



In The Name of GOD




IYNT 2016

Iran-Shiraz



International Young Naturalist's Tournament



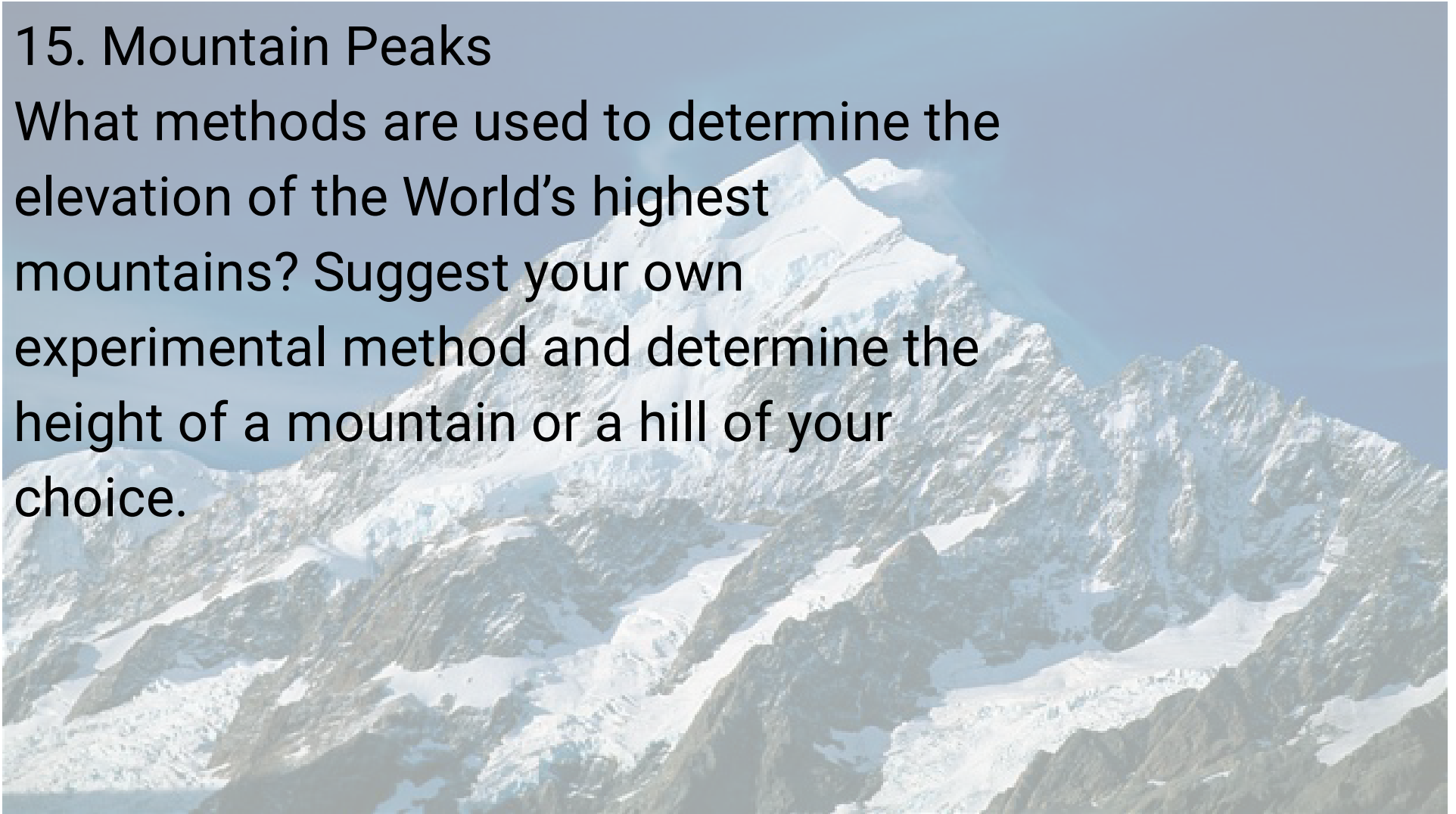


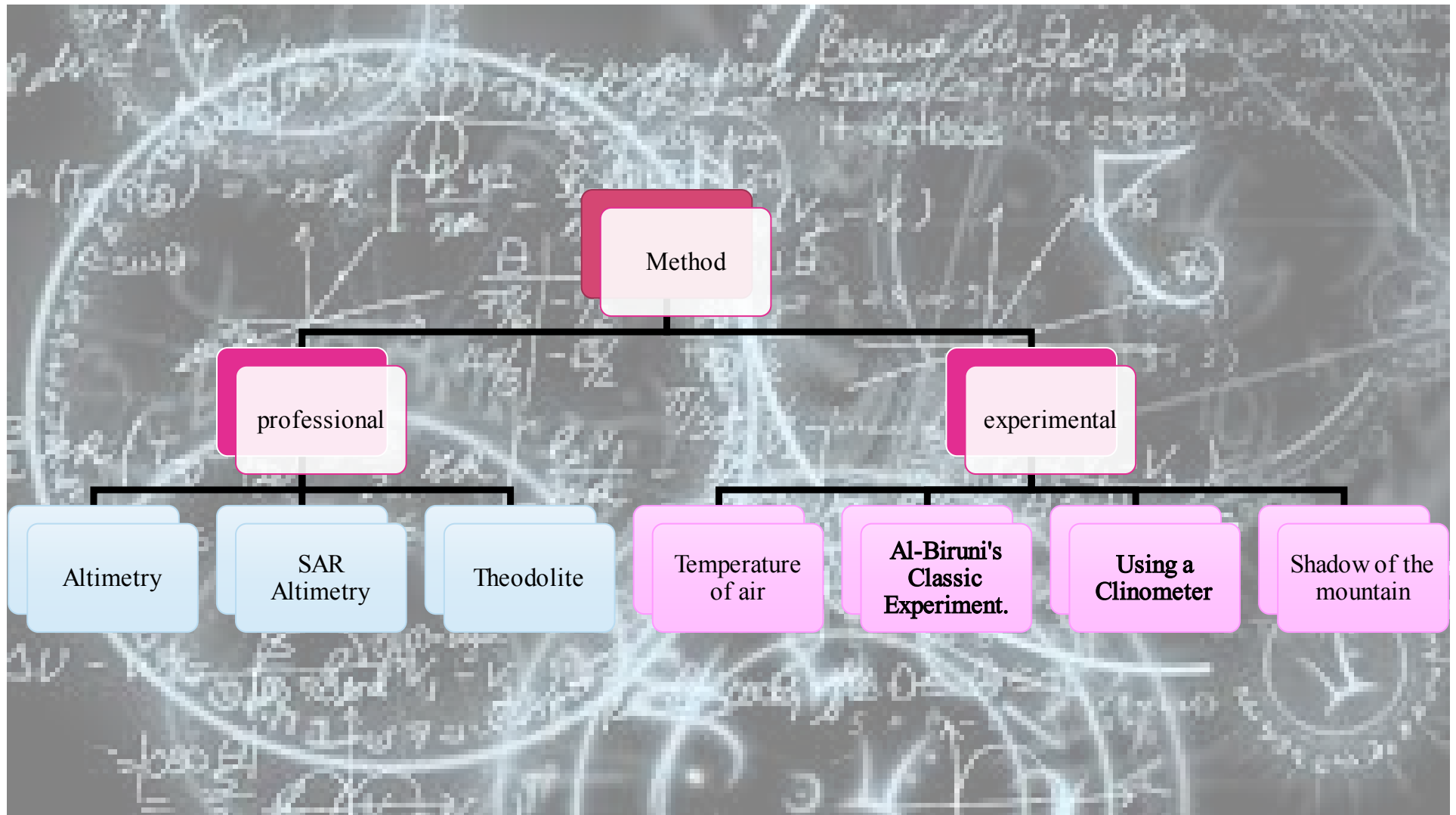
#problem number 15 mountain speak

Reporter : Mahdiyeh
Shahrabi
Maple group

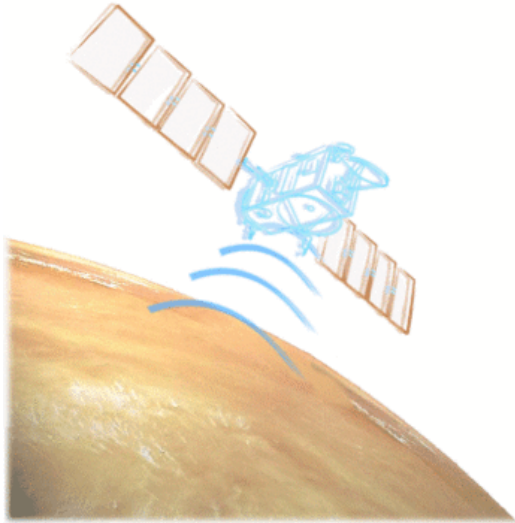
15. Mountain Peaks

What methods are used to determine the elevation of the World's highest mountains? Suggest your own experimental method and determine the height of a mountain or a hill of your choice.

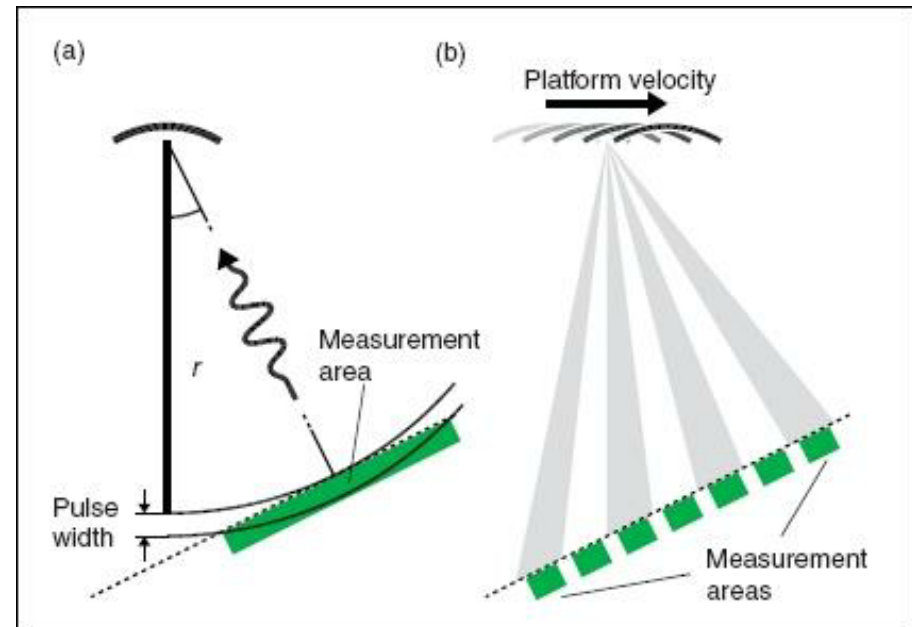




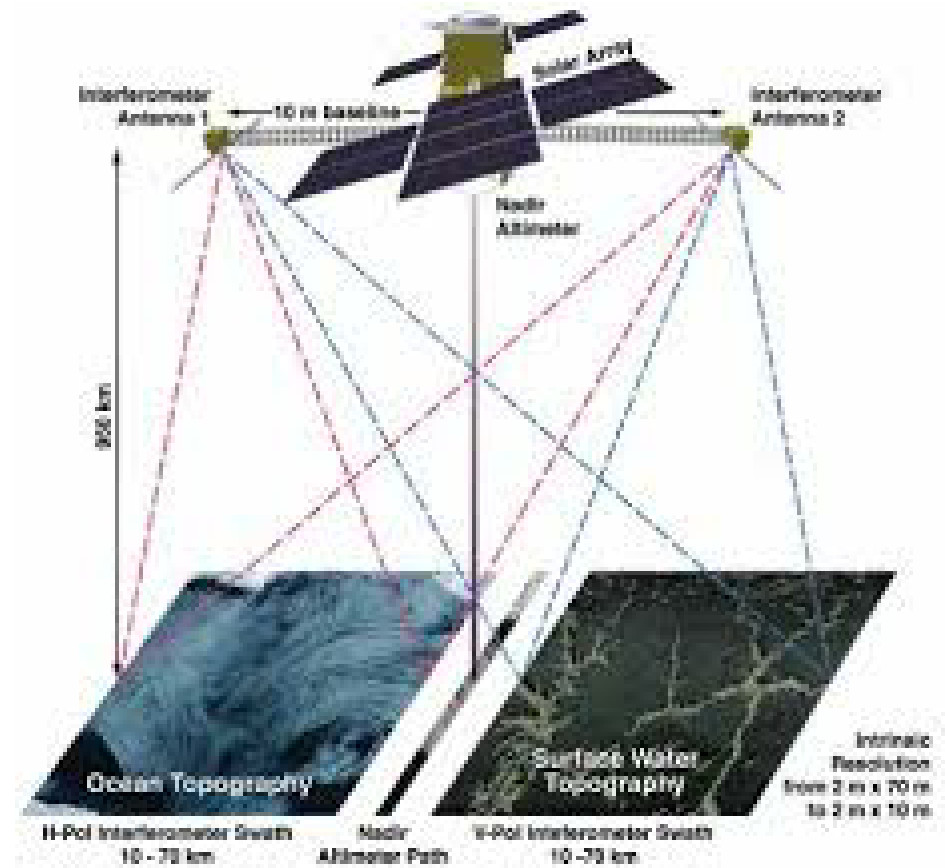
Satellite altimetry



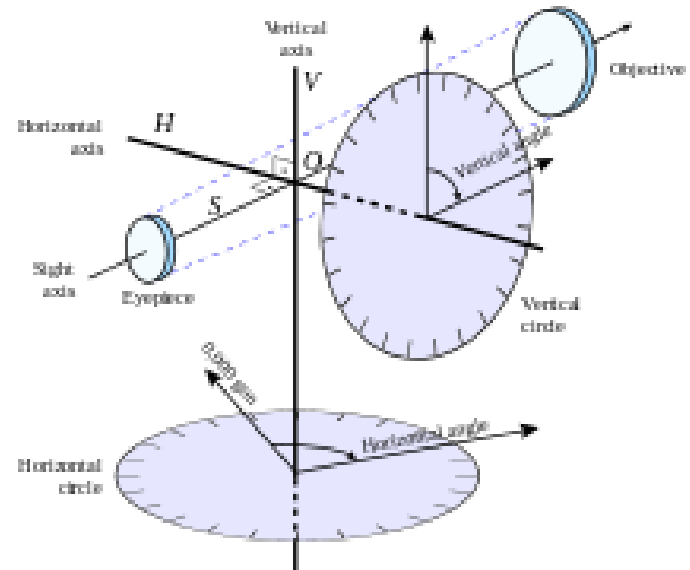
Function



SAR Altimetry (synthetic aperture radar)



Theodolite



Temperature of air

For example if the air temperature at top of mountain is **-10** degrees and **20** degrees in the hillside , altitude mountain will be **5000 meters**



Angle of
elevation

Al-Biruni's
Classic
Experiment

Using a
Clinometer

Angle of elevation

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graph LR; A[Angle of elevation] --- B[An astrolabe]; A --- C[Knowledge of trigonometry]
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An astrolabe

Knowledge of
trigonometry



An astrolabe

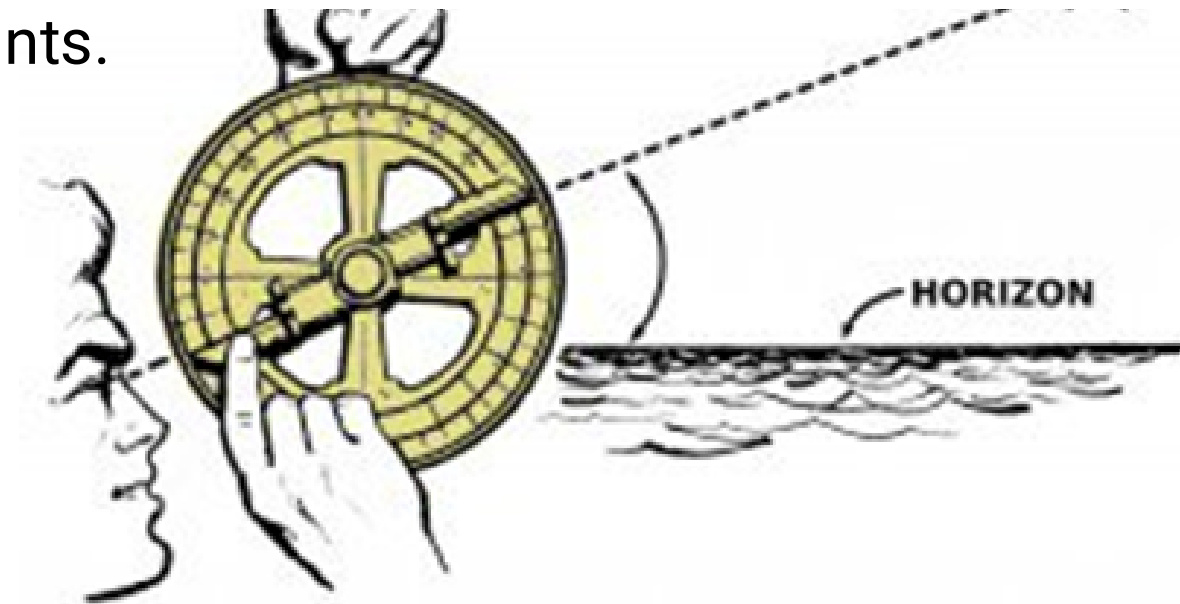
Clinometer



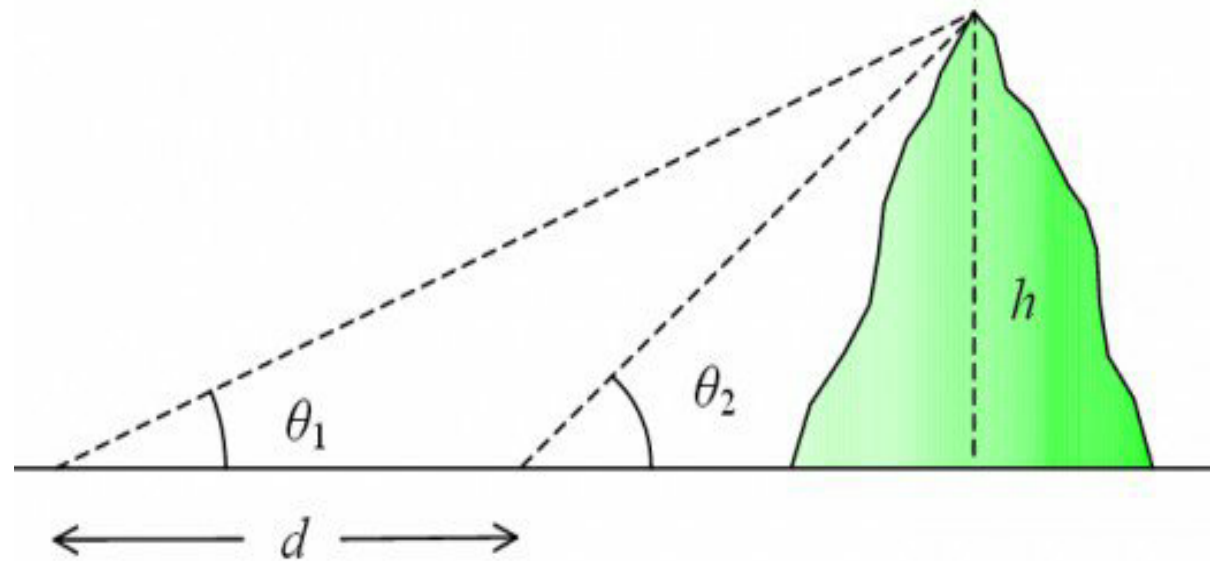
• Angle of elevation of the mountain top at two different points lying on a straight line were measured using an astrolabe.

• The third being the distance between these two points.

Al-Biruni's Classic Experiment

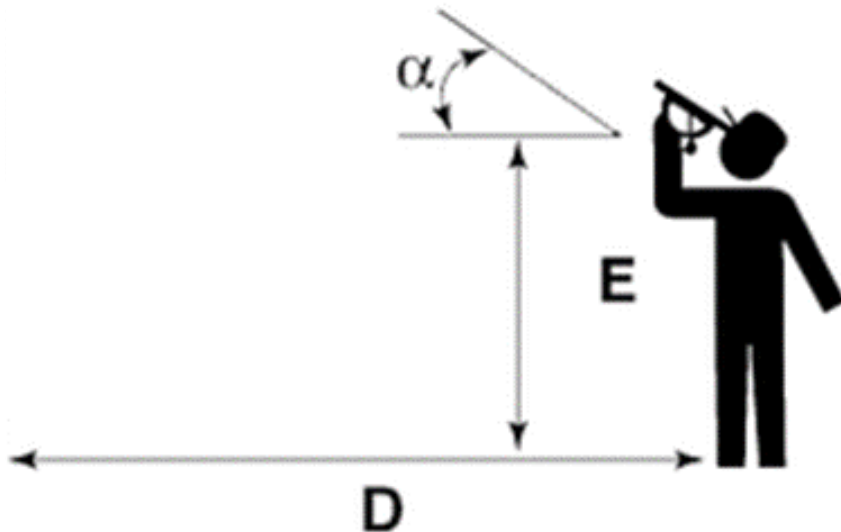


$$h = \frac{d \tan \theta_1 \tan \theta_2}{\tan \theta_2 - \tan \theta_1}$$



Using a Clinometer

Elevation of mountain =
height of Clinometer + distance to mountain \times tan of angle



$$H = E + D \times \tan(a)$$

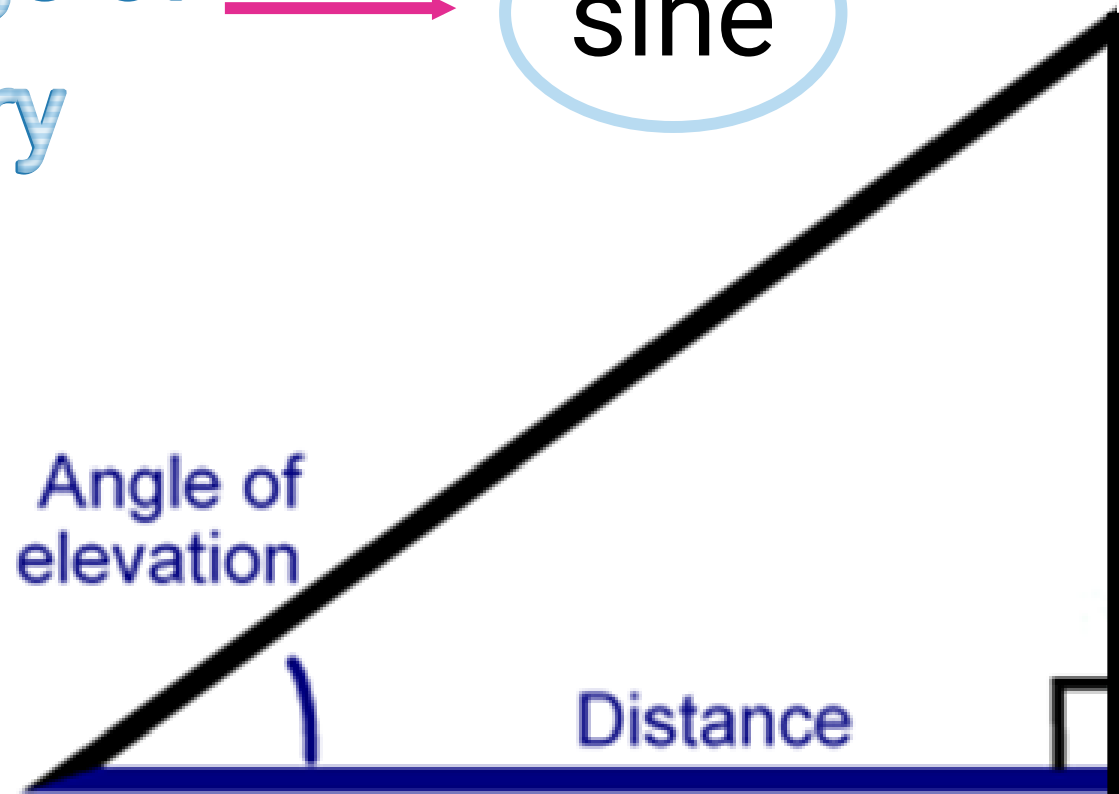


**Thank you
for your attention**

Use knowledge of
trigonometry



sine



sine

the trigonometric function that is equal to the ratio of the side opposite a given angle (in a right triangle) to the hypotenuse