1. A forest, measuring 130,000 sq. kilometers, is represented on a map by a rectangle of size 80 cm X 65 cm. Construct a diagonal scale to read up to one hectometer and long enough to measure 70 kilometers. Show the distances i) 46.2 km and ii) 0.6 km on it.

2. Construct a vernier scale to read Distances, Correct to a Decameter on a map in which the actual distance are reduced in the ratio of 1/40000. The scale should be long enough to measure 6 kilometer. Mark a length 3.34 km and 0.59 km on the scale.

3. The major axis of an ellipse is 100 mm long and the foci are at a distance of 15 mm from its ends. Find the minor axis and draw ellipse using the same.

4. On a cricket ground, the ball thrown by a fielder reaches the wicket keeper following parabolic path. Maximum height achieved by the ball above the ground is 30 m. assuming the point of thrown and the point of catch to be 1m above the ground, draw the path of the ball. The distance between the fielder and the wicket keeper is 70 m.

5. Draw rectangular or equilateral hyperbola given the position of point P on it, 40mm & 20mm from the asymptotes OX & OY respectively.
Figure 1: Draw FV, TV & SV

Figure 2: Draw FV & TV

Figure 3: Draw FV & TV
1. A and B are the ends of a straight line AB. The end A is 65mm above HP and 40mm
infront of VP. The end B is 15mm above HP and 75mm infront of the VP. The distance
between the projectors along XY line is 65mm. Draw the projections of the line AB and
determine its inclination with HP and VP.

2. The top view of a 80mm long line AB measures 55mm, While the length of its front view
is 70mm. Its one end is 15mm in front of V.P. and is in HP. Draw its projection and
determines its inclination with HP & VP.

3. The front view of a 90mm long line PQ measures 60mm and its top view measures
70mm. Its end Q and the mid-point M are in first quadrant, M being 40mm from both the
planes. Draw the projections of line PQ.

4. A line AB, 75mm long, has one end A in VP. Other end B is 15 mm above HP and 50
mm in front of VP. Draw the projections of the line when sum of it’s Inclinations with
HP & VP is 90°, means it is lying in a profile plane. Find true angles with reference
planes.

1. Three lines OA, OB and OC are 25mm, 40mm and 35mm respectively meeting at O at
angles of 120° each other, forms the top view of a tripod stand. The point O is 60mm
above HP. Draw the projections of the tripod and determine the true lengths of the legs of
the tripod.

2. A straight road, going uphill from a point (A) due east to another point (B), is 5km long
and has a slope of 25°. Another straight road from (B), due 30° east of north of a point
(C), is also 5 km long but is on the ground level. Find length and slope of the straight
road, joining the points (A) & (C).

3. A wireless axial tower 20m high is tied by two guy ropes, having angles of depression
30° and 40°. Other ends of the ropes are tied at two towers of height 5m and 7.5m
respectively and 15m apart. Draw projections of guy ropes and find their true lengths.
1. A plate having shape of an isosceles triangle has base 50 mm long and altitude 70 mm. It is so placed that in the front view it is seen as an equilateral triangle of 50 mm sides and one side inclined at 45° to XY. Draw its top view.

2. A rhombus of diagonals 40 mm and 70 mm long respectively having one end of its longer diagonal in HP while that diagonal is 45° inclined to HP and makes 30° inclinations with VP. Draw its projections.

3. An isosceles triangle of 40 mm long base side, 60 mm long altitude is freely suspended from one corner of base side. It’s plane is 45° inclined to VP. Draw its projections.

4. A regular pentagon of 30 mm sides is resting on HP on one of its sides with its surface 45° inclined to HP. Draw its projections when the side in HP makes 30° angle with VP.

1. Draw the three views of a cube of side 60 mm when solid diagonal is parallel to H.P. and perpendicular to V.P.

2. A cylinder 40 mm diameter and 50 mm axis is resting on one point of a base circle on VP while its axis makes 45° with VP and FV of the axis 35° with HP. Draw projections.

3. A pentagonal pyramid, side of base 30mm and height 70mm rests on one of the corners of its base on HP the base being tilted up until the vertex is 60mm above HP. Draw three views of the pyramid with the edge of the base opposite to the corner on which it is resting made inclined at 60° to VP.
1. A right circular cone of base 50 mm and axis 65 mm is resting on its base on H.P. It is cut by A.V.P. inclined at 45° and 10 mm away from axis. Draw sectional front view and true shape of the section. Draw the development of the remaining portion of cone.

2. A pentagonal pyramid, base 30 mm side and axis 60 mm long is lying on one of its triangular faces on the HP with the axis parallel to the VP. A vertical section plane, whose HT bisects the top view of the axis and makes an angle of 30° with the reference line, cuts the pyramid removing its top part. Draw the top view, sectional front view and true shape of the section and development of the surface of the remaining portion of the pyramid.

3. A cube of 40 mm long edges is resting on the ground on one of the faces with vertical faces equally inclined to the VP. A section plane perpendicular to the VP and inclined to the HP cuts the solid in such a way that the true shape of the section is an equilateral triangle of side 50 mm. Determine the inclination of the section plane with the HP and draw the sectional top view and true shape of the section. Draw the development of the cut solid.
Draw Isometric Projection for Figure 1 & Isometric View for Figure 2, Figure 3.