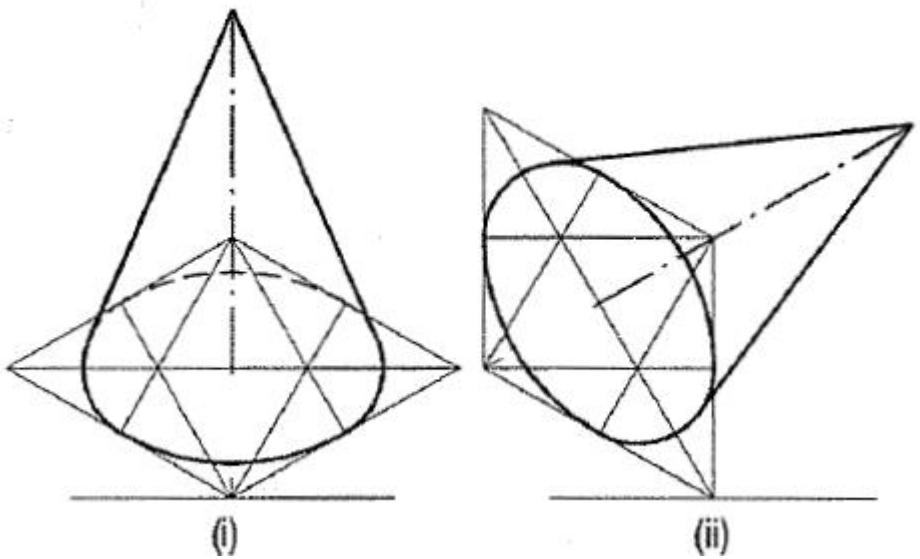
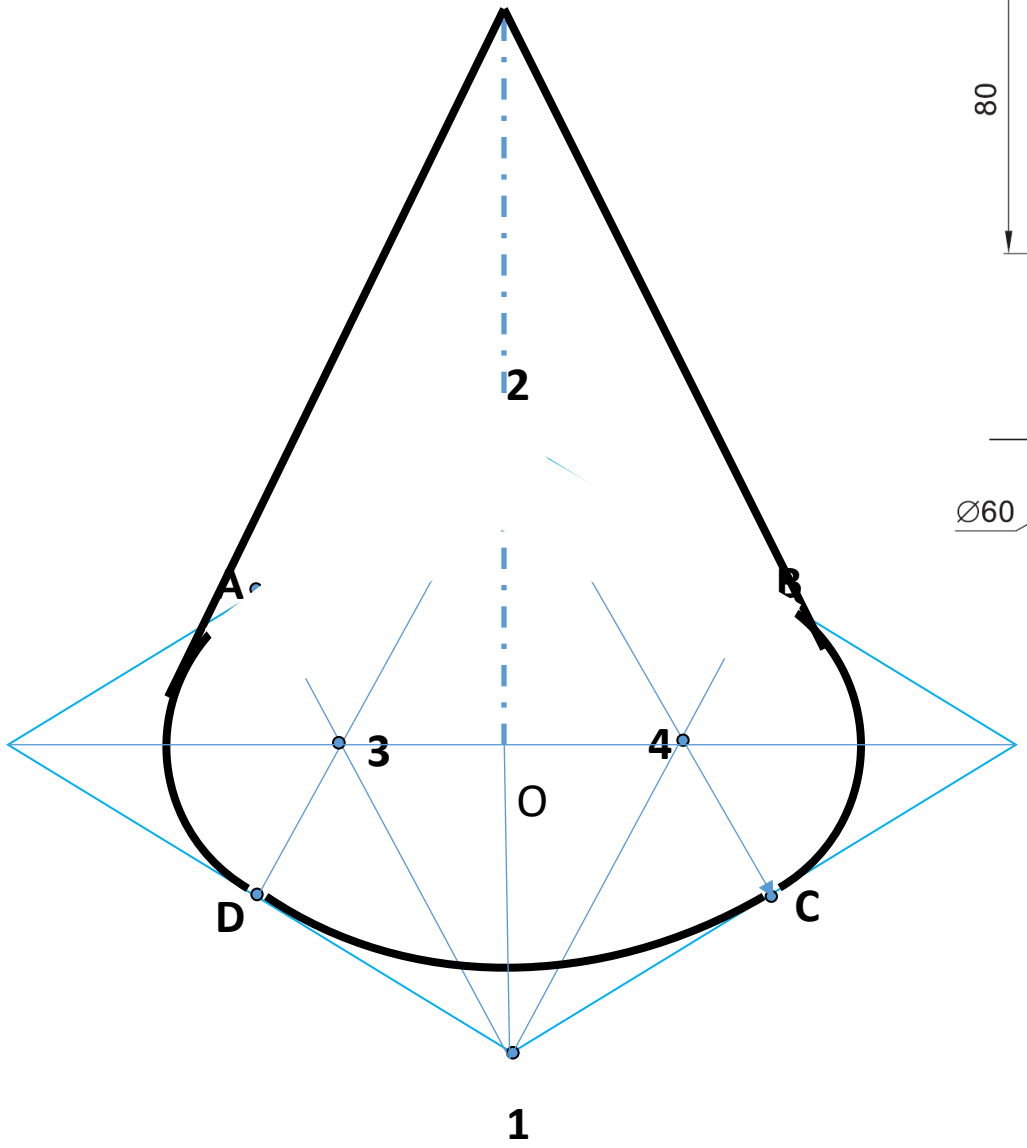
Orthographic to isometric

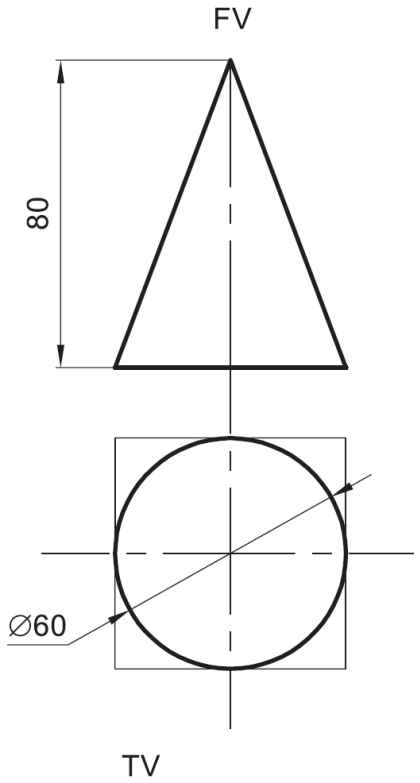
Draw the isometric view of a cone, base 60 mm diameter

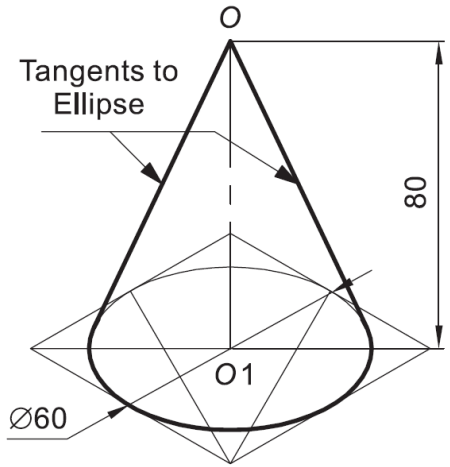
and axis 80 mm long (i) when its axis is vertical and (ii) when its axis is horizontal.



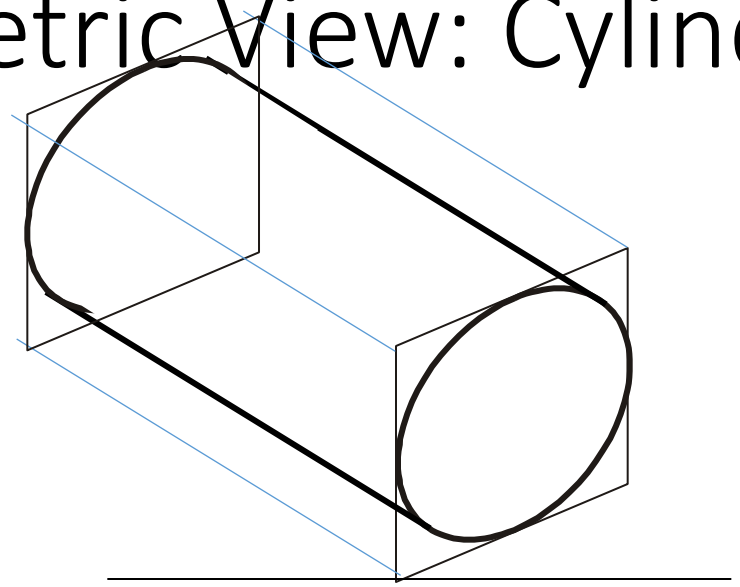
Isometric View: Cone



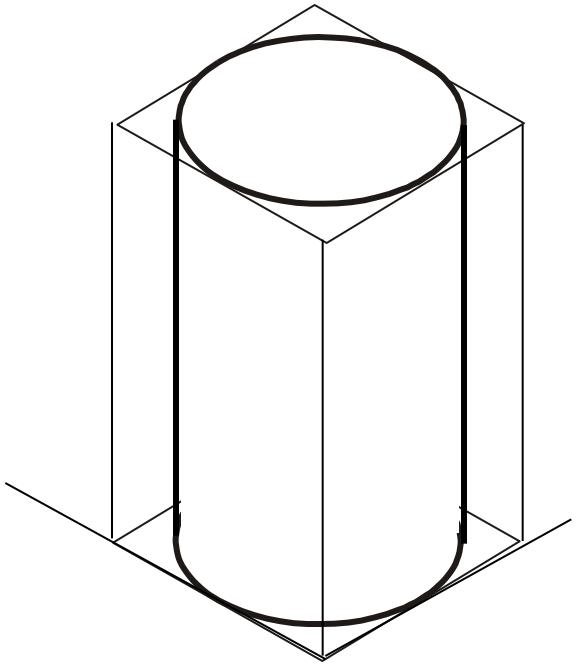




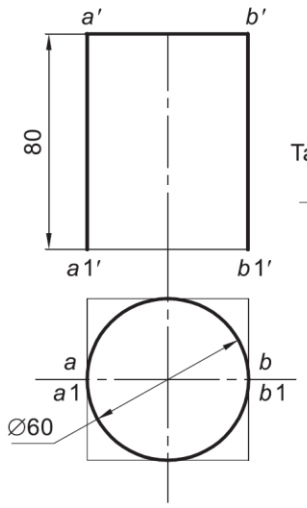
Isometric View: Cylinder

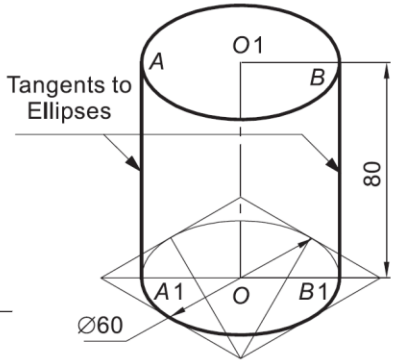


CYLINDER STANDING ON H.P.

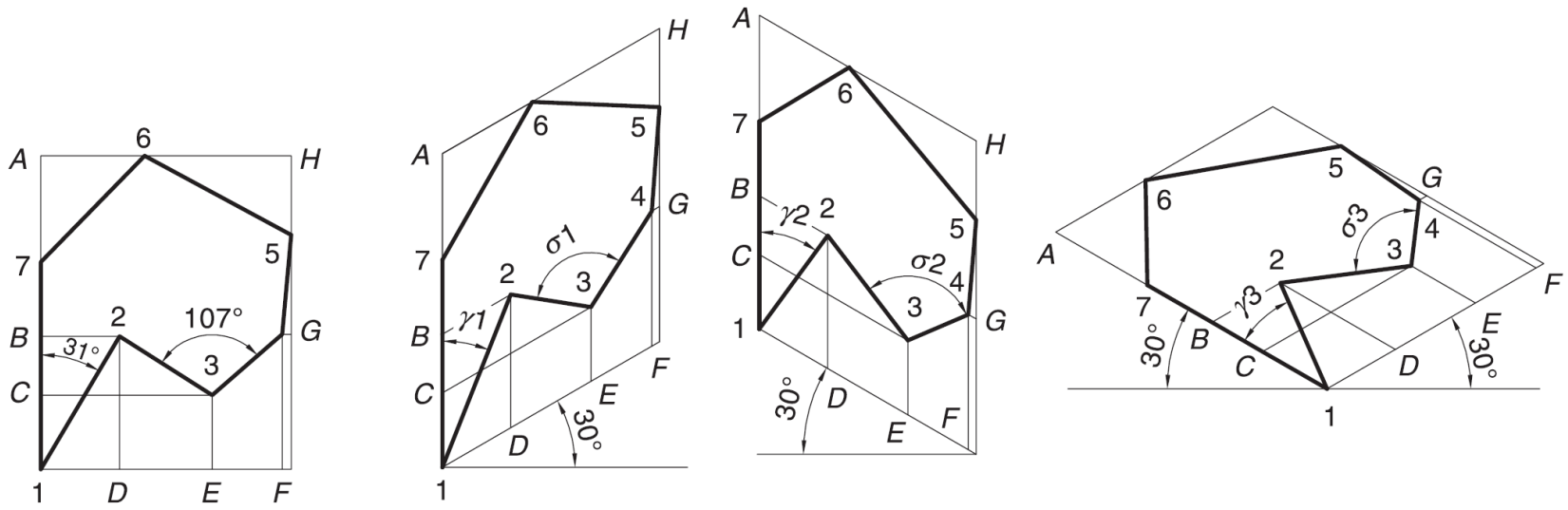


CYLINDER LYING ON H.P.





Isometric View: Irregular Shape



The isolines *B*–2, *D*–2, *C*–3, *E*–3, *G*–4, *F*–4, *H*–5, *H*–6 and *A*–7 has the same length as in original shape, e.g., *B*–2 in isometric = *B*–2 in irregular shape.

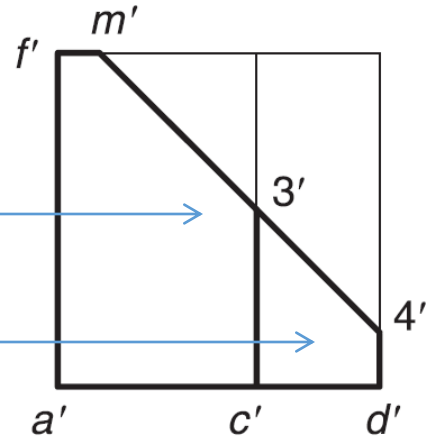
1. Non-isometric line can be located by its end points.

2. Similarly, an angle in orthographic view is never seen in its isometric.

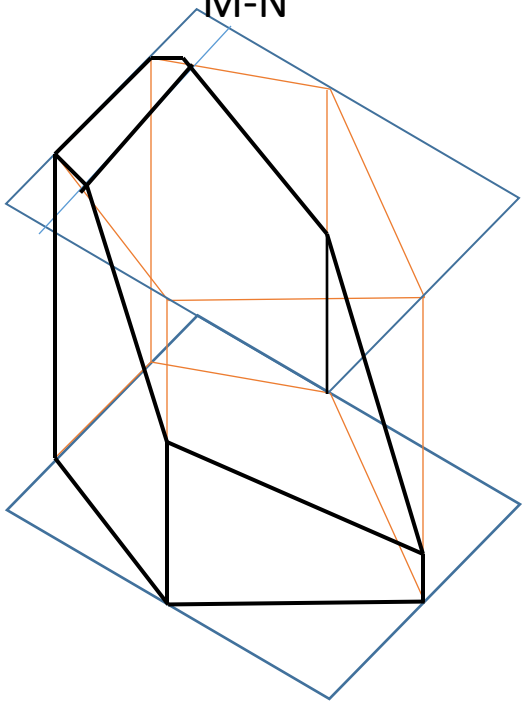
Solids with Non-Isometric Faces

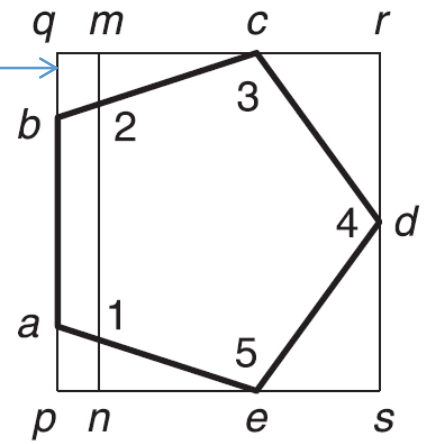
•C-3=E-5=c’-3’

• D-4=d’-4’



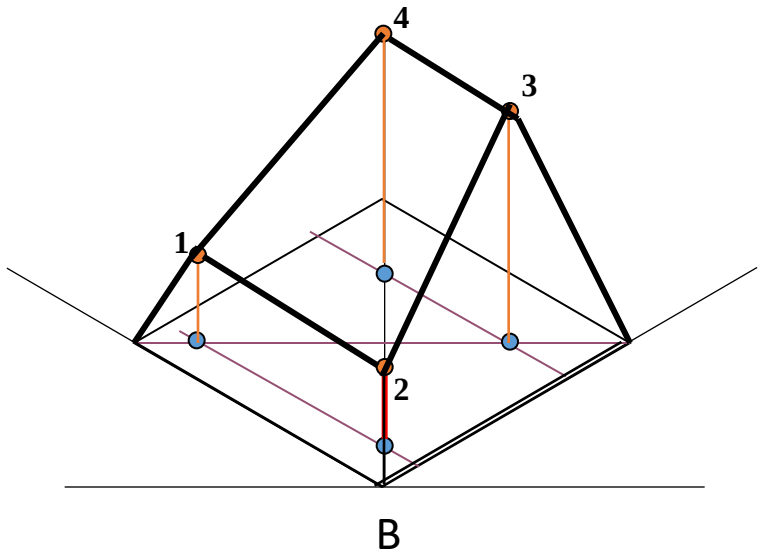
M-N

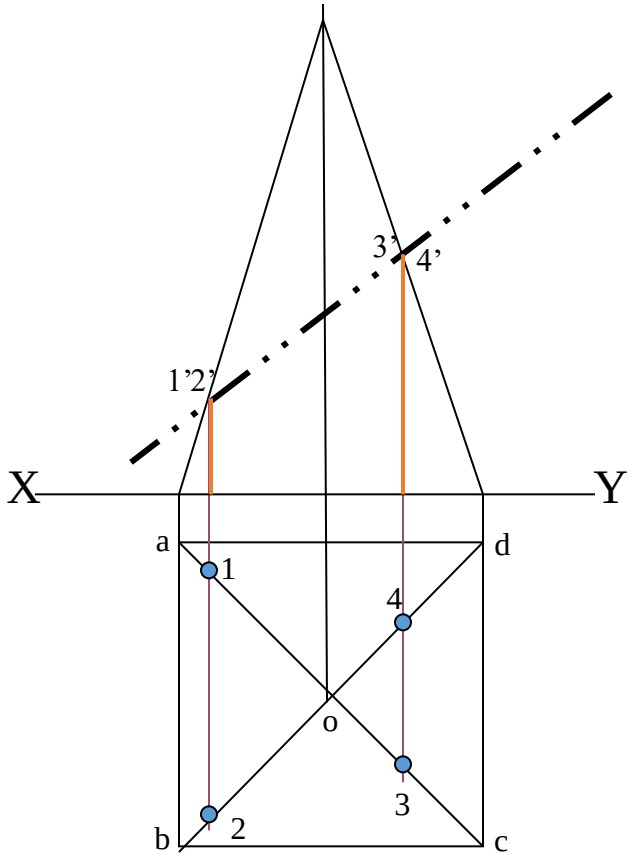




Solids with Non-Isometric Faces

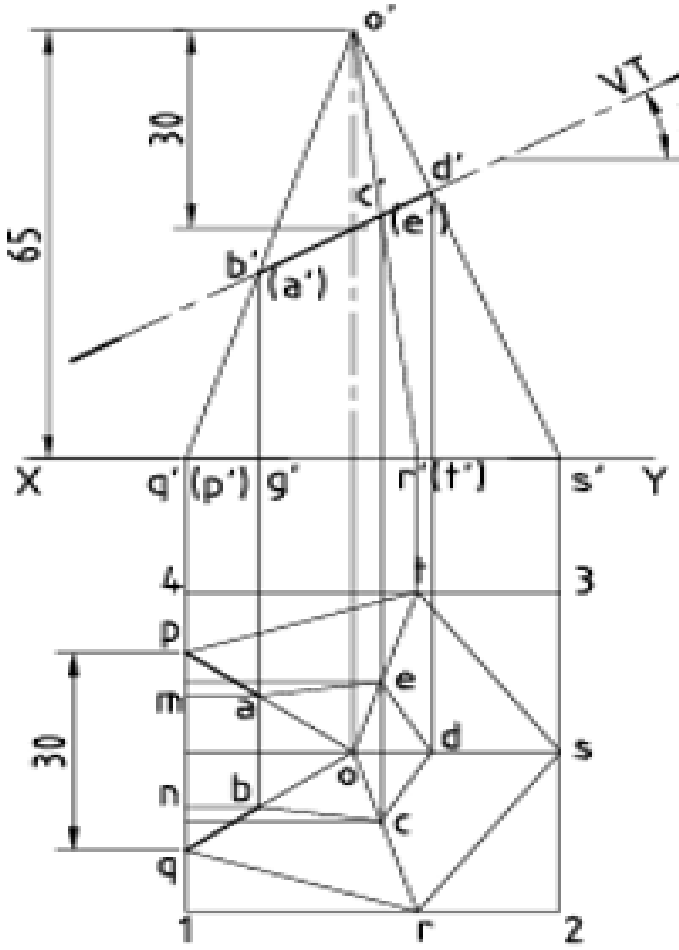
A SQUARE PYRAMID OF 40 MM BASE SIDES AND 60 MM AXIS IS CUT BY AN INCLINED SECTION PLANE THROUGH THE MID POINT OF AXIS AS SHOWN. DRAW ISOMETRIC VIEW OF SECTION OF PYRAMID.



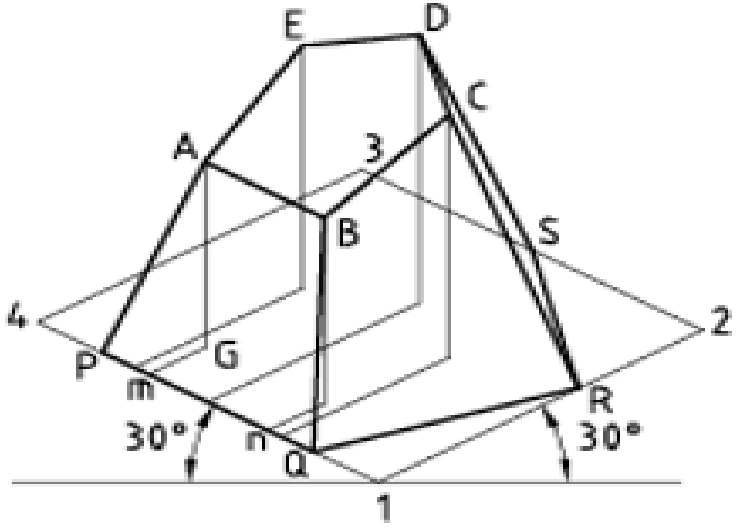


A pentagonal pyramid of base side 30 mm and axis length 65 mm is resting on HP on its base with a side of base perpendicular to VP. It is cut by a plane inclined at 30° to HP and perpendicular to VP and passes through a point at a distance 30 mm from the apex. Draw the isometric view of the remaining portion of the pyramid.

- Draw TV, FV of pyramid and cutting plane at 30° to XY.
- Draw a rectangle to enclose base of pyramid in TV and rhombus in isometric to mark base corners.
- Produce a new corner to touch the side of rectangle like m, then mark it on the sides of rhombus.
- Draw a line from m parallel to an isometric axes.
- Measure the horizontal distance from TV and mark in isometric, similarly get other new points in isometric.
- Darken the visible edges to complete the isometric view.

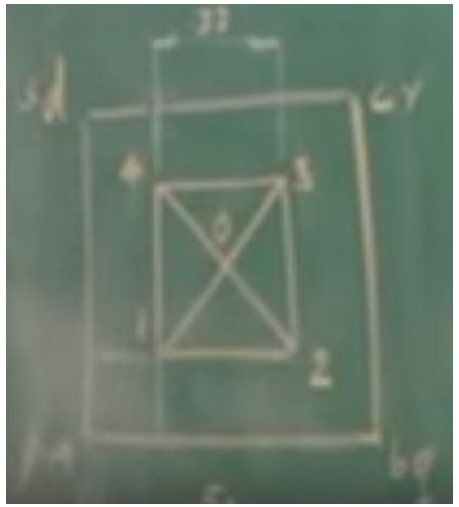

o'
VT
30°
30
65
c'
d'
(e')
b'
(a')
X
q'
(p')
g'
r'
(t')
s'
Y
4
3
p
e
m
a
d
s
30
o
n
b
c
q
1
r
2

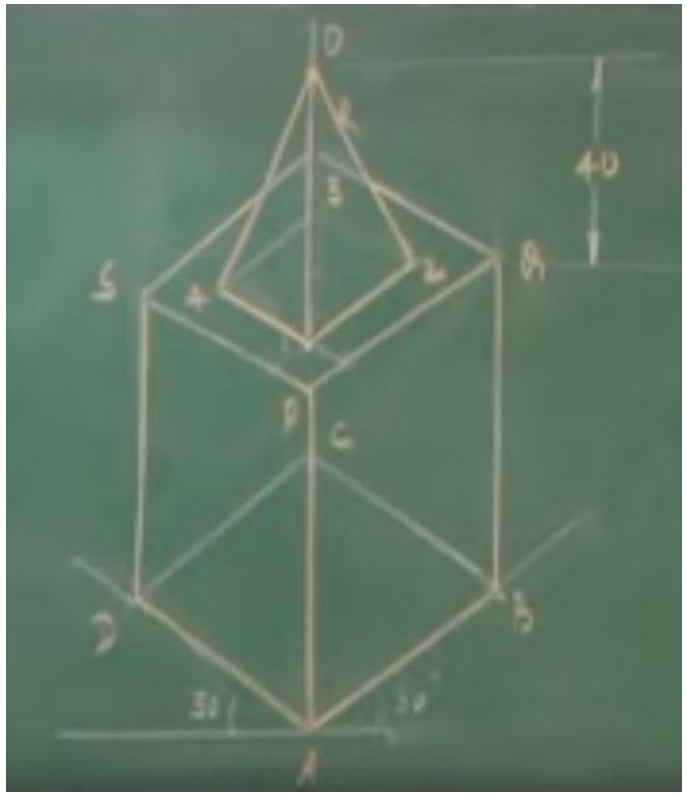
(i)


E
D
C
A
3
B
S
4
2
P
G
m
R
30°
30°
n
Q
1

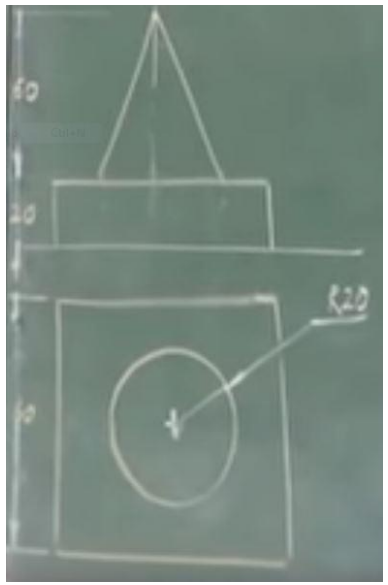
(ii)

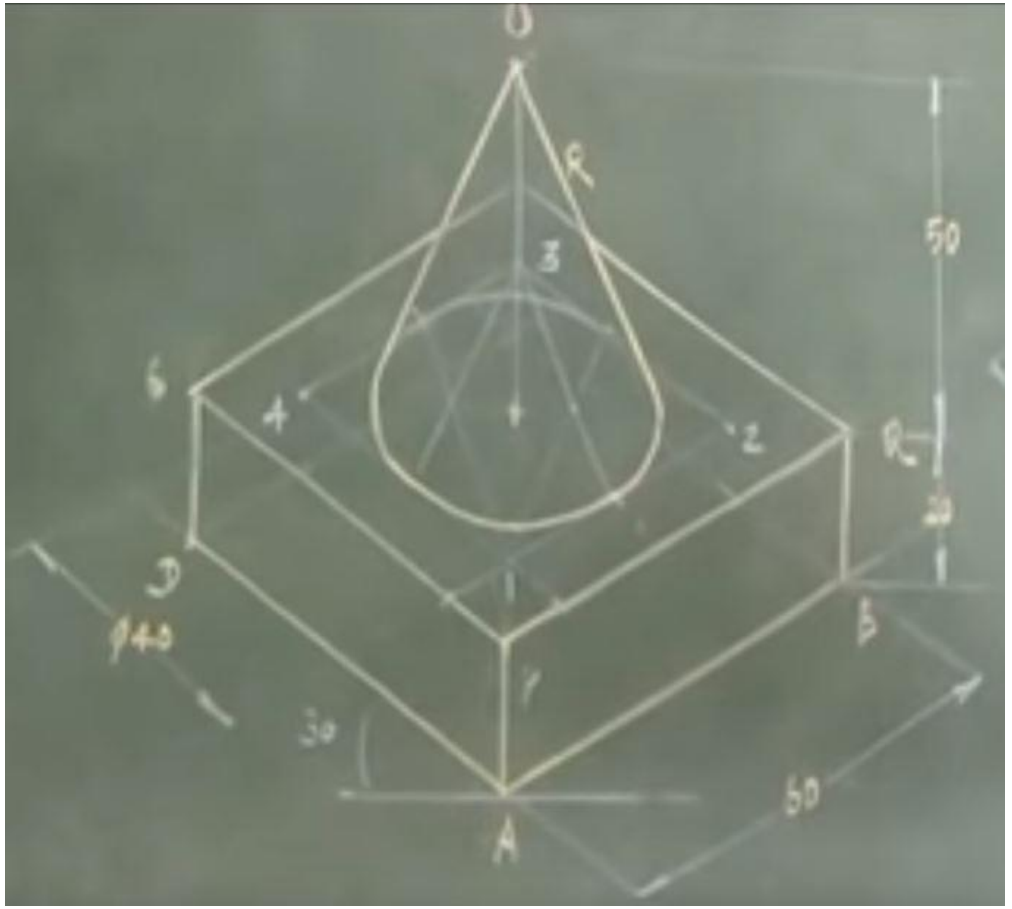
Draw the isometric view of a square pyramid of base 30 mm and height 40 mm which is resting at centre on top of a square prism of base side 50 mm and height 60 mm. Note that the square prism is resting on H.P.



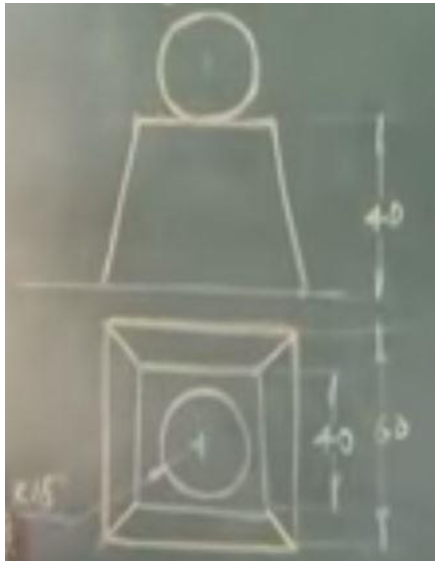

D
40
S
A
B
C
D
30°
30°

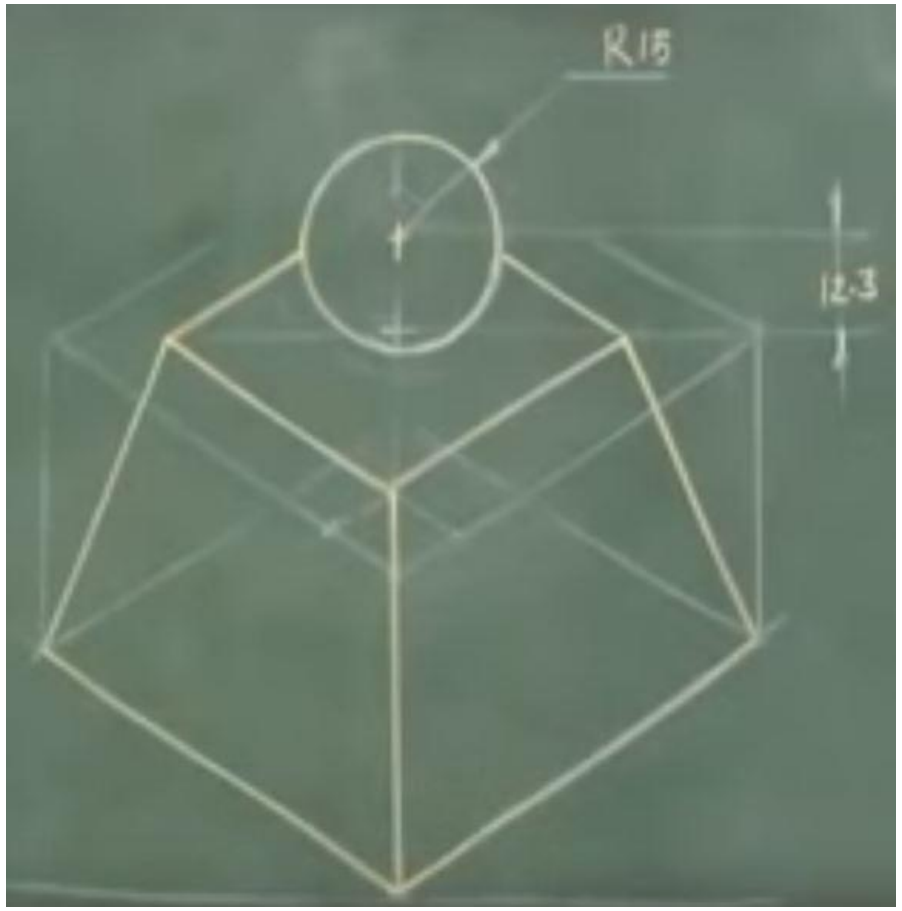
A cone of base diameter 40 mm and height 50 mm is resting at centre on top of a square slab of size 60 mm x 20 mm which is resting on H.P. Draw the isometric view of these combined solids.


60
20
R20
40

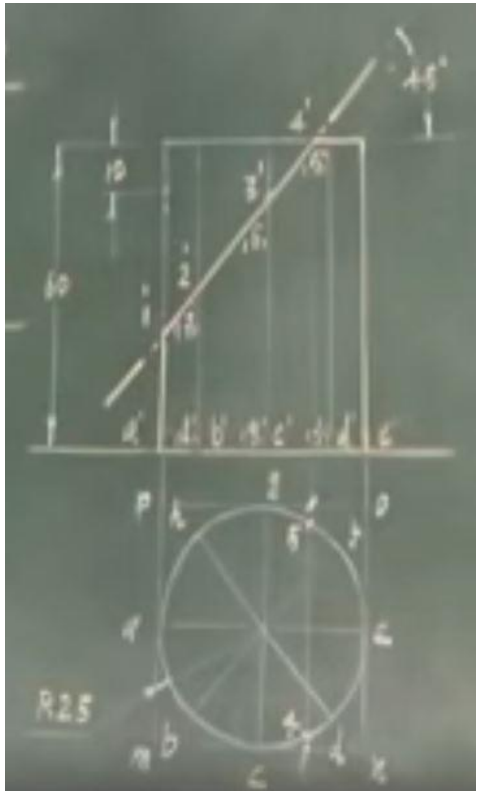

O
R
3
50
6
4
2
R
20
D
140
30
A
50

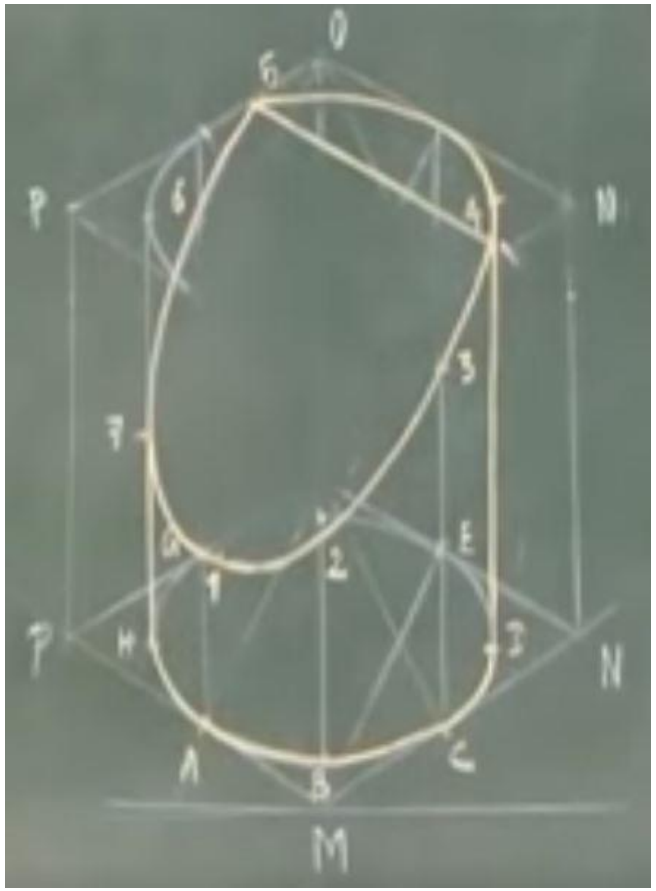
A sphere of 30 mm diameter is kept centrally over a frustum of a square pyramid of bottom base side 60 mm, top base side 40 mm and height 40 mm. draw the isometric view of these combined solids.


40
40
60
R15

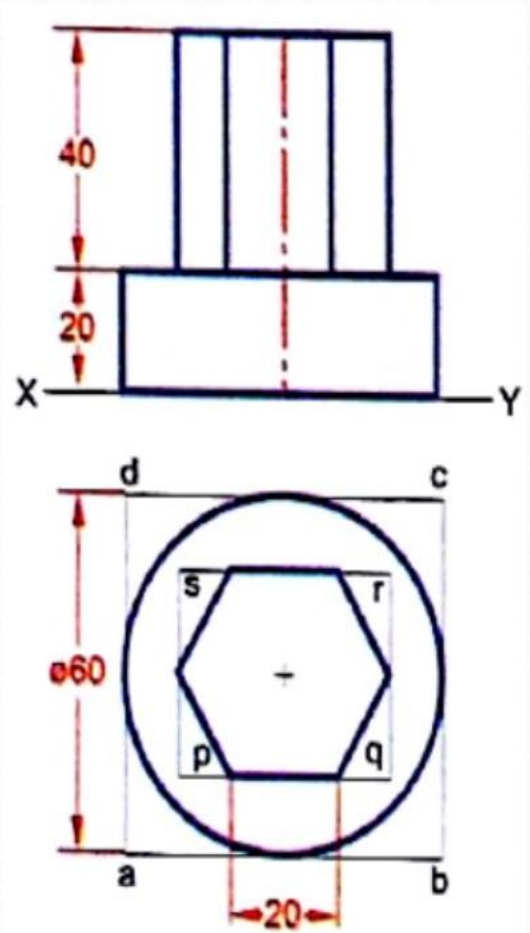

R15
12.3

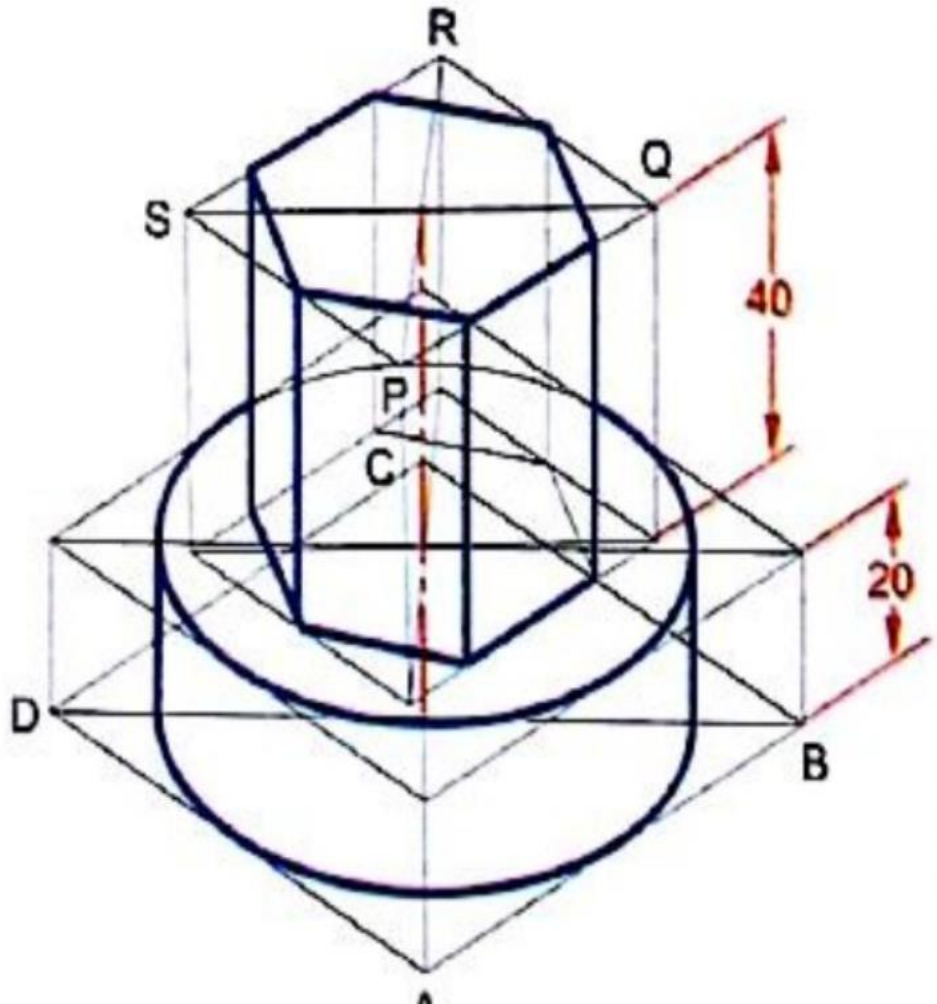
A cylinder of diameter 50 mm and height 60 mm is kept vertically on the ground. It is cut in plane perpendicular to V.P, 45^0 inclined to H.P and meeting the central axis 10 mm from top base. Draw the isometric view of the retained cylinder.


45°
R25

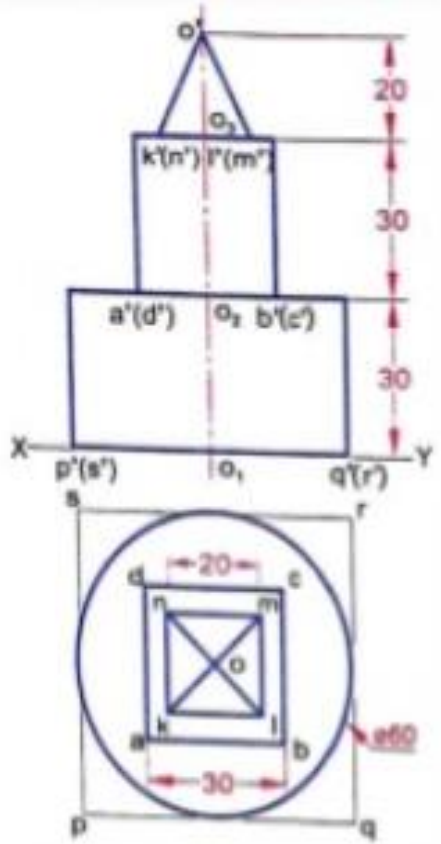

P
N
P
N
M

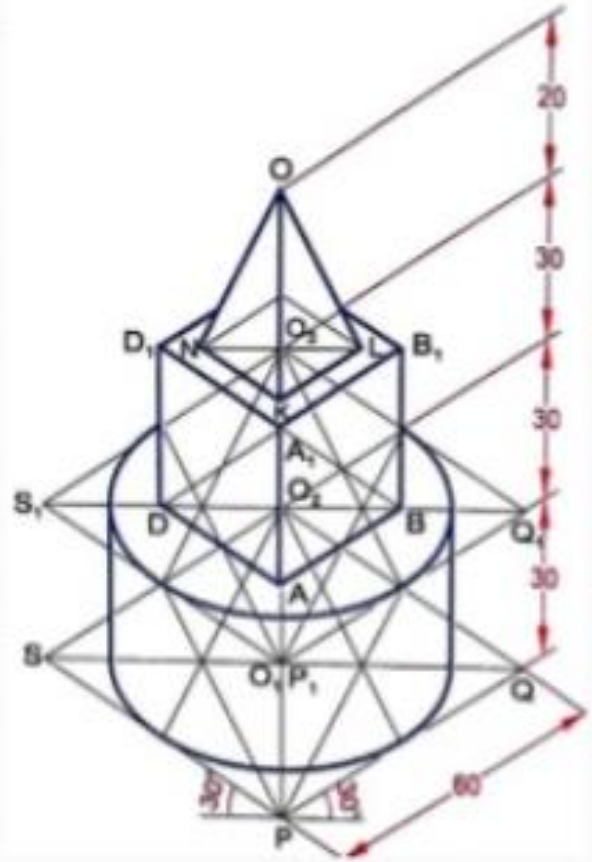
23. A hexagonal shaped solid of base edge 20 mm and height 40 mm lies centrally on a cylinder of 60 mm diameter and 20 mm thick. Draw the isometric view of the solids if their axes lie on the same line



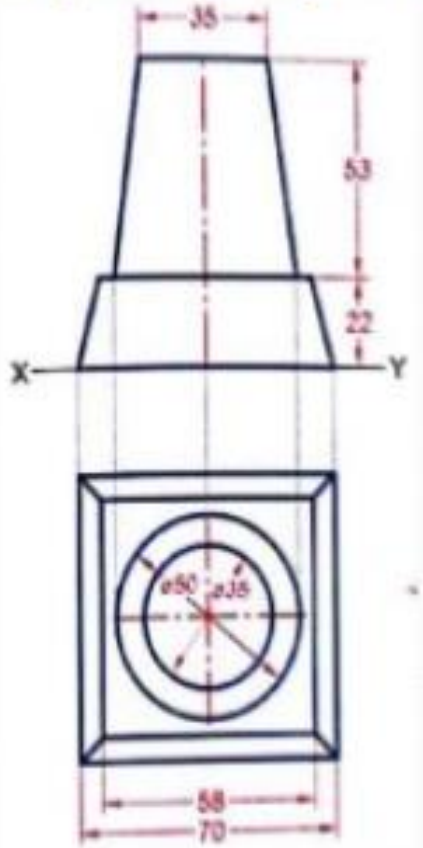


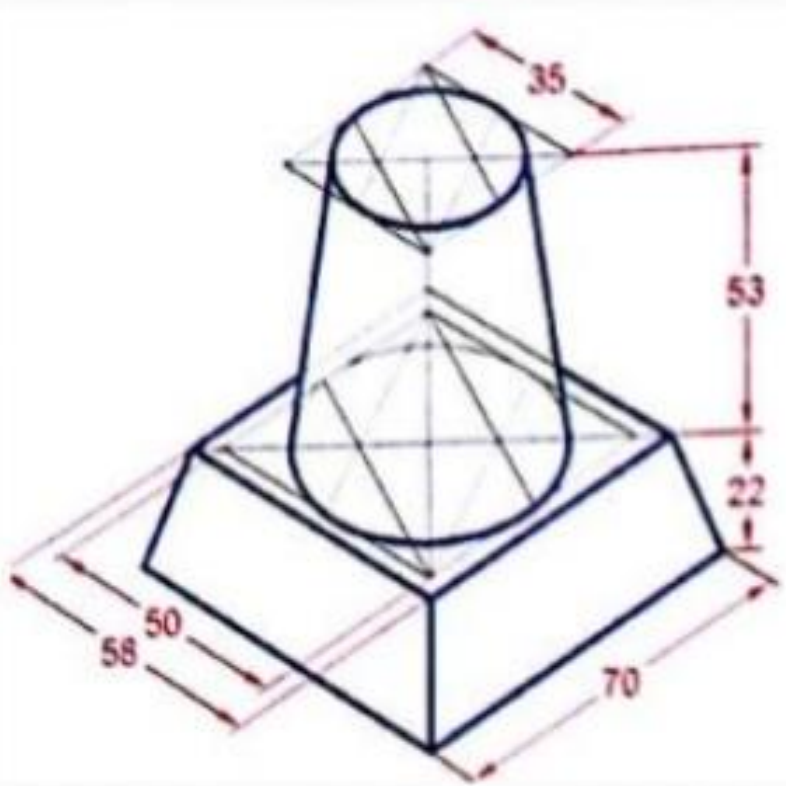
25. A circular slab of 60 mm diameter and 30 mm height resting on HP with one of the base. A cube of 30 mm side is placed over the circular slab centrally. A square pyramid of base side 20 mm and axis height 20 mm placed centrally over the cube. Draw the isometric view.



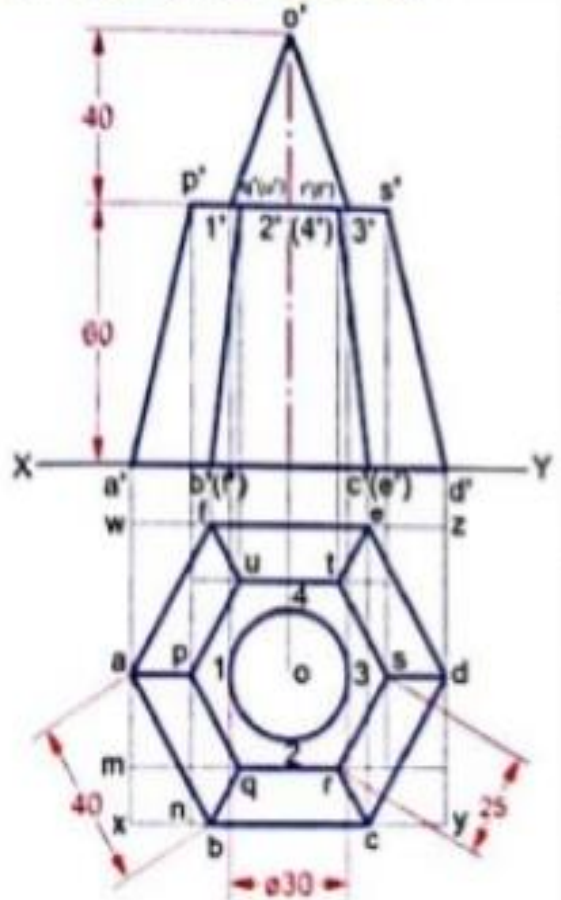


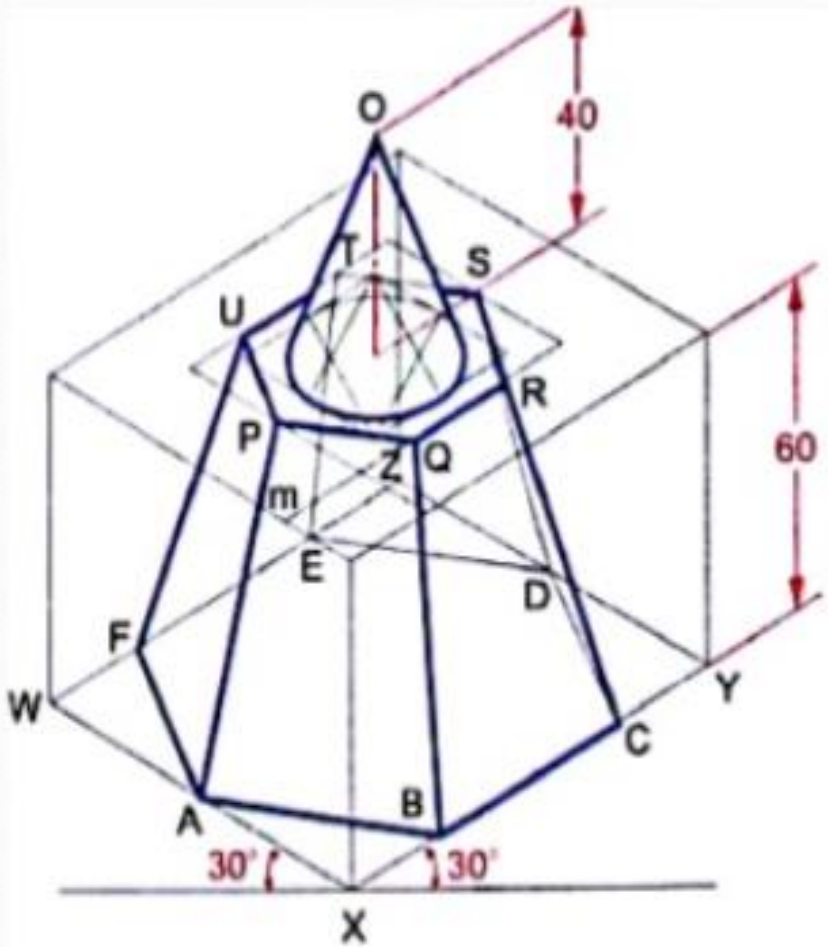
26. A frustum of a cone has its top and bottom diameters 35 mm and 50 mm respectively and altitude 53 mm. It rests on the top face of the frustum of a square pyramid. The sides of the top and bottom faces of the pyramid are 58 mm and 70 mm respectively. The height is 22 mm, Draw the isometric view.



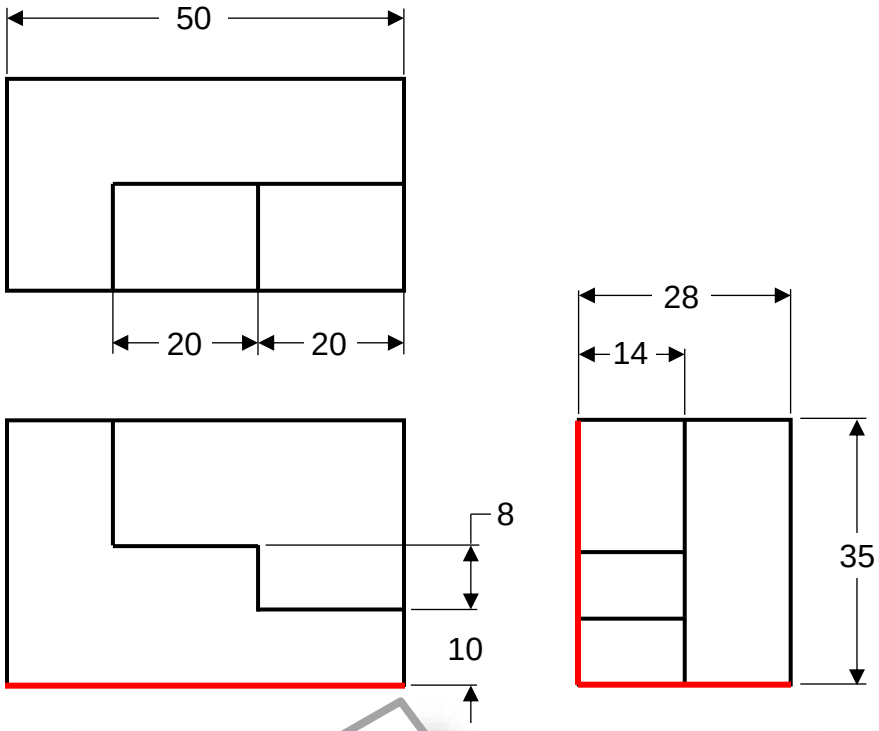


21. A cone of base diameter 30 mm and height 40 mm rests centrally over a frustum of a hexagonal pyramid of base side 40 mm top 25 mm and 60 mm height. Draw the isometric view of the solid.

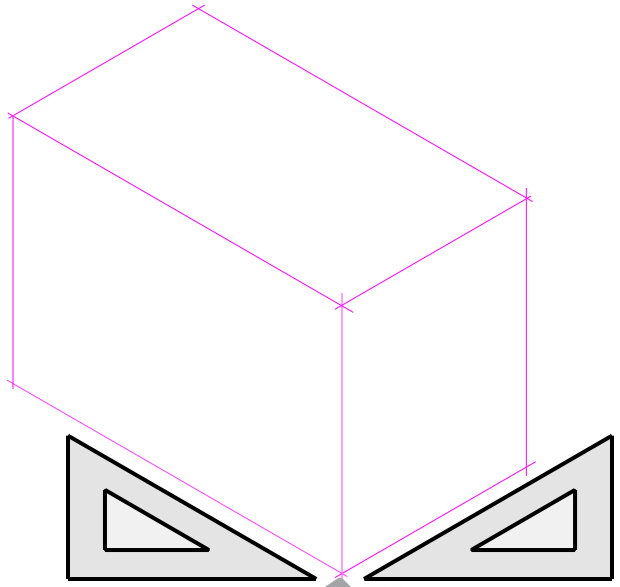




Isometric drawing



We will illustrate the main stages of isometric drawing of the object shown above in multi-view.
We will use a method called box construction.

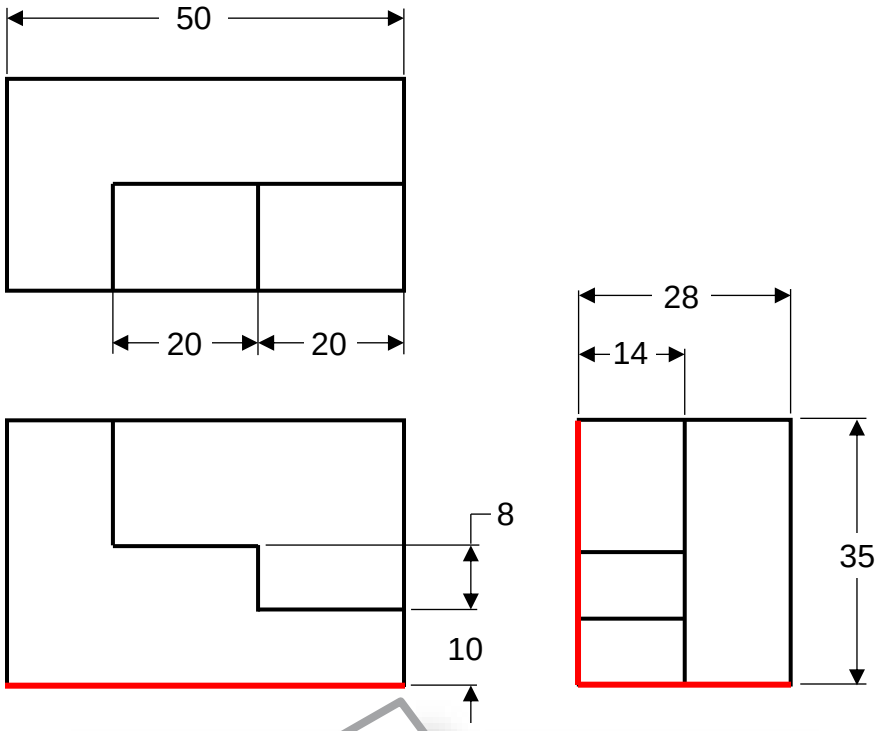


To create the box, use construction lines to outline an isometric box as large as the overall object to be drawn.

The vertical axis is equal to the real height.

The two other axes, drawn at 30° to horizontal, correspond to the actual width and length of the object.

Isometric drawing



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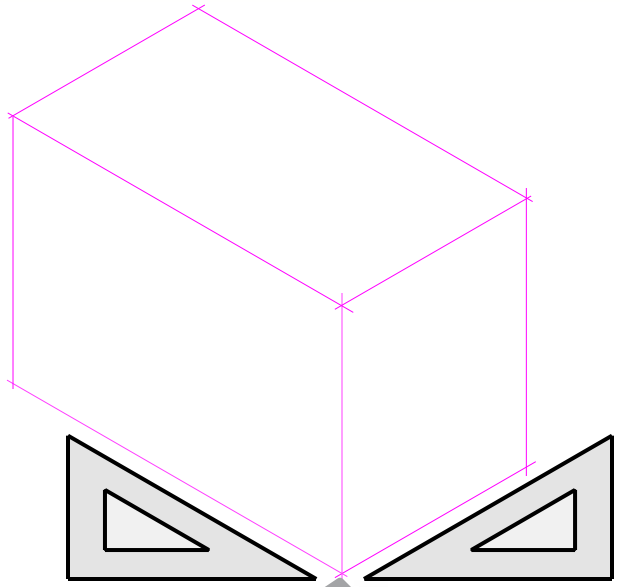


To create the box, use construction lines to outline an isometric box as large as the overall object to be drawn.

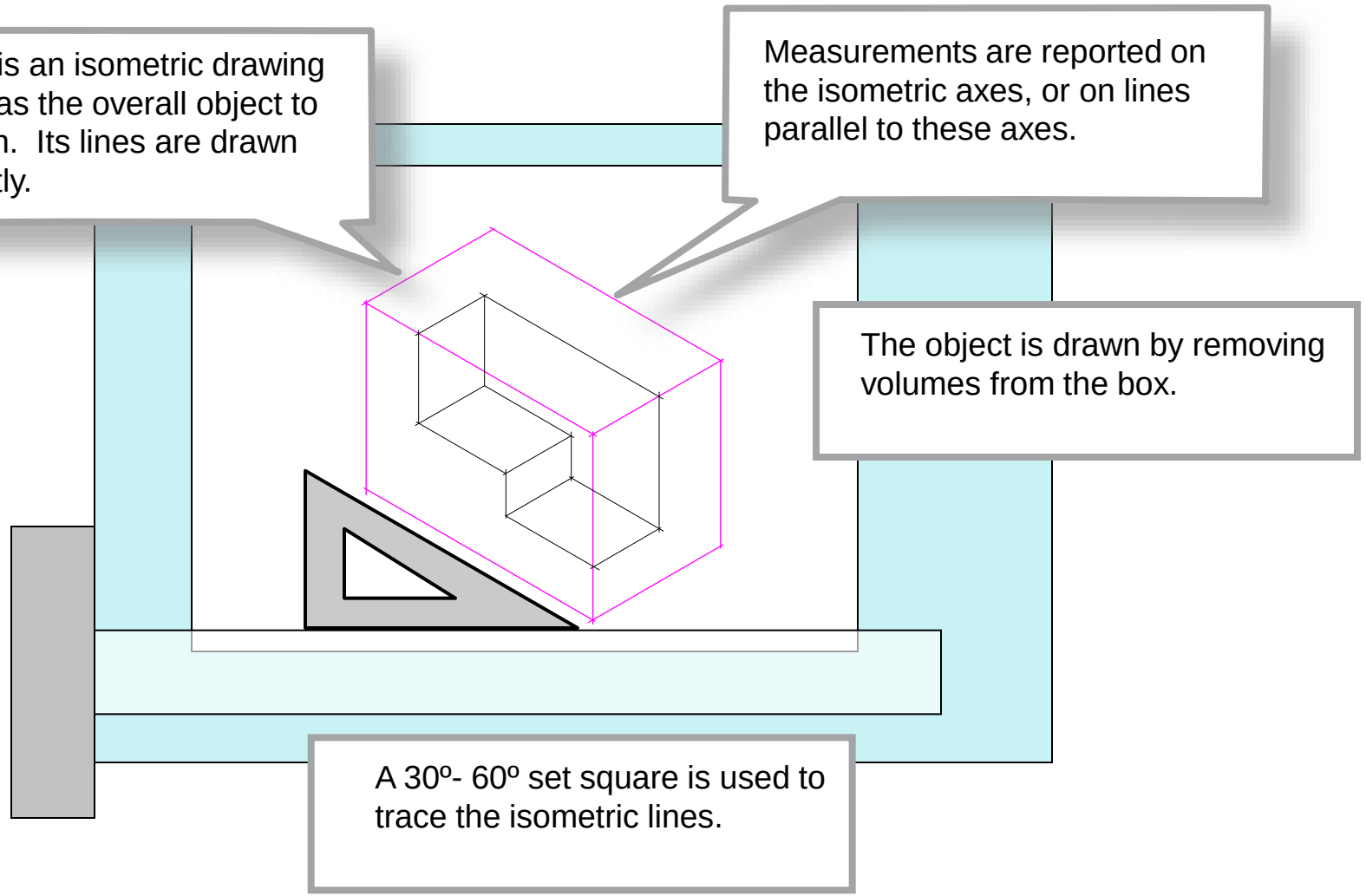
The vertical axis is equal to the real height.

The two other axes, drawn at 30° to horizontal, correspond to the actual width and length of the object.

Isometric drawing

The box is an isometric drawing as large as the overall object to be shown. Its lines are drawn very faintly.

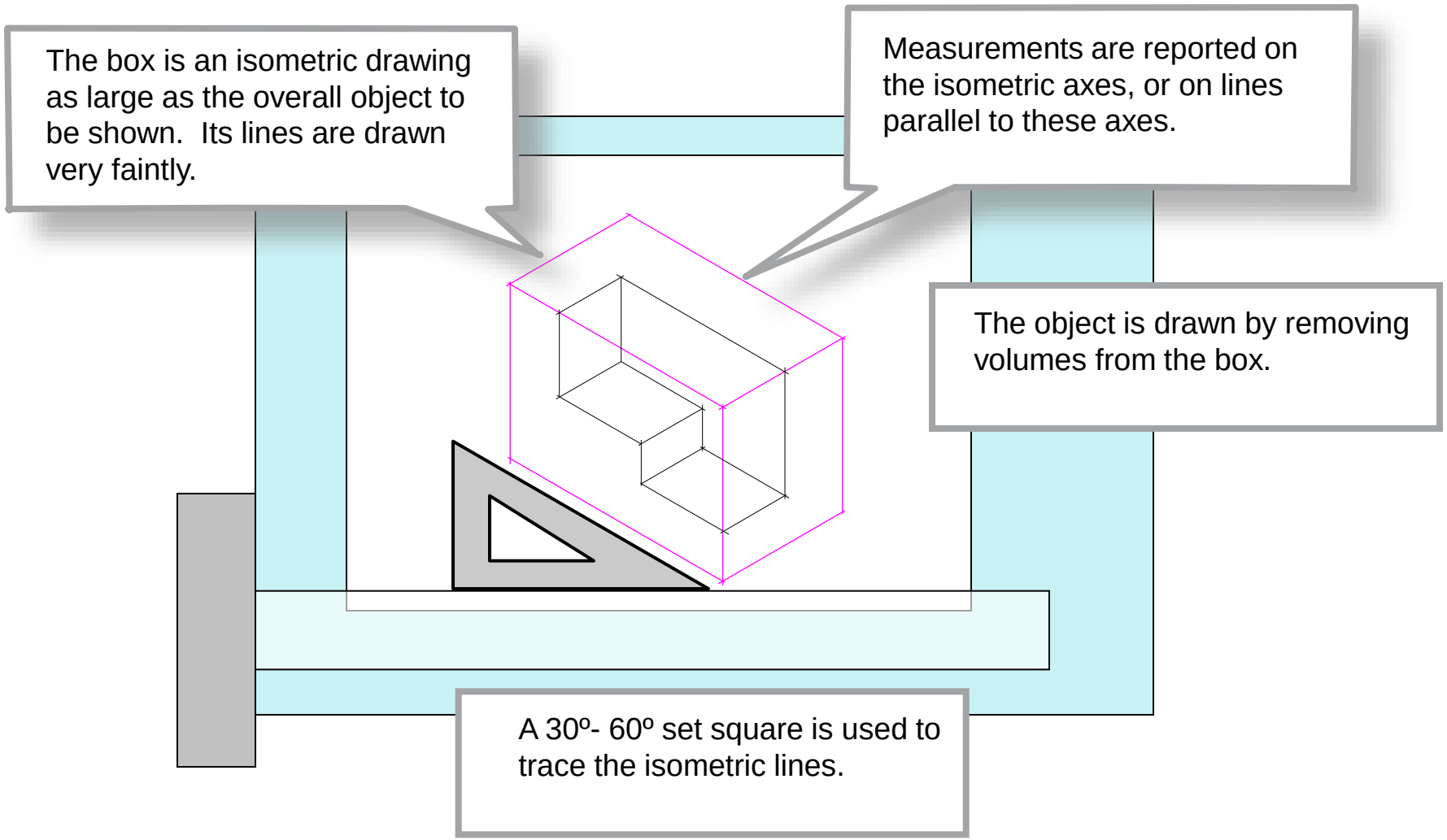
Measurements are reported on the isometric axes, or on lines parallel to these axes.



The object is drawn by removing volumes from the box.

A 30º- 60º set square is used to trace the isometric lines.

Isometric drawing



Isometric drawing

STAGES OF DRAWING IN ISOMETRIC PERSPECTIVE

STAGE 1

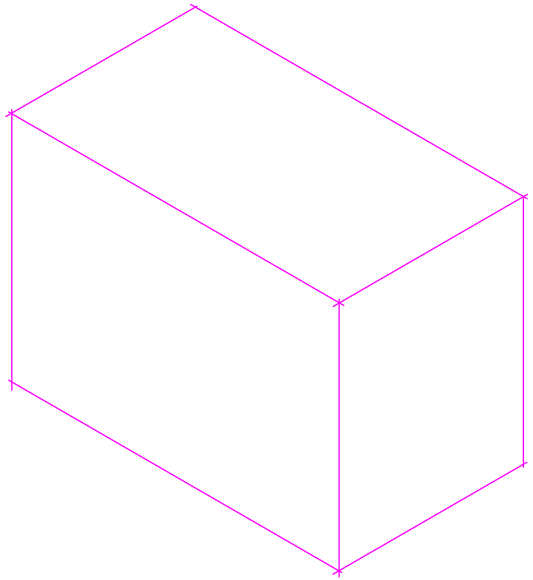
Sketch the box.

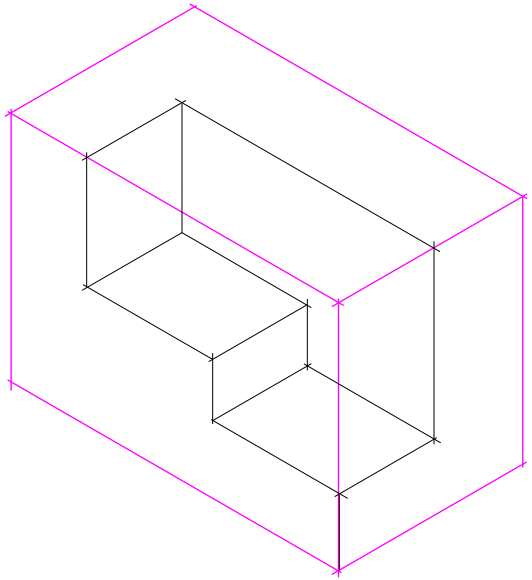
STAGE 2

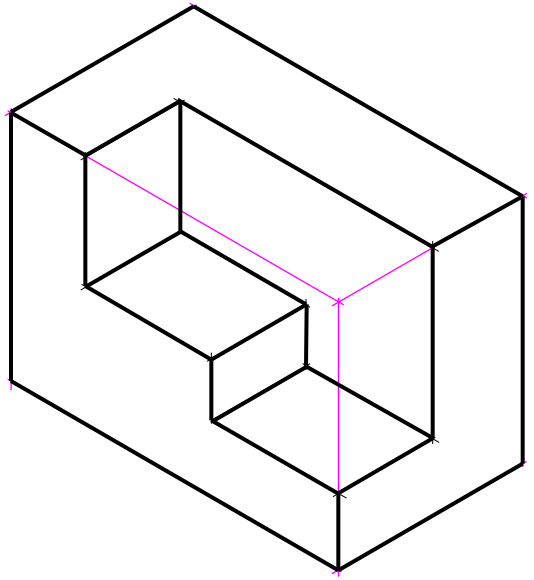
Measure on the axes and trace the details in construction lines.

STAGE 3

Carry out the final layout.





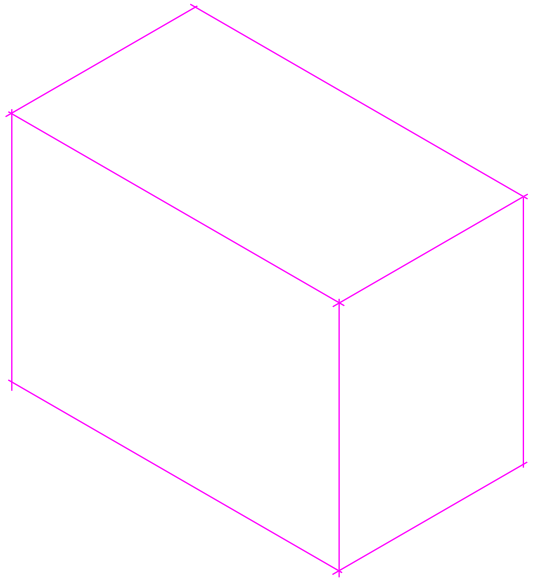


Isometric drawing

STAGES OF DRAWING IN ISOMETRIC PERSPECTIVE

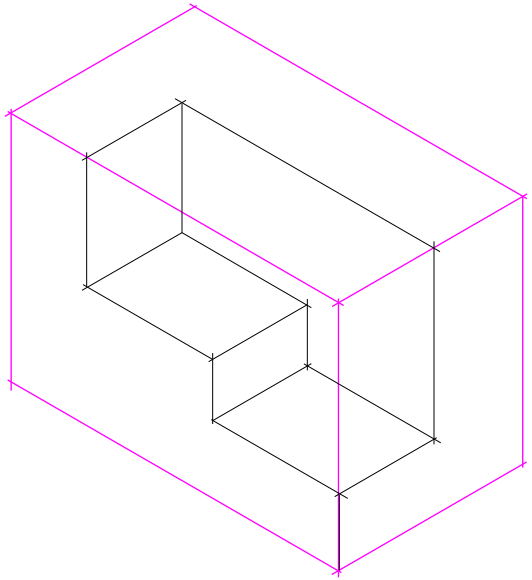
STAGE 1

Sketch the box.



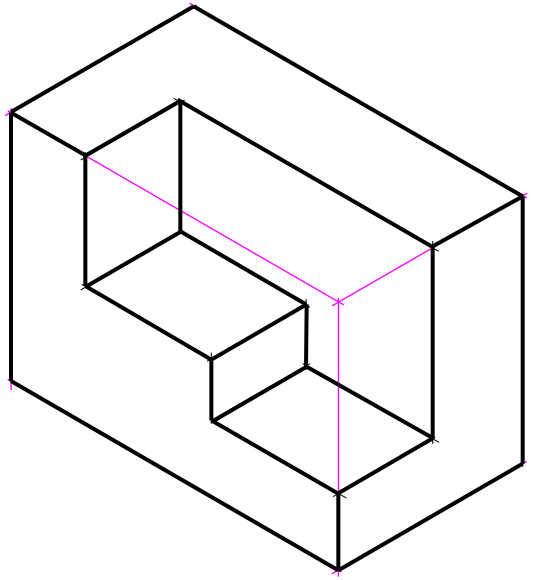
STAGE 2

Measure on the axes and trace the details in construction lines.



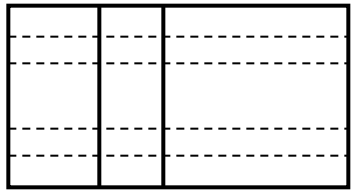
STAGE 3

Carry out the final layout.

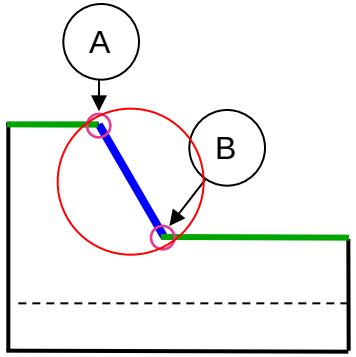


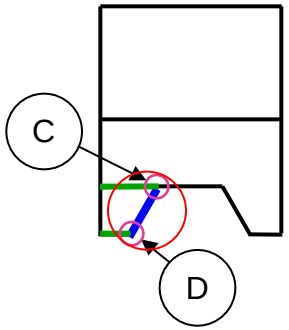
Isometric drawing

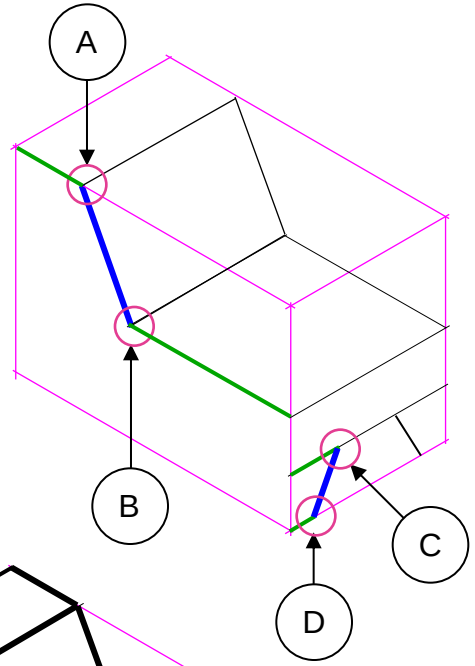
How to draw non-isometric lines and surfaces



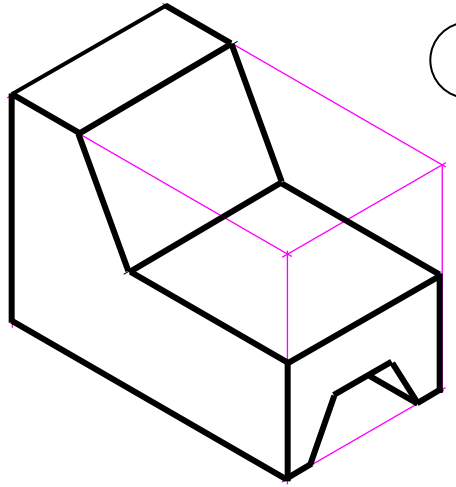
Non-isometric (oblique) lines and surfaces are not true to size in isometric perspective.





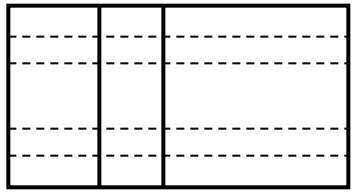


Dimensions of inclined lines and surfaces are determined by using their coordinates which must be located on isometric lines.

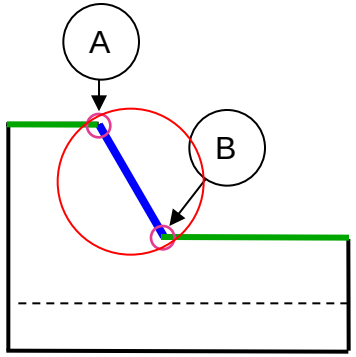


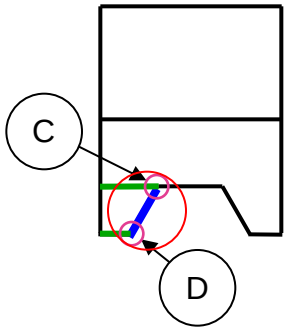
Isometric drawing

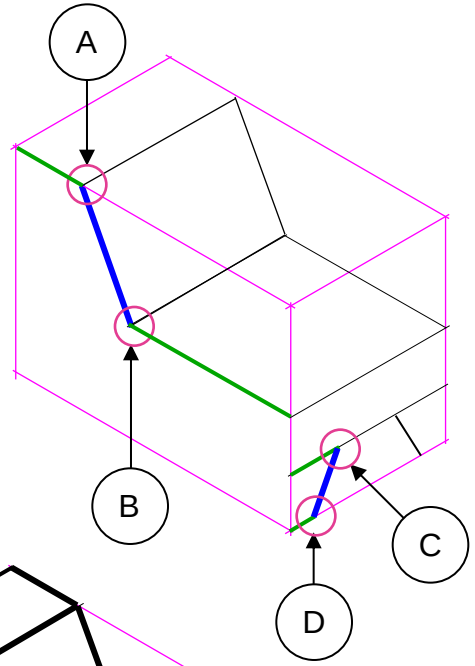
How to draw non-isometric lines and surfaces



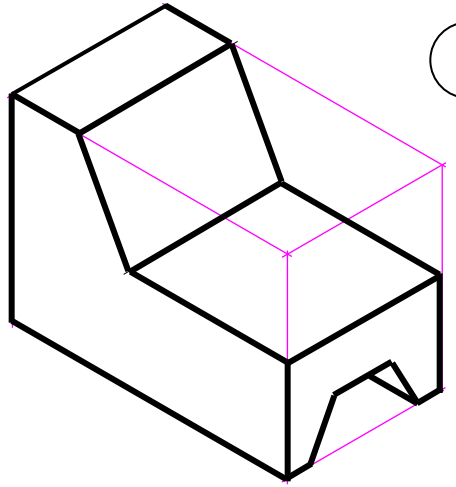
Non-isometric (oblique) lines and surfaces are not true to size in isometric perspective.







Dimensions of inclined lines and surfaces are determined by using their coordinates which must be located on isometric lines.



Reference Videos

- https://www.youtube.com/watch?v=77ufJXvXUk4&t=201s
- https://www.youtube.com/watch?v=M0_RmOKKLFU&t=2s
- https://www.youtube.com/watch?v=RcvhUPX2-No