4. Sections Of Solids

Section:-

The surface obtained by cutting an object by section plane is called "section".

Sectioning:-

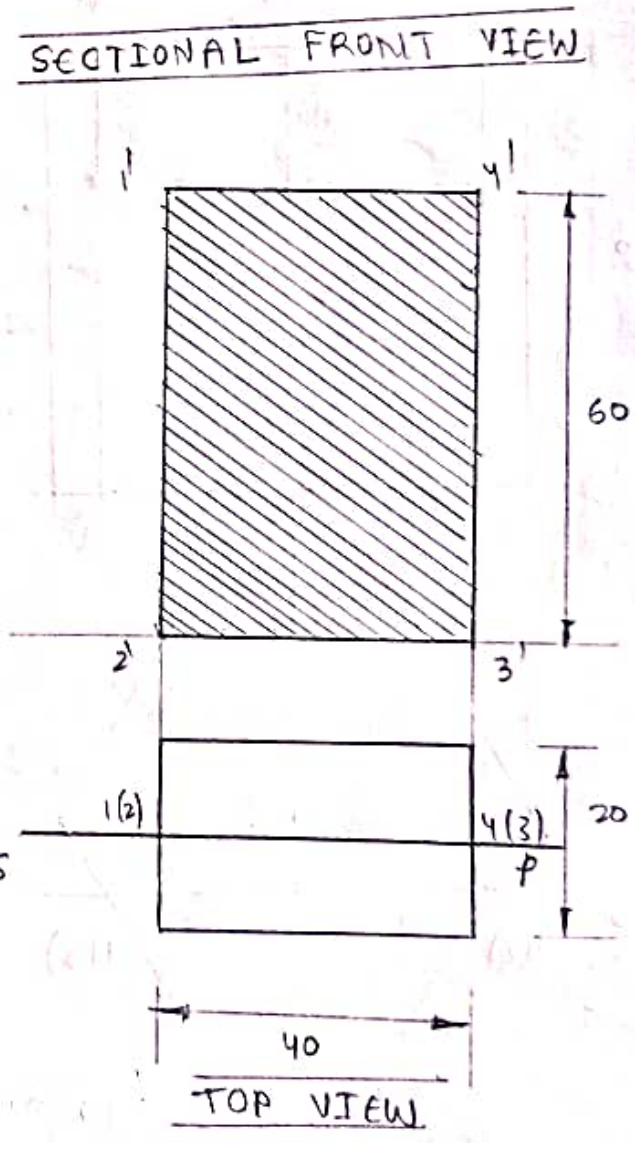
The imaginary process of cutting is called sectioning.

Types of section planes:-

(i) Section plane (SP), perpendicular to HP and parallel to VP.
(ii) SP perpendicular to VP and parallel to HP.
(iii) SP perpendicular to VP and inclined to HP.
(iv) SP perpendicular to HP and inclined to VP.
(v) SP inclined to both HP and VP.

SP ⊥ to HP and // to VP:-

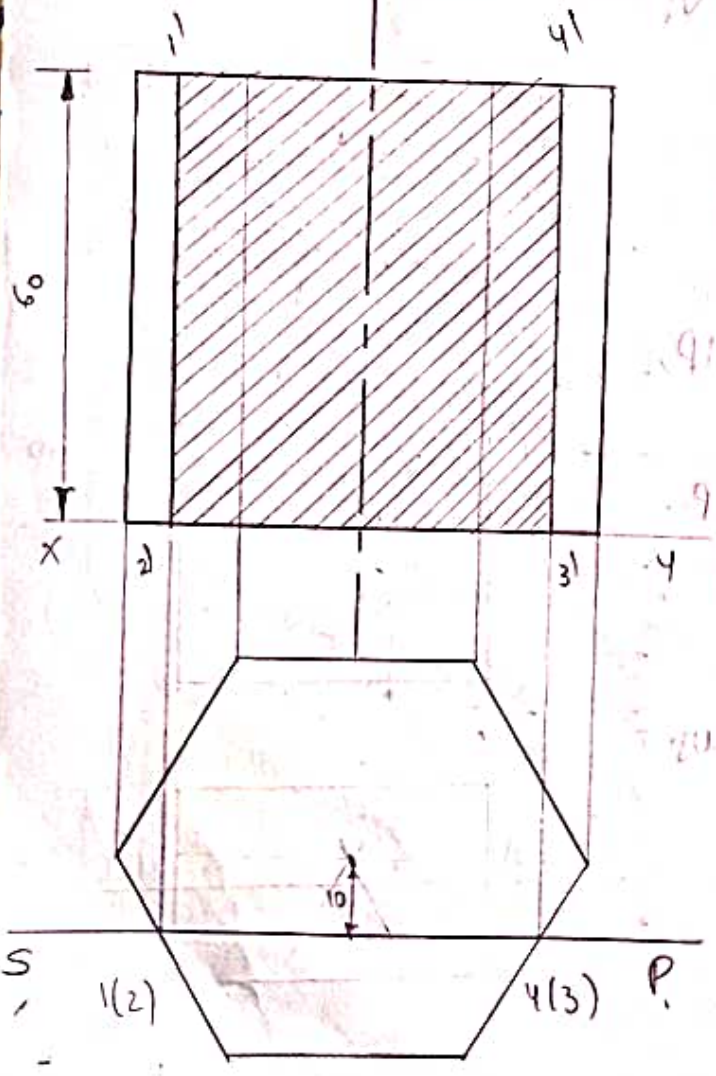
(1) A rectangular prism, side of base 40mm x 25 mm and height 60mm, rest with its base on HP, such that one of its larger rectangular faces is parallel to VP. A section plane ⊥ to HP and // to VP cuts the prism into 2 equal halfs. Draw its top views and sectional front views.



(2). A Hexagonal prism side of base 30mm and axis 60mm long rest with its base on HP. such that one of its rectangular faces is parallel to VP. A section plane ⊥ to HP and parallel to VP. cuts the prism at a distance of 10mm from its axis. Draw its top views and sectional front views.

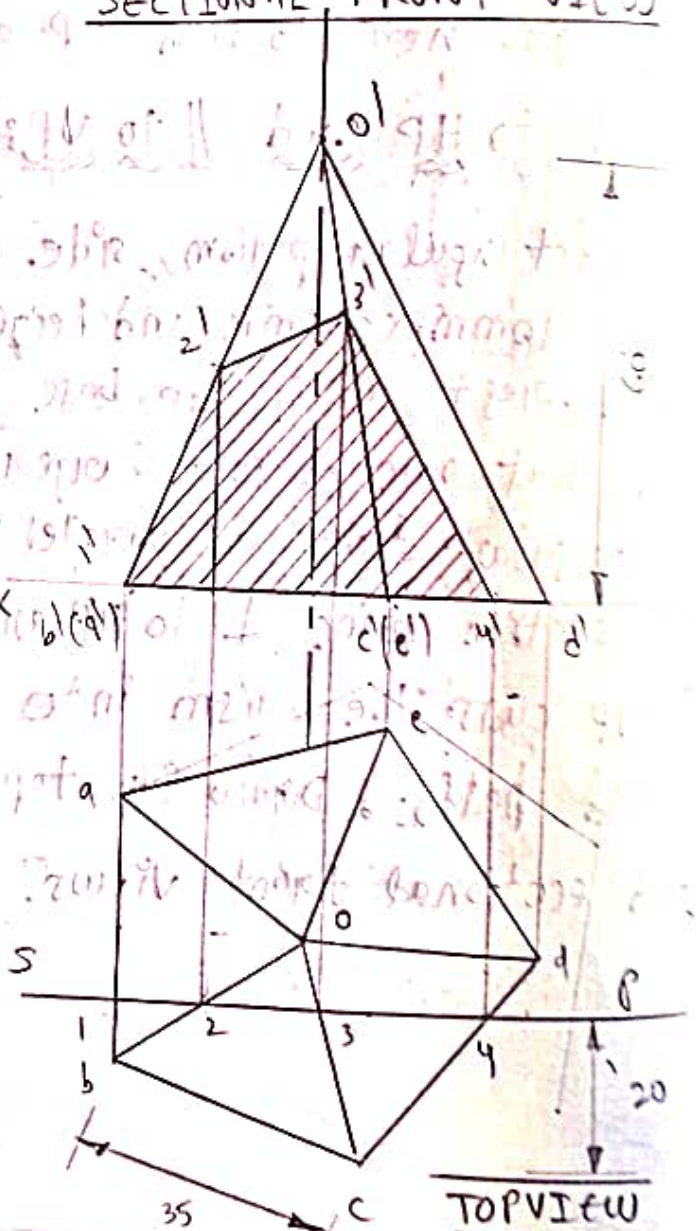
(3). A pentagonal pyramid of base 35mm and axis 60mm long, rest with its base on HP. such that one of the edges of the base is ⊥ to VP. A section plane ⊥ to HP and parallel to VP cuts the pyramid at a distance of 20mm from the corner of the base nearer to the observer. Draw its top and sectional front views.

SECTIONAL FRONT VIEW



TOP VIEW

SECTIONAL FRONT VIEW

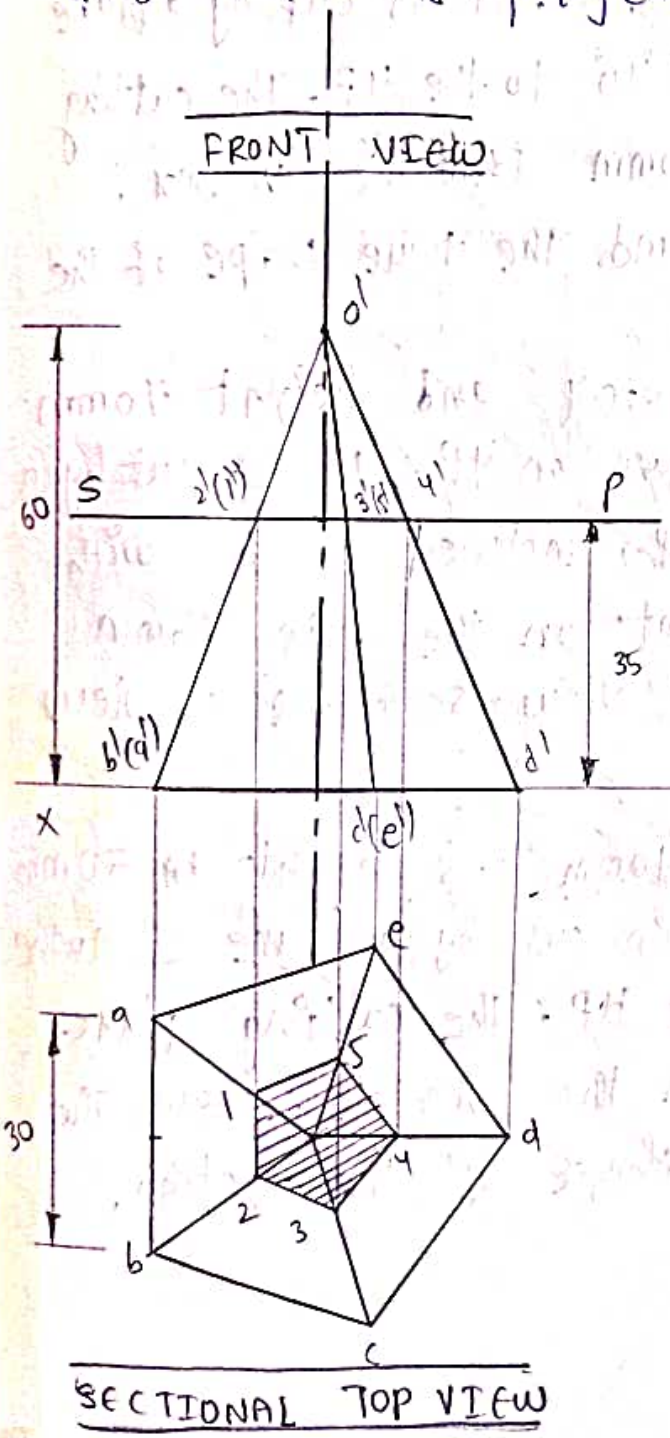


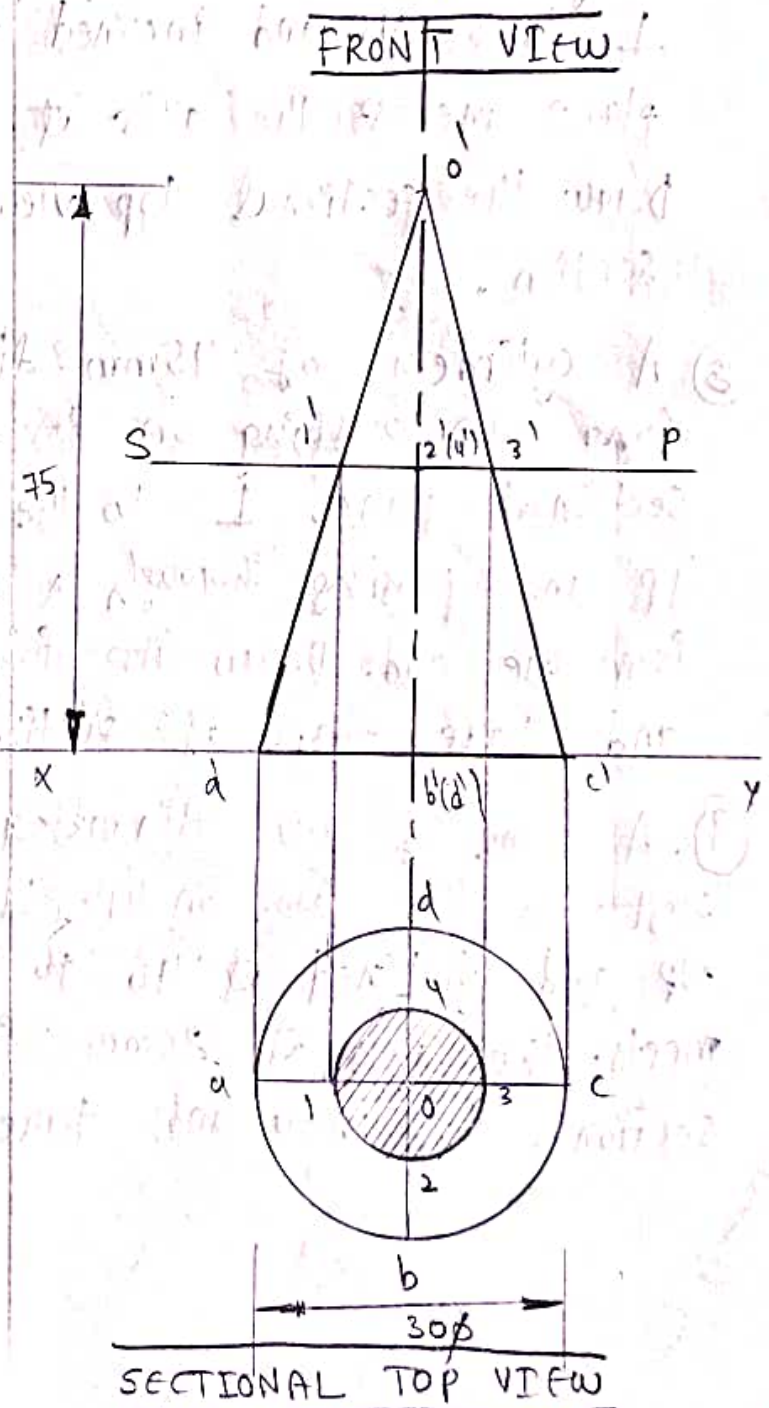
TOPVIEW

④ SP ⊥ to VP and // to HP :-

④. A pentagonal pyramid, side of base 30mm and axis 60 mm long, rest with its base on HP and one of the edges of its base is ⊥ to VP. It is cut by a sectional plane ⊥ to VP and // to HP. and passing through the axis at a point 35mm above the base. Draw its front view and sectional top view.

⑤ A cone with base 60mm diameter and axis 75 long is resting on its base on HP. It is cut by a section plane parallel to HP and passing through the mid point of the axis. Draw the projections of the cut solid.





SP ⊥ to VP and inclined to HP:-

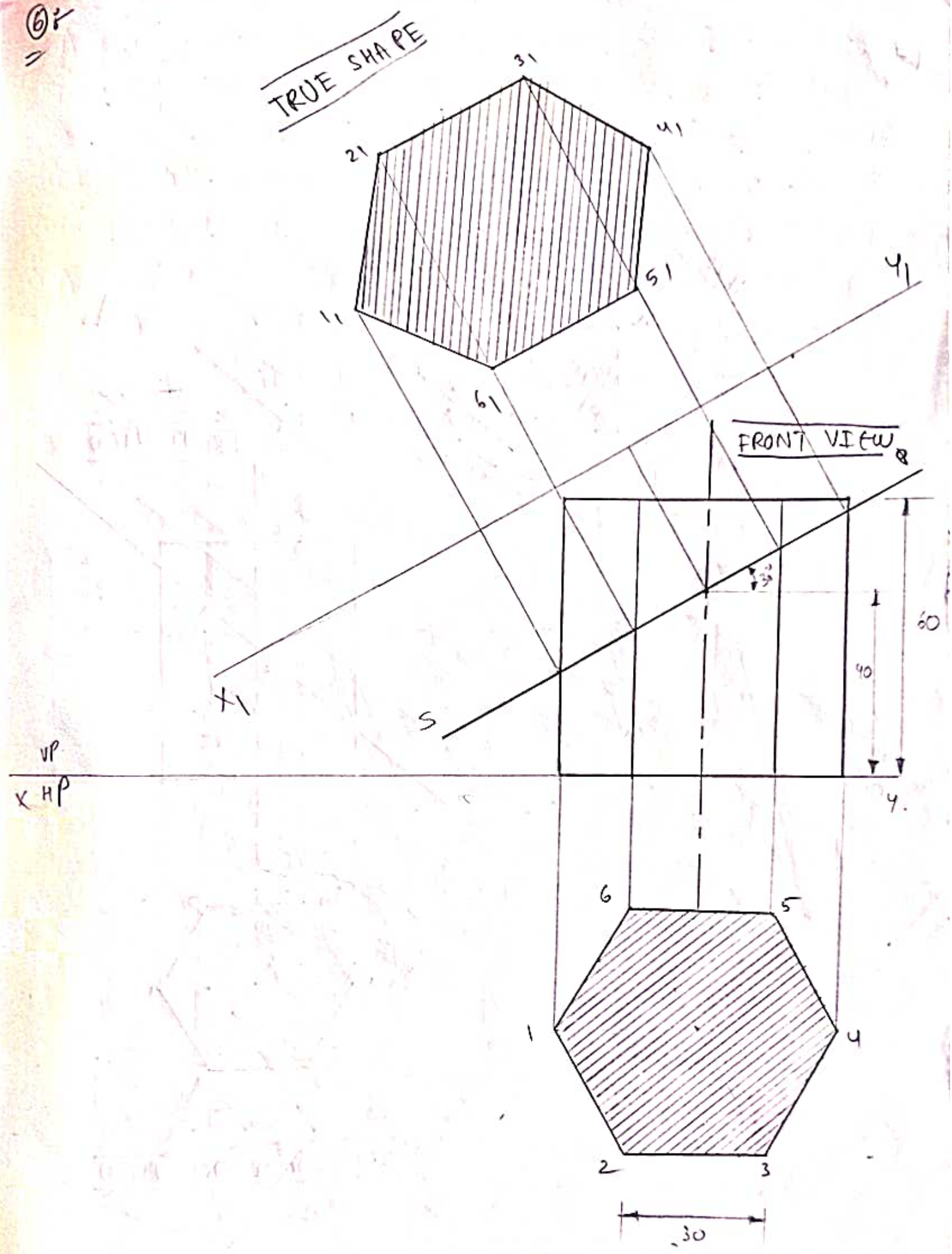
⑥. A hexagonal prism of side 30mm and axis 60mm long and the base lying on the ground. It is cut by a horizontal section plane inclined 30° to HP and cutting the axis at a point 40mm above the ground. Draw front view, sectional top view and True shape of the section.

⑦. A hexagonal prism edge of base 20mm and axis 50mm long rest with its base on the HP. It is cut by a plane ⊥ to the VP and inclined at 40° to the HP. The cutting plane meets the axis at 20mm from the vertex. Draw the sectional top view and the true shape of the section.

⑧ A cylinder of 45mm diameter and height 70mm long is resting on its base on HP. It is cut by a sectional plane, ⊥ to the VP, inclined at 60° with HP and passing through a point on the axis 25mm from one end. Draw its front view, sectional top view and true shape of section.

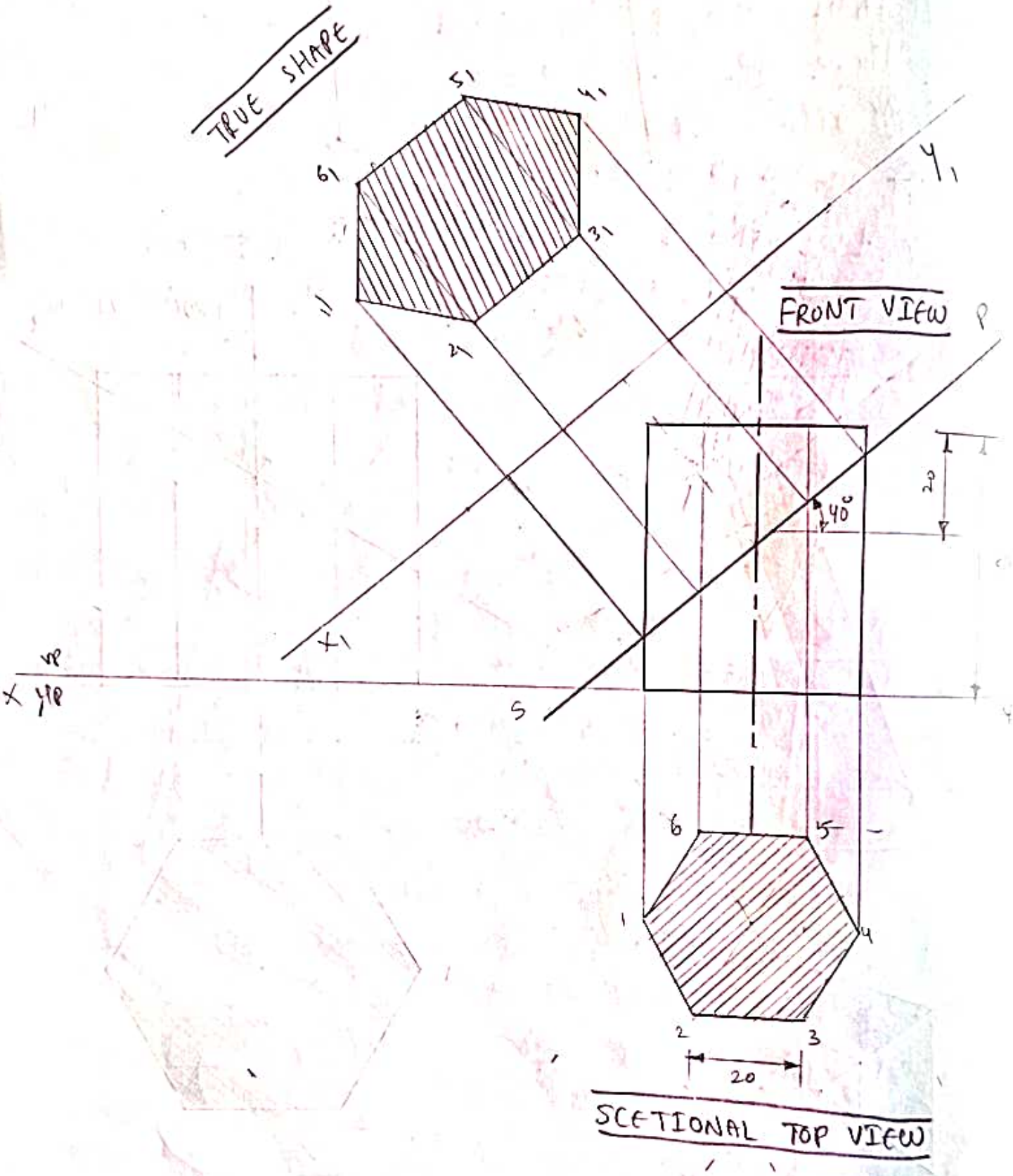
⑨. A cone of base diameter 40mm and height 50mm rest on its base on HP. It is cut by a plane ⊥ to the VP and inclined at 40° to the HP. The cutting plane meets the axis at 20mm from the vertex. Draw the sectional top view and true shape of the section.

⑥

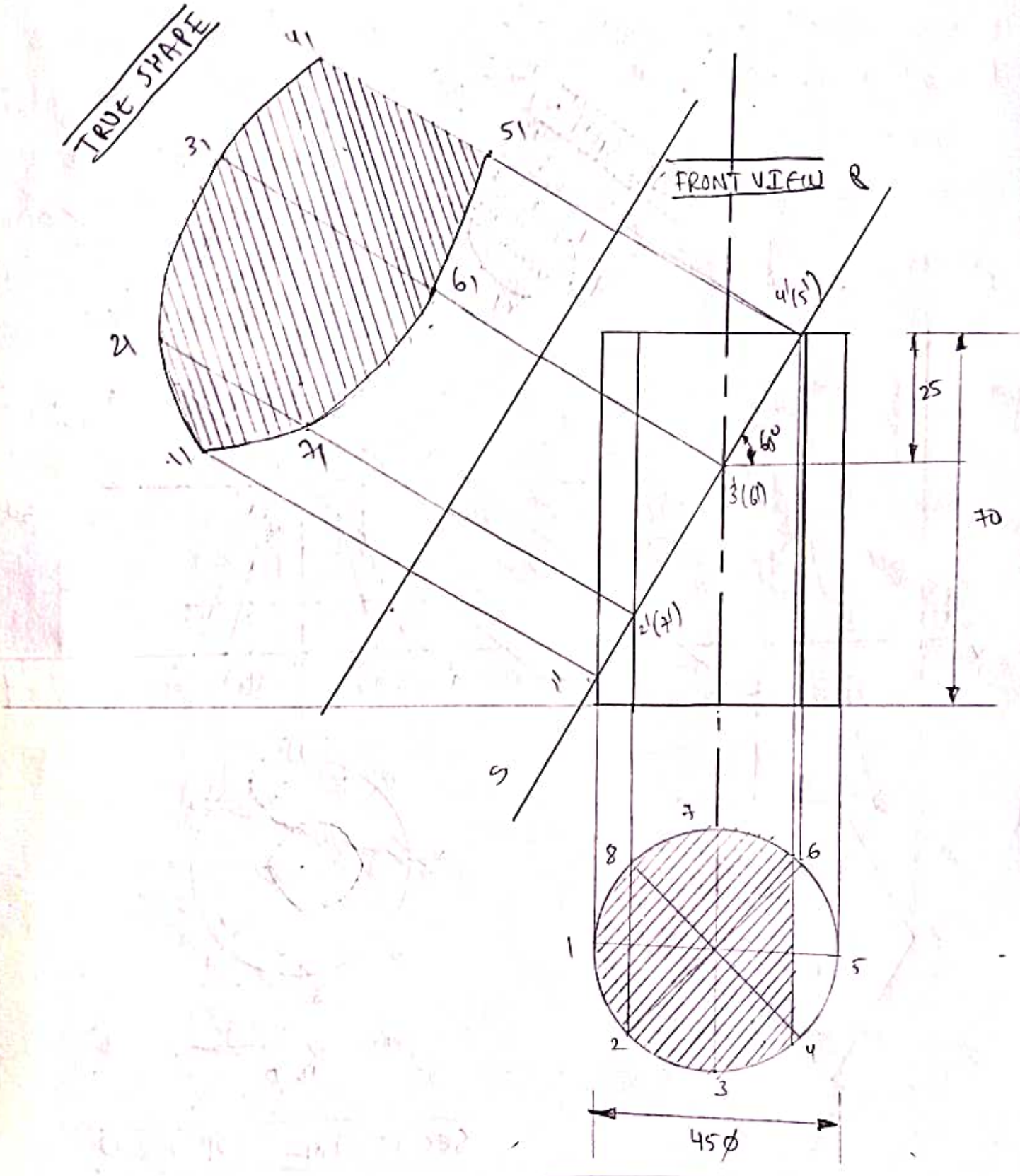


SECTIONAL TOP VIEW

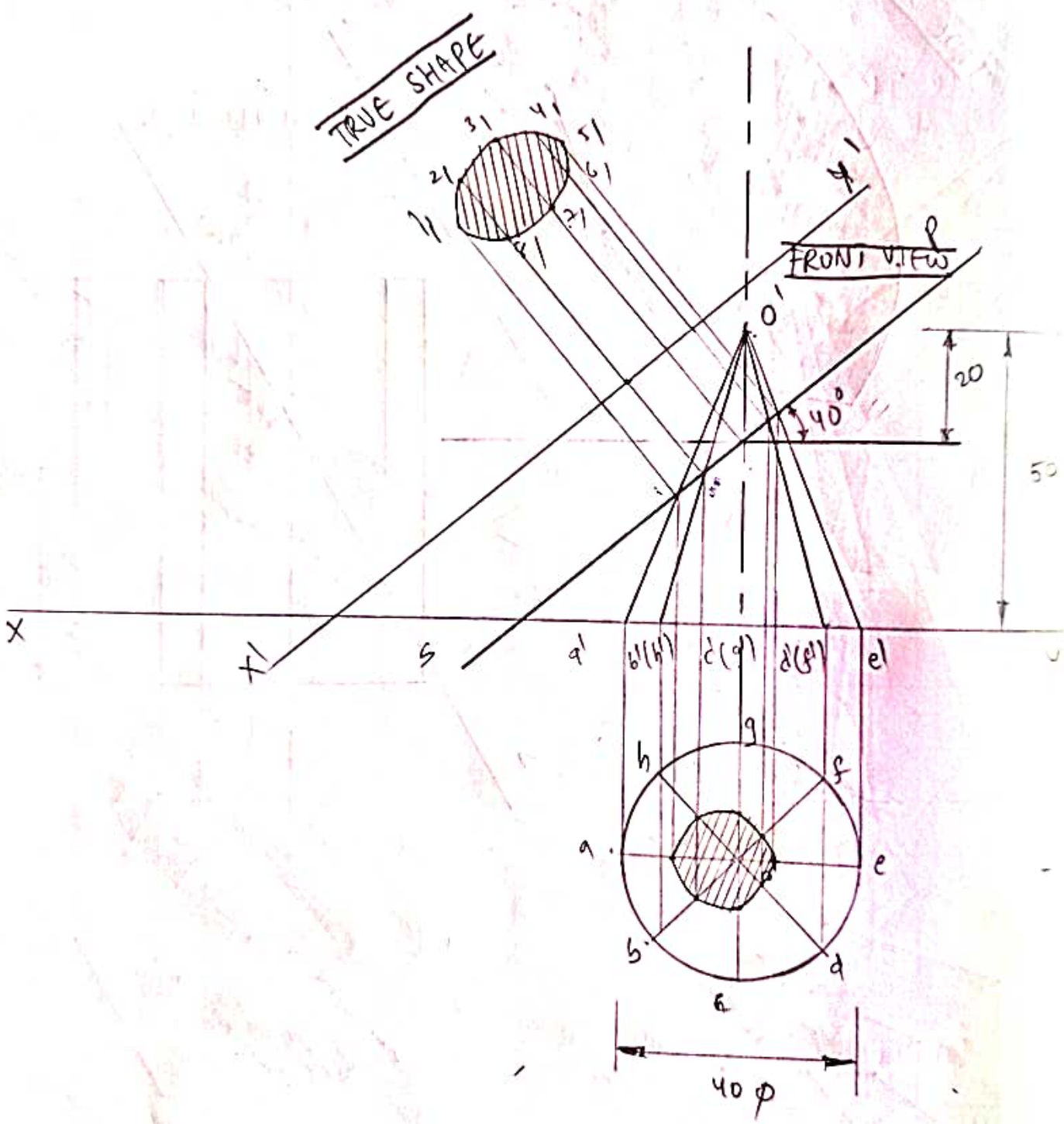
(7)


TRUE SHAPE
5 1
4 1
6 1
3 1
2 1
X 1
Y 1
FRONT VIEW
P
40°
29
VP
X
Y
S
6
5
1
4
2
3
20
SECTIONAL TOP VIEW

(8)11.



(9)

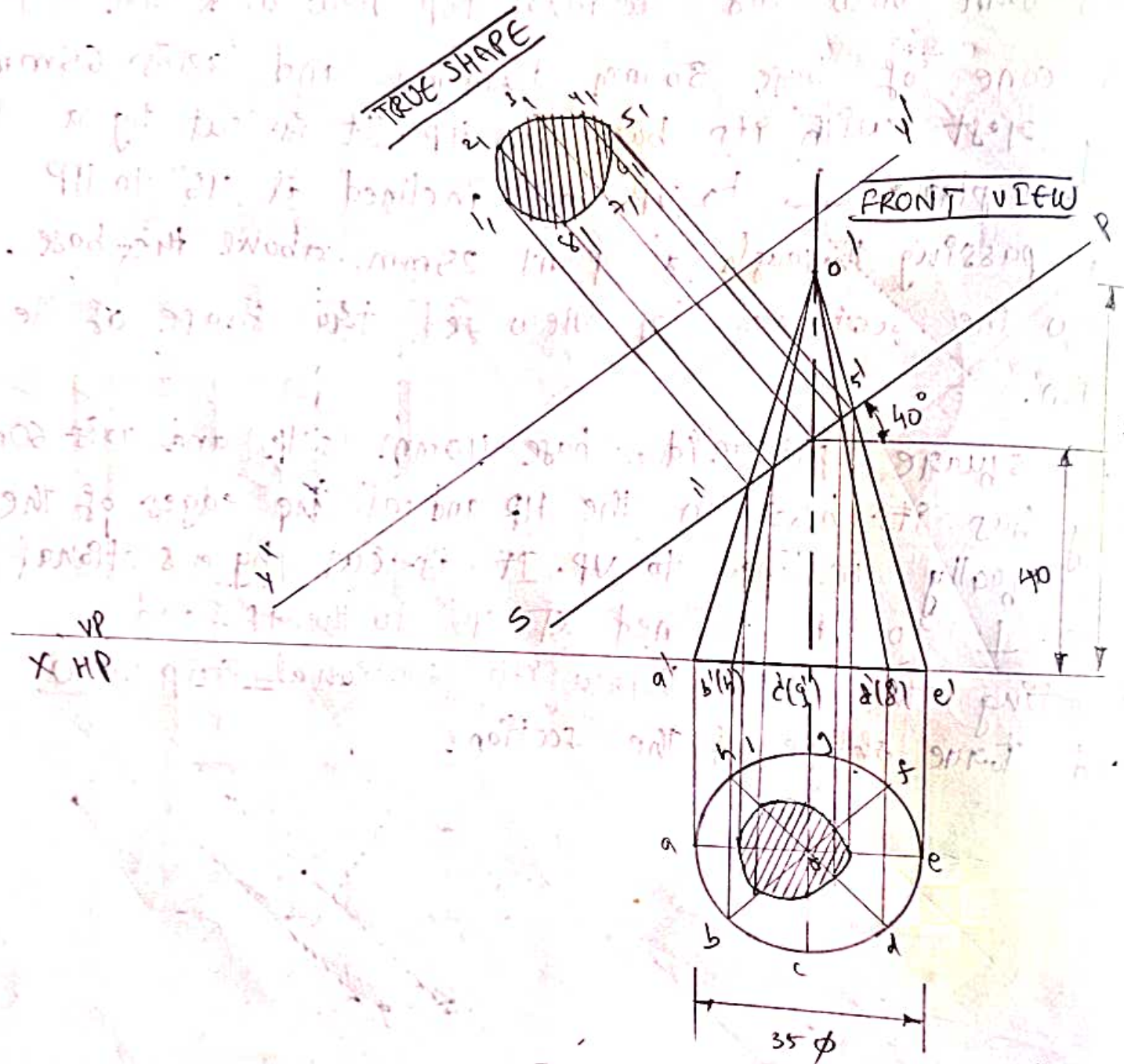


(10) A cone of base 35mm diameter 70mm axis and the base lying on the ground. It is cut by a horizontal section plane inclined 45° to the HP and cutting the axis at a point 40mm above the ground. Draw front view and sectional top view and true shape.

(11) A cone of base 50mm diameter and axis 65mm long rest with its base on HP. It is cut by a section plane ⊥ to VP and inclined at 45° to HP and passing through a point 25mm above the base. Draw the sectional top view and true shape of the section.

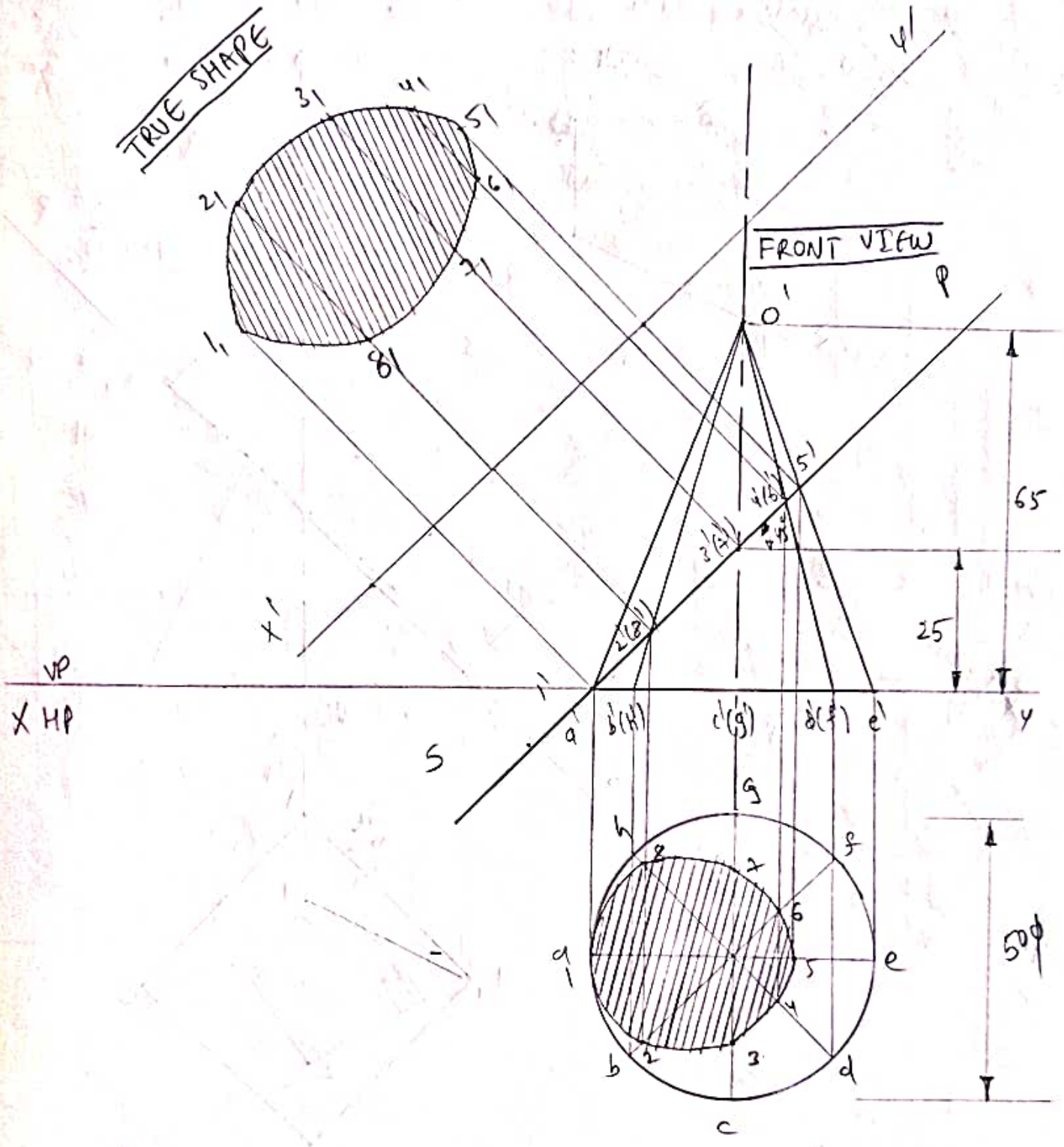
(12) A square pyramid, base 40mm side and axis 60mm long has its base on the HP and all the edges of the base equally inclined to VP. It is cut by a sectional plane ⊥ to VP, inclined at 45° to the HP. and bisecting the axis. Draw its sectional top view and true shape of the section.

(10)

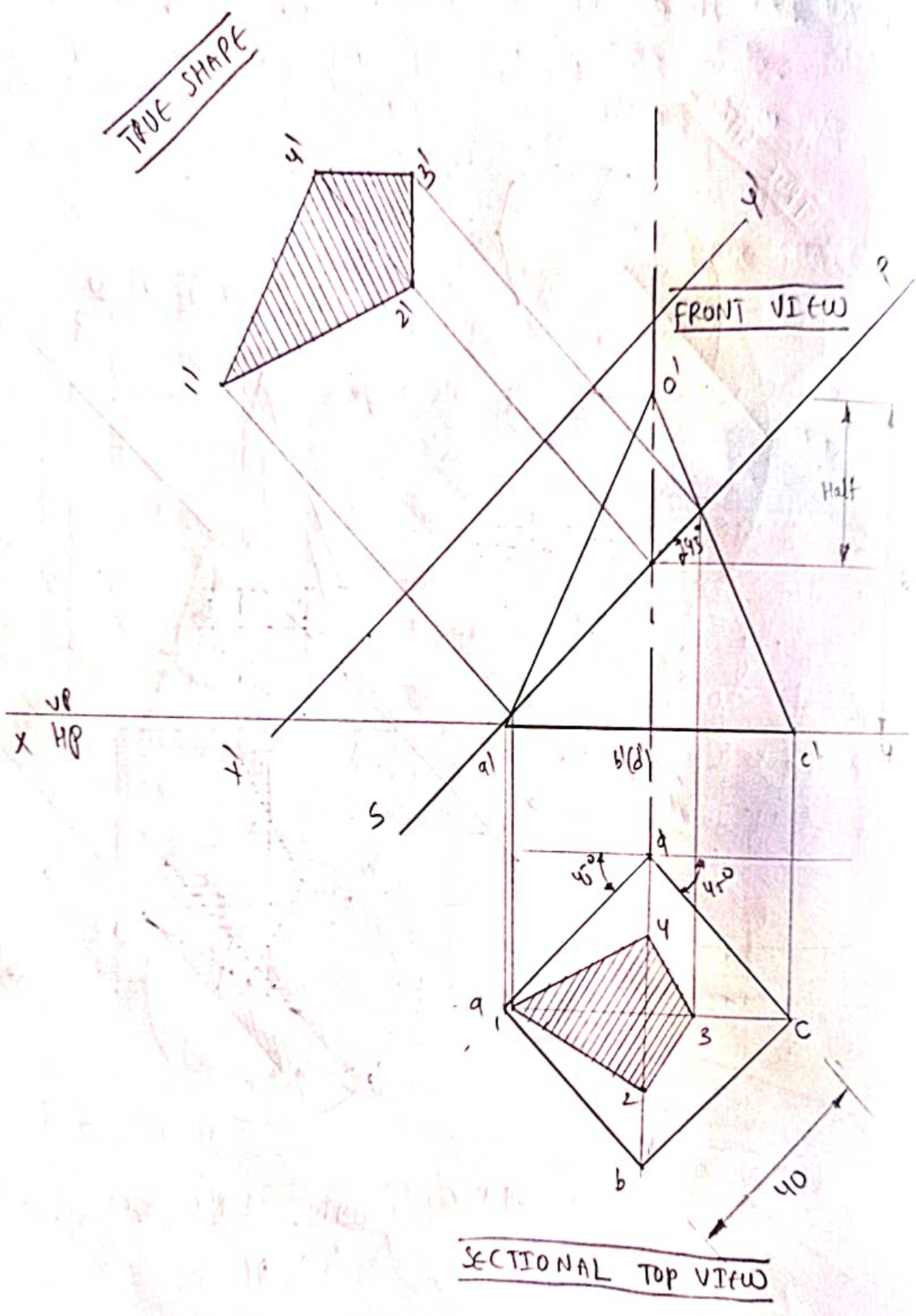


SECTIONAL TOP VIEW

(11)//


TRUE SHAPE
FRONT VIEW
SECTIONAL TOP VIEW
VP
X HP
Y
P
X'
Y'
S
65
25
50
1'
2'(8')
3'(4')
4'(5')
5'
a'
b'(h')
c'(g')
d'(f')
e'
o'
a
b
c
d
e
f
g
h
1
2
3
4
5
6
7
8

(12)


TRUE SHAPE
4'
3'
2'
1'
y'
FRONT VIEW
o'
Half
45°
VP
X HP
x'
a'
b'(d')
c'
S
d
45°
45°
4
a
3
C
2
b
40
SECTIONAL TOP VIEW

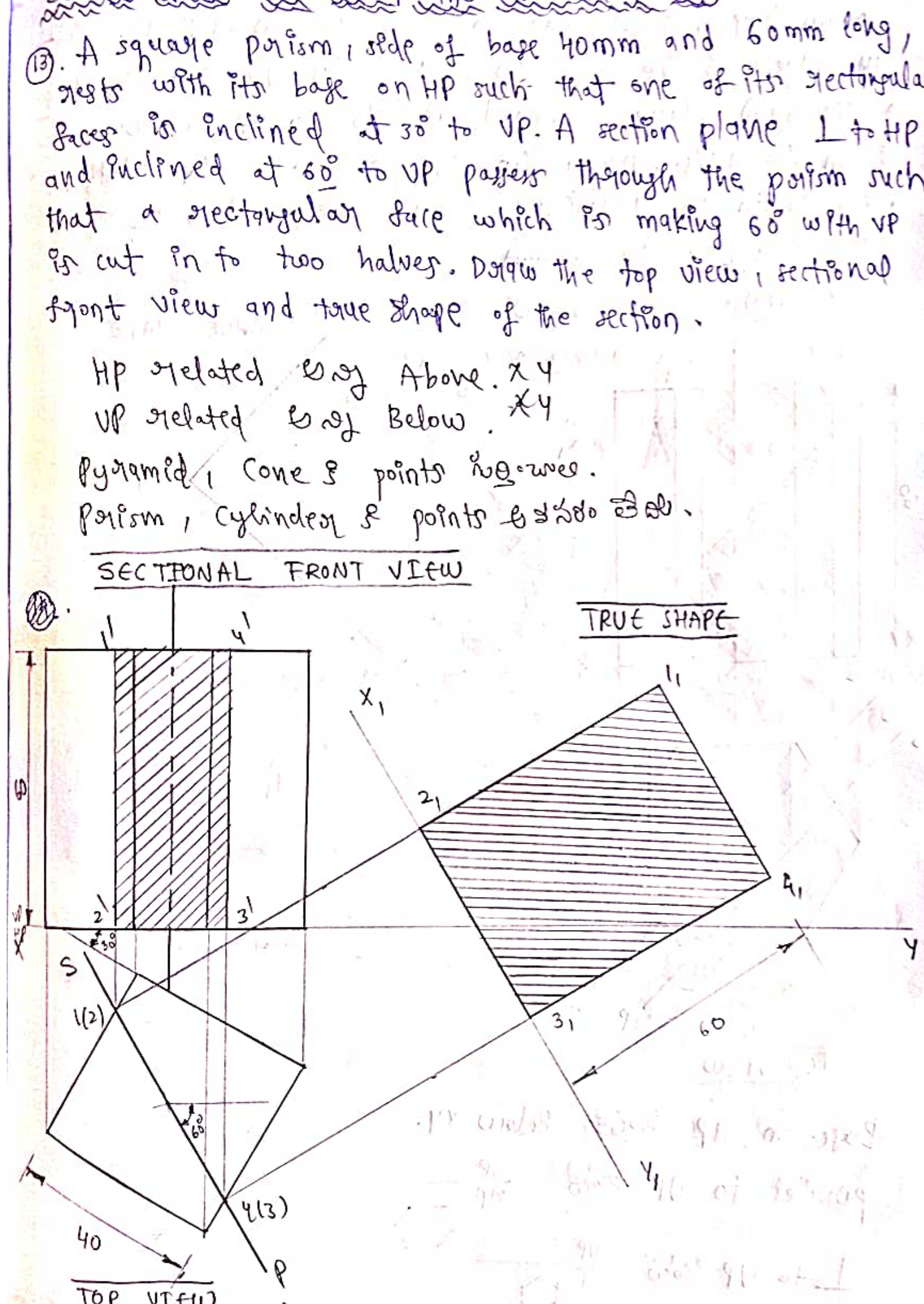
Section plane ⊥ to HP and inclined to VP:

(13). A square prism, side of base 40mm and 60mm long, rests with its base on HP such that one of its rectangular faces is inclined at 30° to VP. A section plane ⊥ to HP and inclined at 60° to VP passes through the prism such that a rectangular face which is making 60° with VP is cut in to two halves. Draw the top view, sectional front view and true shape of the section.

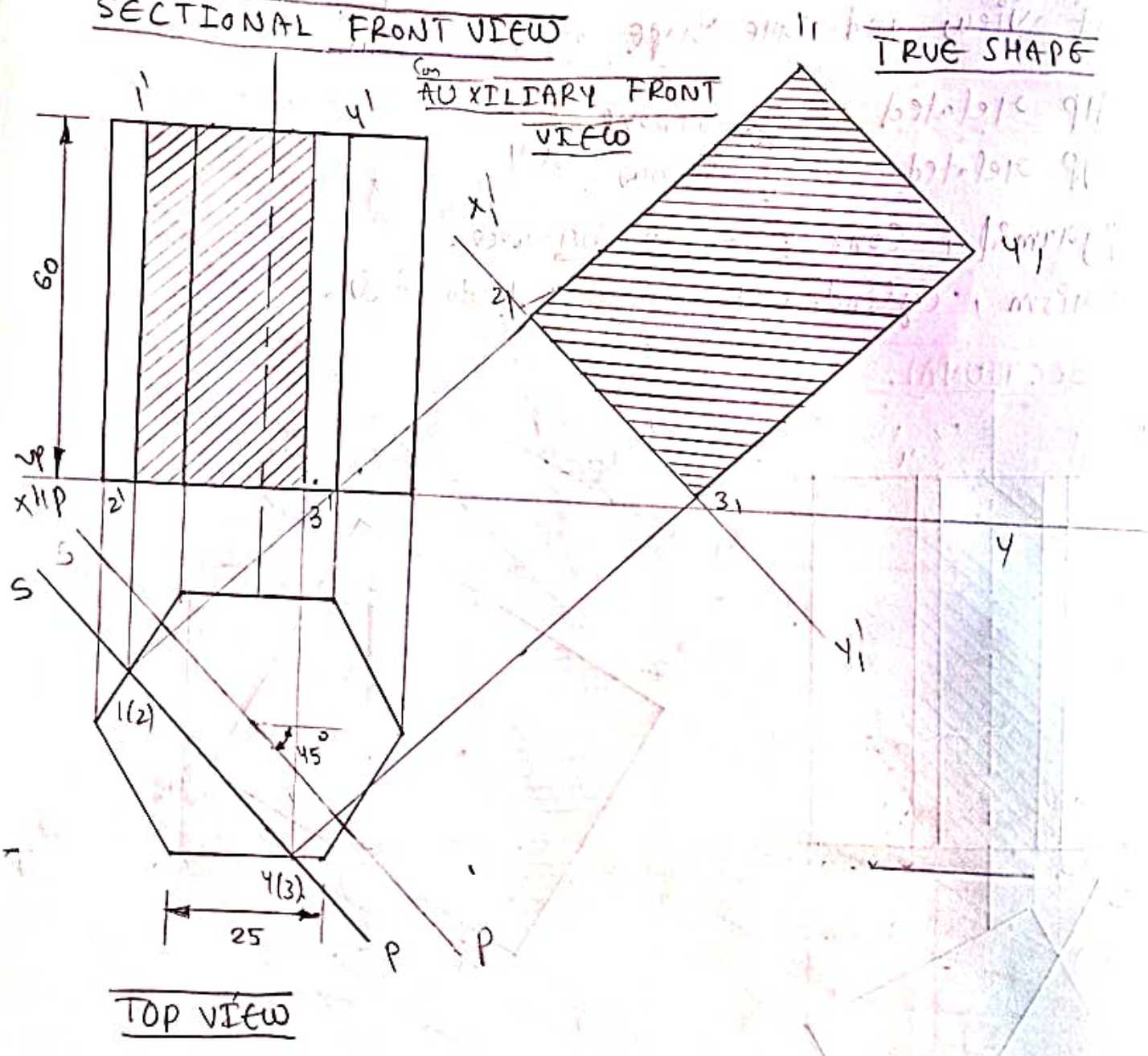
HP related ಆಗಿ Above. x y
VP related ಆಗಿ Below. x y

Pyramid, Cone ಕ್ಕೆ points ಇಲ್ಲಿವೆ.
Prism, Cylinder ಕ್ಕೆ points ಕೊಡಲಾಗಿದೆ.

(14).



(14) A hexagonal prism of side of base 25mm and axis 60 mm long, is resting on its base on HP such that an edge of the base is parallel to VP. It is cut by a sectional plane, inclined at 45° to VP and 10mm from the axis. Draw the projections of the solids. Also, obtain an auxiliary front view, show Pig the true shape of the section.

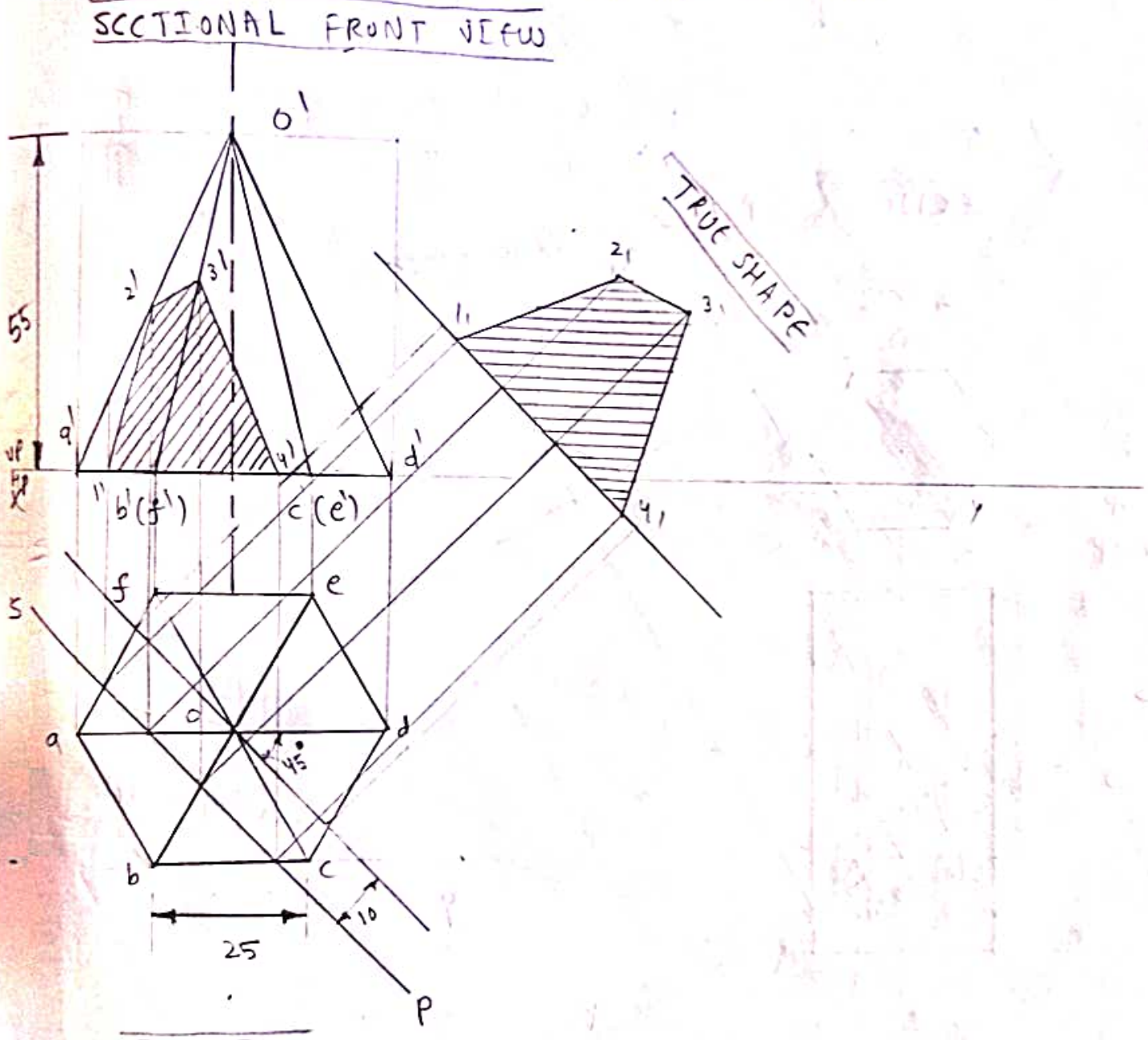


Base on HP Solid Below XY.

parallel to VP Solid $\frac{VP}{HP}$

⊥ to VP Solid $\frac{VP}{HP}$

(15). A Hexagonal pyramid side of base 25mm and axis 55mm long rests with its base on HP such that one of the edges of its base is parallel to VP. It is cut by a section plane ⊥ to HP and inclined at 45° to VP and passing through the pyramid at a distance of 10mm from the axis. Draw the sectional front view and True shape of the section.



(16) A Hexagonal prism 15mm of side of base and height 60mm rests with one of its rectangular faces on the ground and axis beeing parallel to HP. It is cut by a section plane perpendicular to HP and inclined at 30° to VP and passing through a point on the axis 15mm from one of its ends. Draw the sectional front view, and the true shape of the section.