Projections of Solids

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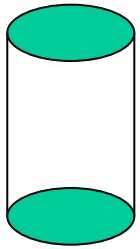
Introduction (Solids)

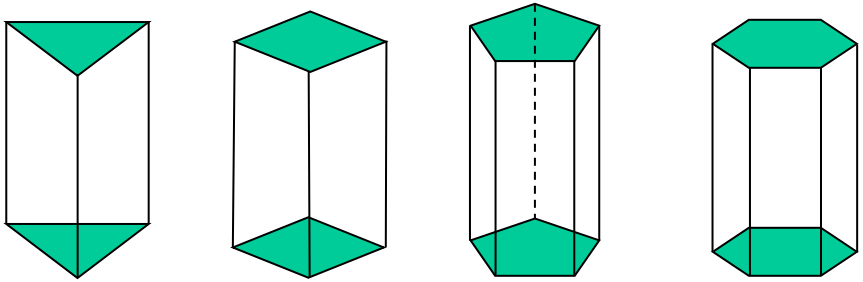
Group A

Solids with top and base of same shape.

Cylinder



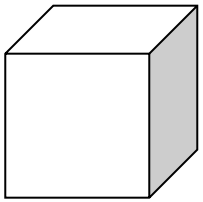
Prisms



Triangular Square Pentagonal Hexagonal

Cube

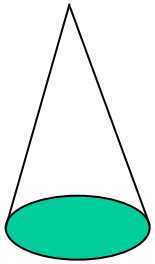
(A solid with six square faces..)



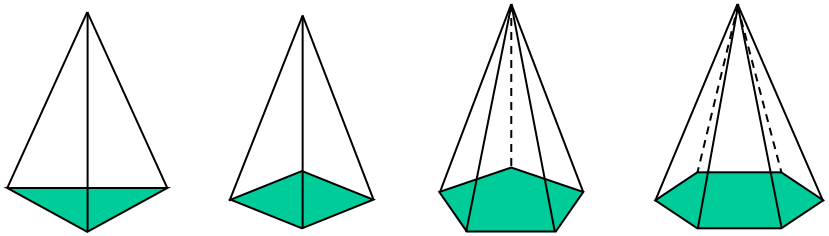
Group B

Solids with base of any shape and only a point as a top, called apex.

Cone



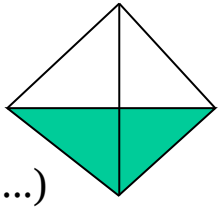
Pyramids



Triangular Square Pentagonal Hexagonal

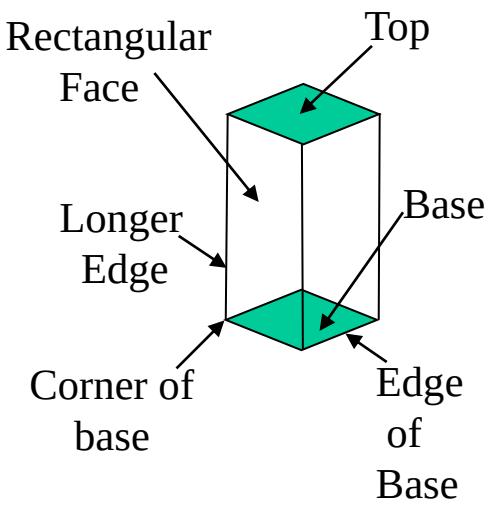
Tetrahedron

(A solid with four triangular faces...)

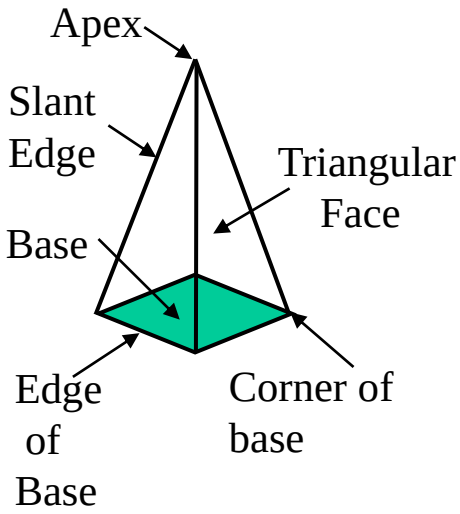


Dimensional Parameters (Solids)

Square Prism

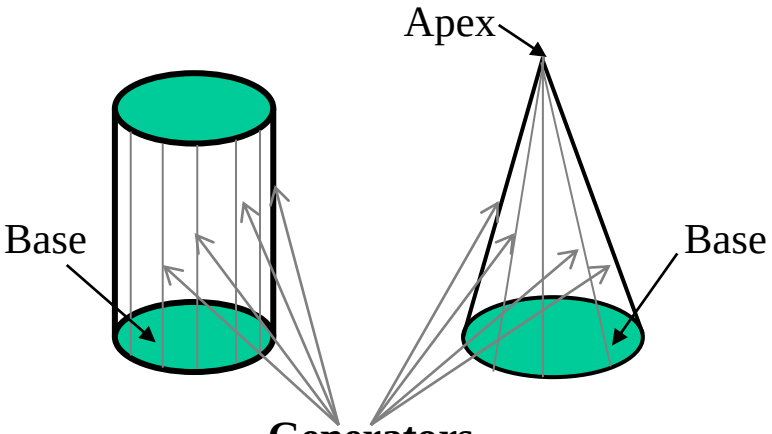


Square Pyramid



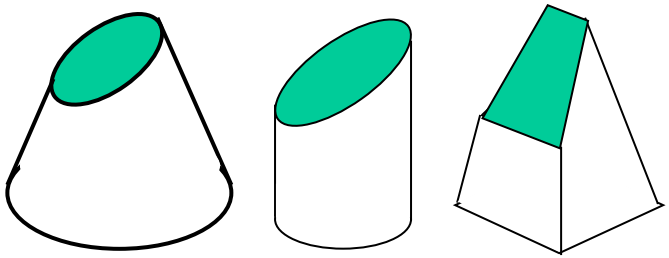
Cylinder

Cone

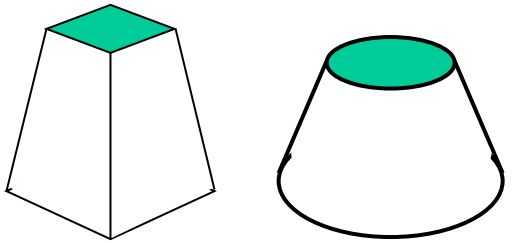


Generators

Imaginary lines generating curved surface of cylinder and cone.



Sections of solids (Top and base are not parallel)



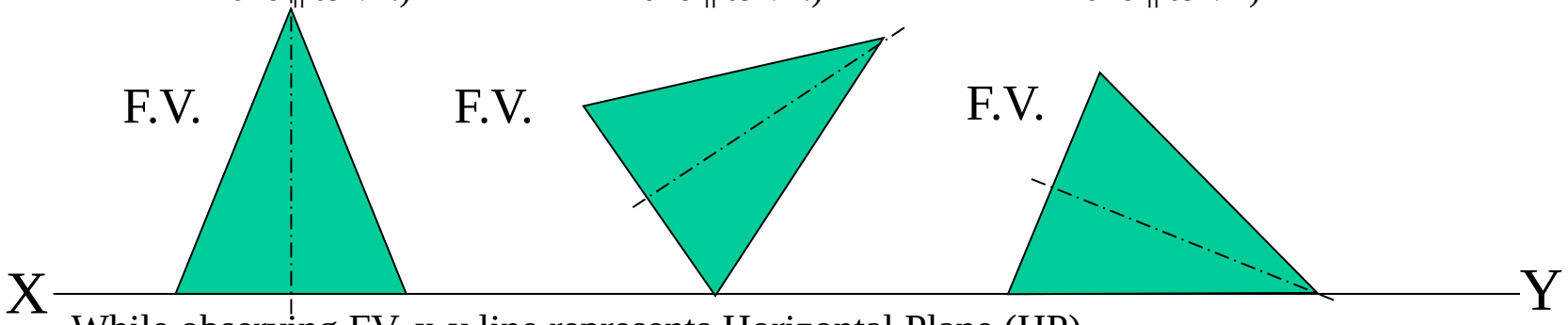
Frustum of cones and pyramids.
(Top and base are parallel to each other)

Example (Cone, Basic Cases)

STANDING ON H.P.
On its base.
(Axis perpendicular to HP and || to VP.)

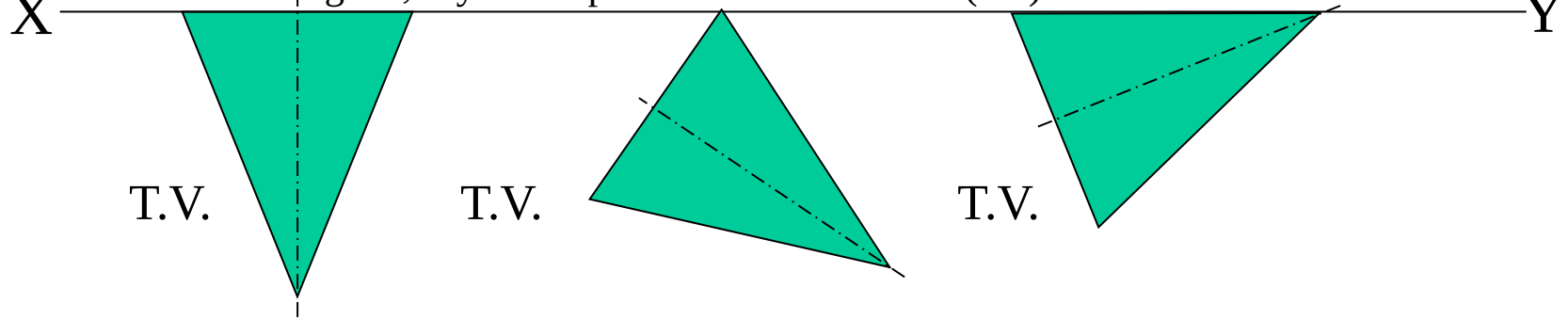
RESTING ON H.P.
On one point of base circle.
(Axis inclined to HP and || to VP.)

LYING ON H.P.
On one generator.
(Axis inclined to HP and || to VP)



While observing FV, x-y line represents Horizontal Plane (HP).

While observing TV, x-y line represents Vertical Plane (VP).



RESTING ON V.P.
On its base.
Axis perpendicular to VP and || to HP.

RESTING ON V.P.
On one point of base circle.
Axis inclined to VP and || to HP.

LYING ON V.P.
On one generator.
Axis inclined to VP and || to HP.

Construction Steps

STEP 1: Assume that the solid stands on the plane with which it is inclined

(If it is inclined to HP, assume it standing on HP)
If solid stands on HP, its TV will be the true shape of its base or top.

(If it is inclined to VP, assume it resting on VP)
If solid rests on VP, its FV will be the true shape of its base or top.

Begin with this view:

(i) Its other view will be a rectangle (for Group A solids) Cylinders and Prims.

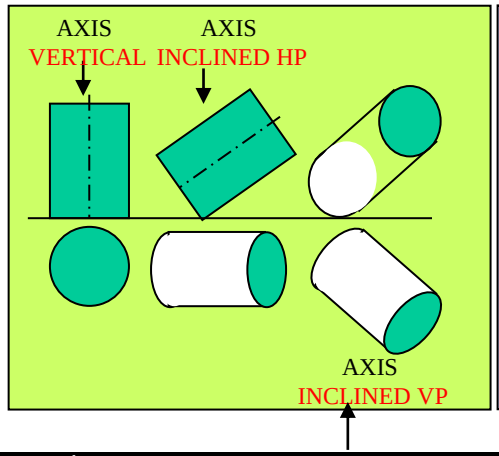
(ii) Its other view will be a triangle (for Group B solids) Cone and Pyramids.

STEP 2: Considering solid's inclination (axis position) draw its FV and TV.

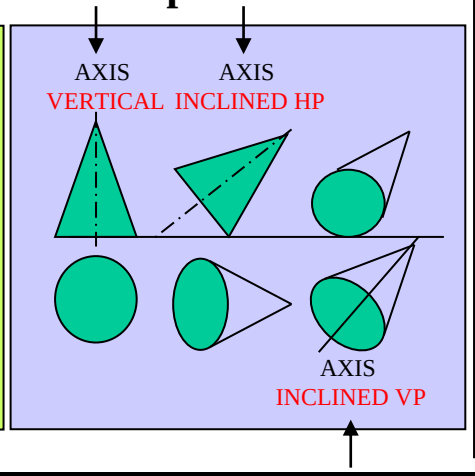
STEP 3: In the last step, consider the remaining inclination and draw its final FV and TV.

If solid is inclined to HP

Group A Solid Cylinder

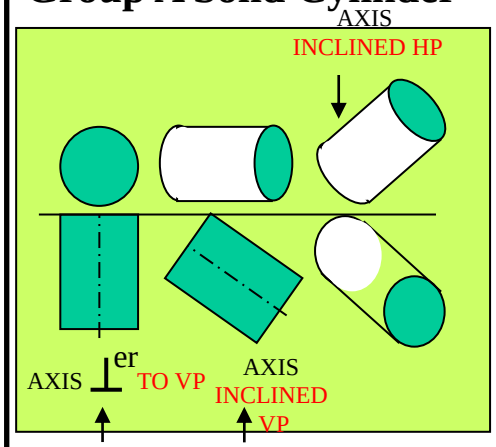


Group B Solid Cone

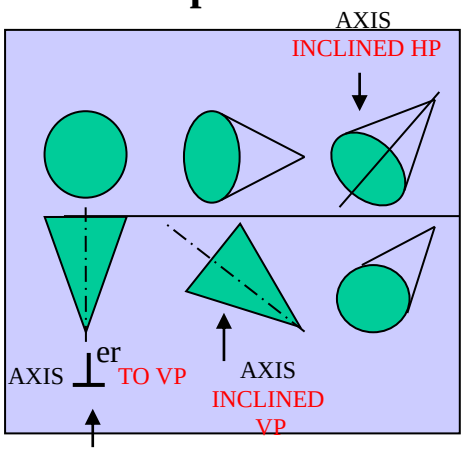


If solid is inclined to VP

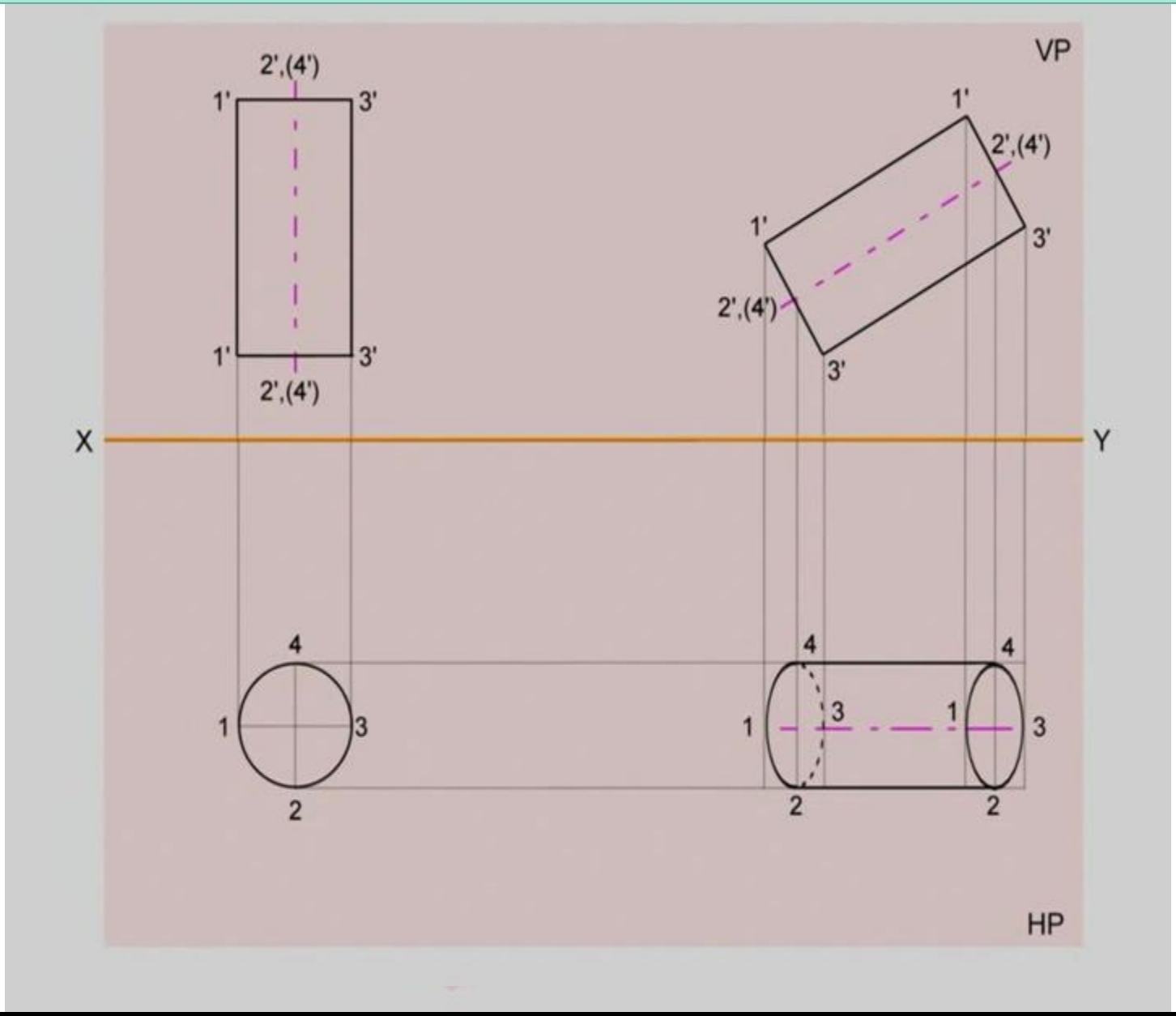
Group A Solid Cylinder



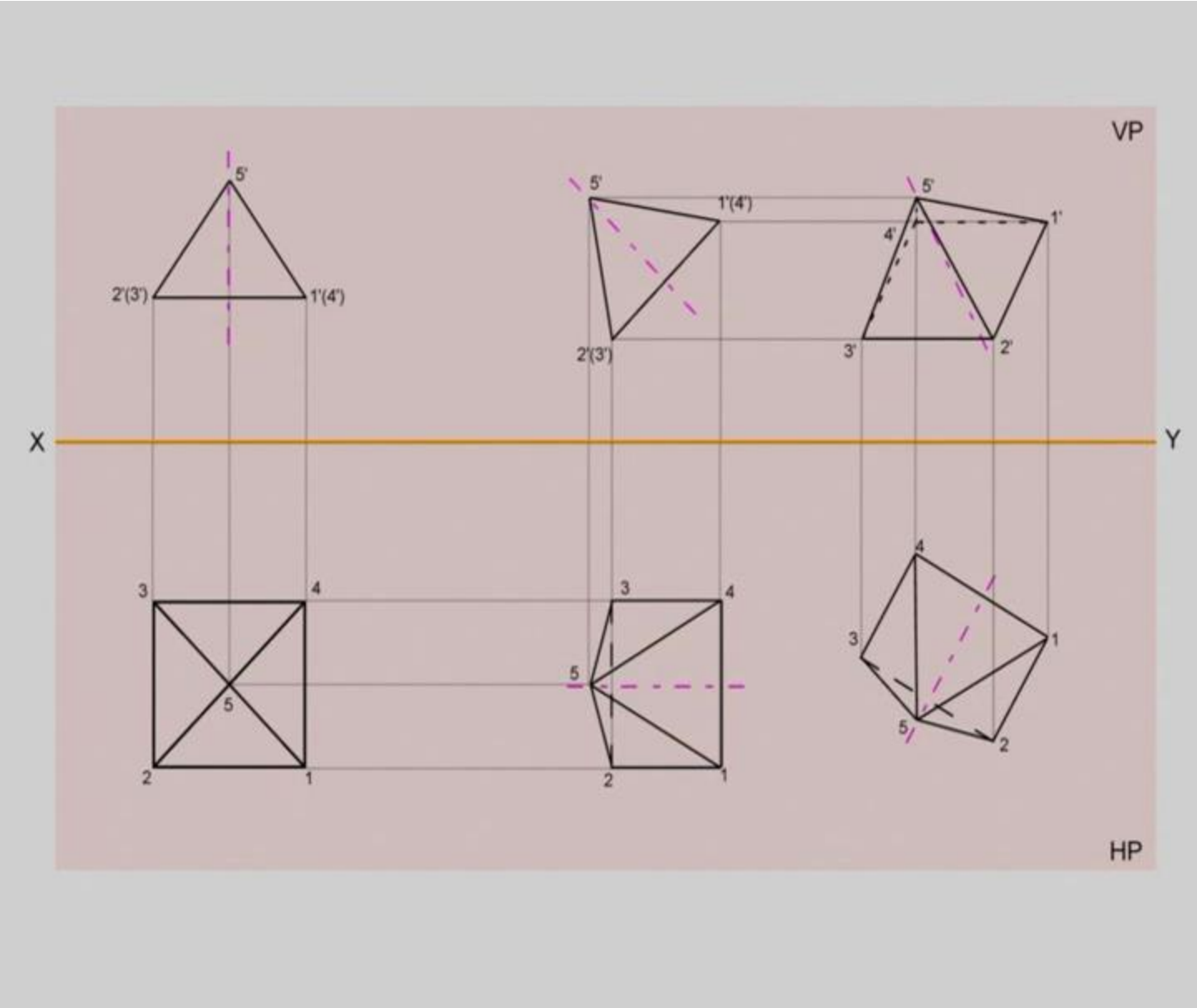
Group B Solid Cone



Cylinder Inclined to One Plane

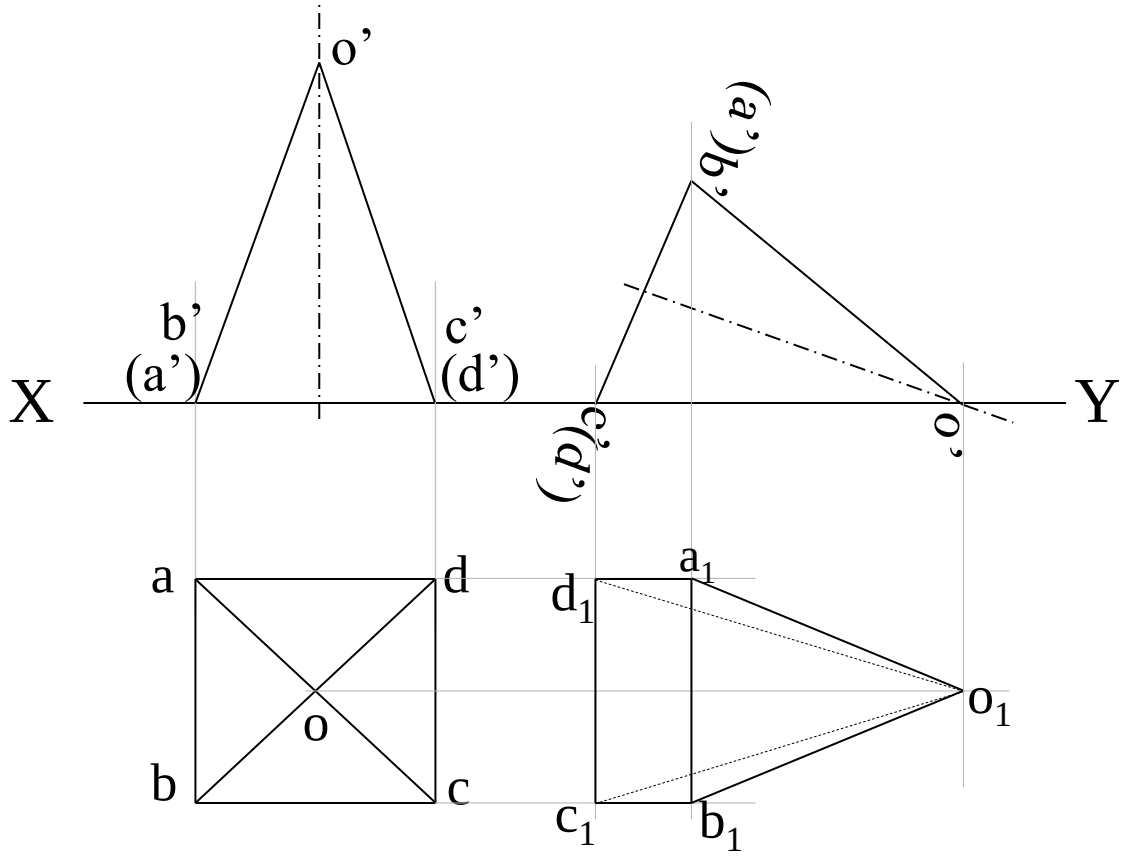


Square Pyramid Inclined to Both Planes



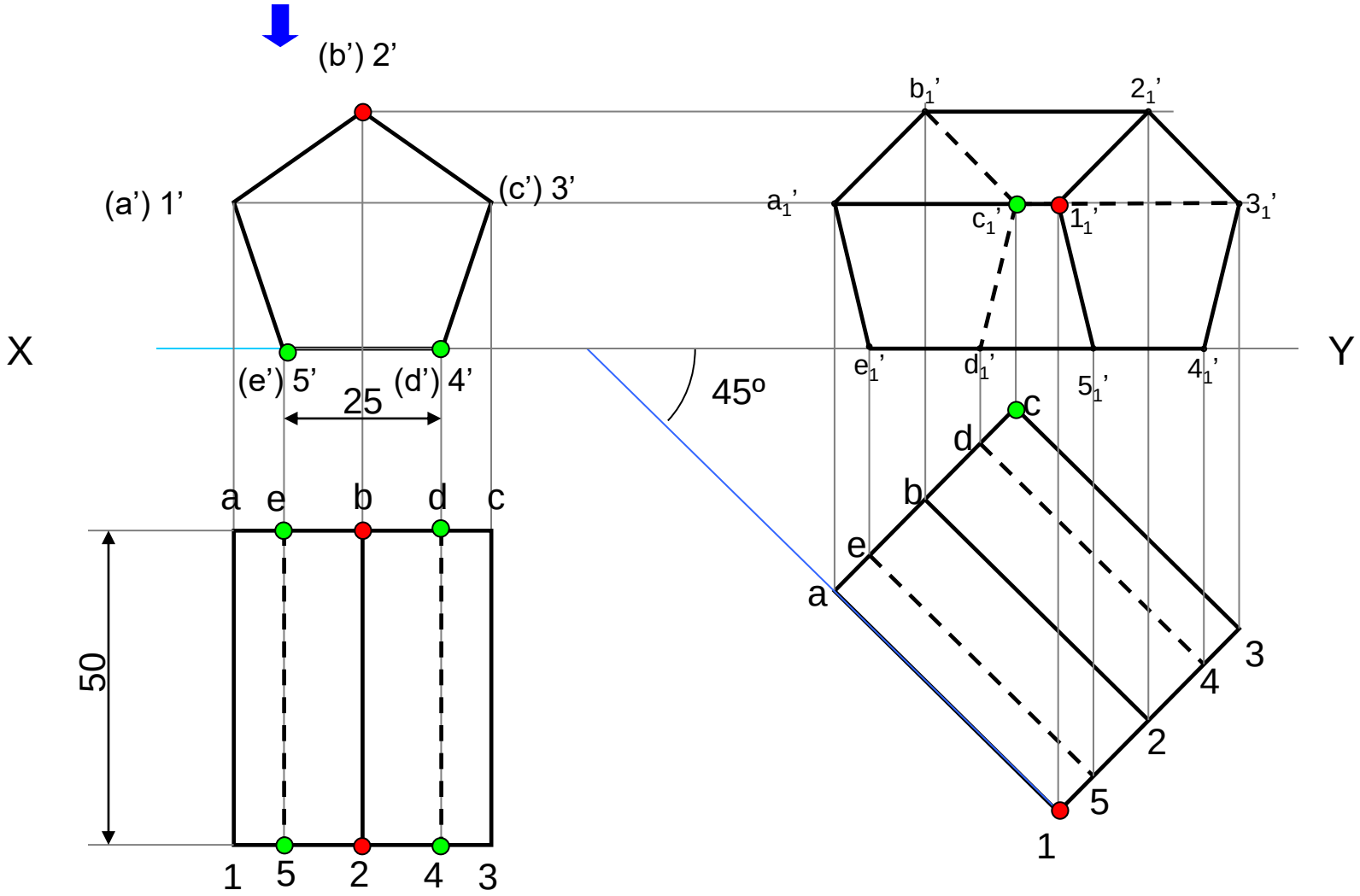
Example 1

A square pyramid, with 40 mm base sides and axis 60 mm long, has a triangular face on the ground. Draw its projections of the solid.



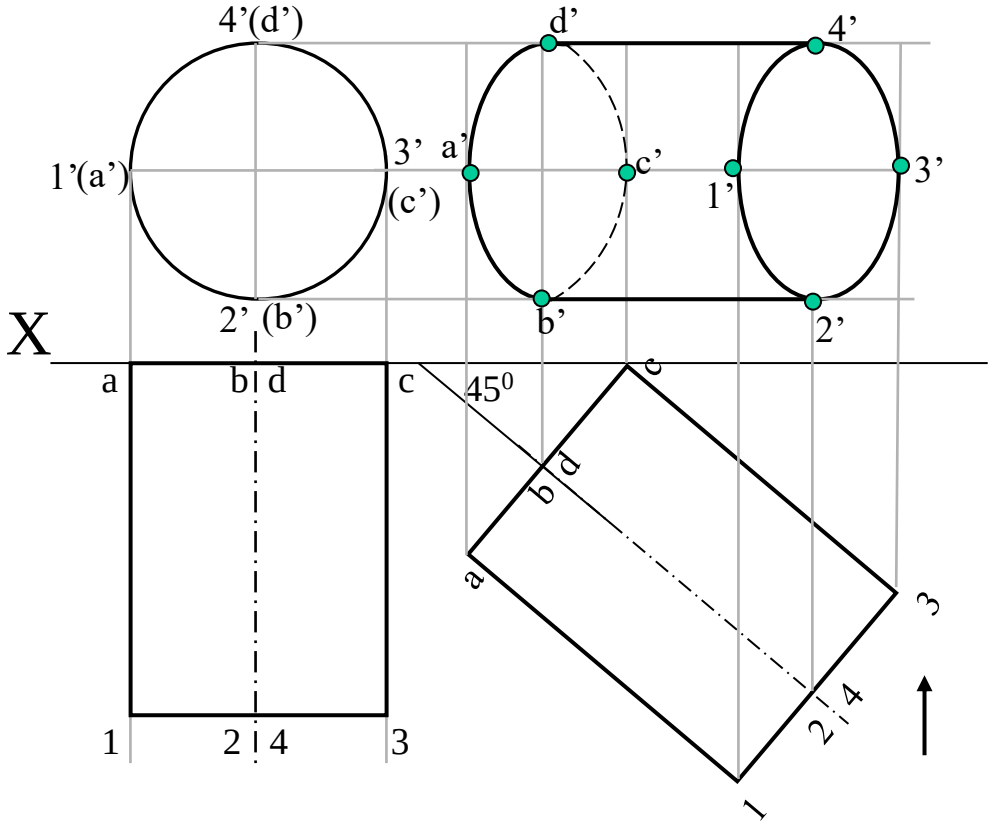
Example 2

Draw the projections of a pentagonal prism, of base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on the H.P. with the axis inclined at 45º to the V.P.



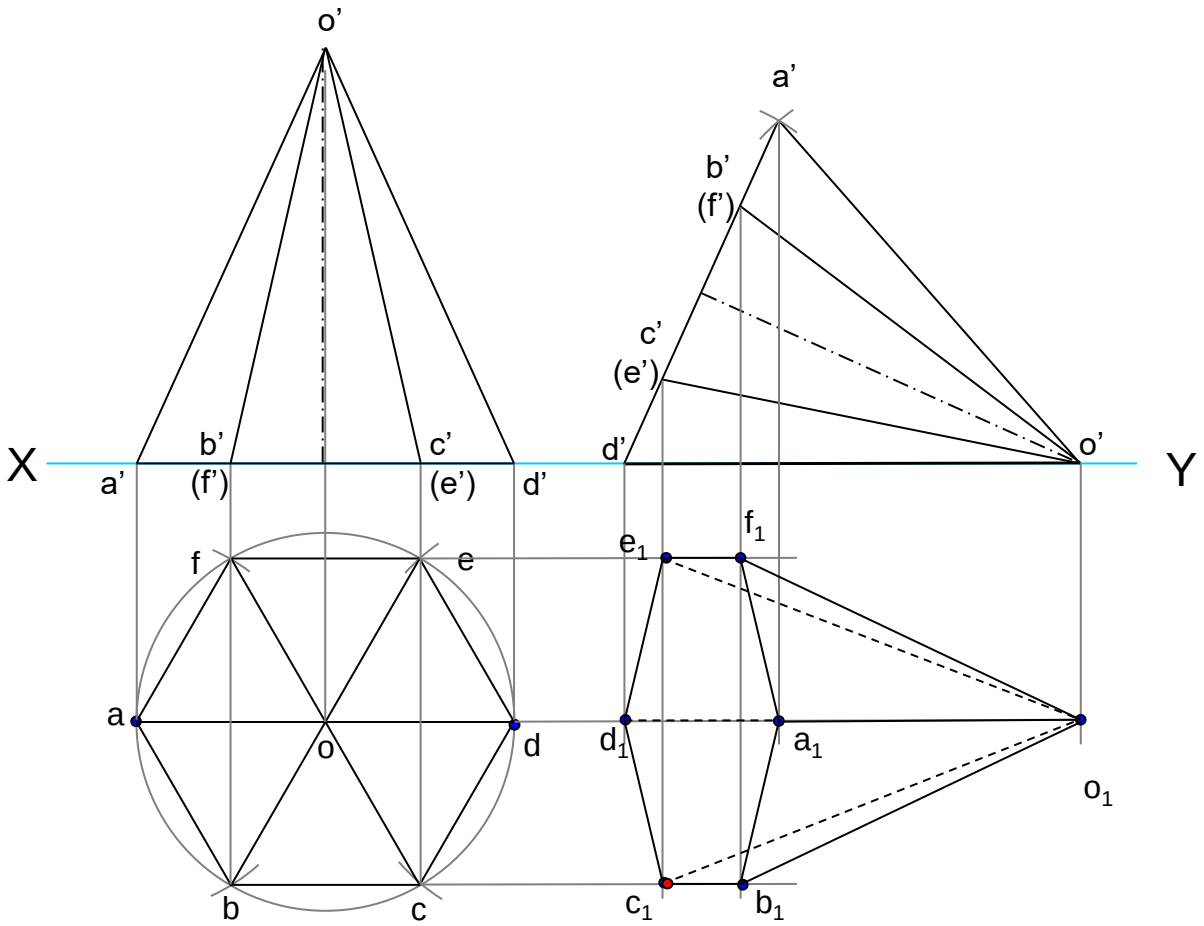
Example 3

A cylinder with 40 mm diameter and 50 mm axis is resting on one point of a base circle on VP while its axis makes 45^0 with VP. Draw its projections.



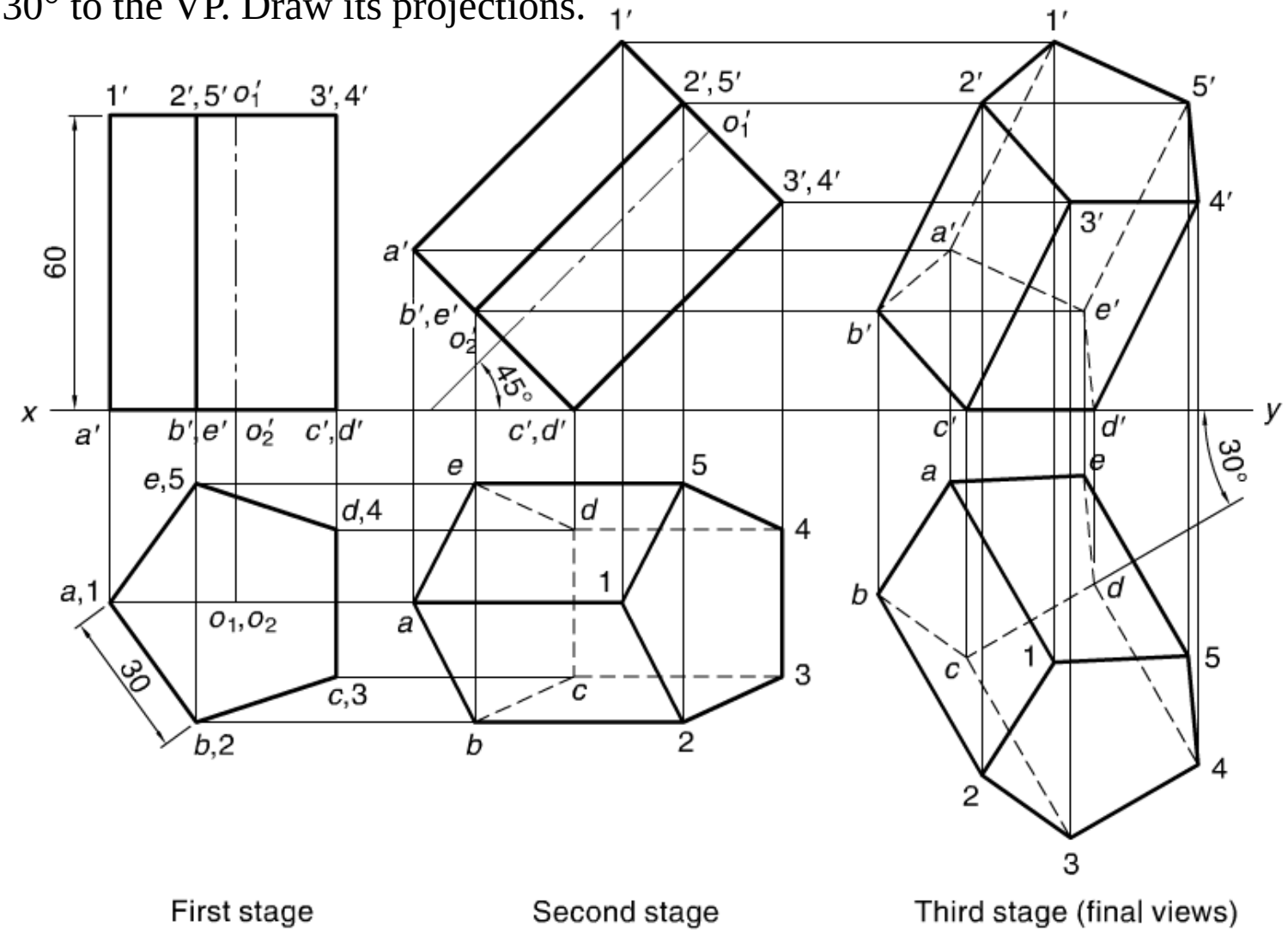
Example 4

A hexagonal pyramid with base 25 mm side and axis 55 mm long has one of its slant edge resting on the ground and with its axis is parallel to VP. Draw its projections .



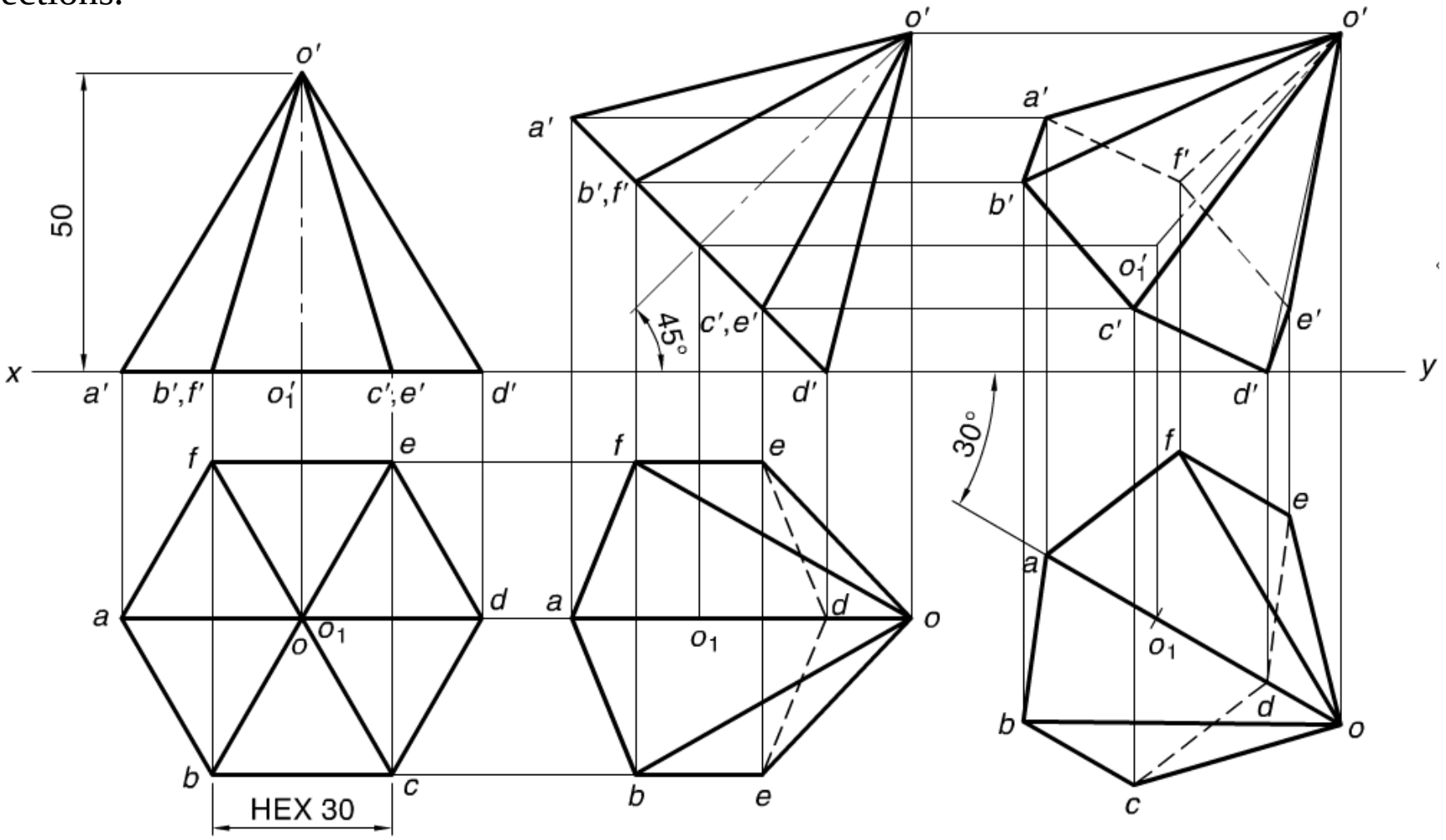
Example 5

A pentagonal prism, having a base with a 30 mm side and 60 mm height, rests on the H.P. on one of its base edges. Its axis is inclined at 45° to the HP and the edge of the base on which it rests is inclined at 30° to the VP. Draw its projections.



Example 6

A hexagonal pyramid, having a base with a 30 mm side and a 50 mm long axis, rests on one of its base corners on the ground with axis inclined at 45° to the HP. Draw its projections when the vertical plane containing the axis and the corner that lies in the HP makes 30° to the VP. Draw its projections.



Thank you