جامعة الفرات الاوسط التقنية /المعهد التقني سماوة

قسم / تقنيات المساحة

المحاضرة الثامنة

اسم المادة / المساحة-٢

المرحلة الدراسية / الثانية

العام الدراسي / 2022 - 2023

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Application of Tangential method

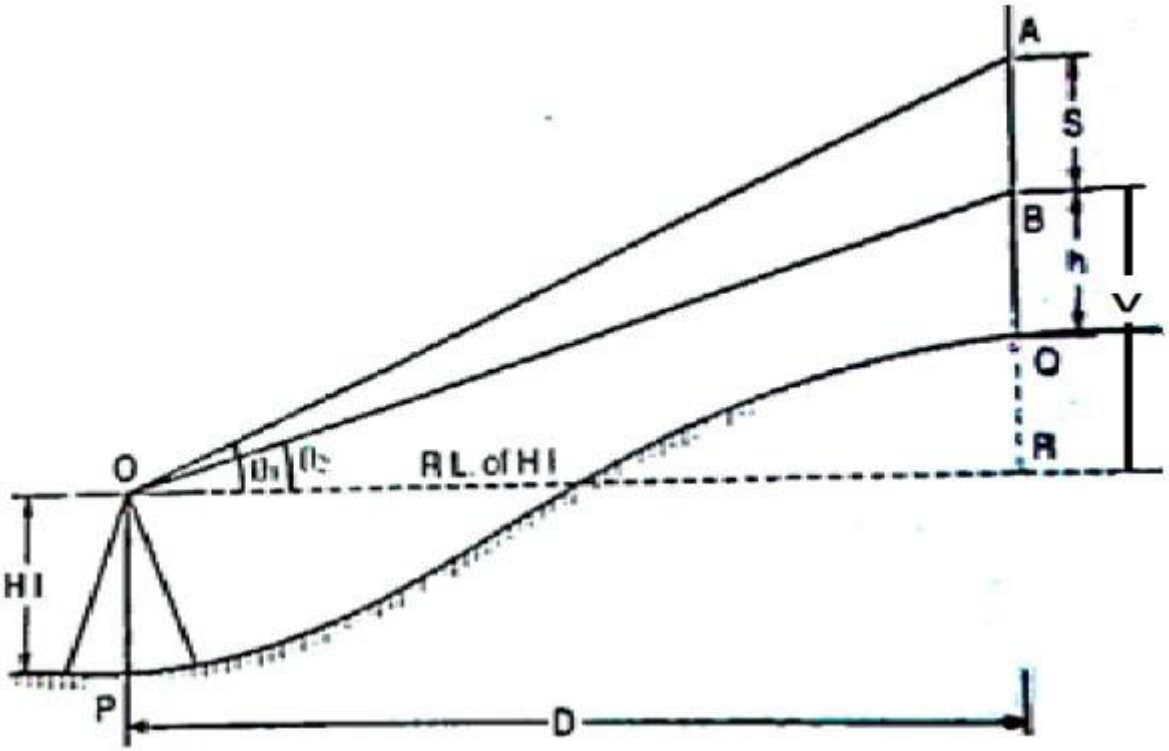
- Tangential method
- • This method is used only when the theodolite
- is simple and transit type.
- • This method is also used when the staff is far
- away from the instrument.
- • In this method the staff consist of two vanes or
- target (S) 2m to 3 m apart.
- • The vertical angle θ1 and θ2 are measured in
- theodolite

Application of Tangential method

- There are main three cases for finding the
- Distance and Elevation.
- • Case : 1 Both the angle are angles of elevation
- in this case, staff is held vertically.
- • Case : 2 Both the angle are angles of
- depression in this case, staff is held vertically.
- • Case : 3 When the one angle is the angle of
- elevation and another angle is the angle of
- depression and the staff held vertical.

Application of Tangential method

- Case : 1 Both the angle are angles of elevation in this case, staff is held vertically.

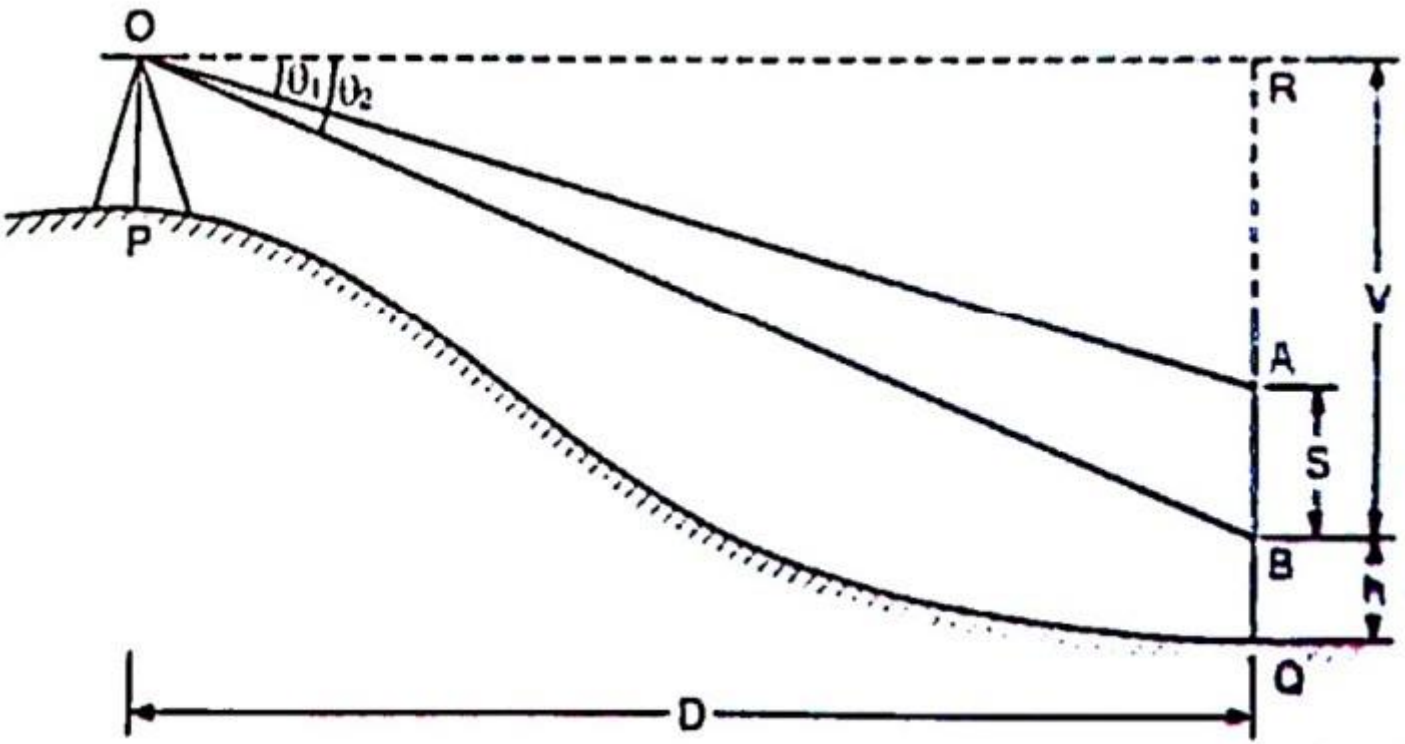


Application of Tangential method

- From the fig.
- $V + S = D \tan\theta 1$
- $V = D \tan\theta 2$
- $S = D \tan\theta 1 – V$
- $S = D \tan\theta 1 – D \tan\theta 2$
- $S = D (\tan\theta 1 - \tan\theta 2)$
- $D = \dfrac{S}{(\tan\theta 1 - \tan\theta 2)}$
- $V = \dfrac{S \tan\theta 2}{(\tan\theta 1 - \tan\theta 2)}$
- R.L of Q = R.L of H.I + V - h

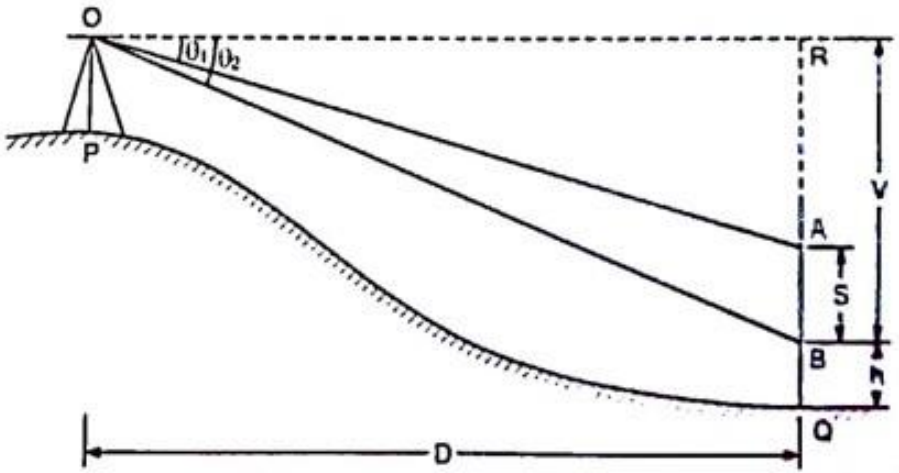
Application of Tangential method

- Case : 2 the angle are angles of depression in this case, staff is held vertically.



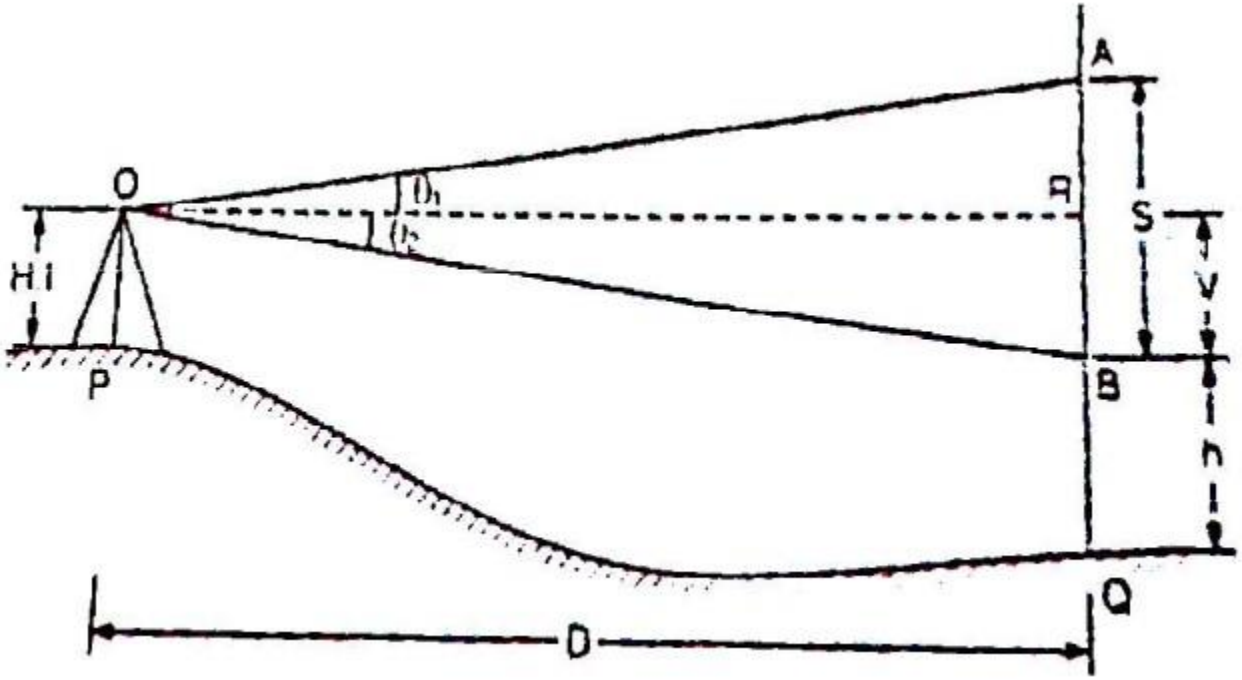
Application of Tangential method

- From the fig.
- $V - S = D \tan\theta_1$
- $V = D \tan\theta_2$
- $S = V - D \tan\theta_1$
- $S = D \tan\theta_2 - D \tan\theta_1$
- $S = D (\tan\theta_2 - \tan\theta_1)$
- $D = \dfrac{S}{(\tan\theta_2 - \tan\theta_1)}$
- $V = \dfrac{S \tan\theta_2}{(\tan\theta_2 - \tan\theta_1)}$
- R.L of Q = R.L of H.I - V - h



Application of Tangential method

- Case : 3 When the one angle is the angle of elevation, and another angle is the angle of depression and the staff held vertical.



Application of Tangential method

- From the fig.

$S - V = D \tan\theta_1$

$V = D \tan\theta_2$

$S = V + D \tan\theta_1$

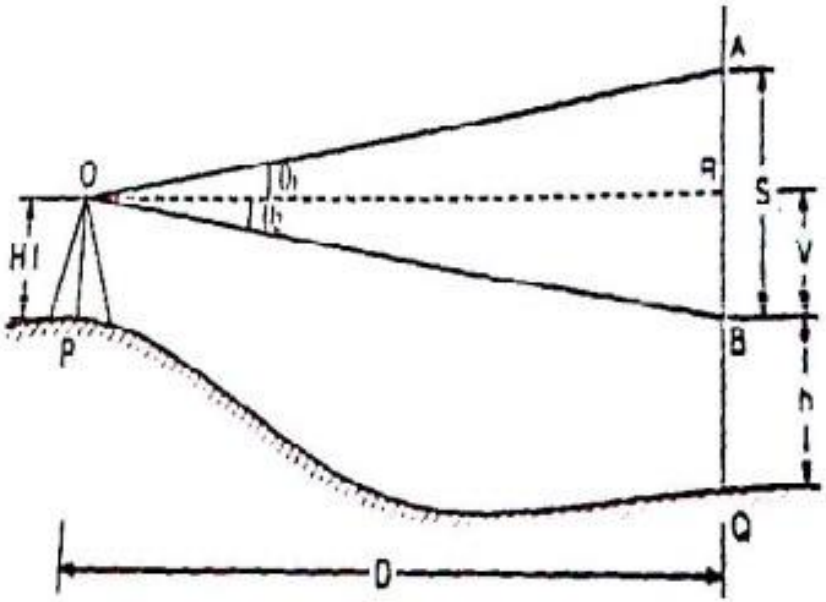
$S = D \tan\theta_2 + D \tan\theta_1$

$S = D (\tan\theta_2 + \tan\theta_1)$

$$D = \frac{S}{(\tan\theta_2 + \tan\theta_1)}$$

$$V = \frac{S \tan\theta_2}{(\tan\theta_2 + \tan\theta_1)}$$

R.L of Q = R.L of H.I - V - h



Disadvantages of the tangential method

- • Two vertical angles are measured.
- • It require comparatively more time.
- • This method is very tedious.