MODULE I

PROJECTIONS OF LINES

1. A room measures 8m long, 5m wide and 4m high. An electric bulb hangs in the center of the ceiling and 1m below it.There is a black spot on the bulb surface. When the bulb is switched on the image of the black spot falls on one of the corner of the room at a height of 1.25m above the floor. Neglecting the size of the bulb, Draw the projections of the line connecting the black spot on the bulb and its image formed on the wall, Also determine the true length of the line connecting the black spot and its image and the slope it makes with the floor. **(DEC 2015)**

   Solution:

   In this problem, we can solve it by using **Line rotation method or Plane rotation method.**

   While solving this problem take **SCALE 1m=10mm**. There are 8 ways to solve this problem.

   a. Image on left bottom corner – Line rotation method
   b. Image on left top corner – Line rotation method
   c. Image on right bottom corner – Line rotation method
   d. Image on right top corner – Line rotation method
   e. Image on left bottom corner – Plane rotation method
   f. Image on left top corner – Plane rotation method
   g. Image on right bottom corner – Plane rotation method
   h. Image on right top corner – Plane rotation method

a. <u>Image on left bottom corner – Line rotation method</u>

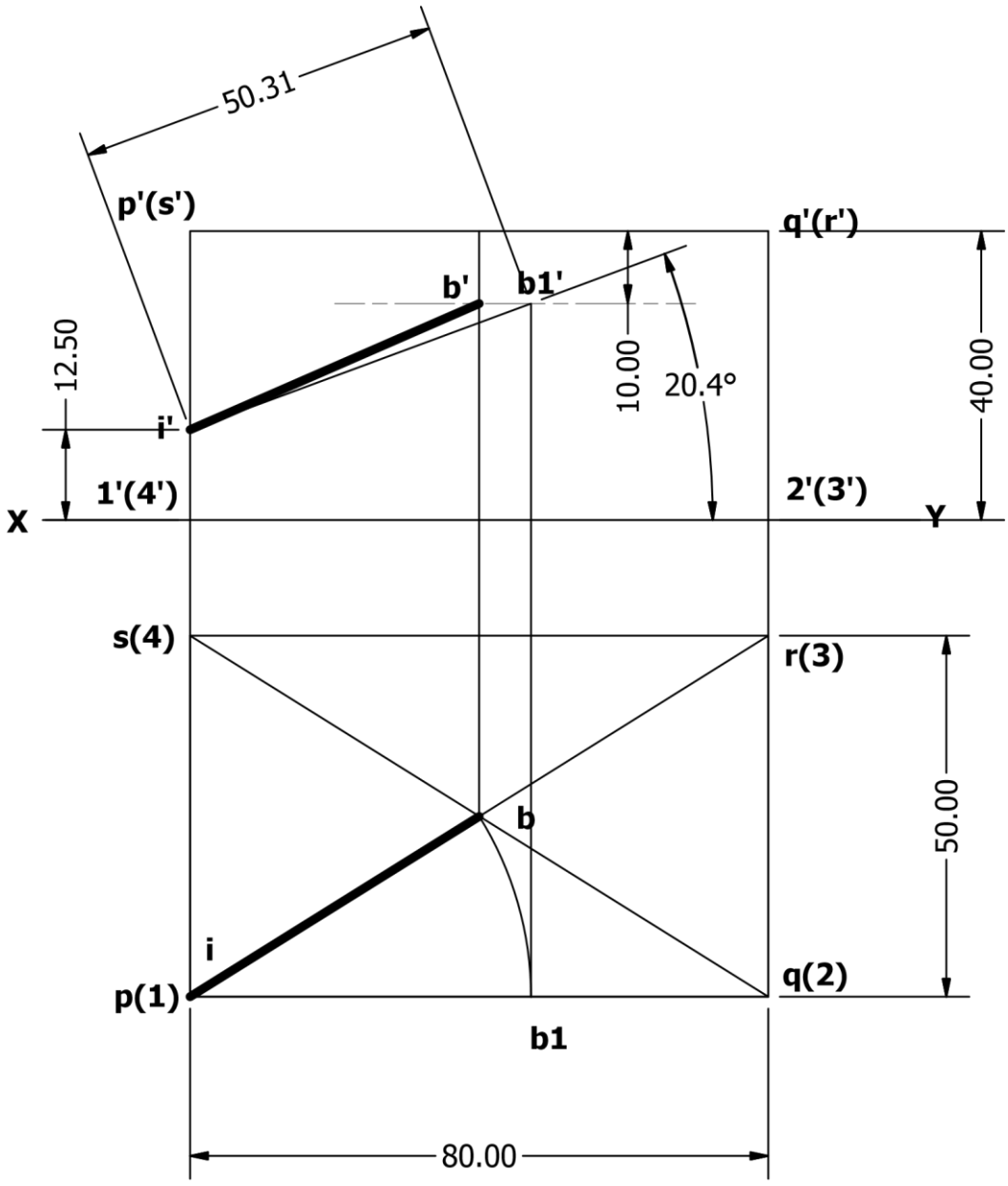


FIGURE 1.1 LINE ROTATION METHOD

<u>Answers:</u>

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

b. <u>Image on left top corner – Line rotation method</u>

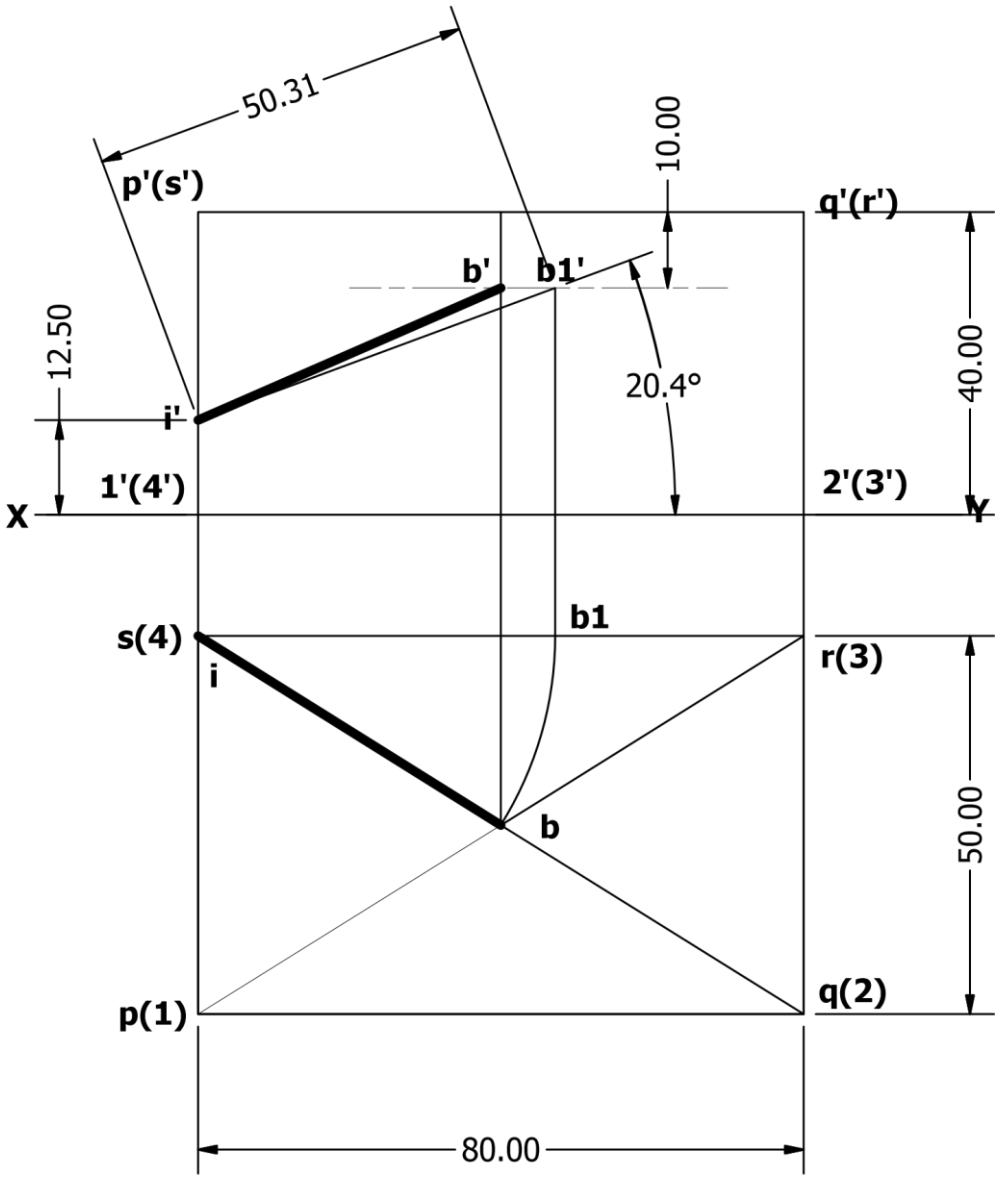


FIGURE 1.2 LINE ROTATION METHOD

<u>Answers:</u>

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

c. Image on right bottom corner – Line rotation method

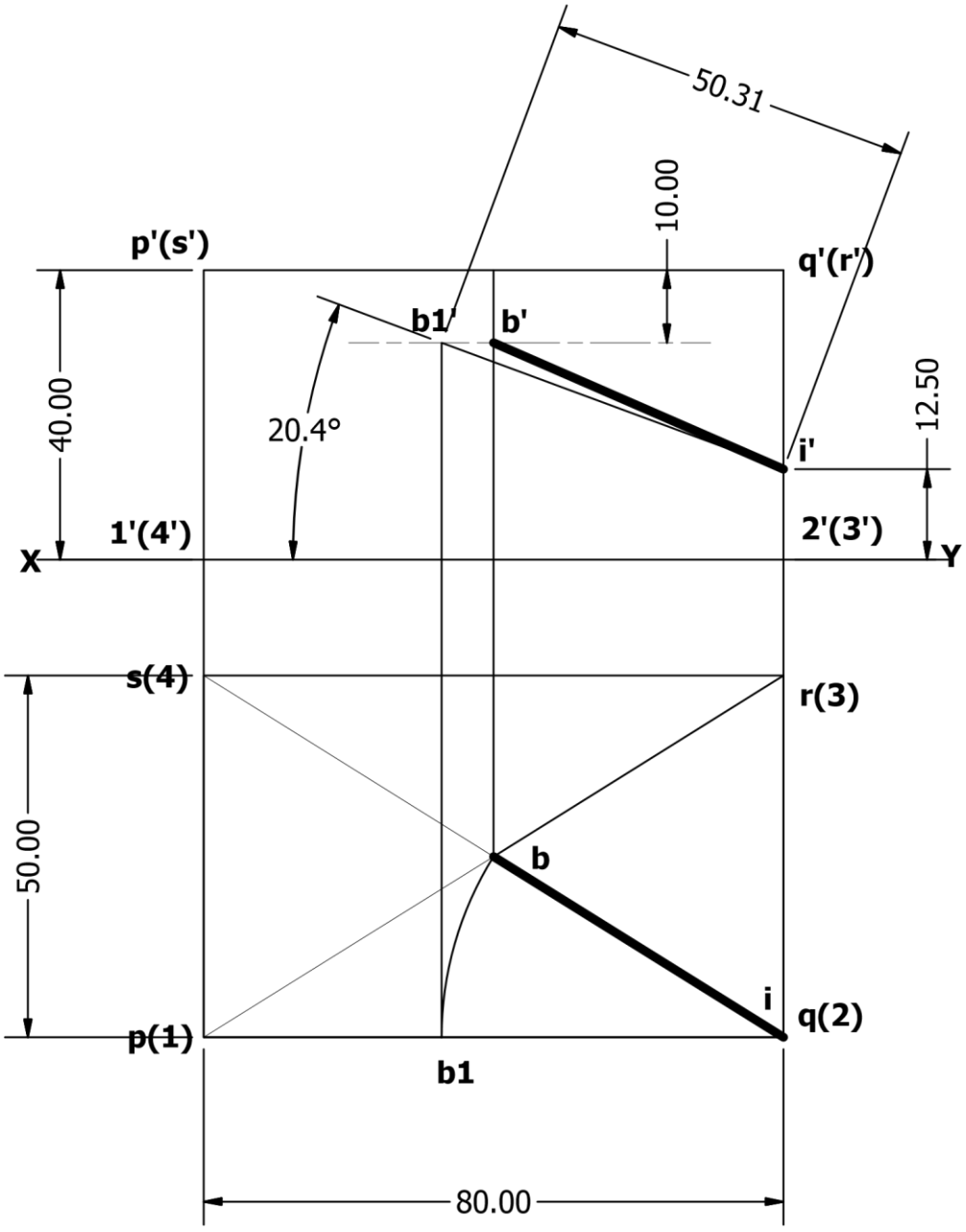


FIGURE 1.3 LINE ROTATION METHOD

Answers:

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

d. Image on right top corner – Line rotation method

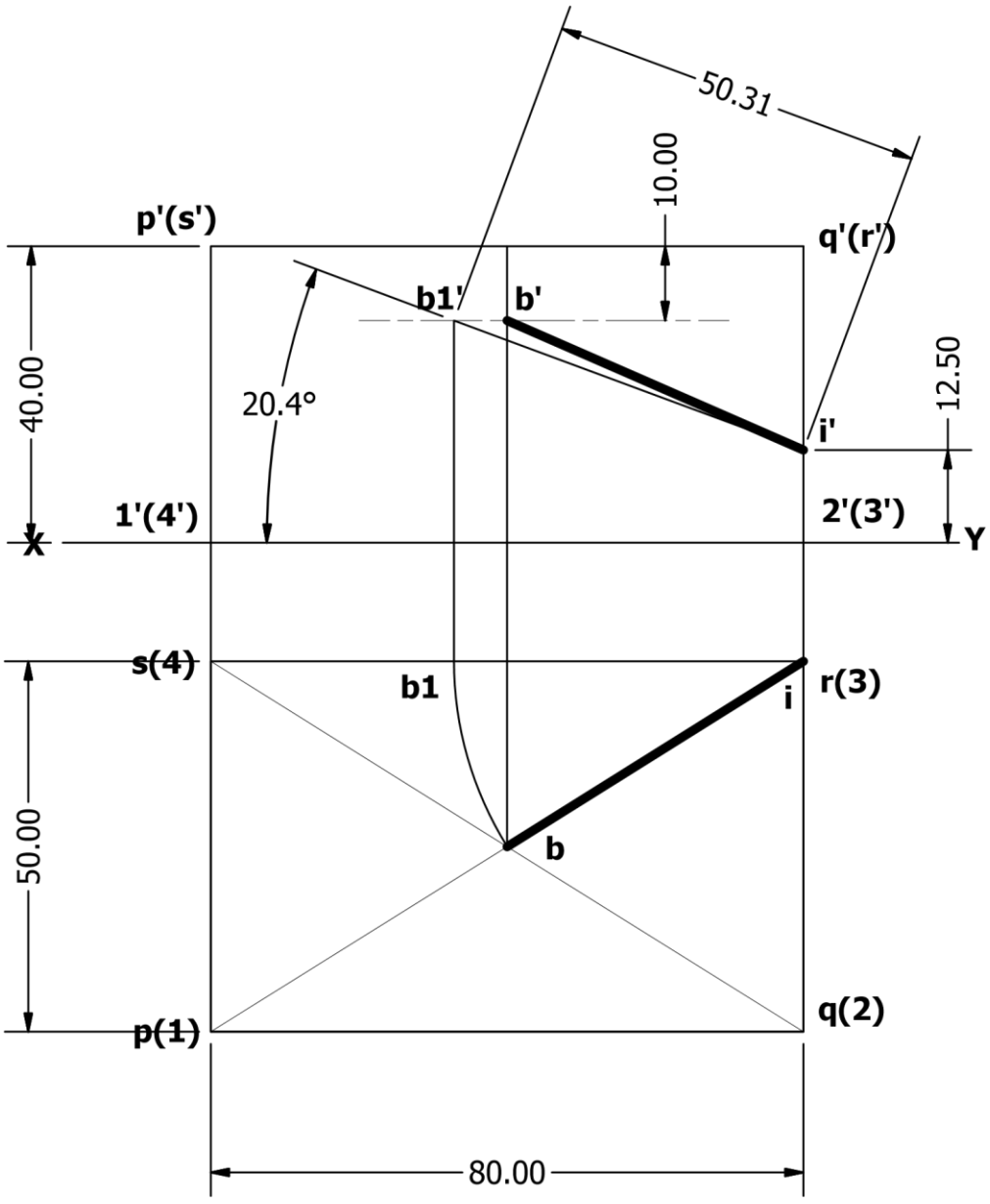


FIGURE 1.4 LINE ROTATION METHOD

Answers:

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

e. Image on left bottom corner – Plane rotation method

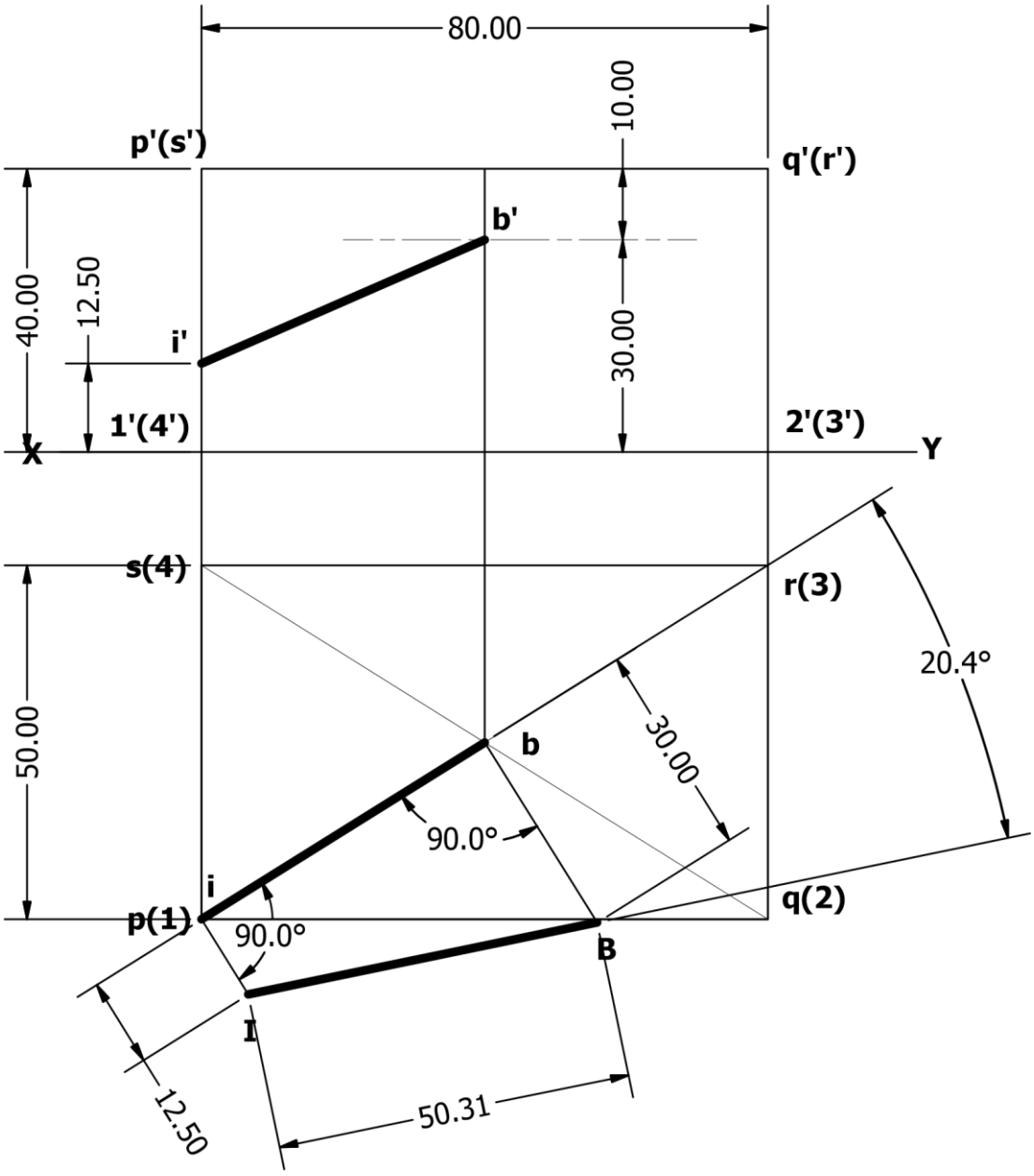


FIGURE 1.5 PLANE ROTATION METHOD

Answers:

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

f. Image on left top corner – Plane rotation method

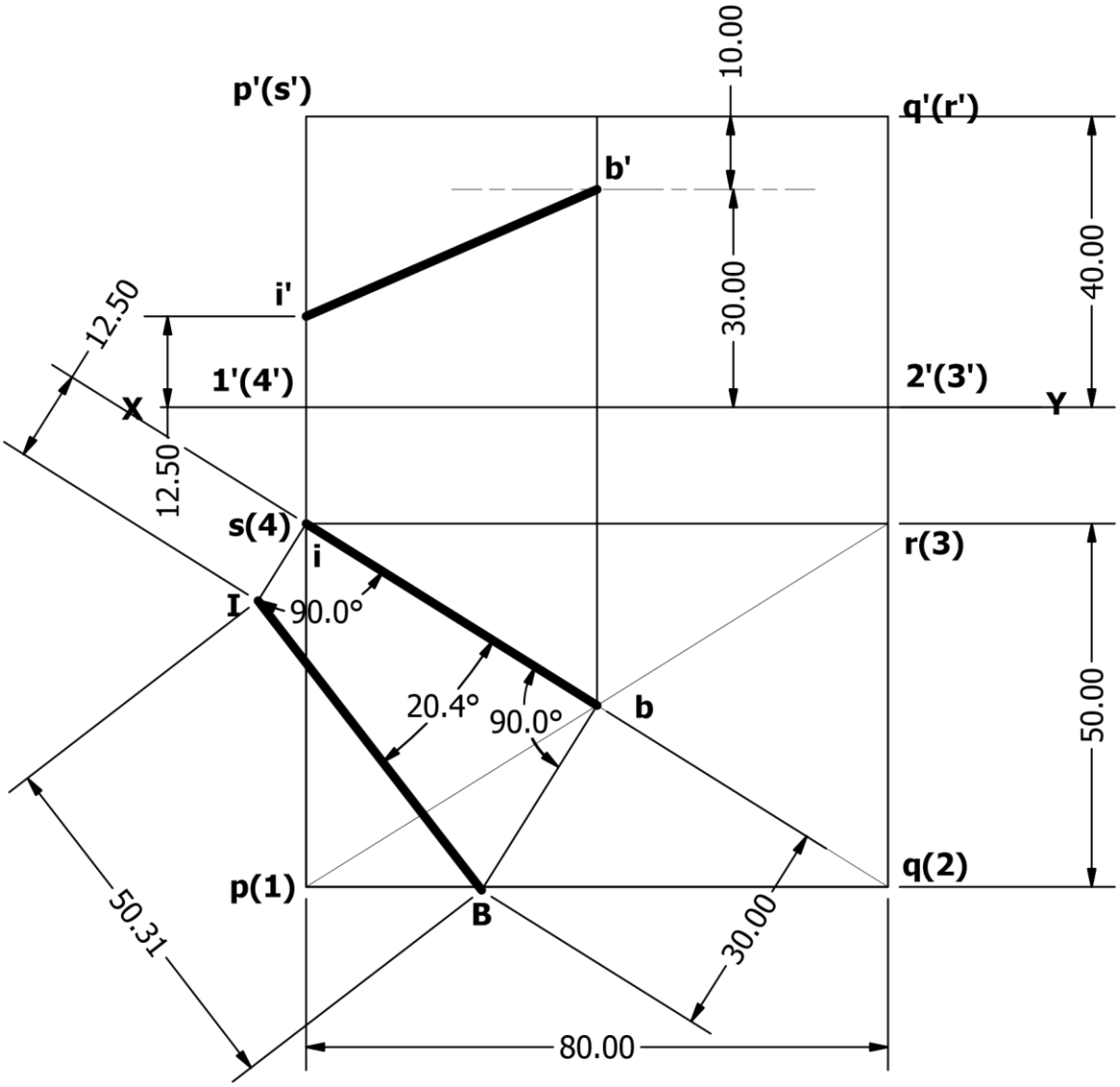


FIGURE 1.6 PLANE ROTATION METHOD

Answers:

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

g. Image on right bottom corner – Plane rotation method

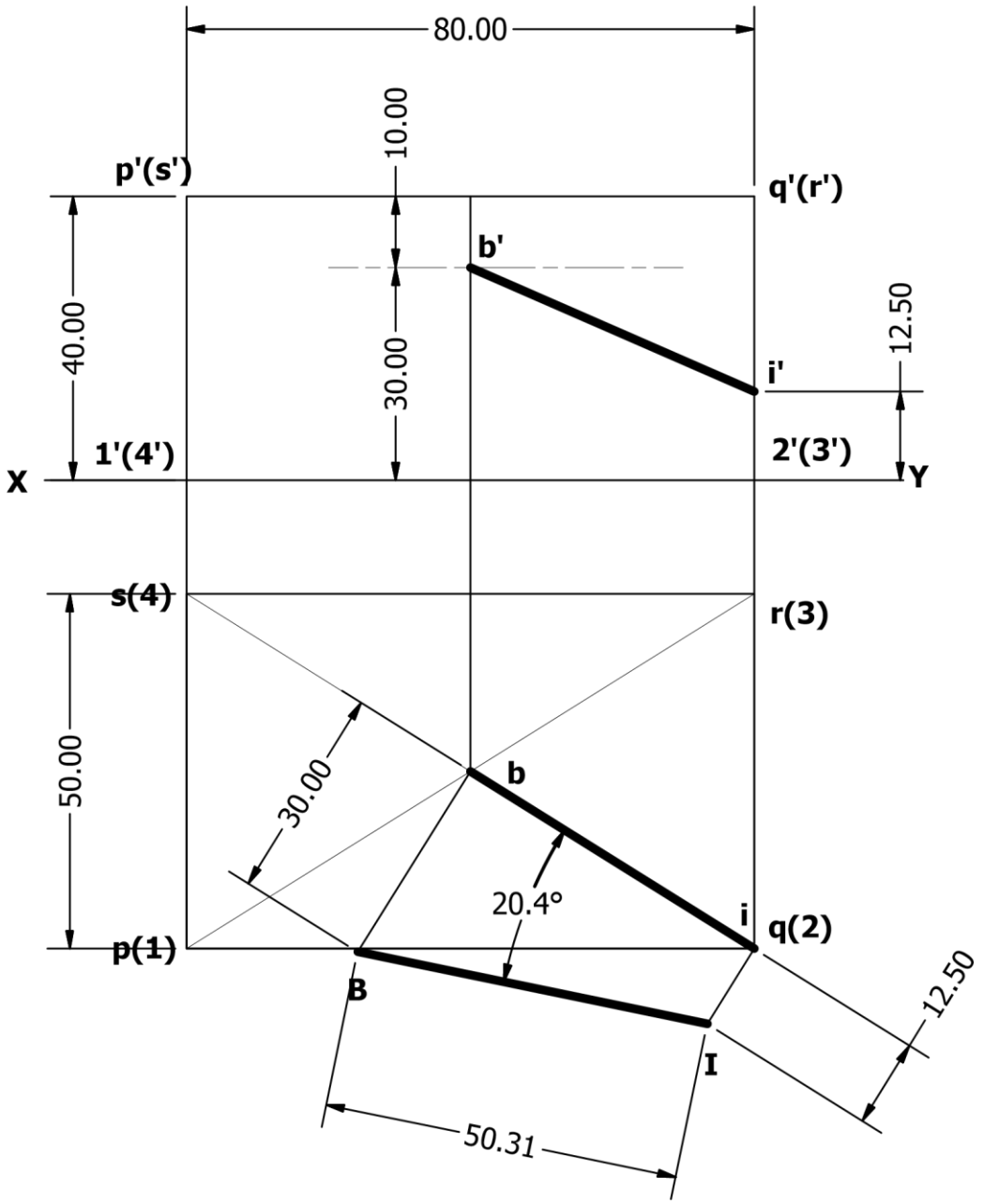


FIGURE 1.7 PLANE ROTATION METHOD

Answers:

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

h. Image on right top corner – Plane rotation method

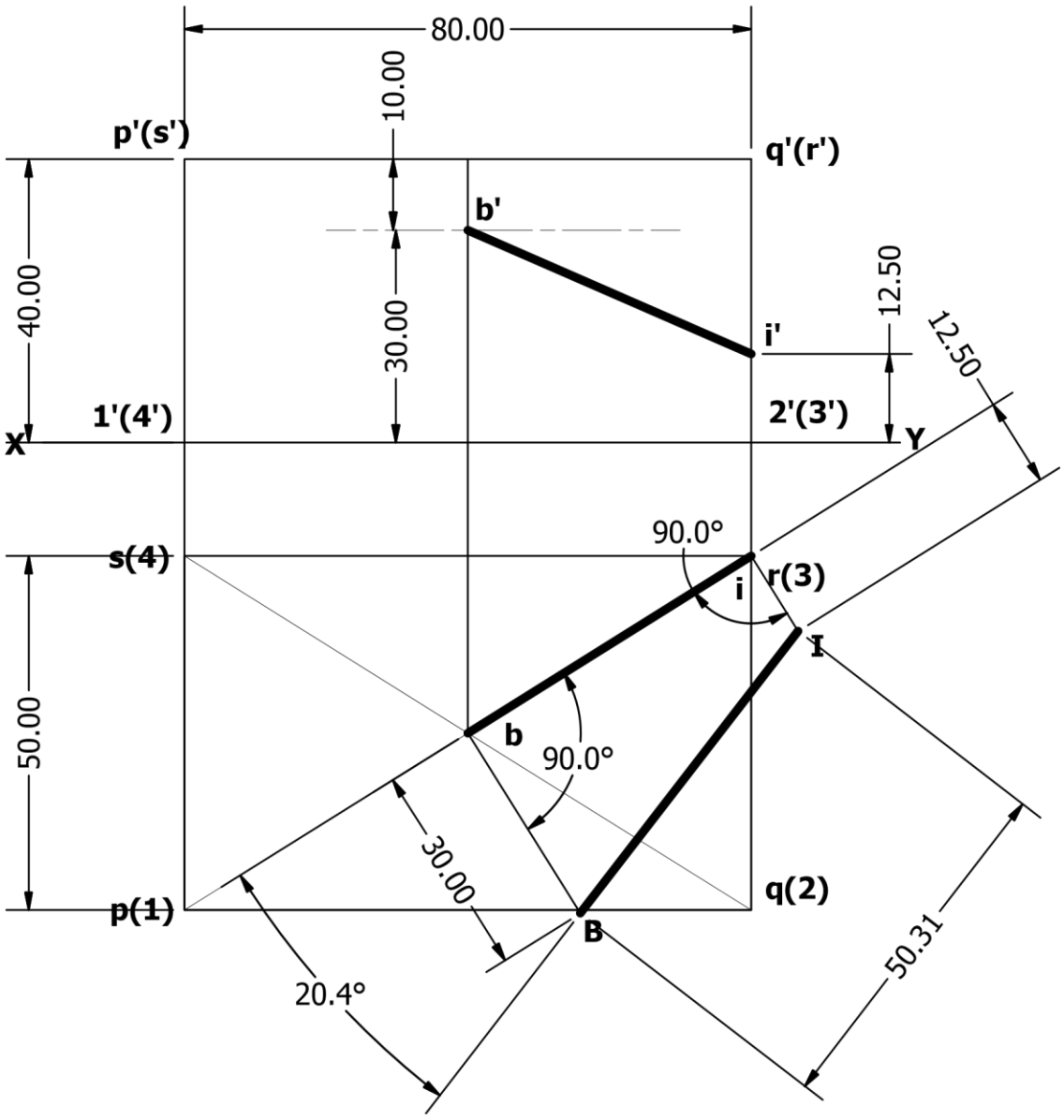


FIGURE 1.8 PLANE ROTATION METHOD

Answers:

1. Projections of the line connecting the black spot and image is drawn.
2. True length of the line connecting the black spot and image = 50.31mm = 5m
3. Slope it makes with the floor=20.4^0

2. Three vertical poles AB, CD and EF are respectively 2m, 4m and 8m long and standing on the floor. There ends B, D and F are on the floor and are the corners of an equilateral triangle of side 5m.Determine the distances between the top ends of the poles, i.e., AC, CE and AE. Find also their inclination to the floor. **(DEC 2015)**

Solution:

In this problem, we can solve it by using **Line rotation method or Plane rotation method.**

While solving this problem take **SCALE 1m=10mm**. There are 2 ways to solve this problem.

a. Using Line rotation method

b. Using plane rotation method.

a) <u>Using Line rotation method.</u>

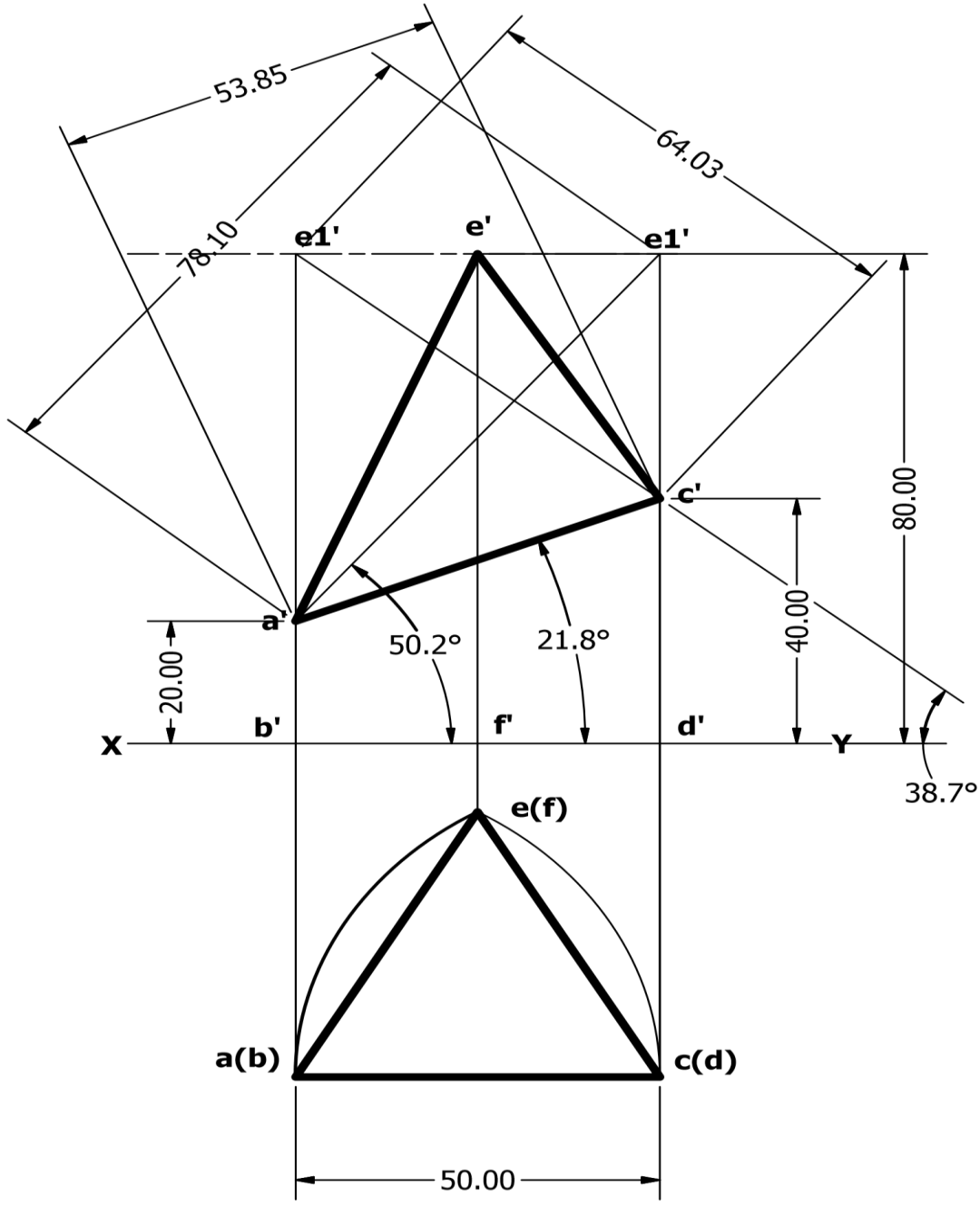


FIGURE 1.9 LINE ROTATION METHOD

<u>Answers:</u>

1. Distance between A and C = 53.85mm = 5.3m. its inclination with floor=21.8^0
2. Distance between C and E = 64.03mm = 6.4m. its inclination with floor=38.7^0
3. Distance between A and E = 78.10mm = 7.8m. its inclination with floor=50.2^0

b) <u>Using Plane rotation method.</u>

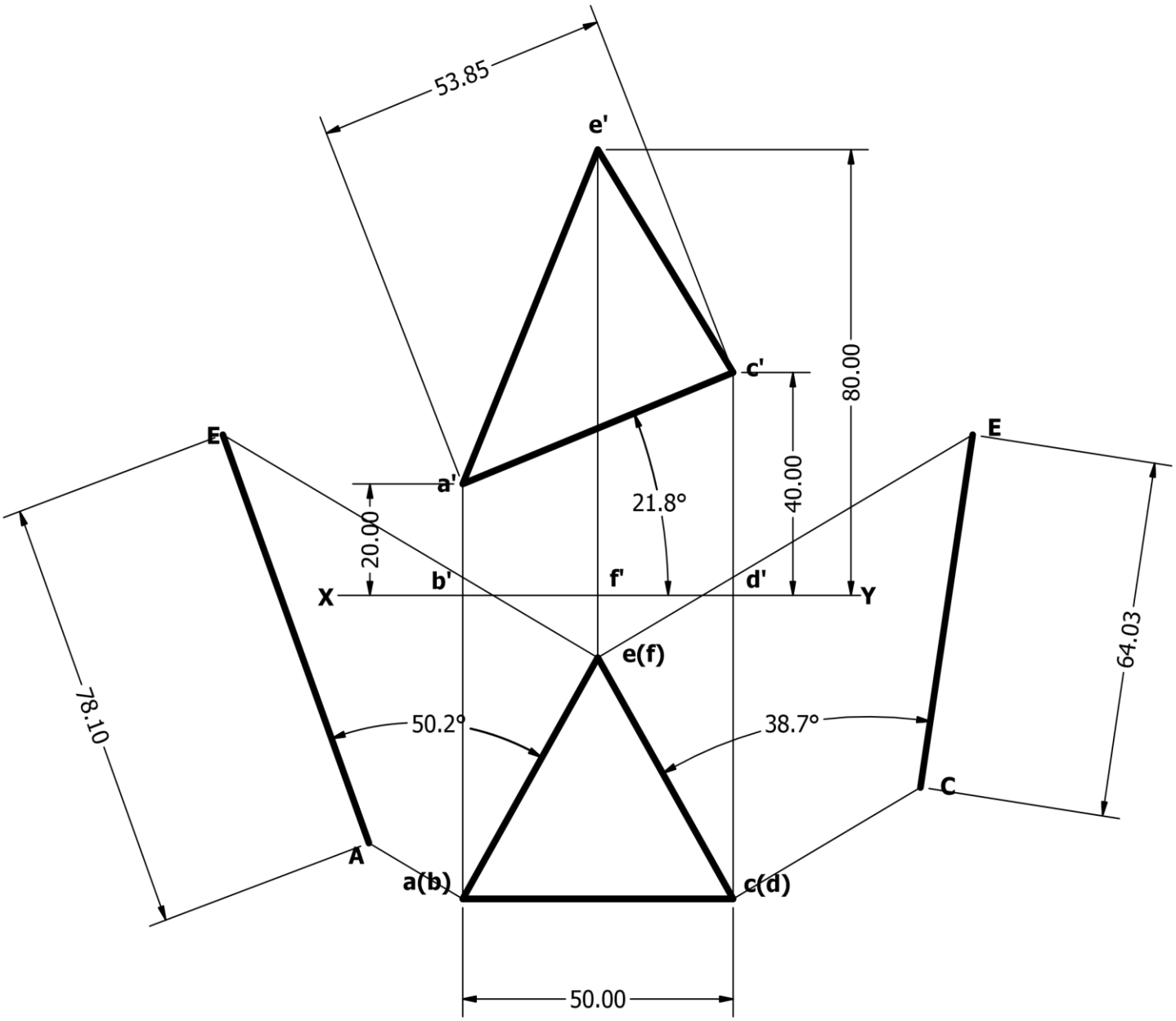


FIGURE 1.10 PLANE ROTATION METHOD

<u>Answers:</u>

1. Distance between A and C = 53.85mm = 5.3m. its inclination with floor=21.8^0
2. Distance between C and E = 64.03mm = 6.4m. its inclination with floor=38.7^0
3. Distance between A and E = 78.10mm = 7.8m. its inclination with floor=50.2^0

3. A line CD of length 65mm is inclined at 45^0 to HP and 30^0 to VP. The end D is 50mm above HP and 45mm in front of VP. Draw the projections of the line and locate its traces. **(M.Q.1)**

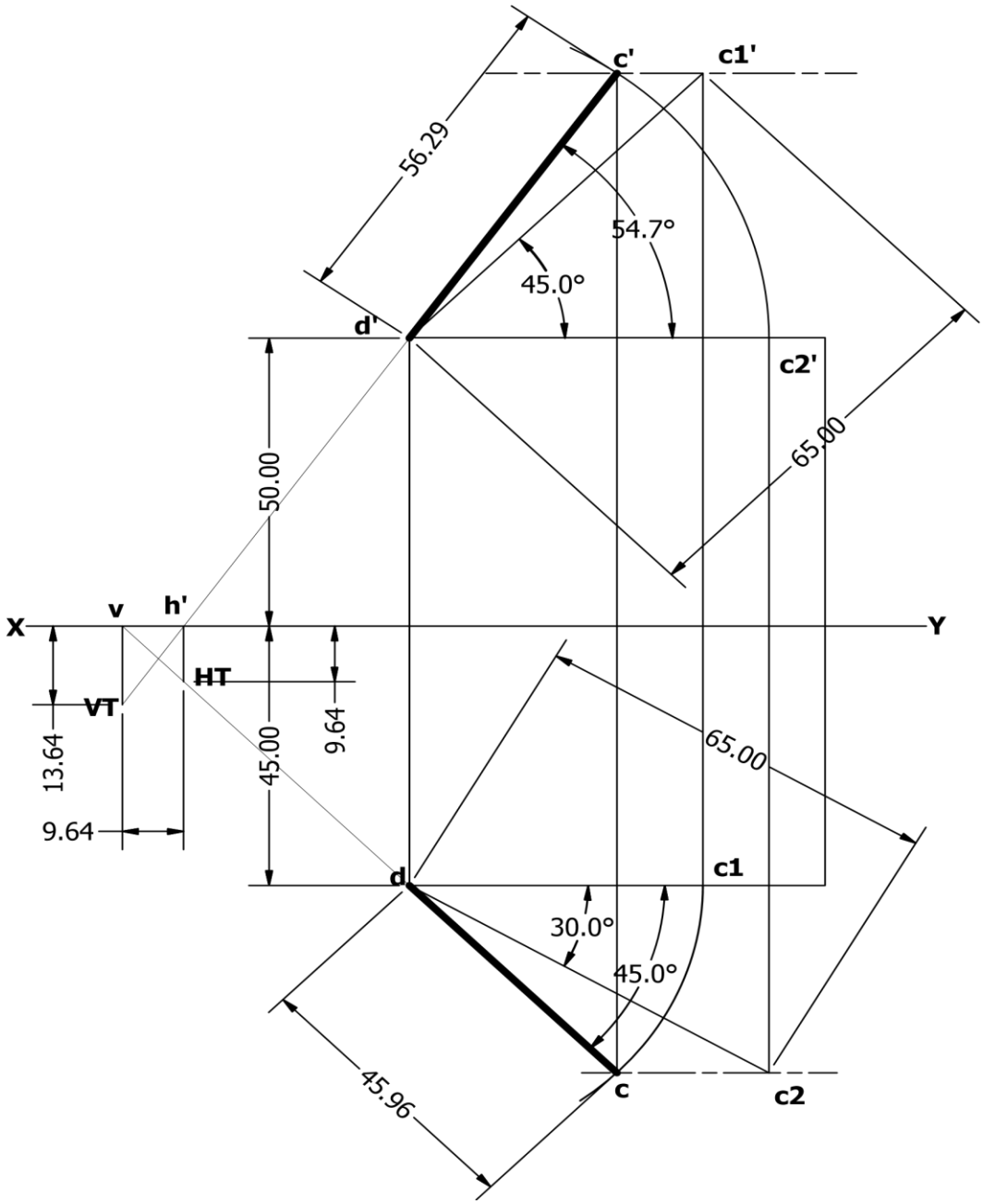


FIGURE 1.11 LINE ROTATION METHOD

Answers:

1. Projections of the line is drawn.(Length of Front view=56.29mm , Length of Top view=45.96mm , Alpha=54.7^0 , Beta =45^0)
2. HT and VT are also plotted (HT is 13.64mm below XY , VT is 9.64mm below XY and Distance between the HT and VT is 9.64mm)

4. A line AB of length 70mm is inclined at 30^0 to HP and 45^0 to VP. A point P on the line is at a distance of 30mm from B and is 55mm above HP and 60mm in front of VP. Draw the projections of the line and mark its traces. **(M.Q.2)**

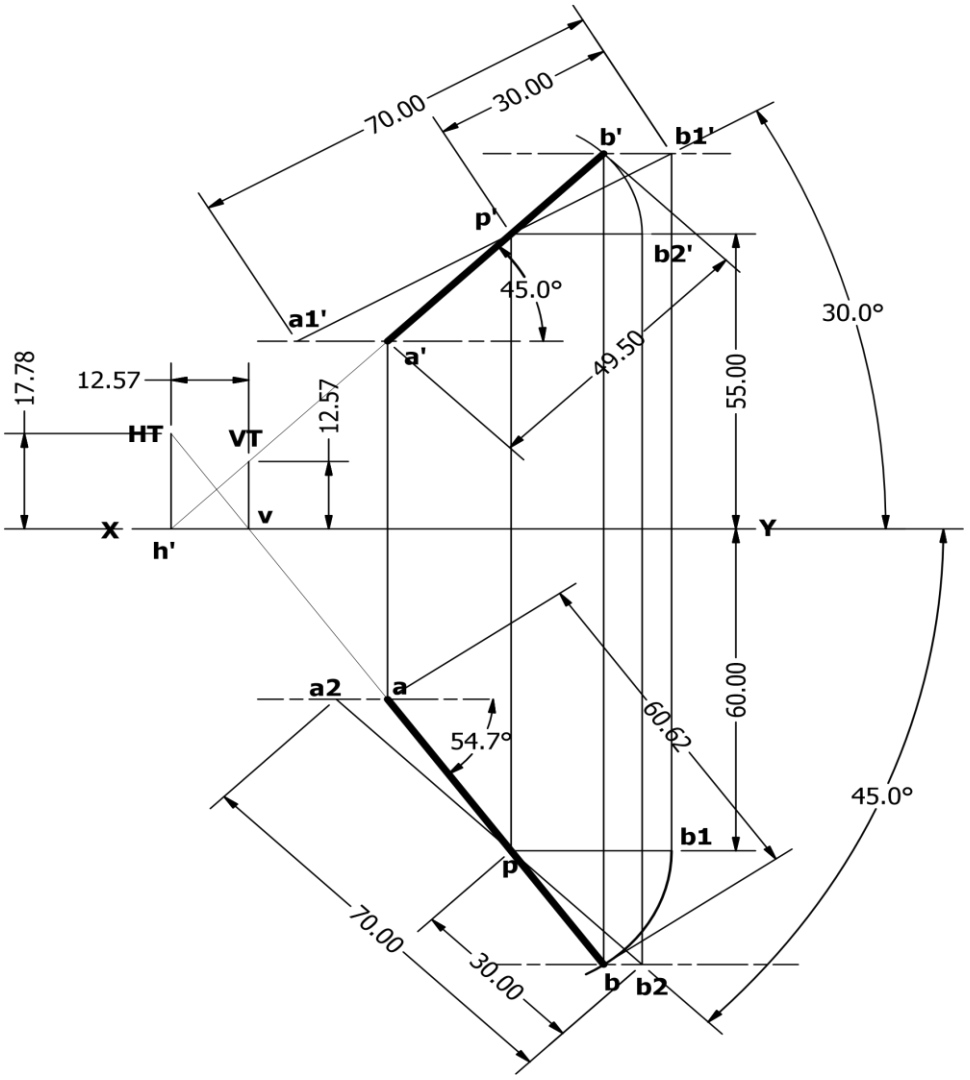


FIGURE 1.12 LINE ROTATION METHOD

Answers:

1. Projections of the line is drawn.(Length of Front view=49.50mm,Length of Top view=60.62mm , Alpha=45^0 , Beta =54.7^0)
2. HT and VT are also plotted (HT is 17.78mm above XY , VT is 12.57mm above XY and Distance between the HT and VT is 12.57mm)

5. One end of a pole 2m long rests against a wall and the other end on top of a horizontal table which is 1m high. The pole makes 40^0 with the table top and 26^0 with the wall. Draw the projections and find the height of the end which rests against the wall from the floor. **(M.Q.2)**

Solution:

While solving this problem take **SCALE 1m=50mm**.

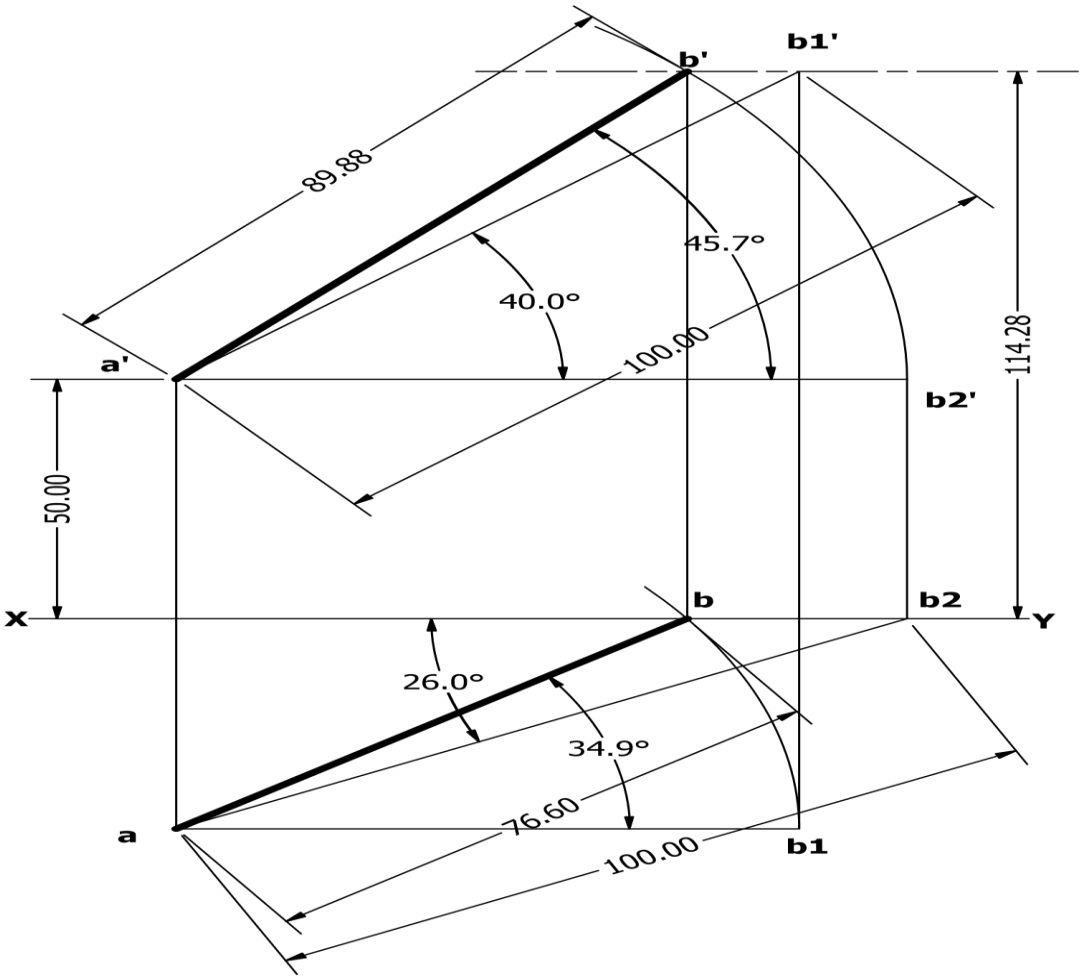


FIGURE 1.13 LINE ROTATION METHOD

Answers:

1. Projections of the line is drawn.(Length of Front view=89.88mm=1.79m,Length of Top view=76.60mm=1.532m , Alpha=45.7^0 , Beta =34.9^0)
2. Height of the end which rests against the wall from the floor = 114.28mm = 2.28m

6. The ends of a line AB are 50mm and 20mm above HP. The length of its elevation is 70mm and its VT is 10mm above HP .The line is inclined at 40^0 to VP. Find its true length and true inclination with HP. Also locate its traces. **(JAN 2016)**

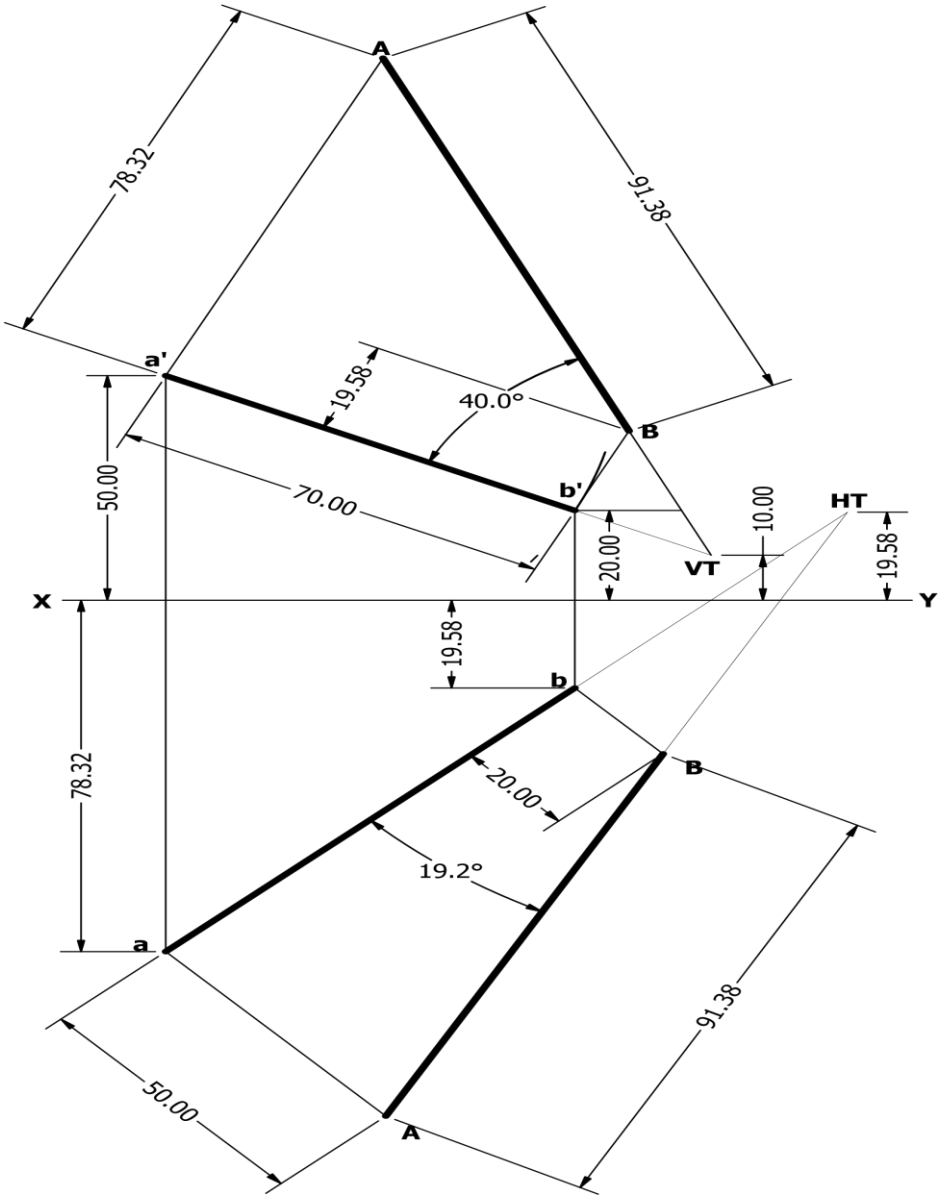


FIGURE 1.14 PLANE ROTATION METHOD

Answers:

1. True length = 91.38mm
2. True inclination with HP=19.2^0
3. HT is located (19.58mm above XY line)

7. The midpoint of a line AB measuring 80mm is 50mm above HP and 30mm in front of VP. The line is inclined at 45^0 to HP and 30^0 to VP. Draw the projections and find the length of plan and elevation. **(JAN 2016)**

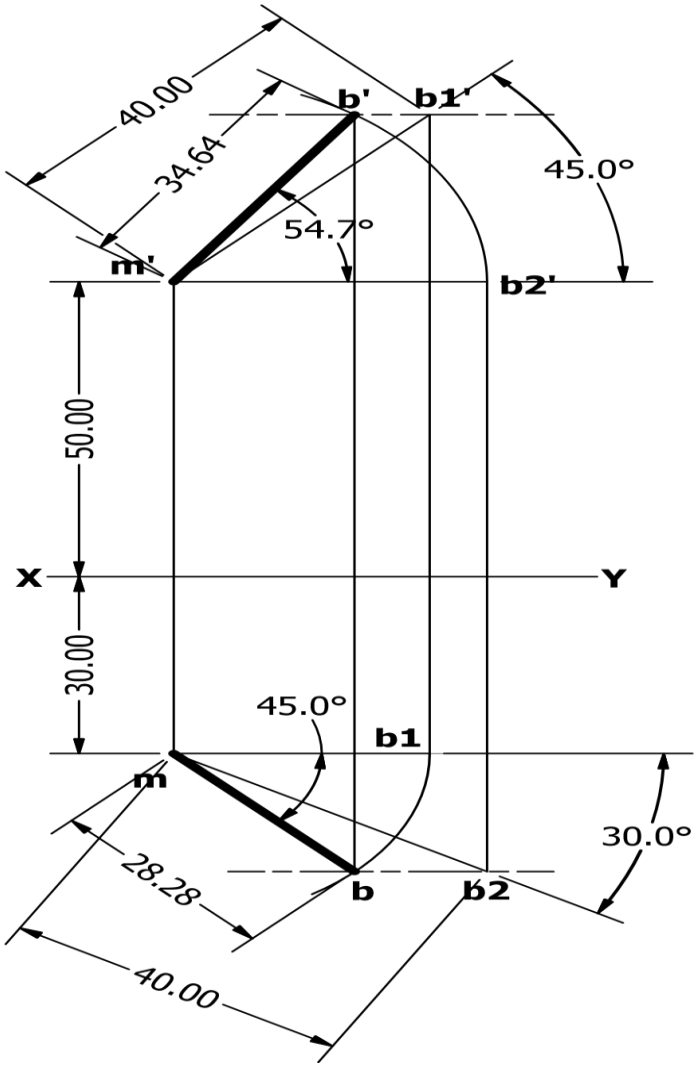


FIGURE 1.15 LINE ROTATION METHOD

Answers:

1. Projections of the line is drawn.(Length of Front view=69.28mm,Length of Top view=56.56mm , Alpha=54.7^0 , Beta =45^0)
2. Length of plan=28.28*2 = 56.56mm
3. Length of elevation=34.64*2 = 69.28mm

8. An 80mm long line PQ has its end P on the HP and 15mm in front of the VP. The line is inclined at 30^0 to the HP and its top view is inclined at 60^0 to the reference line. Draw the projections of line PQ and determine true angle of inclination with the VP. **(MAY/JUNE 2016)**

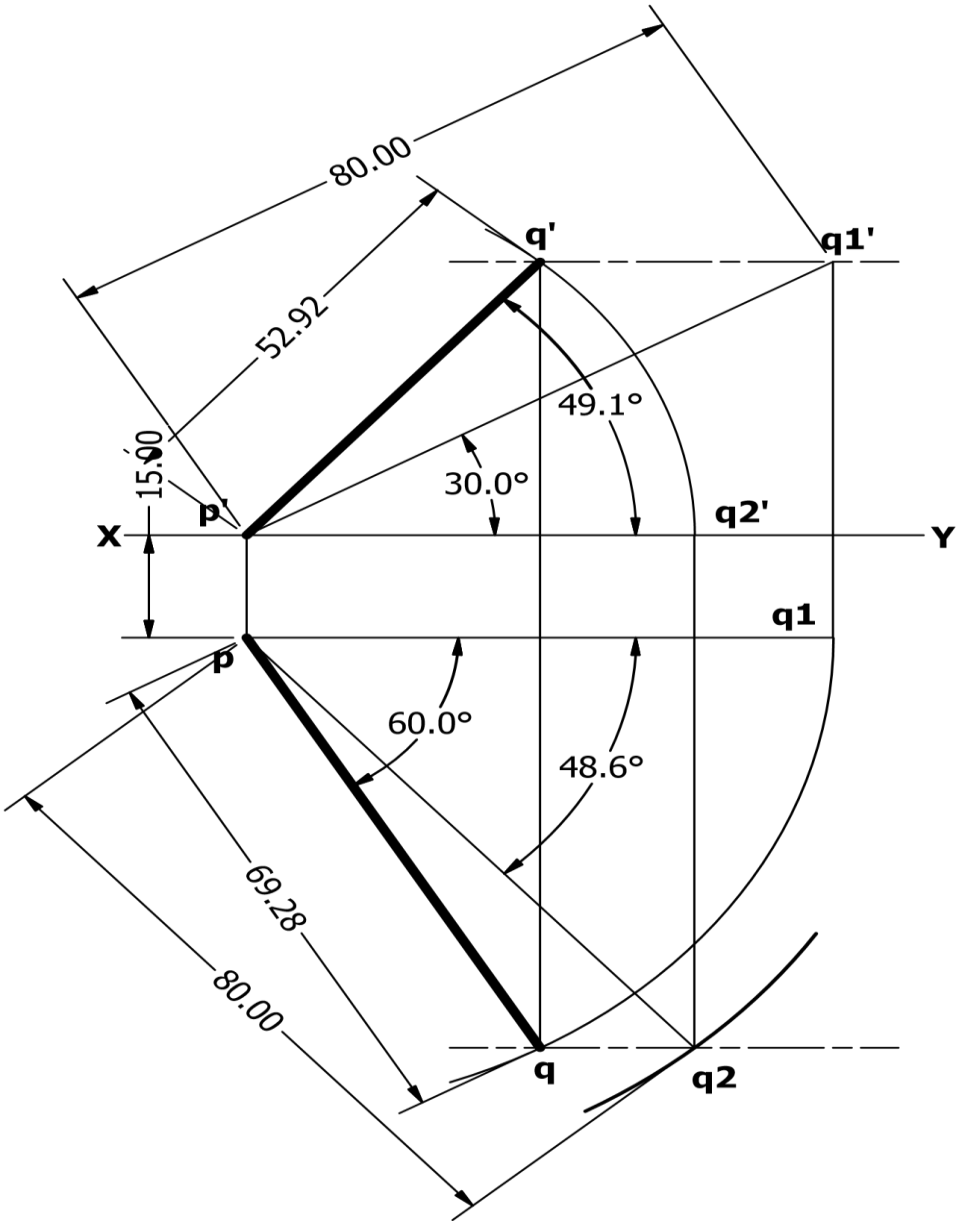


FIGURE 1.16 LINE ROTATION METHOD

Answers:

1. Projections of the line is drawn.(Length of Front view=52.92mm,Length of Top view=69.28mm , Alpha=49.1^0 , Beta =60^0)
2. True angle of inclination with the VP=48.6^0

9. Find graphically the length of the largest rod that can be kept inside a hollow cuboid (rectangular prism) of 60mm*40mm*30mm. **(MAY/JUNE 2016)**

Solution:

In this problem, we can solve it by using **Line rotation method or Plane rotation method.**

There are 8 ways to solve this problem.

a. Largest rod-Diagonal CP –Plane rotation method
b. Largest rod-Diagonal CP –Line rotation method
c. Largest rod-Diagonal DQ –Plane rotation method
d. Largest rod-Diagonal DQ –Line rotation method
e. Largest rod-Diagonal AR –Plane rotation method
f.

a. Largest rod - Diagonal CP –Plane rotation method

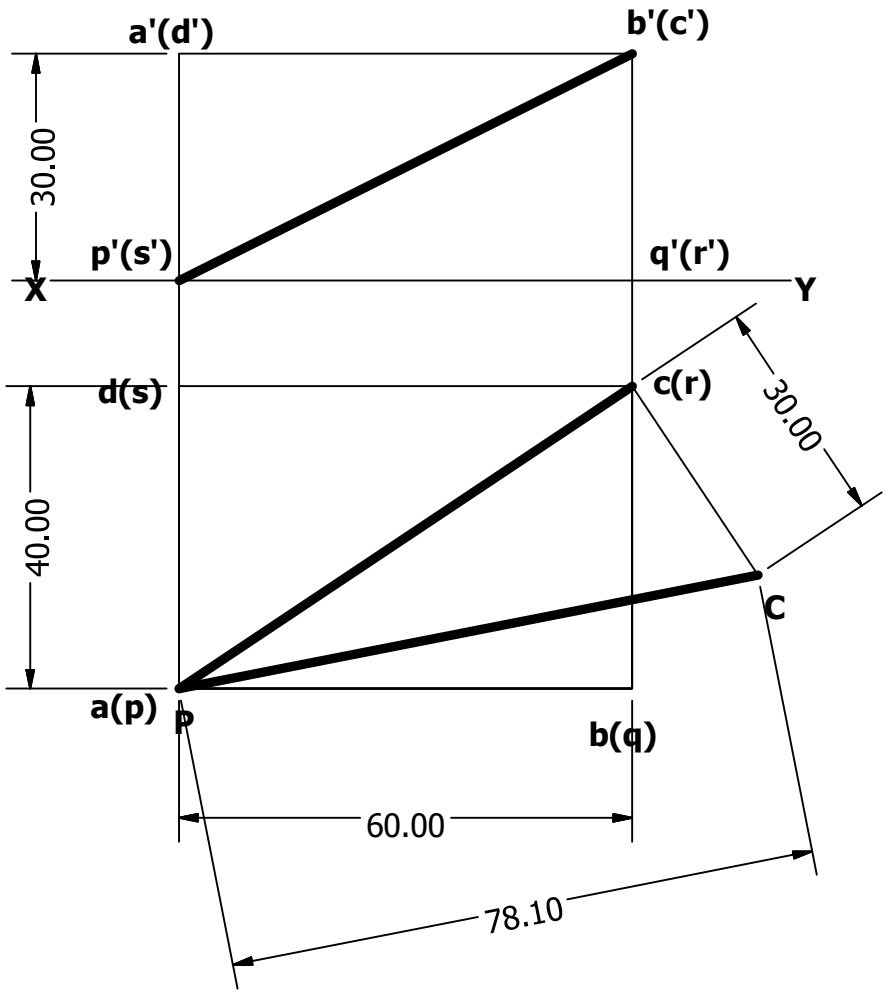


FIGURE 1.17 PLANE ROTATION METHOD

Answers:

1. Length of the largest rod that can be kept inside a hollow cuboid = 78.10mm

b. Largest rod - Diagonal CP –Line rotation method

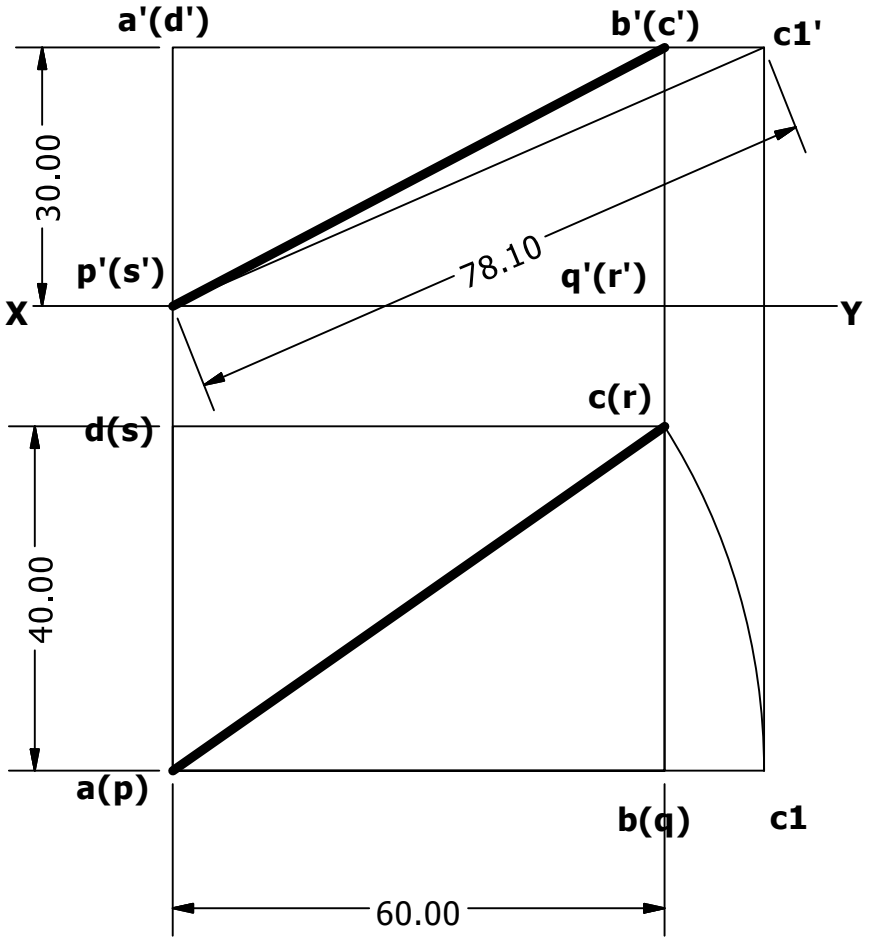


FIGURE 1.18 LINE ROTATION METHOD

Answers:

1. Length of the largest rod that can be kept inside a hollow cuboid = 78.10mm

c. Largest rod - Diagonal DQ –Plane rotation method

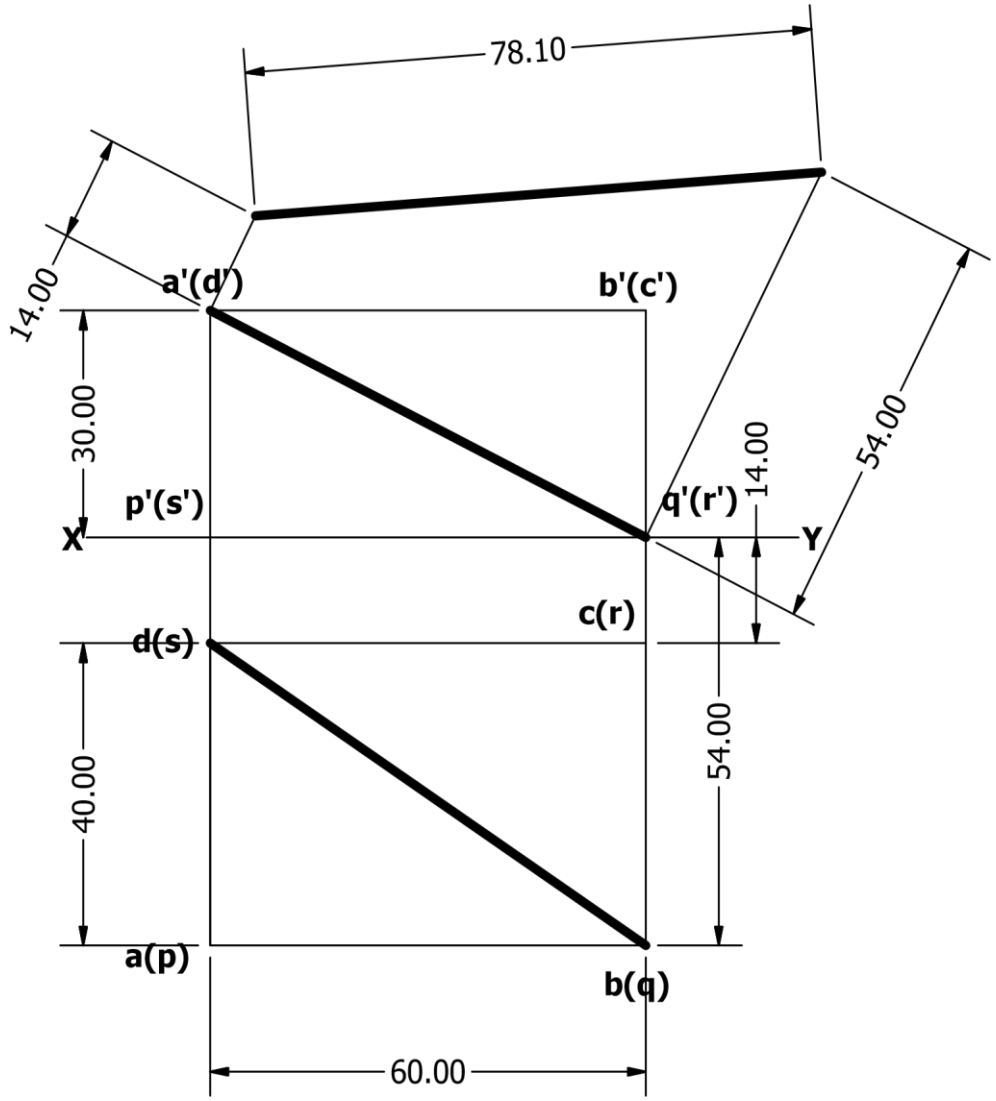
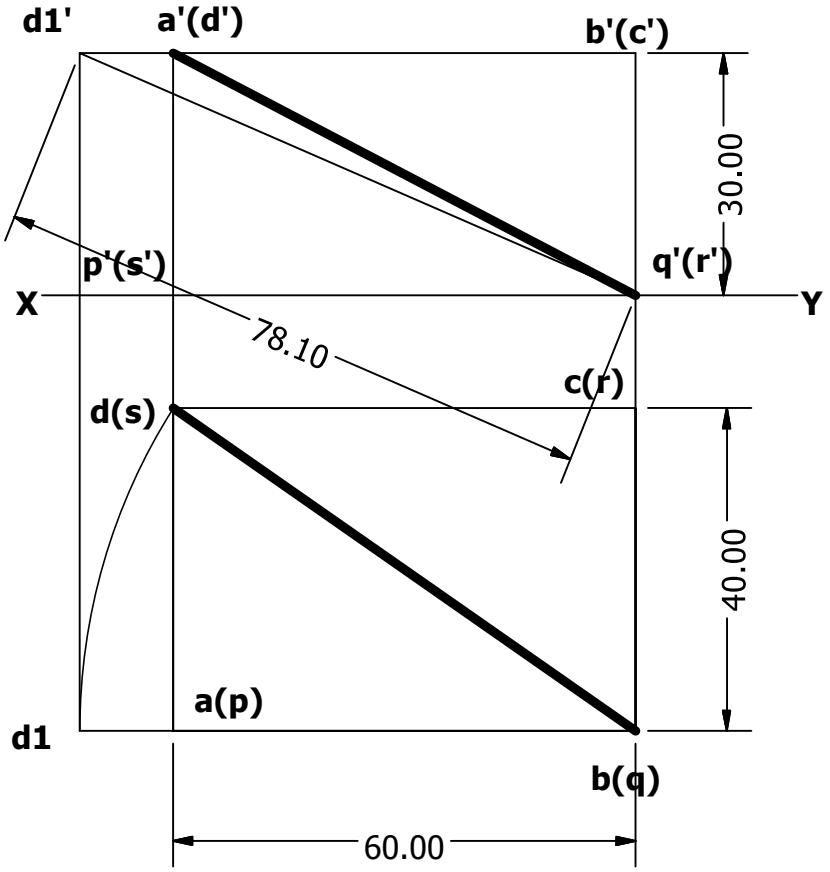


FIGURE 1.19 PLANE ROTATION METHOD

c) **Largest rod - Diagonal DQ –Line rotation method**



d.

FIGURE 1.20 LINE ROTATION METHOD

Answers:

1. Length of the largest rod that can be kept inside a hollow cuboid = 78.10mm

e.

a. Largest rod - Diagonal AR –Plane rotation method

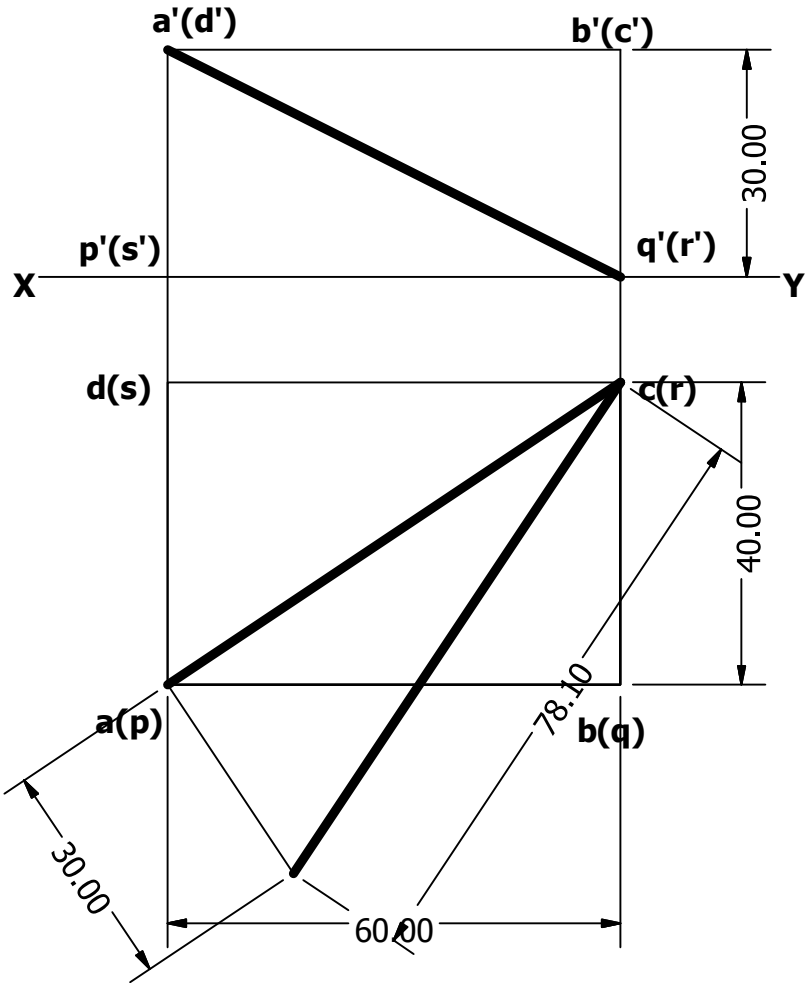


FIGURE 1.21 PLANE ROTATION METHOD

Answers:

1. Length of the largest rod that can be kept inside a hollow cuboid = 78.10mm

a. **Largest rod - Diagonal AR –Line rotation method**

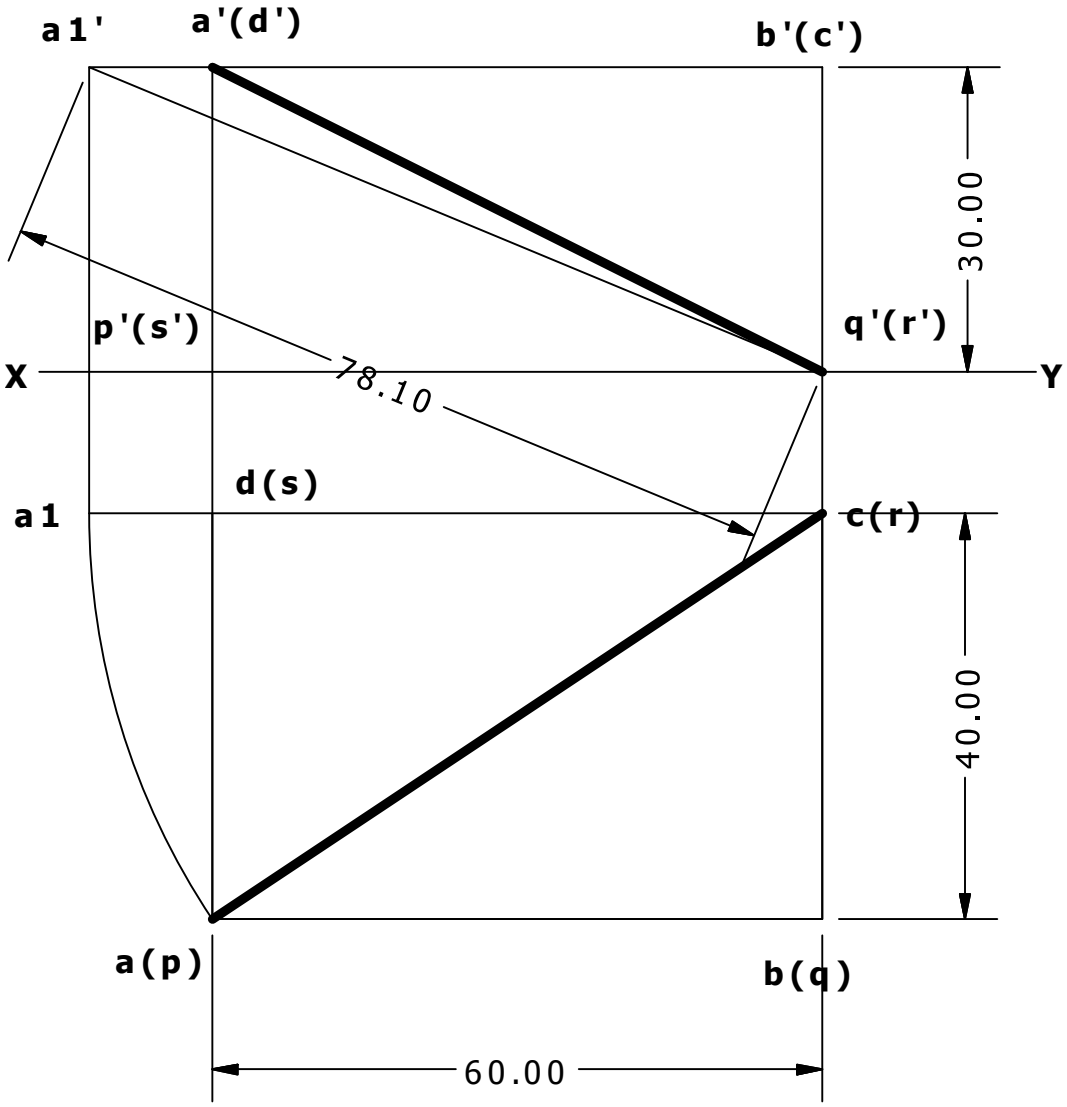


FIGURE 1.22 LINE ROTATION METHOD

Answers:

1. Length of the largest rod that can be kept inside a hollow cuboid = 78.10mm

a. Largest rod - Diagonal SB –Plane rotation method

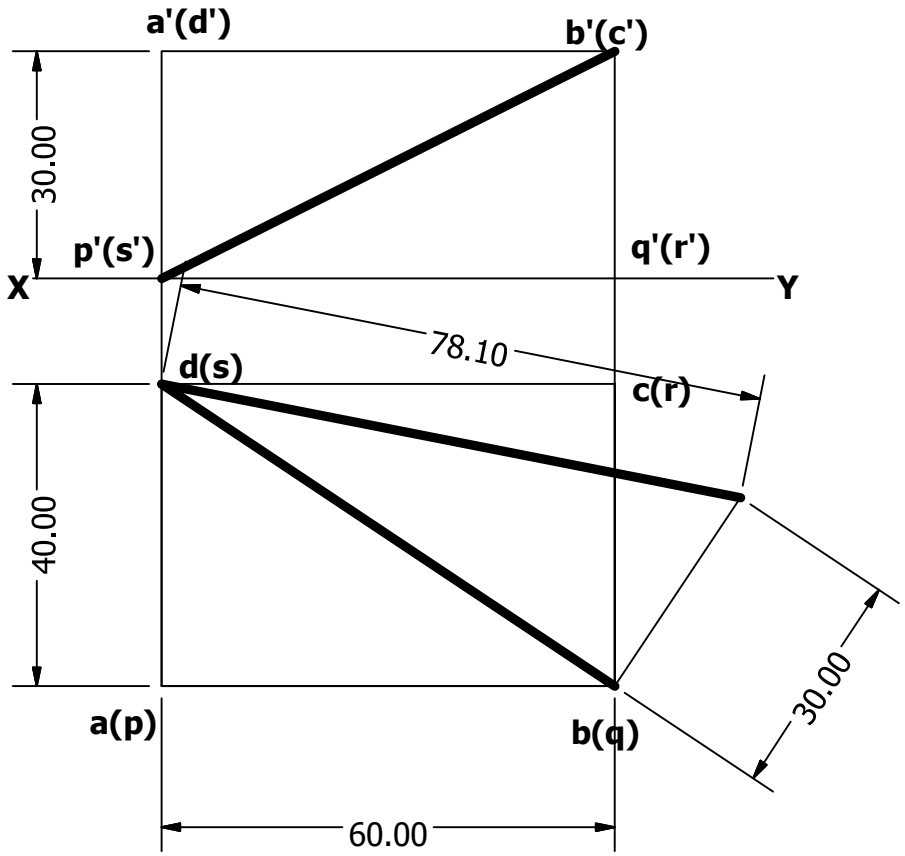


FIGURE 1.23 PLANE ROTATION METHOD

Answers:

1. Length of the largest rod that can be kept inside a hollow cuboid = 78.10mm

a. Largest rod - Diagonal SB - Line rotation method

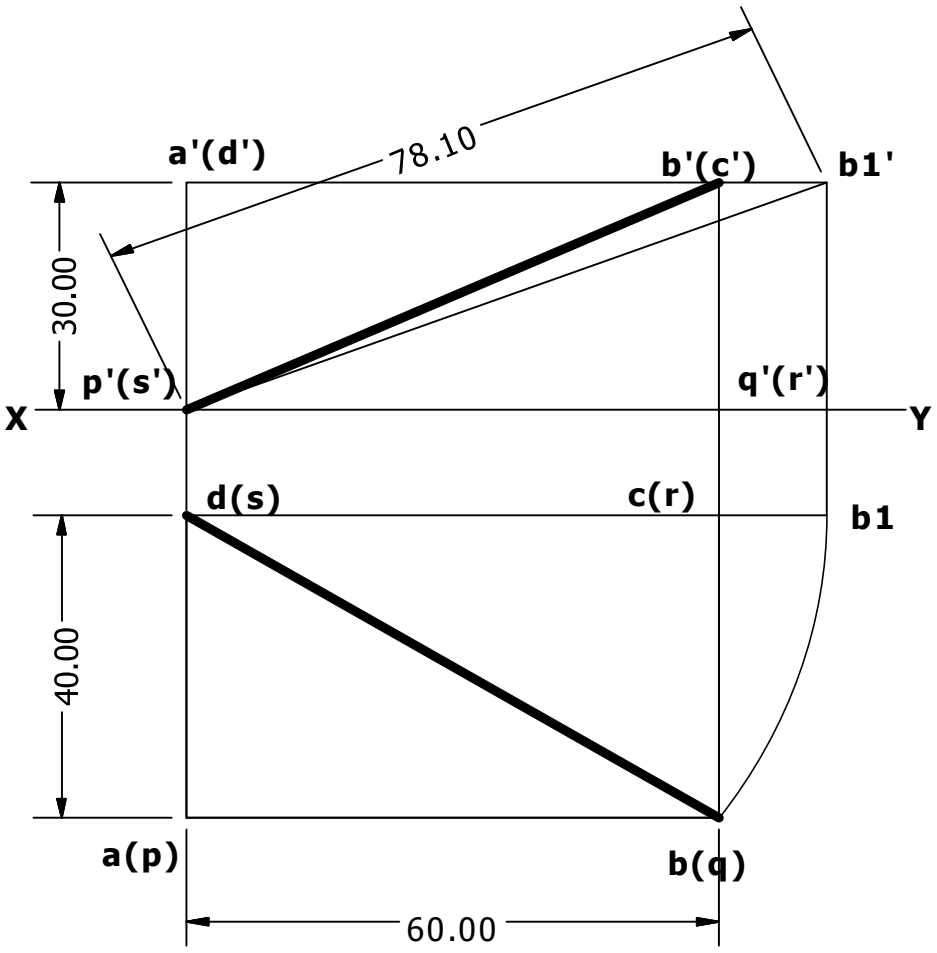


FIGURE 1.24 PLANE ROTATION METHOD

Answers:

1. Length of the largest rod that can be kept inside a hollow cuboid = 78.10mm

10. Three wires AB,CD & EF are tied at points A,C,E on a 14m long vertical pole at heights 12m,10m and 8m respectively from the ground. The lower ends of the wires are tied to hooks at points B,D and F on the ground level, all of which lie at the corners of an equilateral triangle of 7.5m side. If the pole is situated at the center of the triangle, determine the length of each rope and its inclination with the ground. **(JULY 2016)**

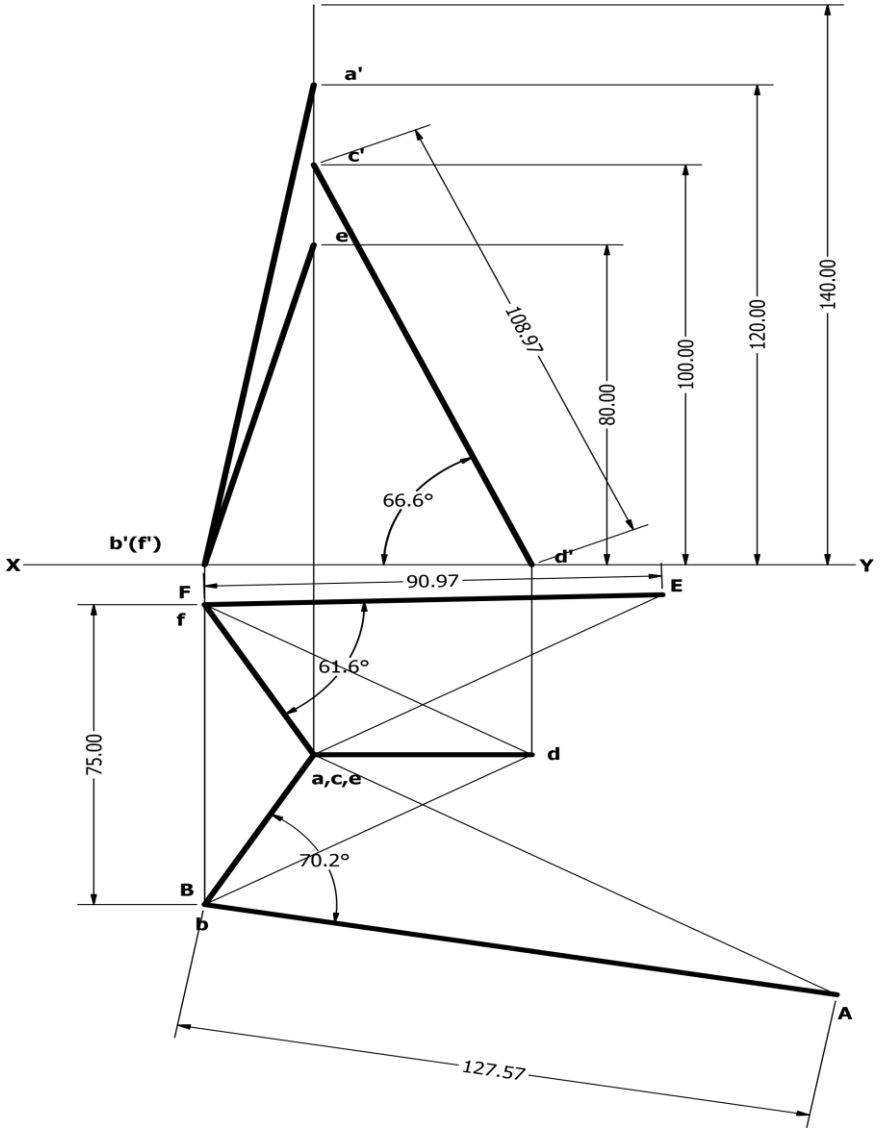


FIGURE 1.25 PLANE ROTATION METHOD

Answers:

1. Length of the rope AB=12.7m and its inclination with ground=70.2^0
2. Length of the rope CD=10.8m and its inclination with ground=66.6^0
3. Length of the rope EF=9m and its inclination with ground=61.6^0

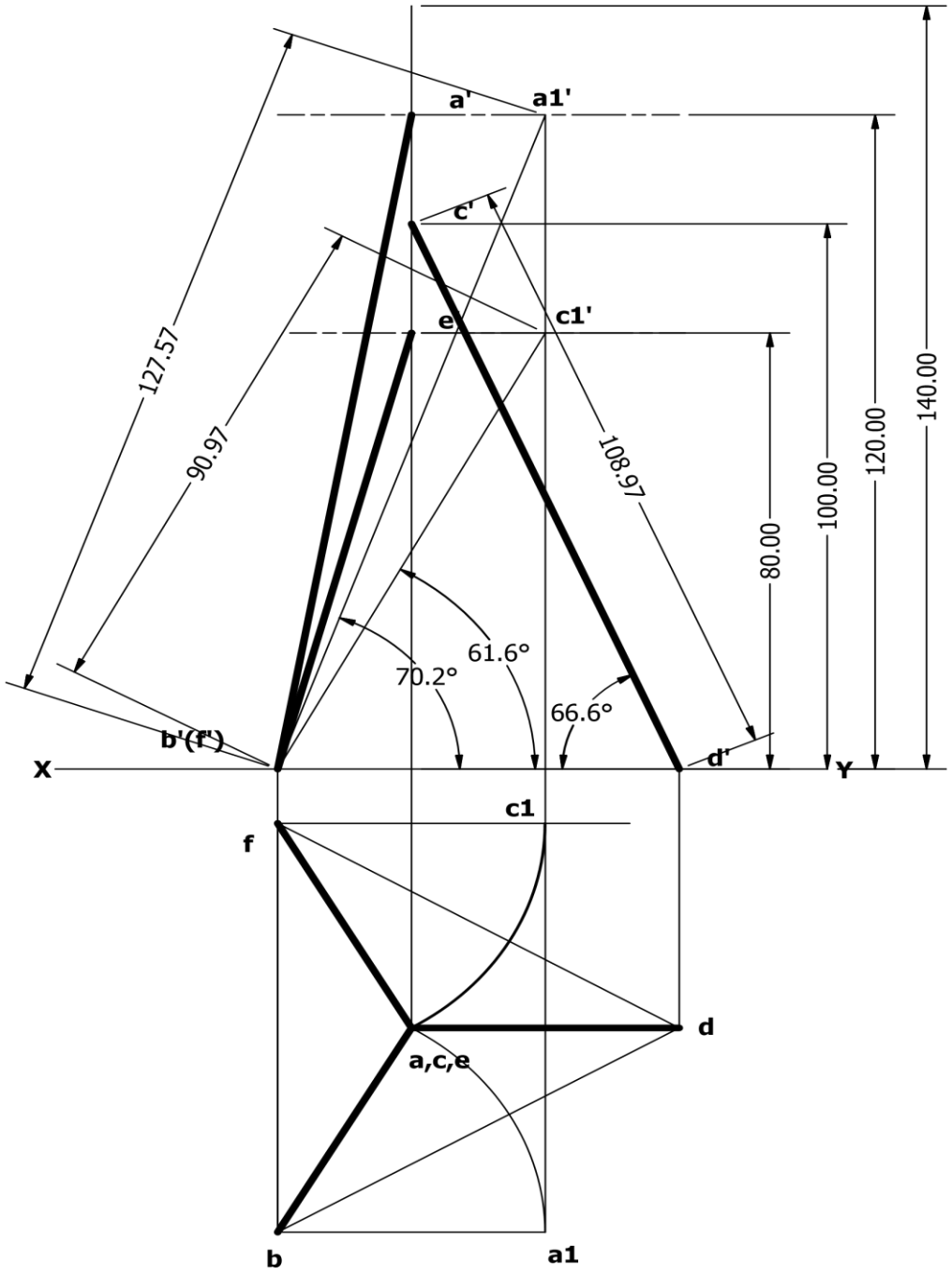


FIGURE 1.26 LINE ROTATION METHOD

Answers:

1. Length of the rope AB=12.7m and its inclination with ground=70.2^0
2. Length of the rope CD=10.8m and its inclination with ground=66.6^0
3. Length of the rope EF=9m and its inclination with ground=61.6^0

11. The front and top views of a straight line PQ measures 50mm and 65mm respectively. The point P is on HP and 20mm in front of VP. The front view of the line is inclined at 45^0 to the reference line. Determine the true length of PQ and its true inclinations with the reference planes. Also locate the traces. **(JULY 2016)**

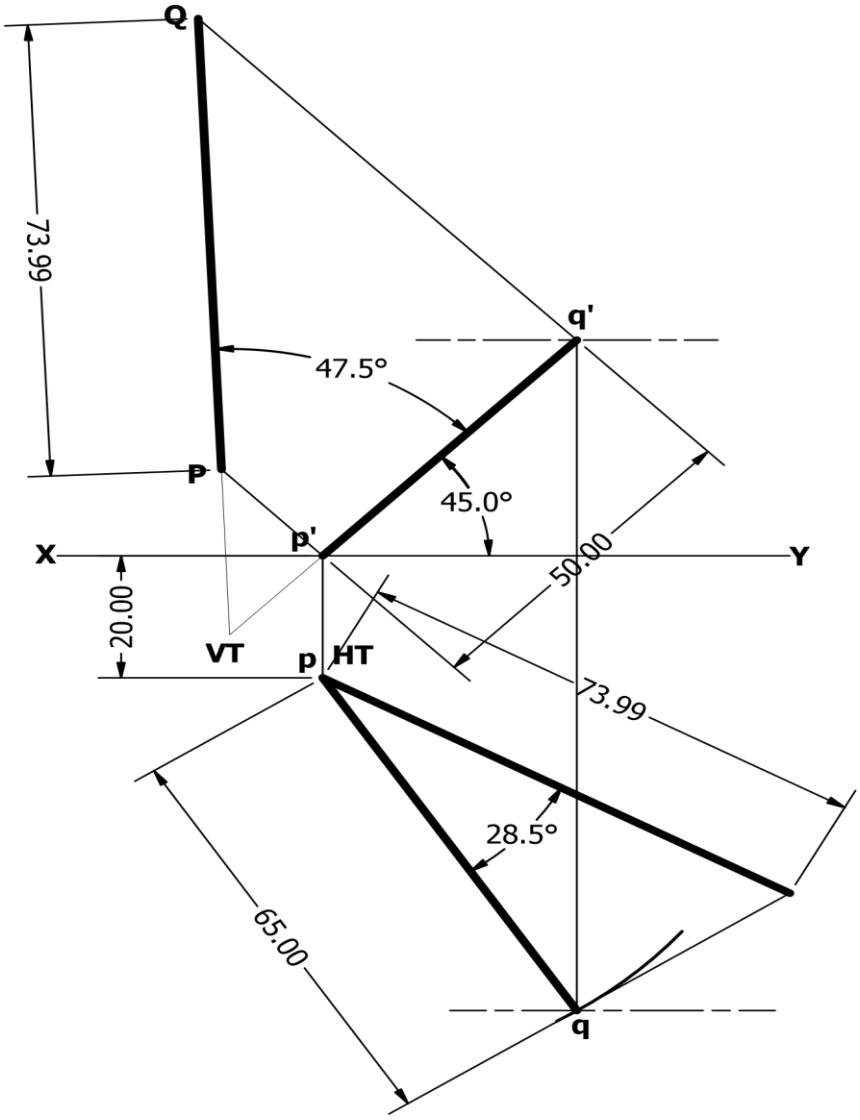


FIGURE 1.27 PLANE ROTATION METHOD

Answers:

1. True length of PQ=73.99mm
2. True inclinations with reference planes =28.5^0 &47.5^0
3. Traces also located.

12. The front view and top view of an 80mm long line PQ measures 70mm and 60mm respectively. The end P is on HP and end Q is in VP. Draw the projection of line PQ and determine the inclination with HP and VP. Also locate its traces. **(SEPT 2016)**

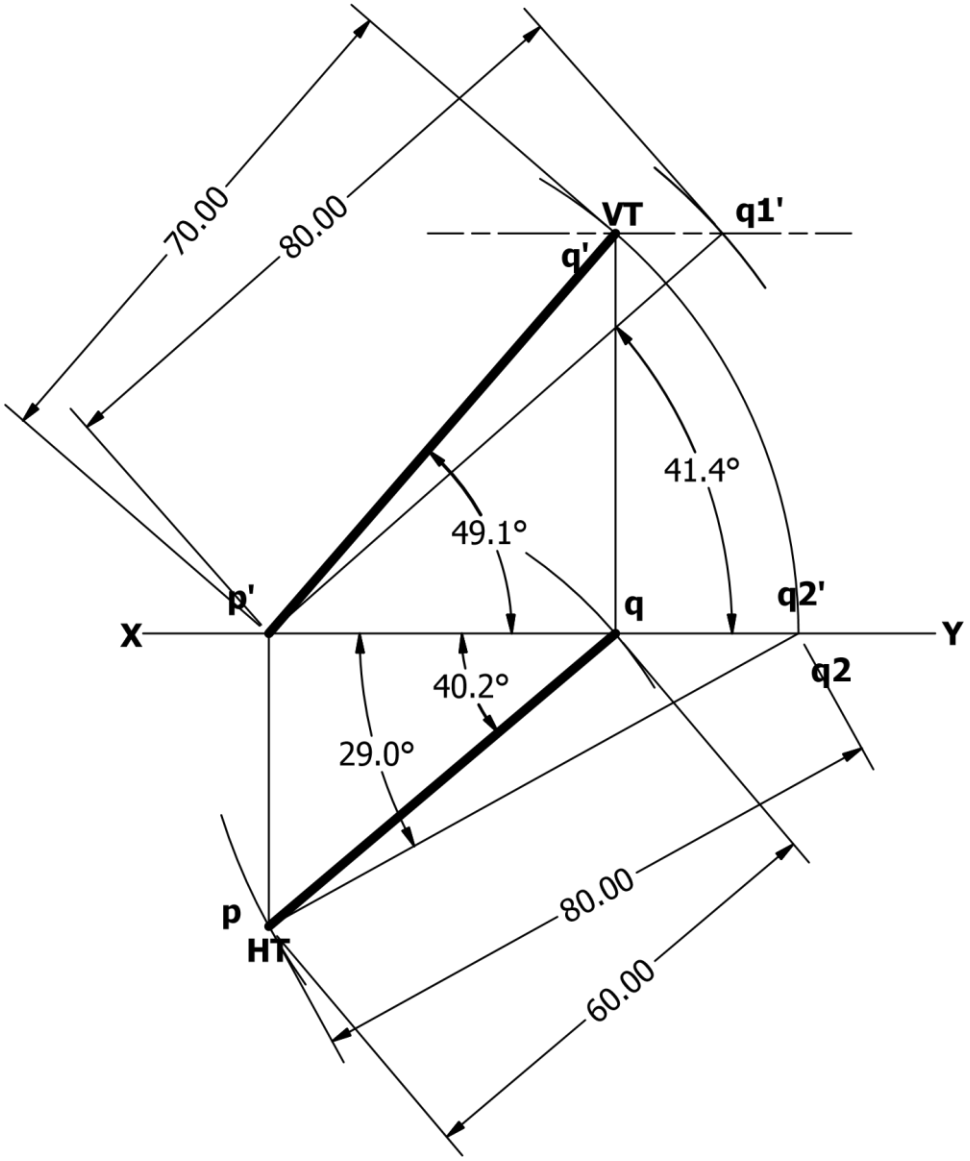


FIGURE 1.28 LINE ROTATION METHOD

Answers:

1. Projections of the line is drawn.(Length of Front view=70mm,Length of Top view=60mm , Alpha=49.1^0 , Beta =40.2^0)
2. True angle of inclination with the VP=29^0
3. True angle of inclination with the HP=41.4^0
4. HT and VT also plotted

13. A room is 4.8m*4.2m*3.6m high. Determine graphically the distance between the top corner and bottom corner diagonally opposite to it. **(SEPT 2016)**

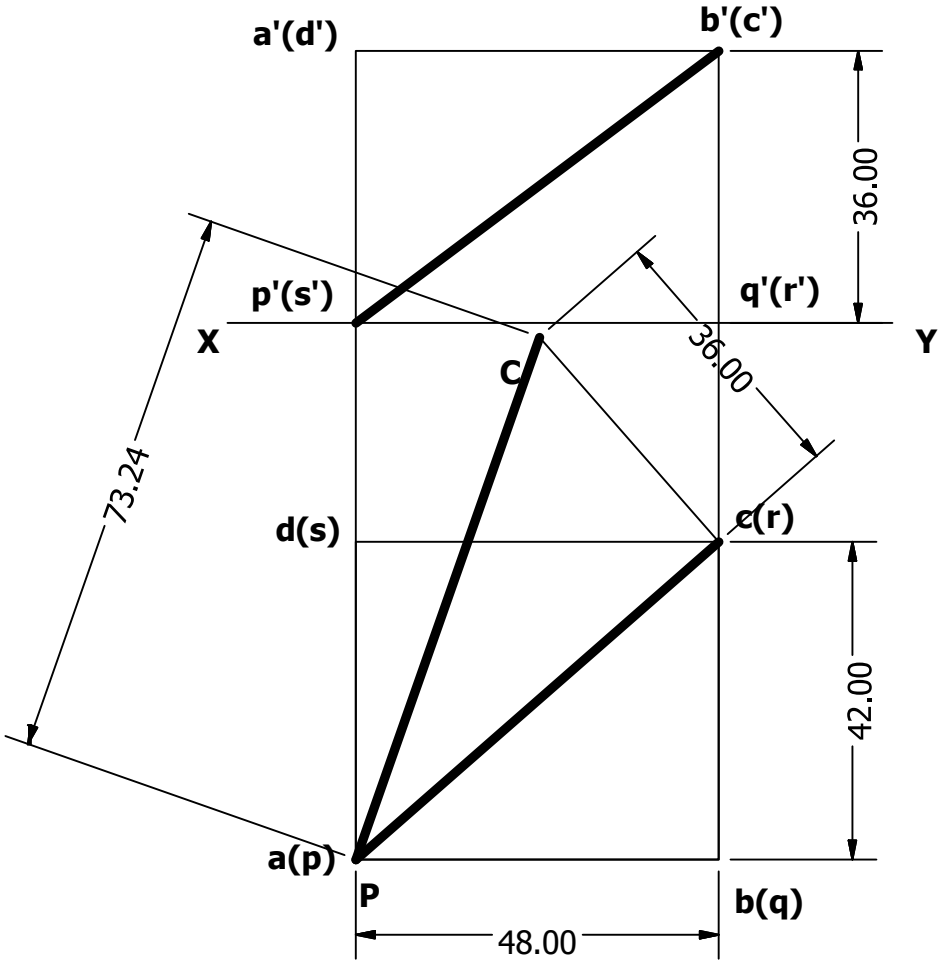


FIGURE 1.29 PLANE ROTATION METHOD

Answers: (Consider diagonal CP)

1. Distance between the top corner and bottom corner diagonally opposite to it = 7.3m

14. A line AB inclined at 45^0 to VP has its ends 20mm and 50mm above HP. The length of its front view is 70mm and its VT is 10mm above HP. Find its true length, true inclination with HP and locate its traces. **(JAN 2017)**

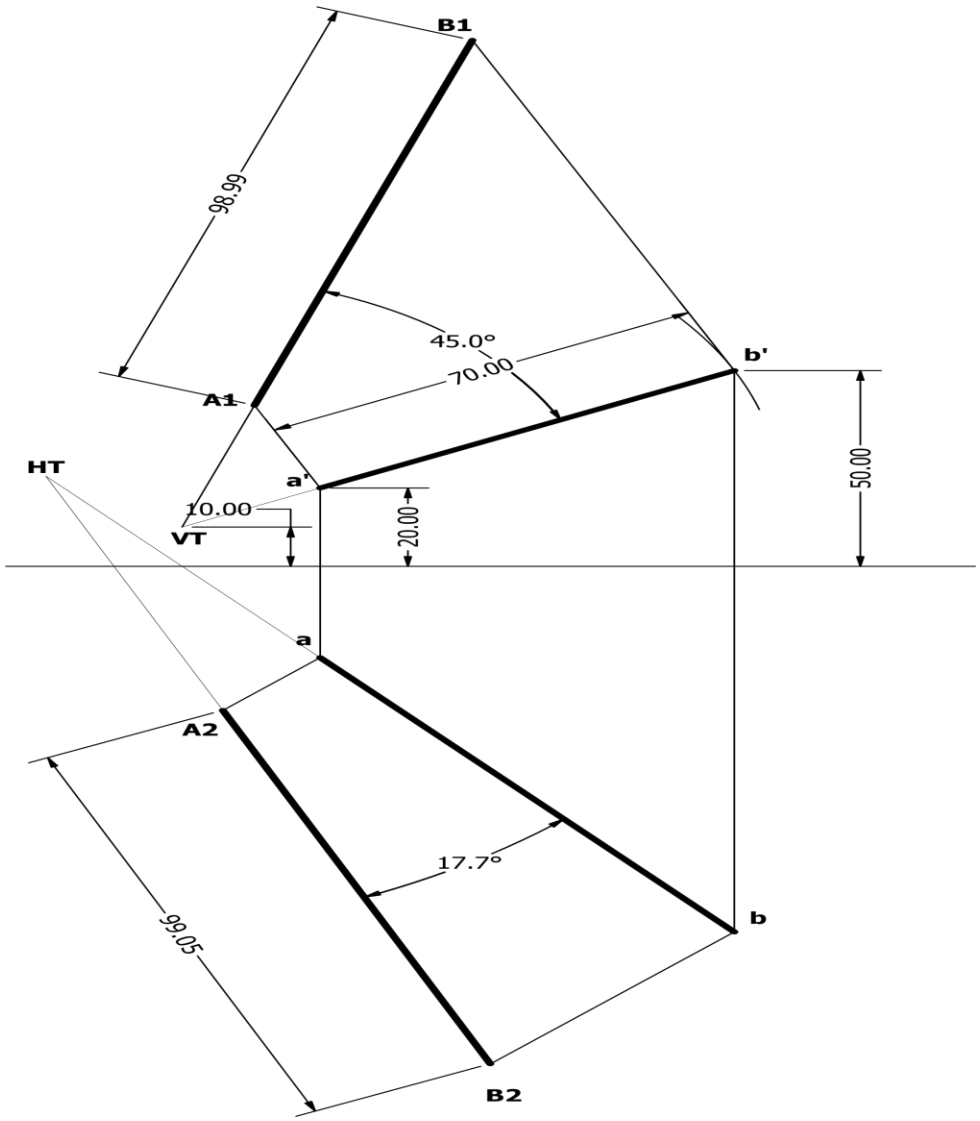


FIGURE 1.30 PLANE ROTATION METHOD

Answers:

1. True length = 99mm
2. True angle of inclination with the HP=17.7^0
3. HT and VT also plotted

15. An electric lamp is hung vertically from the center of the flat roof of a room (5m*5m and height 6m), at a height of 4m above the floor. Find graphically the distance between the lamp and any one of the floor corner. **(JAN 2017)**

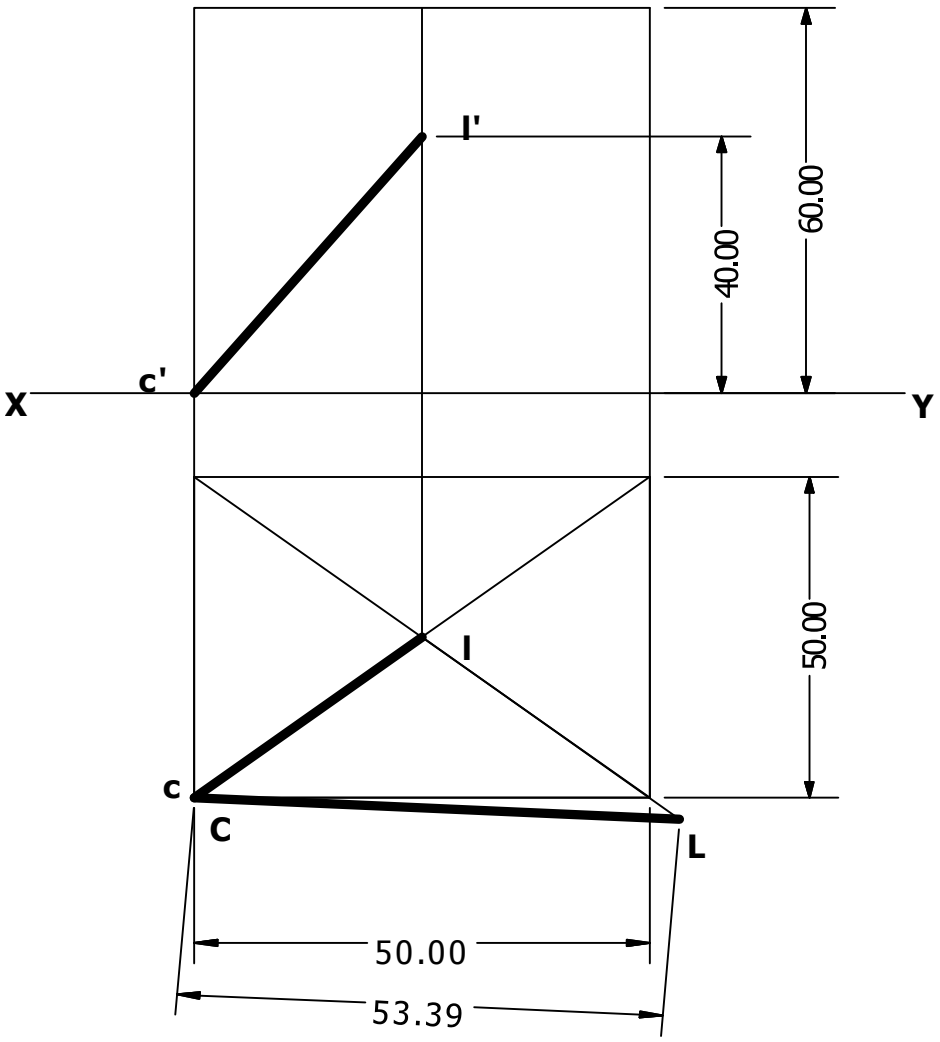


FIGURE 1.31 PLANE ROTATION METHOD

Answers: (Consider corner C and Lamp L)

1. Distance between the lamp and any one of the floor corner= 5.339m

16. A line AB 100mm long and end A 30mm from HP, 50mm from VP, 30 degree inclined to HP and 45 degree inclined to VP. Draw the projections of the line and locate its traces. Assume the line is in first quadrant. **(MAY 2017)**

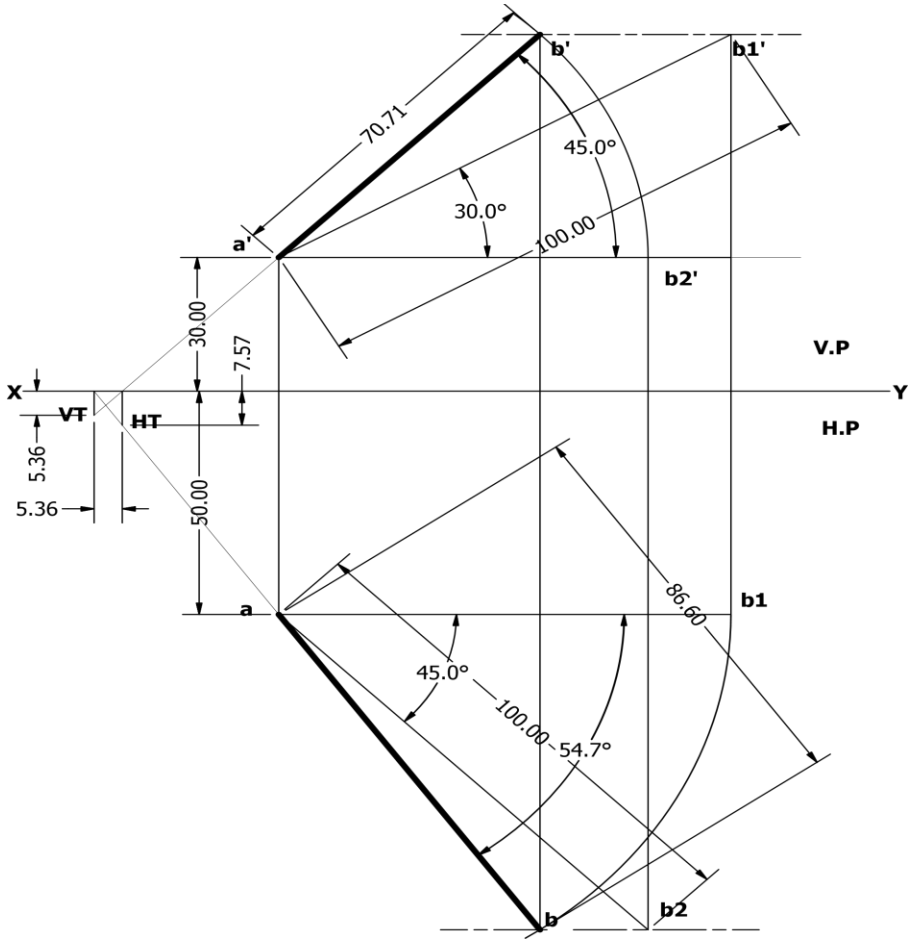


FIGURE 1.32 LINE ROTATION METHOD

Answers:

1. Projections of the line is drawn.(Length of Front view=70.71mm,Length of Top view=86.60mm , Alpha=45^0 , Beta =54.7^0)
2. HT is 7.57mm below XY line. VT is 5.36mm below XY line. Distance between HT & VT is 5.36mm.

MODULE II

PROJECTIONS OF SOLIDS

1. A square pyramid of base 30mm and height 60mm rests with one of its base edges on HP. The axis of the pyramid makes an angle of 45^0 with HP. Draw its projections. **(DEC 2015)**

i. Object tilt to right side

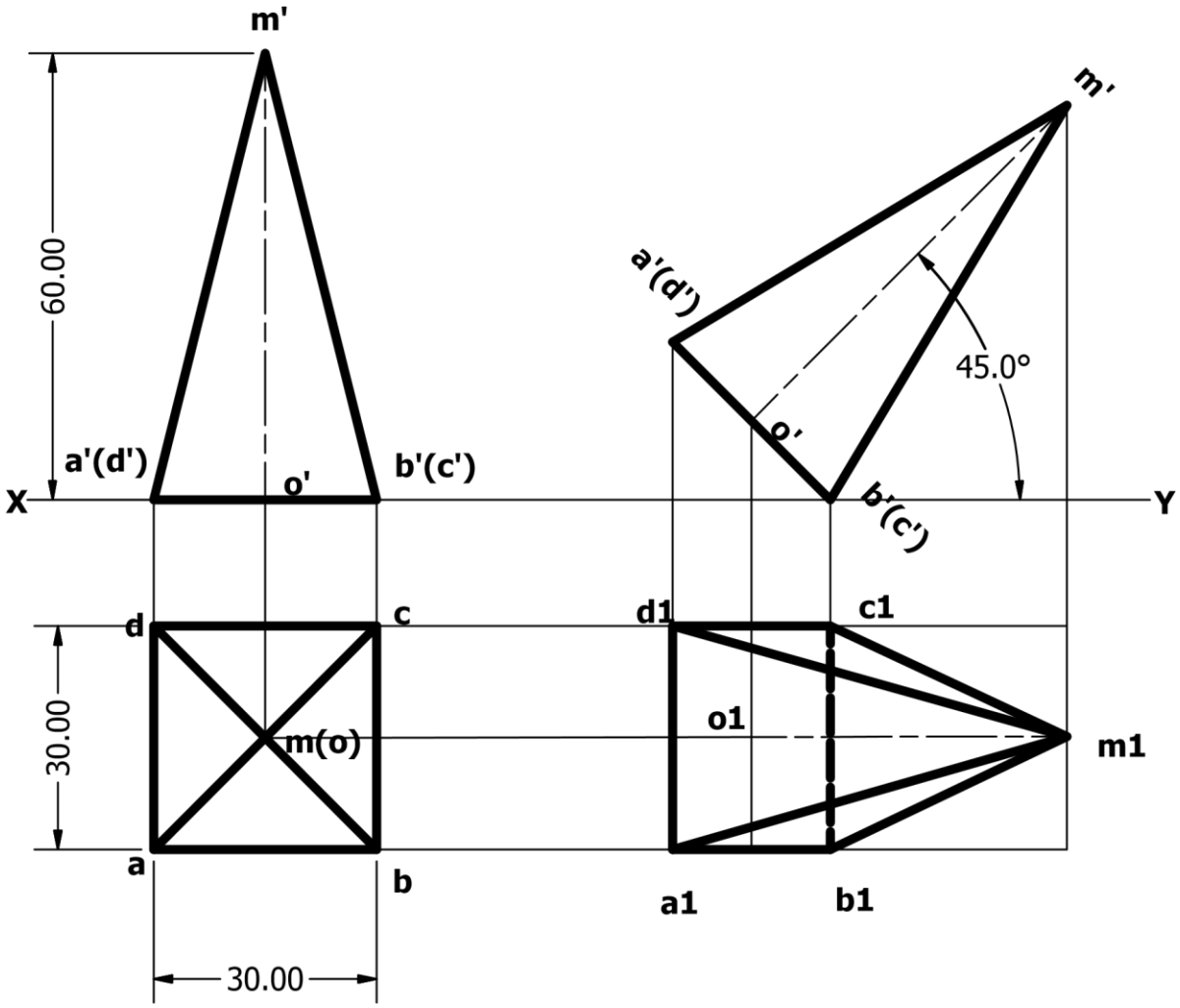


FIGURE 2.1 PROJECTIONS OF SQUARE PYRAMID (TILT TO RIGHT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid rests on HP on its base edge BC and axis MO inclined at 45^0 to HP

ii. Object tilt to left side

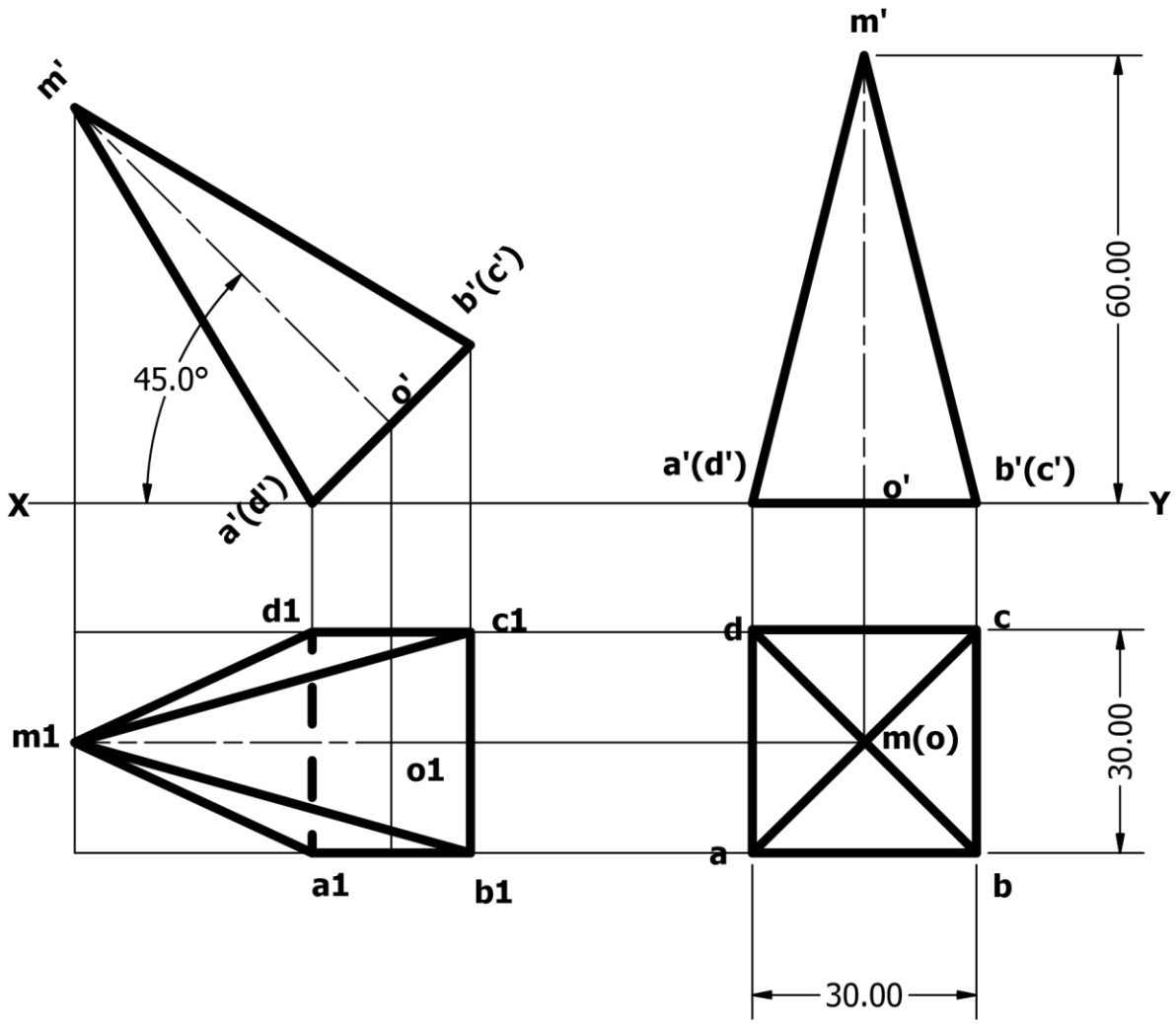


FIGURE 2.2 PROJECTIONS OF SQUARE PYRAMID (TILT TO LEFT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid rests on HP on its base edge AD and axis MO inclined at 45^0 to HP

2. A pentagonal pyramid of base 30mm and height 60mm rests with one of its base edges on HP. The axis of the pyramid makes an angle of 45^0 with HP. Draw its projections. **(M.Q.1)**

i. Object tilt to right side

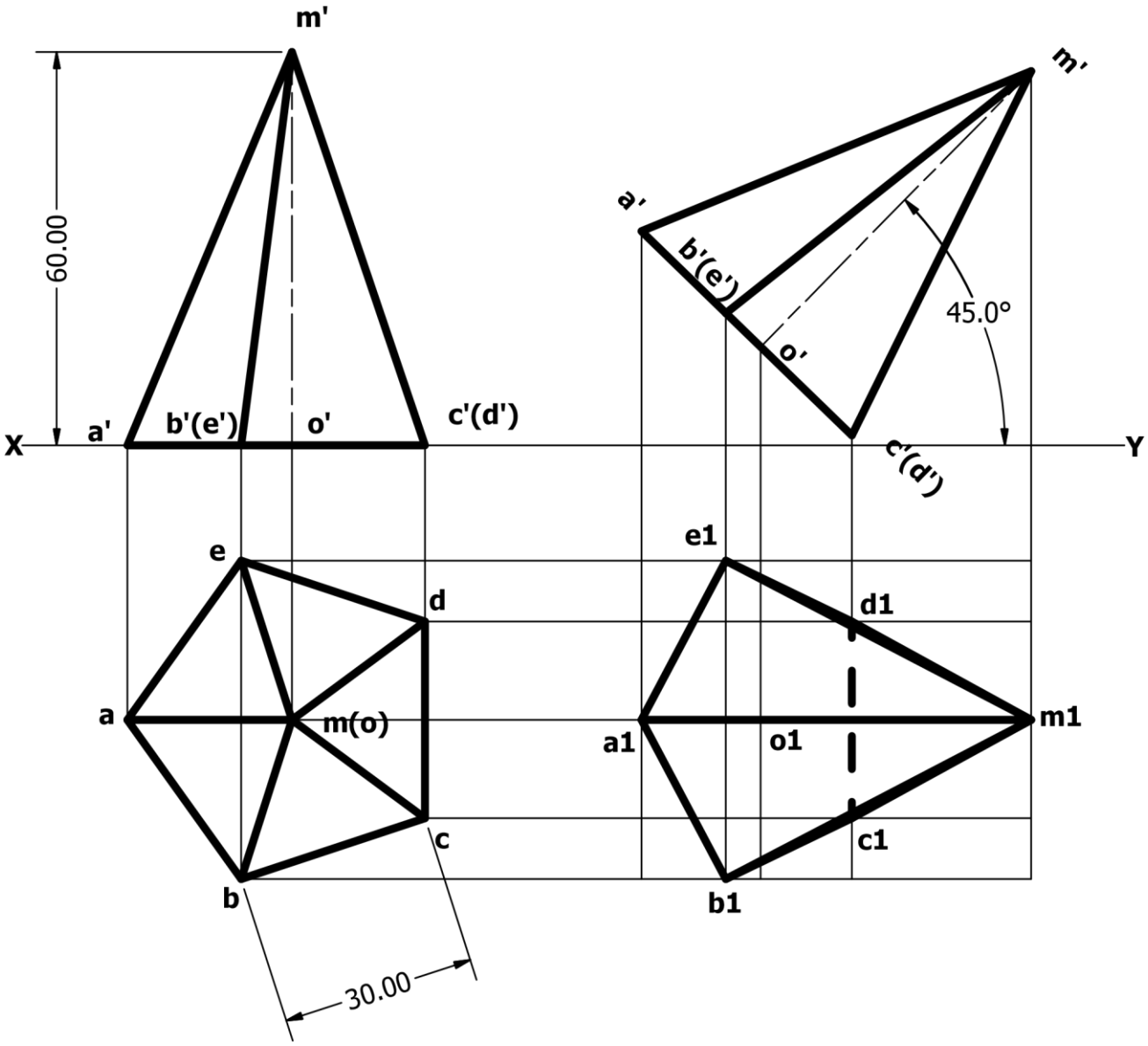


FIGURE 2.3 PROJECTIONS OF PENTAGONAL PYRAMID (TILT TO RIGHT SIDE)

Answers:

1. Projections of pentagonal pyramid is drawn.
2. Here the pyramid rests on HP on its base edge CD and axis MO inclined at 45^0 to HP

ii. Object tilt to left side

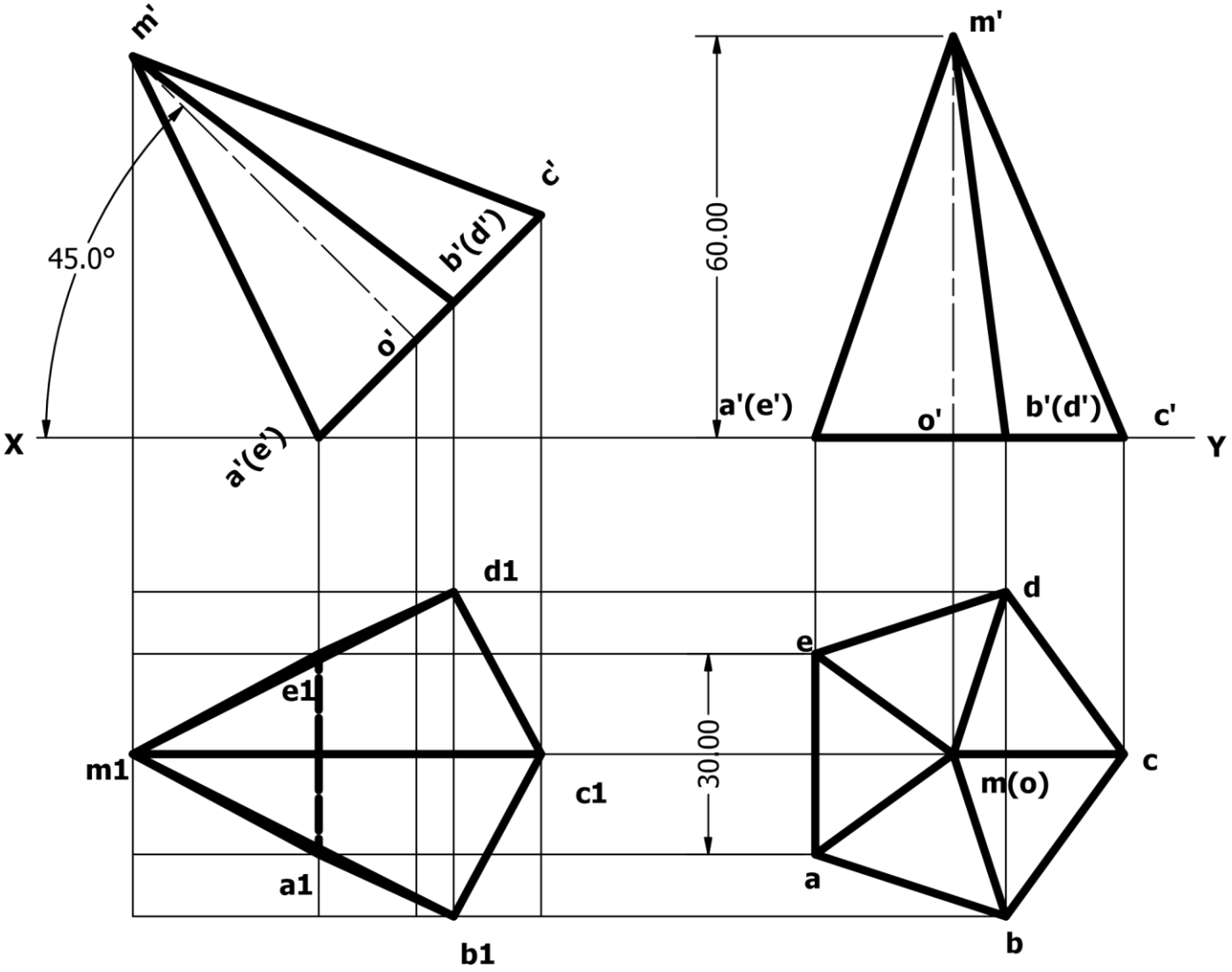


FIGURE 2.4 PROJECTIONS OF PENTAGONAL PYRAMID (TILT TO LEFT SIDE)

Answers:

1. Projections of pentagonal pyramid is drawn.
2. Here the pyramid rests on HP on its base edge AE and axis MO inclined at 45^0 to HP

3. A square pyramid of base 30mm and height 60mm rests with one of its base edges on HP. The axis of the pyramid makes an angle of 50^0 with HP. Draw its projections. **(M.Q.2)**

i. Object tilt to right side

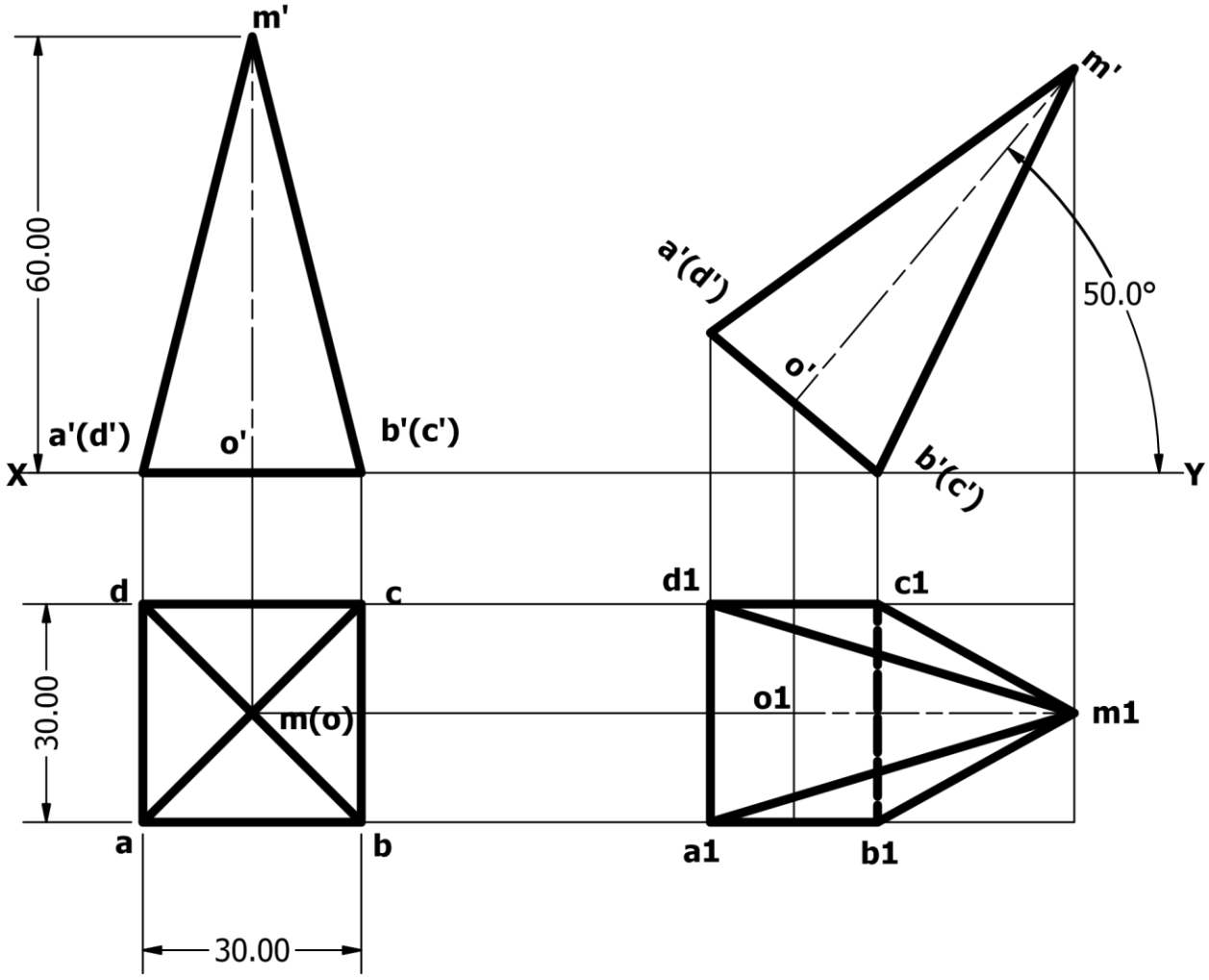


FIGURE 2.5 PROJECTIONS OF SQUARE PYRAMID (TILT TO RIGHT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid rests on HP on its base edge BC and axis MO inclined at 50^0 to HP

ii. Object tilt to left side

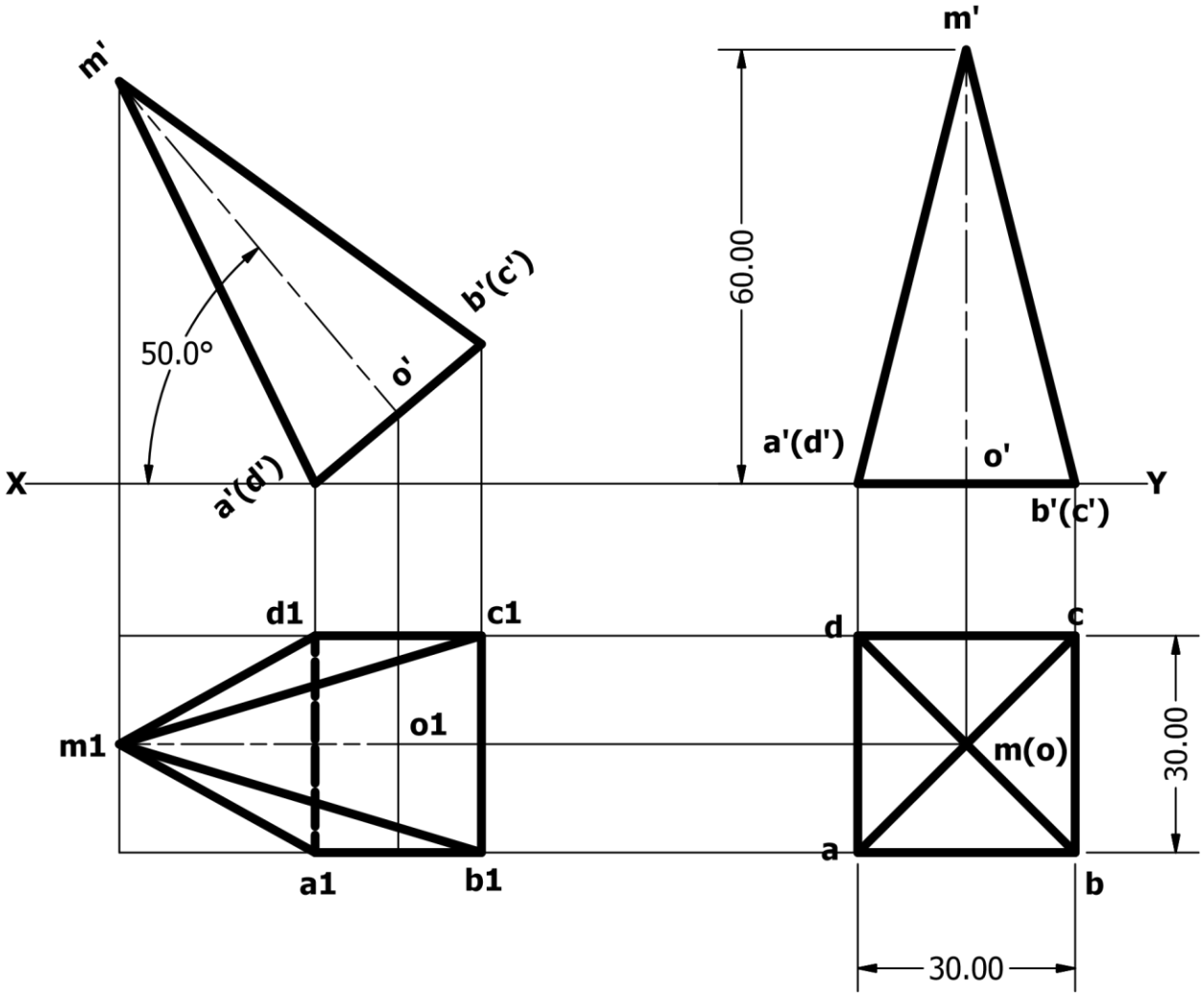


FIGURE 2.6 PROJECTIONS OF SQUARE PYRAMID (TILT TO LEFT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid rests on HP on its base edge AD and axis MO inclined at 50^0 to HP

4. A square prism of base 30mm and height 50mm has a base edge on VP, axis inclined at 35^0 to VP and the resting base edge is inclined at 45^0 to HP. Draw the projections of the solid. **(JAN 2016)**

i. Object tilt to right side

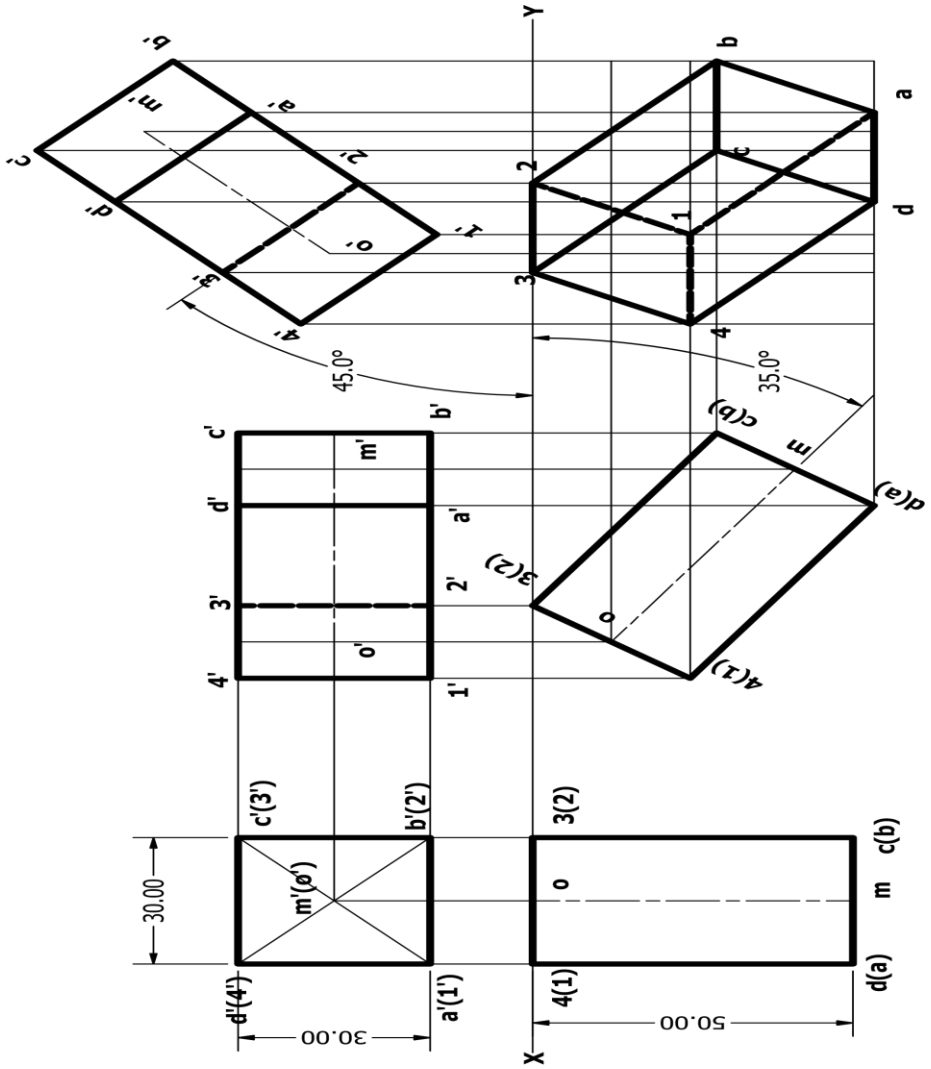


FIGURE 2.7 PROJECTIONS OF SQUARE PRISM (TILT TO RIGHT SIDE)

Answers:

1. Projections of square prism is drawn.
2. Here the prism rests on VP on its base edge **2-3** and axis MO inclined at 35^0 to VP.
3. Here the resting edge **2-3** makes 45^0 to HP.

ii. Object tilt to left side

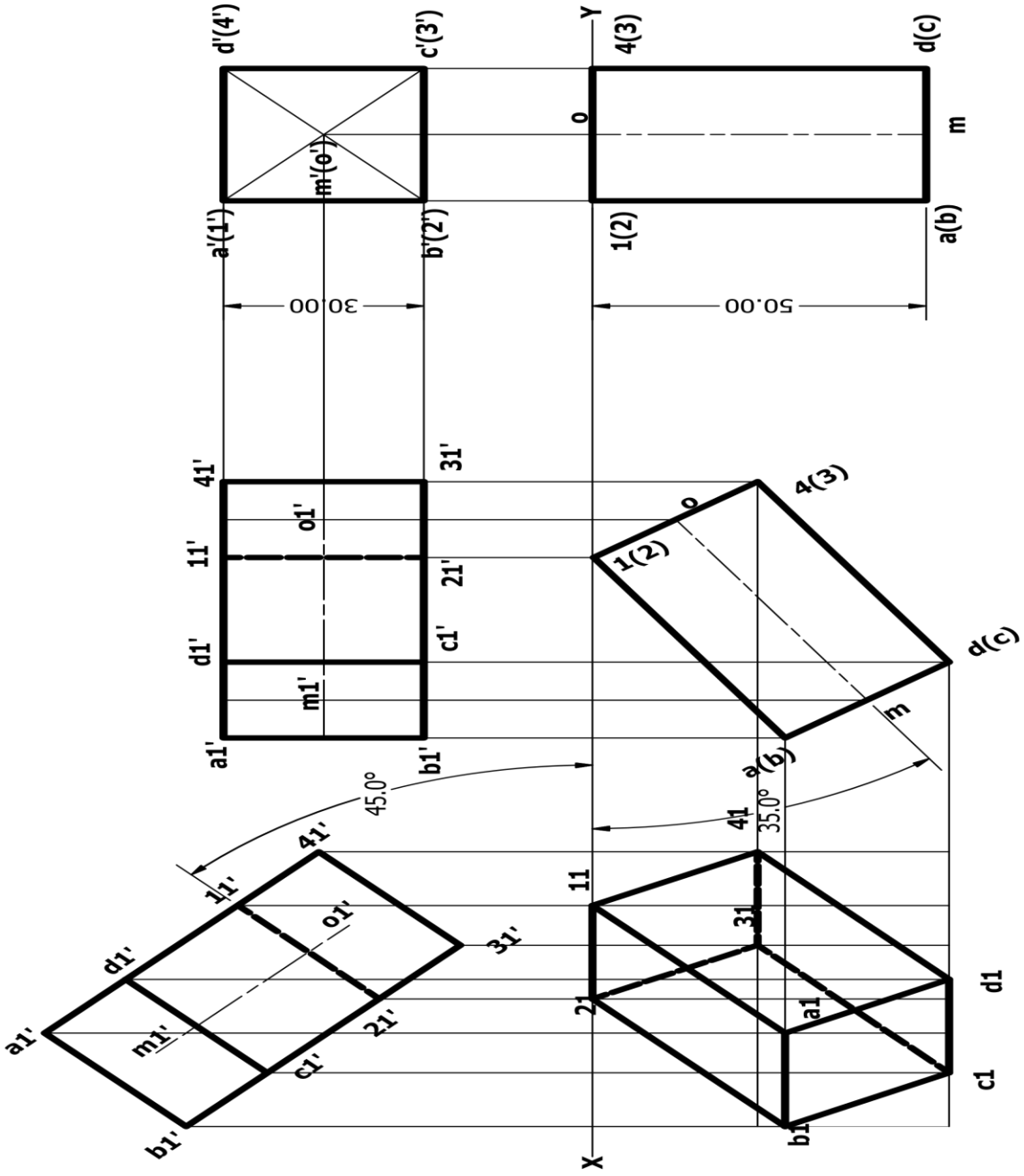


FIGURE 2.8 PROJECTIONS OF SQUARE PRISM (TILT TO LEFT SIDE)

Answers:

1. Projections of square prism is drawn.
2. Here the prism rests on VP on its base edge **1-2** and axis MO inclined at 35^0 to VP.
3. Here the resting edge **1-2** makes 45^0 to HP.

5. A square pyramid of base 30mm and height 60mm is suspended by means of a string from one of its base corners with its axis parallel to VP. Draw its projections. **(MAY/JUNE 2016)**

i. Point of suspension is A

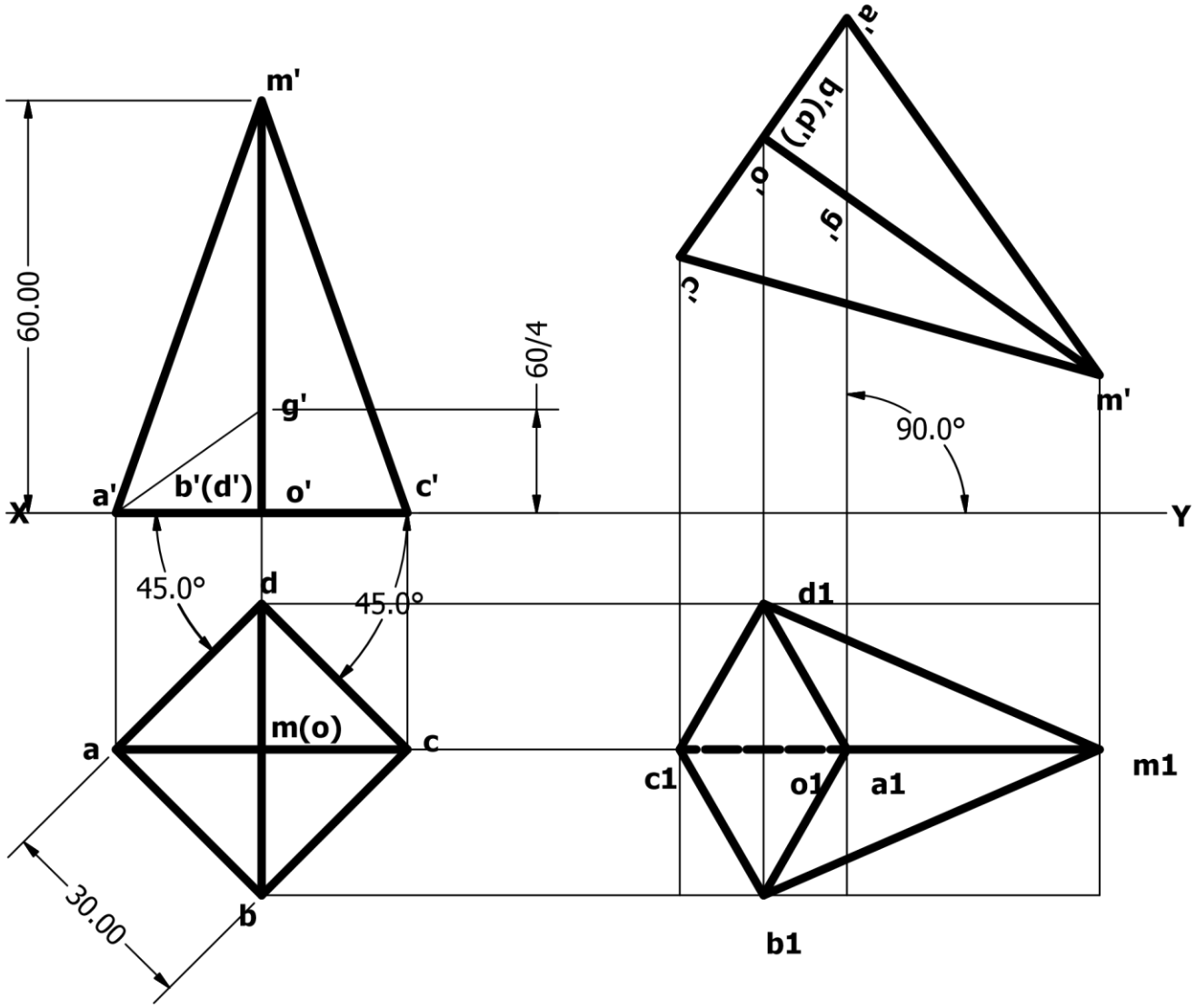


FIGURE 2.9 PROJECTIONS OF SQUARE PYRAMID (TILT TO RIGHT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid is suspended by means of a string on its base corner **A**
3. Also the axis line **MO** is parallel to VP

ii. Point of suspension is C

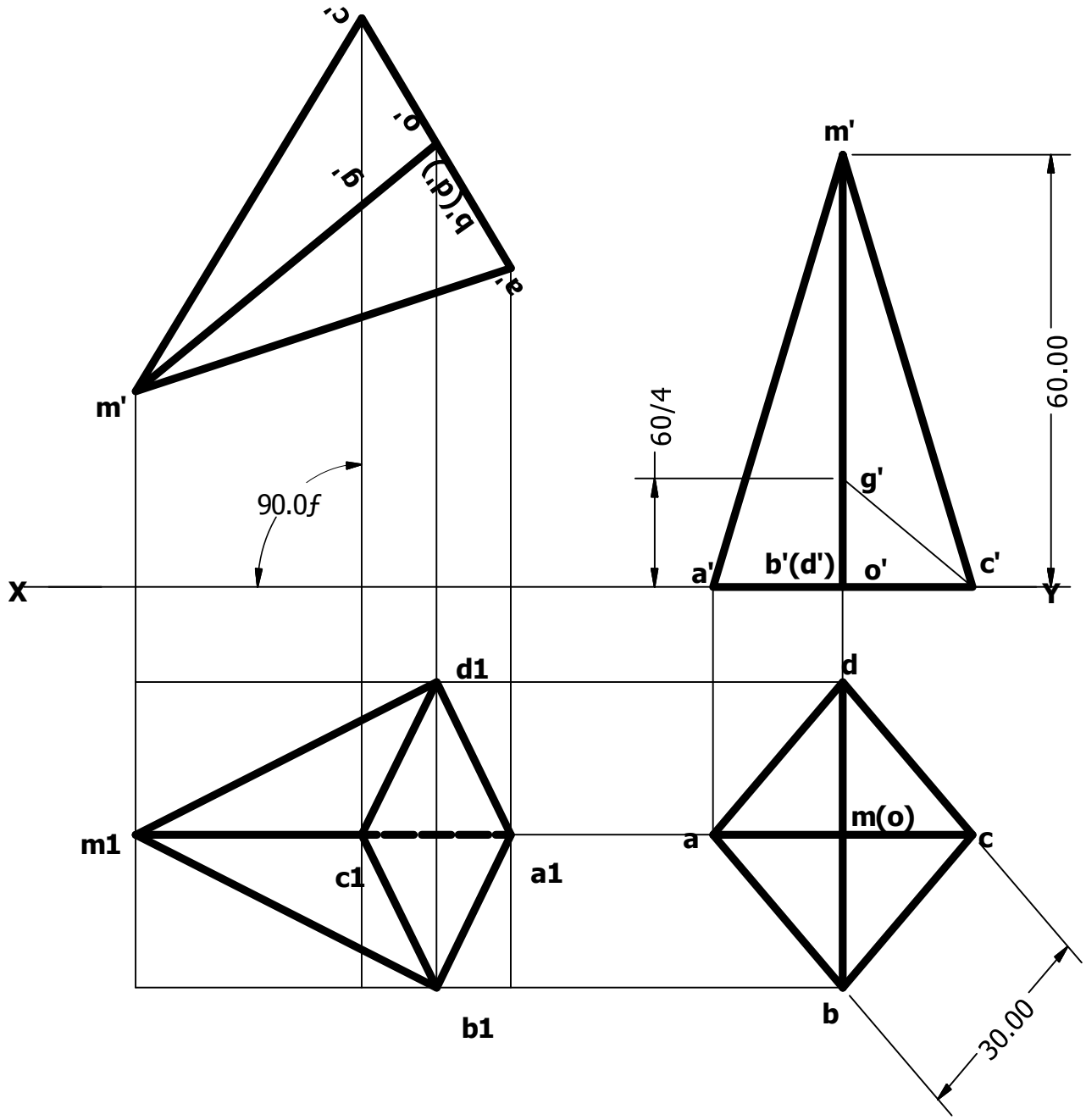


FIGURE 2.10 PROJECTIONS OF SQUARE PYRAMID (TILT TO LEFT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid is suspended by means of a string on its base corner **C**
3. Also the axis line **MO** is parallel to V.P

6. A pentagonal prism of 25mm base side and 50mm axis length is resting on the HP on one of its base corners with its axis inclined at 40^0 to the HP and parallel to the VP. Draw its projection when the base sides containing the resting corner are equally inclined to HP.**(JULY 2016)**

i. Object tilt to right side

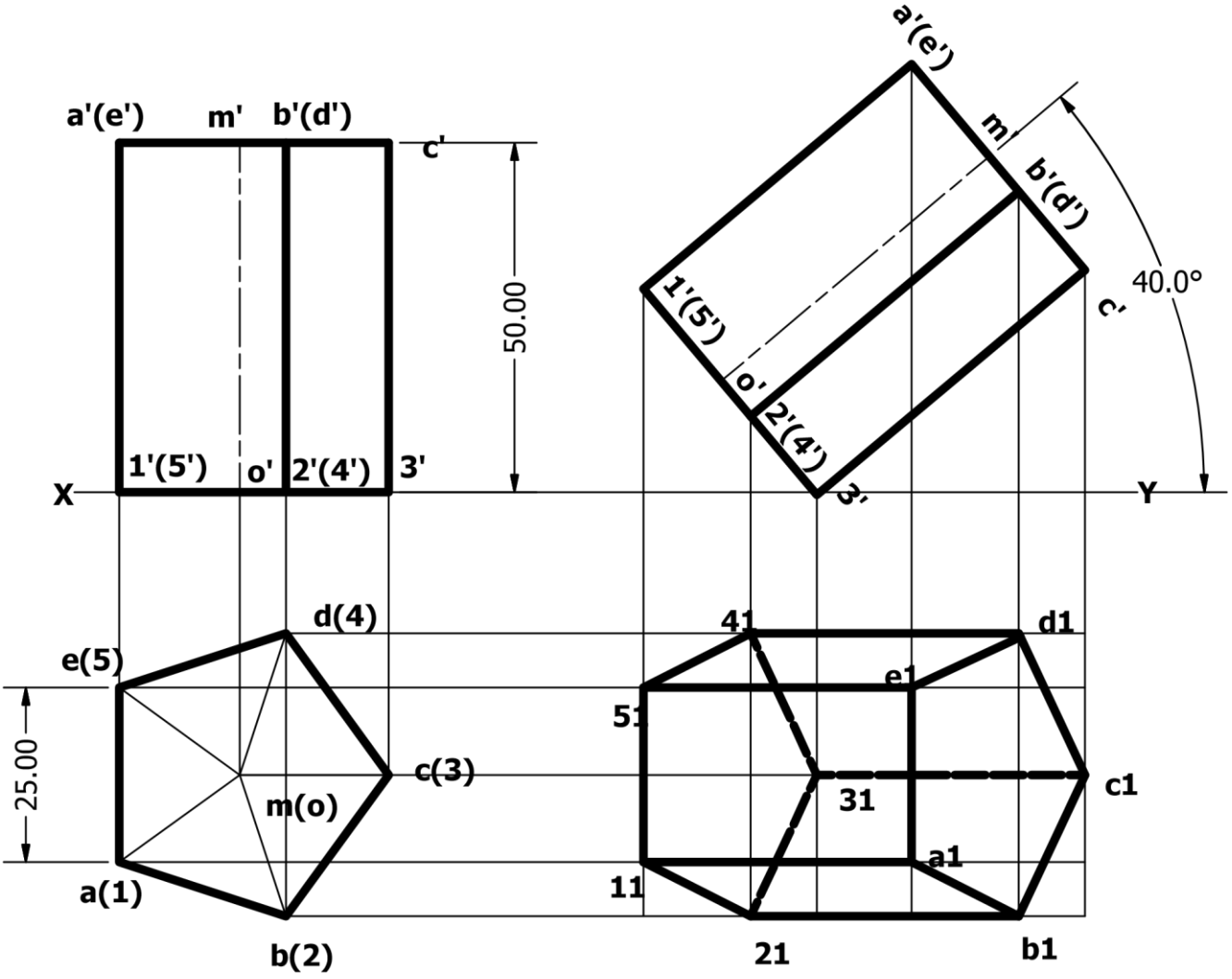


FIGURE 2.11 PROJECTIONS OF PENTAGONAL PRISM (TILT TO RIGHT SIDE)

Answers:

1. Projections of Pentagonal prism is drawn.
2. Here the prism rests on HP on its Corner **3** and axis MO inclined at 40^0 to HP.
3. The base sides 2-3 & 3-4 are equally inclined to HP.

ii. Object tilt to left side

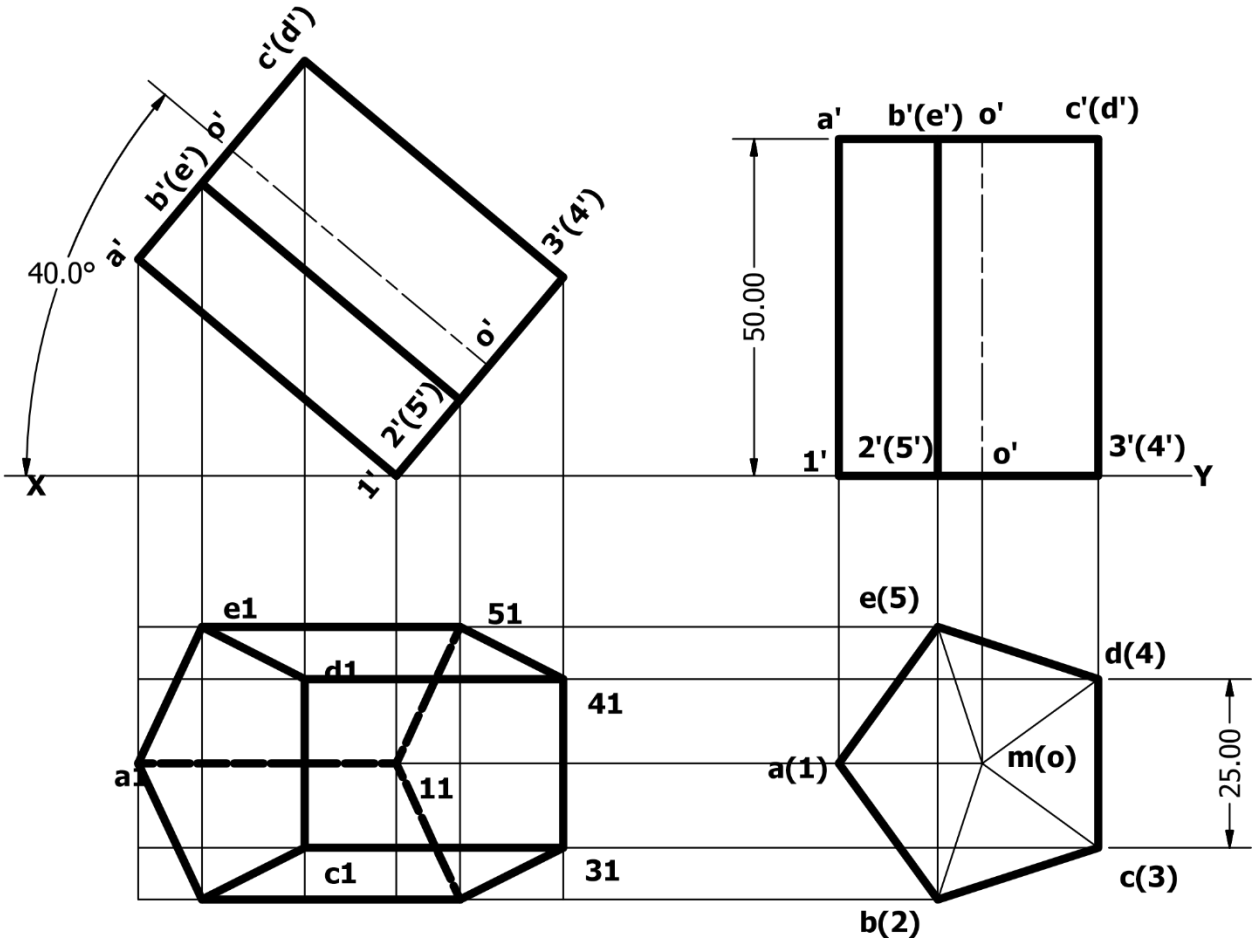


FIGURE 2.12 PROJECTIONS OF PENTAGONAL PRISM (TILT TO LEFT SIDE)

Answers:

1. Projections of Pentagonal prism is drawn.
2. Here the prism rests on HP on its Corner **1** and axis MO inclined at 40^0 to HP.
3. The base sides 1-2 & 1-5 are equally inclined to HP.

7. A square pyramid of base 30mm and height 60mm resting on HP on one of its triangular faces with its axis parallel to VP. Draw its projections. **(SEPTEMBER 2016)**

i. Object tilt to right side

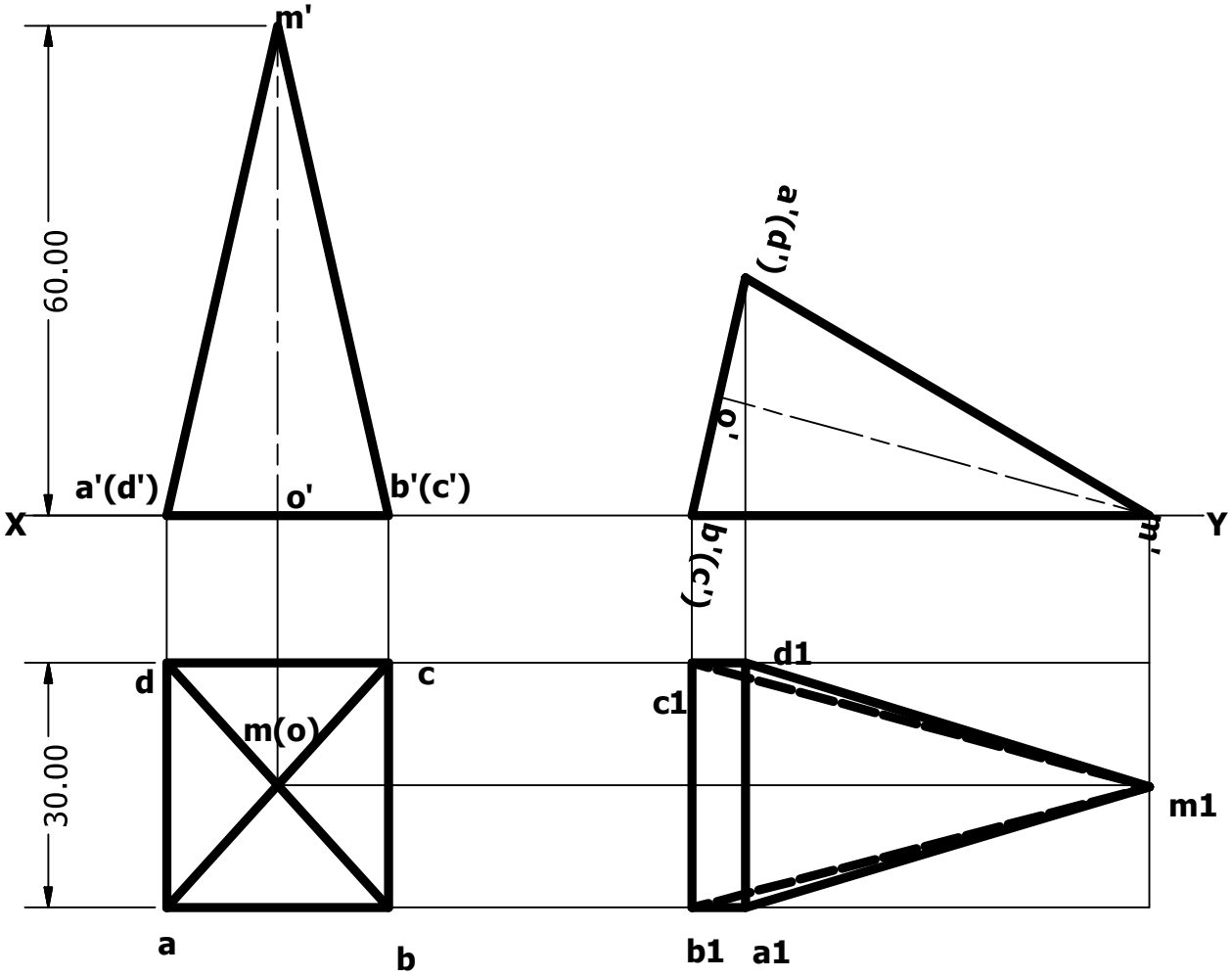


FIGURE 2.13 PROJECTIONS OF SQUARE PYRAMID (TILT TO RIGHT SIDE)

Answers:

1. Projections of Square pyramid is drawn.
2. Here the pyramid rests on HP on its triangular face **MBC**

ii. Object tilt to left side

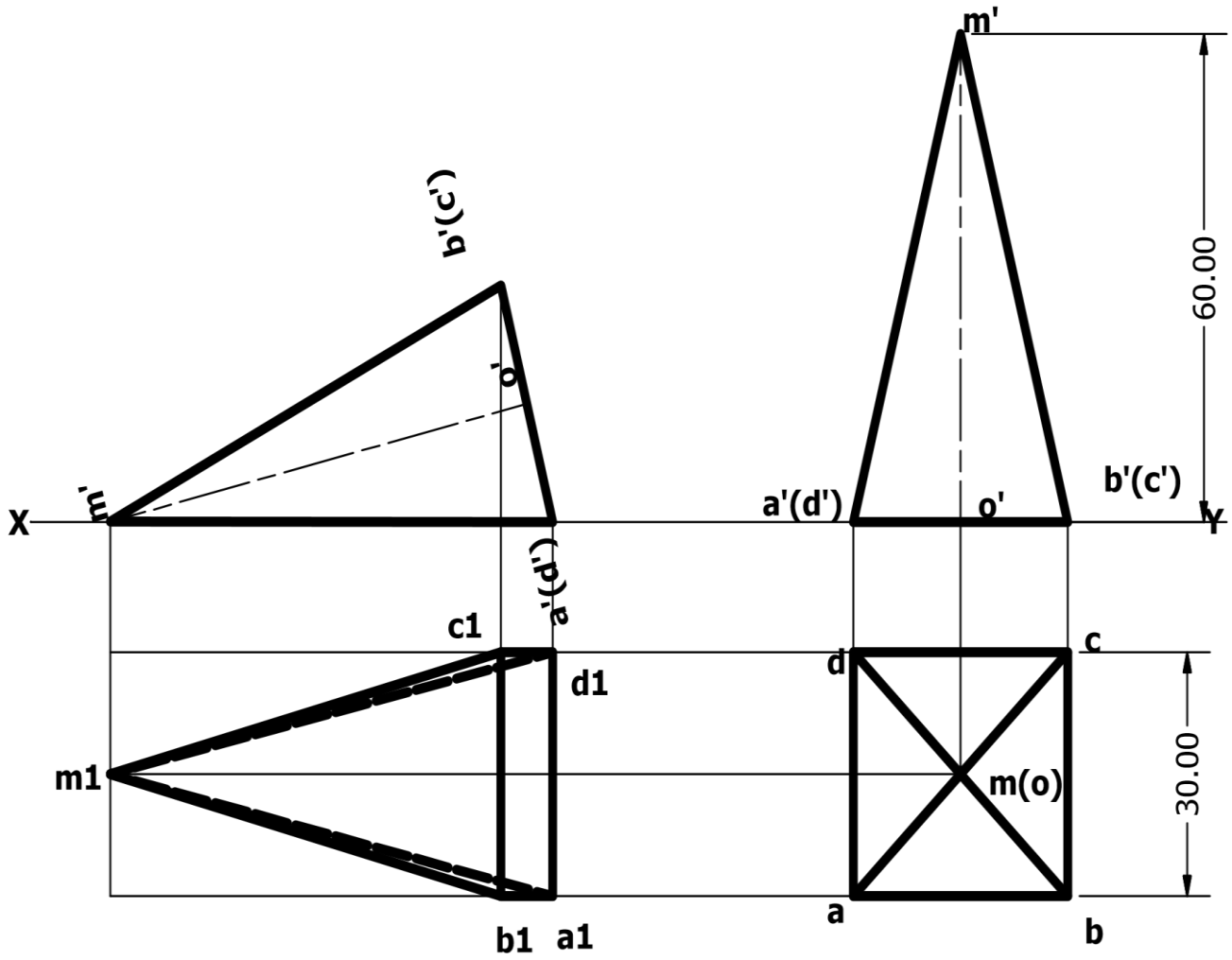


FIGURE 2.14 PROJECTIONS OF SQUARE PYRAMID (TILT TO LEFT SIDE)

Answers:

1. Projections of Square pyramid is drawn.
2. Here the pyramid rests on HP on its triangular face **MAD**

8. A square pyramid of base 40mm and height 60mm is on HP with one of its base edges so that the axis is making 45^0 with HP and the base edge making 30^0 with VP. Draw the projections. **(JANUARY 2017)**

i. Object tilt to right side

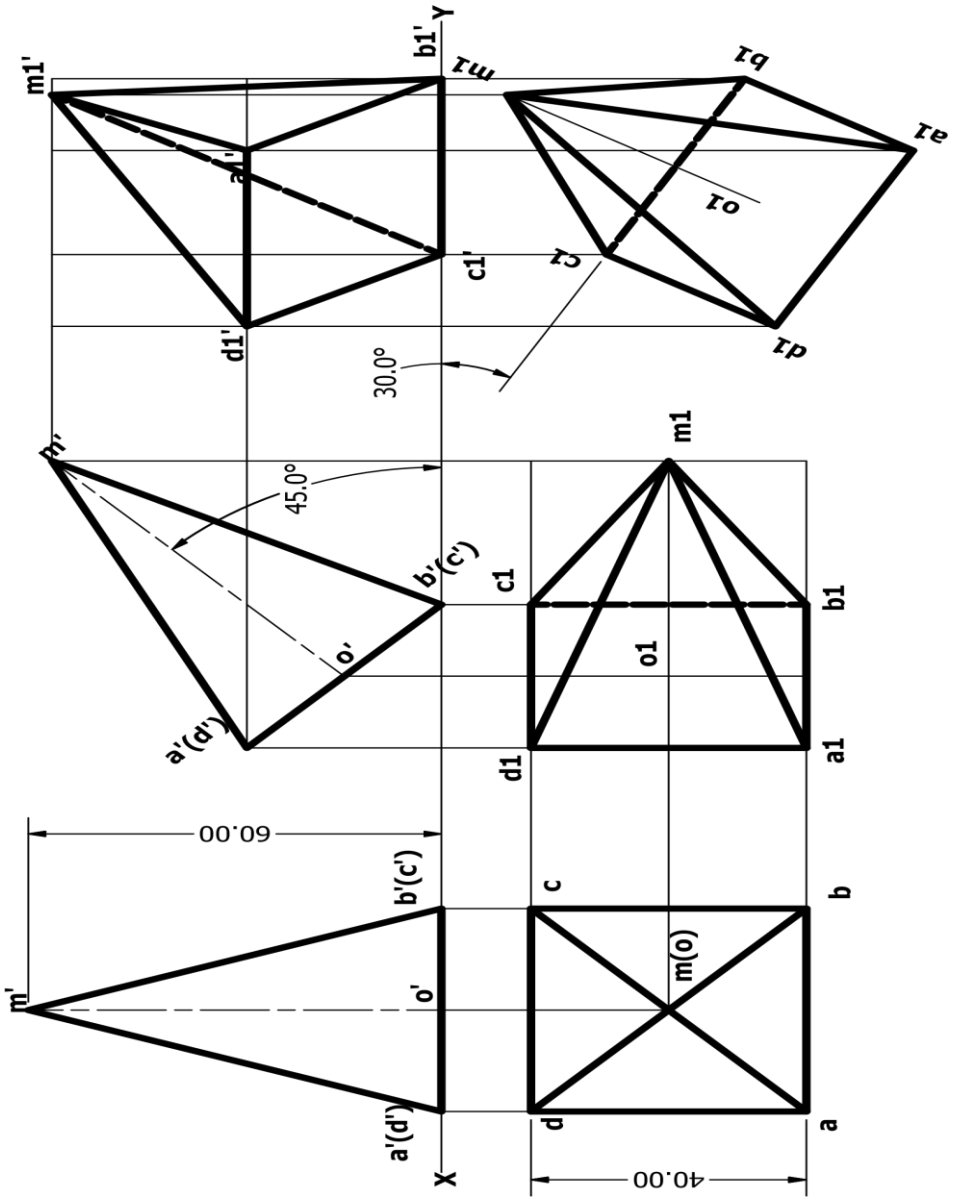


FIGURE 2.15 PROJECTIONS OF SQUARE PYRAMID (TILT TO RIGHT SIDE)

Answers:

1. Projections of Square pyramid is drawn.
2. Here the pyramid rests on HP on its edge **BC** and axis MO is inclined at 45^0 to HP.
3. The resting edge **BC** is inclined at 30^0 to VP.

ii. Object tilt to left side

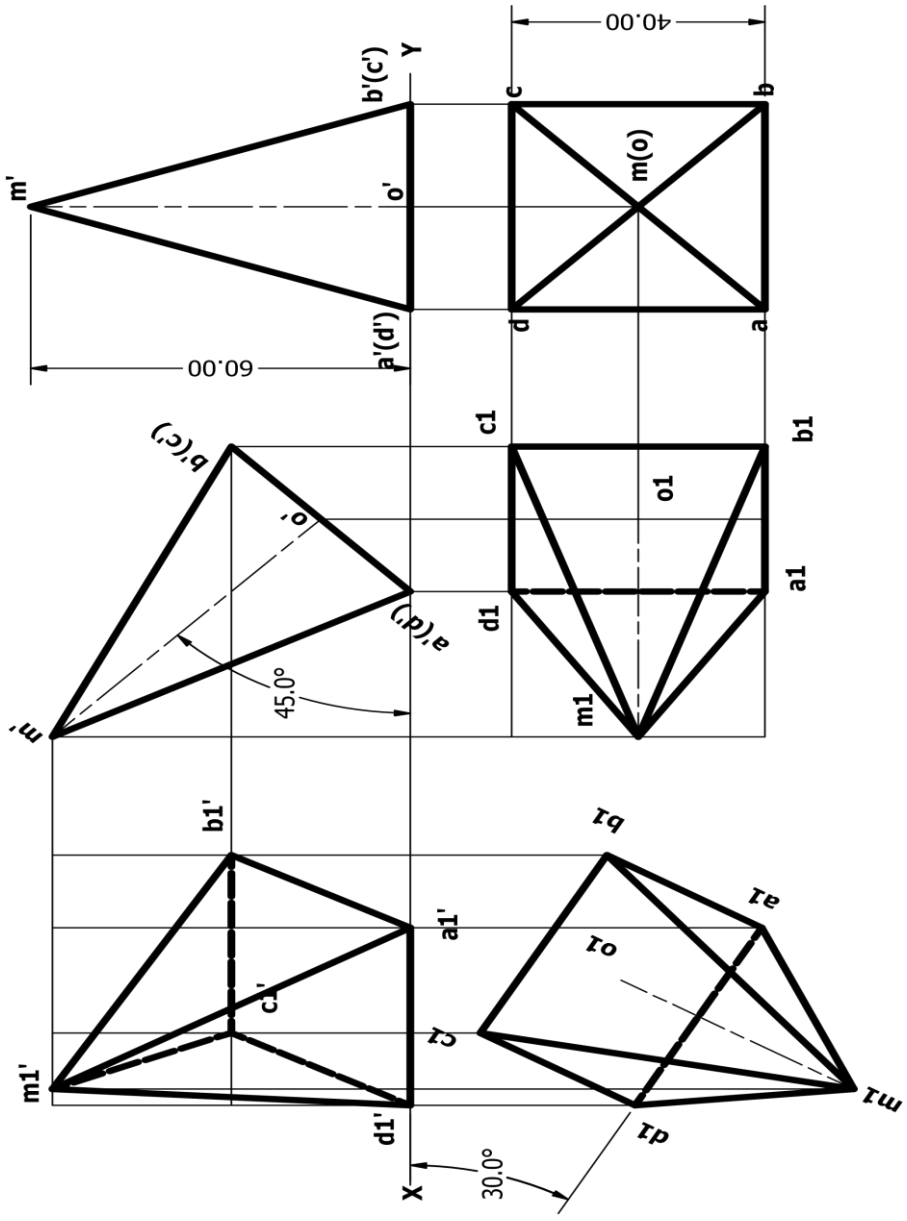


FIGURE 2.16 PROJECTIONS OF SQUARE PYRAMID (TILT TO LEFT SIDE)

Answers:

1. Projections of Square pyramid is drawn.
2. Here the pyramid rests on HP on its edge **AD** and axis MO is inclined at 45^0 to HP.
3. The resting edge **AD** is inclined at 30^0 to VP.

9. A square pyramid of base 30mm and height 50mm long.it is freely suspended from one of the corners of its base. The axis is parallel to the V.P. Draw the projections of the pyramid. **(MAY 2017)**

i. Point of suspension is A

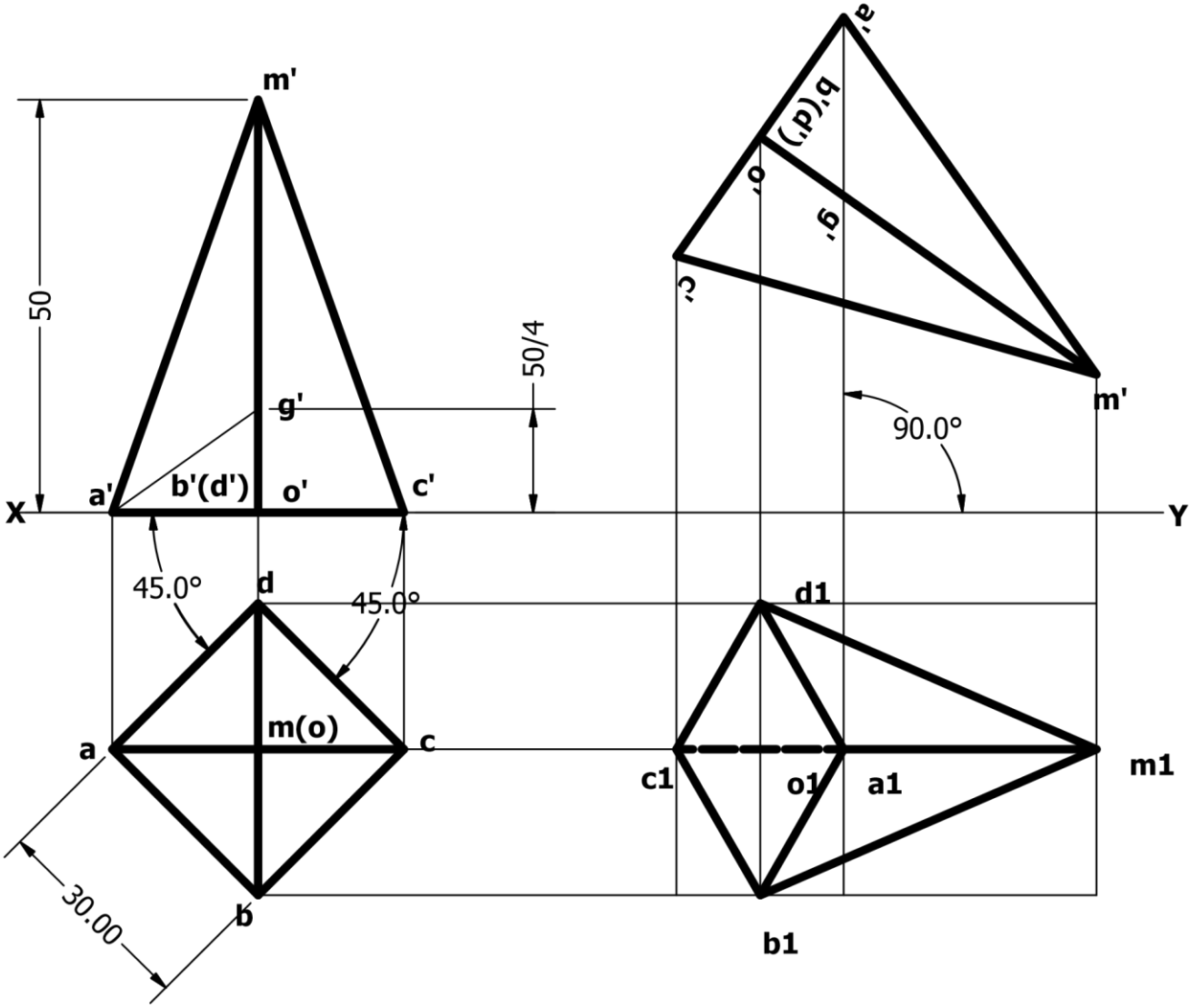


FIGURE 2.17 PROJECTIONS OF SQUARE PYRAMID (TILT TO RIGHT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid is suspended on its base corner **A**
3. Also the axis line **MO** is parallel to VP

ii. Point of suspension is C

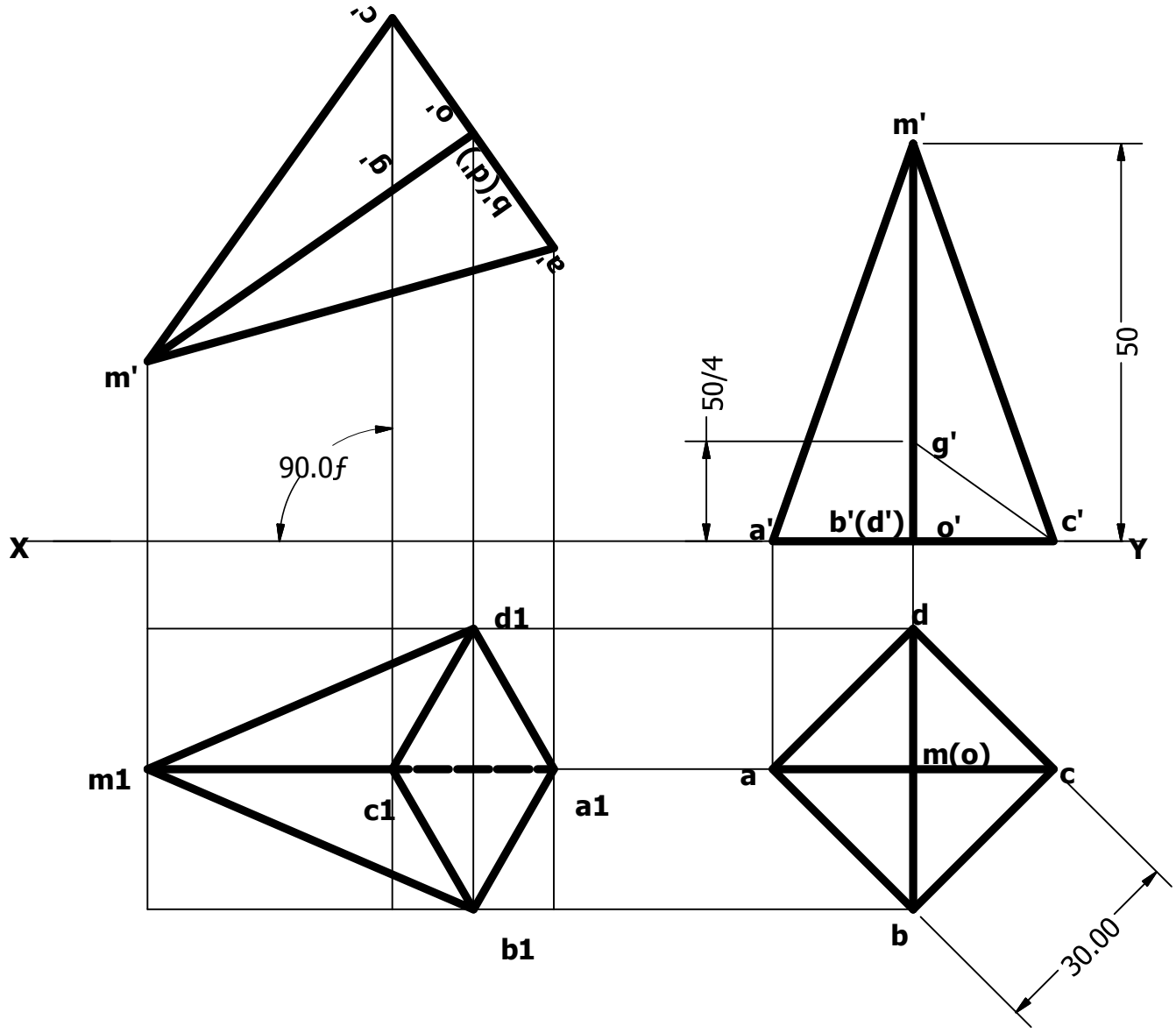


FIGURE 2.18 PROJECTIONS OF SQUARE PYRAMID (TILT TO LEFT SIDE)

Answers:

1. Projections of square pyramid is drawn.
2. Here the pyramid is suspended on its base corner **C**
3. Also the axis line **MO** is parallel to VP

10. A cube resting one of its base corner in such a way that one of its solid diagonal perpendicular to VP. The length of solid diagonal of cube is 80mm.Draw the projections of the cube. **(MAY 2017)**

i. Object tilt to right side

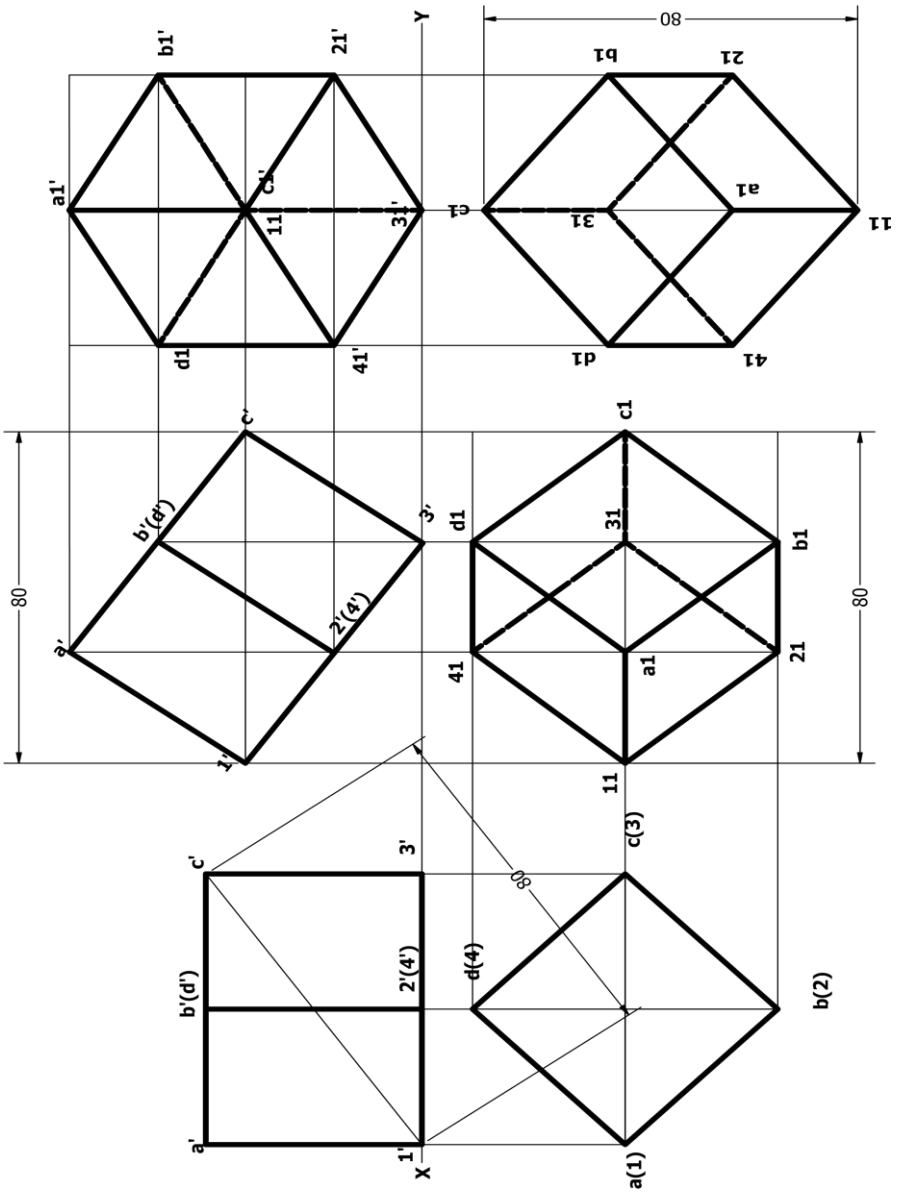


FIGURE 2.19 PROJECTIONS OF CUBE (TILT TO RIGHT SIDE)

Answers:

1. Projections of cube is drawn.
2. Here the cube is resting on HP on corner **3**
3. The solid diagonal ($\sqrt{3}$*edge =80mm) **1-c** is perpendicular to VP.

ii. Object tilt to right side

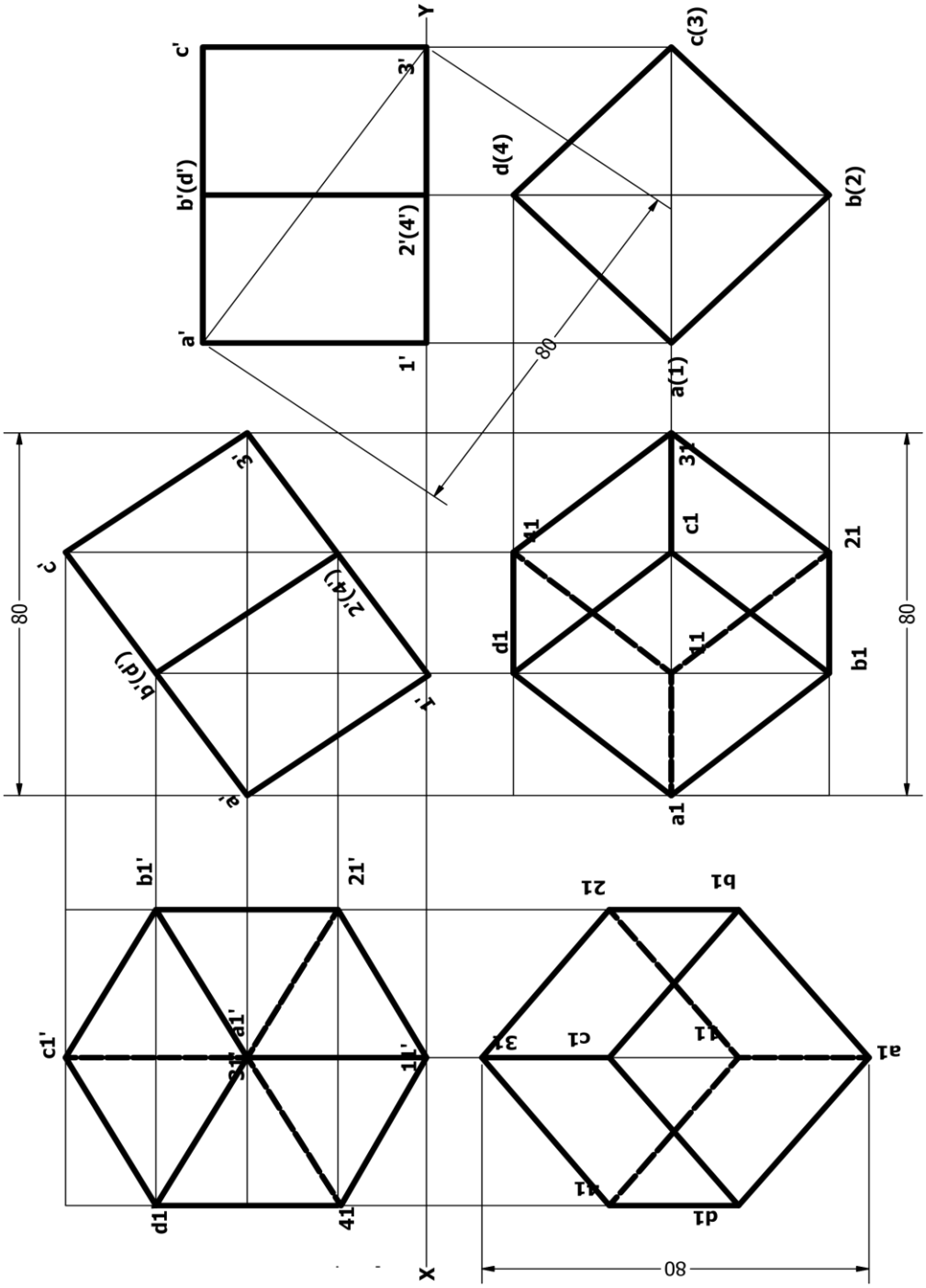


FIGURE 2.20 PROJECTIONS OF CUBE (TILT TO LEFT SIDE)

Answers:

1. Projections of cube is drawn.
2. Here the cube is resting on HP on corner **1**
3. The solid diagonal ($\sqrt{3}$*edge =80mm) **a-3** is perpendicular to VP.

MODULE III A

CONVERSION OF PICTORIAL VIEW INTO ORTHOGRAPHIC VIEWS

1. Figure shows the isometric view of a machine component with all dimensions. Draw its view from the front, the view from above and view from the right. **(DECEMBER 2015)**

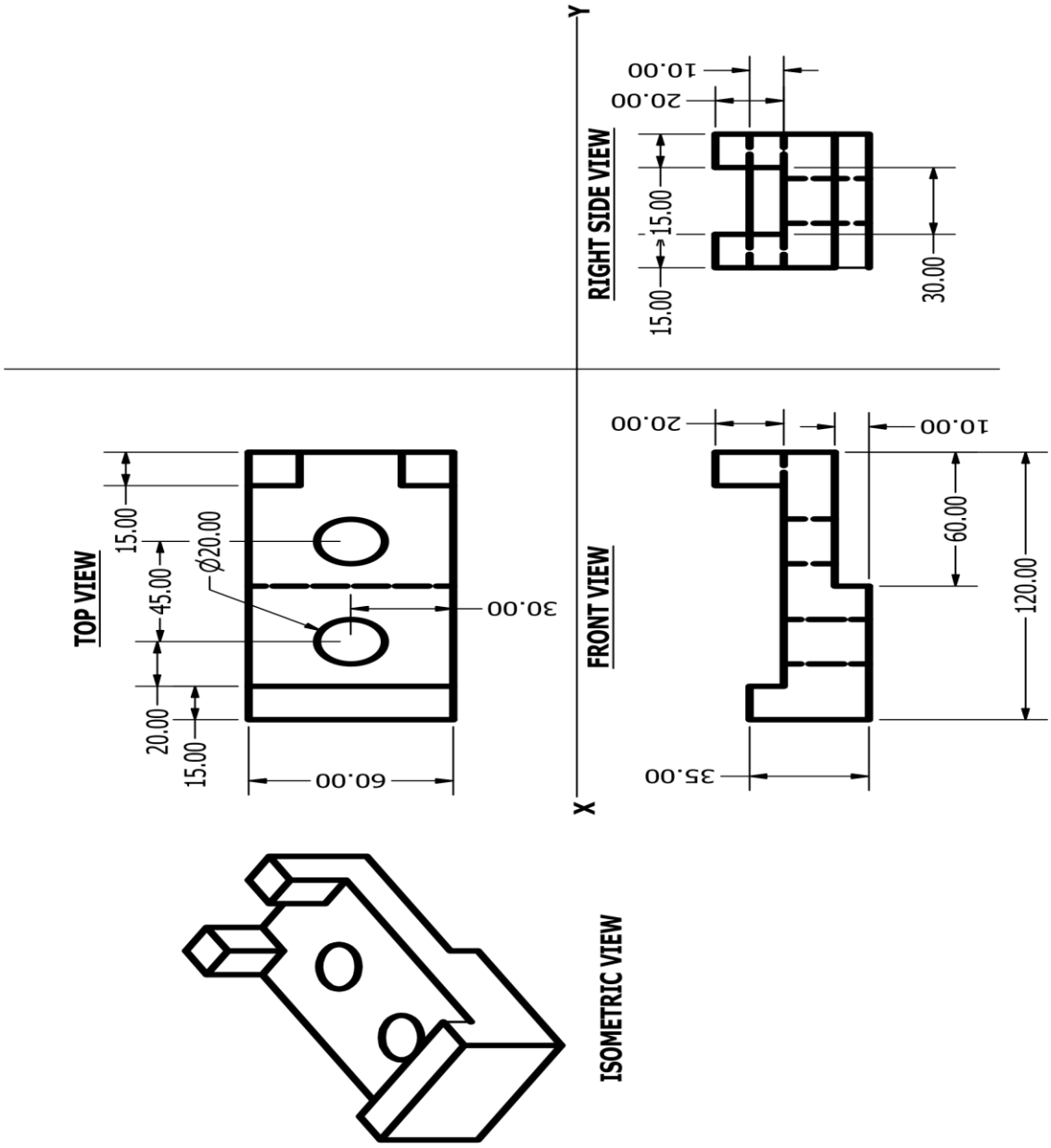


FIGURE 3A.1 THIRD ANGLE PROJECTION

2. Figure shows the isometric view of a machine component with all dimensions. Draw its view from the front, the view from above and view from the left.

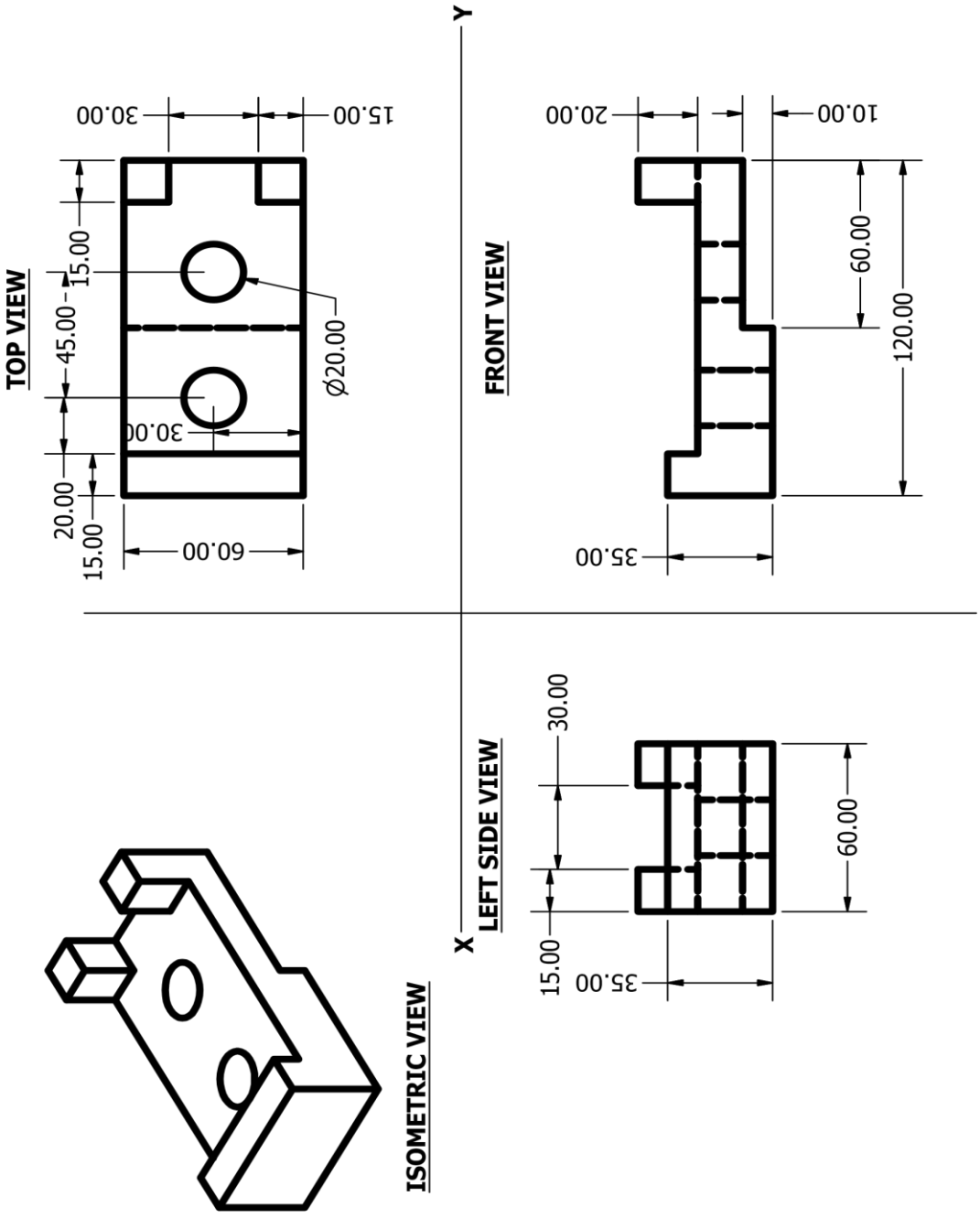


FIGURE 3A.2 THIRD ANGLE PROJECTION

3. Isometric View of a cylindrical block is shown in figure. Draw the Front view, top view and side view from left. **(MAY/JUNE 2016)**

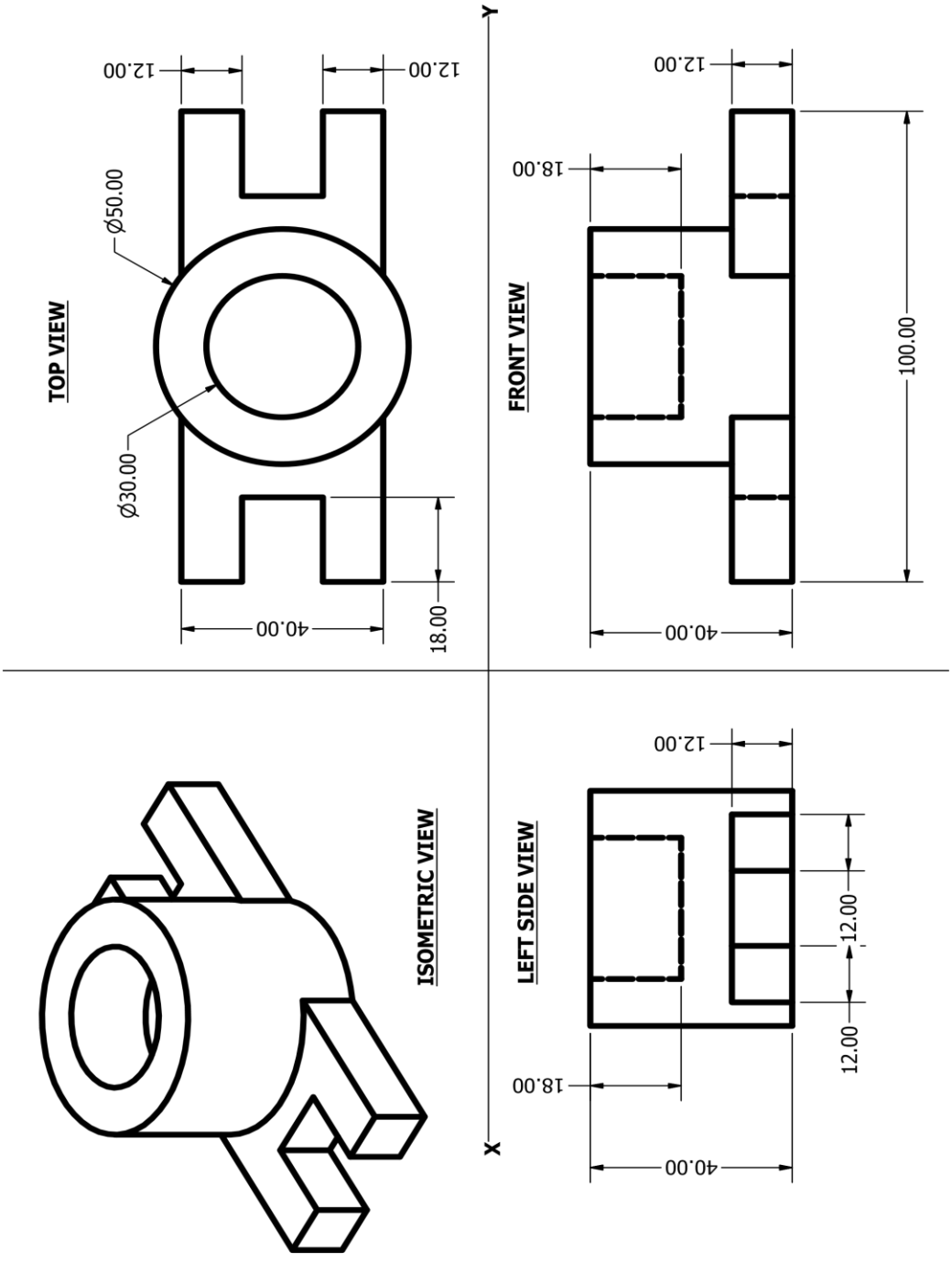


FIGURE 3A.3 THIRD ANGLE PROJECTION

4. Isometric View of a cylindrical block is shown in figure. Draw the Front view, top view and side view from right.

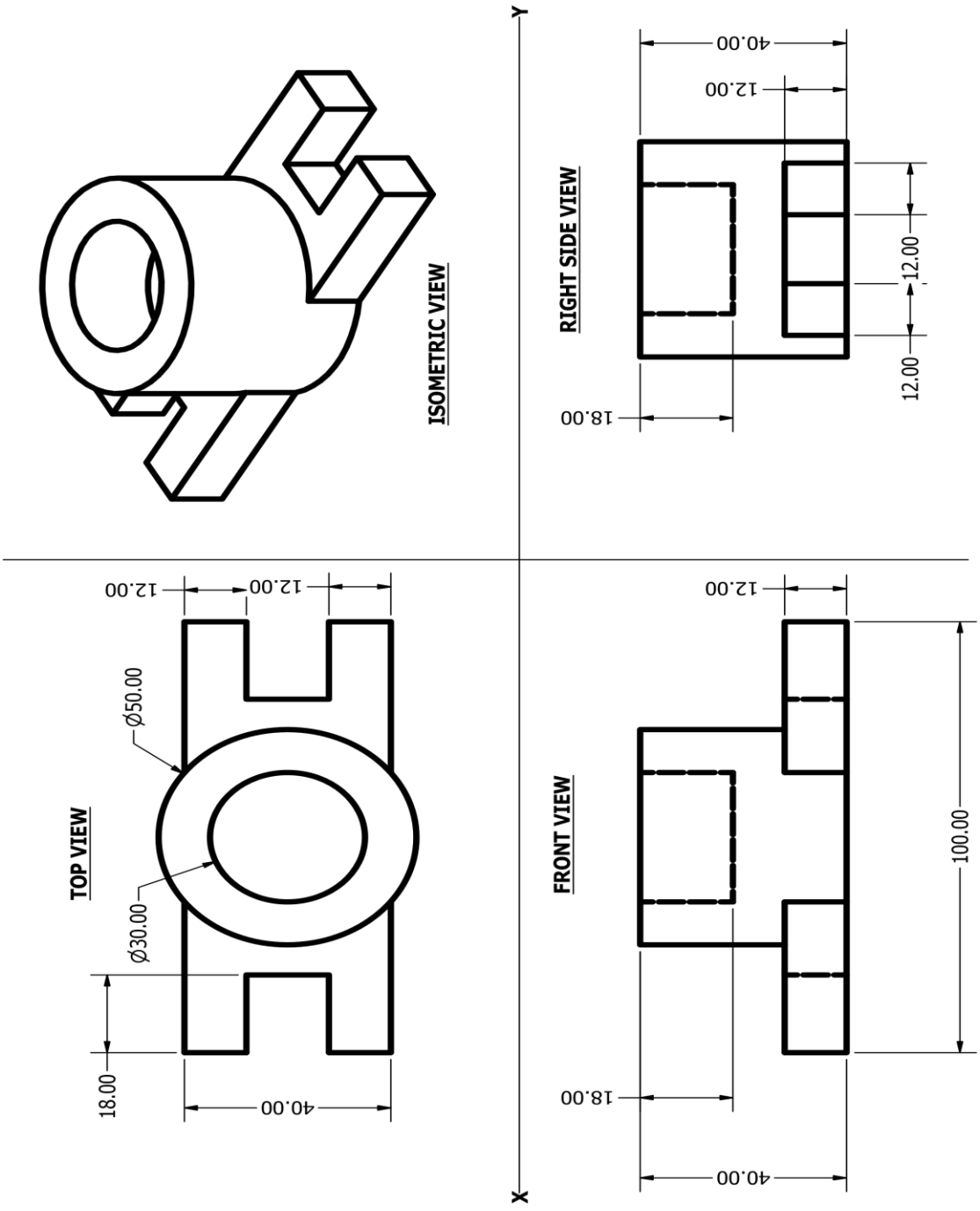


FIGURE 3A.4 THIRD ANGLE PROJECTION

5. Isometric View of a Machine component is shown in figure. Draw the Front view, top view and side view from right. **(MAY 2017)**

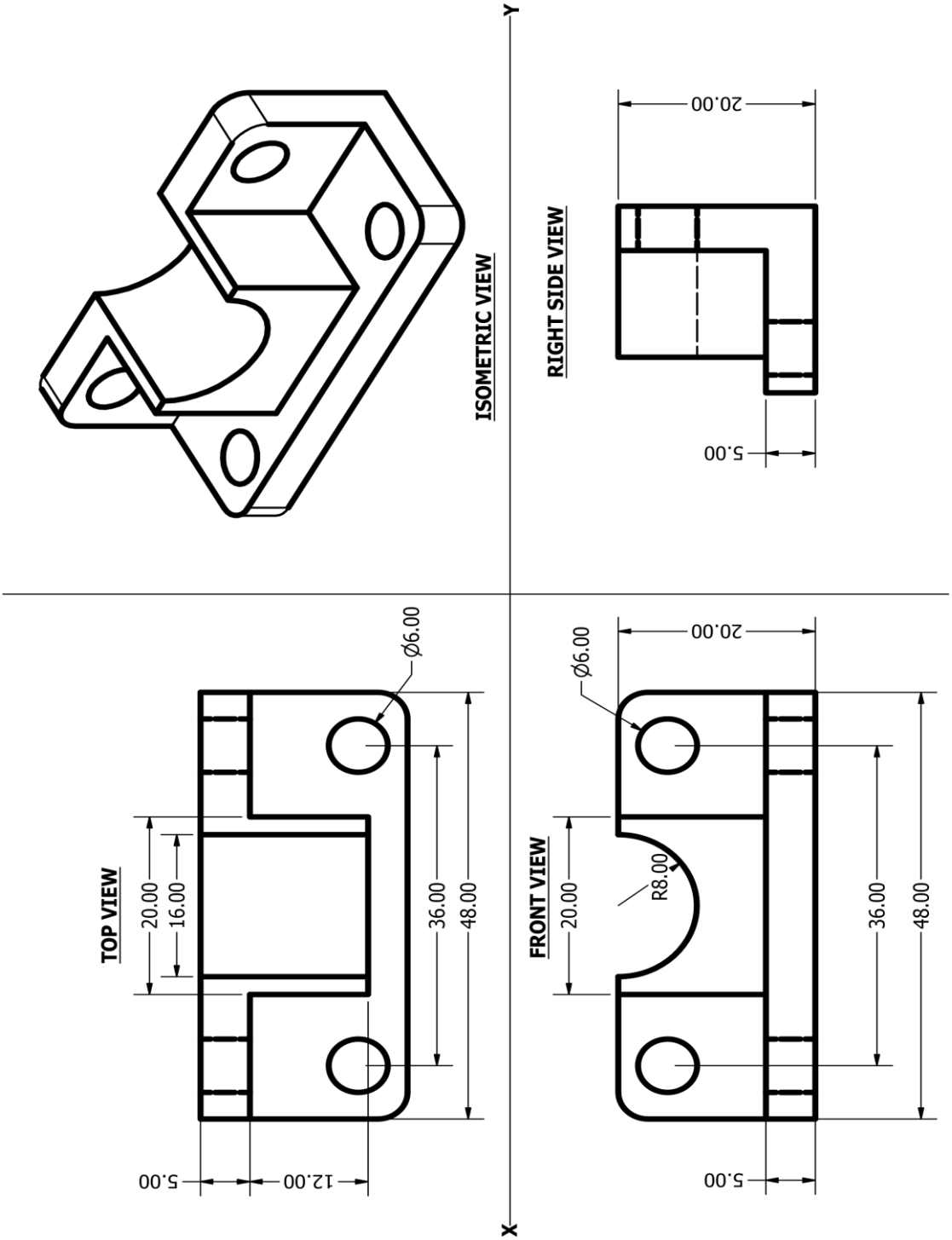


FIGURE 3A.5 THIRD ANGLE PROJECTION

6. Isometric View of a Machine component is shown in figure. Draw the Front view, top view and side view from left.

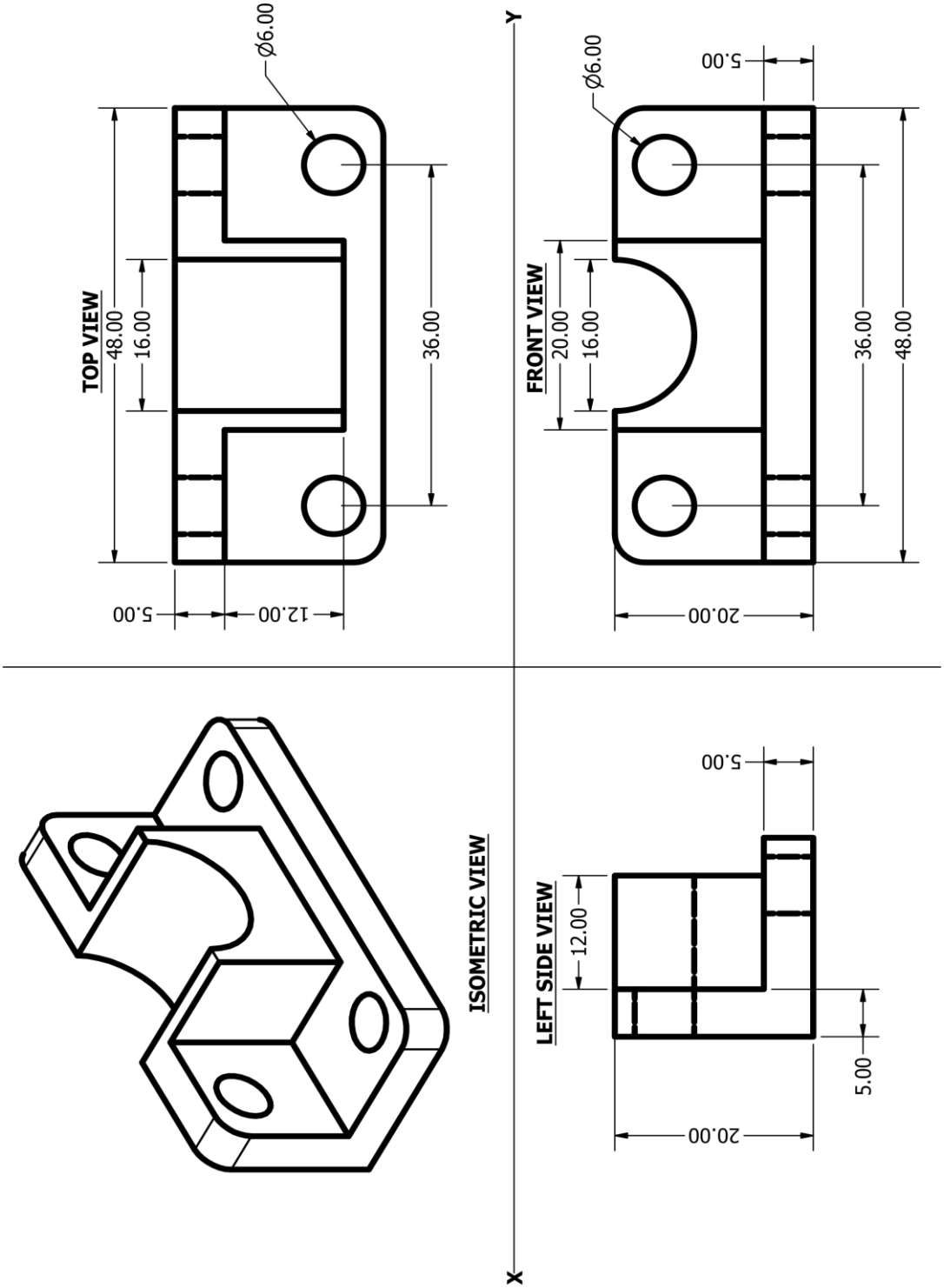


FIGURE 3A.6 THIRD ANGLE PROJECTION

MODULE III B

ISOMETRIC VIEW/ISOMETRIC PROJECTION

1. A hexagonal prism of 20mm base edge and axis 45mm long has a through square hole of 16mm sides. The axis of the hole coincides with the axis of the prism. Two lateral faces of the hole are parallel to that of the prism. Draw the isometric view of the solid when it is standing upright. **(M.Q.2)**

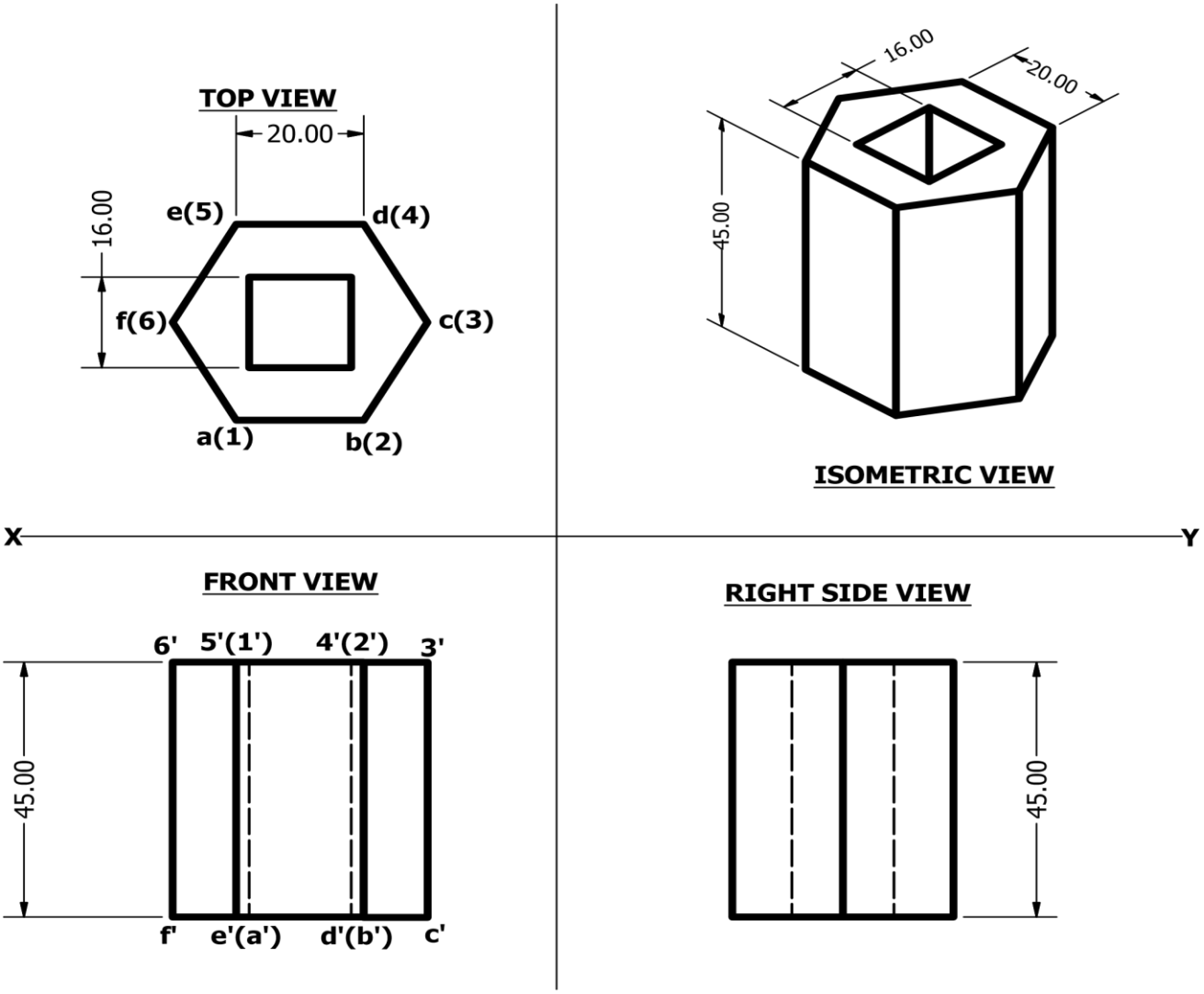


FIGURE 3B.1 THIRD ANGLE PROJECTION

2. A hemisphere of diameter 80mm is resting on the ground with its flat surface facing upwards. A square pyramid having side of base 40mm and axis 60mm is resting on its base centrally on the top of the hemisphere. Draw the isometric projection of the combination of solids. **(JANUARY 2016)**

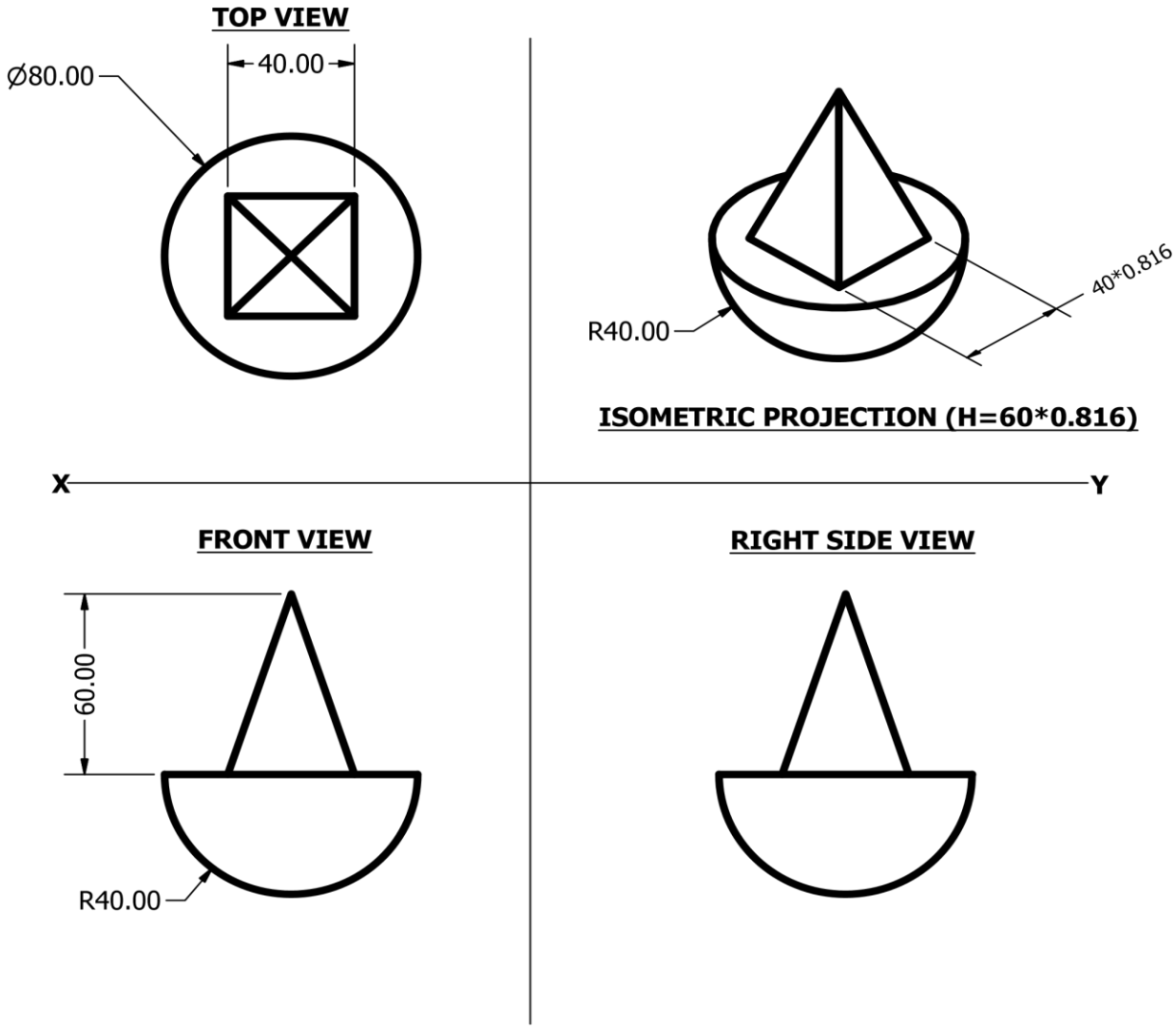


FIGURE 3B.2 THIRD ANGLE PROJECTION

3. A hexagonal prism having base with a 30mm side and 40mm height surmounted by a hemisphere such that the hemisphere is touching all the edges of the top face. Draw the isometric view of the arrangement. **(JULY 2016)**

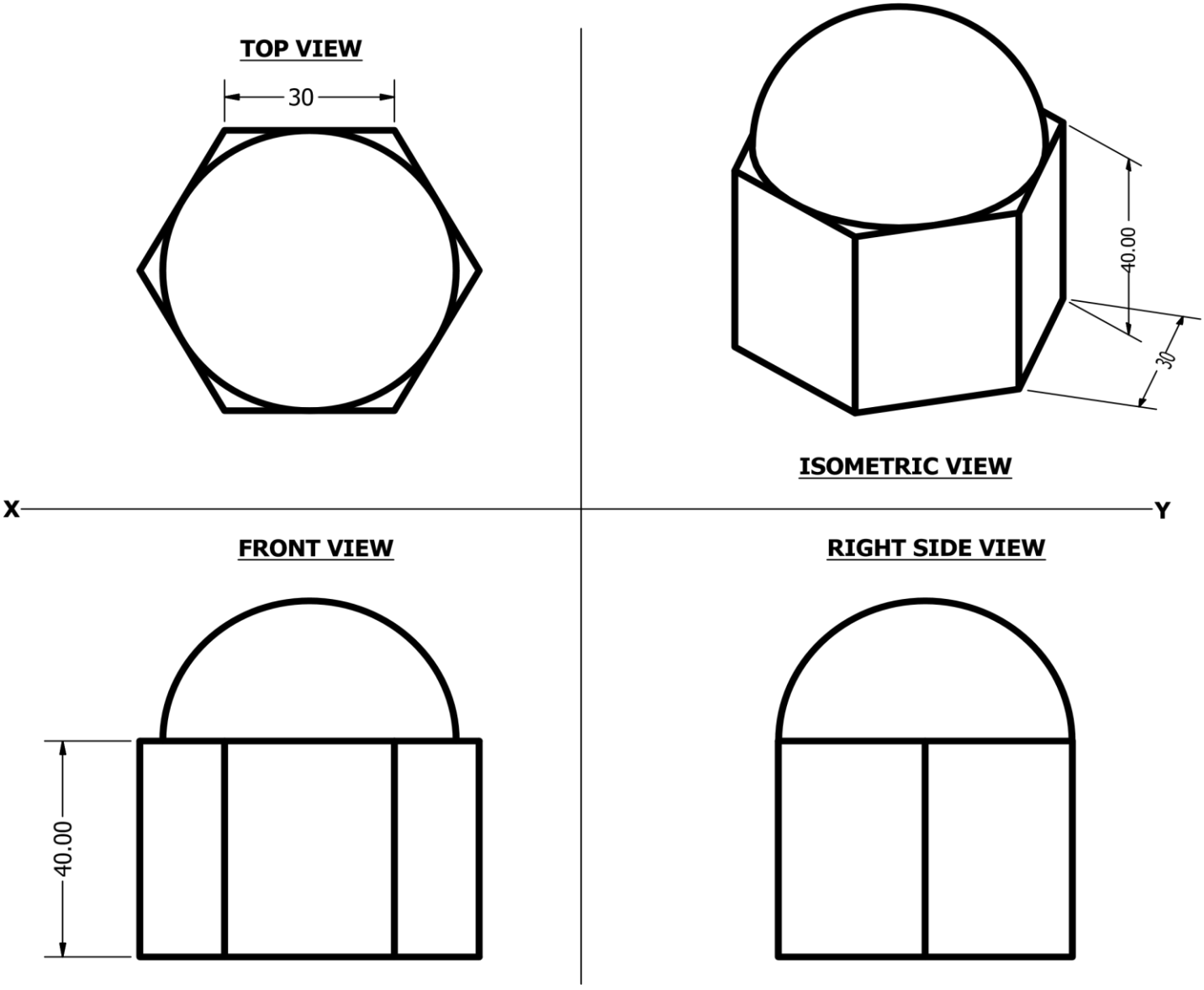


FIGURE 3B.3 THIRD ANGLE PROJECTION

4. A frustum of a cone of base diameter 50mm and top diameter 30mm and height 45mm is resting upon its base in HP. Draw the isometric projection of the frustum. **(SEPT 2016)**

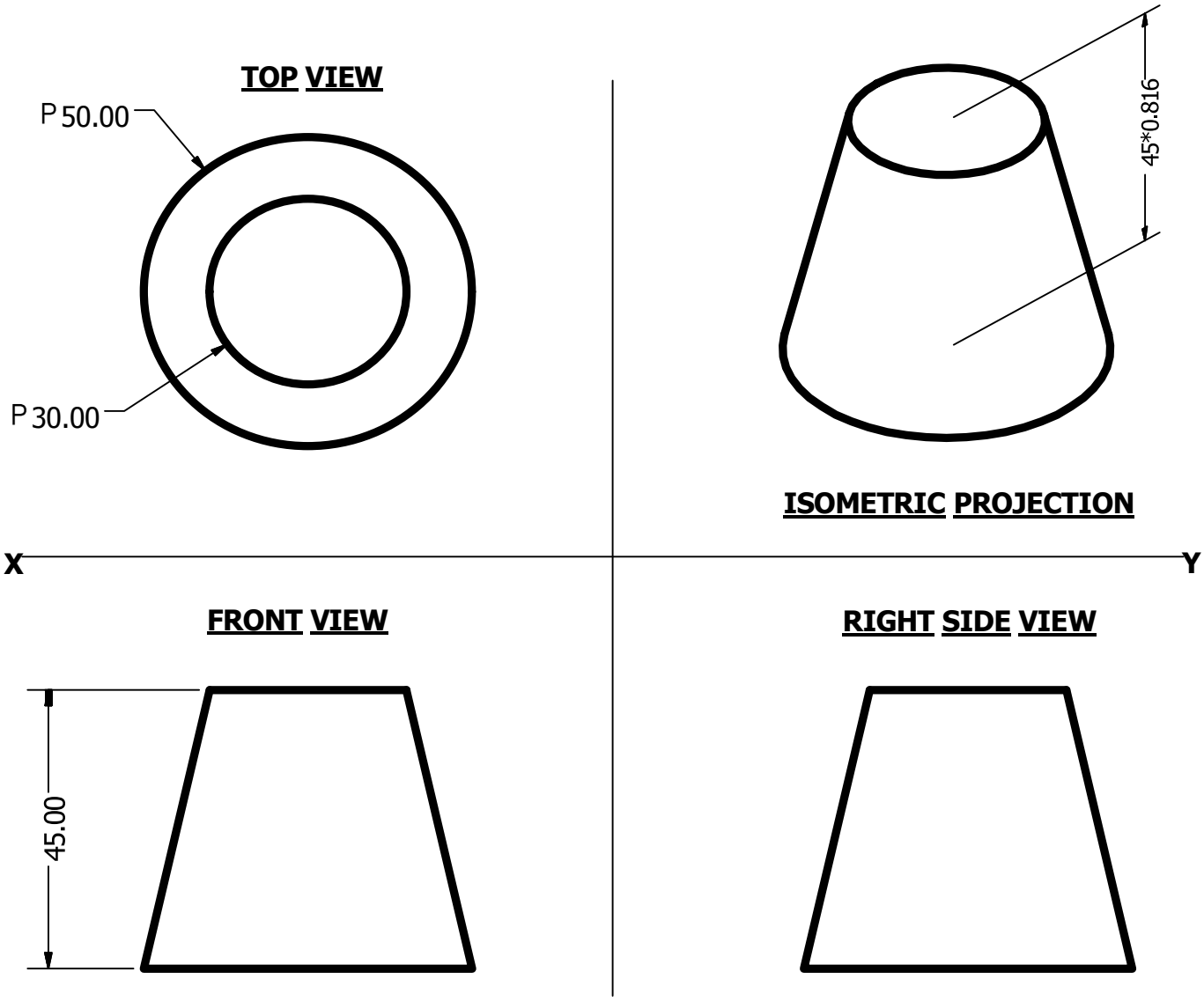


FIGURE 3B.4 THIRD ANGLE PROJECTION

5. A sphere of radius 25mm rests centrally on the top of the frustum of a square pyramid of 40mm side of base and 20mm side at the top and the axis is mm long. Draw the isometric projection of the solids in the given position. **(JANUARY 2017)**

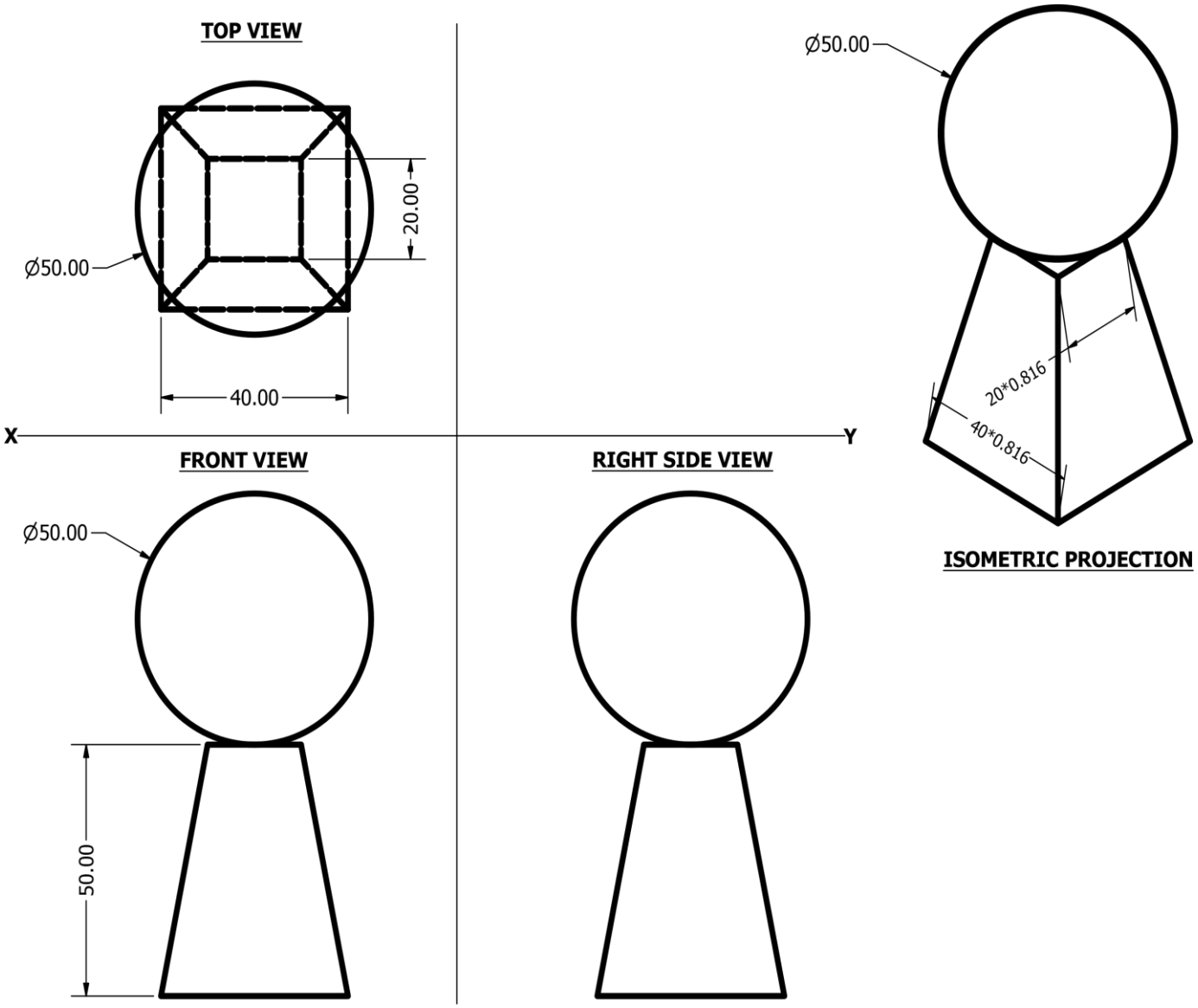


FIGURE 3B.5 THIRD ANGLE PROJECTION

6. Draw the isometric view of a sphere of size 40mm diameter placed centrally over another sphere of size 60mm diameter. **(MAY 2017)**

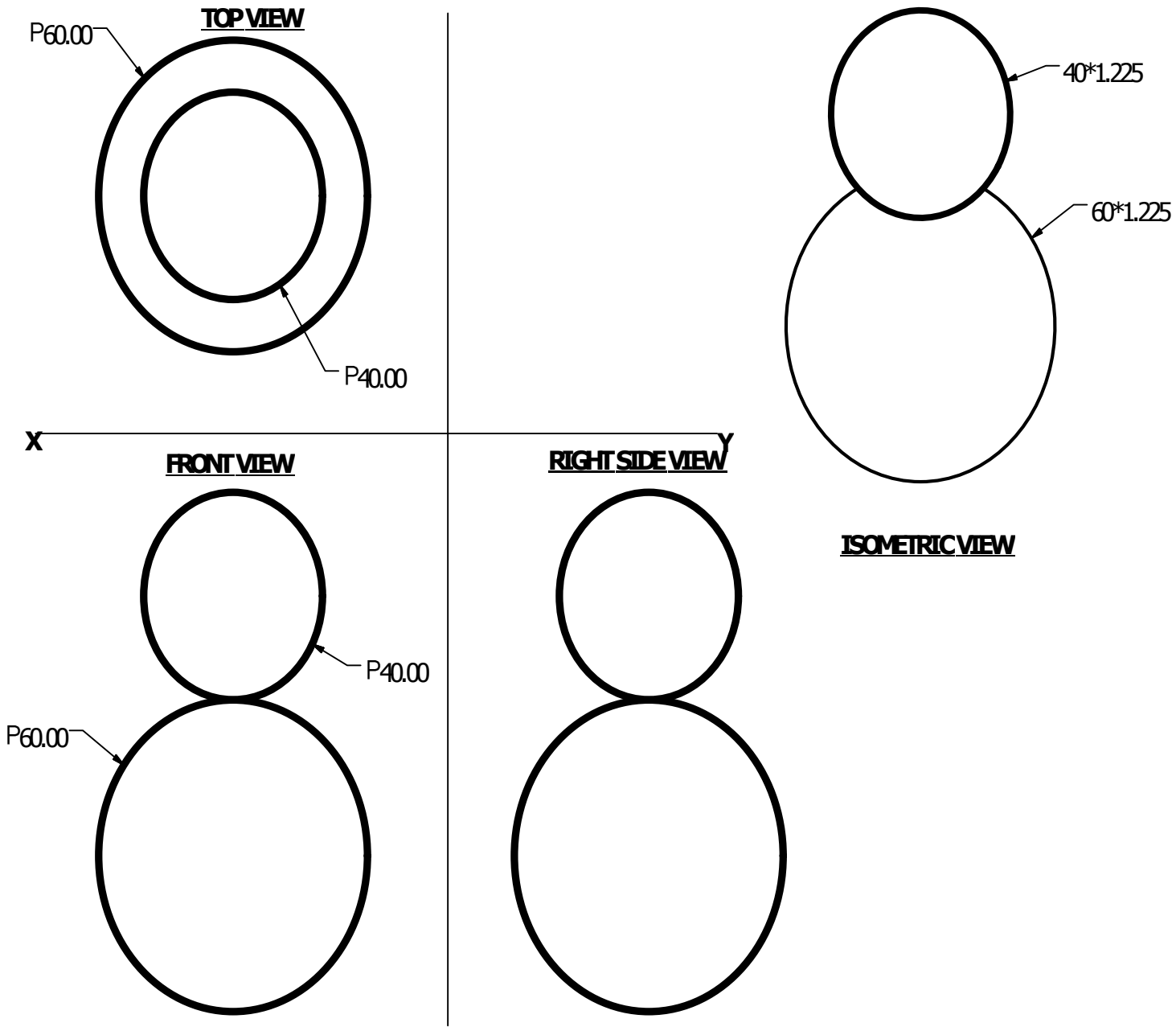


FIGURE 3B.6 THIRD ANGLE PROJECTION

MODULE V

SECTION AND DEVELOPMENT

1. A square pyramid with side of base 30mm and axis length 50mm is resting on its base on HP with an edge of the base parallel to VP.it is cut by a section plane perpendicular to VP and inclined at 45^0 to HP. The section plane is passing through the midpoint of the axis. Draw the true shape of the section. Draw also the development of the surface of the retained solid. **(DECEMBER 2015)**

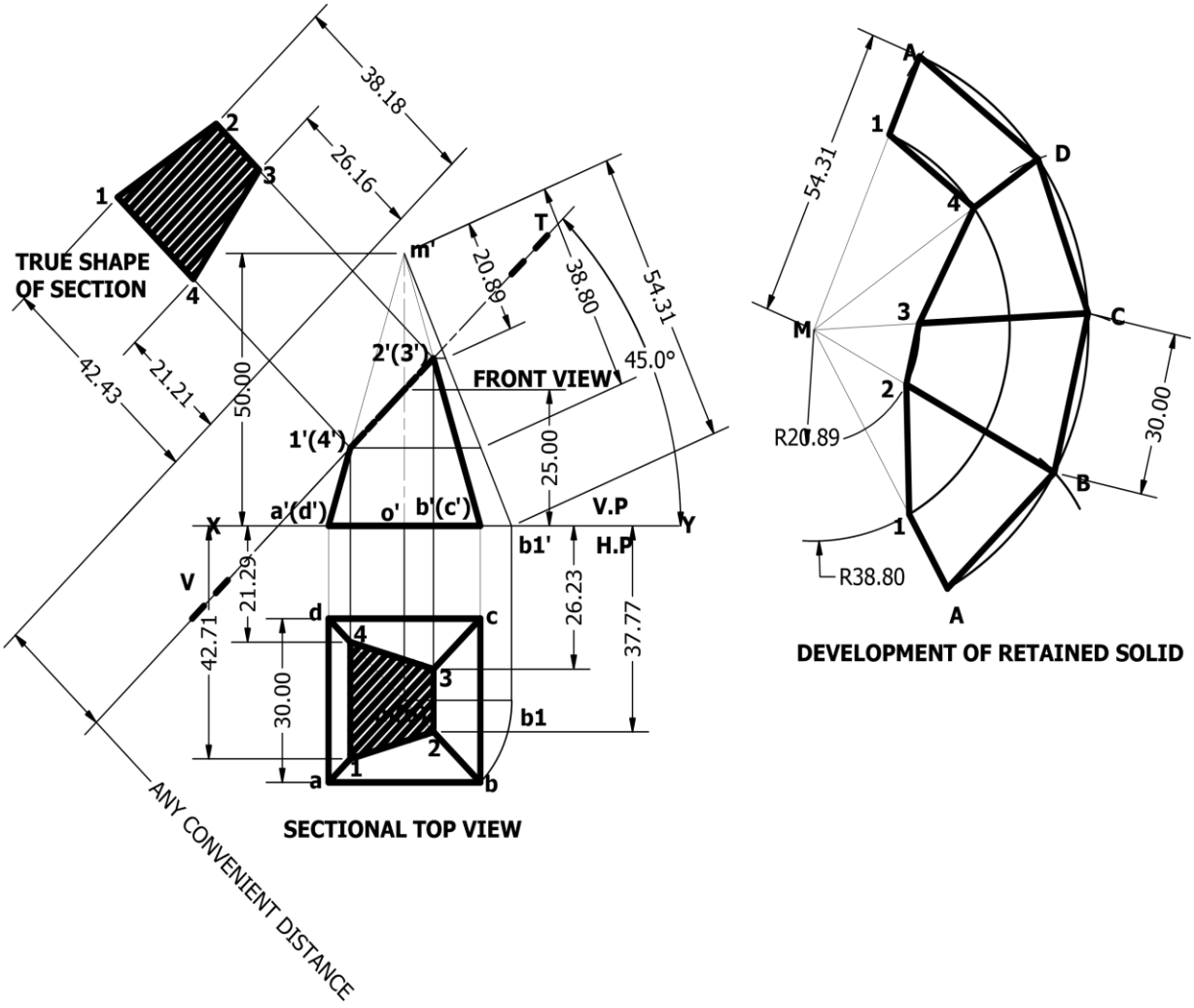


FIGURE 5.1 SECTION AND DEVELOPMENT OF A SQUARE PYRAMID

2. A right circular cone of 40mm diameter and 50mm height is standing on its base on HP. The vertical trace of a section plane perpendicular to VP makes an angle of 45^0 with the reference line and intersects the axis of cone at a distance of 20mm from the vertex. Draw the true shape of the section and the development of lower part of sectioned cone. **(M.Q.2)**

3. A right circular cone of base diameter 60mm is cut by a section plane so that the true shape of the section is a parabola of maximum double ordinate 50mm and vertex of the parabola is 70mm from this ordinate. Draw the front view, sectional top view and true shape of the section. **(JANUARY 2016)**

4. A cylinder of diameter 50mm and length of the axis 65mm rests on its base with the axis perpendicular to the HP.it is cut by the cutting plane perpendicular to the VP, inclined at 45^0 to the HP and passing through a point on axis 25mm from the top. Draw the front view, the sectional top view and the development of the lateral surface of the cylinder. **(MAY/JUNE 2016)**

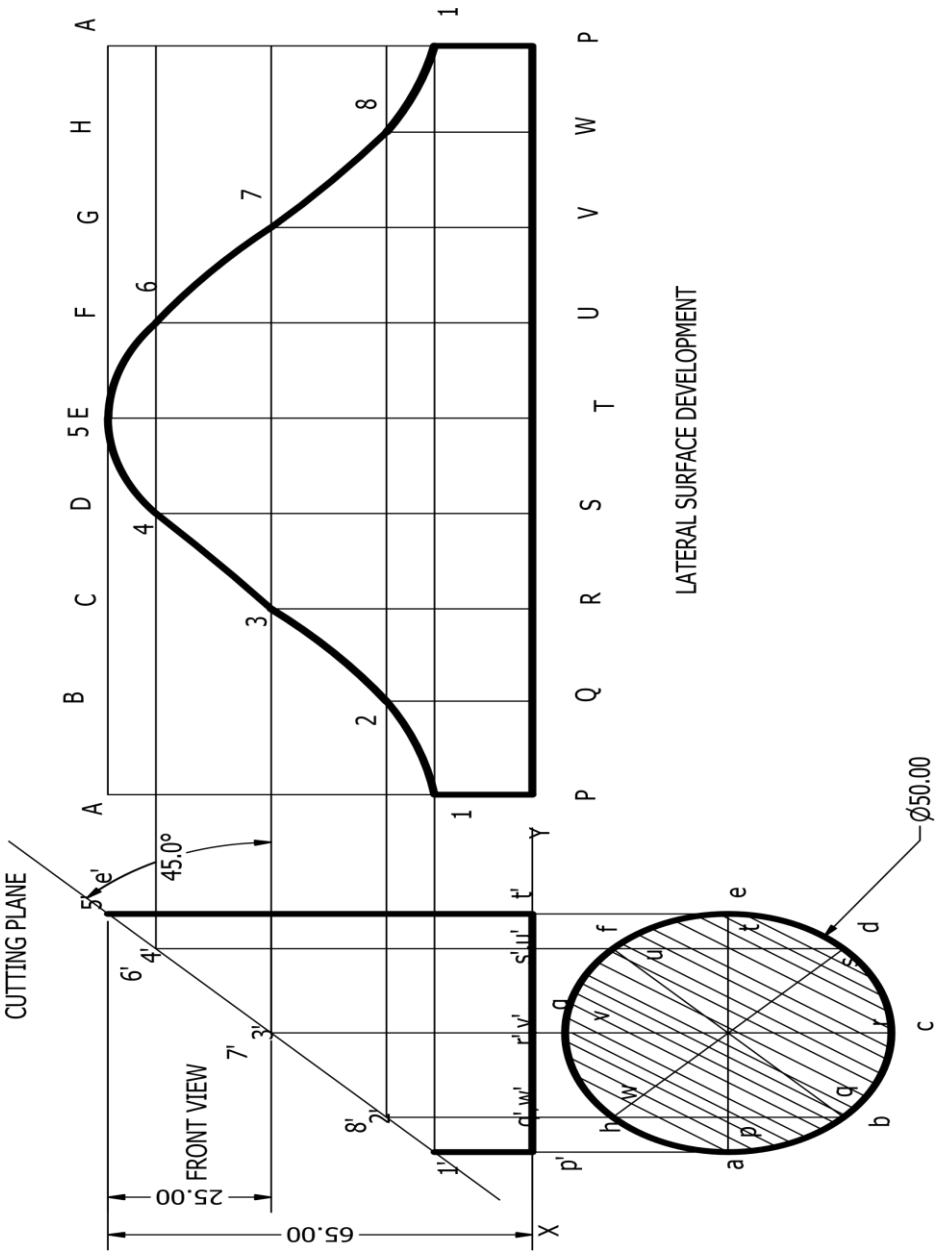


FIGURE 5.4 SECTION AND DEVELOPMENT OF A CYLINDER

5. A cone with 50mm base diameter and 70mm long axis, rests on its base on the HP. Draw the sectional top view and the development of its lateral surface when it is cut by an inclined plane bisecting the axis and inclined at 45^0 to the HP. **(JULY 2016)**

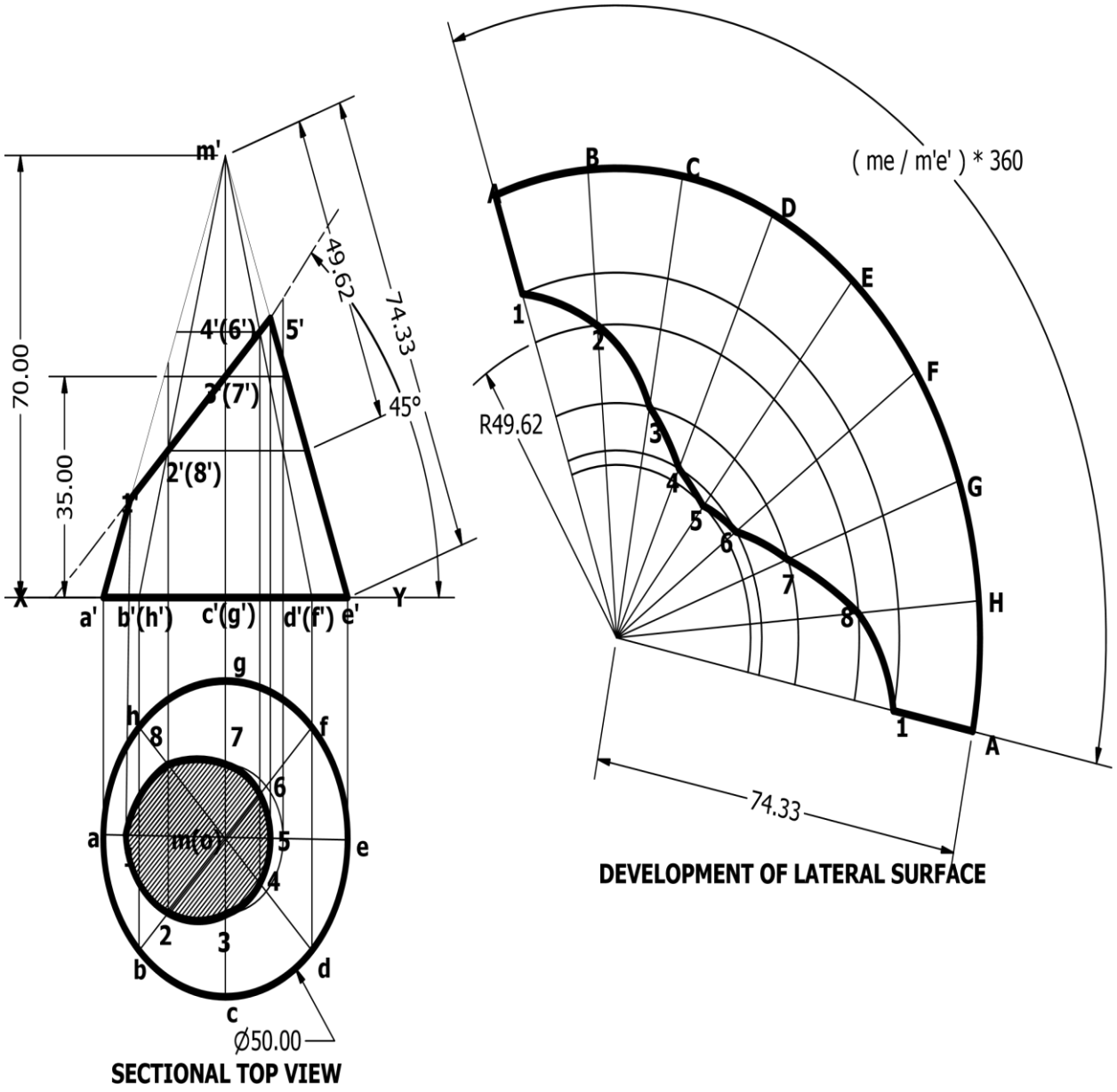


FIGURE 5. SECTION AND DEVELOPMENT OF A CONE

6. A pentagonal prism having a base within a 30mm side and 70mm long axis is resting on its base on HP, such that one of its rectangular faces is parallel to VP.it is cut by an auxiliary inclined plane making an angle of 45^0 with HP and passes through the midpoint of axis. Draw the sectional top view, true shape of the sectional view and development of lateral surface of truncated prism. **(SEPTEMBER 2016)**

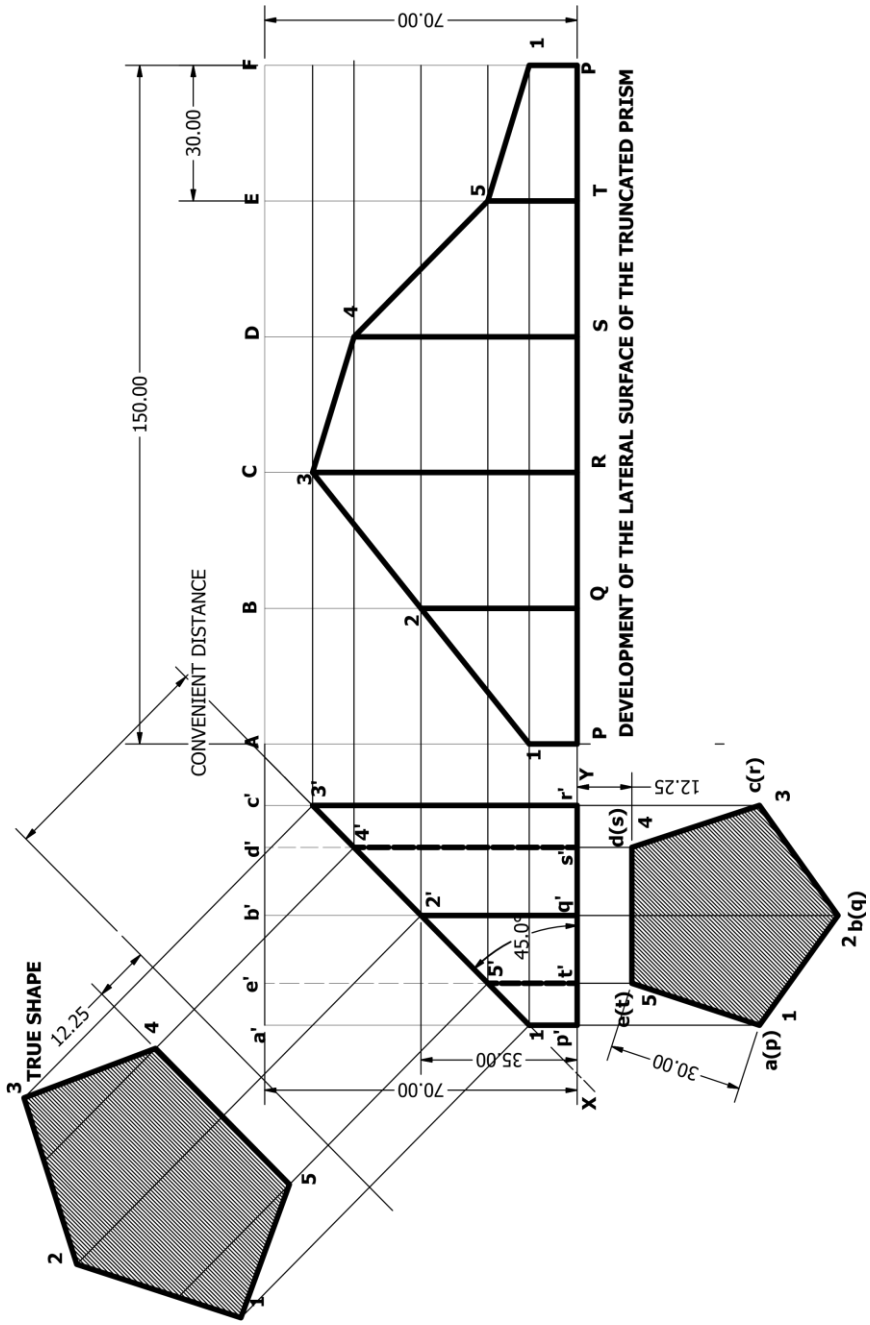
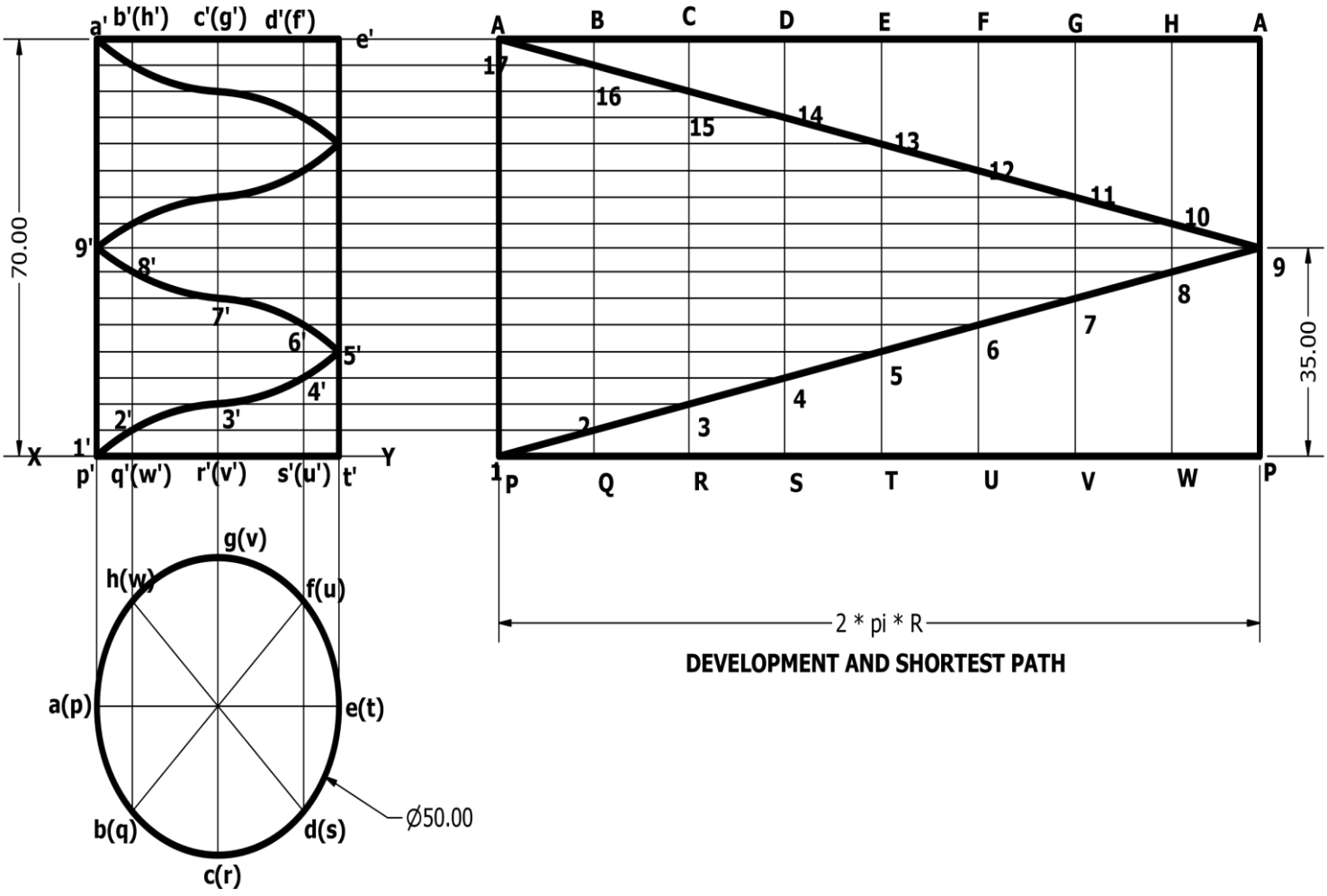


FIGURE 5.6 SECTION AND DEVELOPMENT OF A PENTAGONAL PRISM

7. A right circular cylinder of base diameter 50mm and height 70mm resting upon HP on its base. An insect starts from a point on the base at the bottom, moves around the curved surface of the cylinder and reaches the top after completing two revolutions along the shortest path. Draw the development and sketch the path of the insect in the front view. **(JAN 2017)**

PATH OF INSECT IN FRONT VIEW



8. A cube of 65mm long edges has it vertical faces equally inclined to the VP.it is cut by a section plane perpendicular to the VP so that the true shape of the section is a regular hexagon. Determine the inclination of the cutting plane with HP and draw the sectional top view and true shape. **(MAY 2017)**

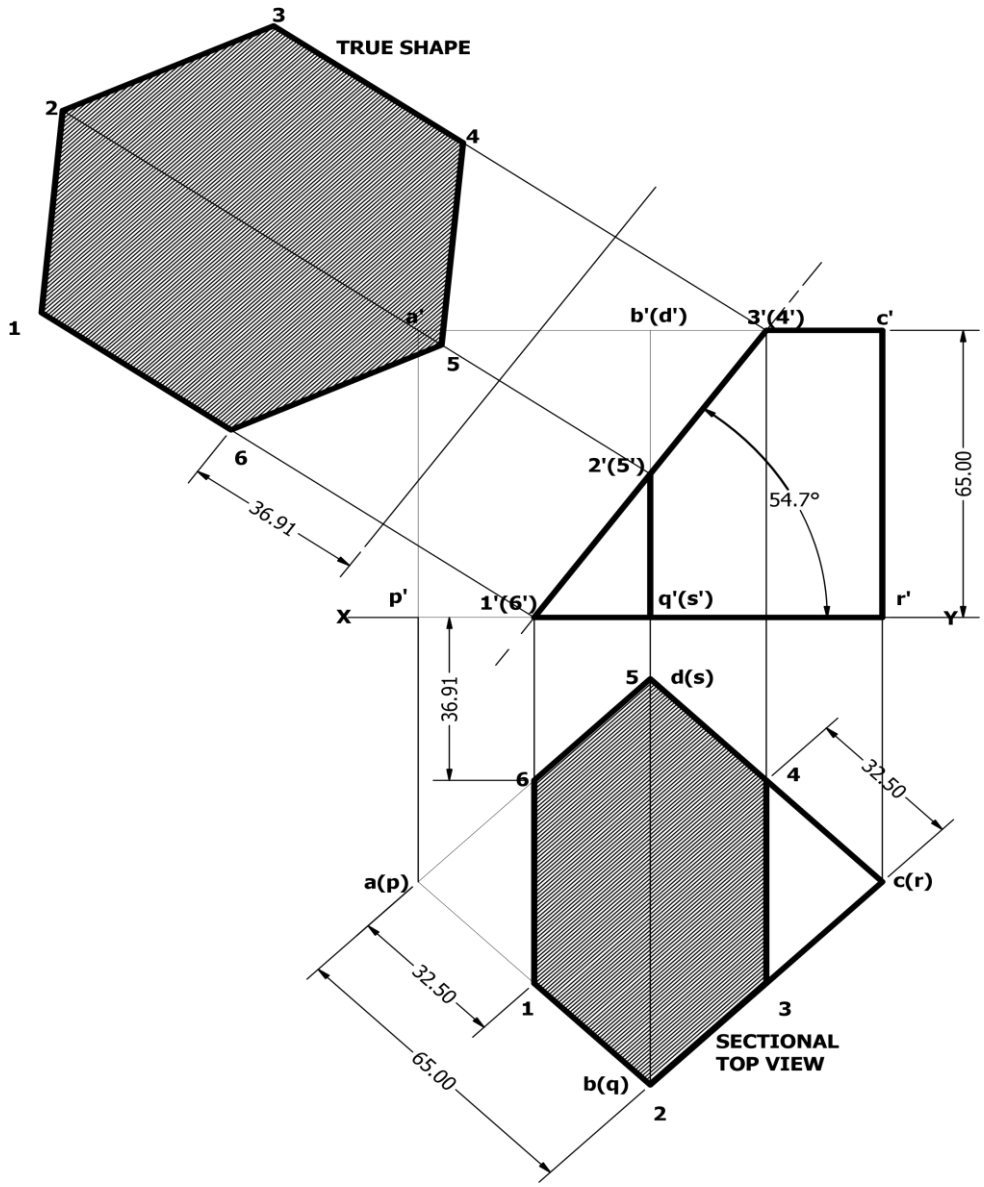


FIGURE 5.8 TRUE SHAPE IS HEXAGON

9. A pentagonal prism having a base within a 30mm side and 70mm long axis is resting on its base on HP, such that one of its rectangular faces is parallel to VP.it is cut by an auxiliary inclined plane making an angle of 45^0 with HP and passes through the midpoint of axis. Draw the sectional top view, true shape of the sectional view and development of lateral surface of truncated prism. **(MAY 2017)**

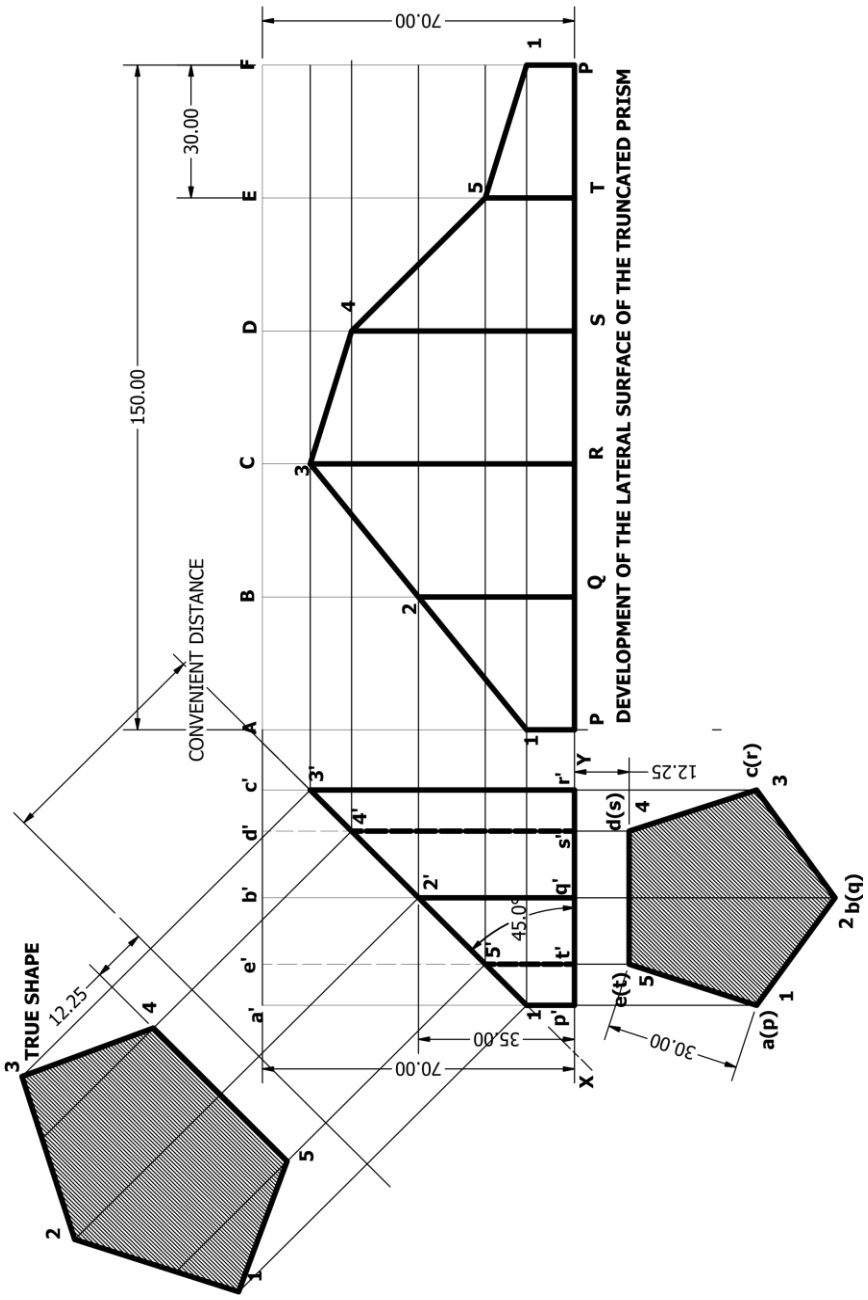


FIGURE 5.9 SECTION AND DEVELOPMENT OF A PENTAGONAL PRISM

MODULE VI A

PERSPECTIVE PROJECTION

1. A rectangular prism 25mm*30mm side and 50mm long is lying on the ground plane on one of its rectangular faces in such a way that one of its end face is parallel to and 10mm behind the picture plane. The central plane is 60mm away from the axis of the prism towards the left. Draw the perspective view of the prism if the station point is located 55mm in front of the picture plane and 40mm above ground plane. The prism is resting on the ground plane on its 50mm*25mm rectangular face. **(DEC 2015)**

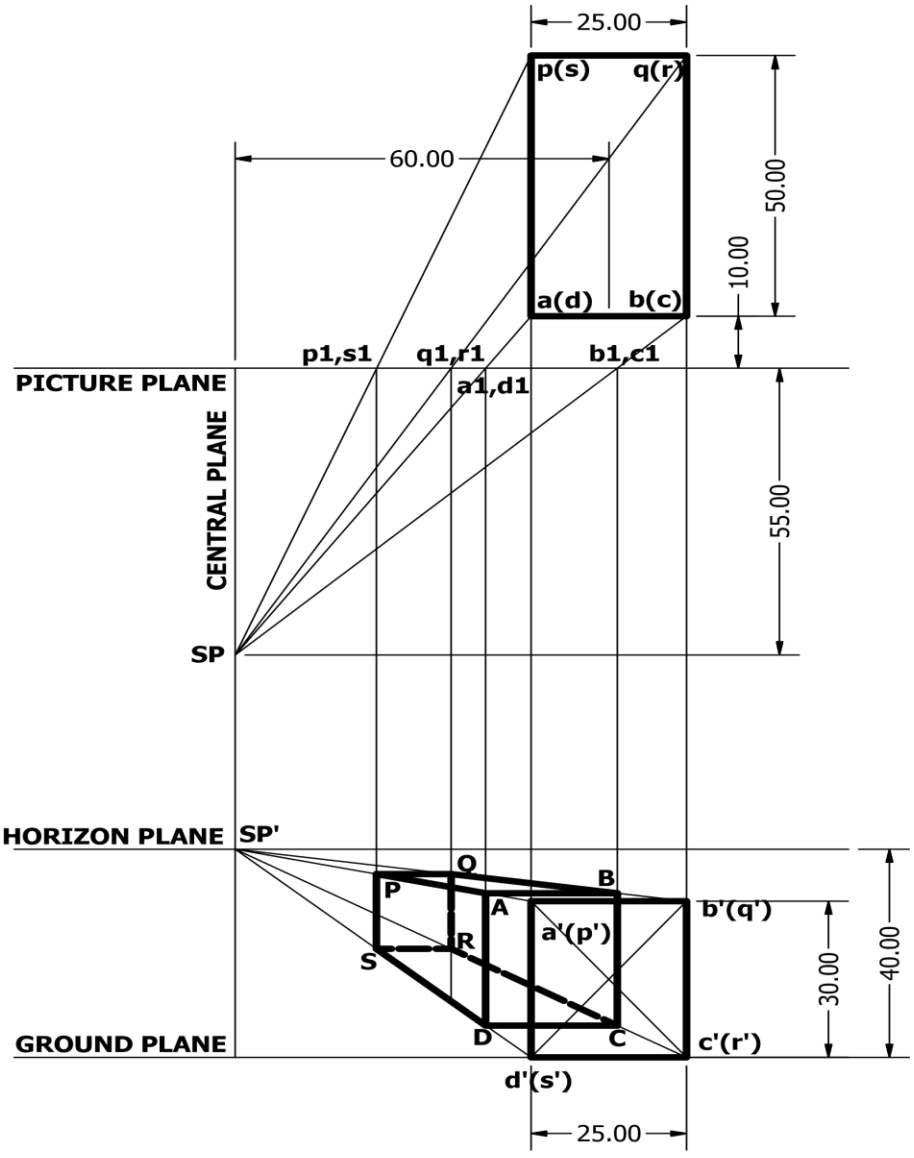


FIGURE 6A.1 SQUARE PRISM

2. A cube of 25mm side is placed vertically with its top face on an auxiliary ground plane, which is at a height of 45mm above the horizon plane. The nearest vertical edge of the cube touches the picture plane and the adjacent square faces of this edge are equally inclined to the picture plane. Draw the perspective view of the cube, if the station point is 70mm in front of the picture plane and lies in a central plane which is 30mm to the right side of the center of the cube. **(JANUARY 2016)**

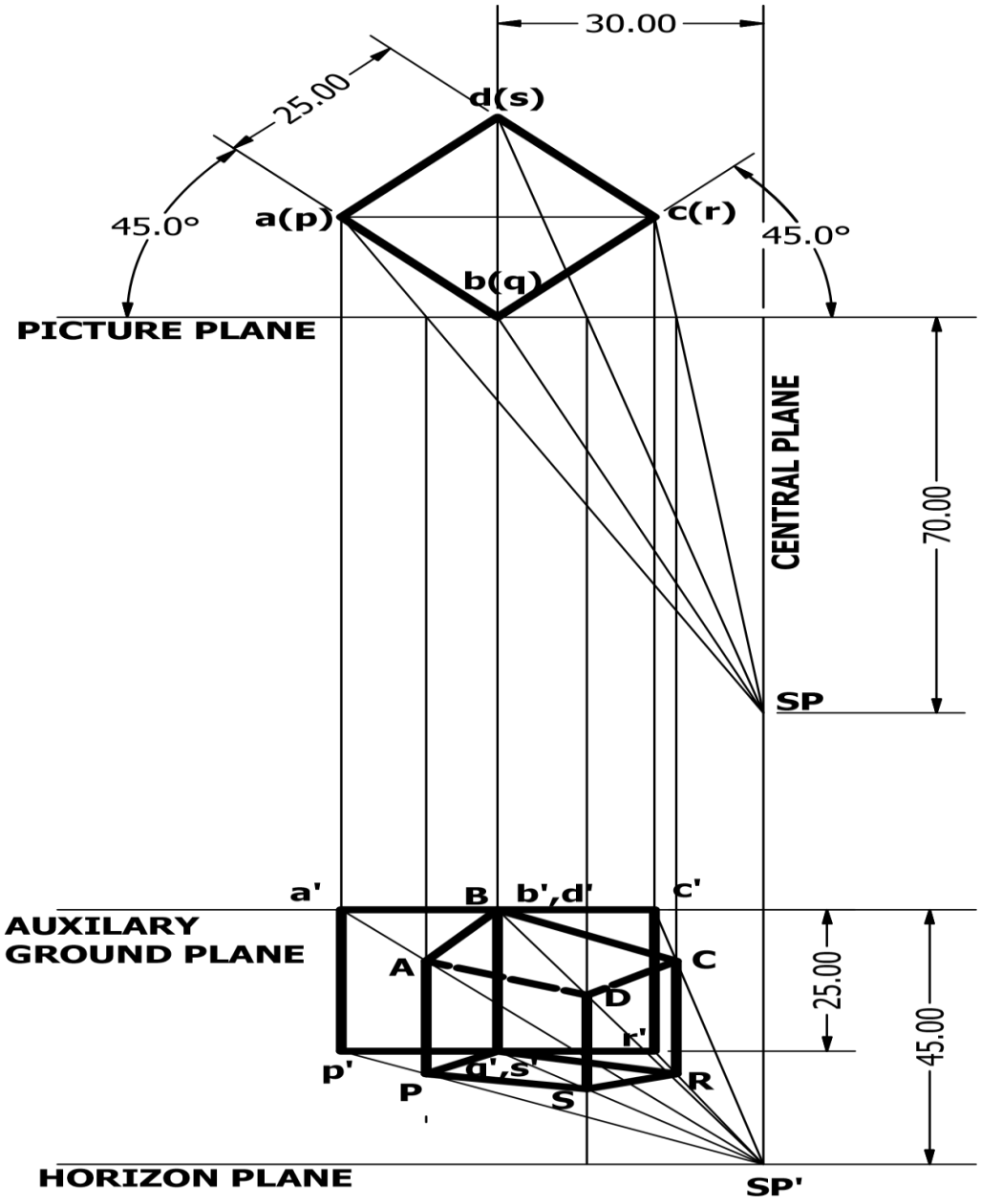


FIGURE 6A.2 CUBE

3. Draw the perspective projection of a pentagonal prism of side 25mm and height 50mm lying on one of its rectangular faces on the ground plane and one pentagonal face touching the picture plane. The station point is 55mm in front of the picture plane and lies in the central plane which is 75mm to the left of the center of the prism. Station point is 30mm above the ground plane. **(MAY/JUNE 2016)**

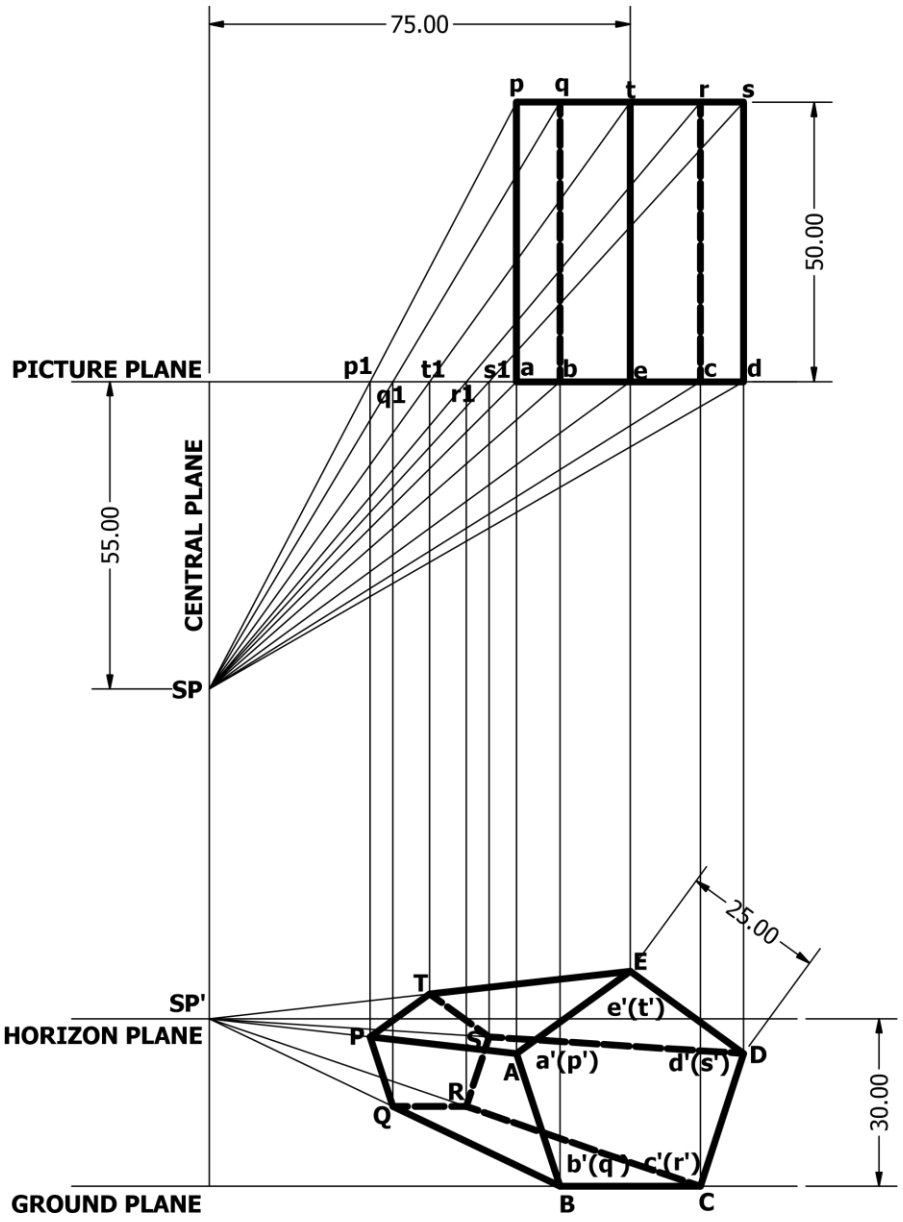


FIGURE 6A.3 PENTAGONAL PRISM

4. A rectangular pyramid base 35mm*45mm and axis 50mm long is resting on its base on the ground plane such that one of its longer edges of base is touching on the picture plane. Draw the perspective view of the pyramid, if the station point is 60mm in front of picture plane 35mm above ground plane and in the central plane which is 50mm to the left of the axis of the pyramid. **(JANUARY 2017)**

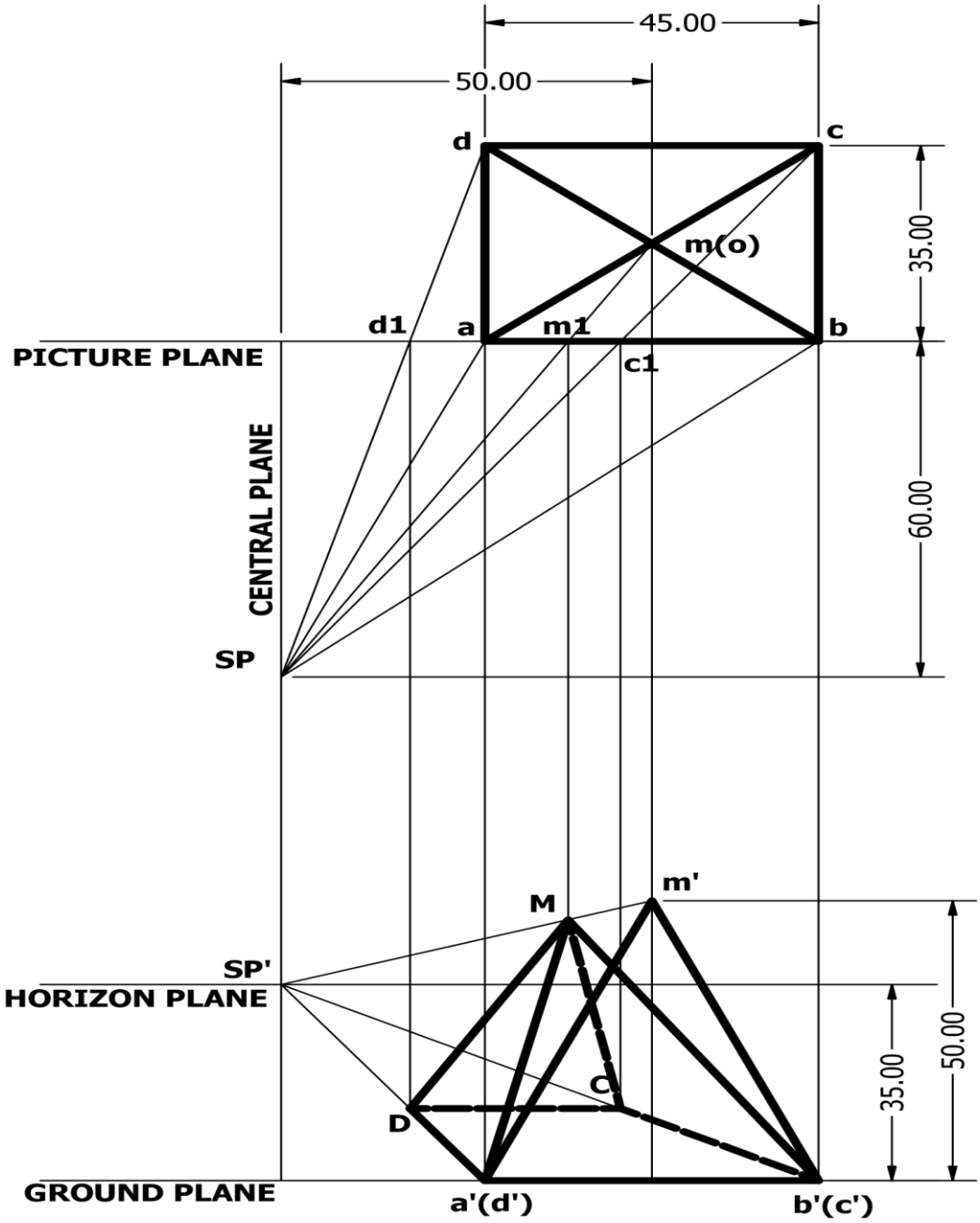


FIGURE 6A.4 RECTANGULAR PYRAMID

5. A square pyramid 40mm base edge and height 80mm is resting on its base on the ground plane with one base edge 45^0 inclined to PP which is 30mm in front of the object. The station point is 50mm in front of the PP, 100mm above the ground plane and lies in a vertical plane which is 40mm towards right of center of the pyramid. Draw the perspective view of the block. **(MAY 2017)**

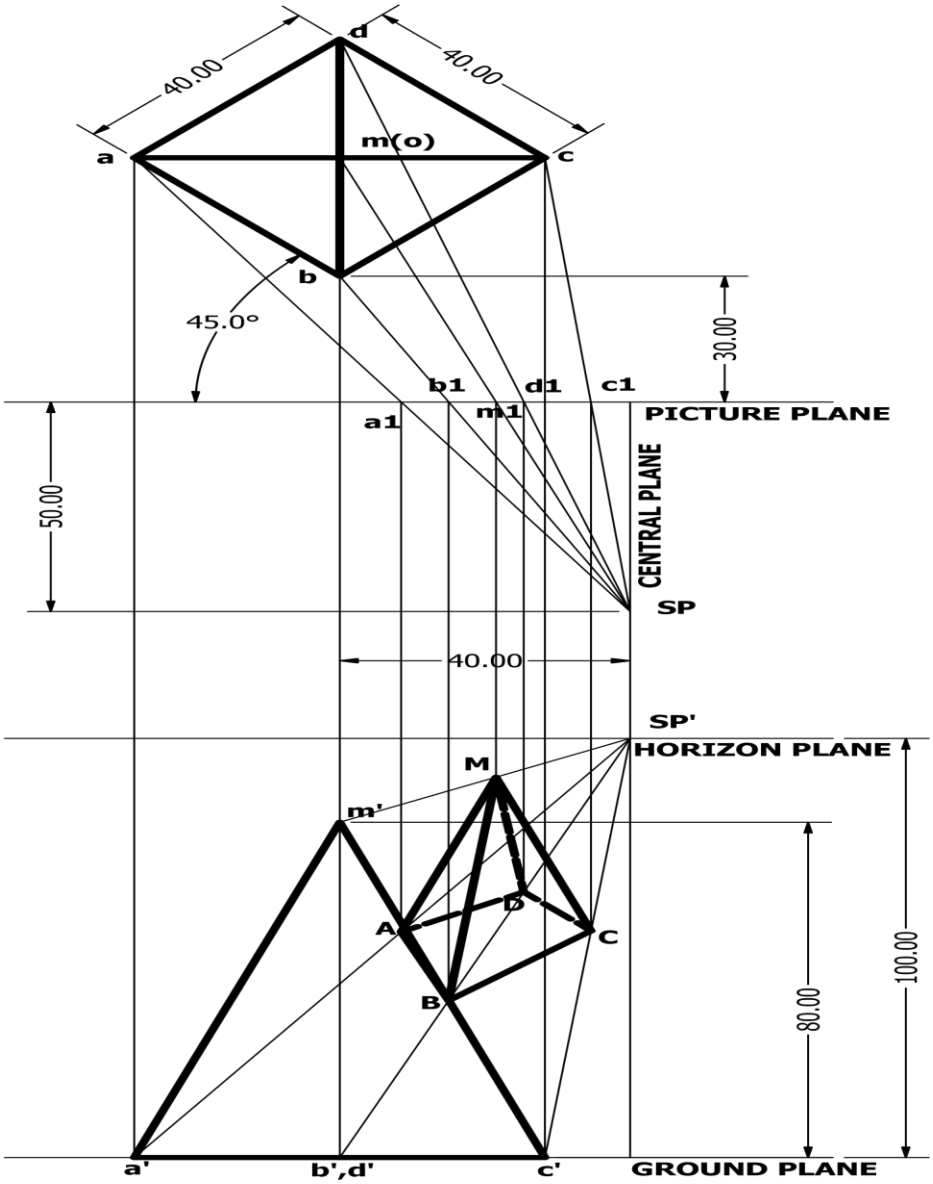


FIGURE 6A.5 SQUARE PYRAMID

MODULE VI B

INTERSECTION OF SURFACES

1. A square prism of base side 60mm rests on one of its ends on HP with the base sides equally inclined to the VP.it is penetrated fully by another square prism of base side 45mm with the base side equally inclined to the HP. The axes intersect at right angles. The axis of the penetrating prism is parallel to both HP and VP. Draw the projections of the prisms and show the lines of intersection. Assume suitable height for the prisms.

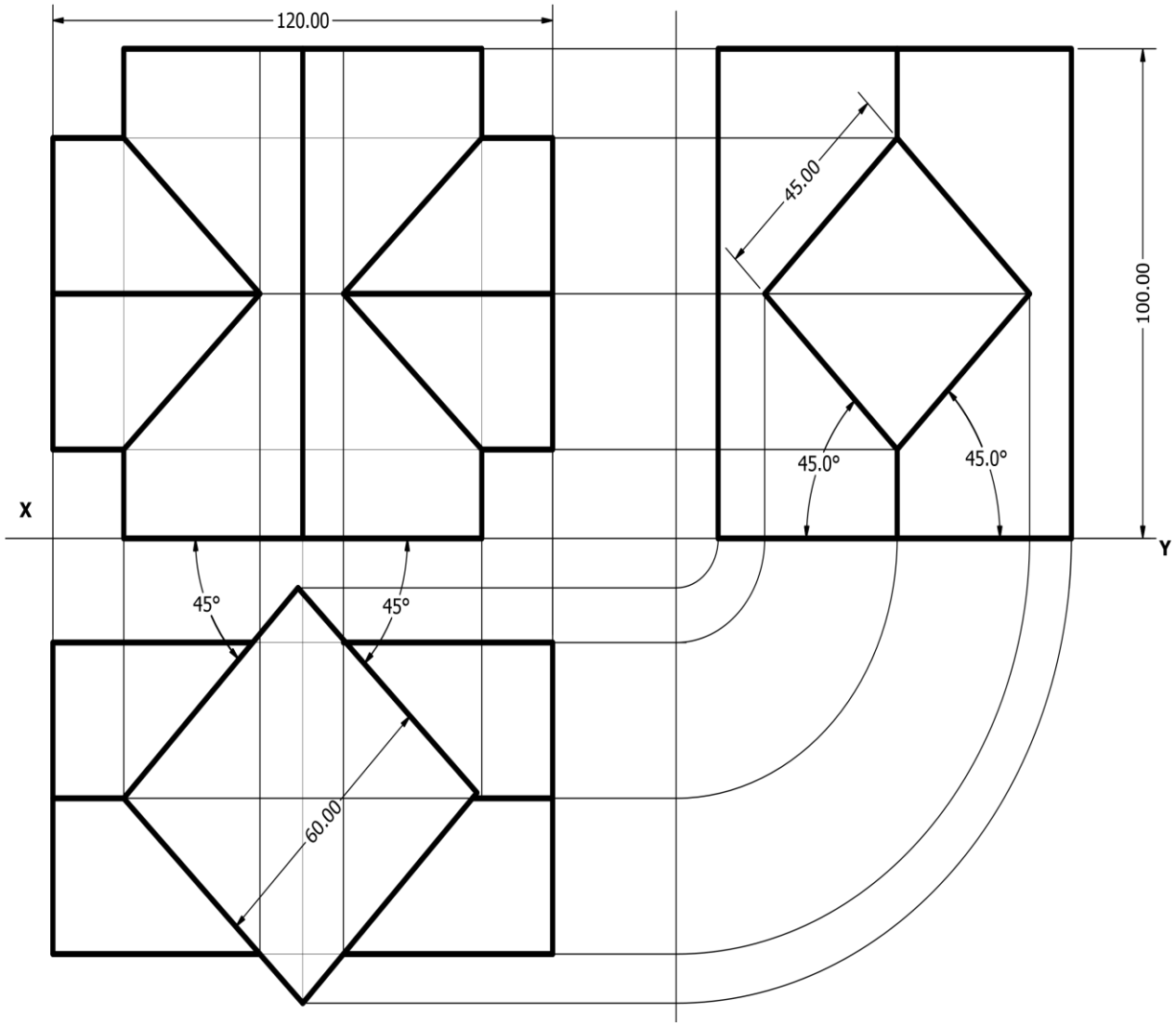


FIGURE 6B.1 SQUARE PRISM IN SQUARE PRISM

2. A square prism having base with 50mm side is resting on its base on the HP.it is completely penetrated by another square prism having base with a 40mm side such that the axes of both the prisms intersect each other at right angles and faces of both the prisms are equally inclined to VP. Draw the projections of the combination and show the lines of intersection.

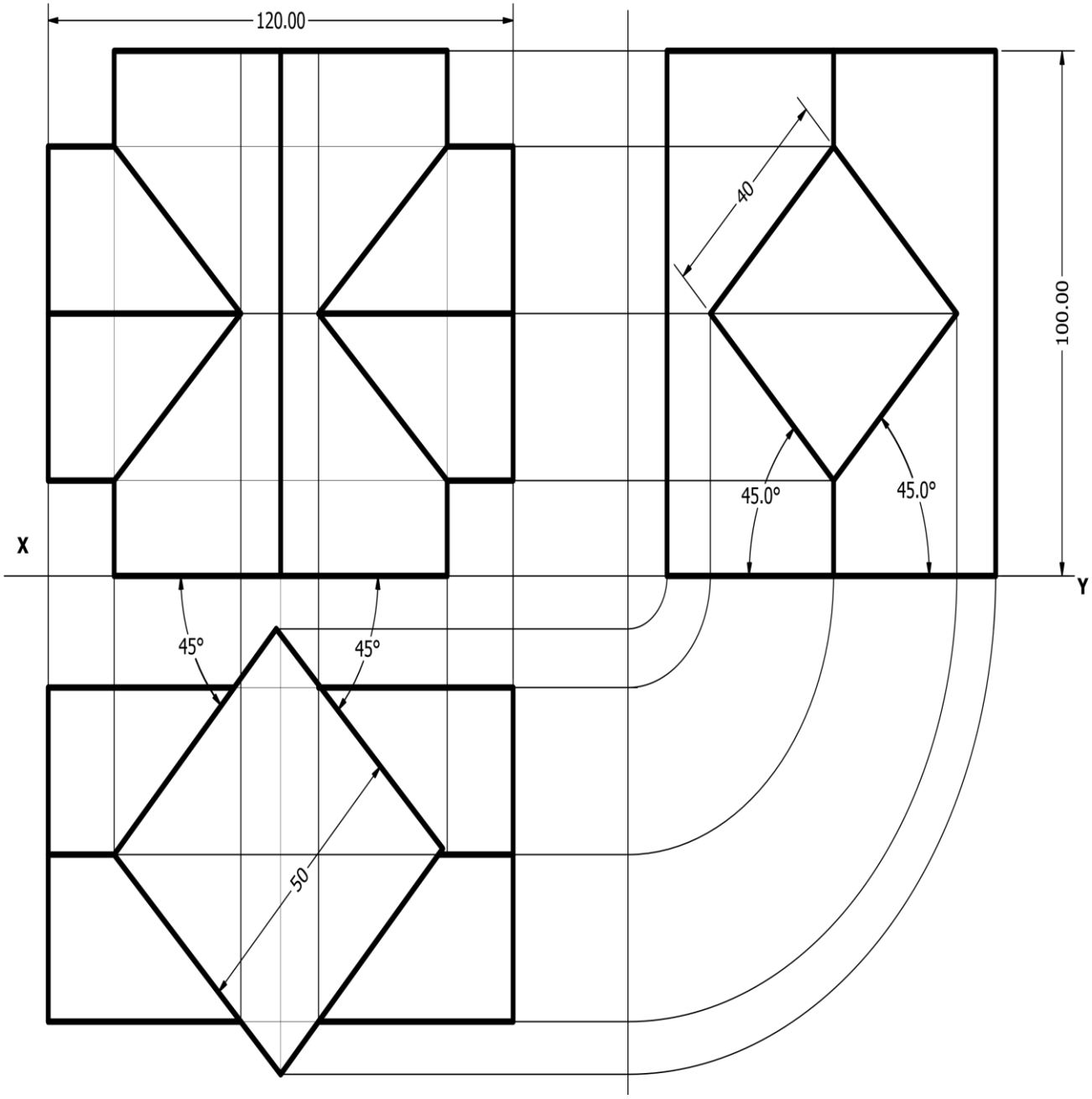


FIGURE 6B.2 SQUARE PRISM IN SQUARE PRISM

3. A horizontal cylinder of 50mm diameter and 100mm long penetrates a vertical cylinder of 80mm diameter and 120mm long resting on HP. The axis of horizontal cylinder is parallel to VP and 60mm above HP. Draw the projections showing the curve of intersection.

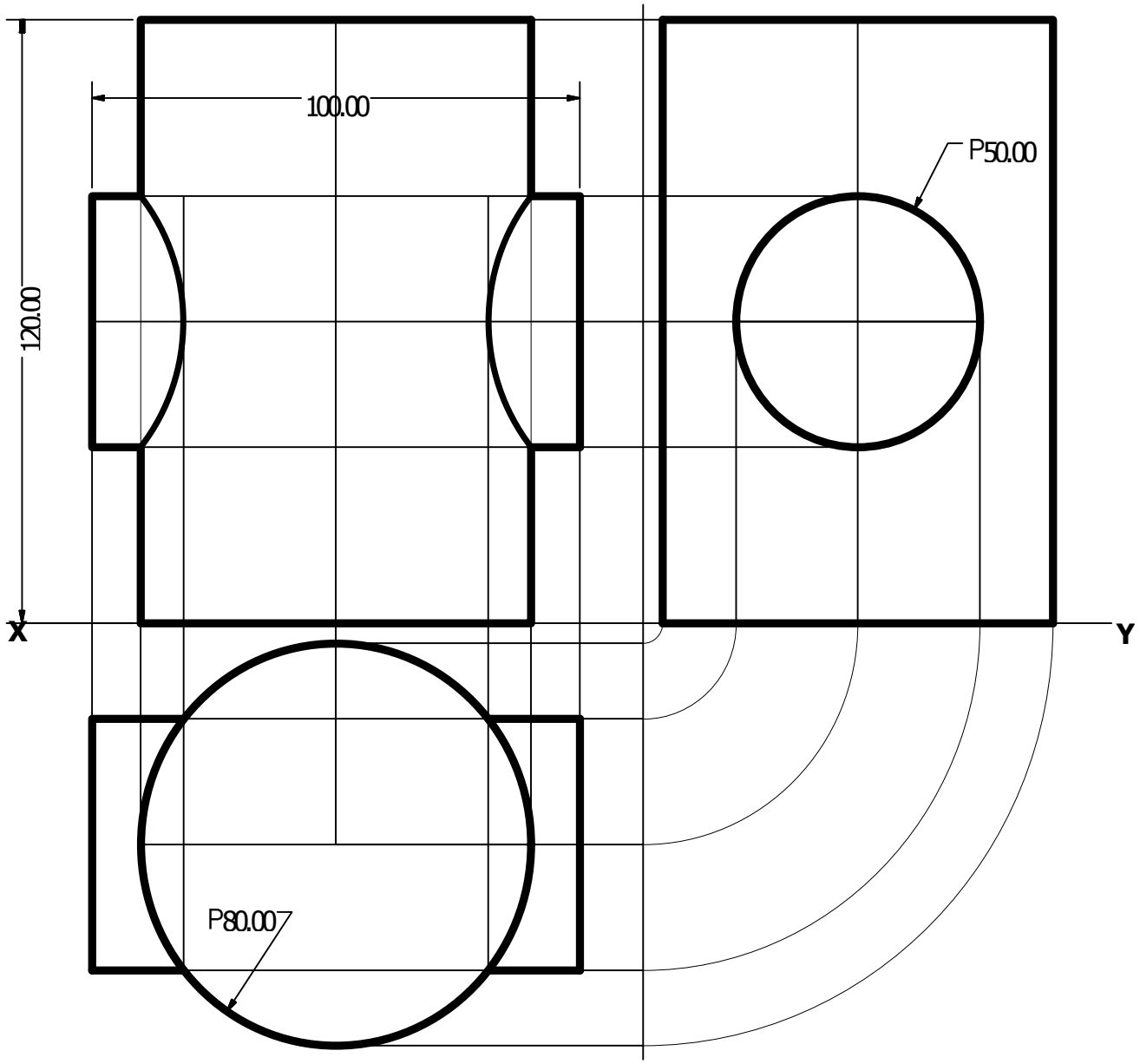


FIGURE 6B.3 CYLINDER IN CYLINDER

4. A vertical cylinder of 60mm diameter has a circular hole of 30mm side cut through the center of the cylinder. The axis of the hole is horizontal and 8mm from the axis of the cylinder. Draw the projection showing the curve of intersection of the hole. The axis of the hole is parallel to VP. Assume suitable height for the prism.

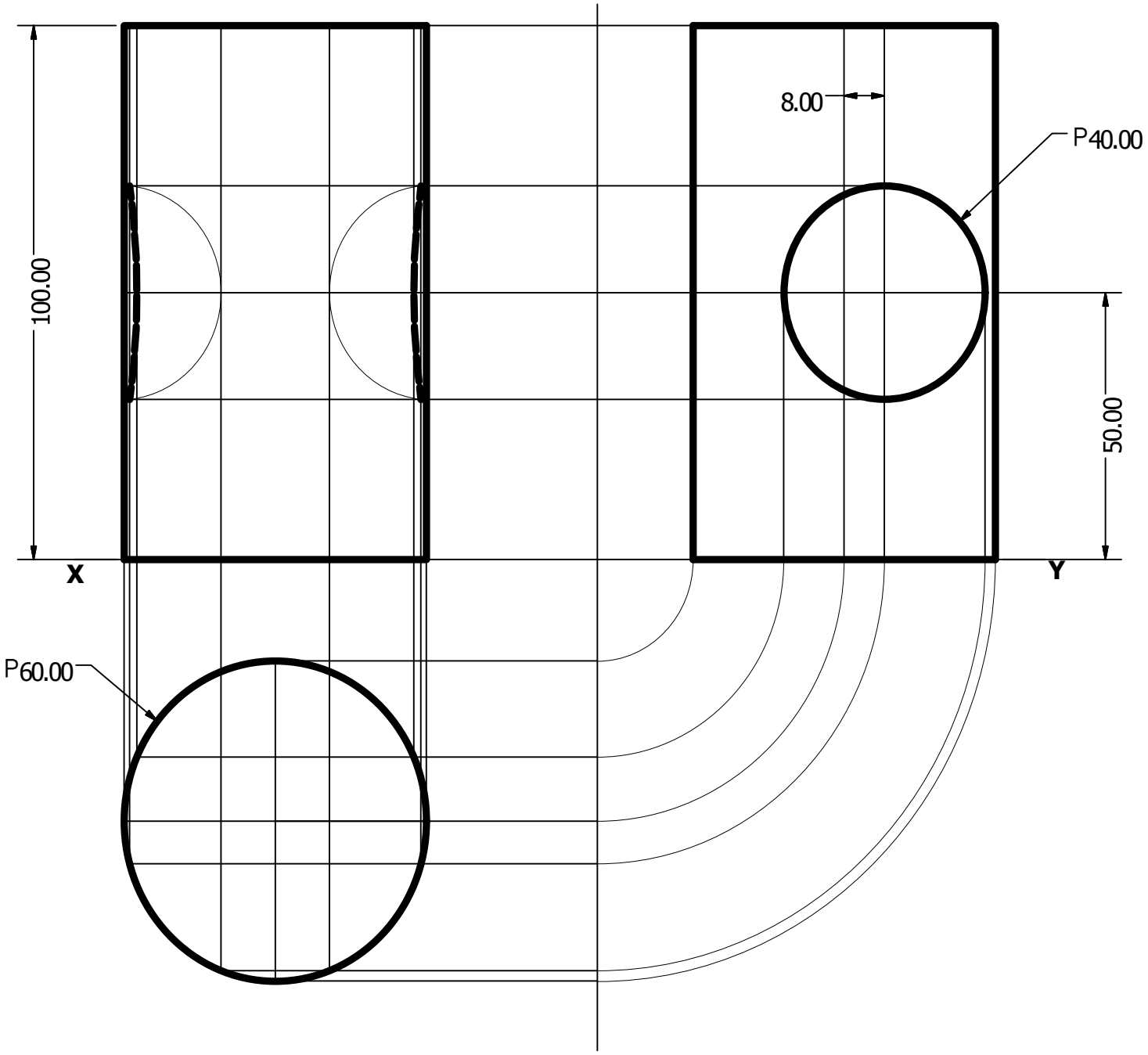


FIGURE 6B.4 CYLINDER IN CYLINDER