



MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

Department of Mechanical and Manufacturing Engineering

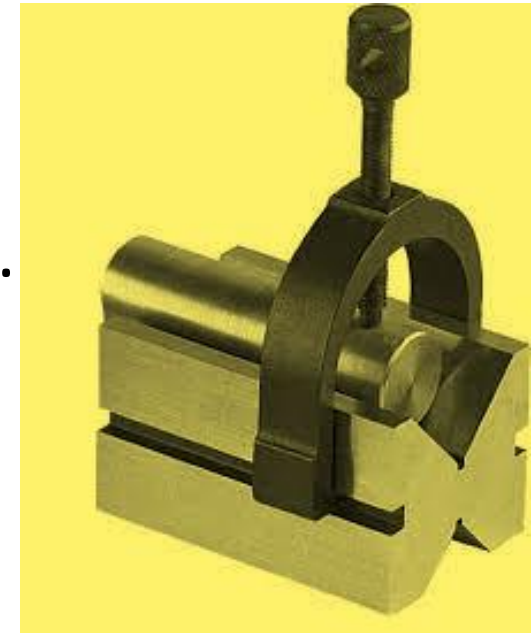
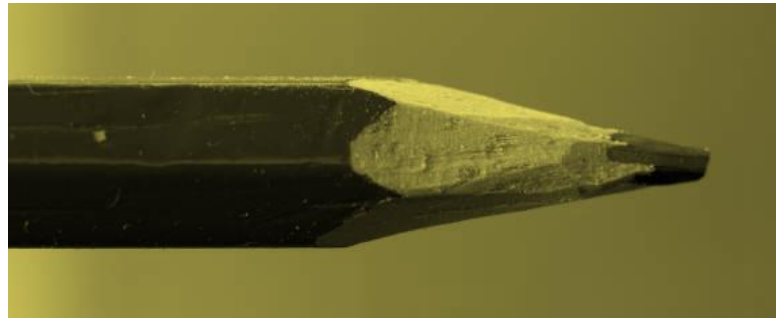
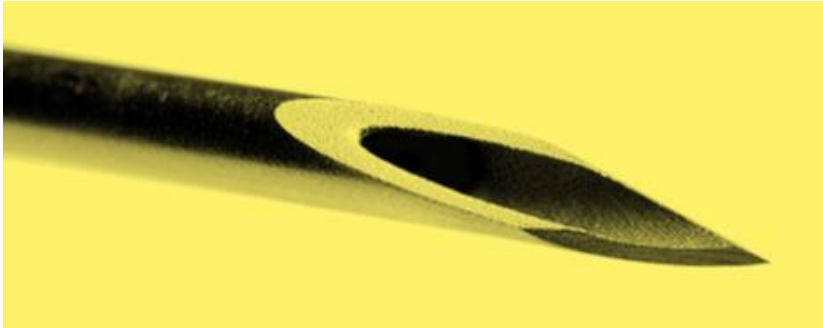
ENGINEERING GRAPHICS - II

CLASS 1: SECTION OF SOLIDS 1
(SHEET 1)

Purpose of Sectioning a Solid

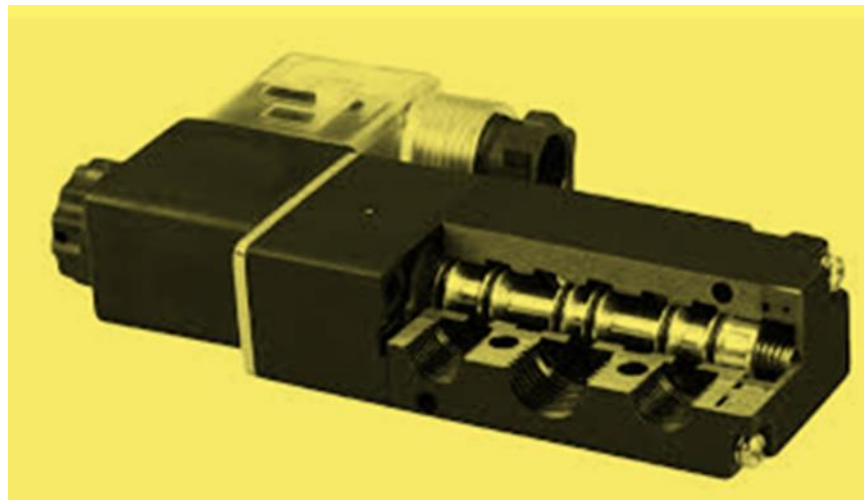
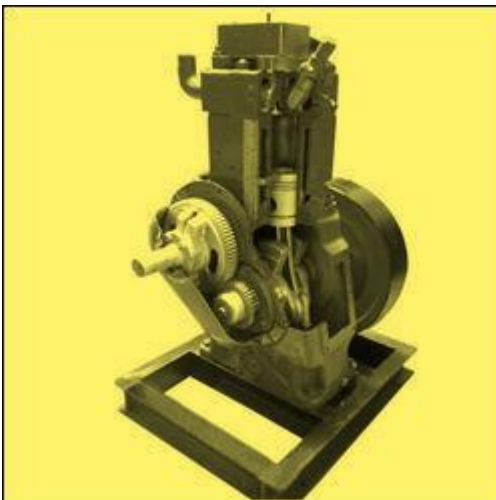
1) Slicing: To get the desired shape out of a solid block

Eg: Injection Needle Grinding, Pencil Tip Sharpening, Vee Block etc.



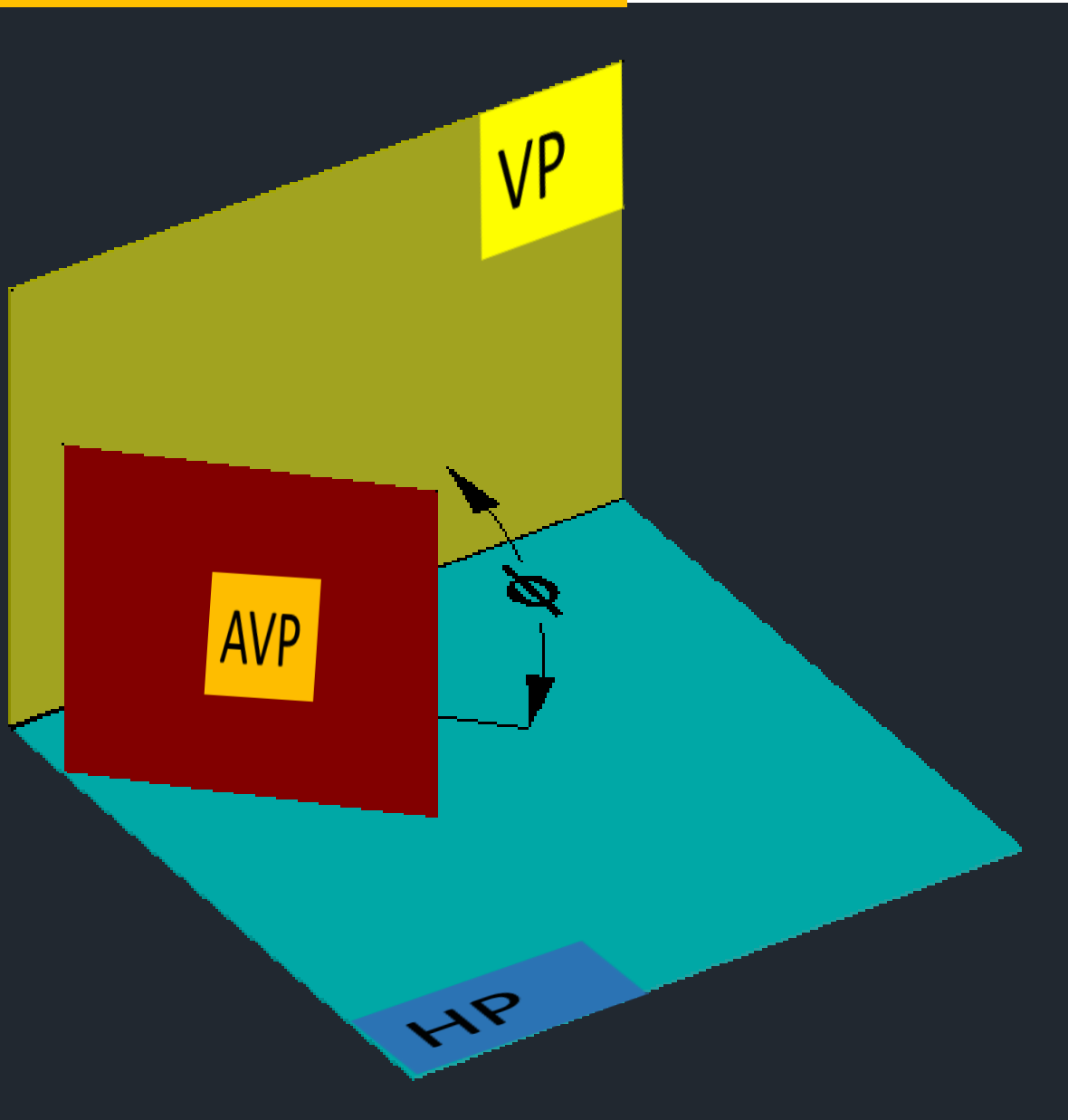
2) Cut Section: To view inside a solid component and to know the inner details.

Eg: Engine cross section, Hydraulic valve cut section etc.

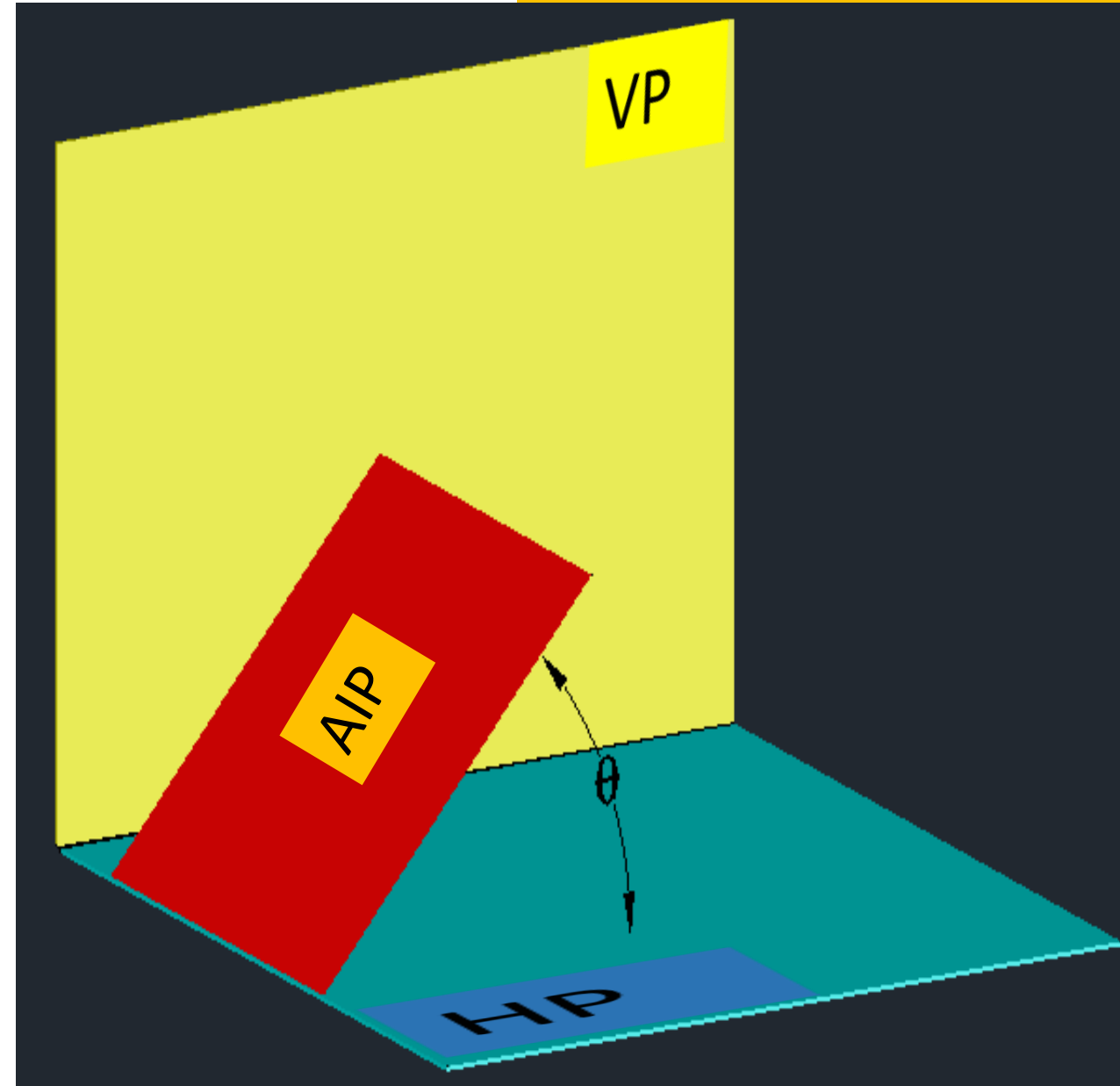


AUXILLARY PLANES

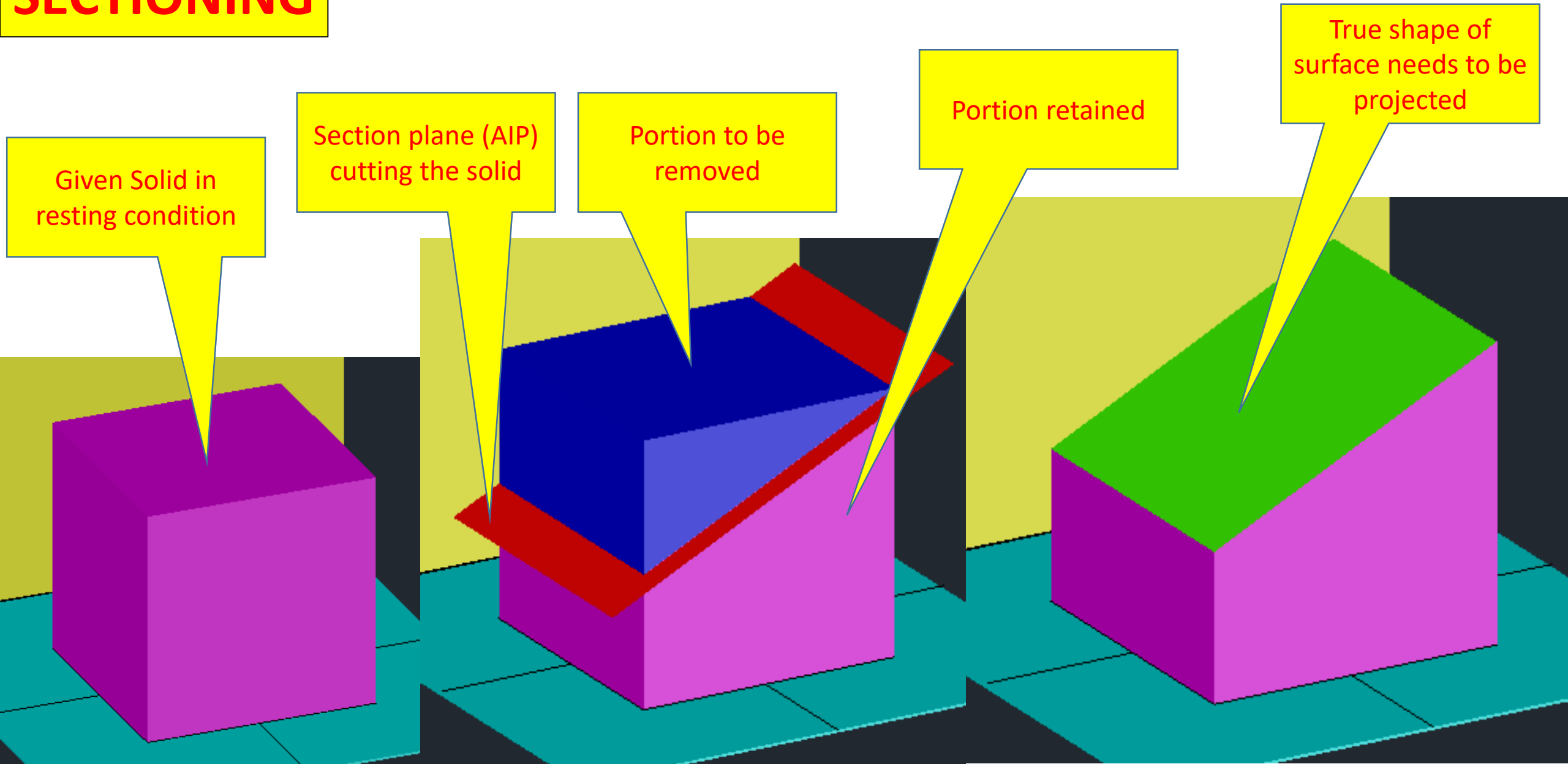
AUXILLARY VERTICAL PLANE



AUXILLARY INCLINED PLANE

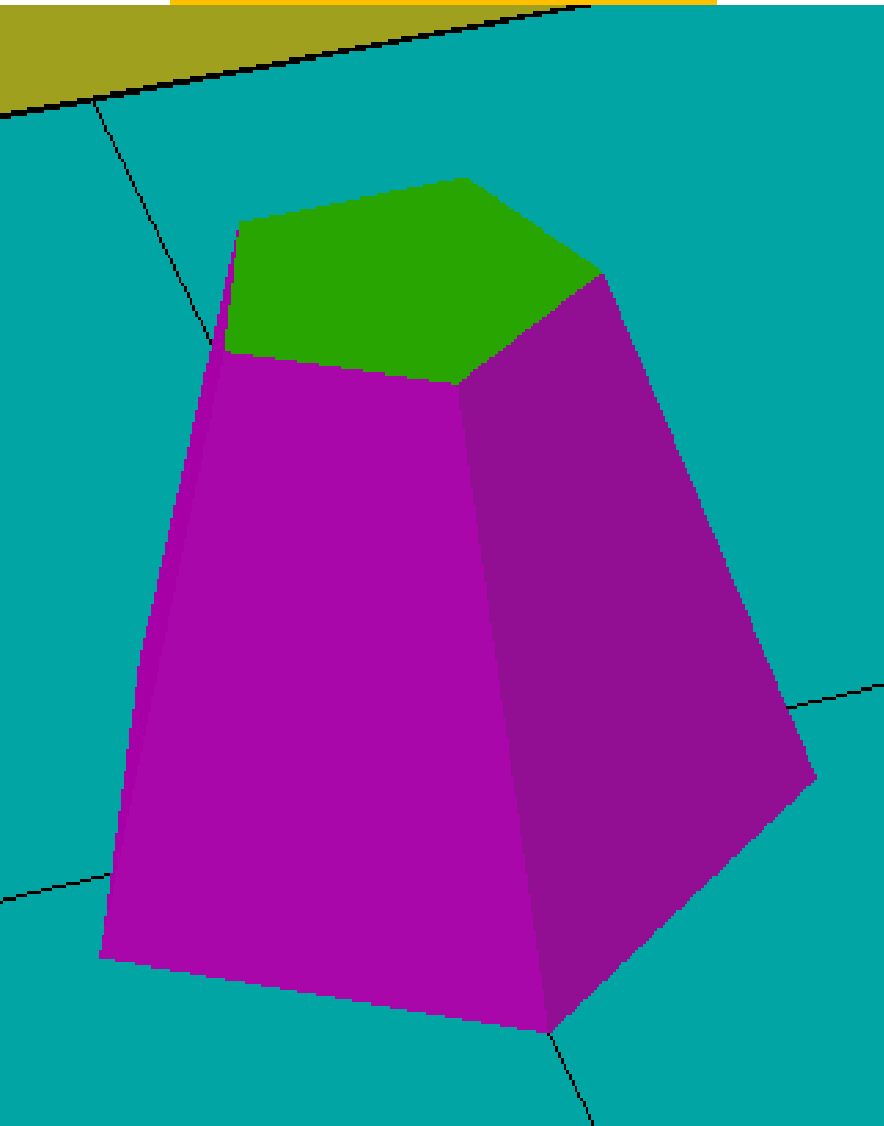


STAGES OF SECTIONING

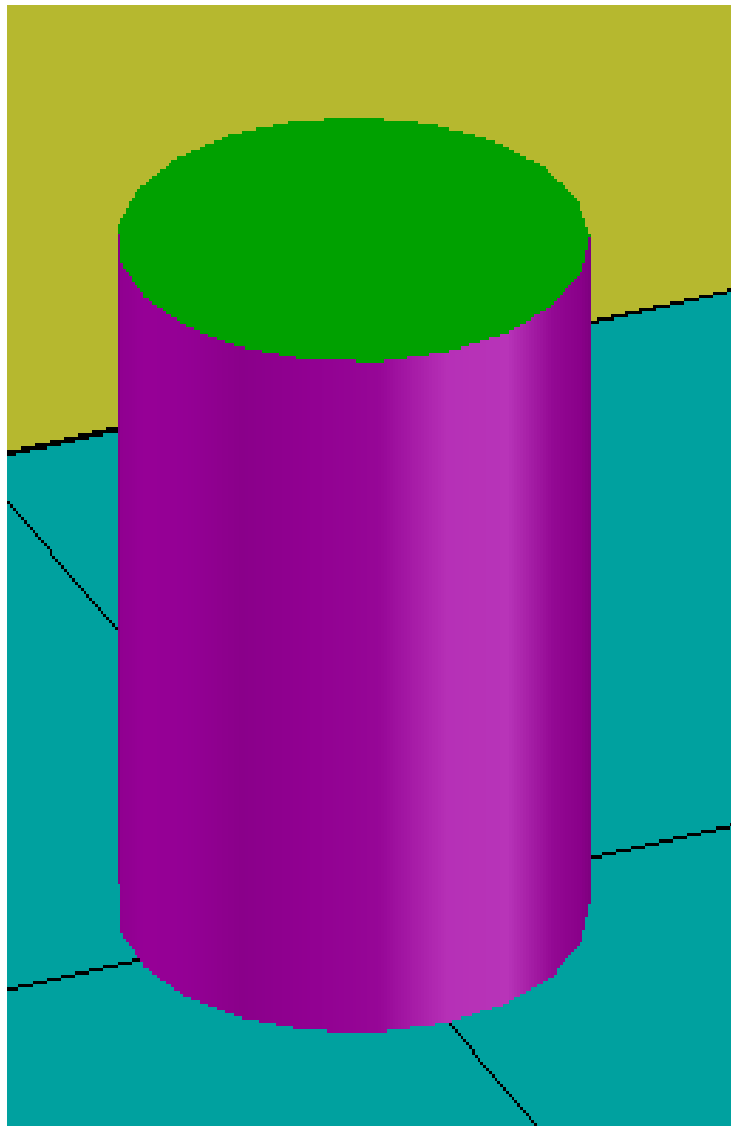


SECTION PLANE PARALLEL TO BASE

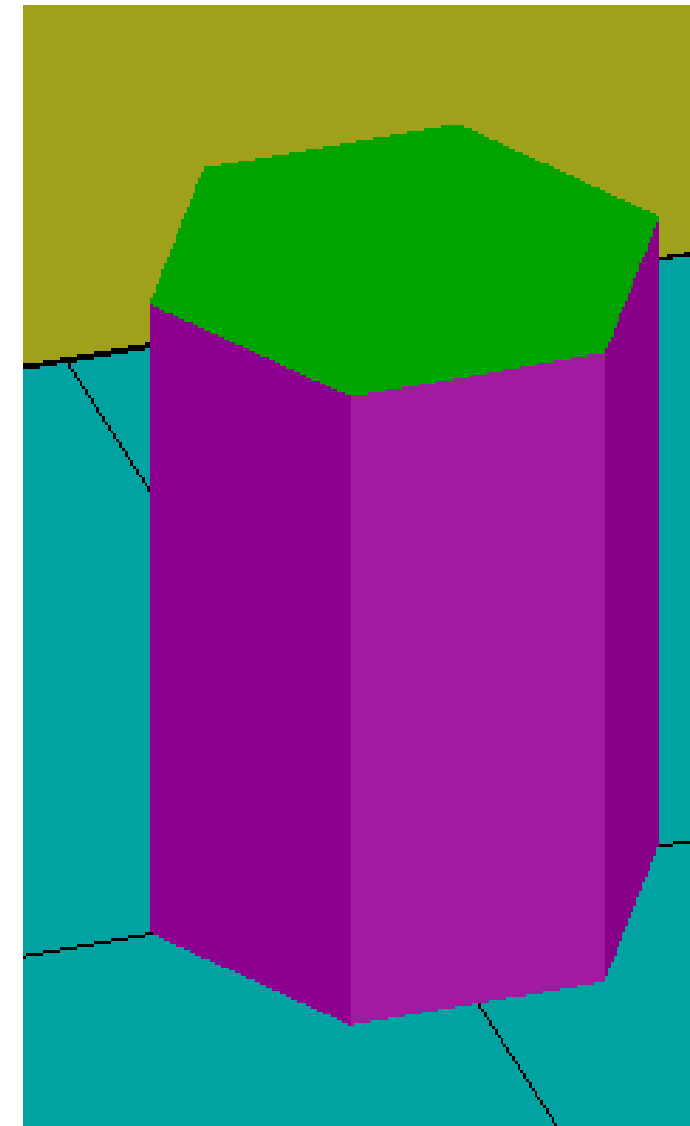
PENTAGONAL PYRAMID



CYLINDER



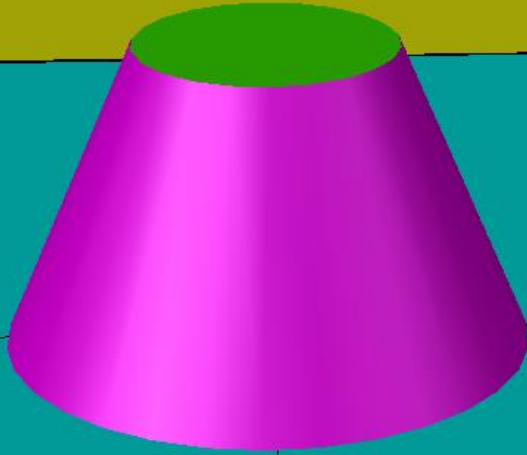
HEXAGONAL PRISM



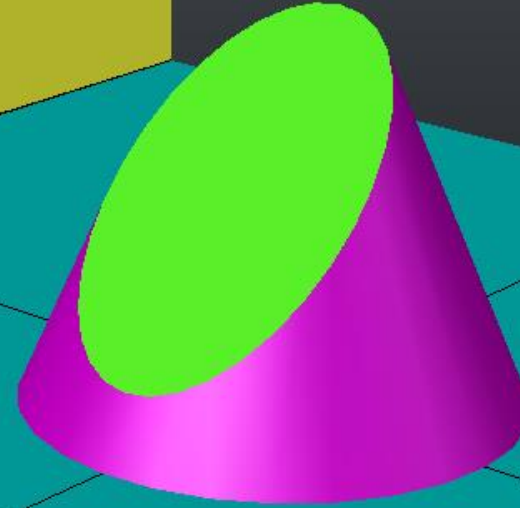
SECTIONS OF A CONE

- 1) Parallel to base
- 2) Inclined not cutting base
- 3) Vertical passing through apex
- 4) Cutting base & parallel to generator
- 5) Cutting base at an angle not parallel to generator
- 6) Vertical not passing through apex

1)CIRCLE



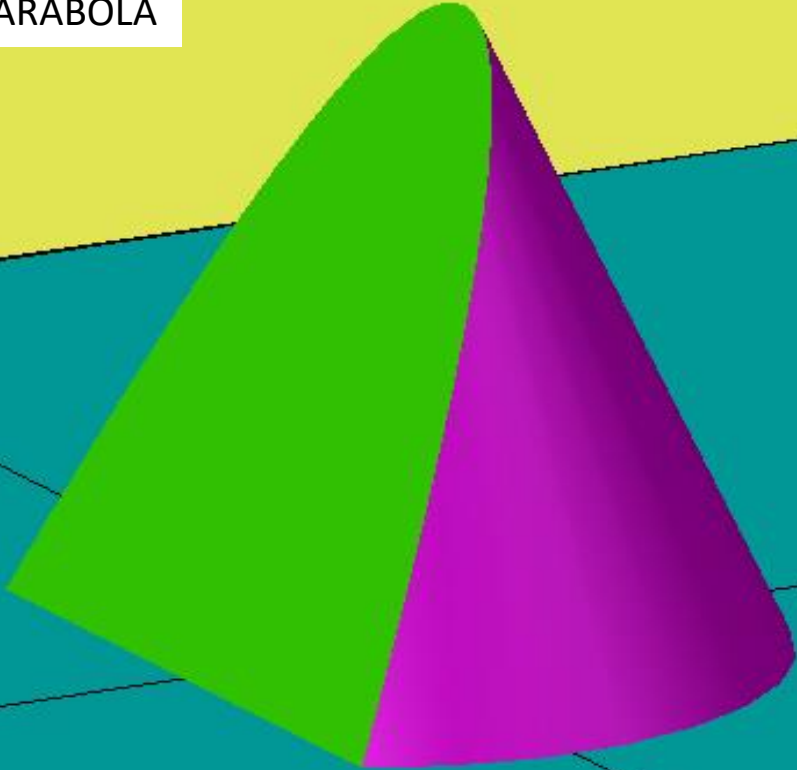
2)ELLIPSE



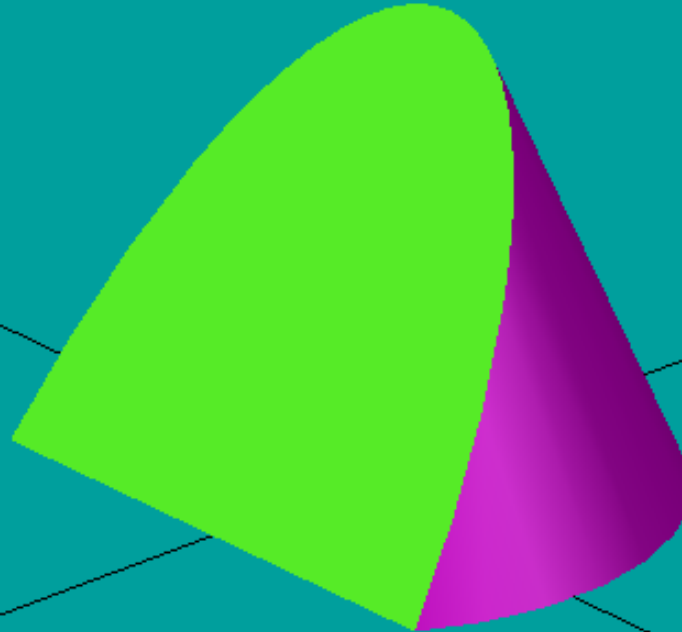
3)TRIANGLE



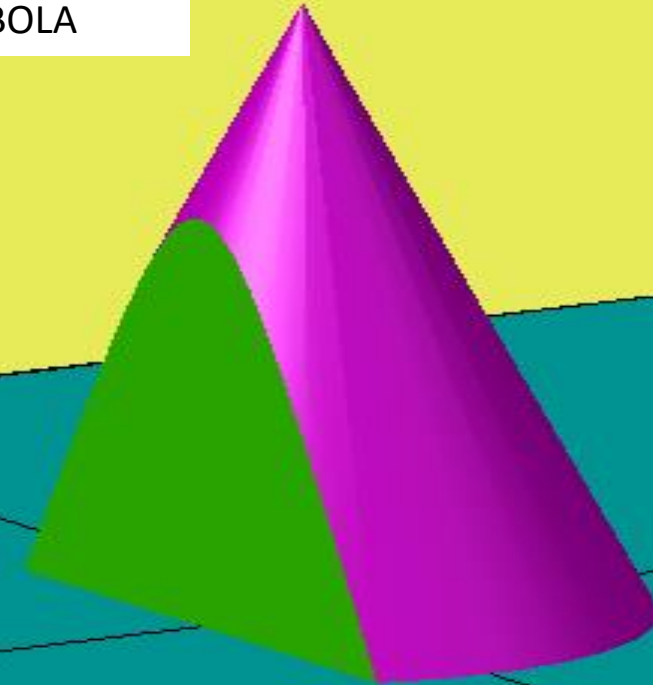
4)PARABOLA



5)HYPERBOLA



6)RECTANGULAR
HYPERBOLA



A square prism of sides 50mm & height 80mm rests with its base on HP with two of its vertical faces equally inclined to VP. A section plane perpendicular to VP and inclined to HP at 60° cuts the prism so as to pass through a point on the axis 10mm below its top end. Draw its front view, sectional top view and true shape of the section.

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.

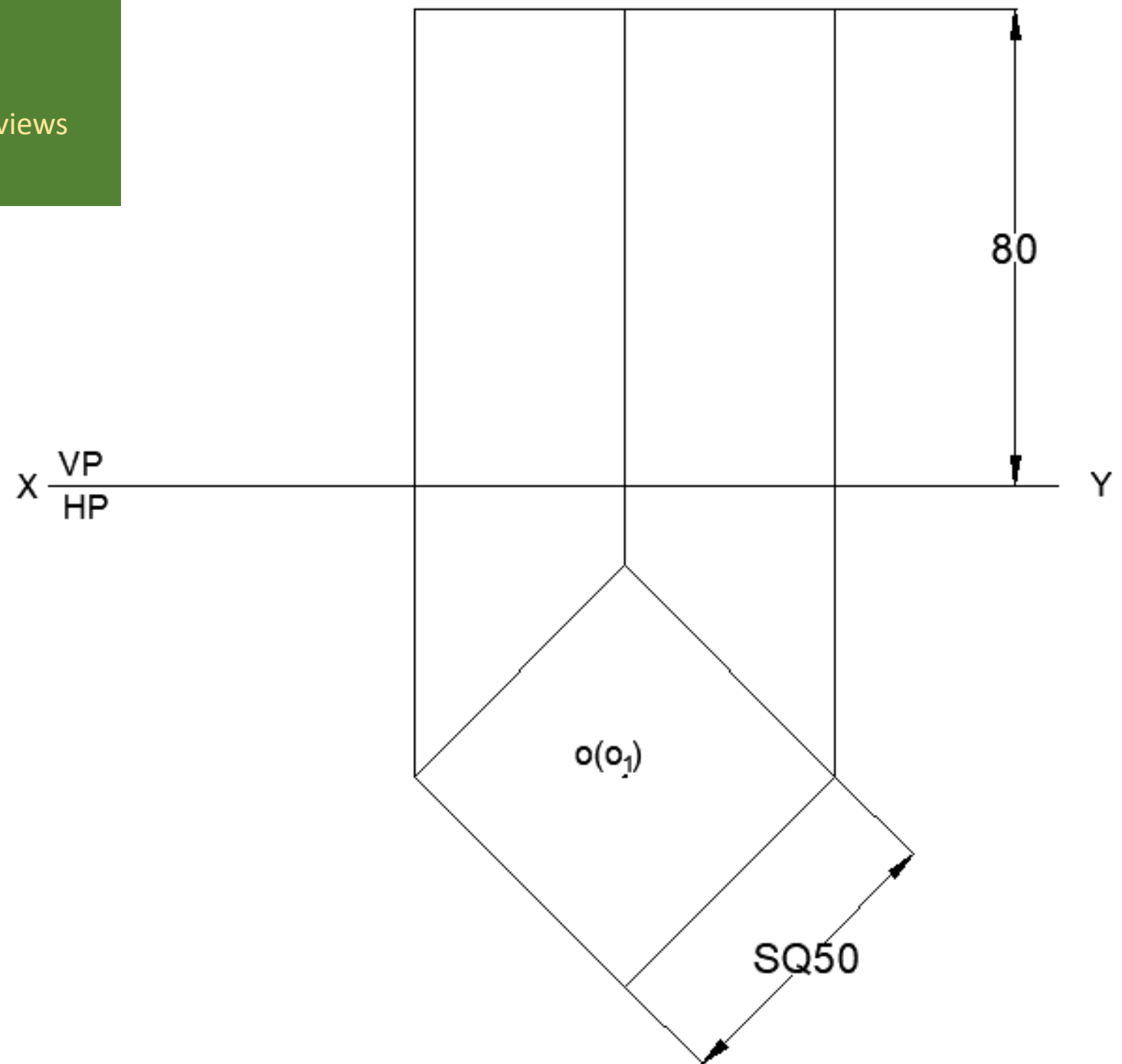
A square prism of sides 50mm & height 80mm rests with its base on HP with two of its vertical faces equally inclined to VP. A section plane perpendicular to VP and inclined to HP at 60° cuts the prism so as to pass through a point on the axis 10mm below its top end. Draw its front view, sectional top view and true shape of the section.

Steps Involved

- Draw the XY line
- Draw the top and front views
- Dimensioning

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



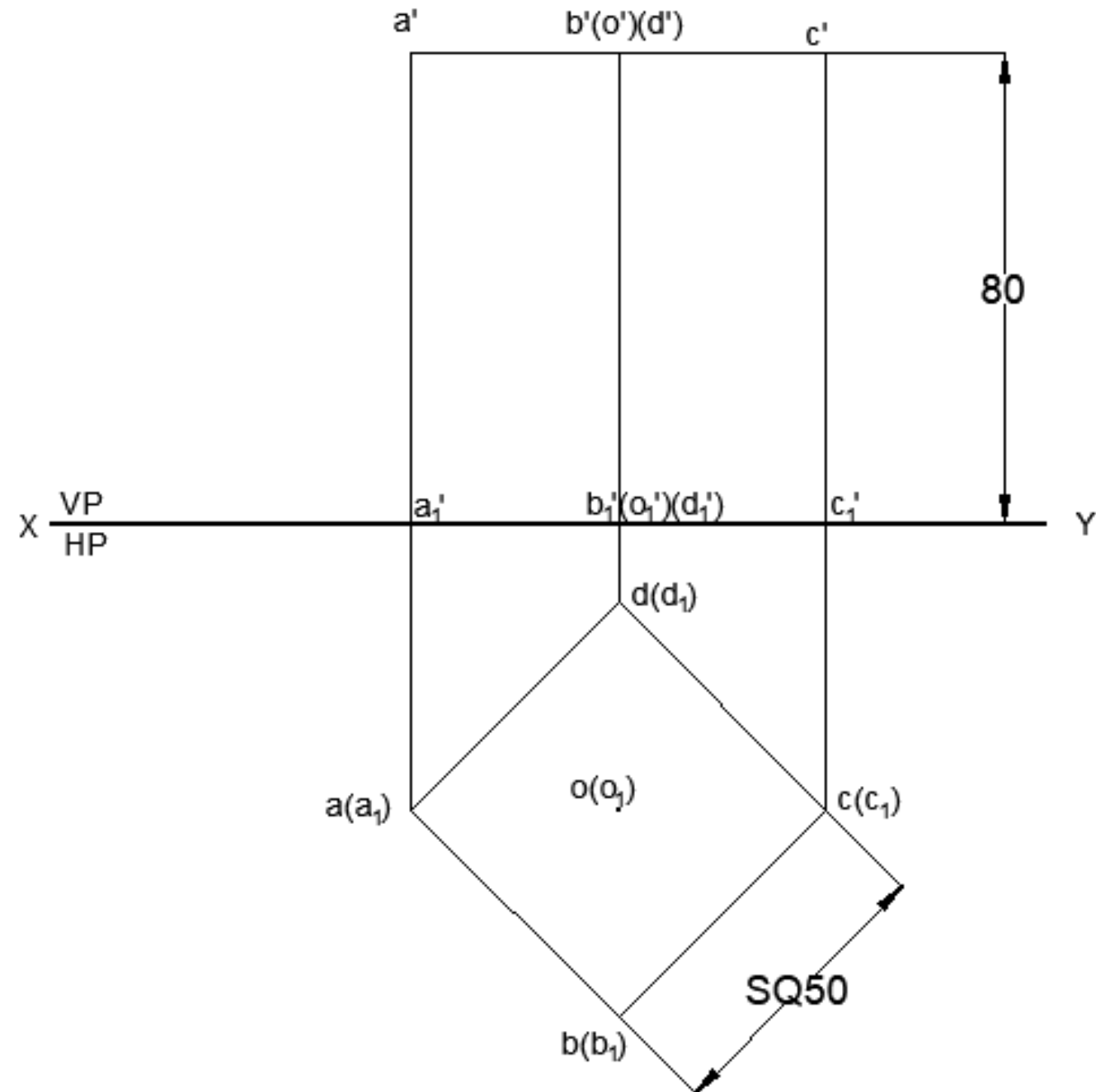
A square prism of sides 50mm & height 80mm rests with its base on HP with two of its vertical faces equally inclined to VP. A section plane perpendicular to VP and inclined to HP at 60° cuts the prism so as to pass through a point on the axis 10mm below its top end. Draw its front view, sectional top view and true shape of the section.

Steps Involved

- Naming

Data

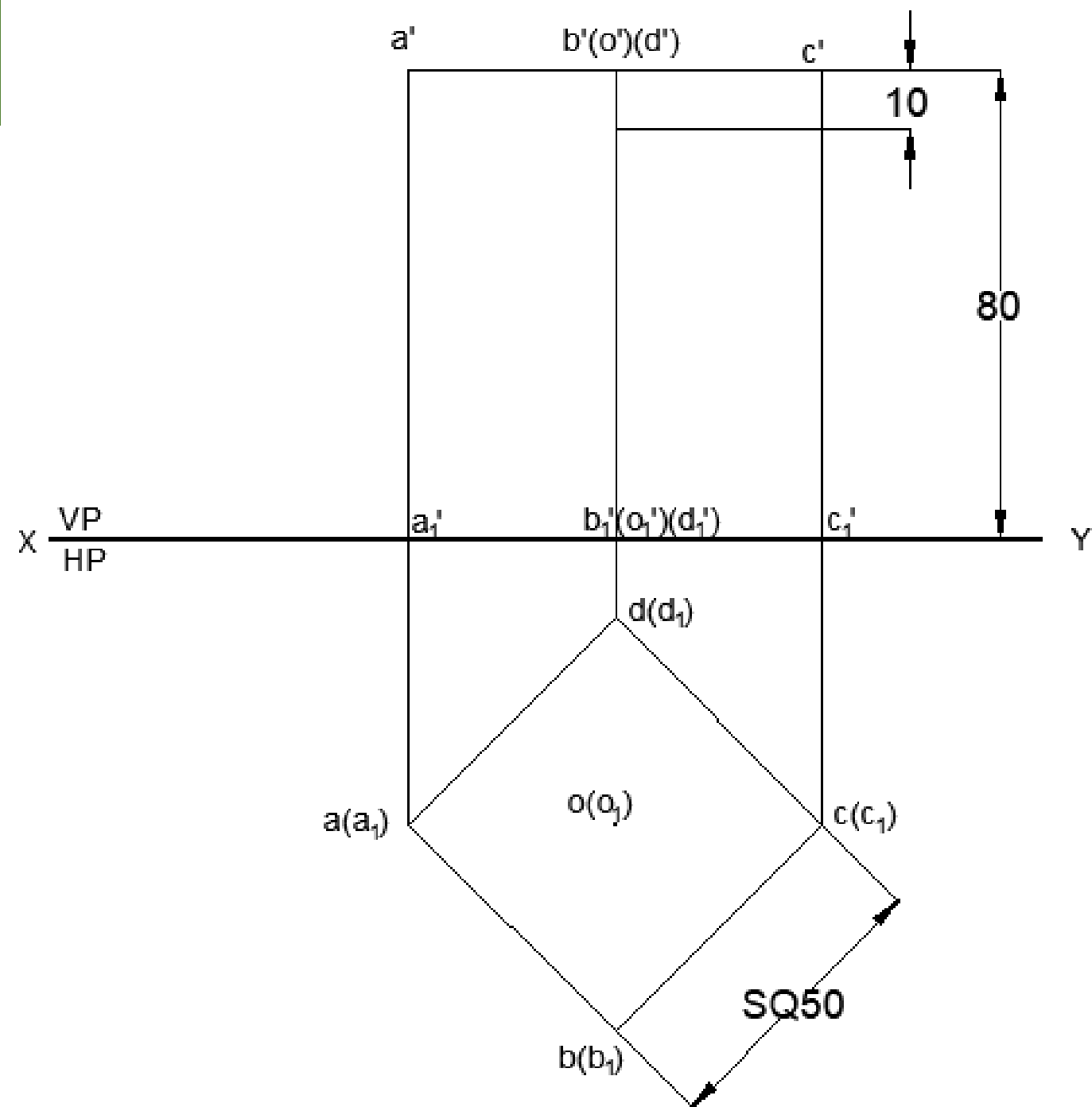
- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



A square prism of sides 50mm & height 80mm rests with its base on HP with two of its vertical faces equally inclined to VP. A section plane perpendicular to VP and inclined to HP at 60° cuts the prism so as to pass through a point on the axis 10mm below its top end. Draw its front view, sectional top view and true shape of the section.

Steps Involved

- Mark 10mm from top end



Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.

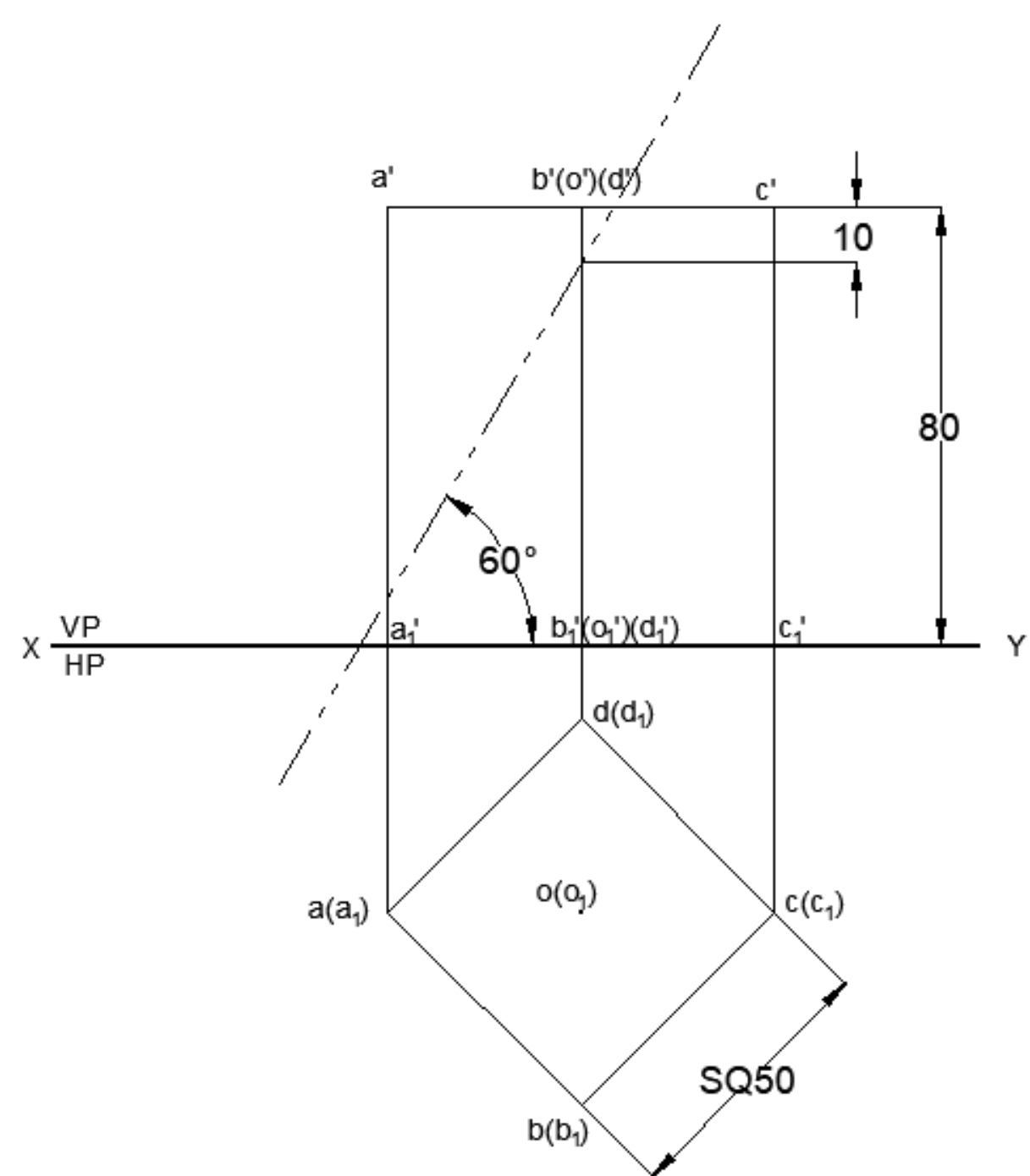
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Steps Involved

- Draw the section line at 60° passing through the point.

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



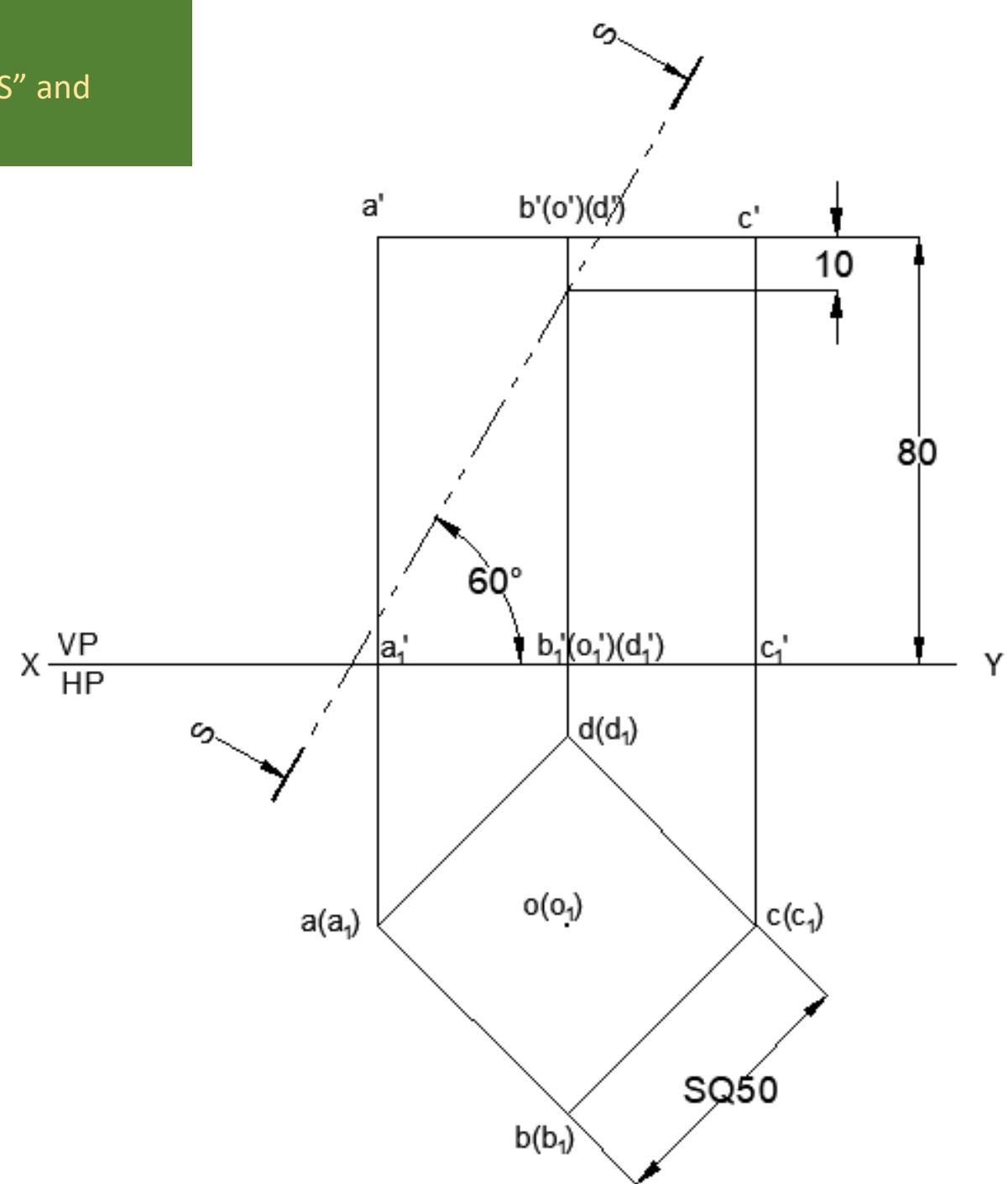
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Steps Involved

- Show the portion to be retained with “S” and arrow. [Section line convention]

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



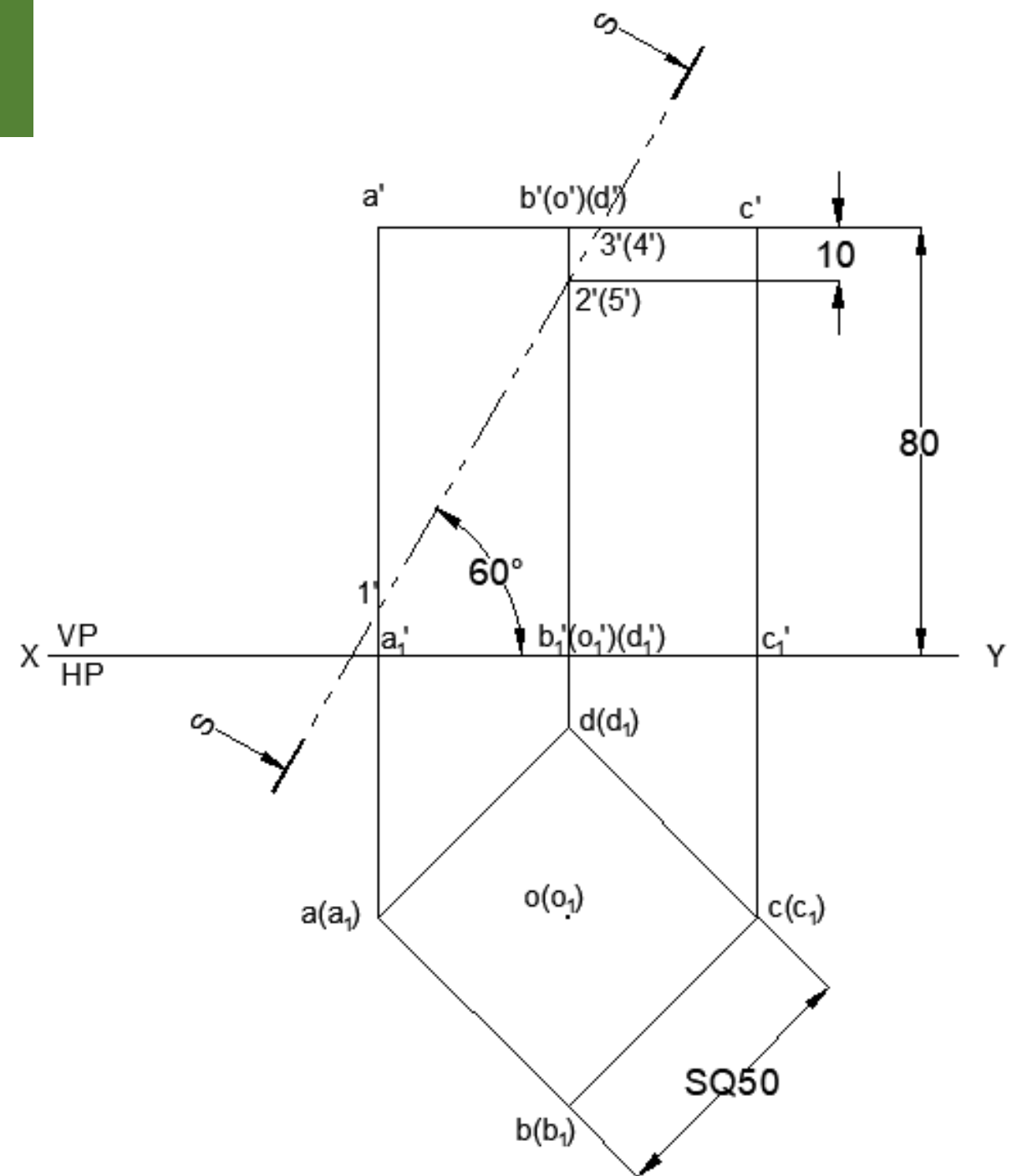
A square prism of sides 50mm & height 80mm rests with its base on HP with two of its vertical faces equally inclined to VP. A section plane perpendicular to VP and inclined to HP at 60° cuts the prism so as to pass through a point on the axis 10mm below its top end. Draw its front view, sectional top view and true shape of the section.

Steps Involved

- Identify & number the cutting points

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



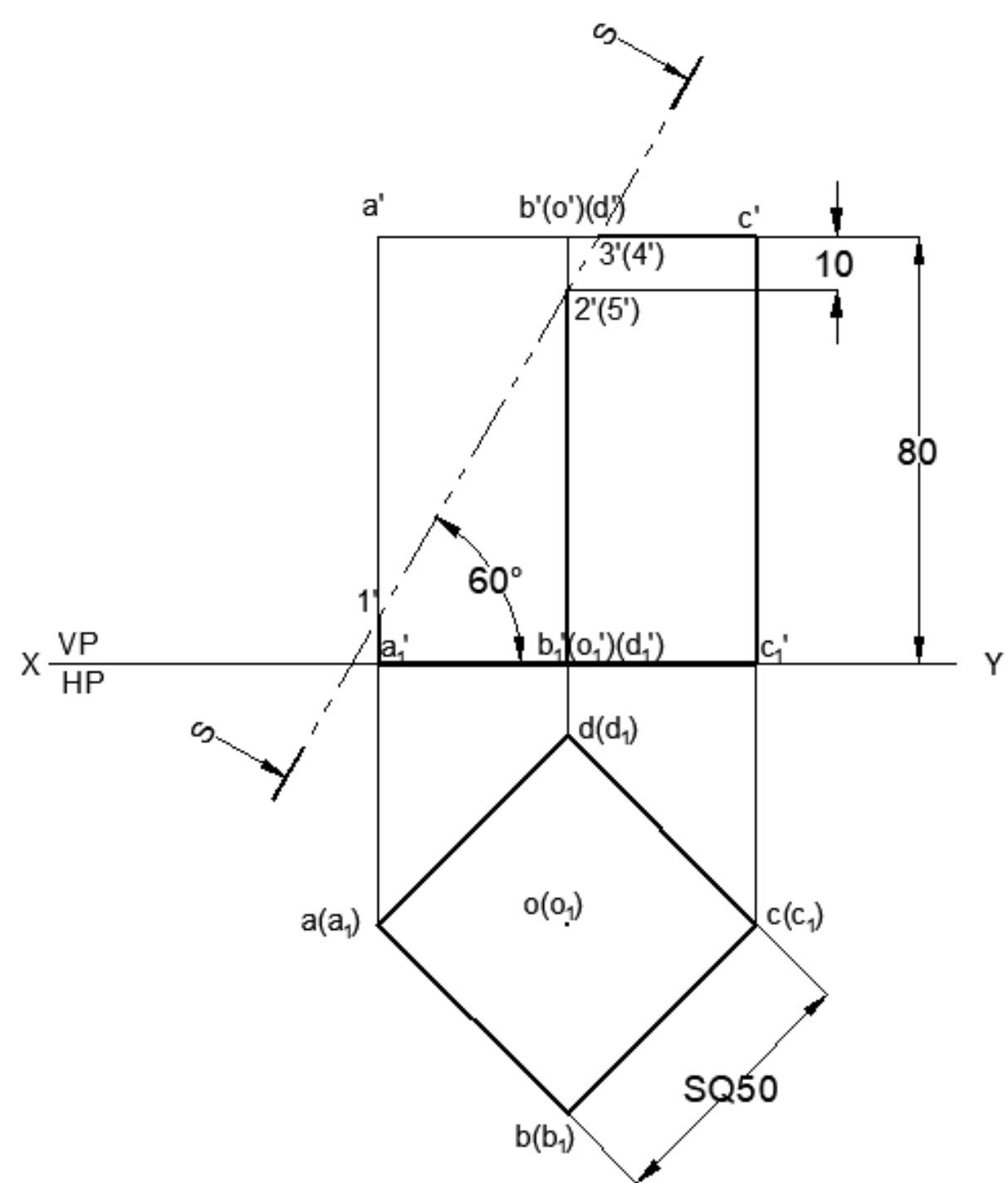
A square prism of sides 50mm & height 80mm rests with its base on HP with two of its vertical faces equally inclined to VP. A section plane perpendicular to VP and inclined to HP at 60° cuts the prism so as to pass through a point on the axis 10mm below its top end. Draw its front view, sectional top view and true shape of the section.

Steps Involved

- Darken the retained portion

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



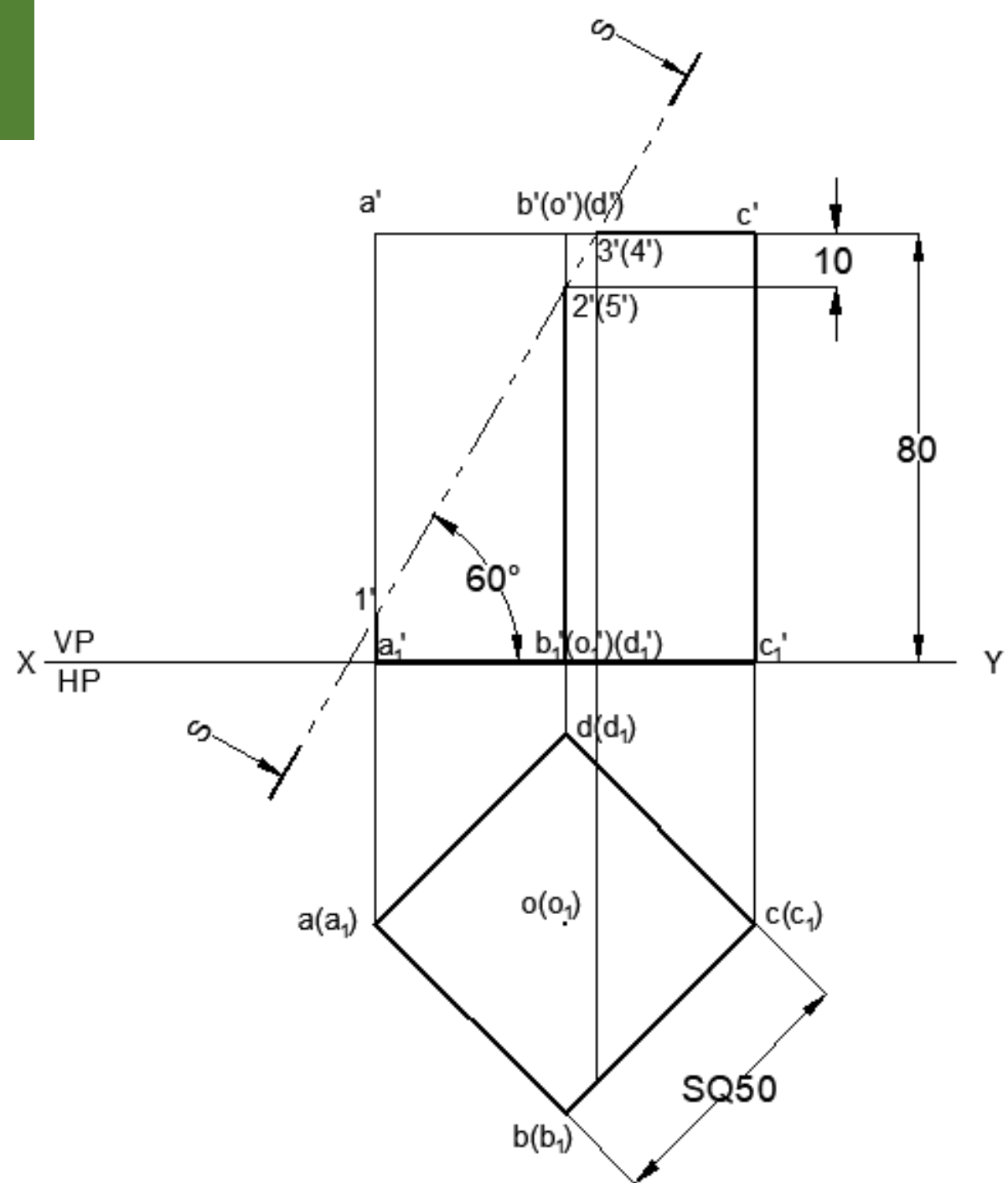
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Steps Involved

- Mark the cutting points in the Top view

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



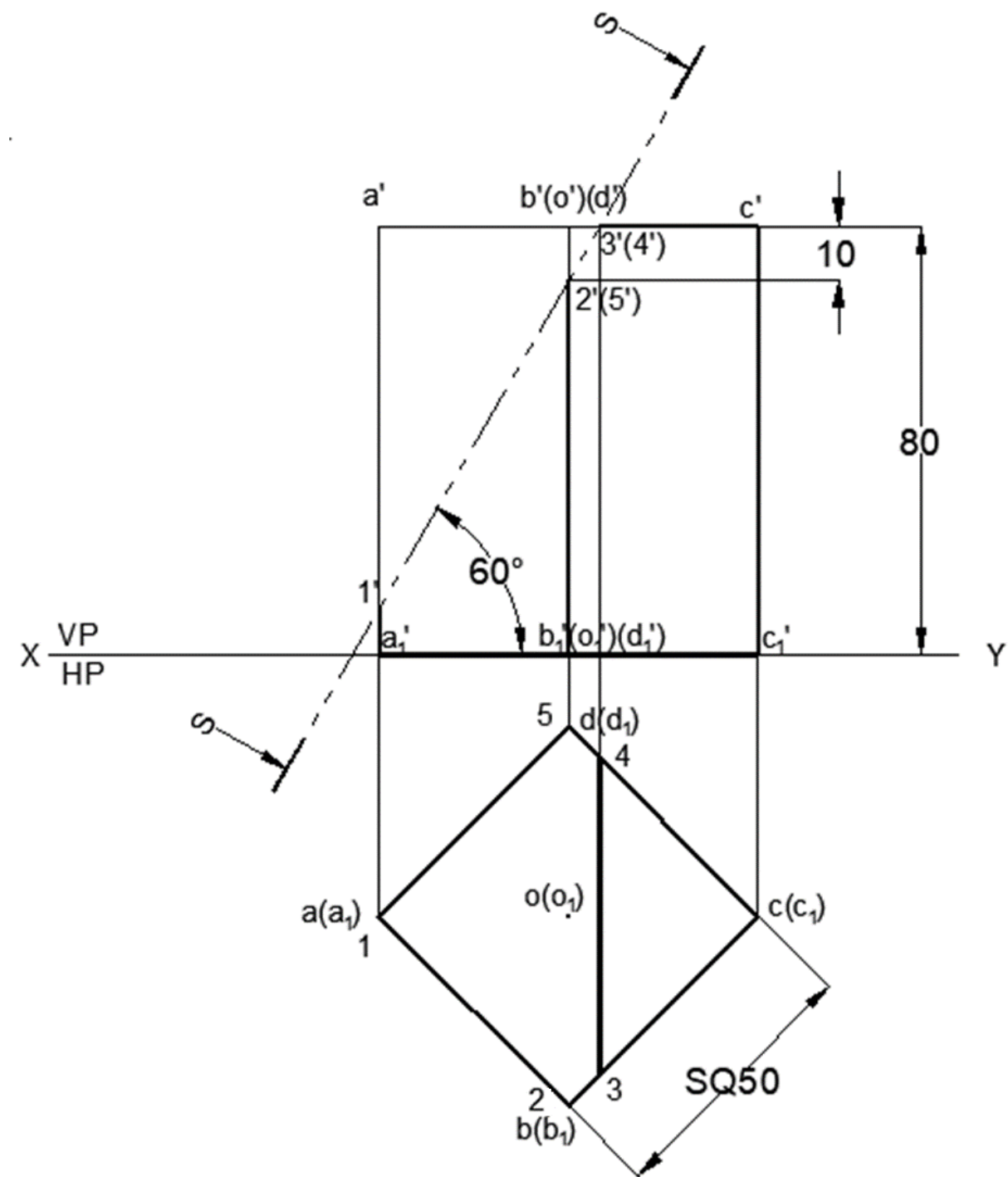
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Steps Involved

- Mark the cutting points in the Top view

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



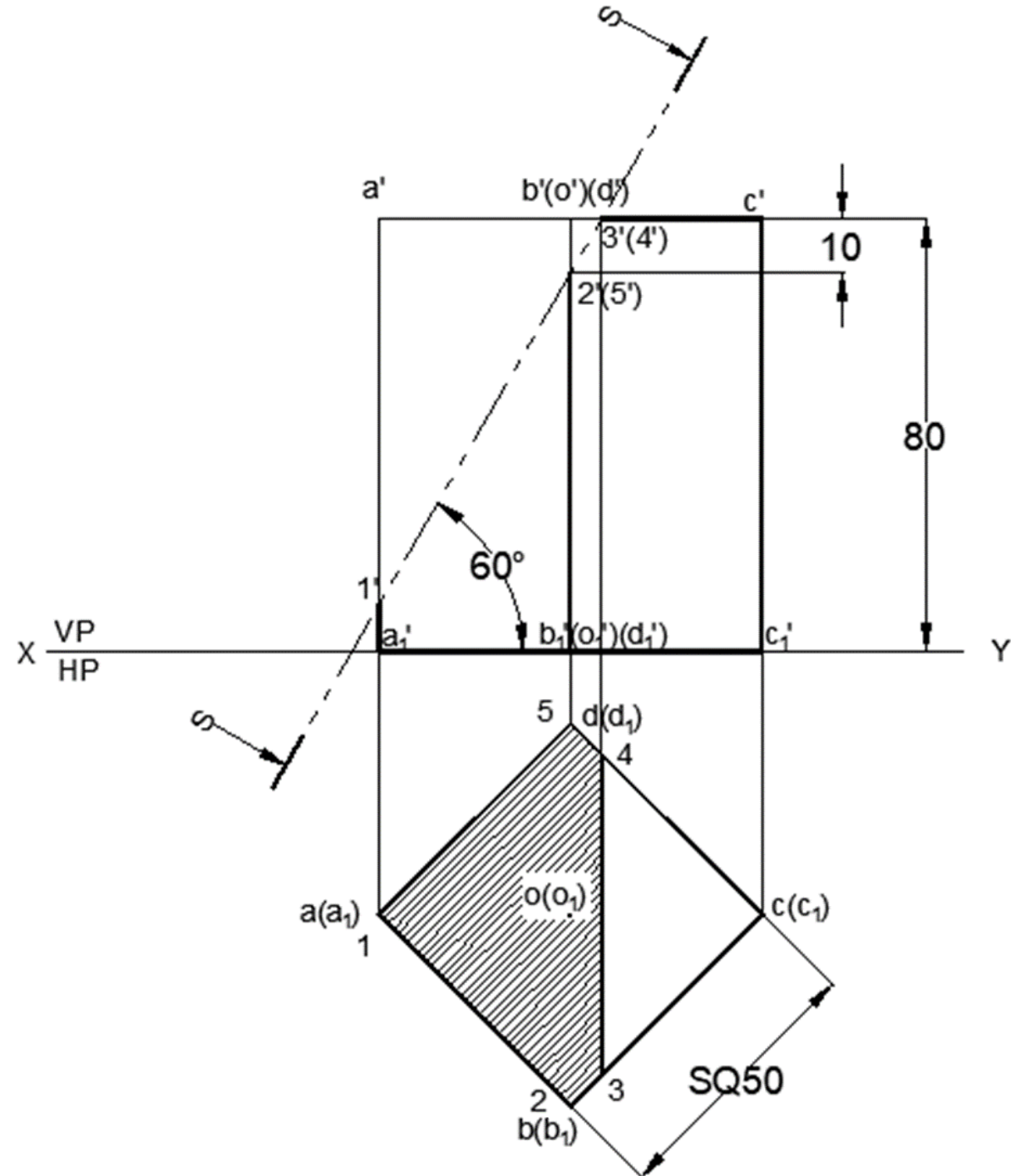
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Steps Involved

- Hatch the cut portion

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



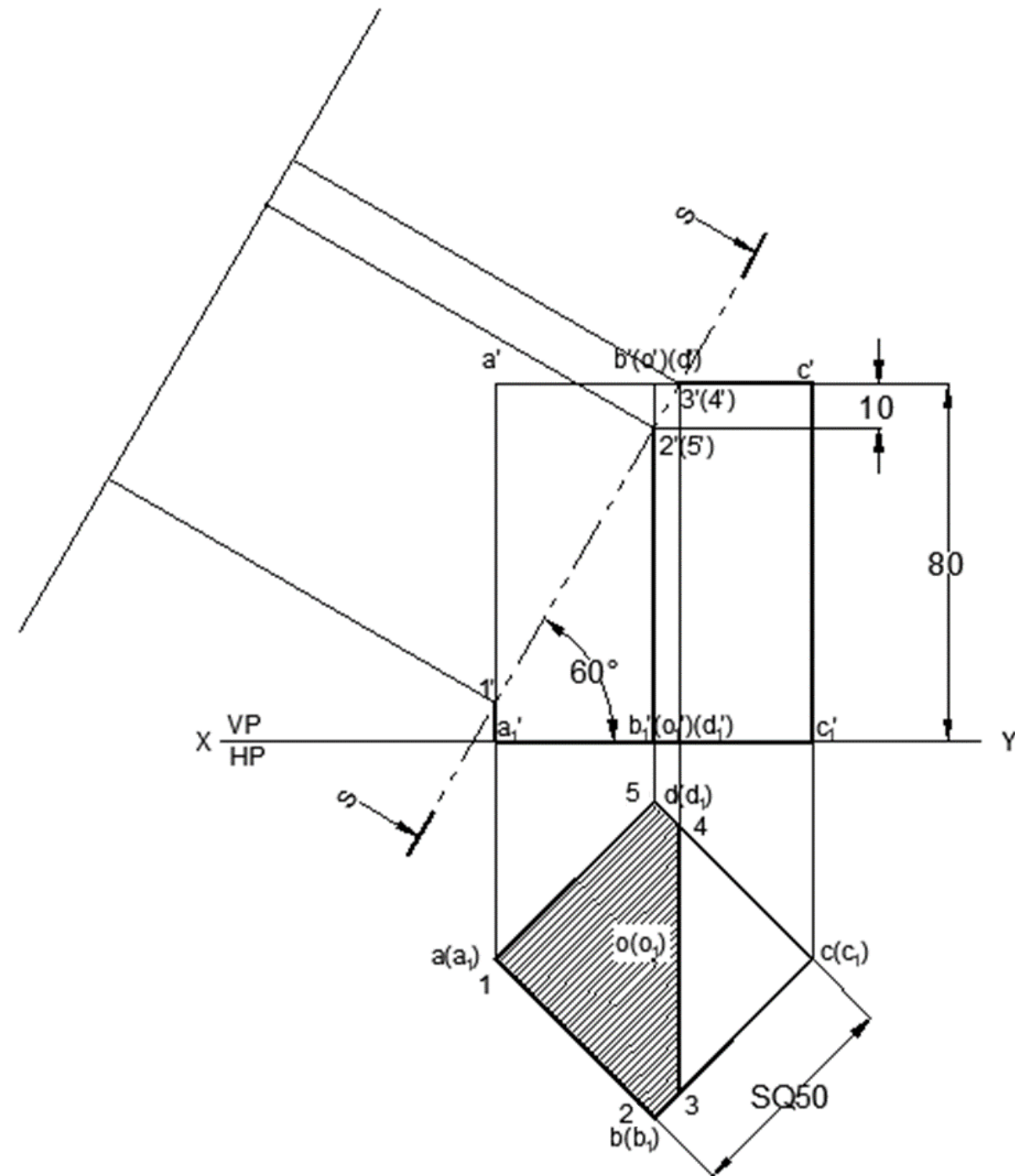
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Steps Involved

- Project perpendiculars from the cutting points

Data

- Square prism.
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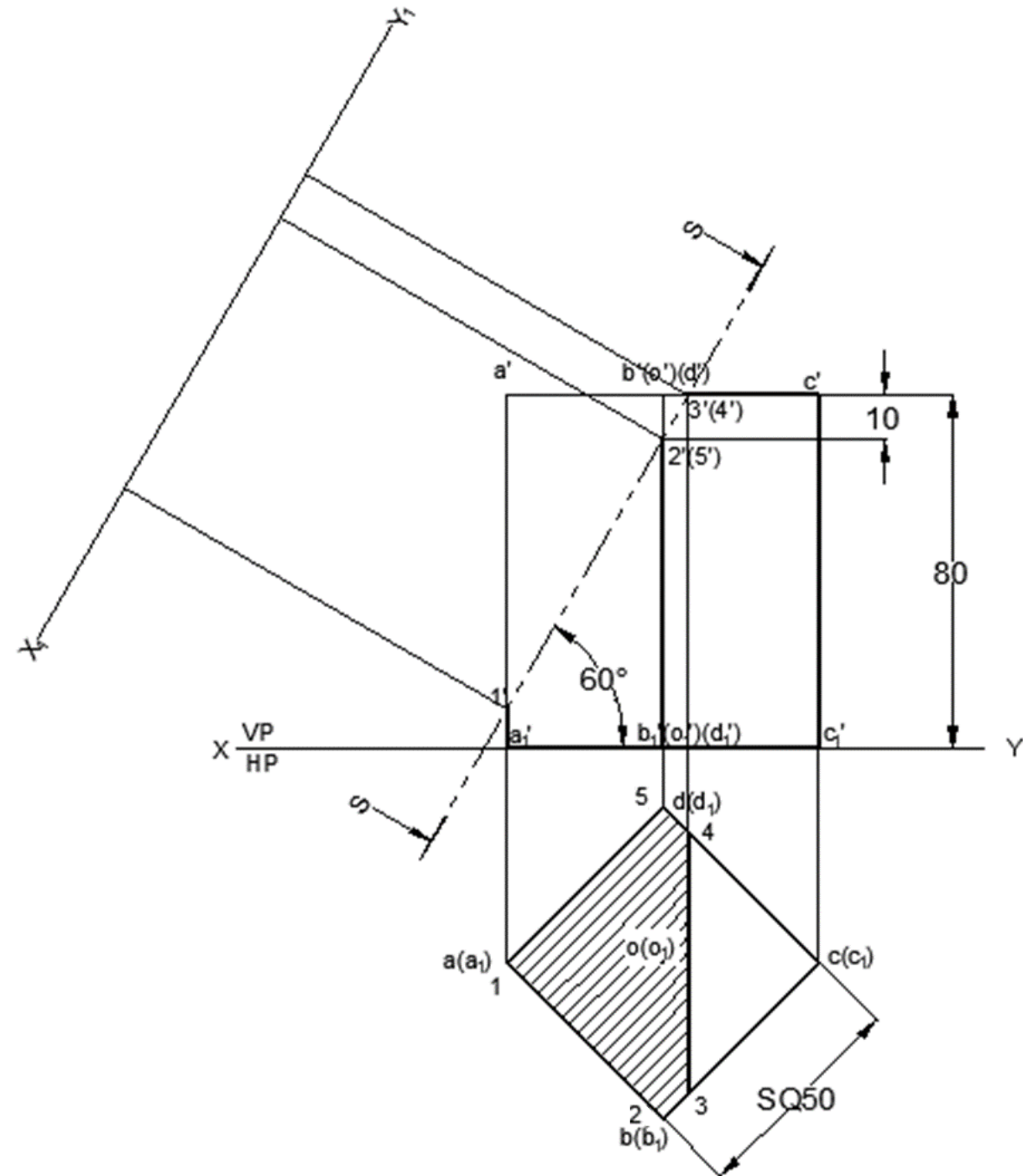
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Steps Involved

- Mark X_1Y_1 at suitable distance from section line

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



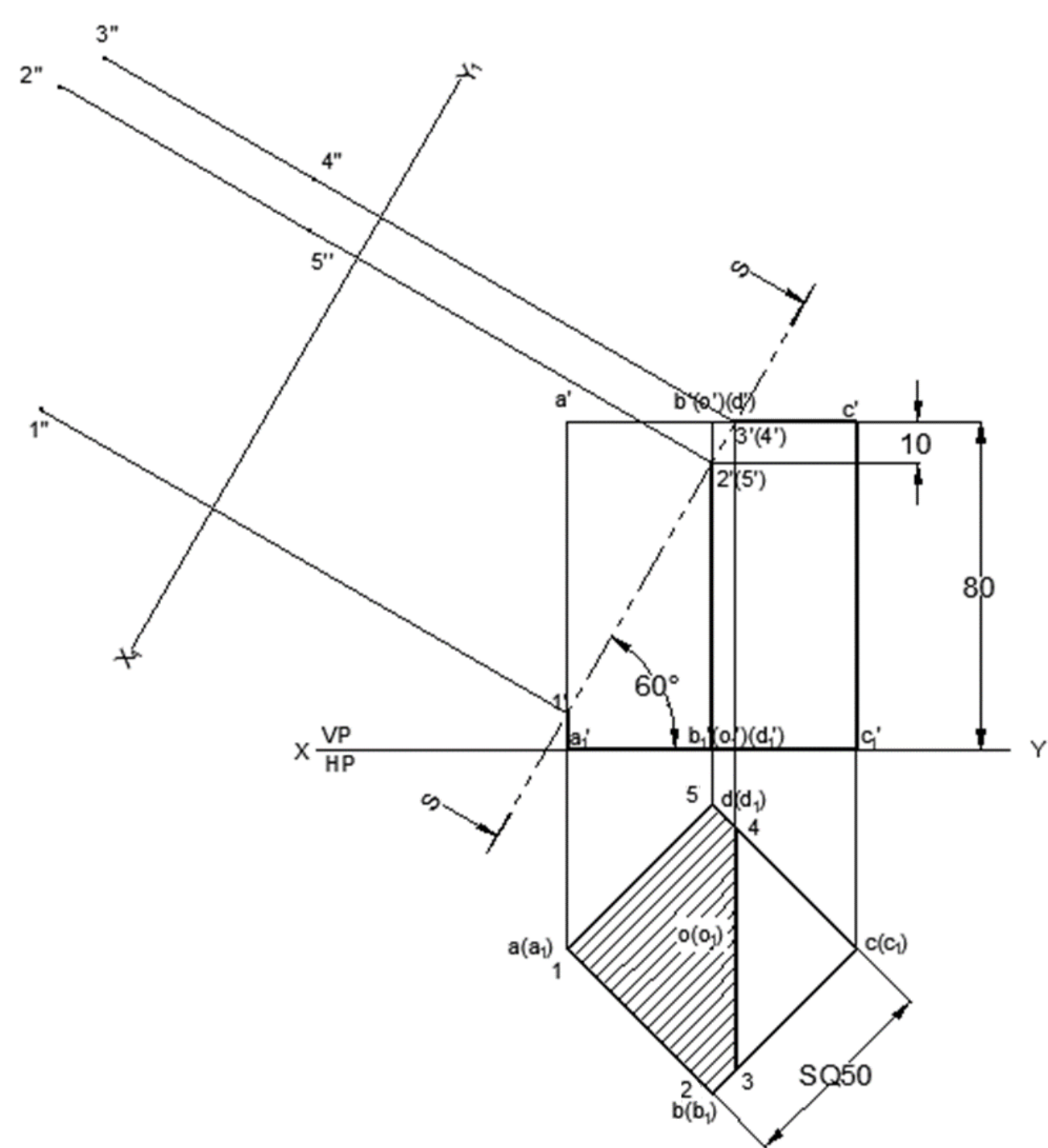
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Steps Involved

- Mark the distances (from XY line in the top view) and transfer on the extended perpendiculars

Data

- Square prism.
- 50mm side & 80mm height.
- Resting with base on HP.
- With vertical lateral faces equally inclined to VP.
- Section plane is AIP at 60° .
- Passes through axis 10mm below the top end.



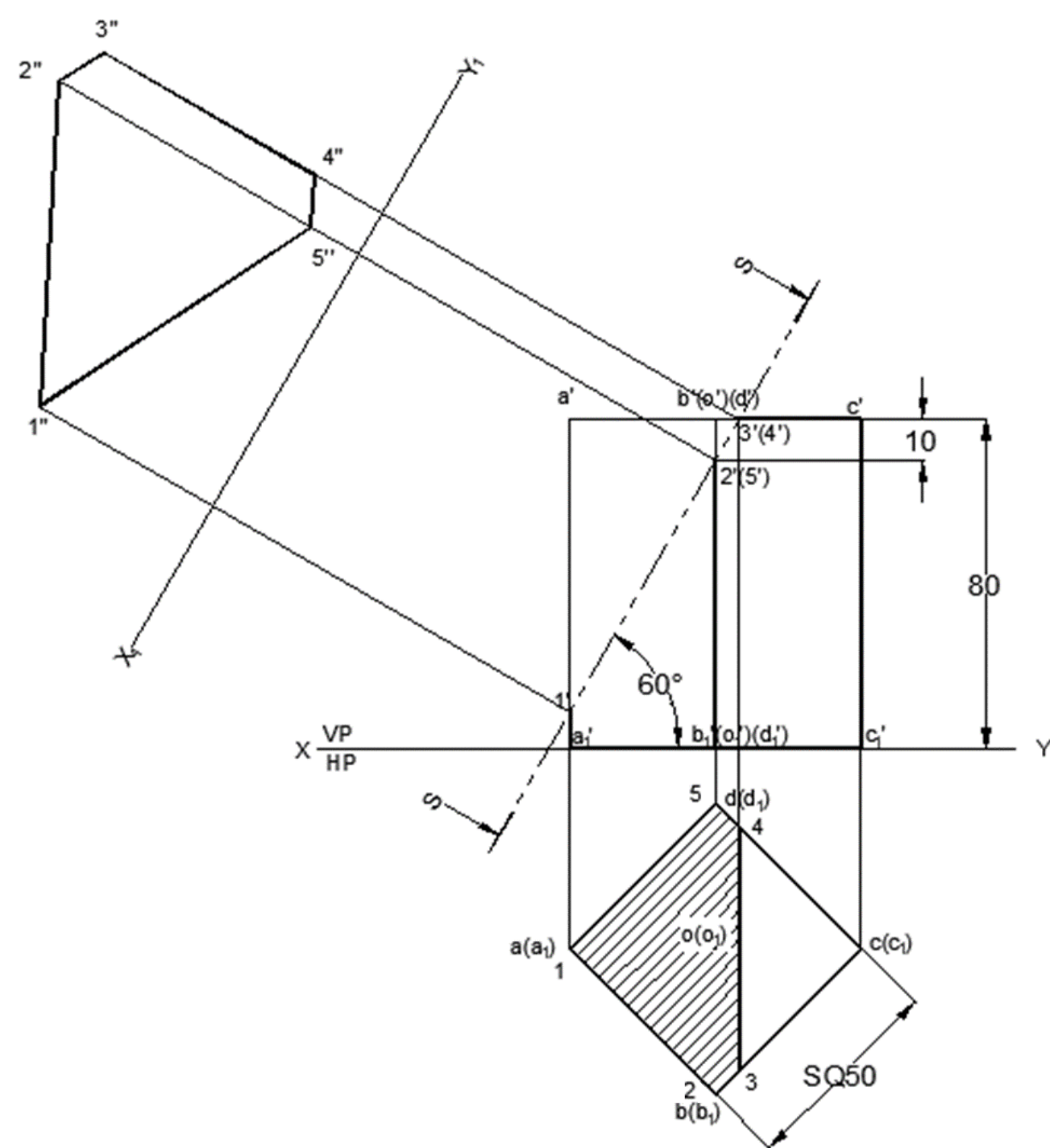
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Steps Involved

- Mark all the points
- Join all points with straight lines suitably

Data

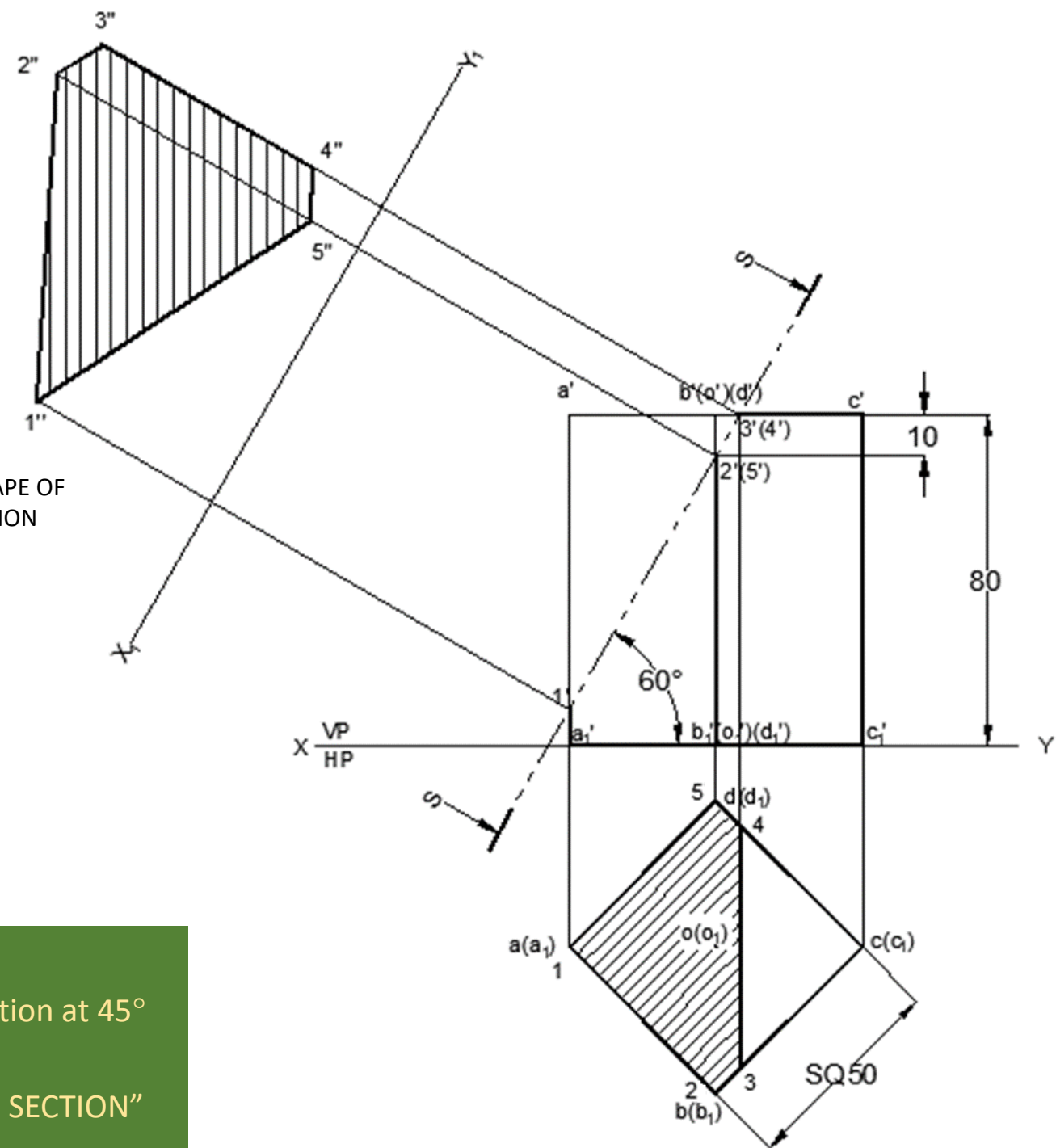
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TRUE SHAPE OF THE SECTION



Steps Involved

- Hatch the true shape of section at 45° to X_1Y_1 line
- Write "TRUE SHAPE OF THE SECTION"