obtain the development of the lateral surface of the truncated cone.

Problem 47 Draw the development of the lateral surface of a funnel consisting of a cylinder and a frustum of a cone. The diameter of the cylinder is 20mm and top face diameter of the funnel is 80mm. The height of frustum and cylinder are equal to 60mm and 40mm respectively.