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)

A hexagonal pyramid of sides 35mm and altitude 65mm is resting on HP on its base with two of the base sides perpendicular to VP. The pyramid is cut by a plane inclined at 30^{o} to HP and perpendicular to VP and is intersecting the axis at 30mm above the base. Draw the development of the remaining portion of the pyramid.

Data

- Hexagonal Pyramid.
- 35mm side & 65mm height.
- 2 base sides perpendicular to VP.
- Section plane is AIP at 30° to HP.
- Intersecting the axis at 30mm above the base.

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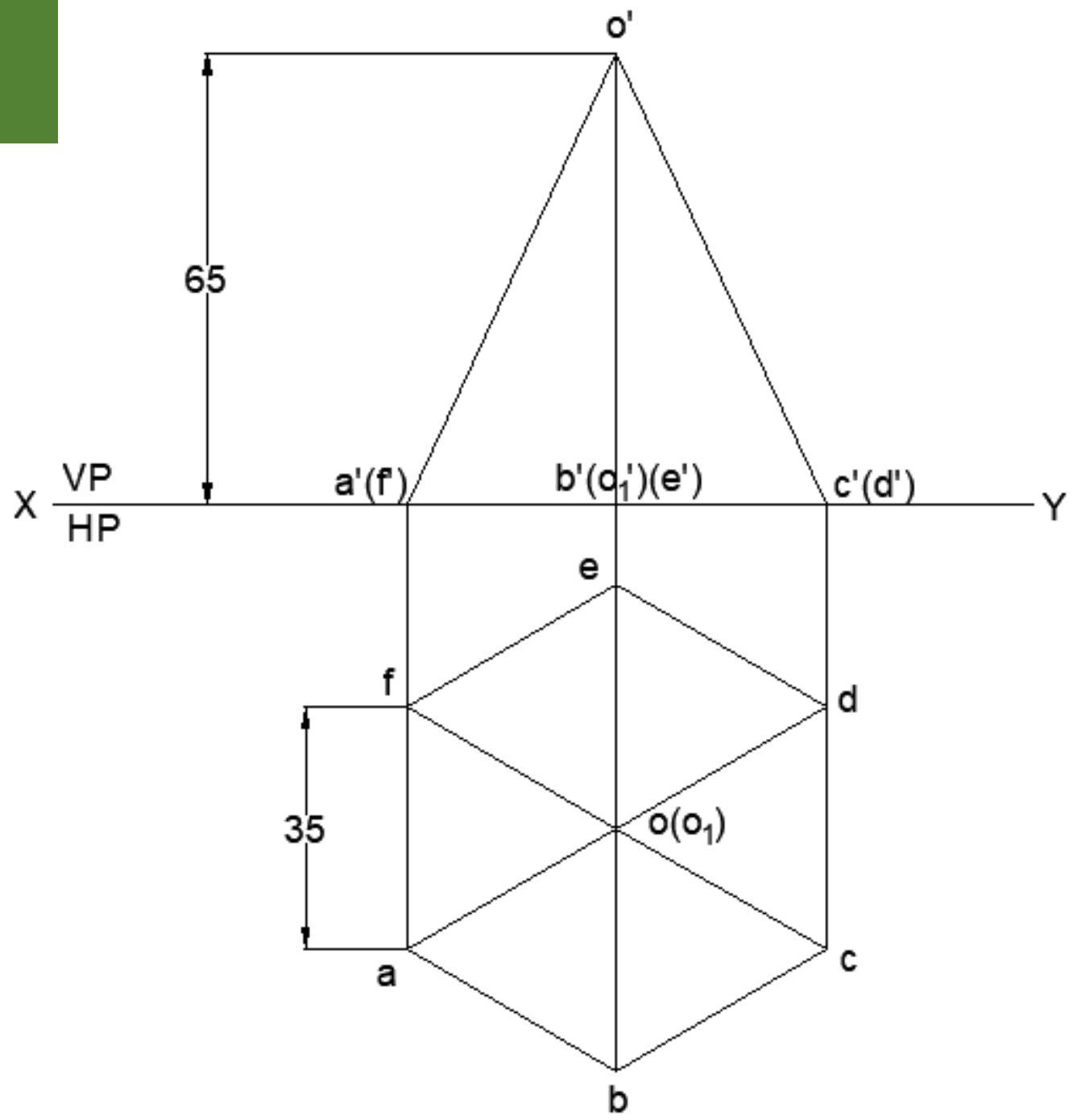
Steps Involved

- Draw the front & top views of the given solid



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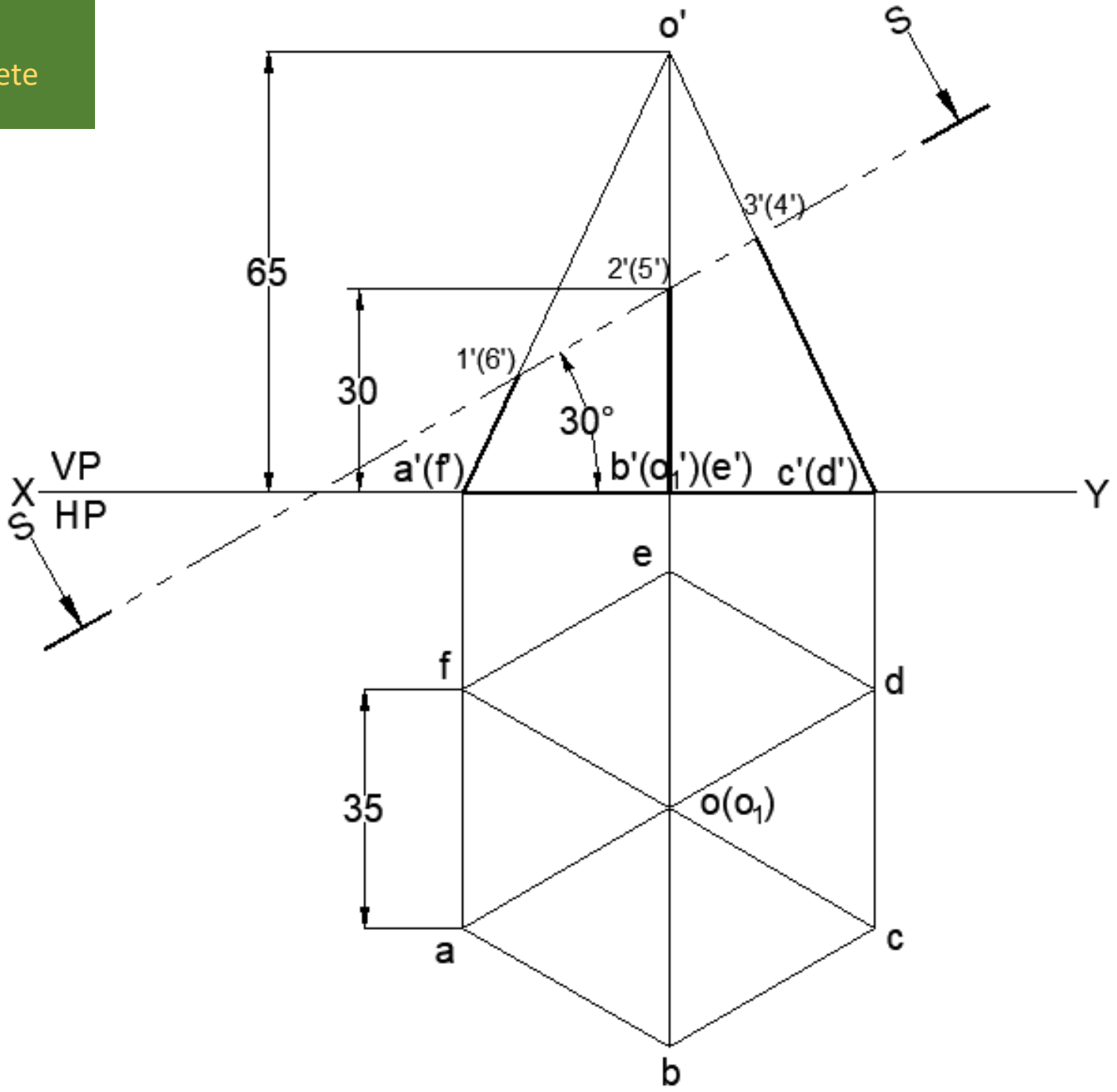
Steps Involved

- Draw the section line as per given conditions and complete the preliminary steps



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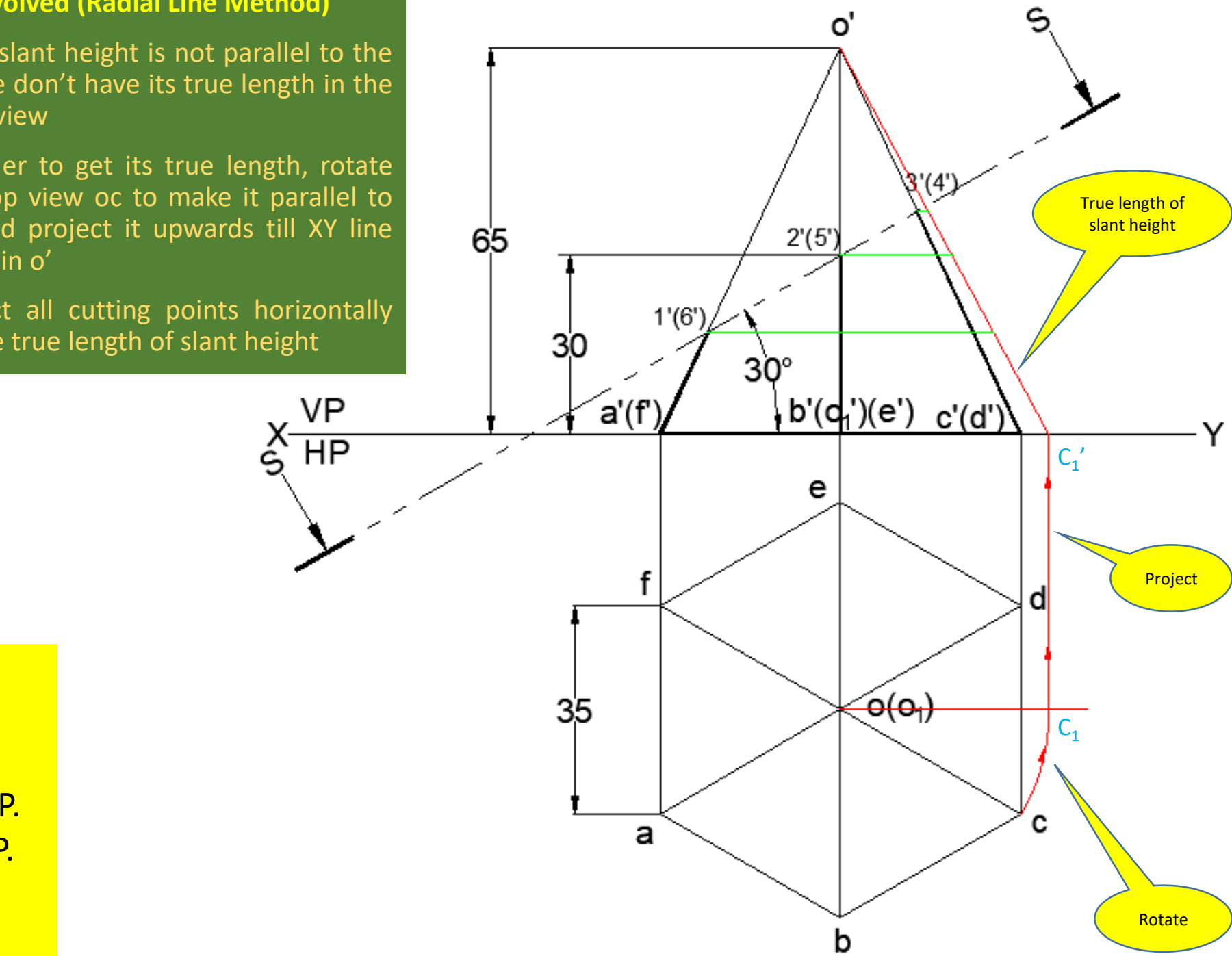
Steps Involved (Radial Line Method)

- Since slant height is not parallel to the VP, we don't have its true length in the front view
- In order to get its true length, rotate the top view oc to make it parallel to VP and project it upwards till XY line and join o'
- Project all cutting points horizontally on the true length of slant height



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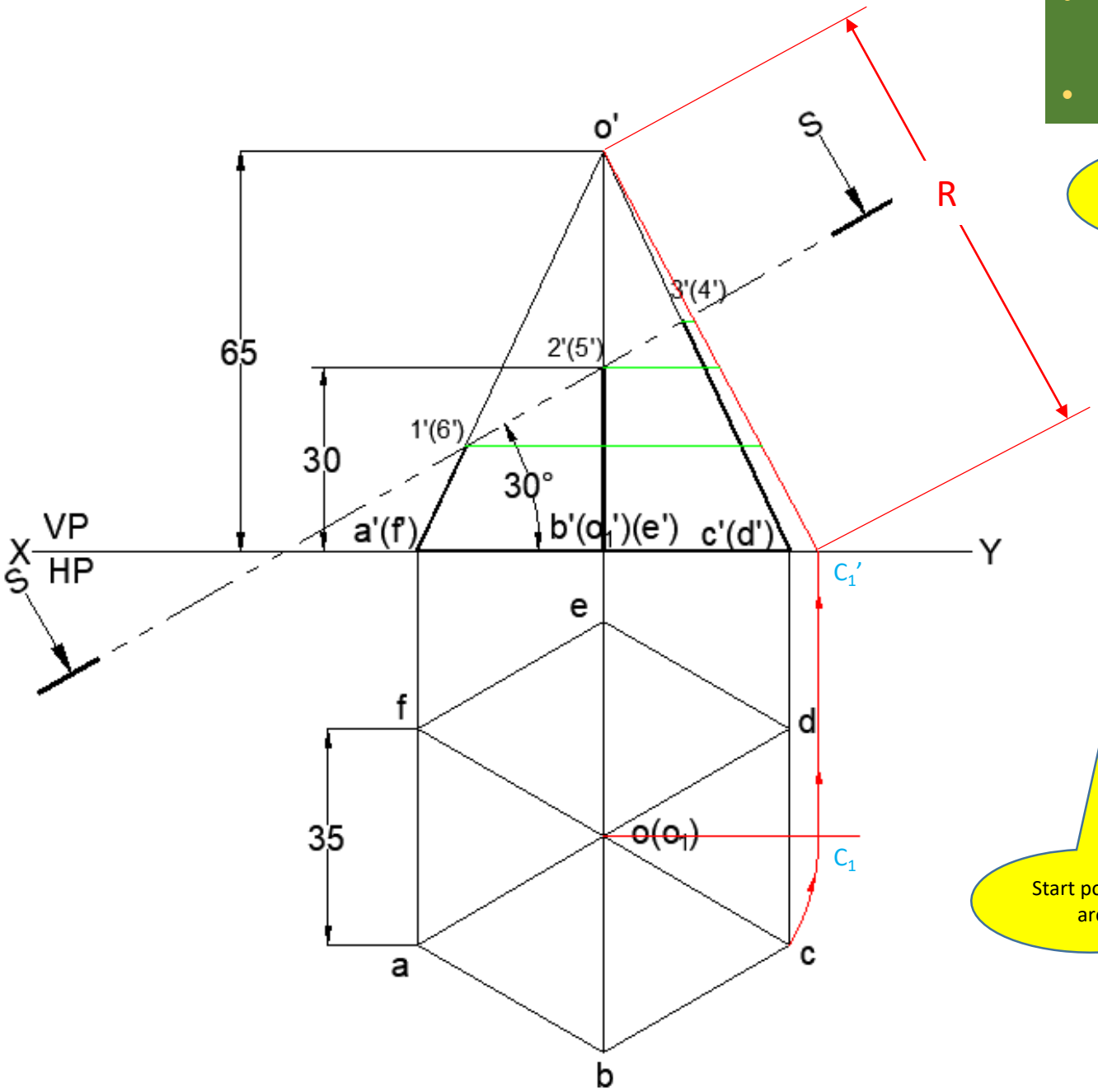
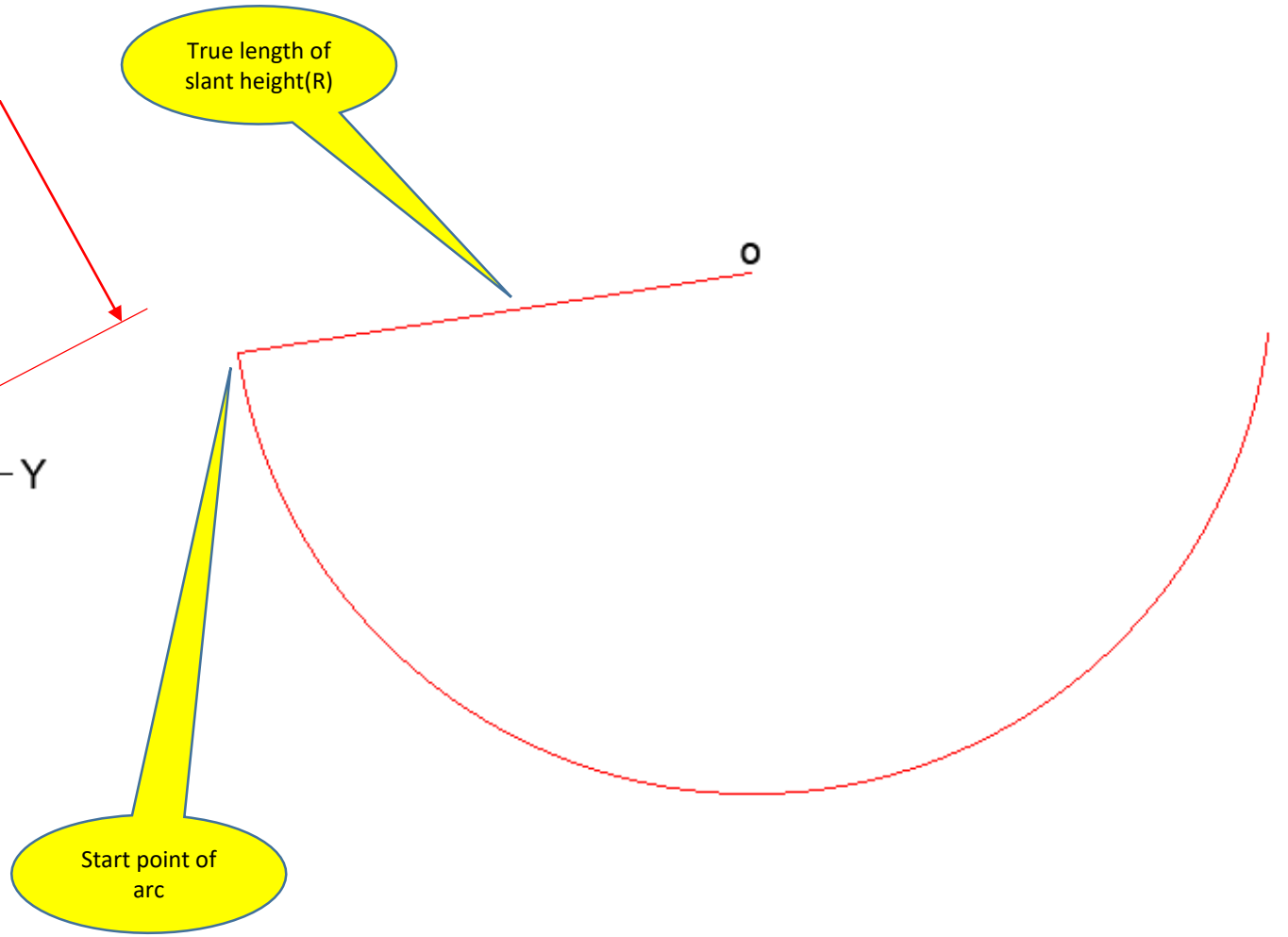
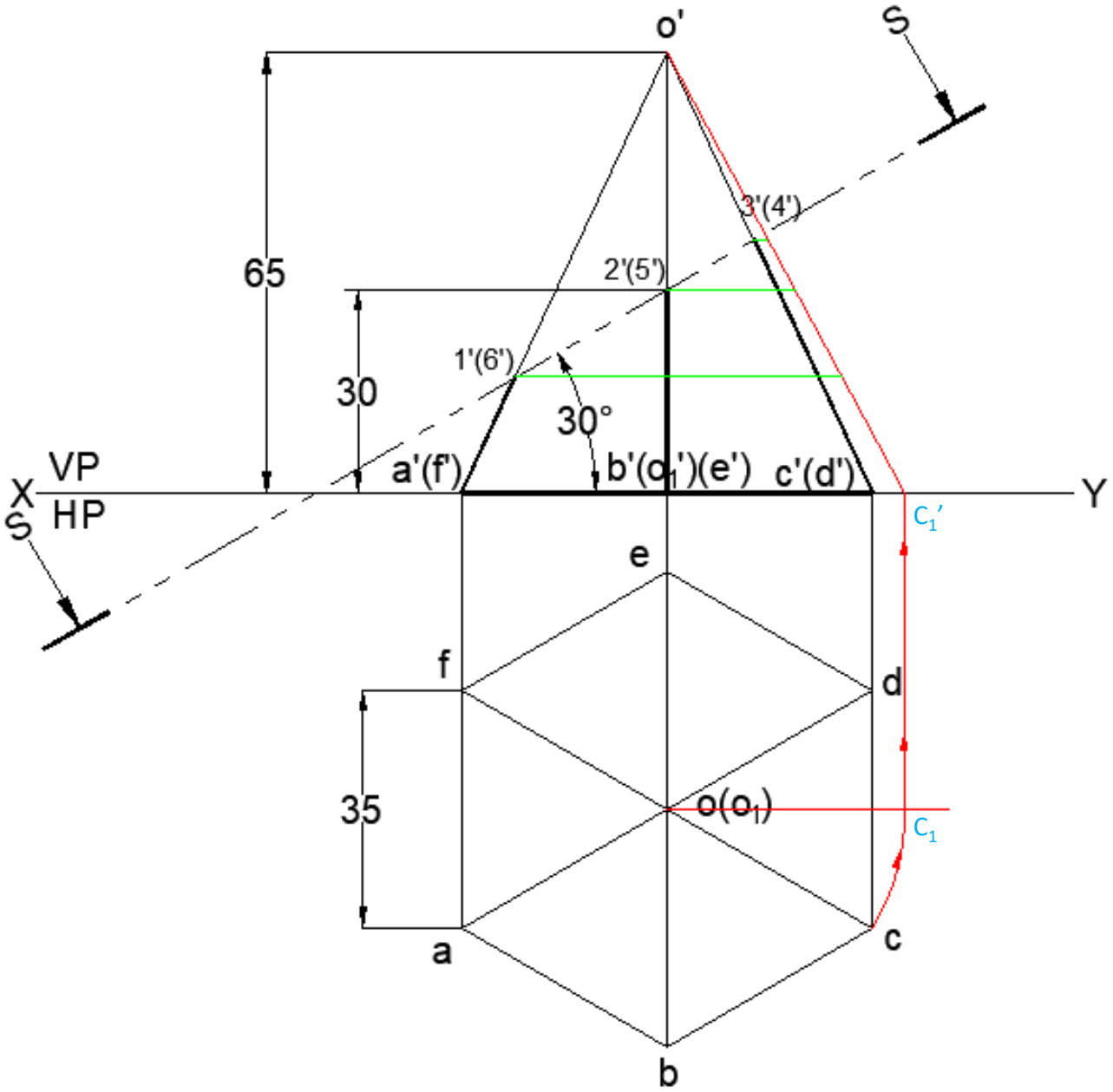
Steps Involved (Radial Line Method)

- Project all cutting points horizontally on the true length (R) of slant height
- Draw arc of radius R and centre O

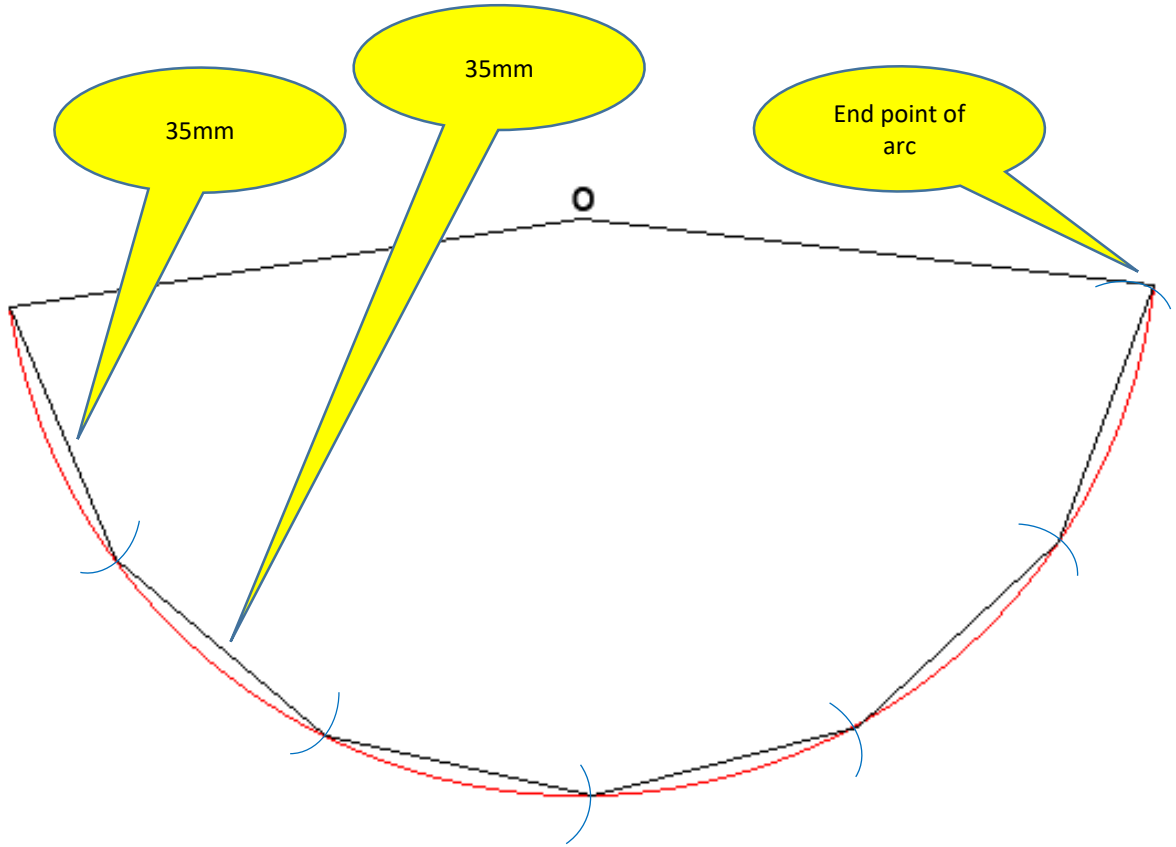






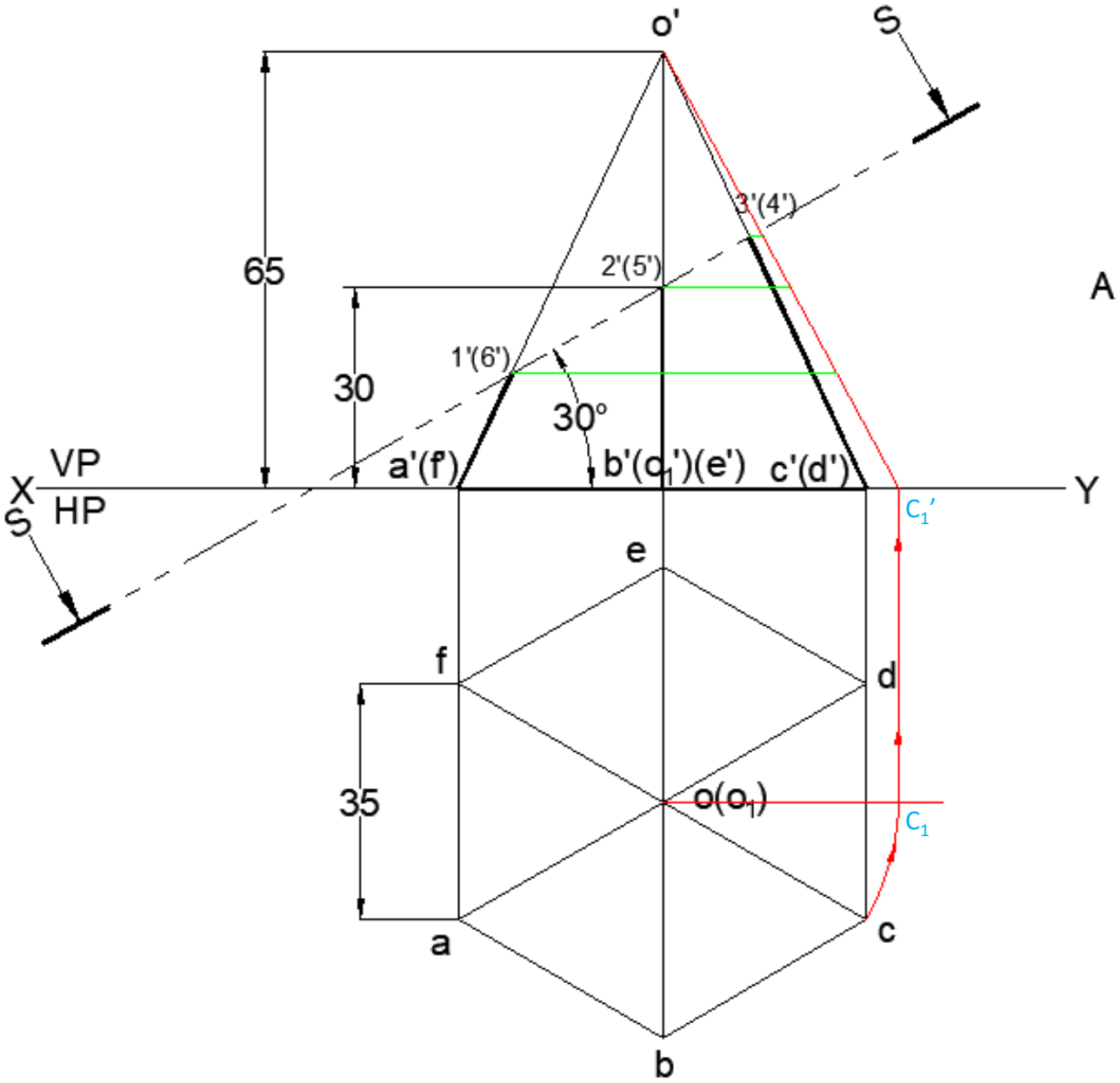
Steps Involved (Radial Line Method)

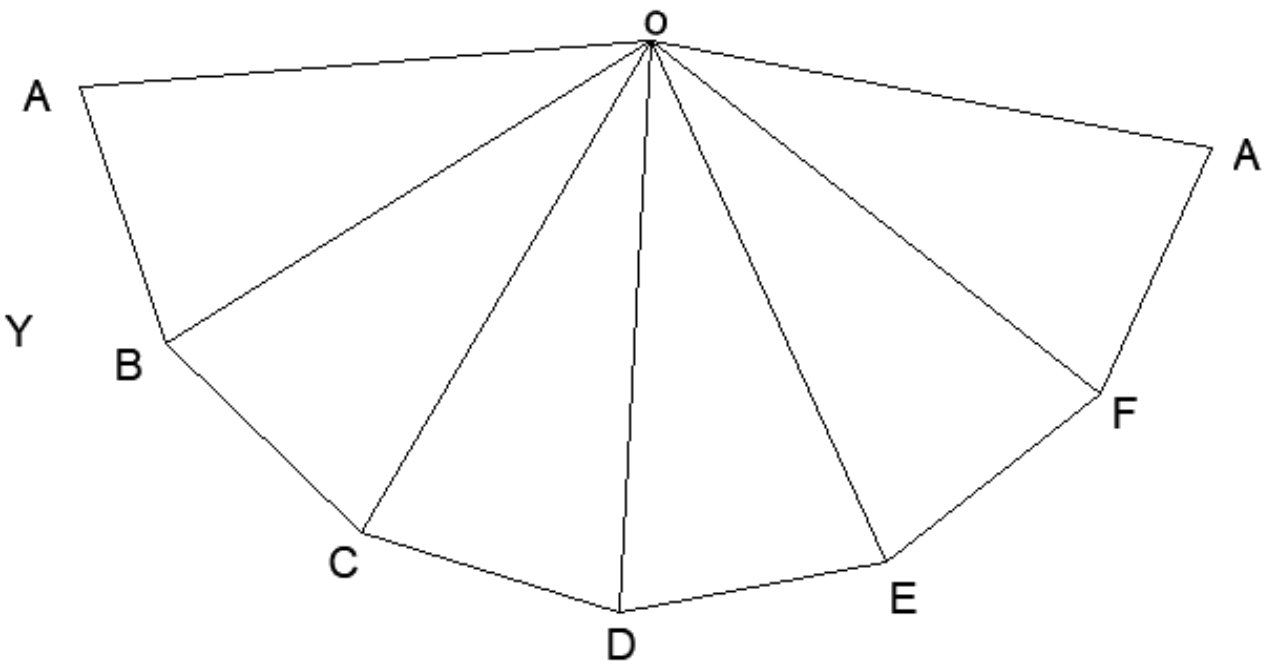
- Cut the arc with base length of 35mm as chords (6 times)
- Note, the arc length is not equal to 35mm



Steps Involved (Radial Line Method)

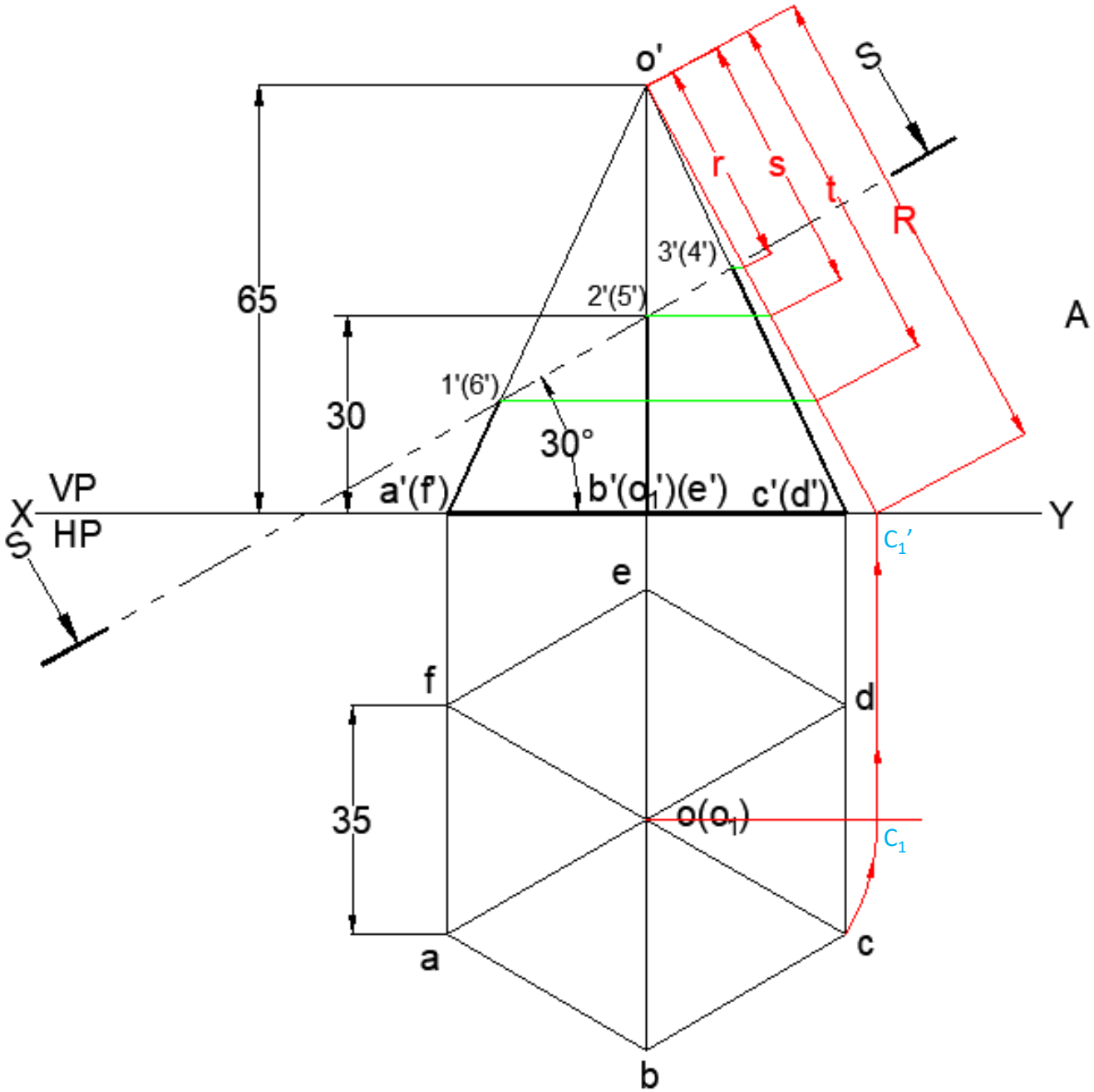
- Draw lines as shown corresponding to slant edges

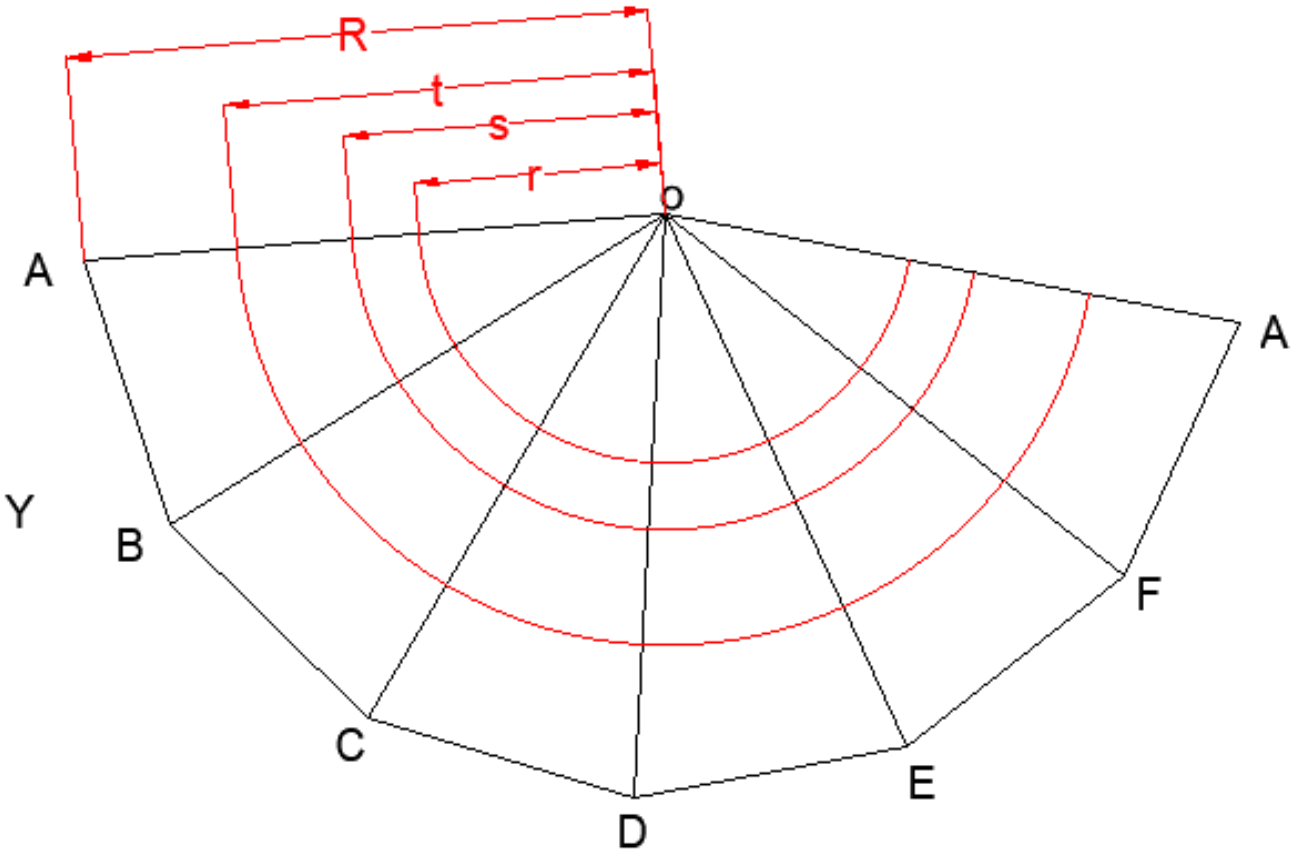




Steps Involved (Radial Line Method)

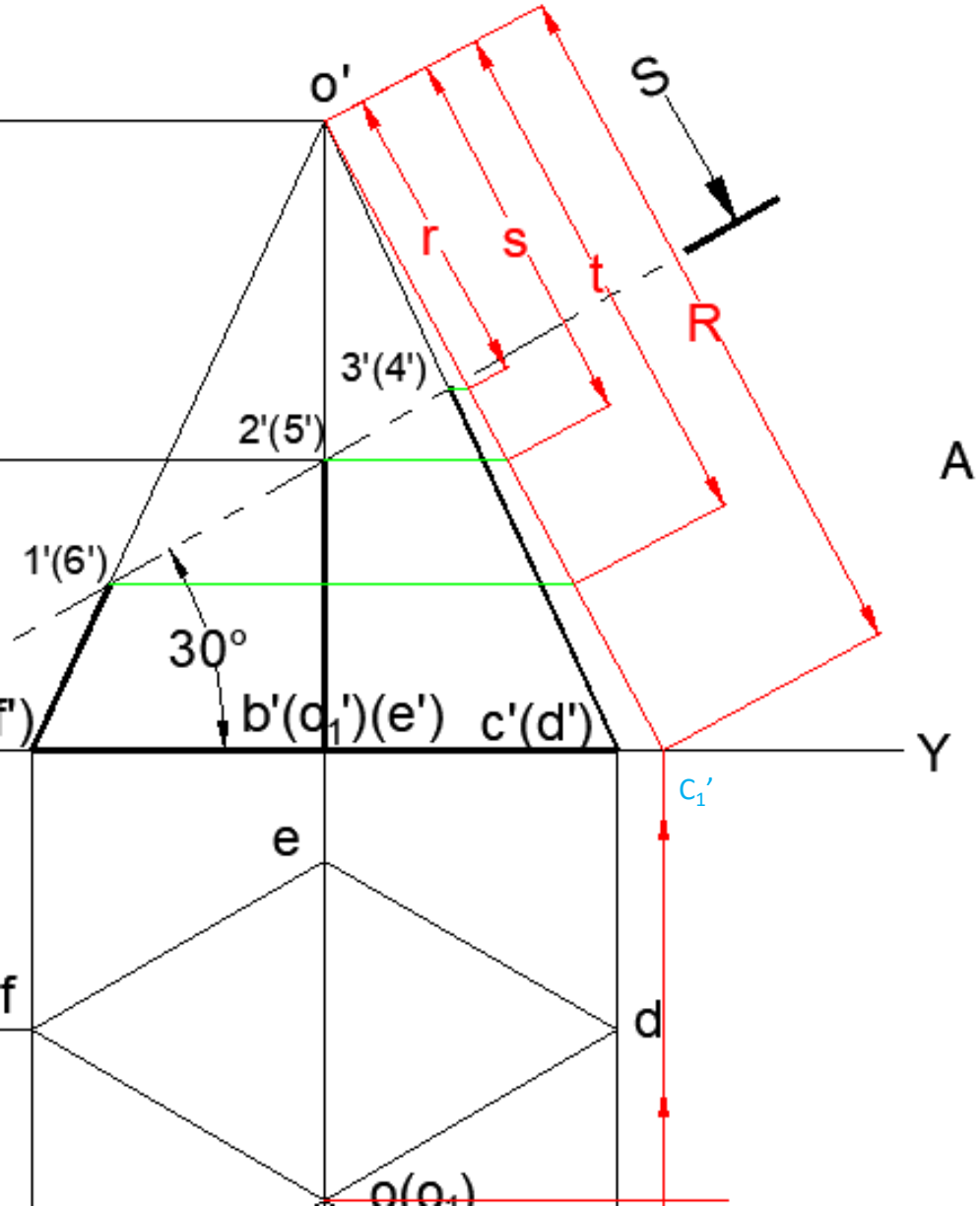
- Transfer all distances on to corresponding edges

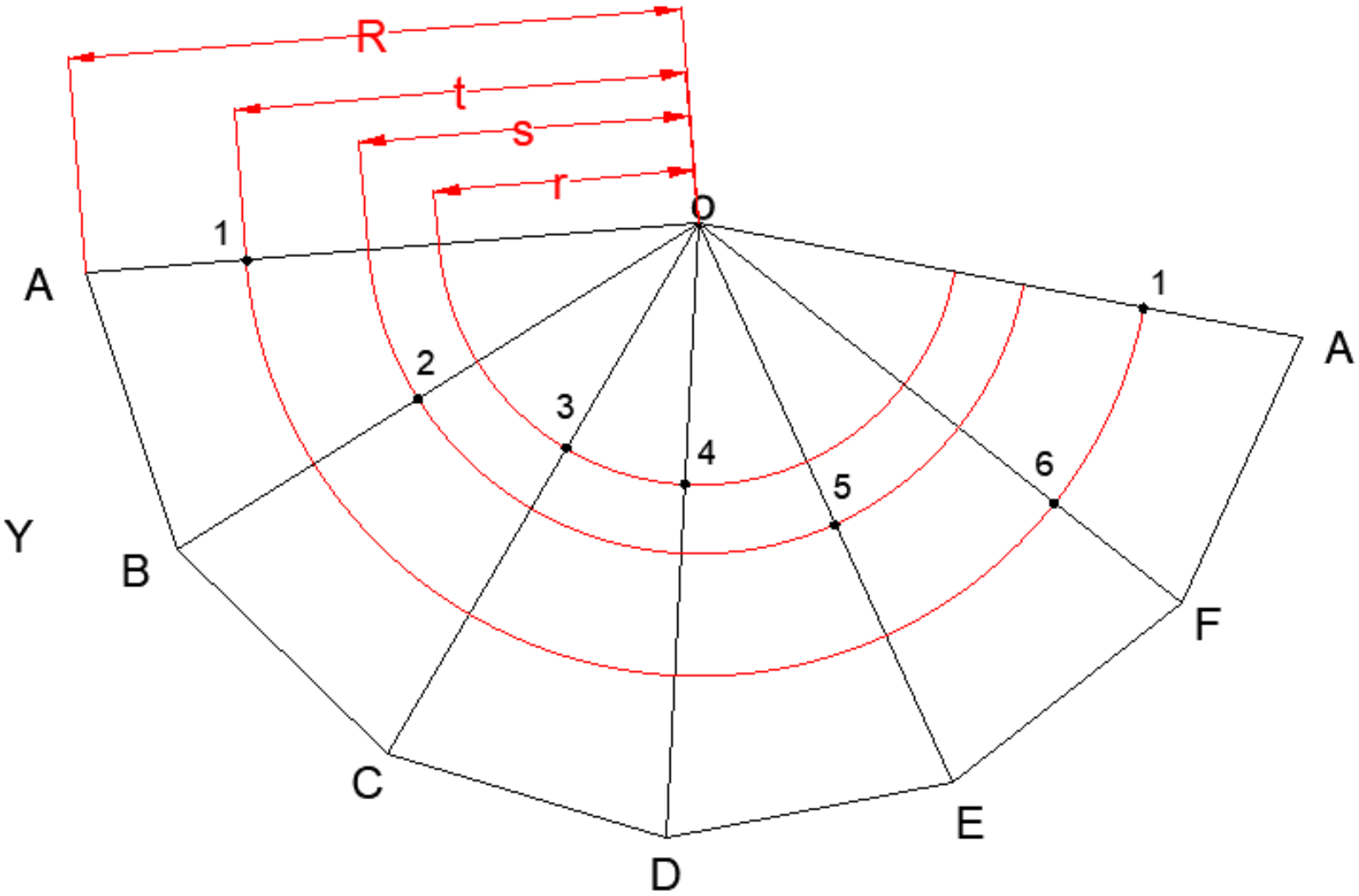




Steps Involved (Radial Line Method)

- Mark the respective points on to corresponding edges





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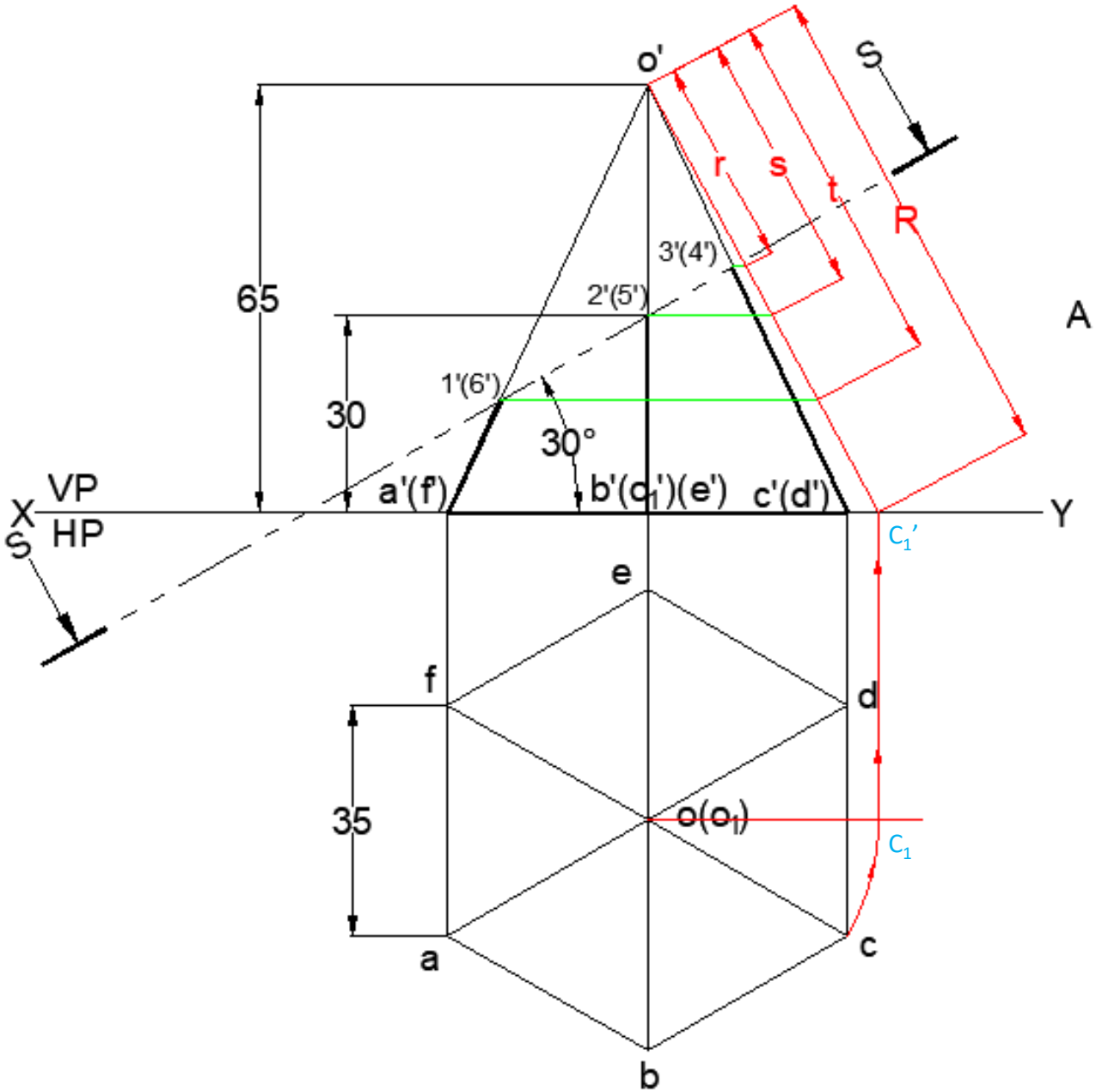
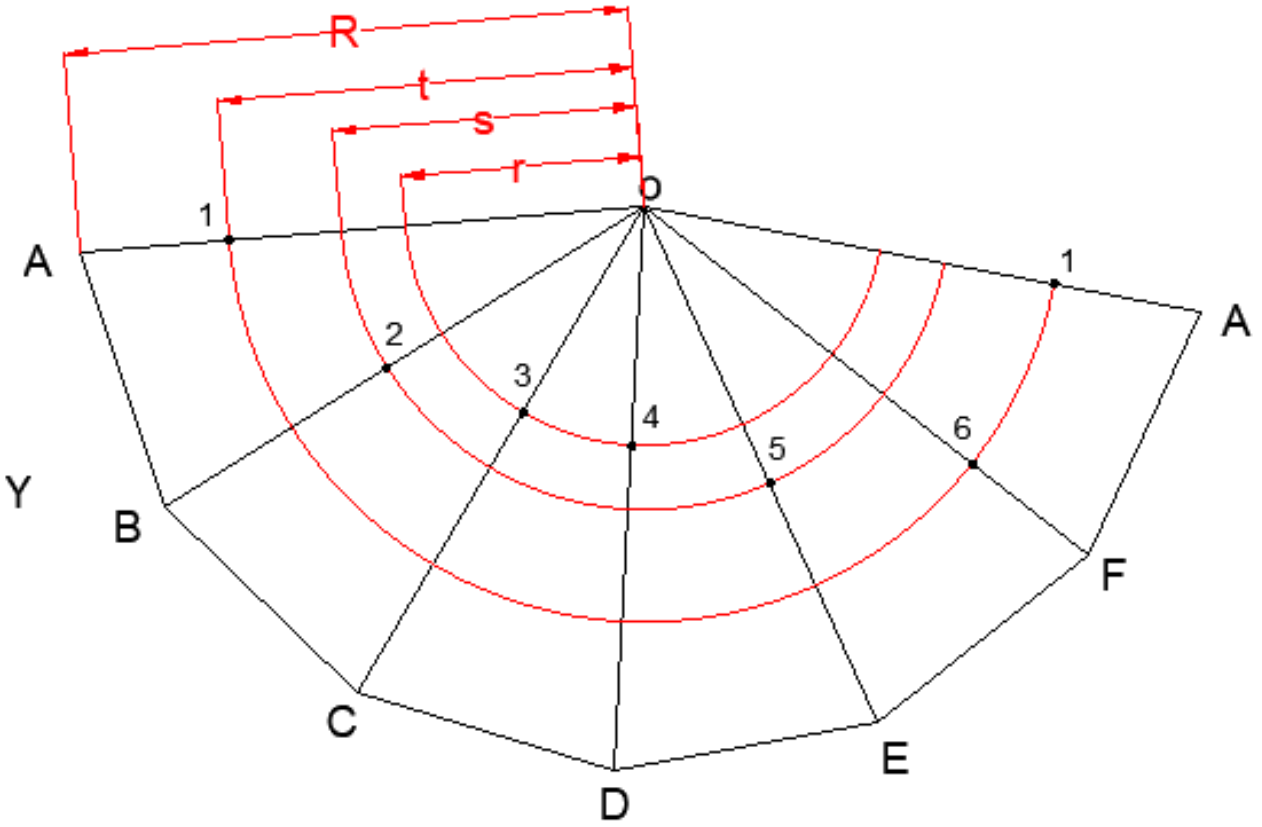
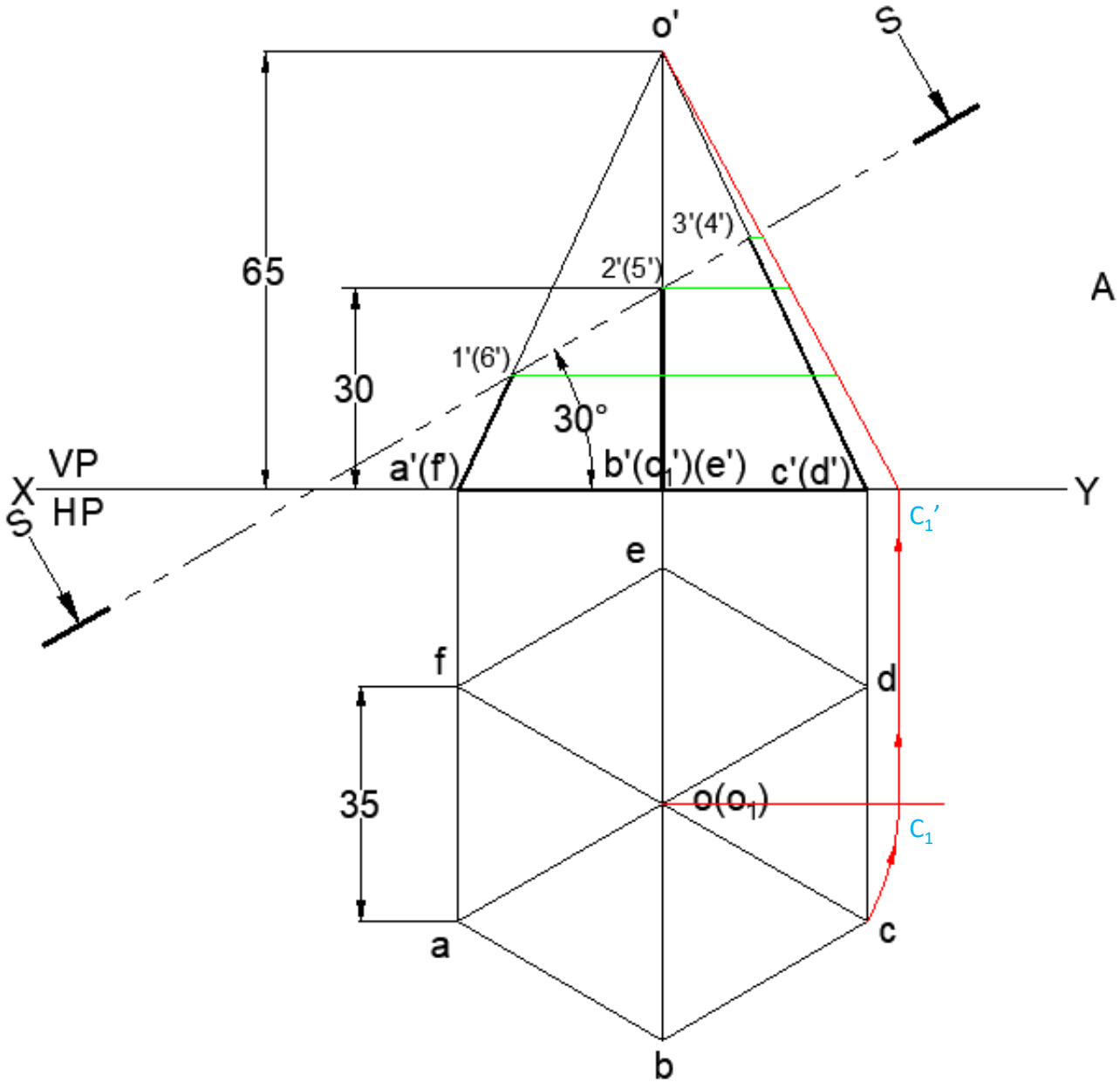
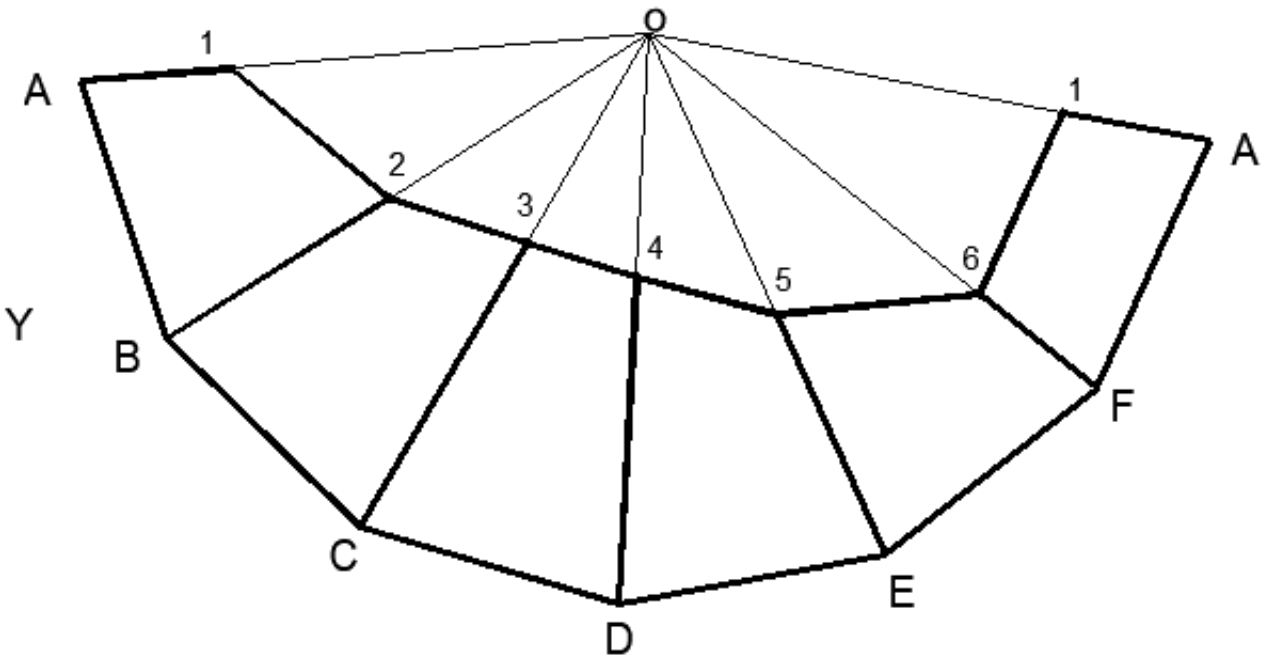




Steps Involved (Radial Line Method)

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





DEVELOPMENT OF THE CUT HEXAGONAL PYRAMID