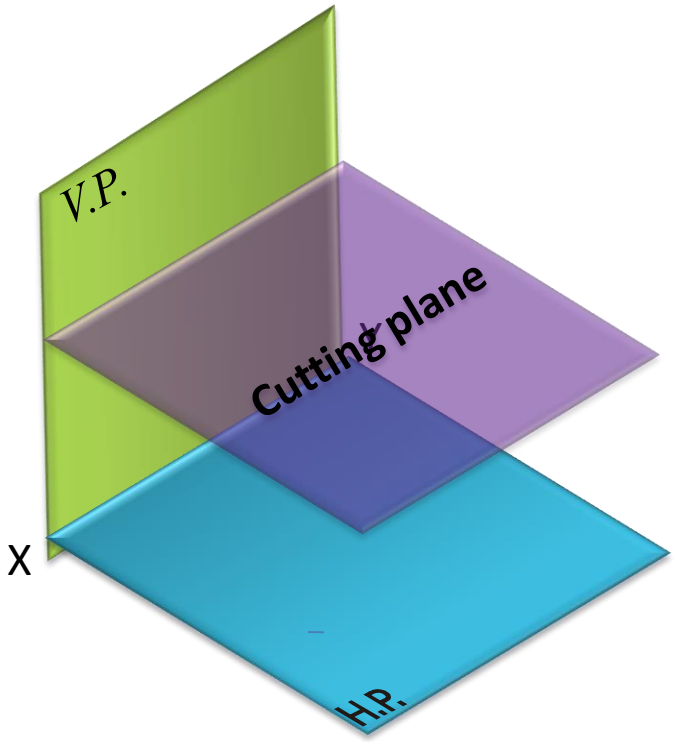
TYPES OF SECTION PLANES

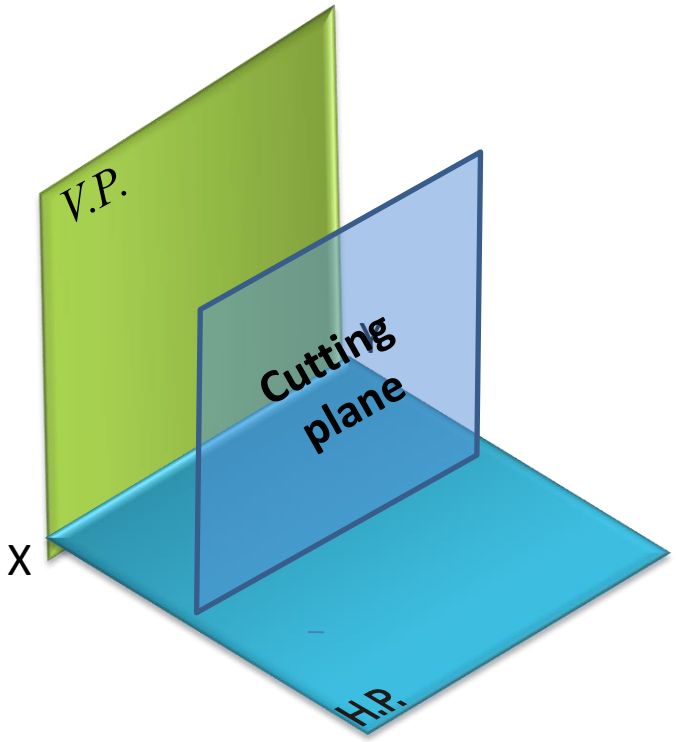


No HT for this CP

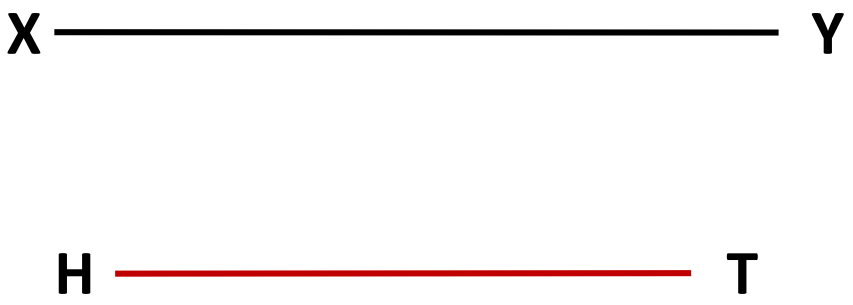
SECTION PLANE / CUTTING PLANE

Parallel to HP & Perpendicular to VP

TYPES OF SECTION PLANES



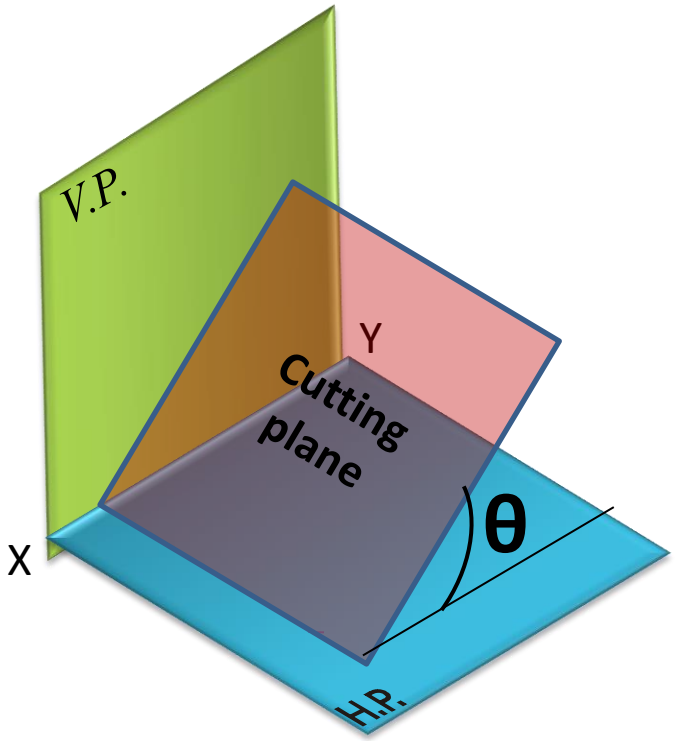
No VT for this CP

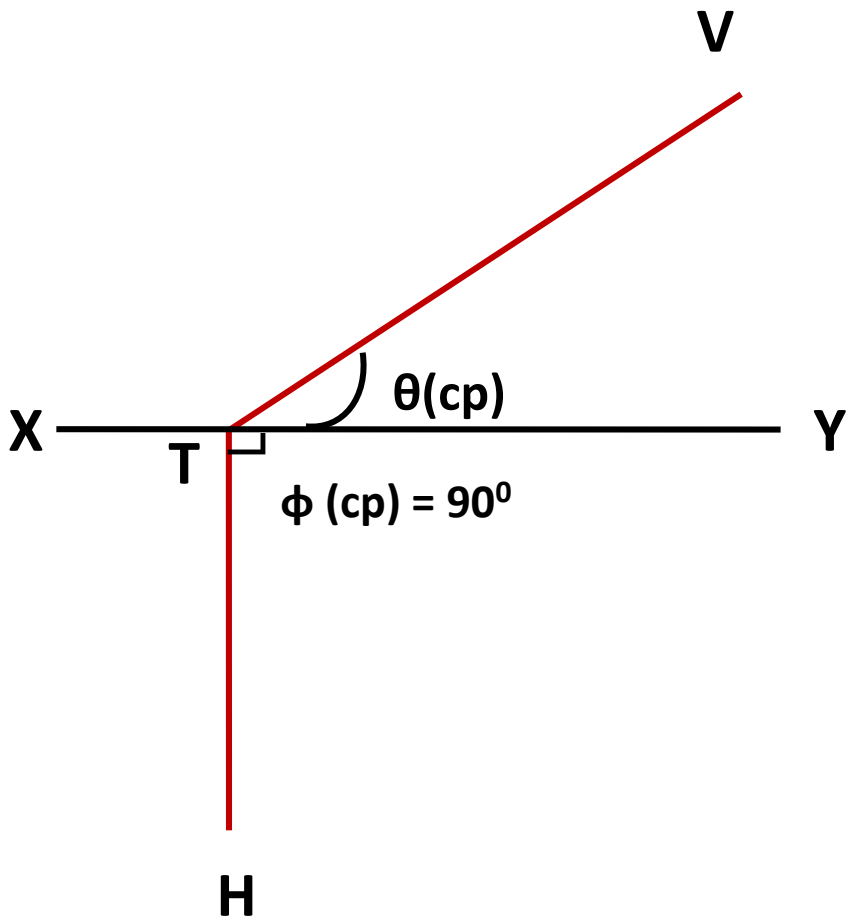


SECTION PLANE / CUTTING PLANE

Perpendicular to HP & Parallel to VP

TYPES OF SECTION PLANES

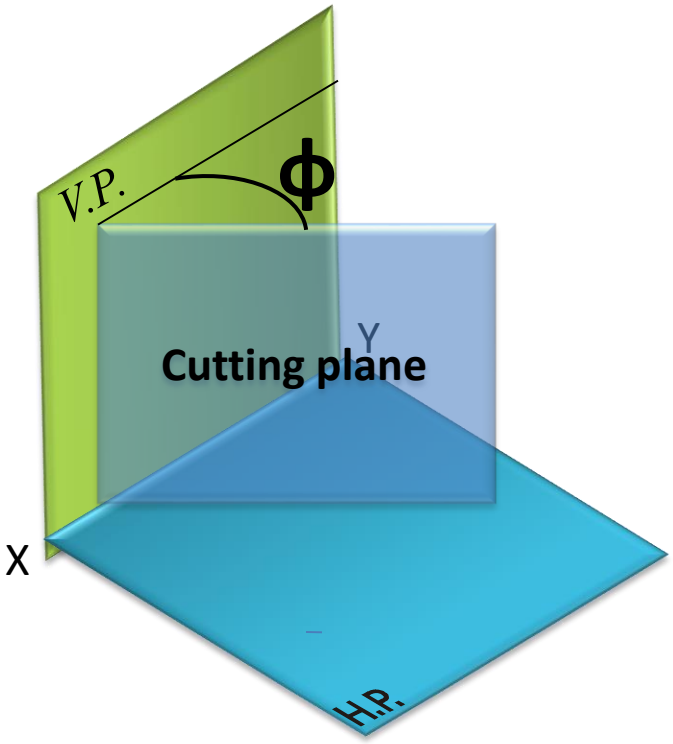


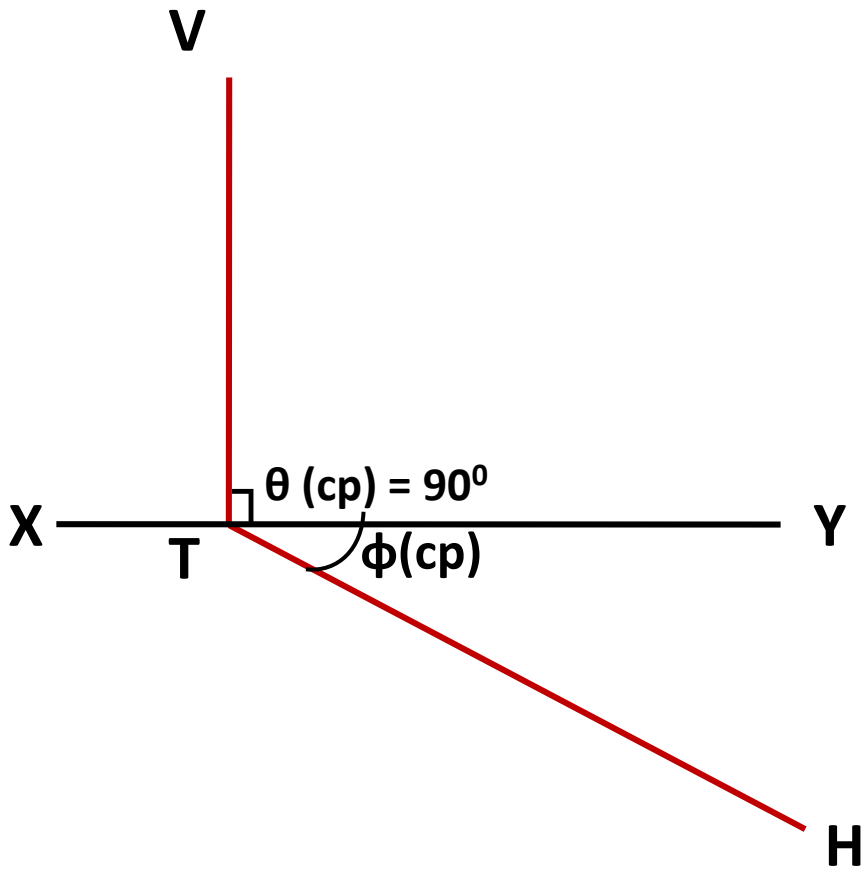


SECTION PLANE / CUTTING PLANE

Inclined to HP & Perpendicular to VP

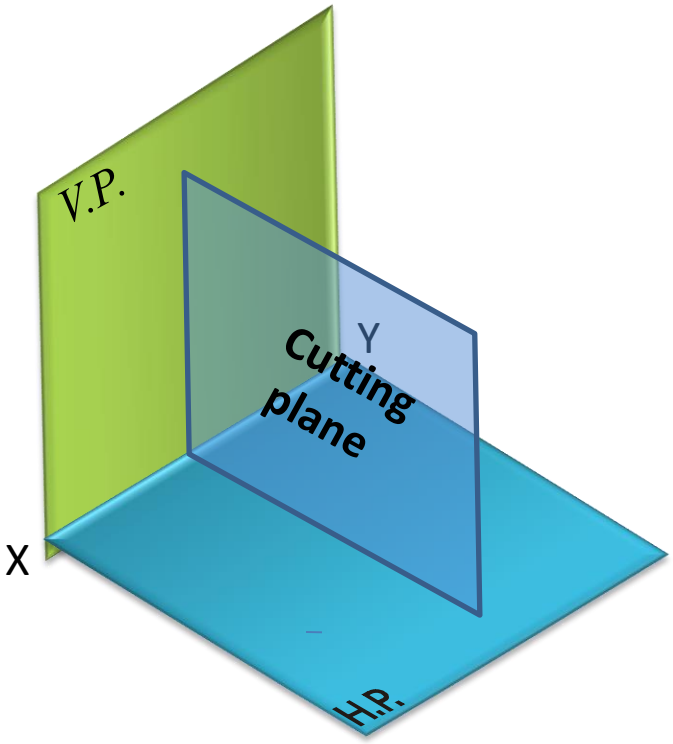
TYPES OF SECTION PLANES

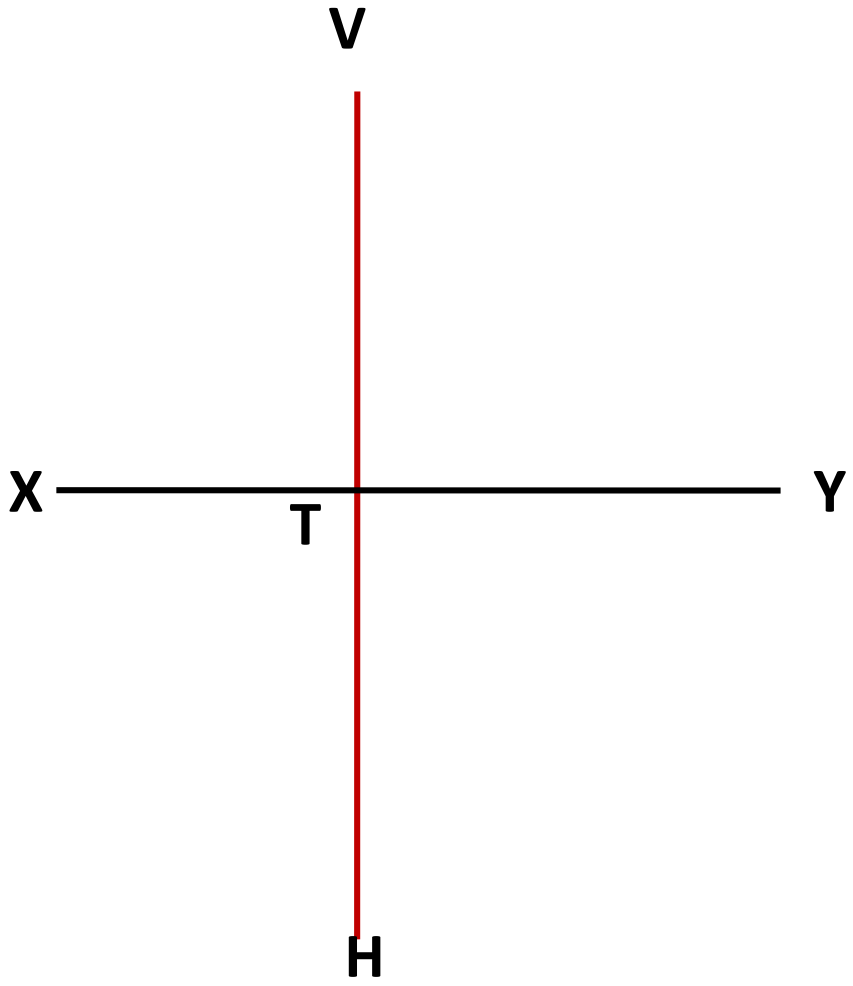




SECTION PLANE / CUTTING PLANE

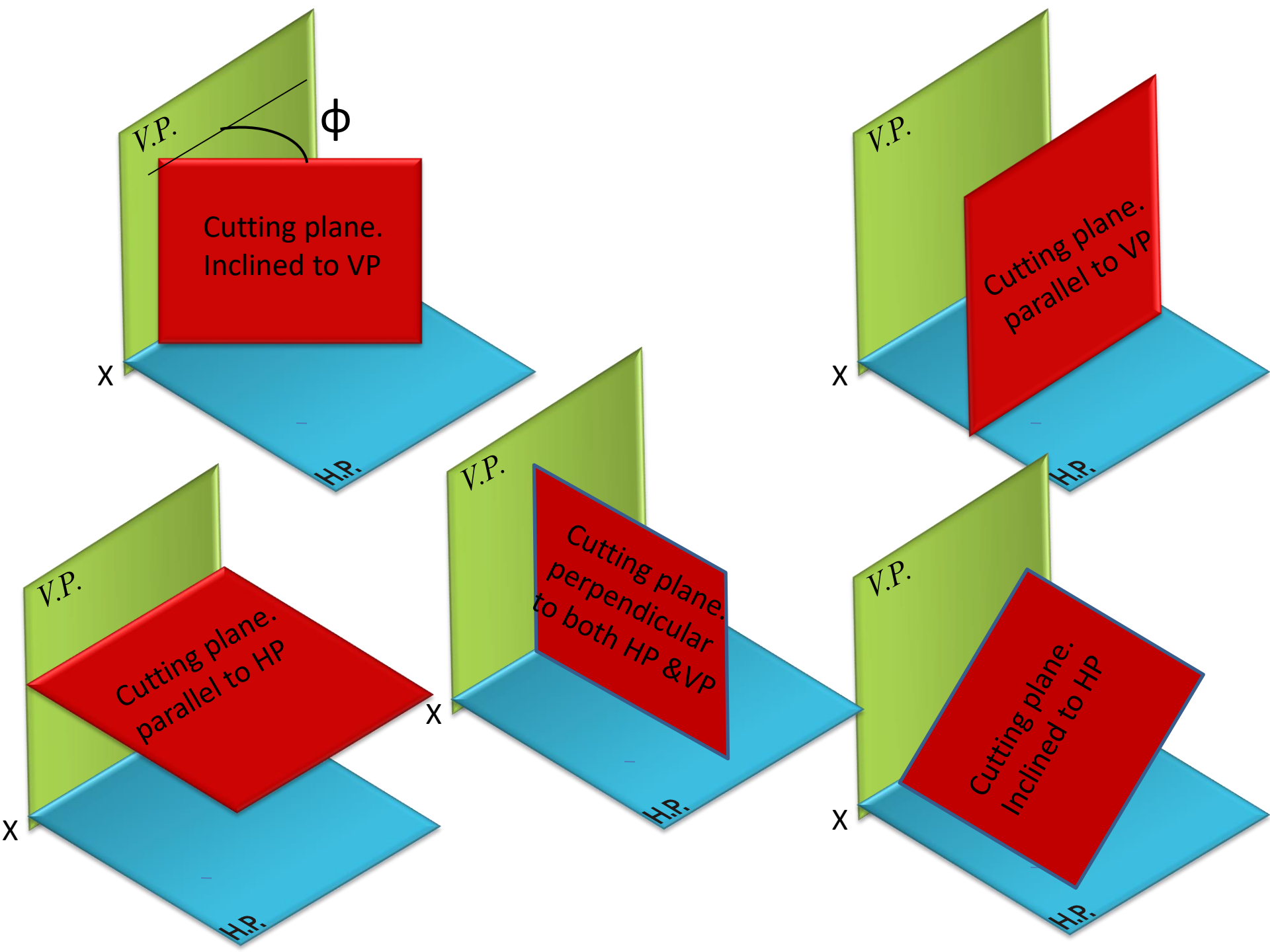
Perpendicular to HP & Inclined to VP





SECTION PLANE / CUTTING PLANE

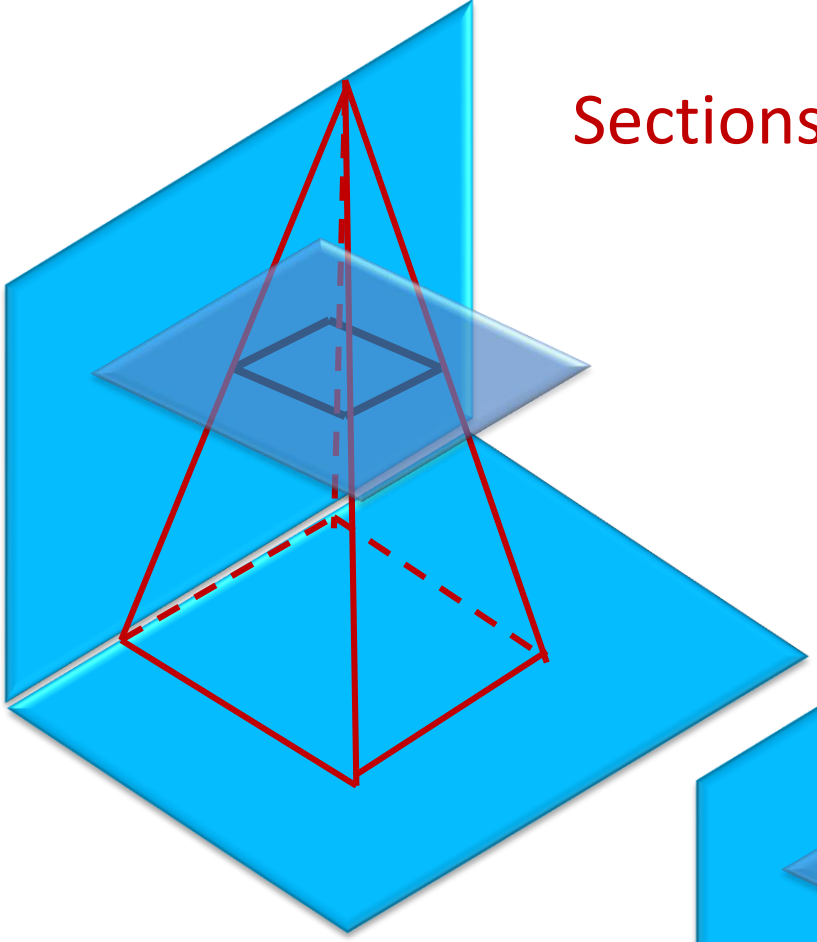
Perpendicular to HP & Perpendicular to VP

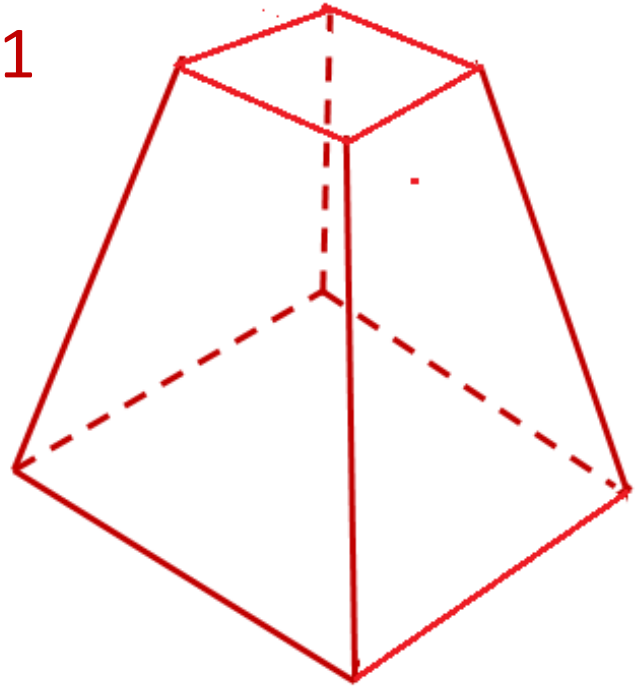

V.P.
ϕ
Cutting plane.
Inclined to VP
X
H.P.
V.P.
Cutting plane.
parallel to VP
X
H.P.
V.P.
Cutting plane.
parallel to HP
X
H.P.
V.P.
Cutting plane.
perpendicular
to both HP &VP
X
H.P.
V.P.
Cutting plane.
Inclined to HP
X
H.P.

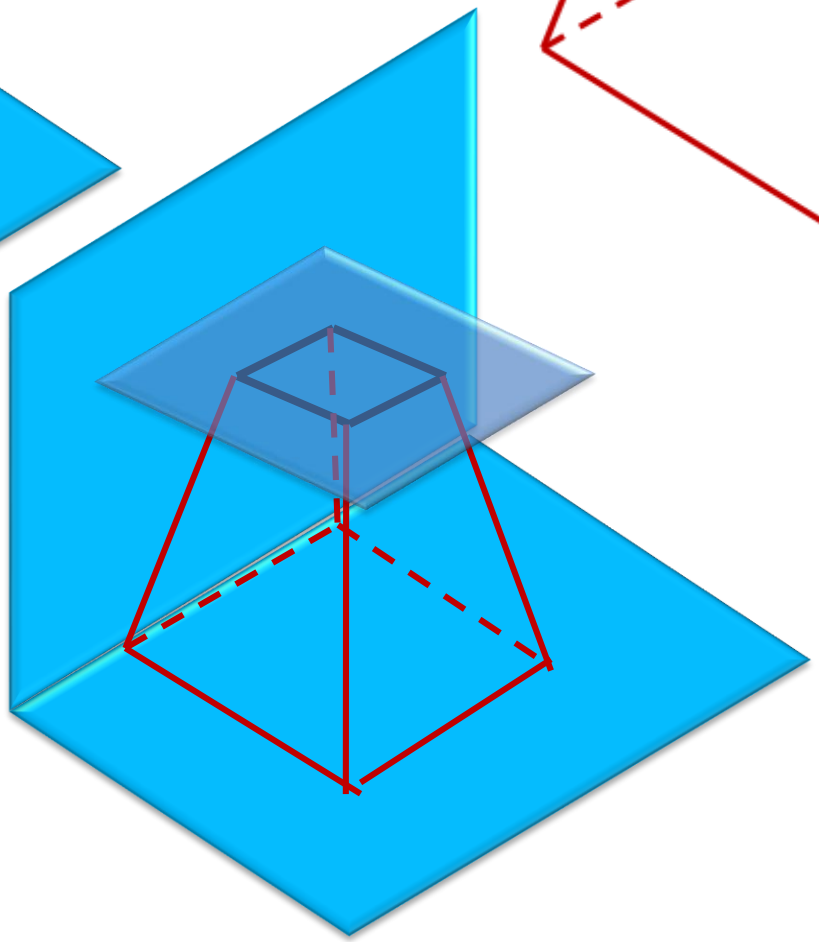
Sections of solids – Q1

A square pyramid 50 mm base side and axis 90 mm long is resting on HP at its base with a side of base parallel to VP. The pyramid is cut by a section plane parallel to HP and perpendicular to VP, bisecting the axis. Draw the sectional views and the true shape of the section.

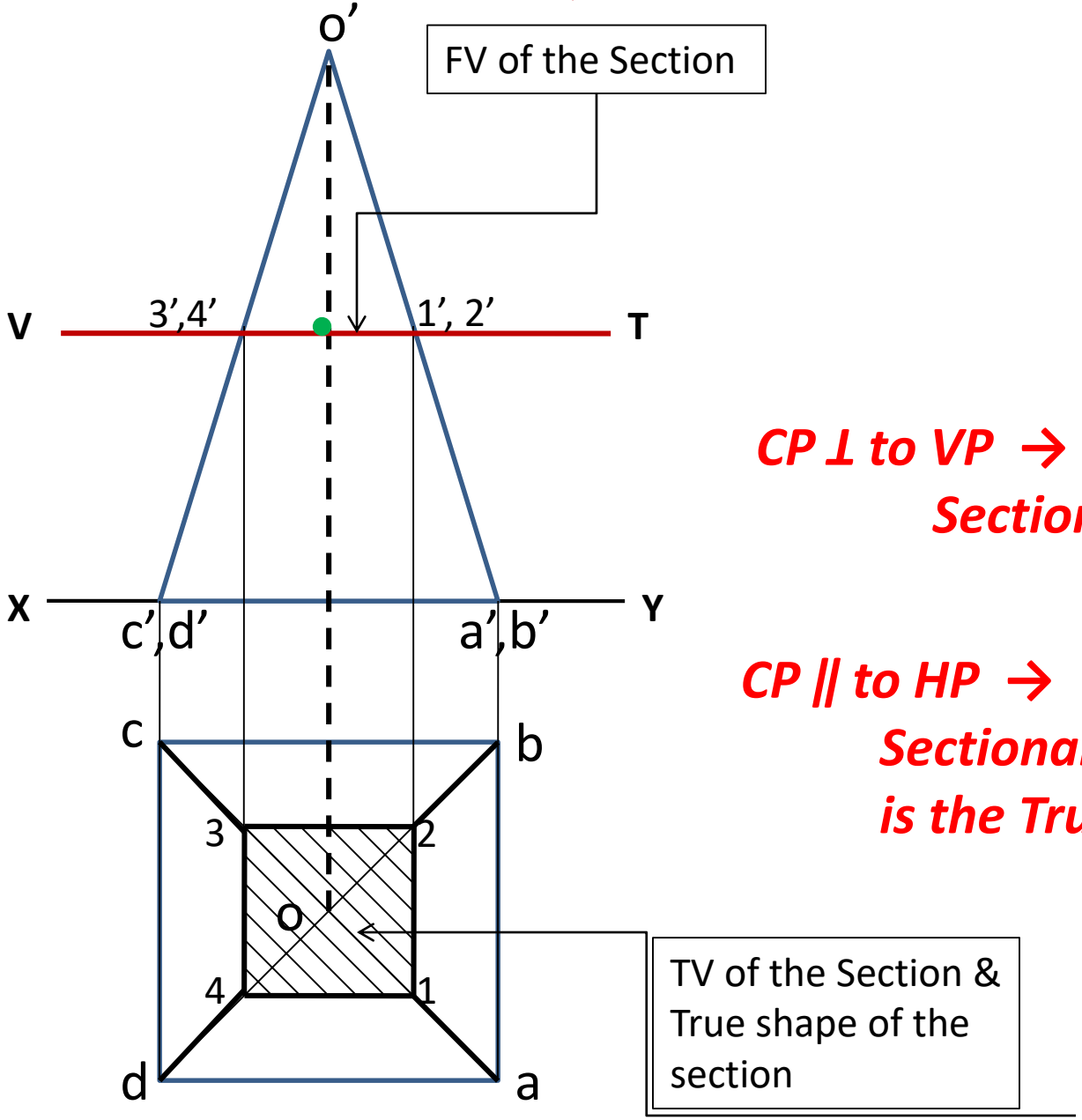
Sections of solids – Q1

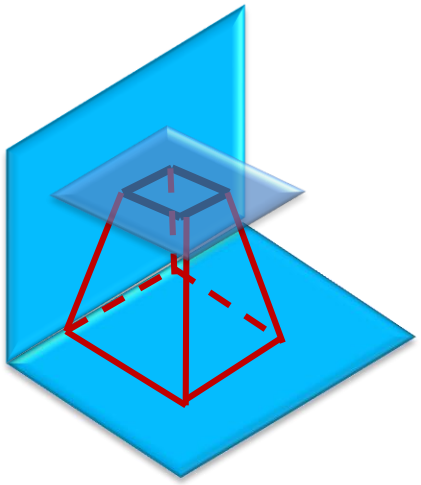






Sections of solids – Q1





CP ⊥ to VP →

Sectional FV is a straight line.

CP ∥ to HP →

Sectional TV is a closed figure & is the True shape of the section

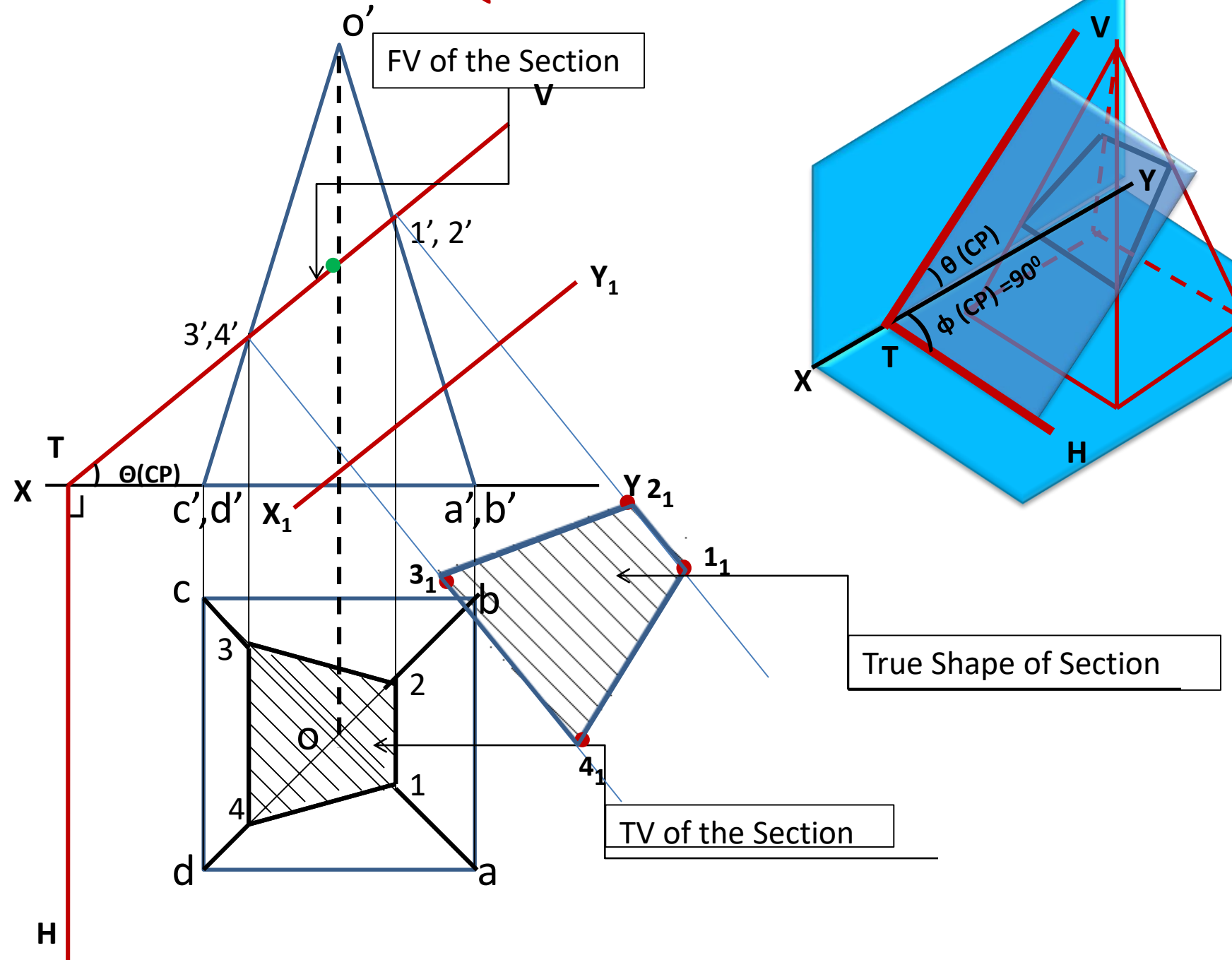
Sections of solids – Q2

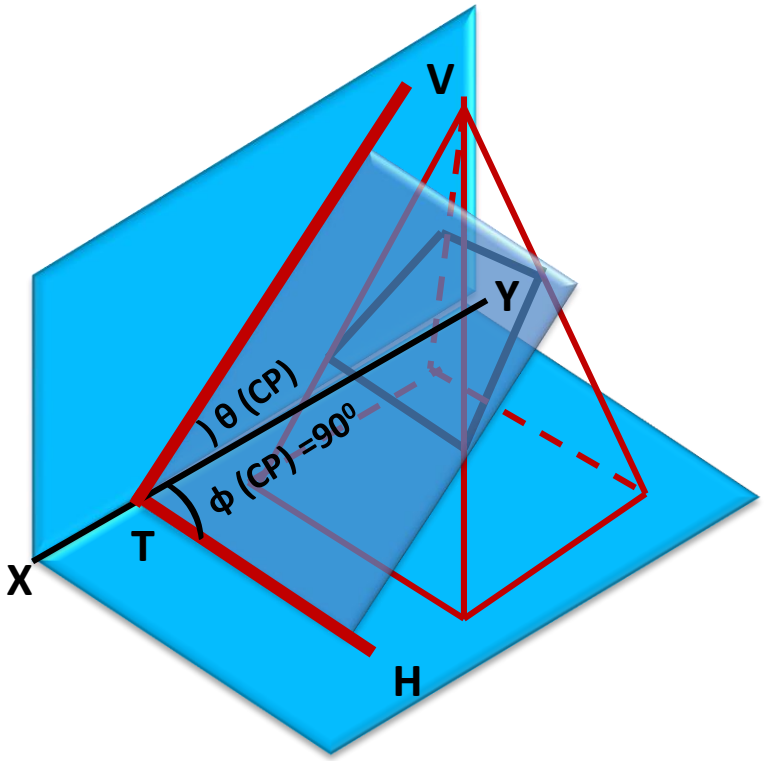
A square pyramid 50 mm base side and axis 90 mm long is resting on HP at its base with a side of base parallel to VP. The pyramid is cut by a section plane inclined at 45° to HP and perpendicular to VP, bisecting the axis. Draw the sectional views and the true shape of the section.

CP ⊥ to VP → Sectional FV is a straight line.

CP Inclined to HP → Sectional TV is a closed figure,
but not the True shape of the section.

Sections of solids – Q2





CP perpendicular to VP & inclined to HP

(1). Sectional FV is a Straight Line.

(2). Sectional TV is a Closed Figure.

(3). True Shape is similar to Sectional TV, but enlarged.

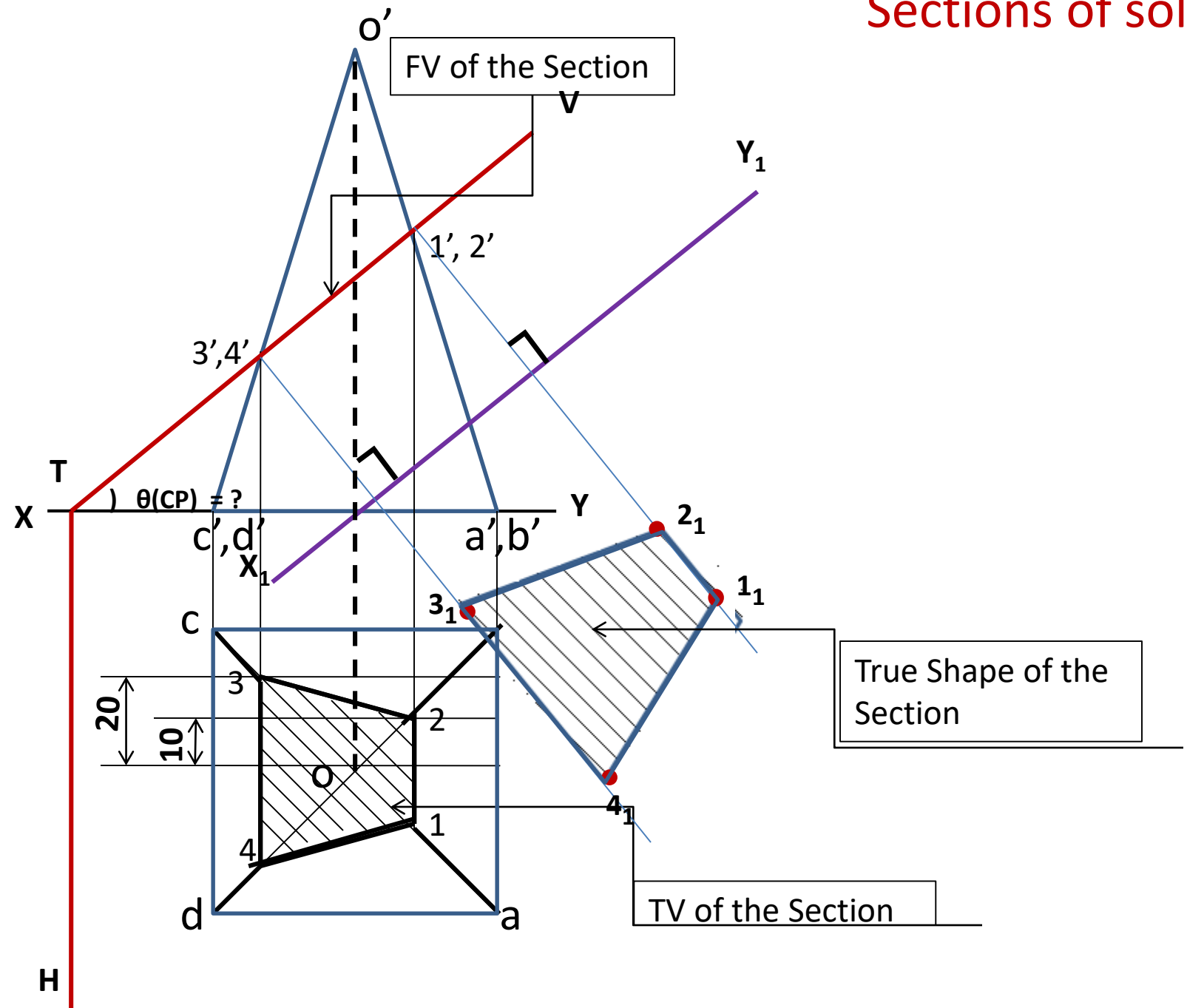
Distance of New Plan points from X_1 Y_1

= Distance of Old Plan points from XY.

Sections of solids – Q3

A square pyramid 60 mm base side and axis 90 mm long is resting on HP at its base. The pyramid is cut by a section plane in such away that the true shape of the section is a trapezium with parallel sides 40mm and 20 mm. Draw the FV and TV showing the section. Also show the true shape of the section.

Sections of solids – Q3



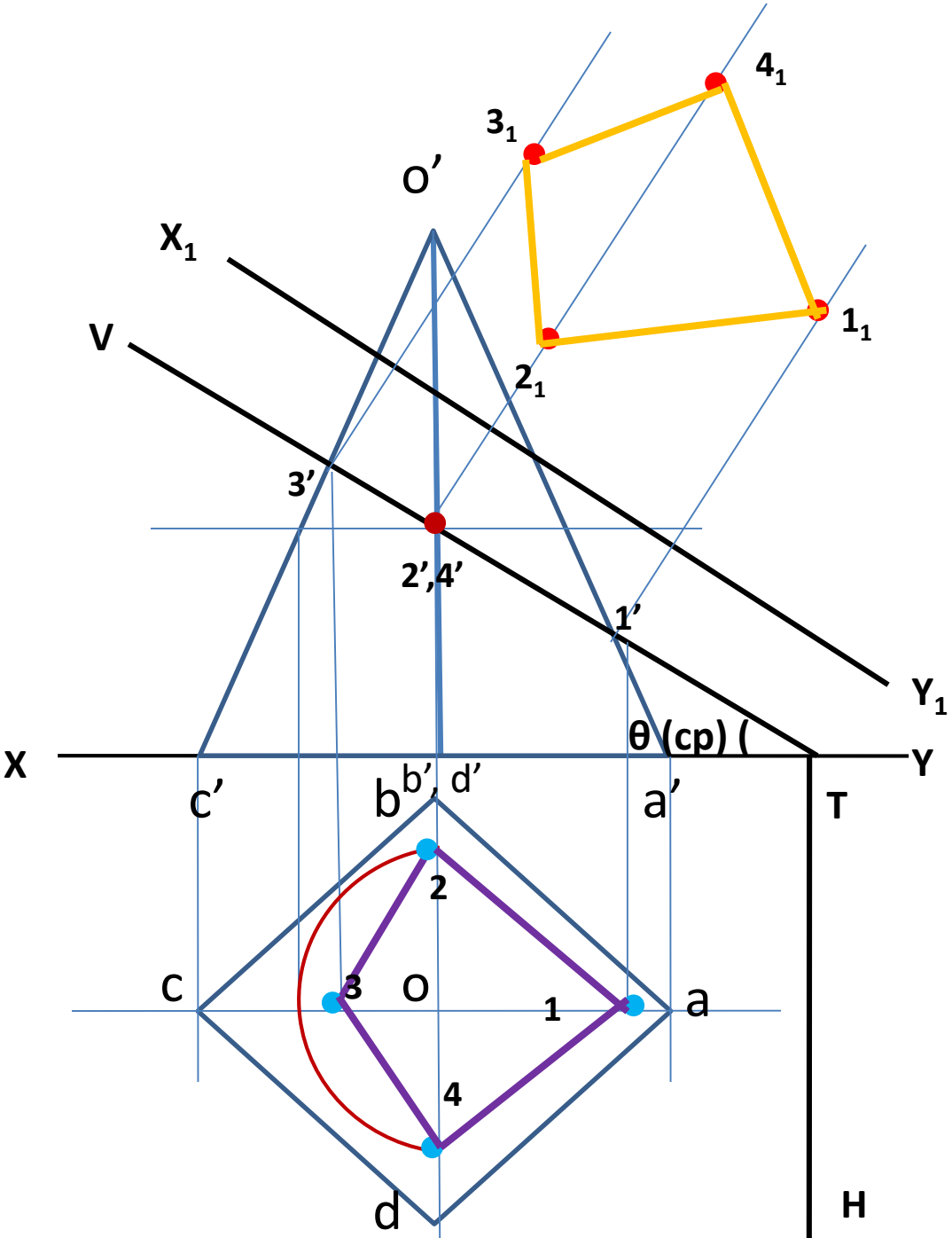
Sections of solids – Q4

A square pyramid 40 mm base side and axis 65 mm long its base on HP and all the edges of base are equally inclined to the VP. It is cut by section plane perpendicular to VP, inclined at 45° to HP and bisecting the axis. . Draw its front view, sectional top view, sectional side view and true shape of the section.

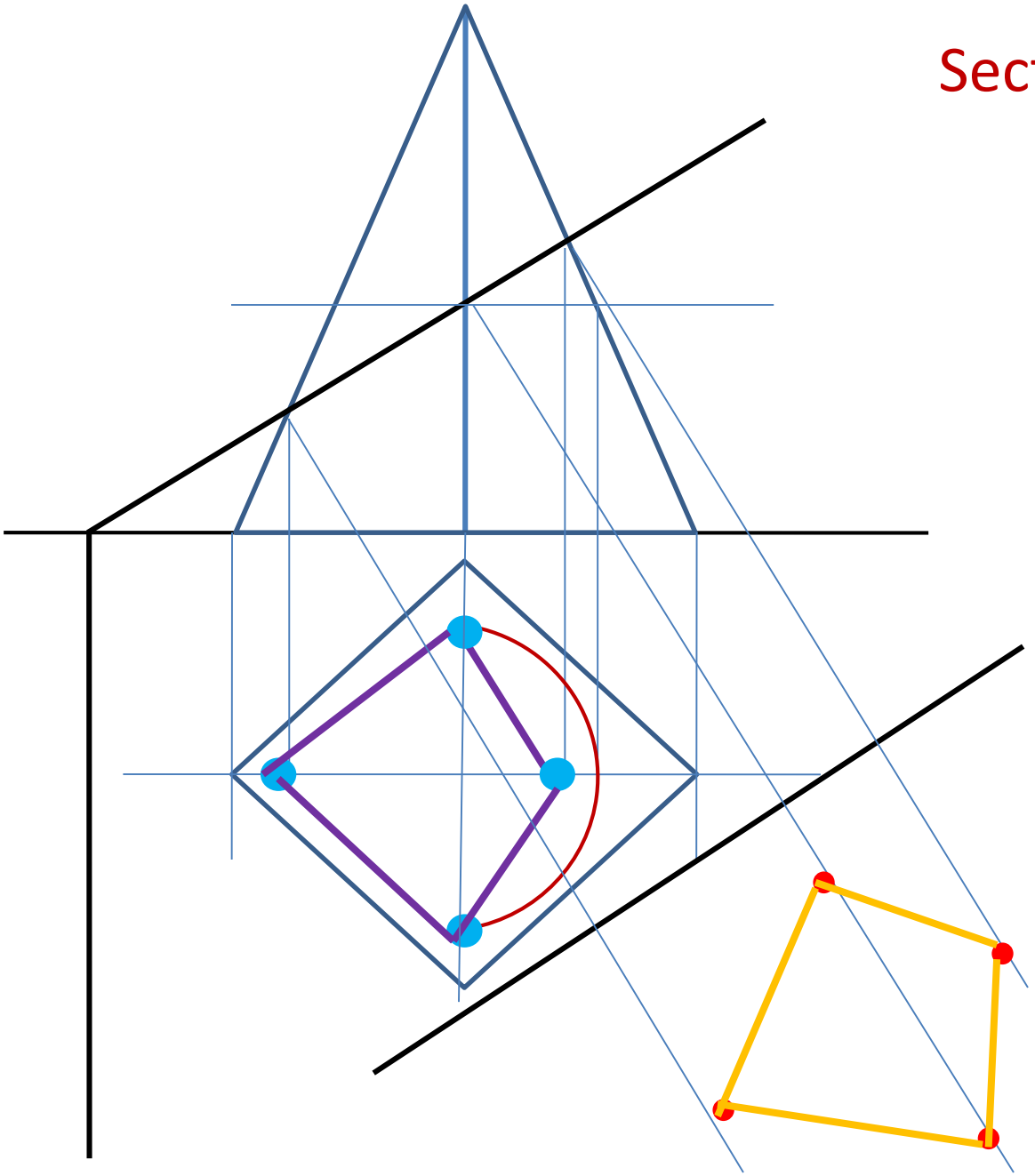
CP ⊥ to VP → Sectional FV is a straight line.

CP Inclined to HP → Sectional TV is a closed figure, but not the True shape of the section.

Sections of solids – Q4



Sections of solids – Q4



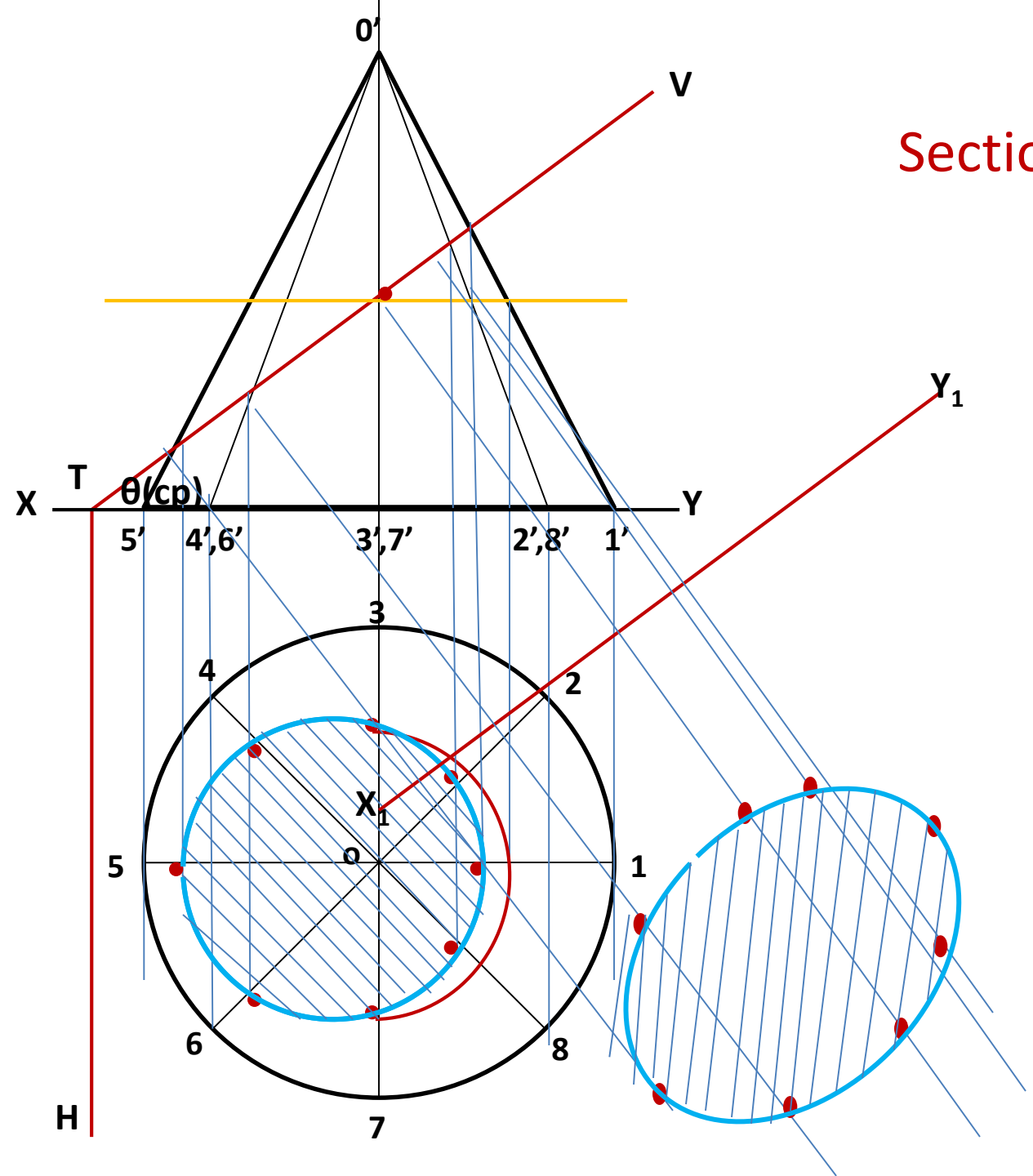
Sections of solids – Q5

A cone is resting on its base on HP. It is cut by a plane inclined 45° to HP and perpendicular to VP. It cuts the axis of the cone at a point 40 mm below the vertex. Draw the front view, sectional top view and the true shape of the section, if the diameter of the cone base is 80 mm and the length of the axis is 90 mm.

CP ⊥ to VP → Sectional FV is a straight line.

CP Inclined to HP → Sectional TV is a closed figure,
but not the True shape of the section.

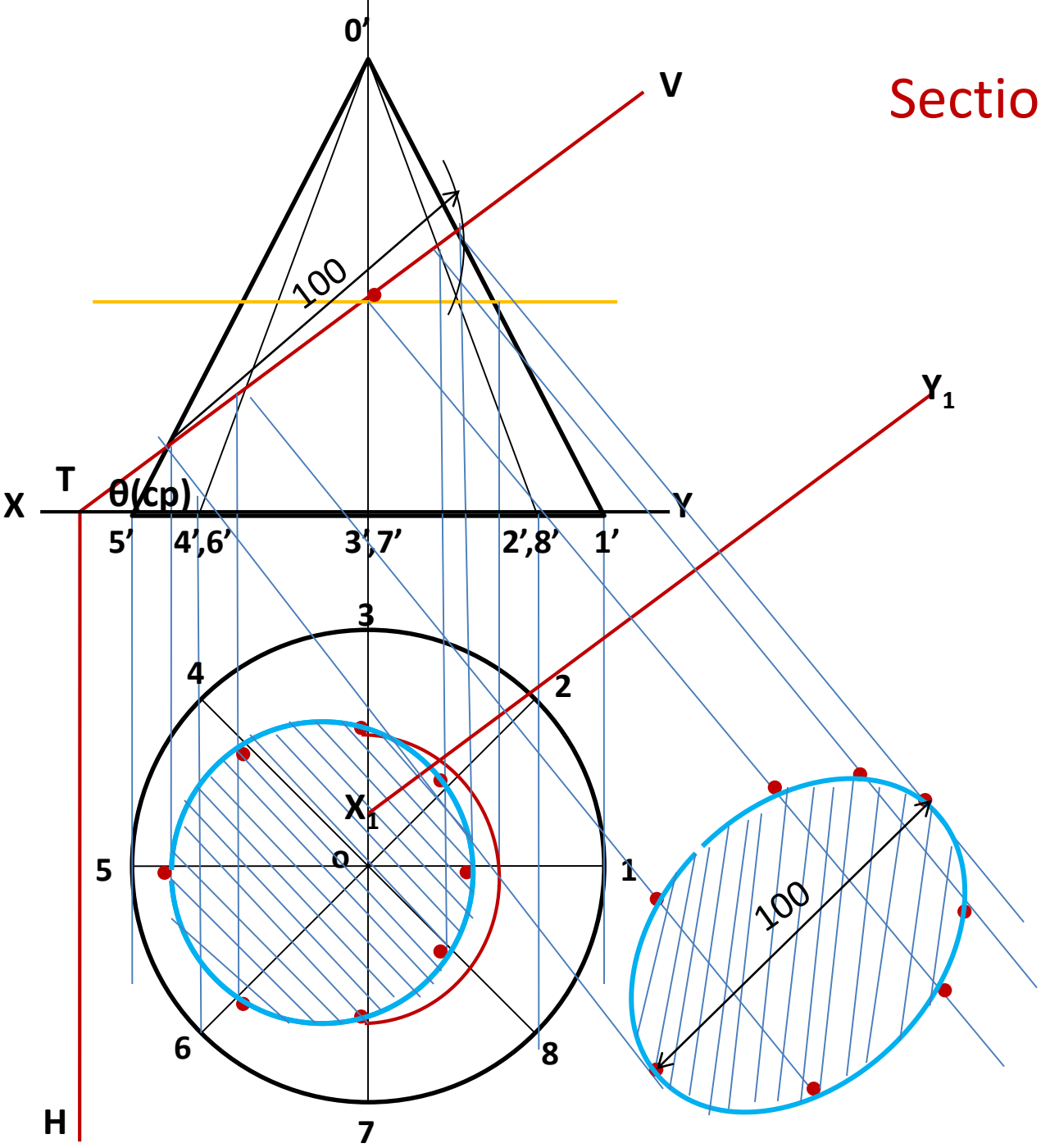
Sections of solids – Q5



Sections of solids – Q6

A cone of base diameter 120 mm and height 135 mm is resting on HP on its base. It is cut by an inclined HP such that the true shape obtained is an ellipse whose major axis is 100 mm long. Draw the projections of cone showing sectional views and the true shape of the section.

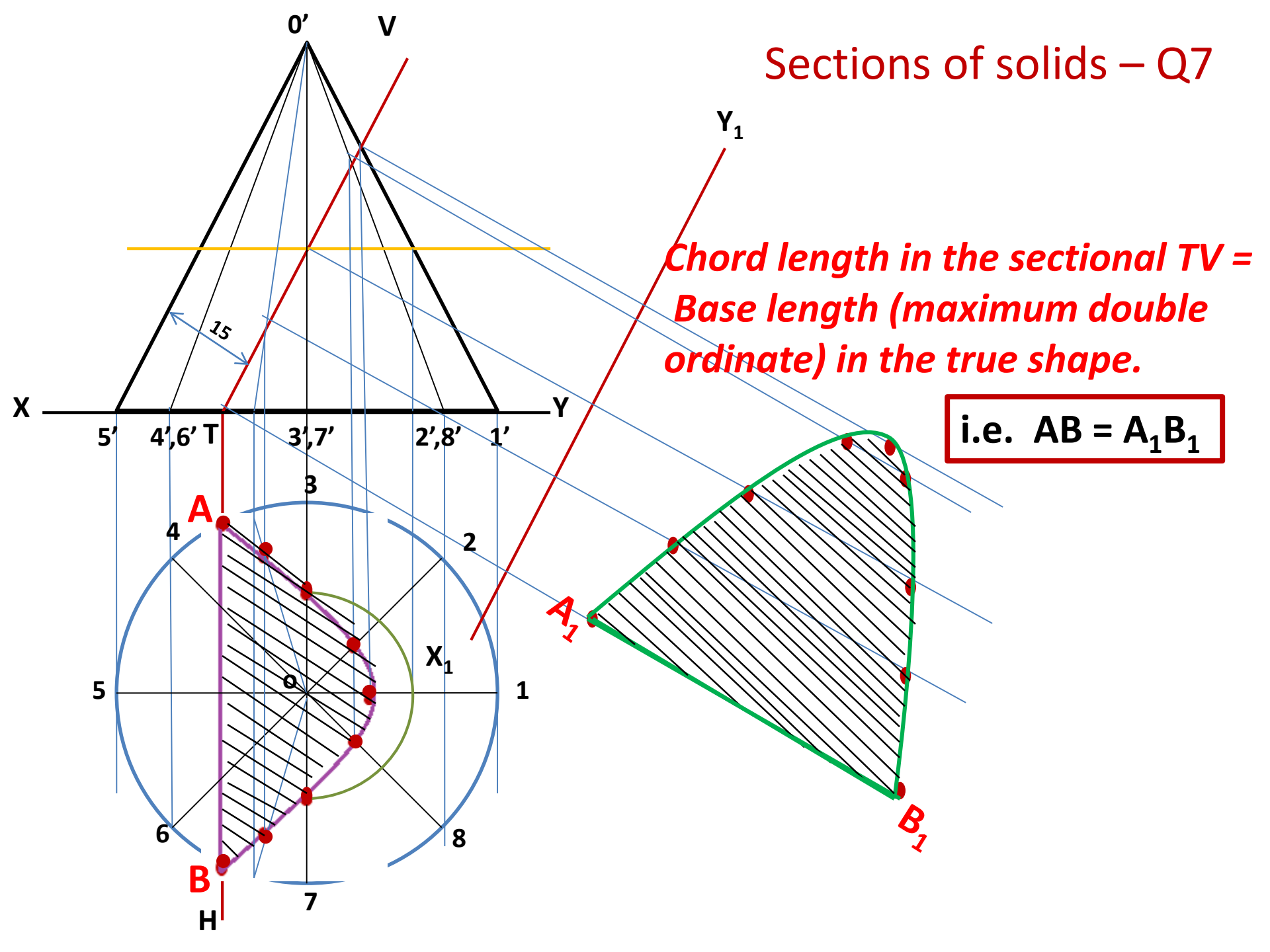
Sections of solids – Q6



Sections of solids – Q7

A cone base 60 mm diameter and axis 70 mm stands vertically with its base on HP. The vertical trace of a section plane perpendicular to VP and parallel to one of the end generators of the cone passes at a distance of 15 mm from it. Draw the sectional plan and the true shape of the section.

Sections of solids – Q7



Chord length in the sectional TV = Base length (maximum double ordinate) in the true shape.

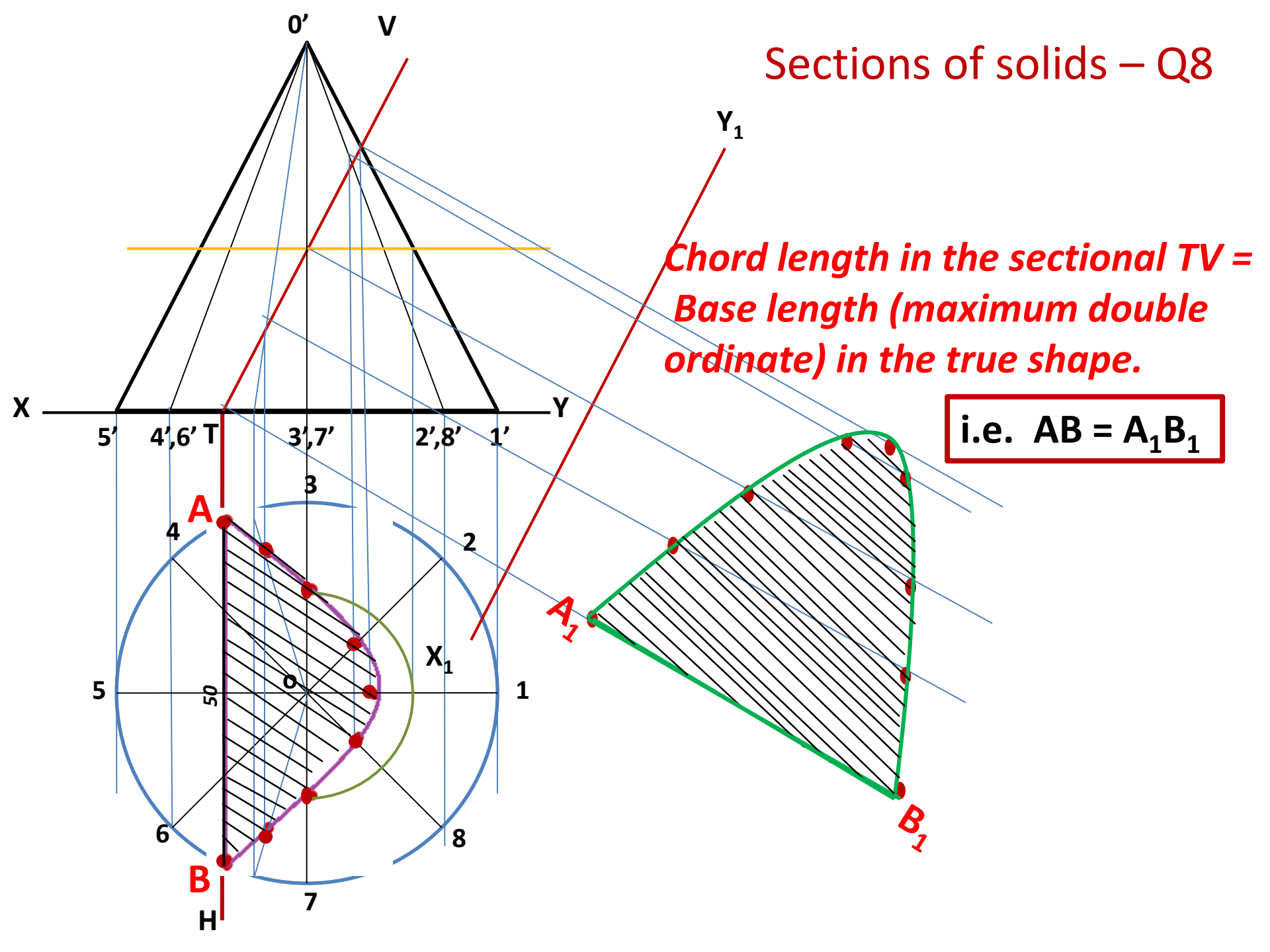
i.e. $AB = A_1B_1$

A cone base 60 mm diameter and axis 90 mm stands vertically with its base on HP. It is cut by a section plane such that the true shape is a parabola of maximum double ordinate of 50 mm. Draw the projections of the cone showing sectional views and the true shape of the section.

NOTE:

Cone Fully defined.
Parabola Not Fully defined.

Sections of solids – Q8



Chord length in the sectional TV = Base length (maximum double ordinate) in the true shape.

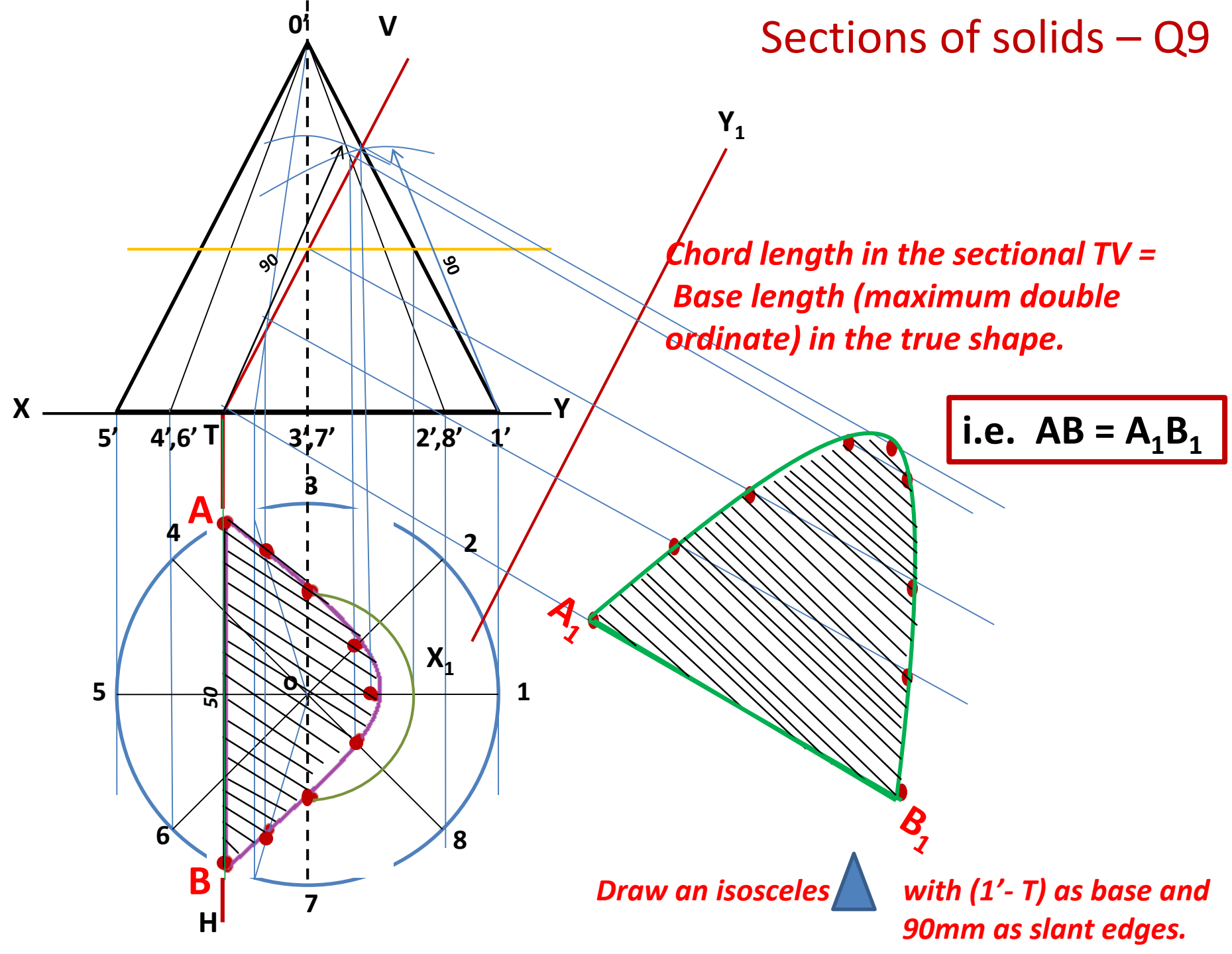
i.e. $AB = A_1B_1$

A cone base 60 mm diameter standing up right is cut by a section plane such that the true shape is a parabola of maximum double ordinate of 50 mm. and the vertex being 70 mm from this ordinate. Draw the front view, sectional top view and true shape of the section. What is the inclination of the section plane?

NOTE:

Cone Not Fully defined.
Parabola Fully defined.

Sections of solids – Q9



Chord length in the sectional TV = Base length (maximum double ordinate) in the true shape.

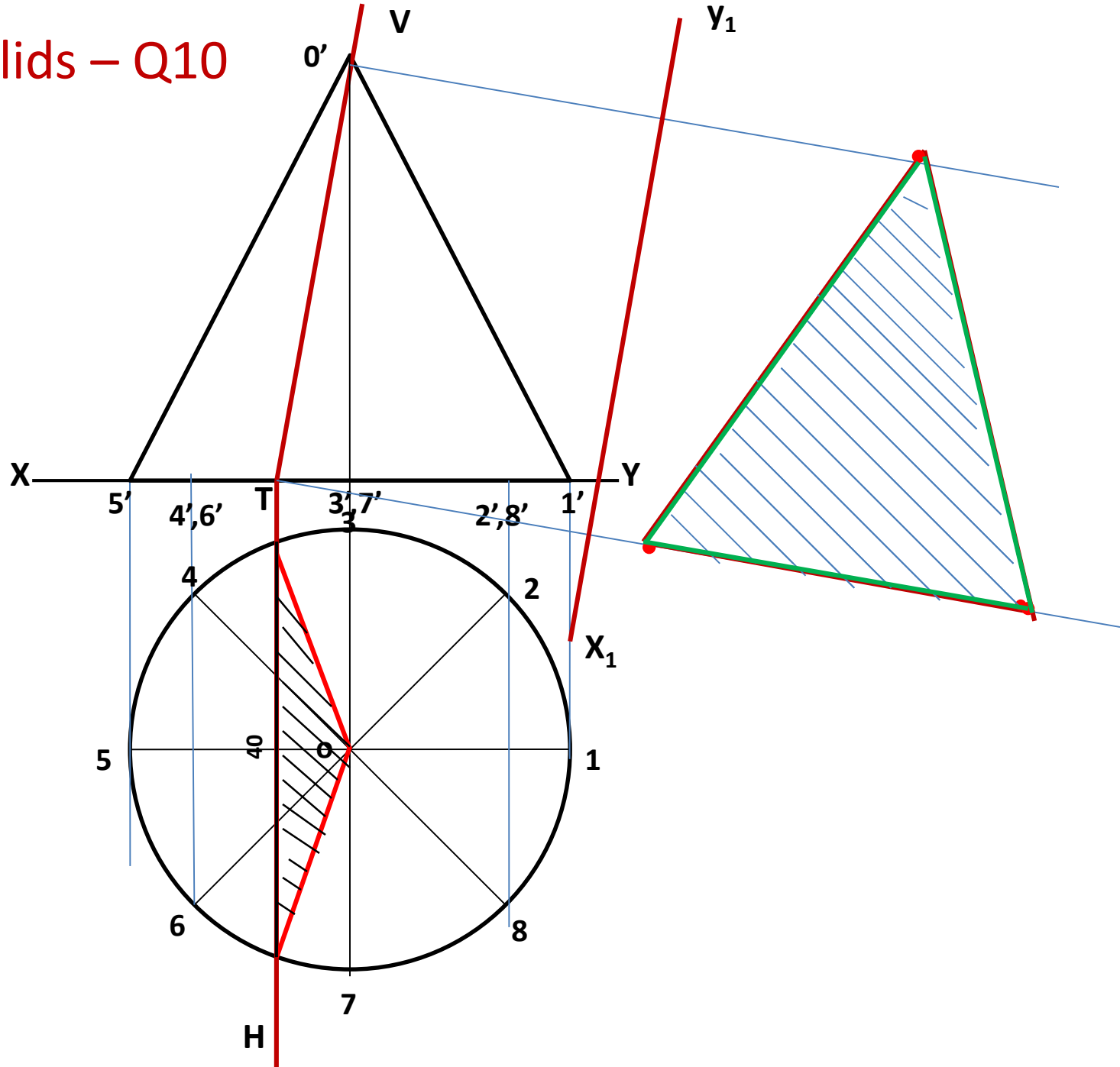
i.e. $AB = A_1B_1$

Draw an isosceles *with (1'- T) as base and 90mm as slant edges.*

Sections of solids – Q10

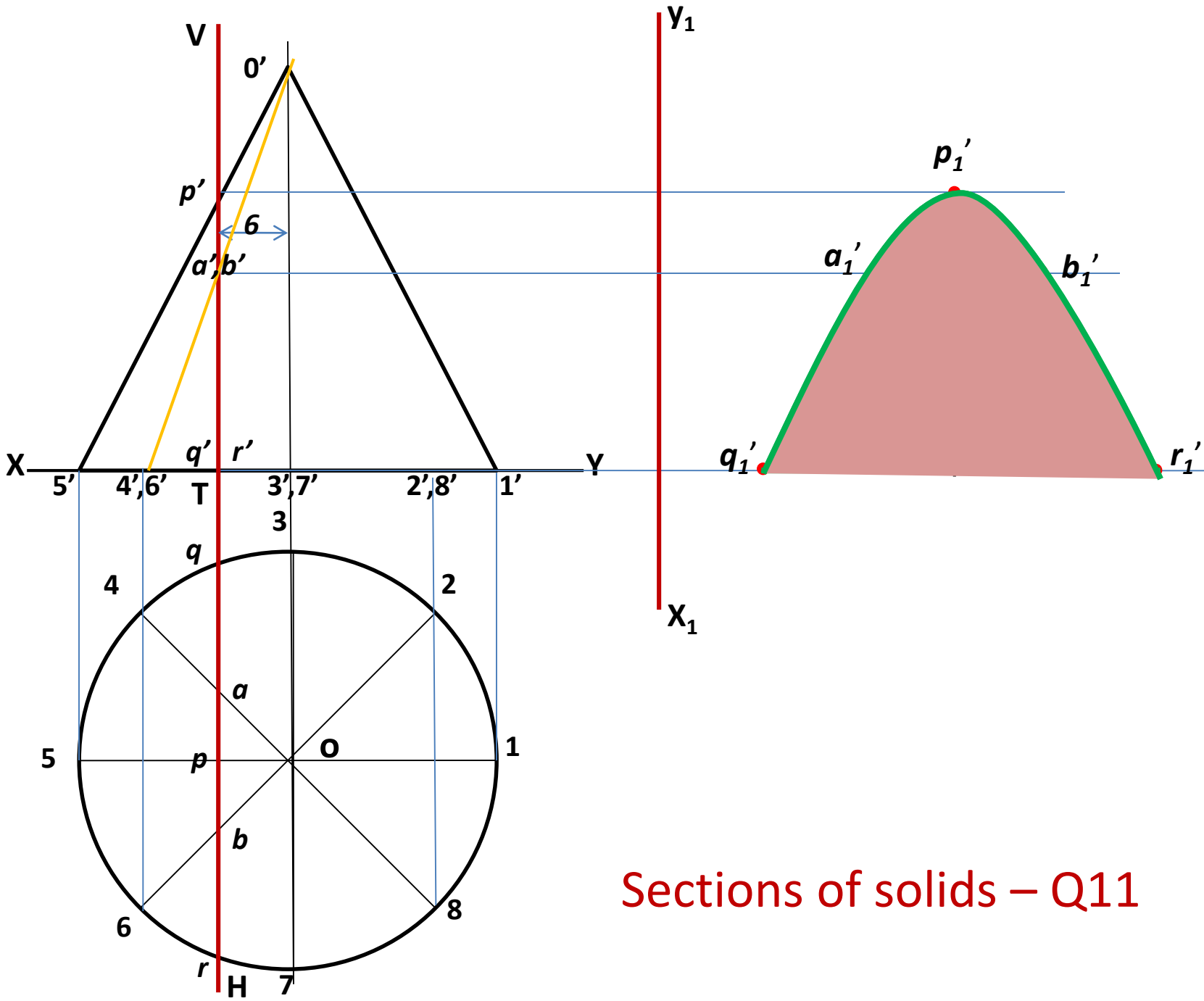
A cone of base diameter 50 mm and axis 60 mm long is resting on HP on its base. It is cut by a section plane such that the true shape is an isosceles triangle of base 40 mm. Draw the sectional views and the true shape of the section.

Sections of solids – Q10



Sections of solids – Q11

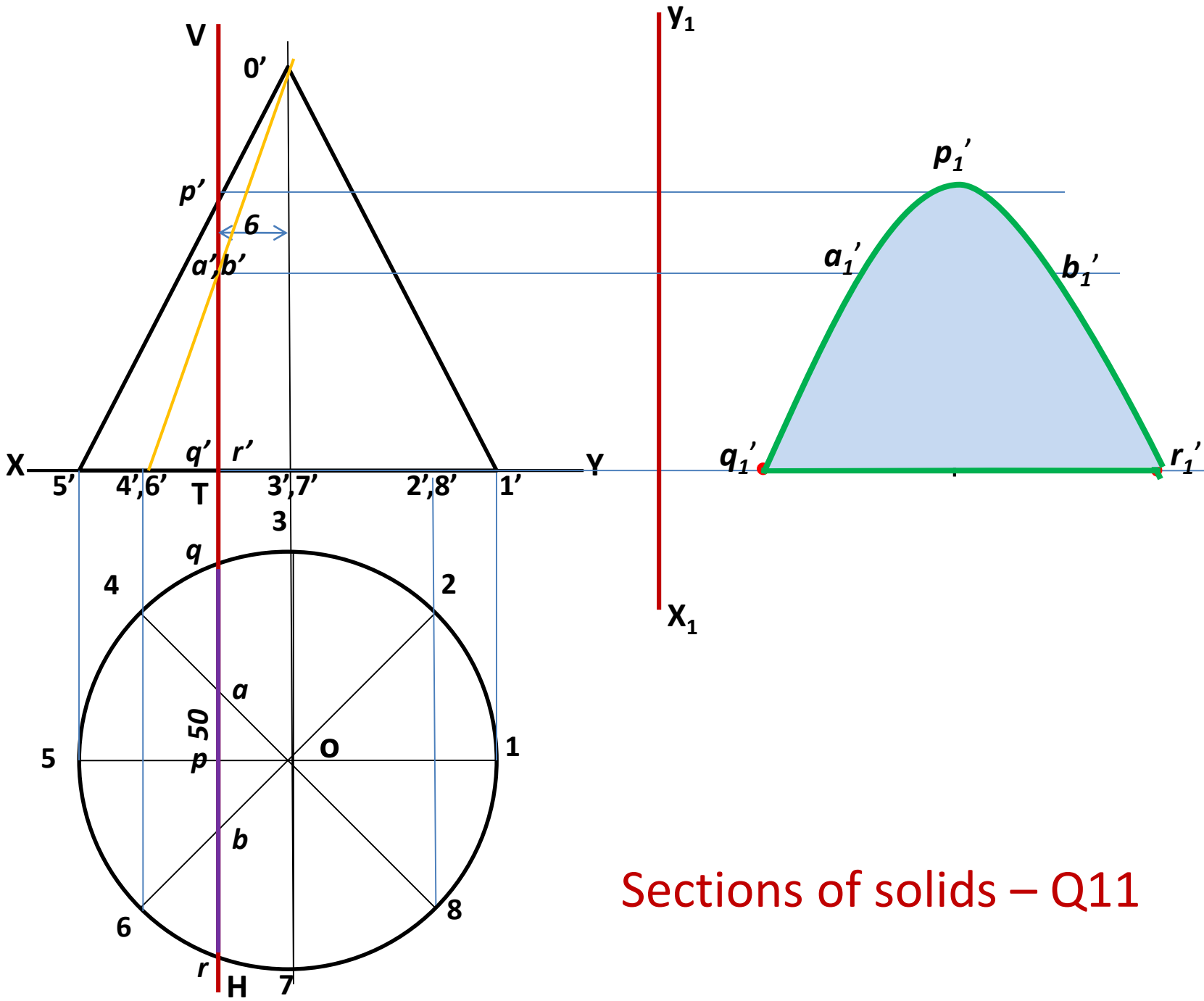
A cone of base diameter 50 mm and axis 55 mm long is resting on HP on its base. It is cut by a section plane perpendicular to both HP and VP and 6mm away from the axis. Show the sectional side view. Mark the height of the section.



Sections of solids – Q11

Sections of solids – Q12

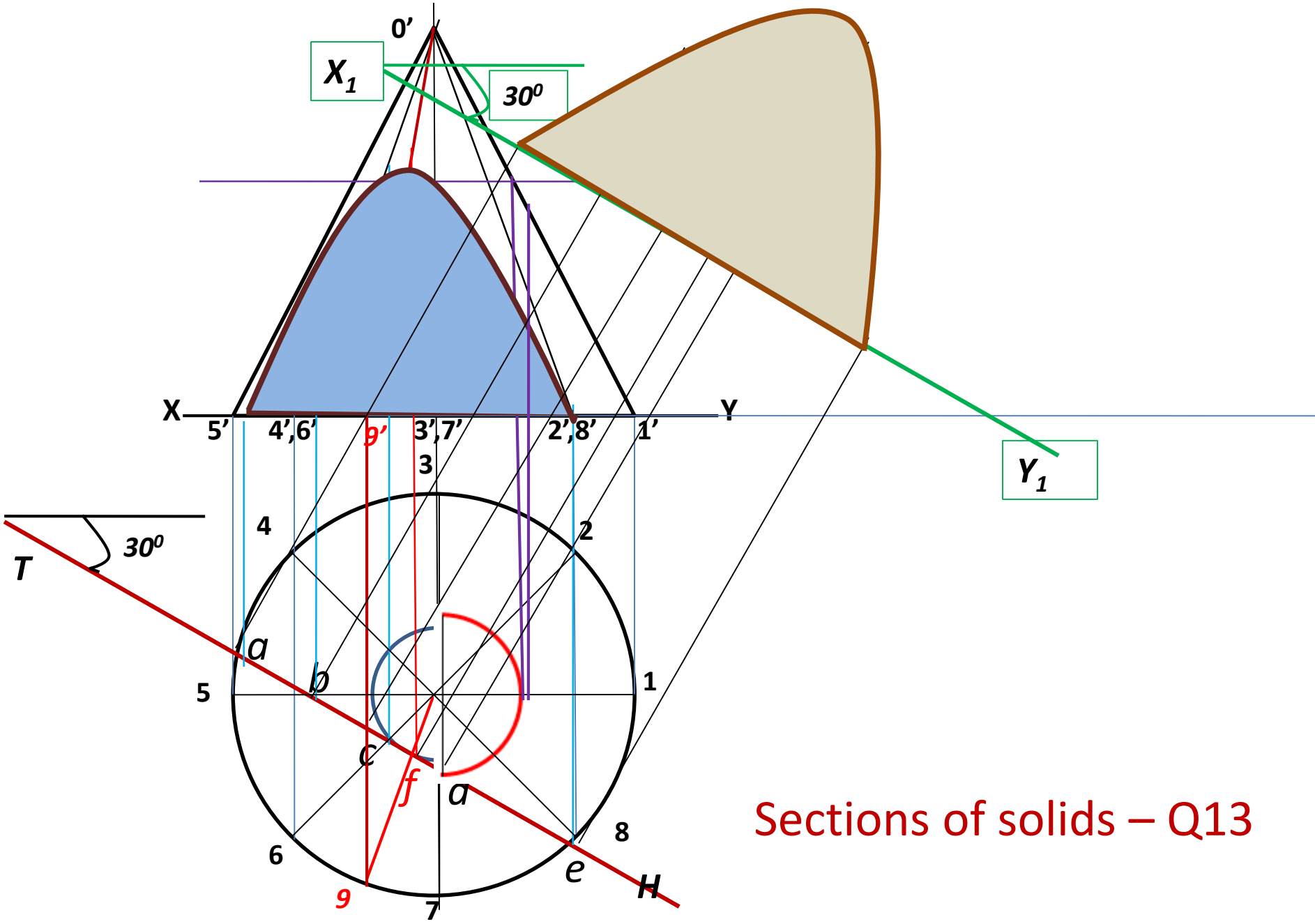
A cone of base diameter 60 mm and axis 75 mm long is resting on HP on its base. It is cut by a section plane such that the true shape is a hyperbola of maximum double ordinate of 50 mm. Draw the sectional views and the true shape of the section.



Sections of solids – Q11

Sections of solids – Q13

A cone base 60 mm diameter and axis 90 mm stands vertically with its base on HP. It is cut by a vertical section plane inclined at 30° to VP and passing through a point on the cone 10 mm off the axis. Draw the sectional views and the true shape of the section.



Sections of solids – Q13

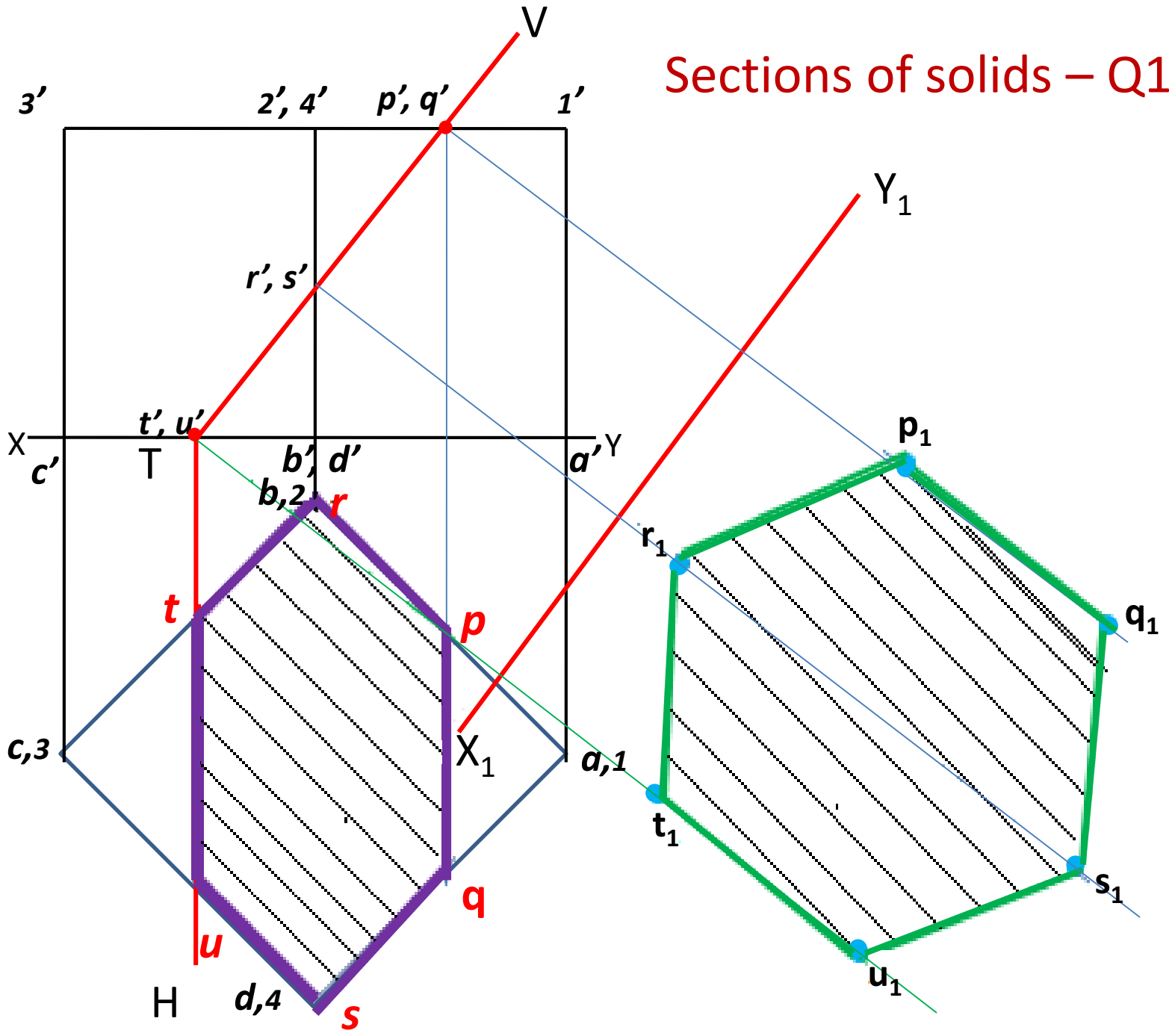
Sections of solids – Q14

A cube of 50 mm side is cut by an inclined plane such that the true shape obtained is a regular hexagon. Draw the sectional views and the true shape of the section.

Cube in Corner position.

VT through
Mid points of top right half & bottom left half.

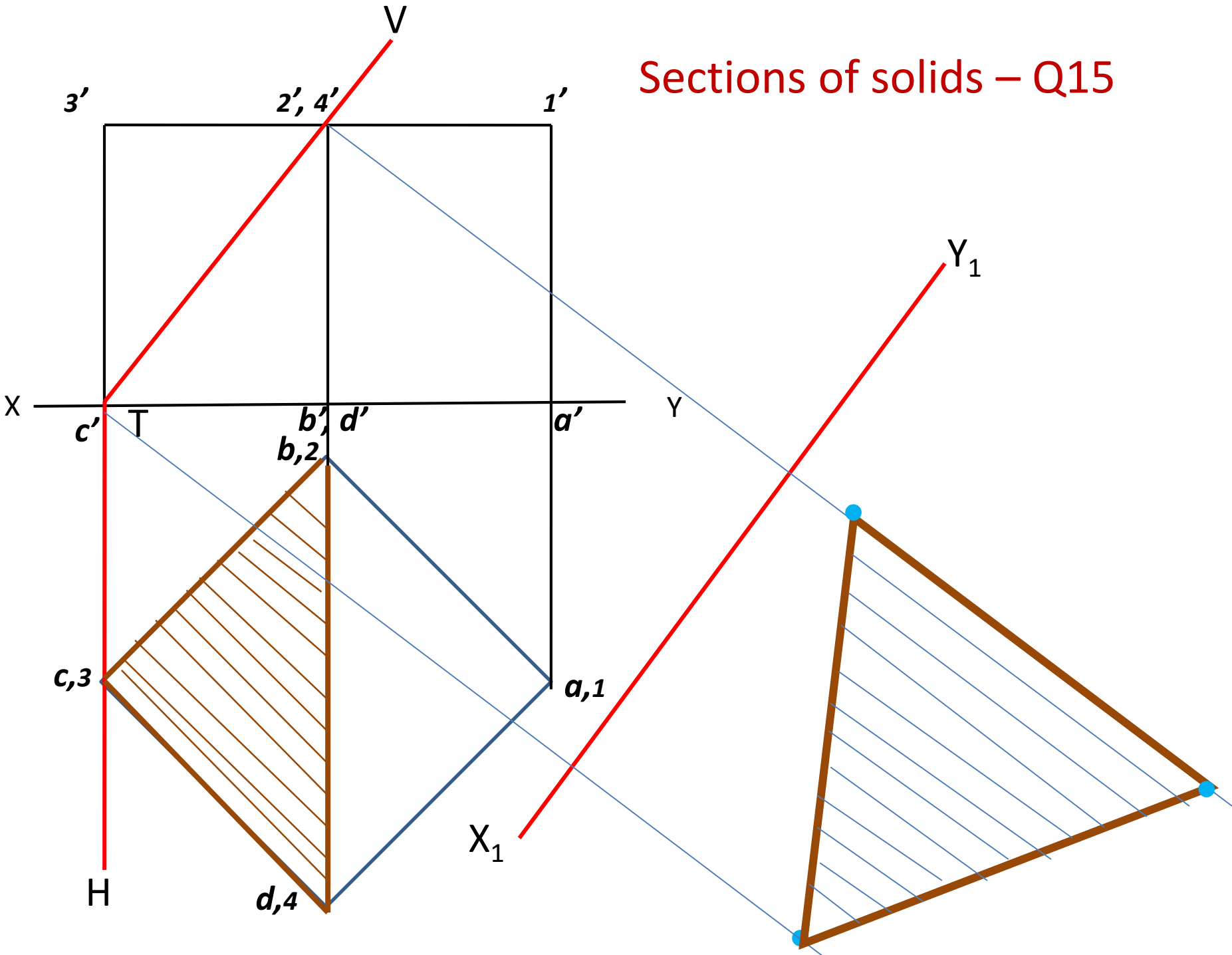
Sections of solids – Q14



Sections of solids – Q15

A cube of 35 mm side is cut by an inclined plane such that the true shape obtained is an equilateral triangle of maximum size. Draw the sectional views and the true shape of the section.

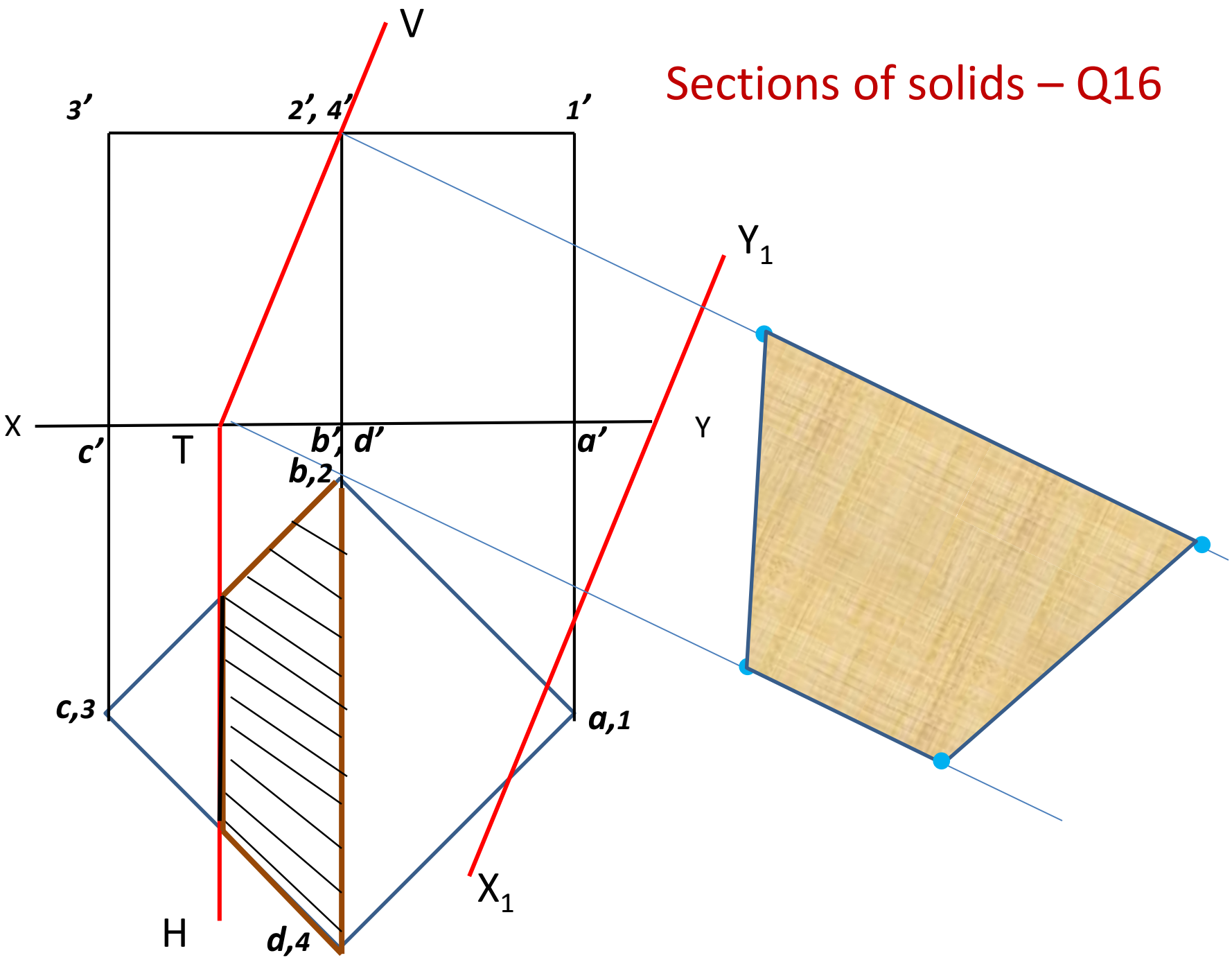
Sections of solids – Q15



Sections of solids – Q16

A cube of 40 mm side is cut by an inclined plane such that the true shape obtained is a trapezium of parallel sides equal to the length of the diagonal of a square face for one side and half of that length for the other side. Draw the sectional views and the true shape of the section.

Sections of solids – Q16



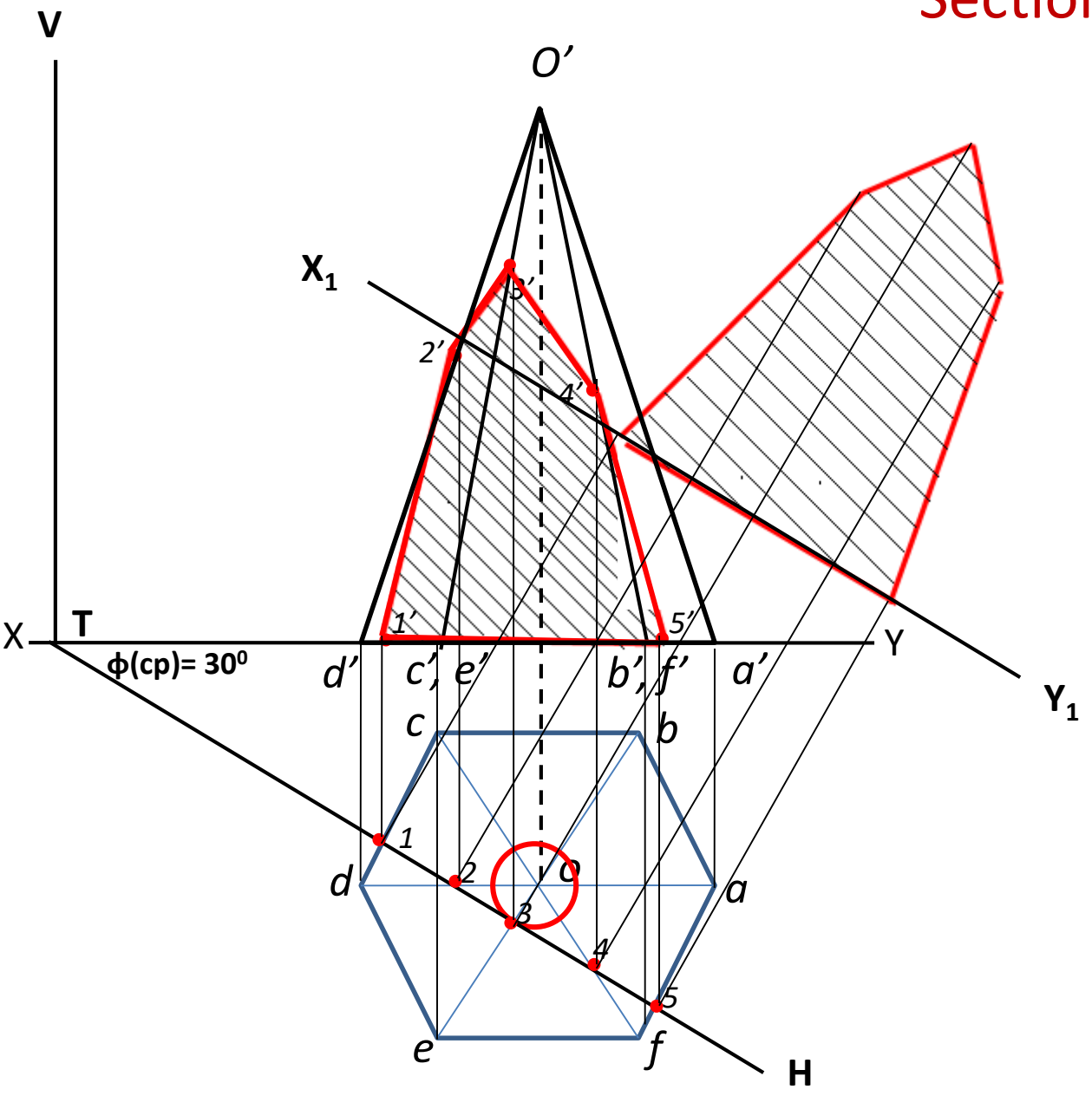
Sections of solids – Q17

A hexagonal pyramid, side of base 30 mm and axis 60 mm long, is resting on its base on ground with two base edges parallel to VP. It is cut by a vertical plane inclined at 30° to VP and cutting the pyramid 5 mm off the axis. Draw the top view, sectional front view and the true shape of the section.

CP ⊥ to HP → Sectional TV is a straight line.

CP Inclined to VP → Sectional FV is a closed figure, but not the True shape of the section.

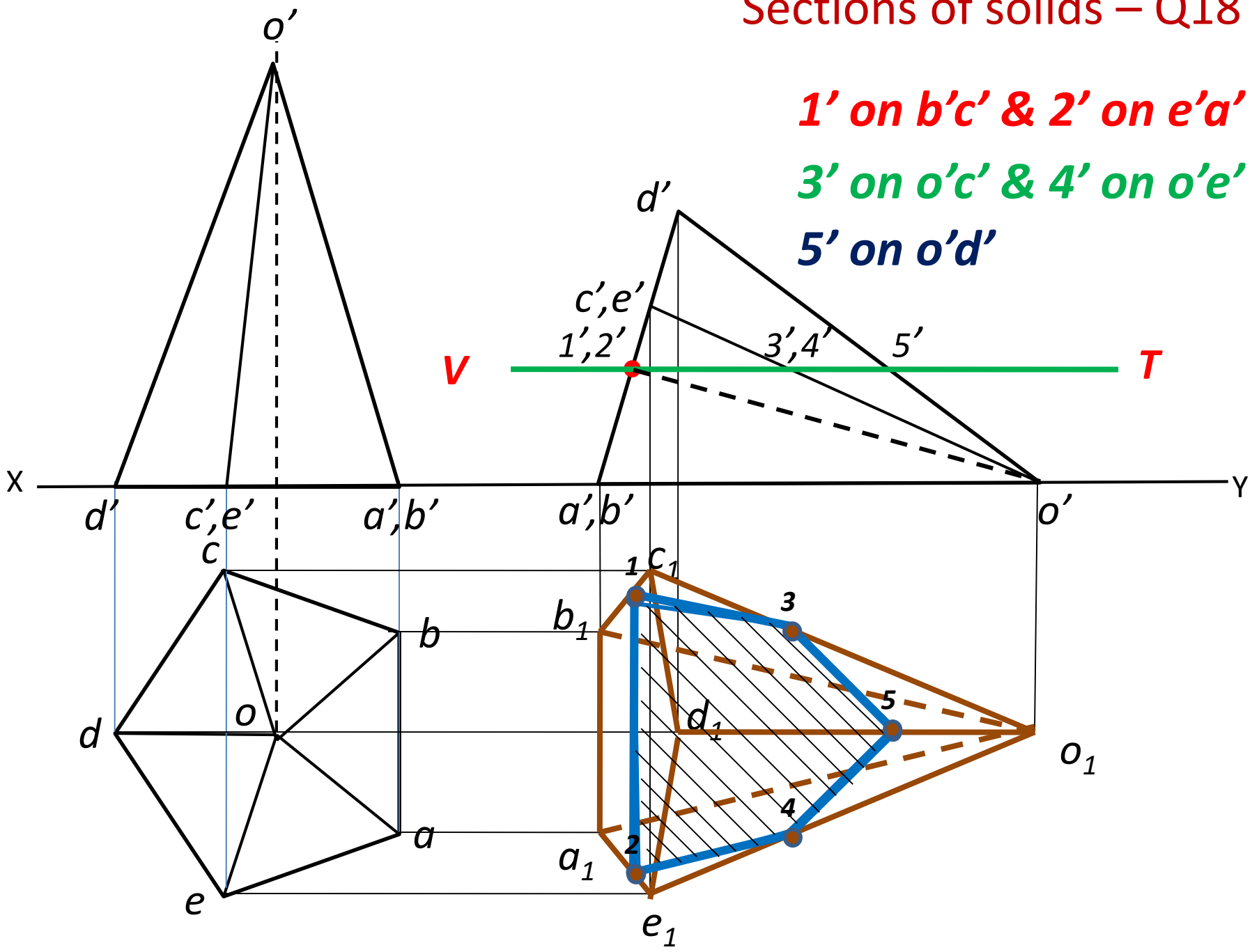
Sections of solids – Q17



Sections of solids – Q18

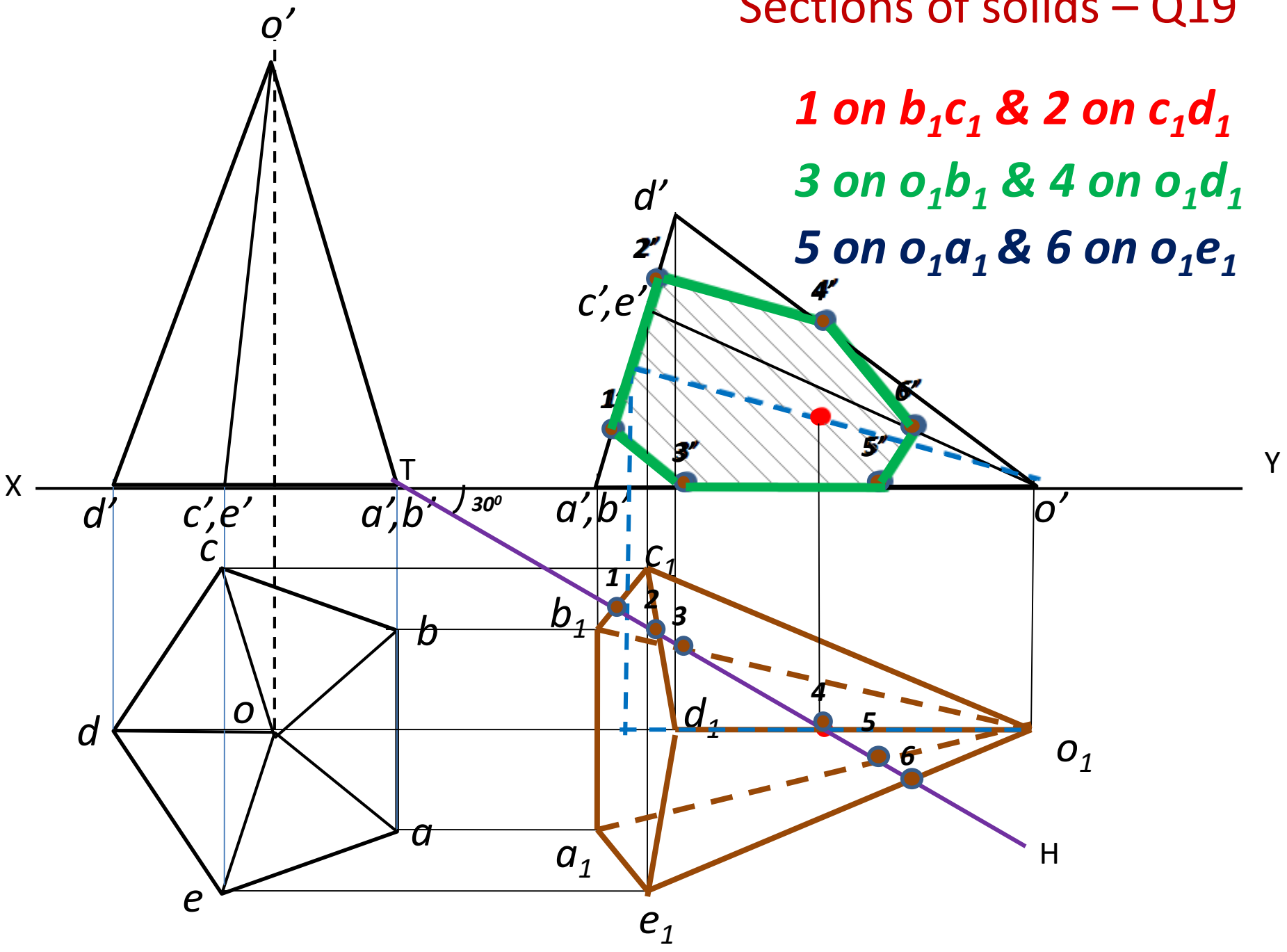
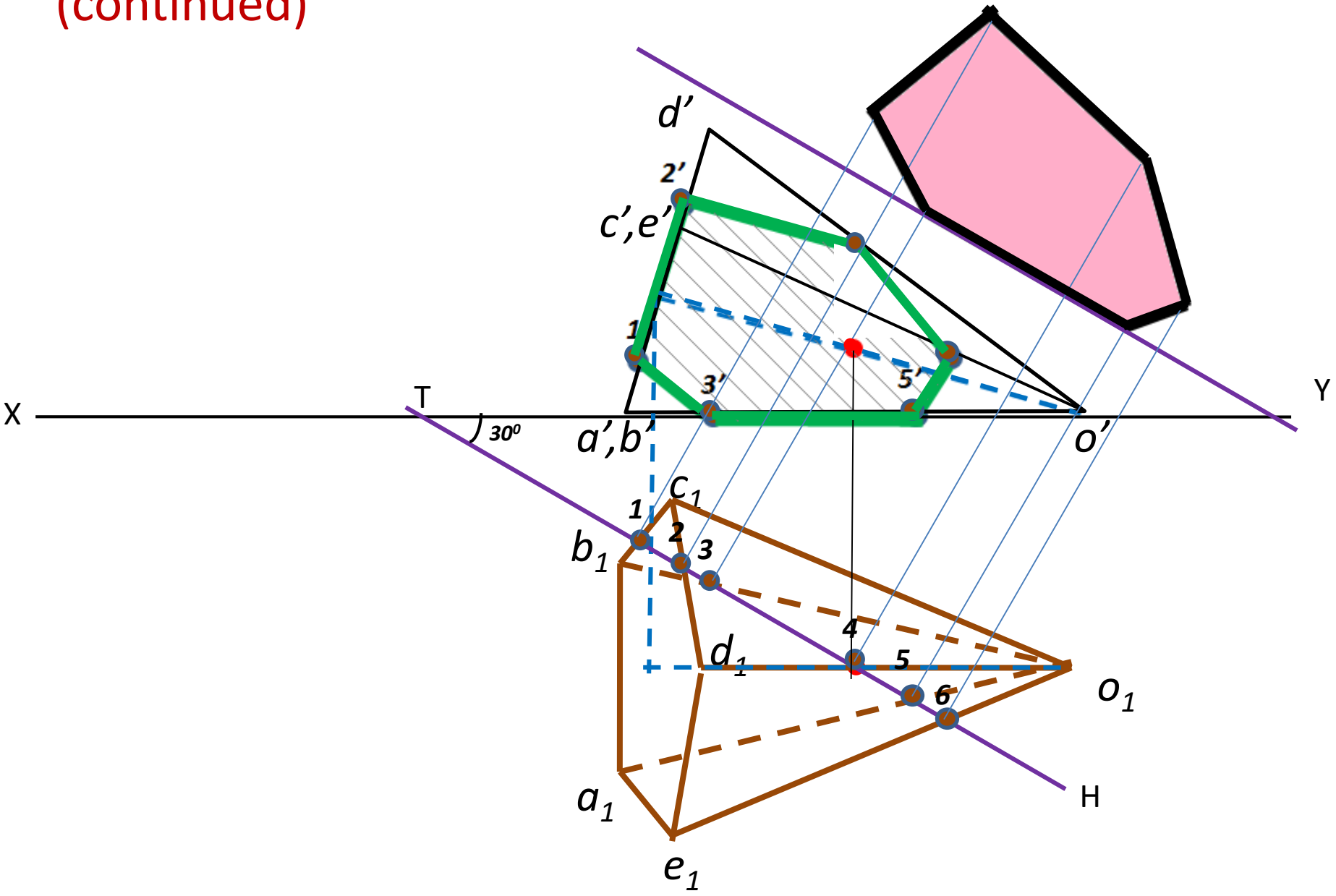
A pentagonal pyramid, side of base 30 mm and height 60 mm, is lying on one of its triangular faces on ground with the axis parallel to the VP. The vertical trace of a horizontal section plane passes through the centre of the base of the pyramid. Draw the top view showing the section.

Sections of solids – Q18



A pentagonal pyramid, side of base 30 mm and height 60 mm, is lying on one of its triangular faces on ground with the axis parallel to the VP. A vertical section plane, whose HT bisects the plan of the axis and makes an angle of 30° with the reference line, cuts the pyramid, removing its top part. Draw the plan, sectional elevation and true shape of the section.

Sections of solids – Q19



Sections of solids – Q19 (continued)