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

Department of Mechanical and Manufacturing Engineering

ENGINEERING GRAPHICS - II

CLASS 4: DEVELOPMENT OF SURFACES

(SHEET 4)

QUESTION BANK: DEVELOPMENT OF SURFACES PROBLEM 3

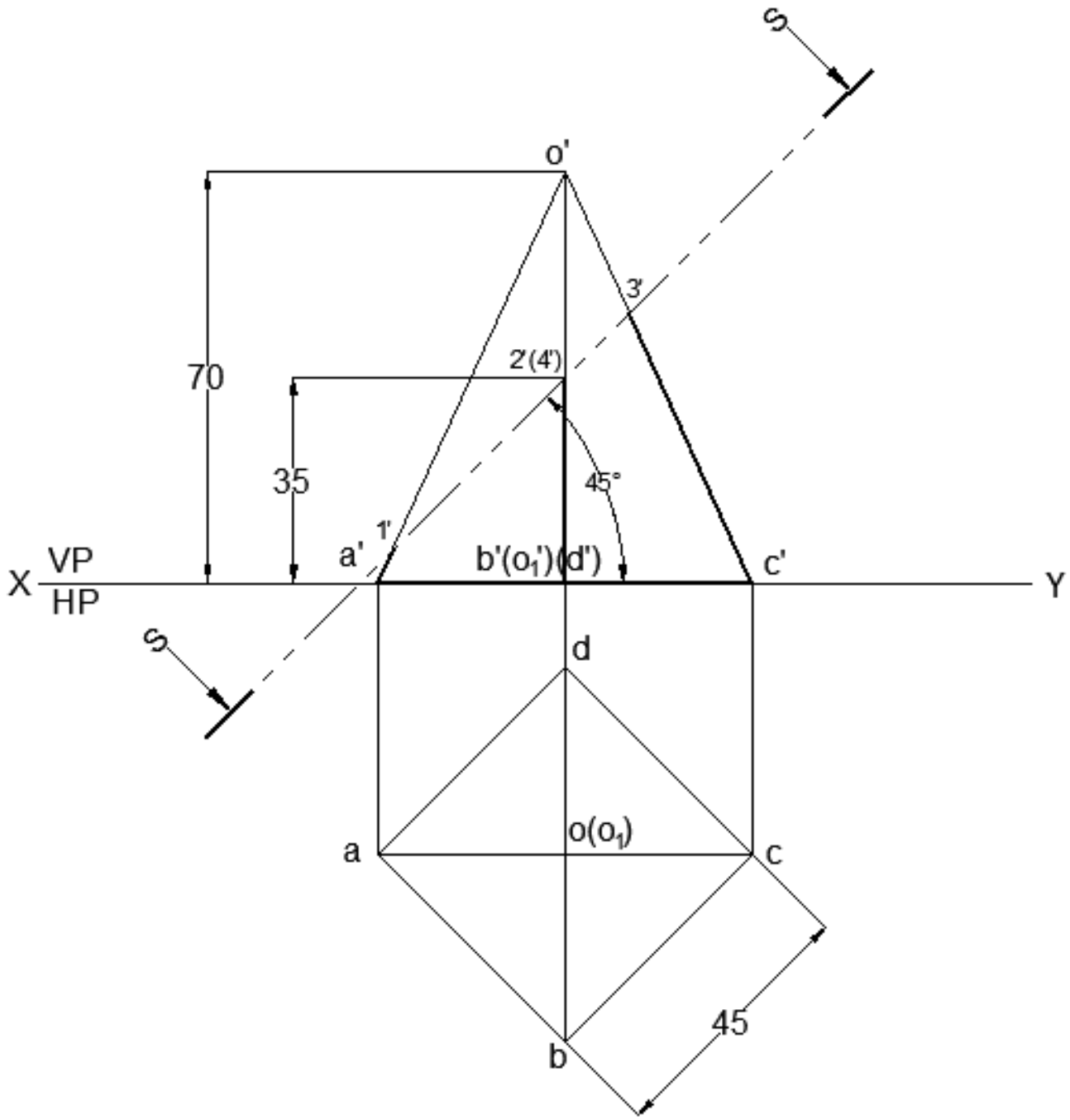
A square pyramid of side of base 45mm, altitude 70mm is resting with its base on HP with all the edges of the base are equally inclined to VP. The pyramid is cut by a section plane which is perpendicular to the VP and inclined at 45^{o} to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces the truncated pyramid.

Data

- Square Pyramid.
- 45mm side & 70mm height.
- Resting with base on HP with all base edges equally inclined to VP.
- Section plane is AIP at 45°.
- Bisects the axis.

Steps Involved

- Draw the front & top views of the given solid and complete the preliminary steps



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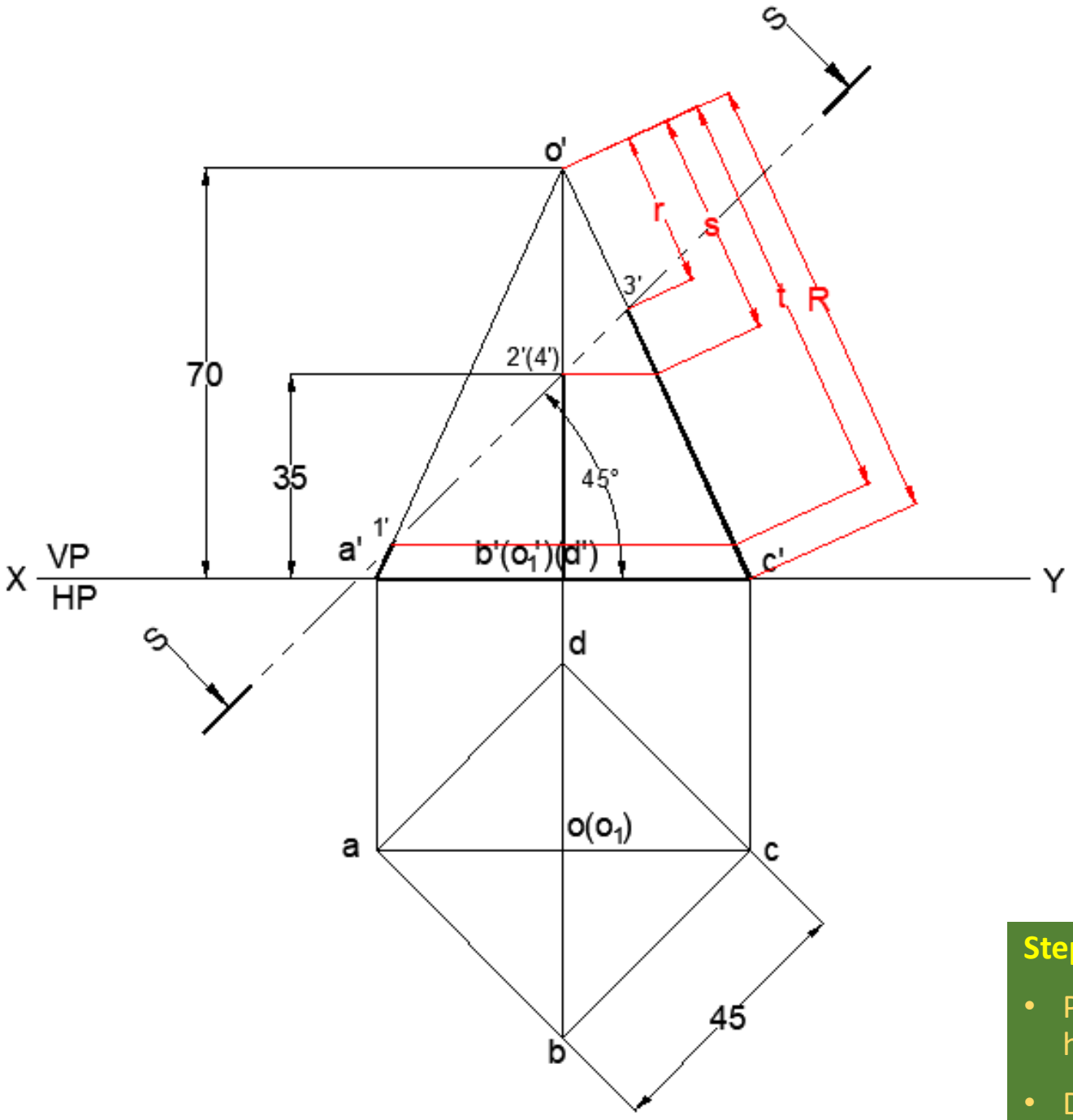
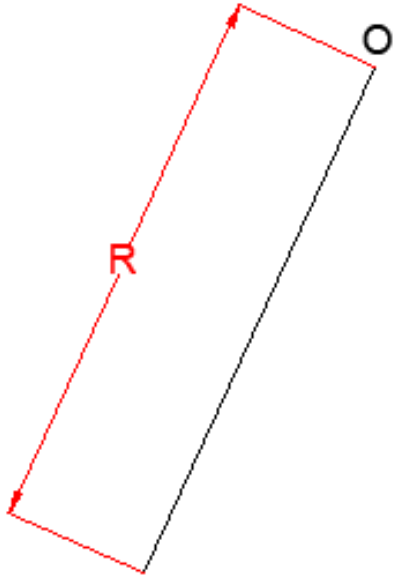
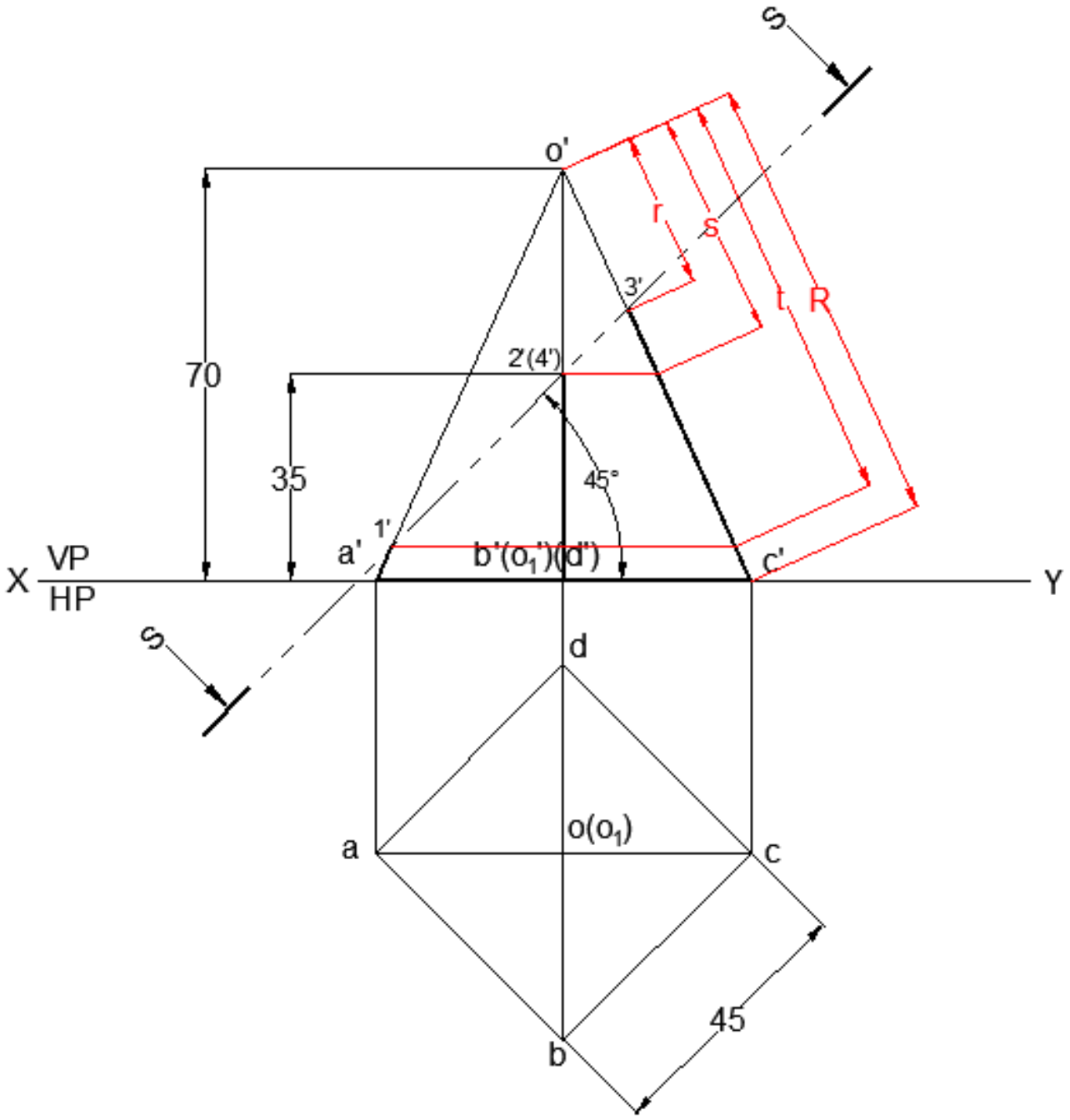
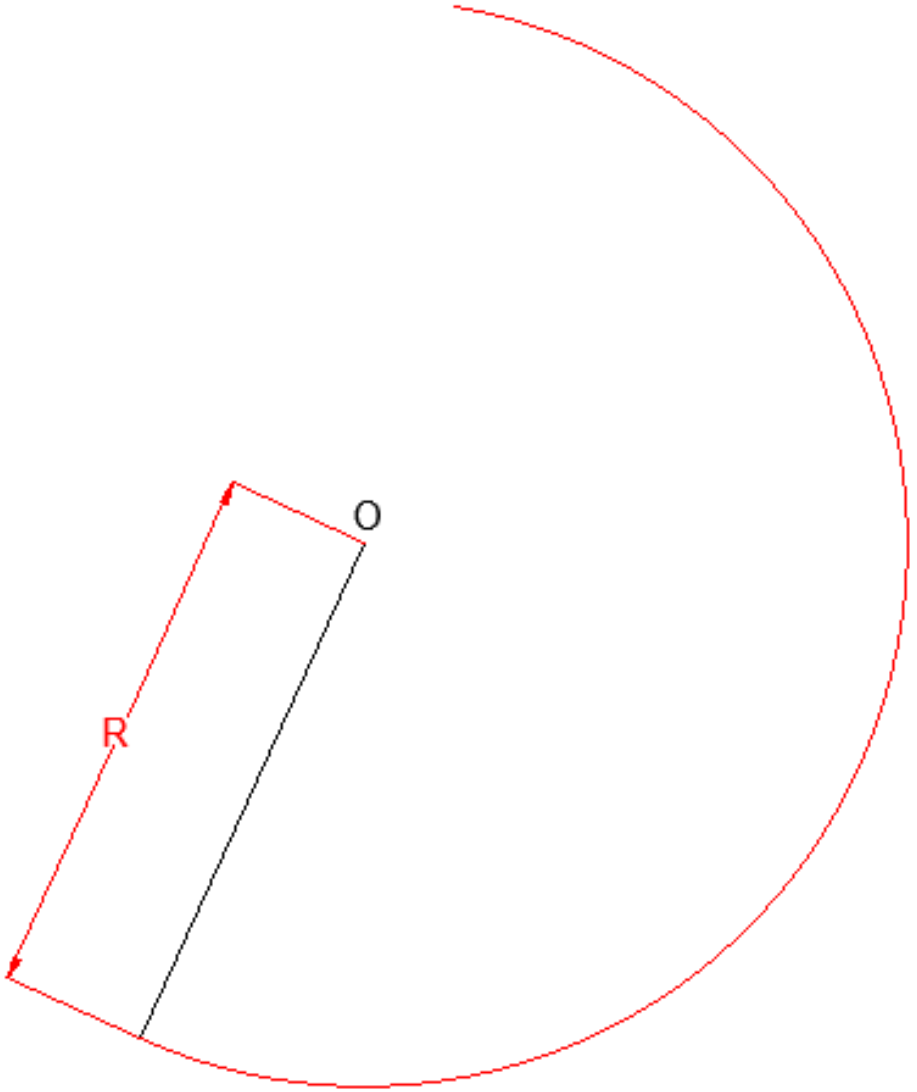




Steps Involved (Radial Line Method)

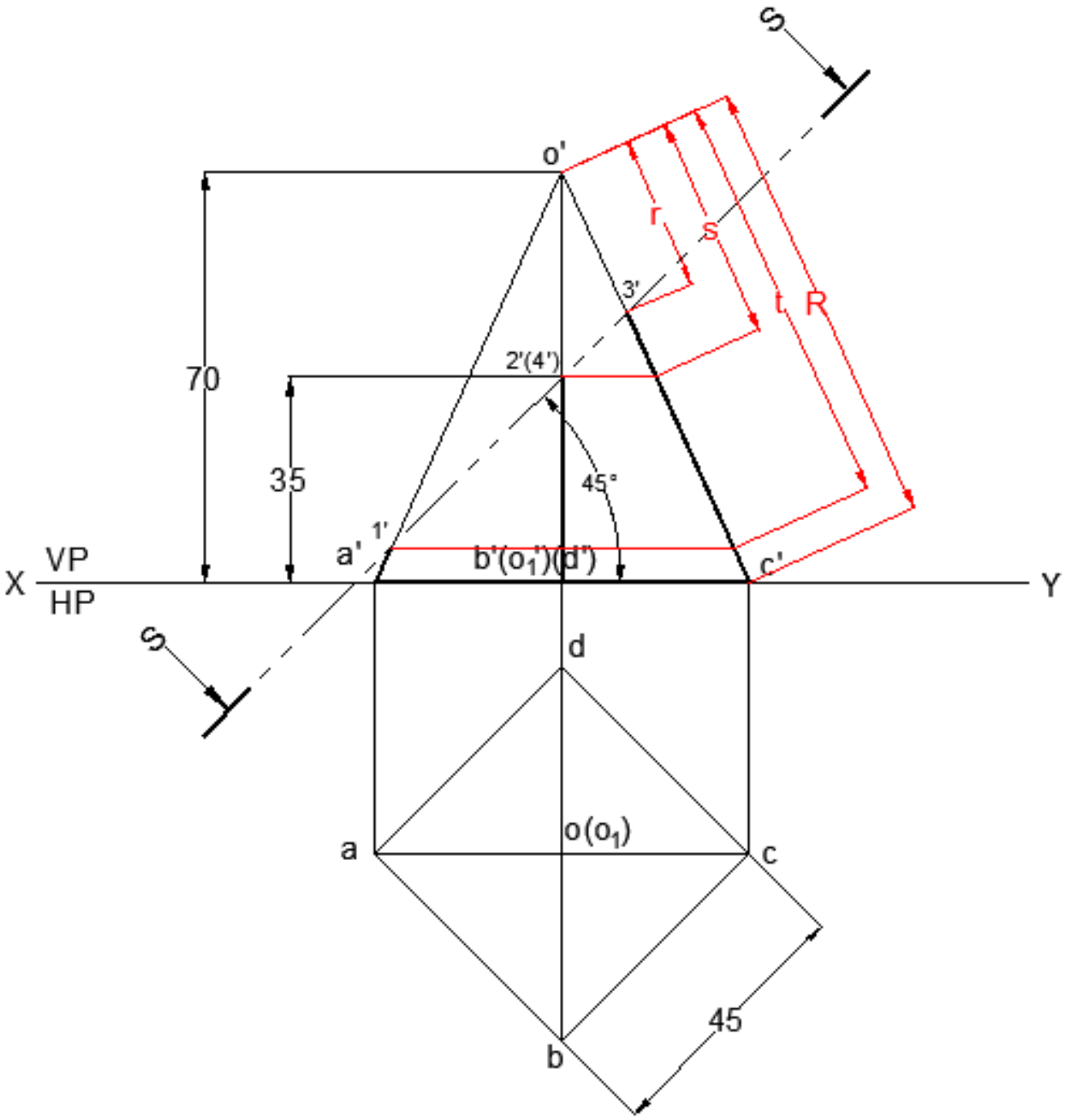
- Project all cutting points horizontally on the true length of slant height (In this case o'c' as it is parallel to VP)
- Draw R length as shown at any convenient space

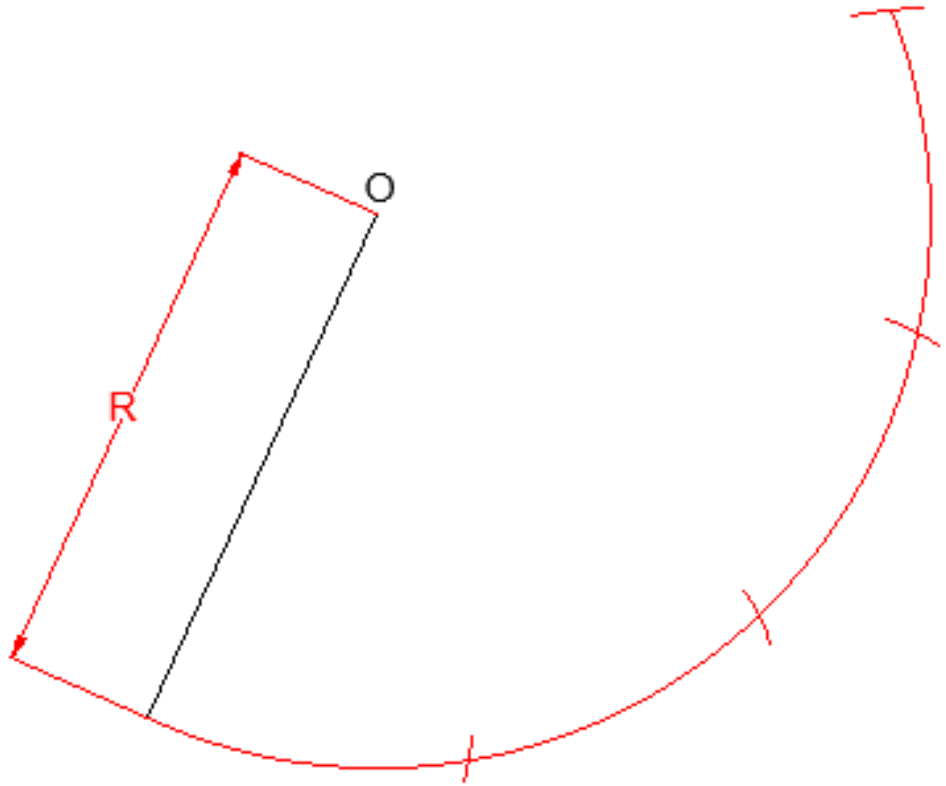




Steps Involved (Radial Line Method)

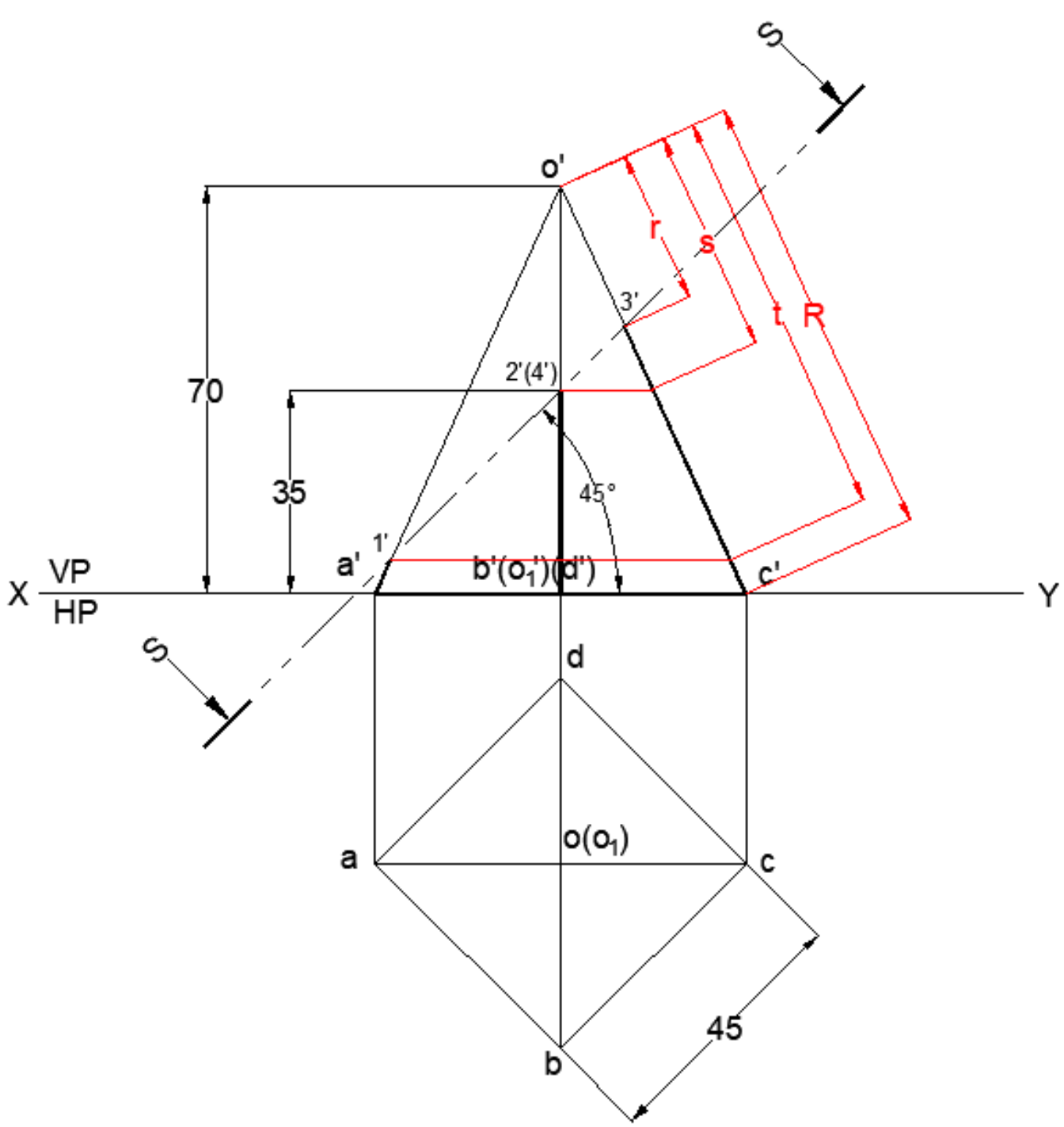
- Draw arc of radius R and centre O

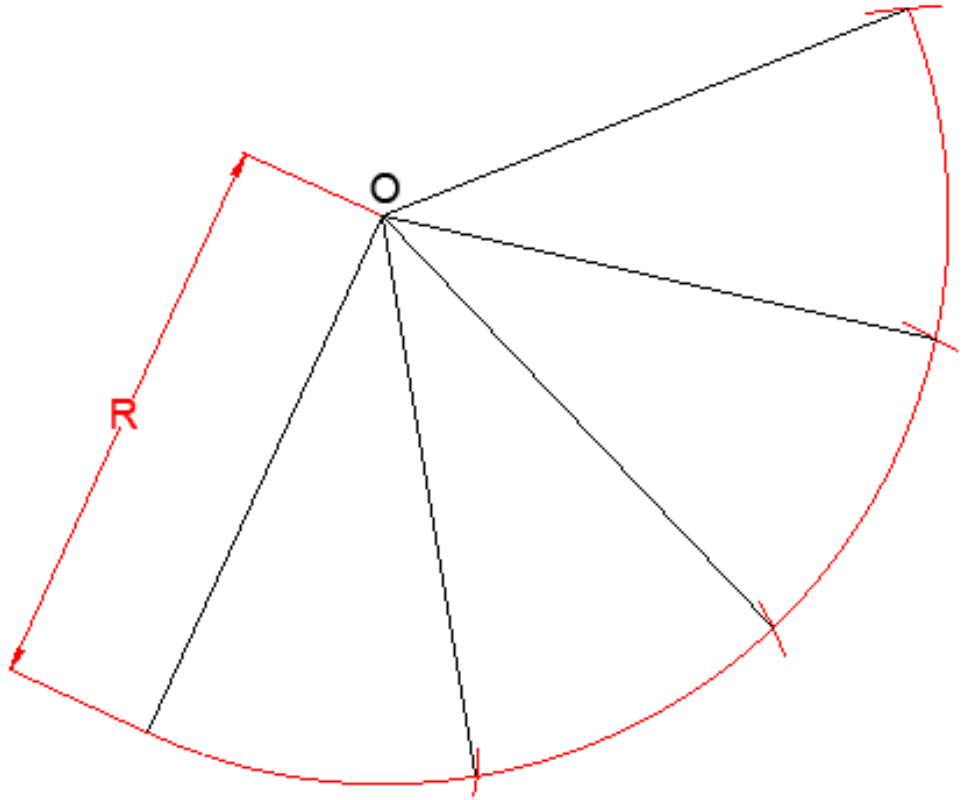




Steps Involved (Radial Line Method)

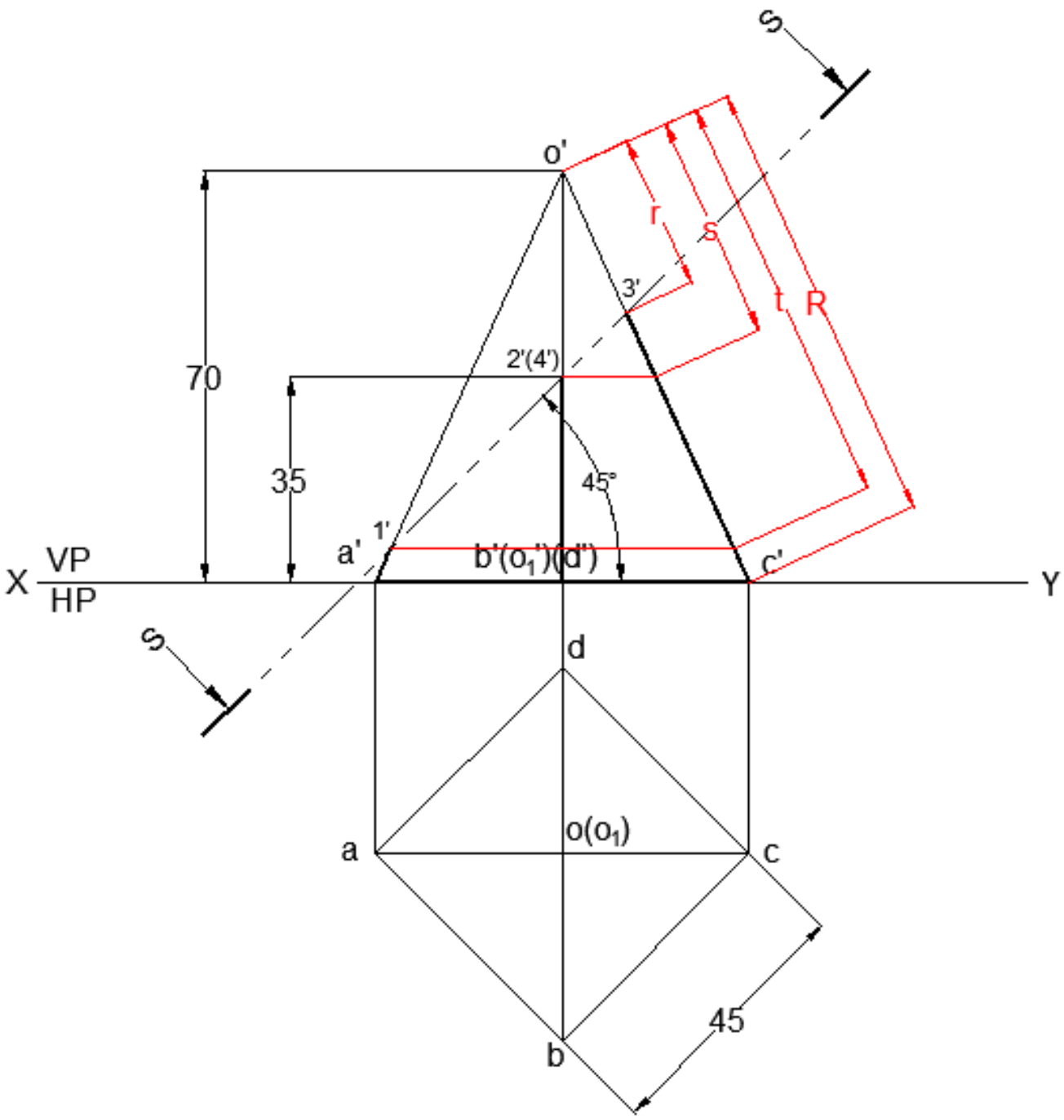
- Cut the arc with base length of 45mm as chords (4 times)
- Note, the arc length is not equal to 45mm

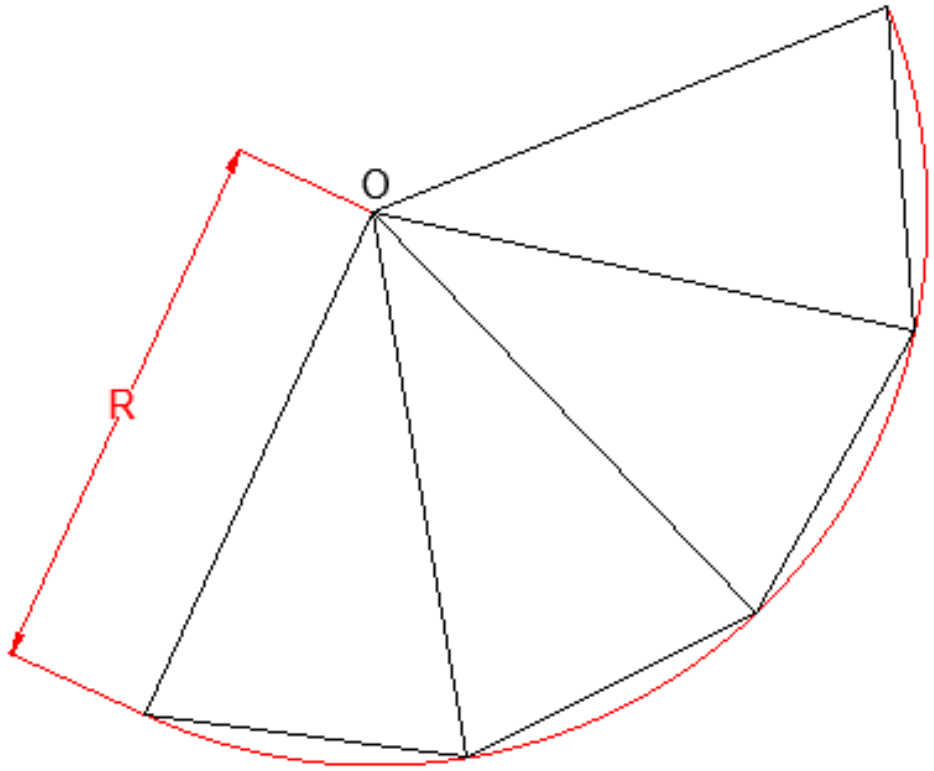




Steps Involved (Radial Line Method)

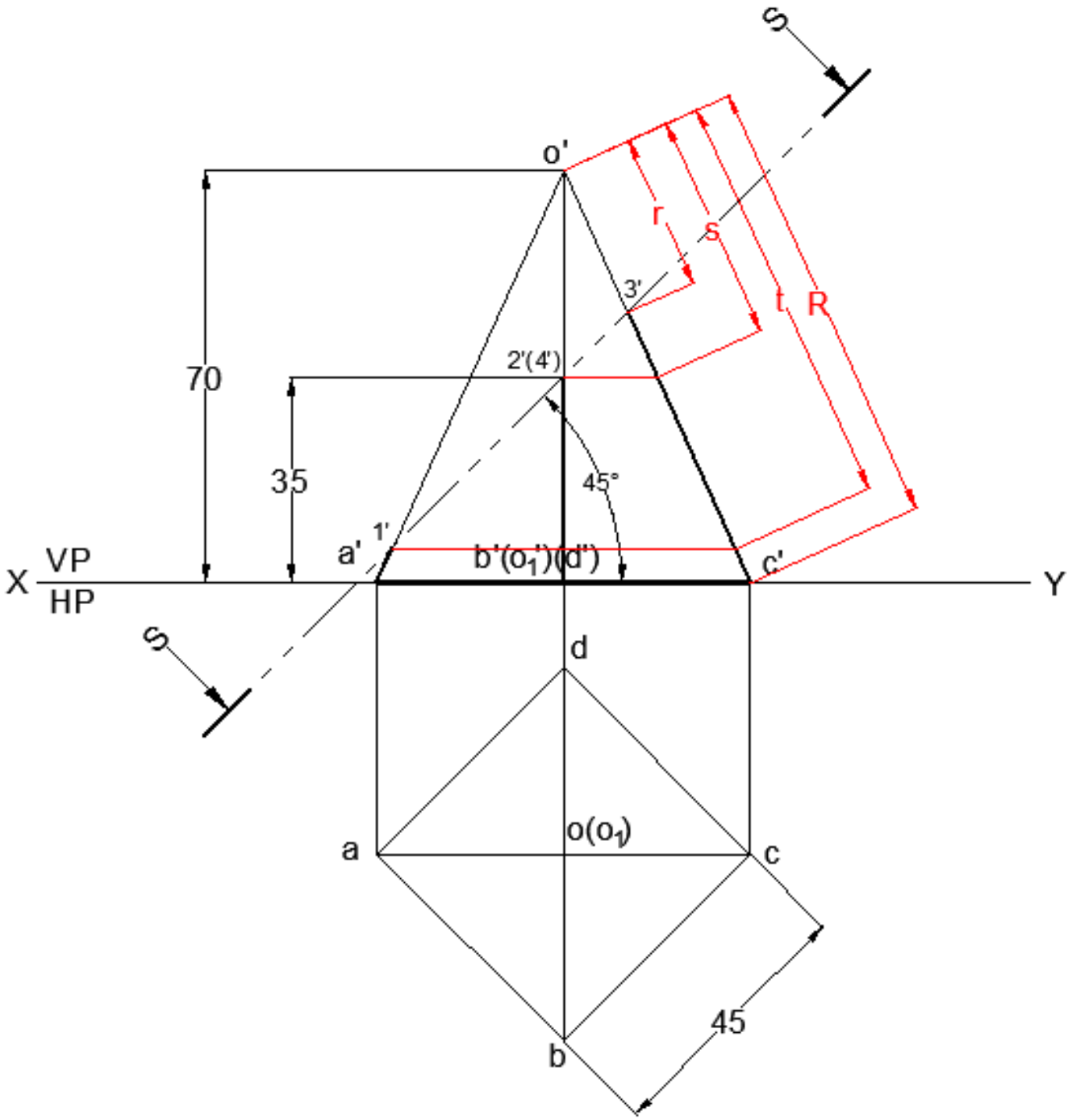
- Draw lines as shown corresponding to slant edges

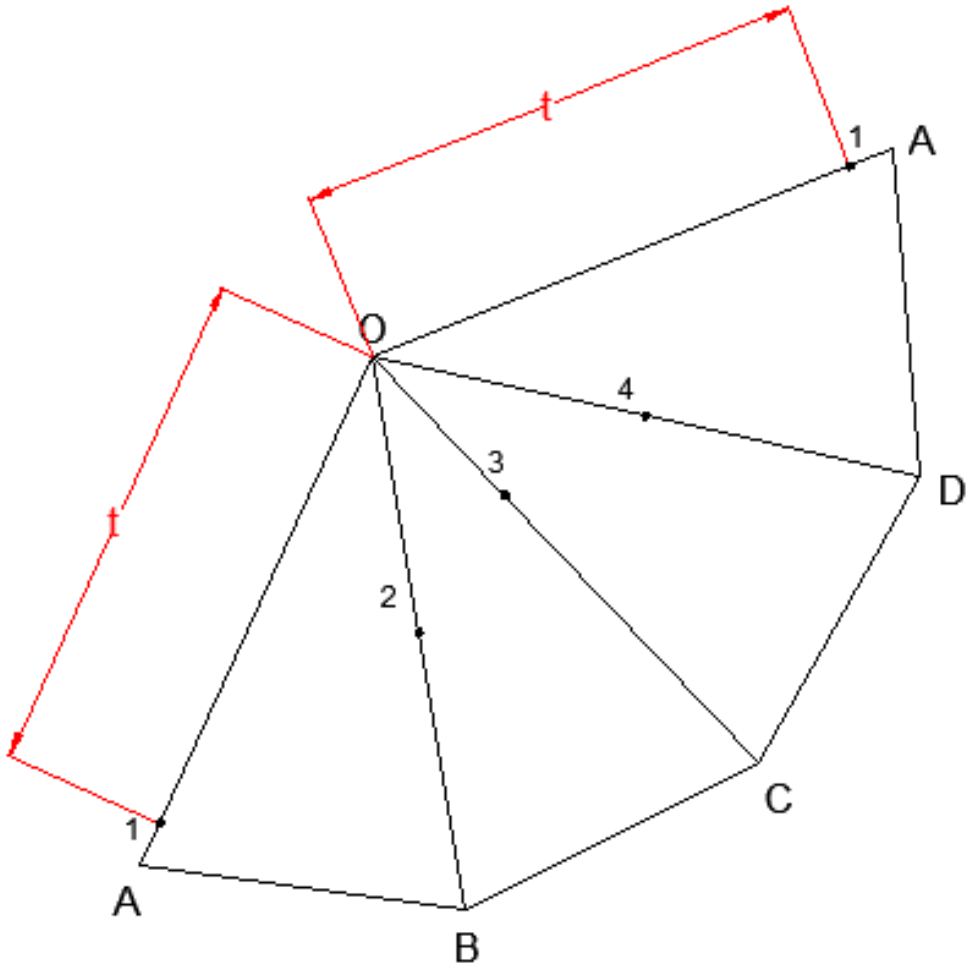




Steps Involved (Radial Line Method)

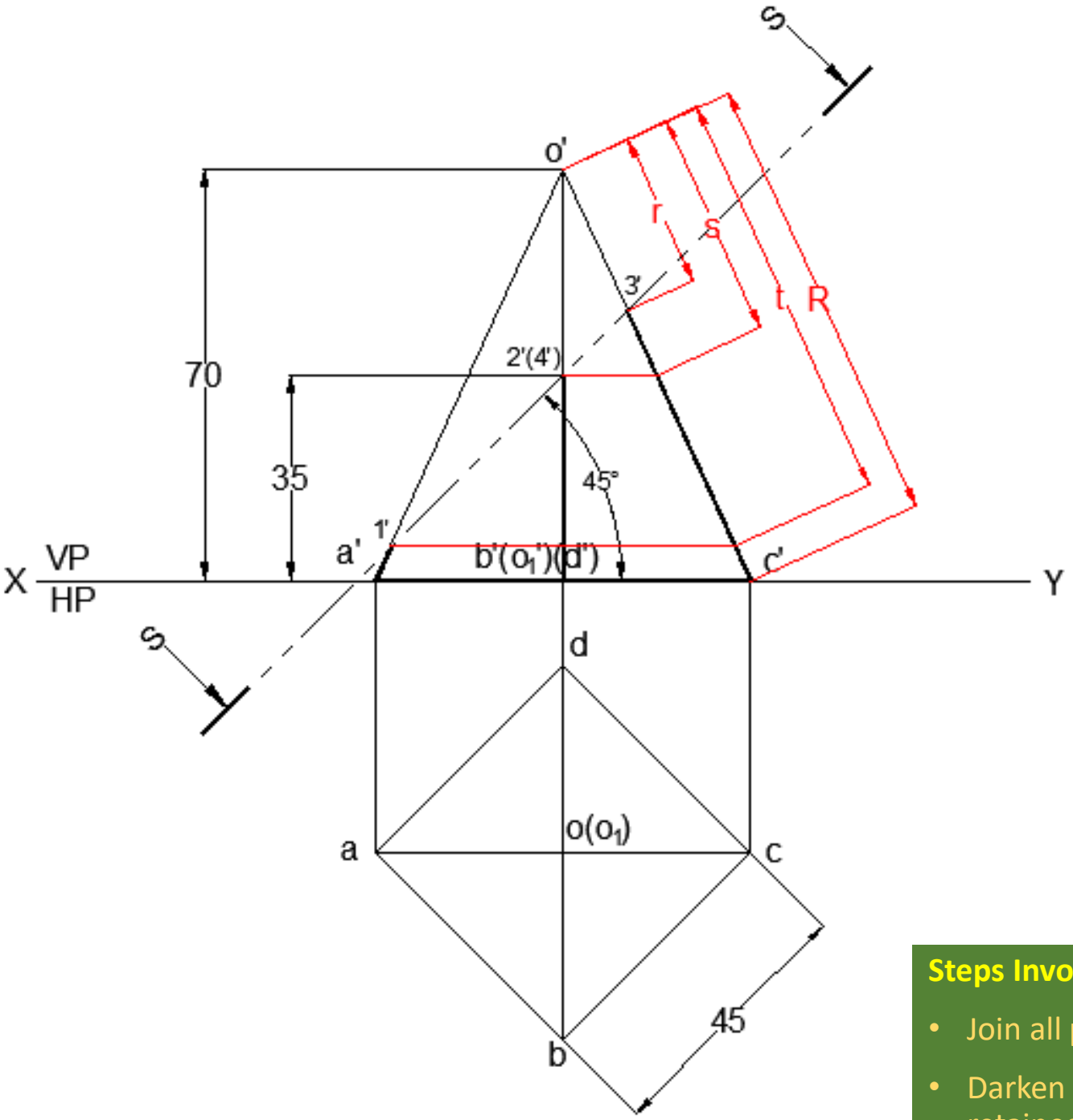
- Draw chords as shown corresponding to base edges

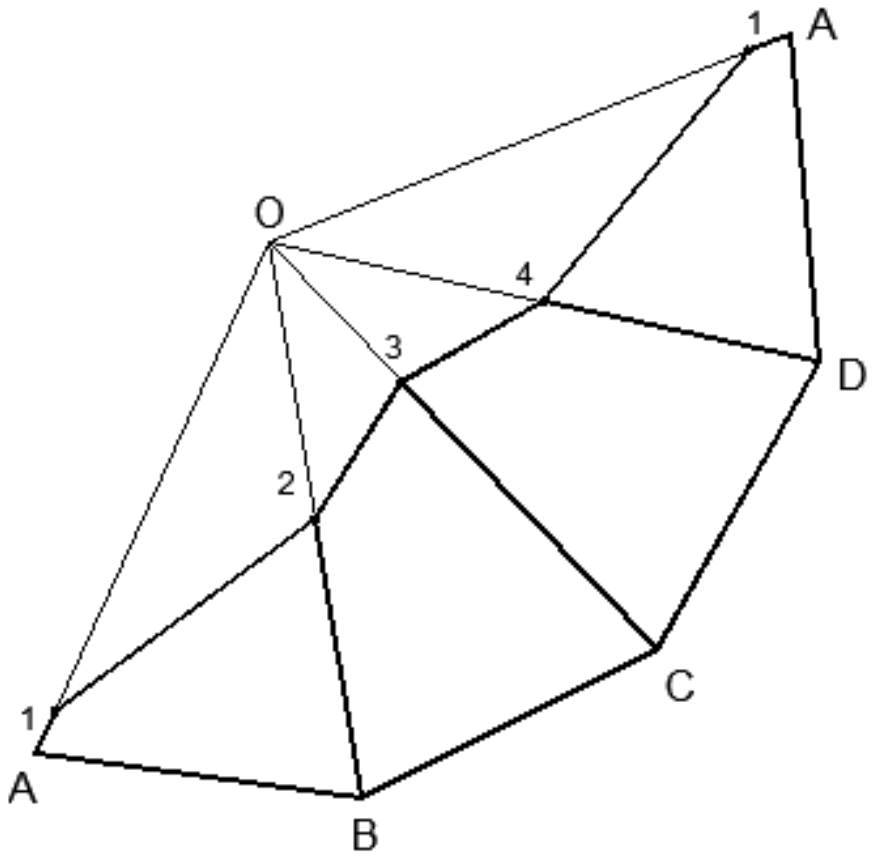




Steps Involved (Radial Line Method)

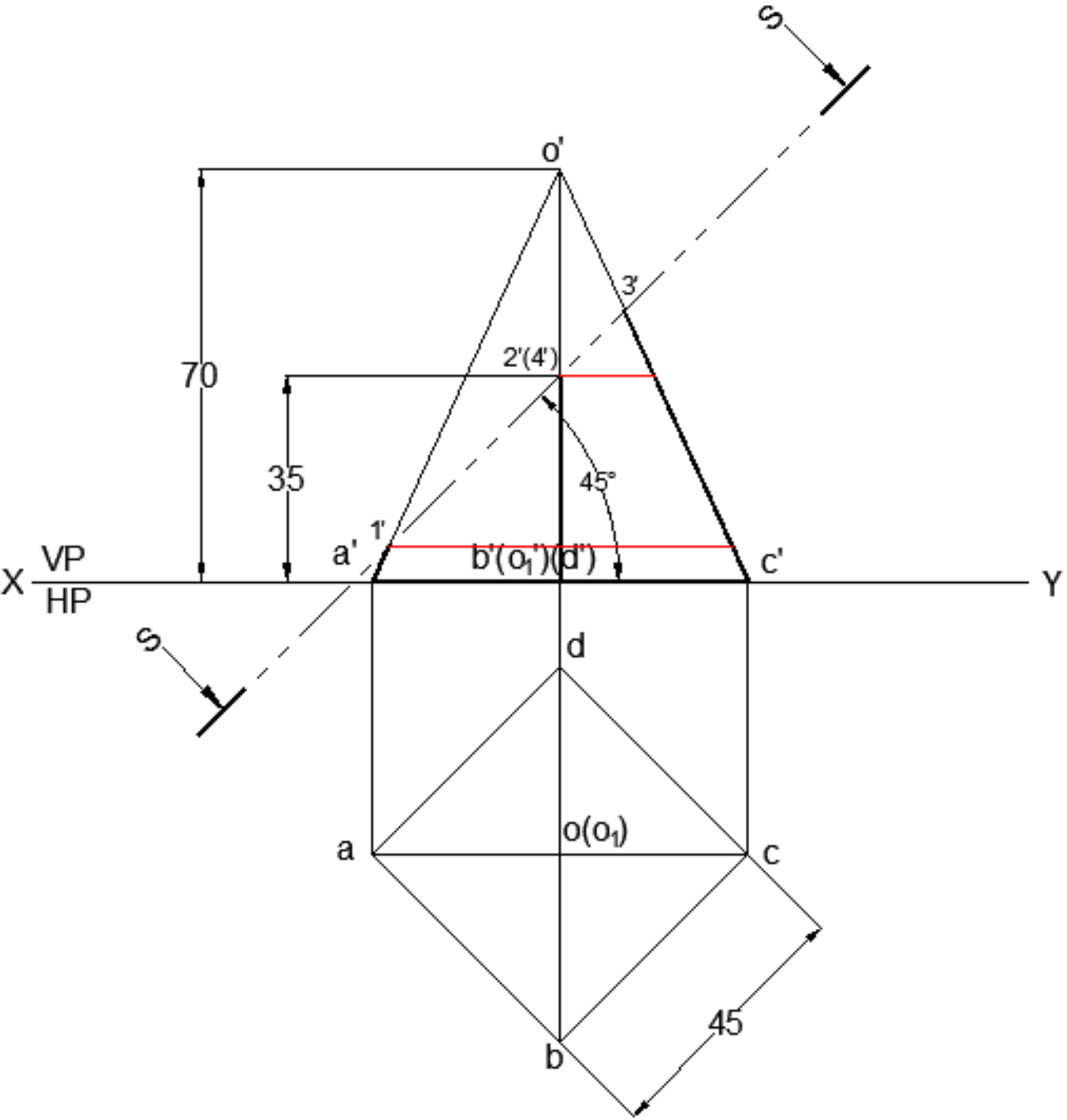
- Transfer all distances on to corresponding edges

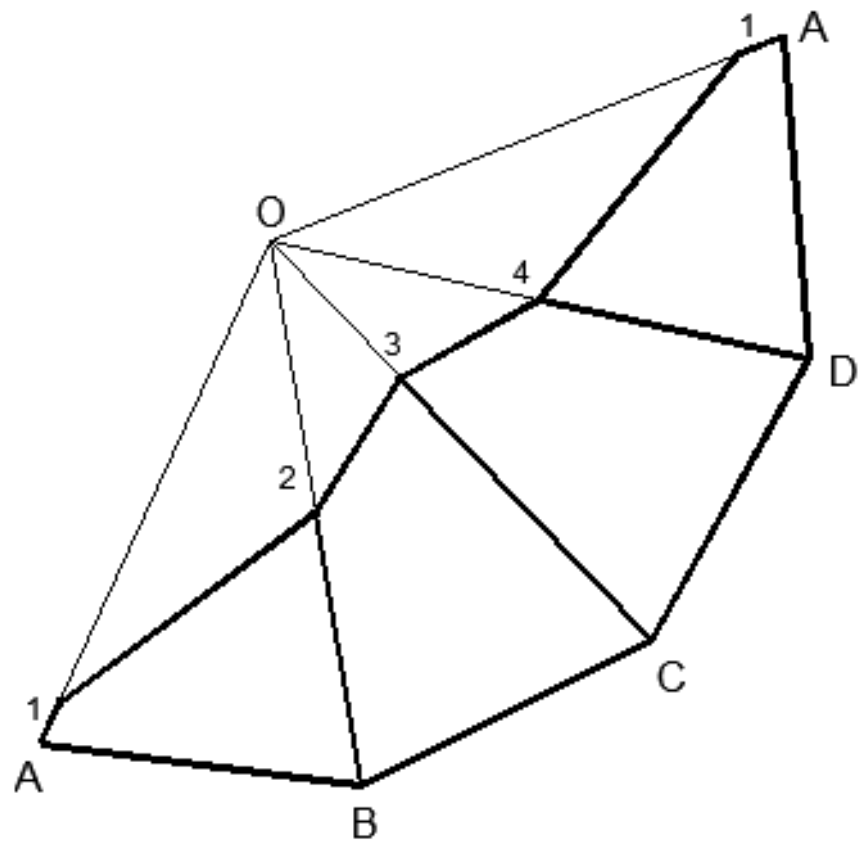




Steps Involved (Radial Line Method)

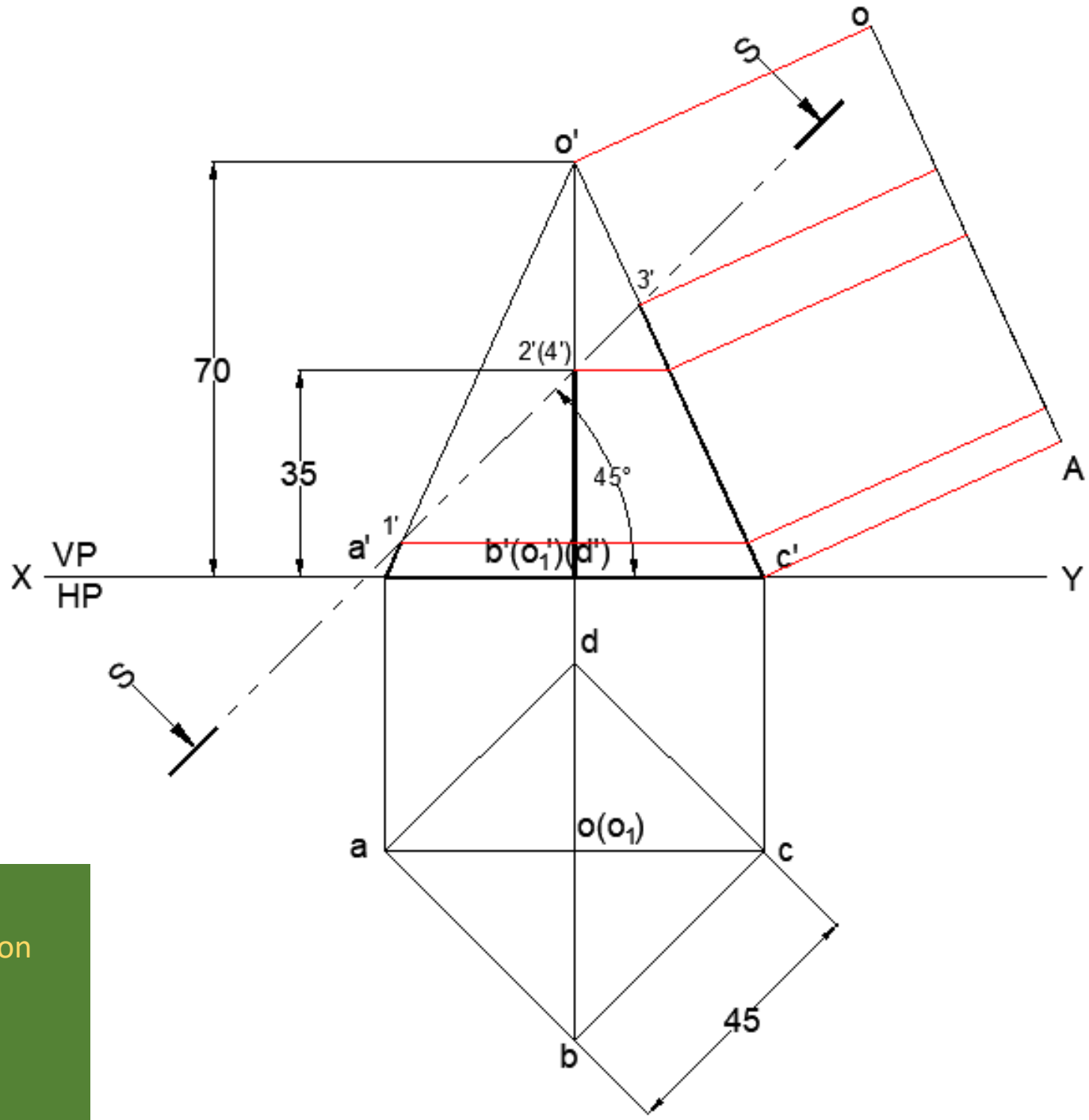
- Join all points using straight lines
- Darken the retained portion of the pyramid along with the base edges & retained slant edges





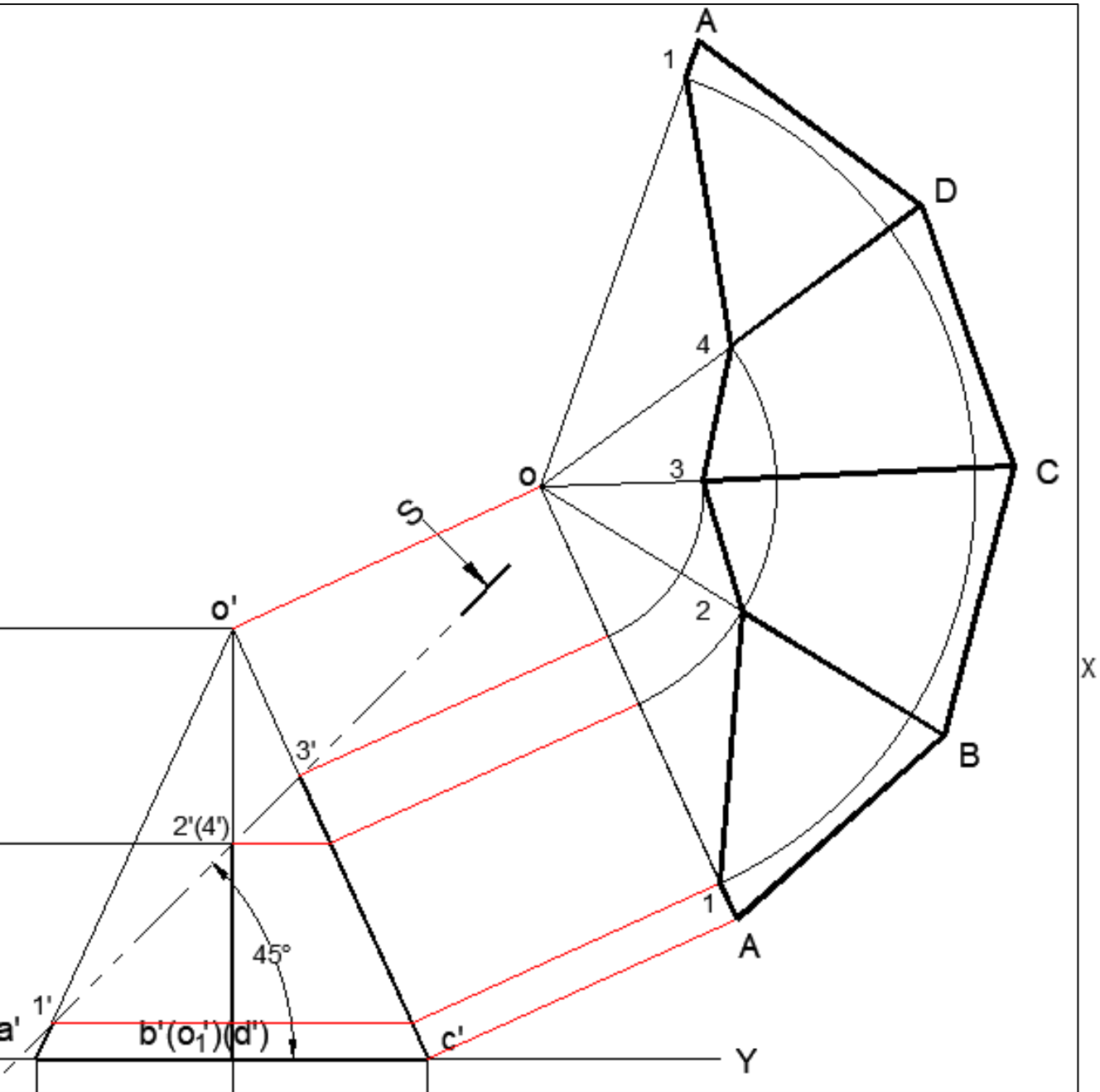
DEVELOPMENT OF THE SQUARE PYRAMID

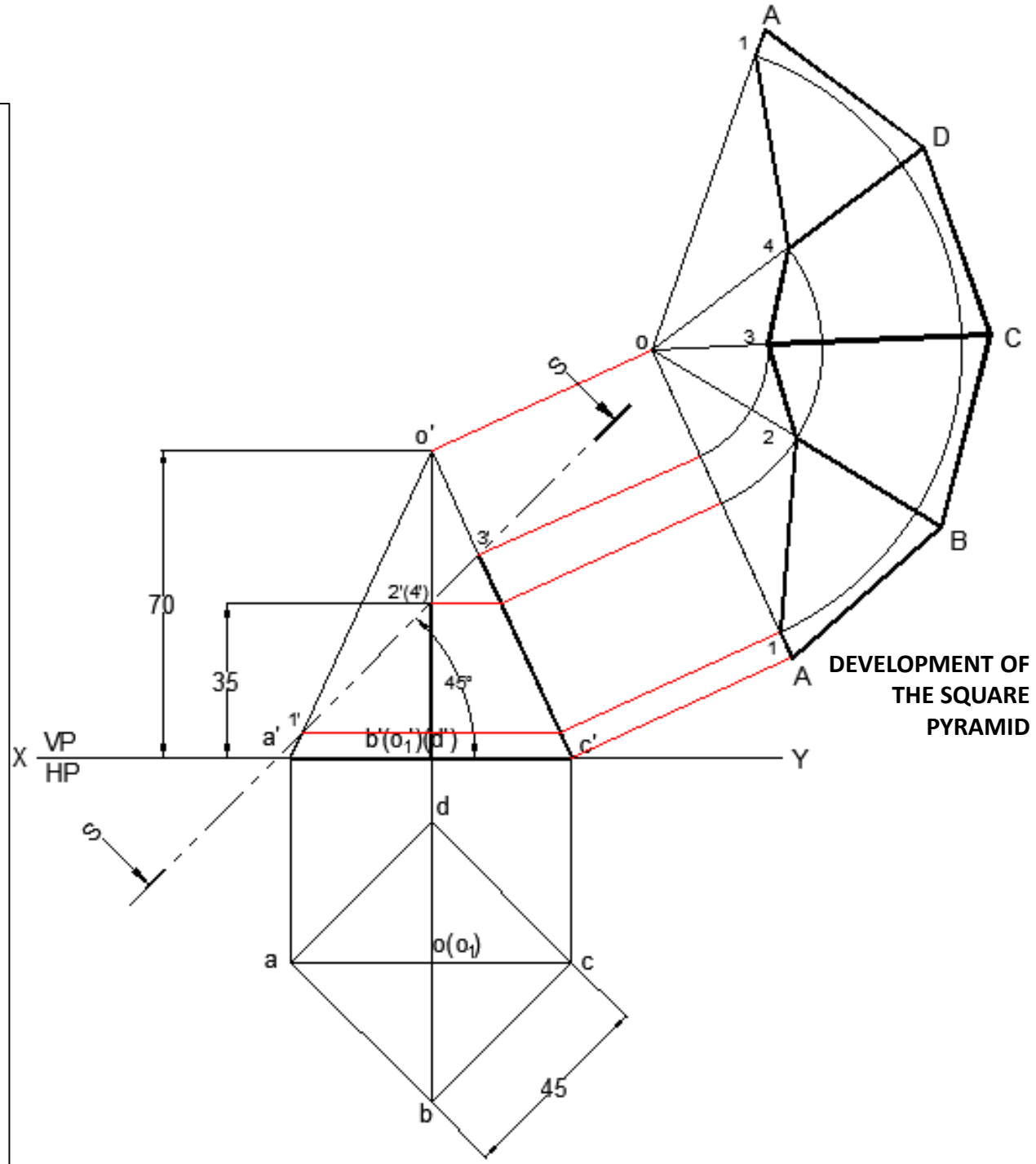
ALTERNATIVE APPROACH



Steps Involved (Radial Line Method)

- Draw perpendiculars through each point on true length
- Mark OA equal to true length at suitable distance to form a “ladder”





DEVELOPMENT OF THE SQUARE PYRAMID