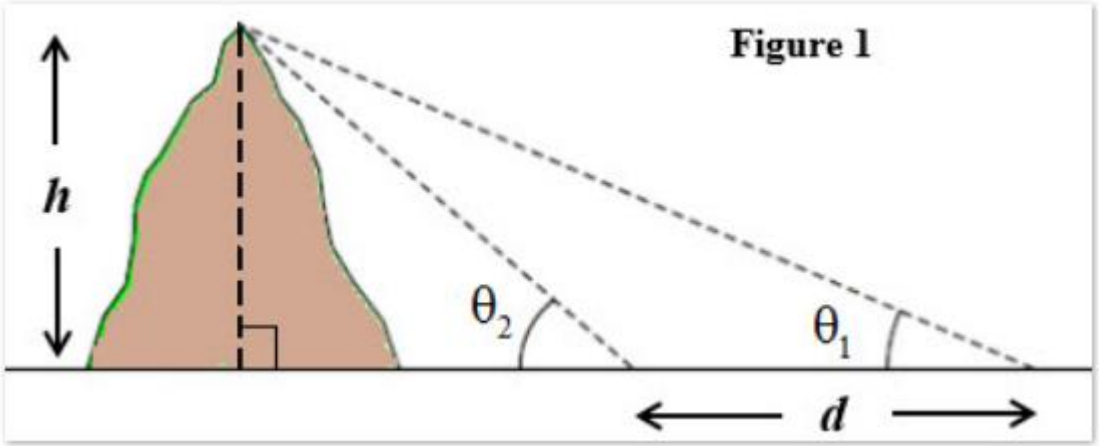
Measuring the earth's radius 1000 years ago

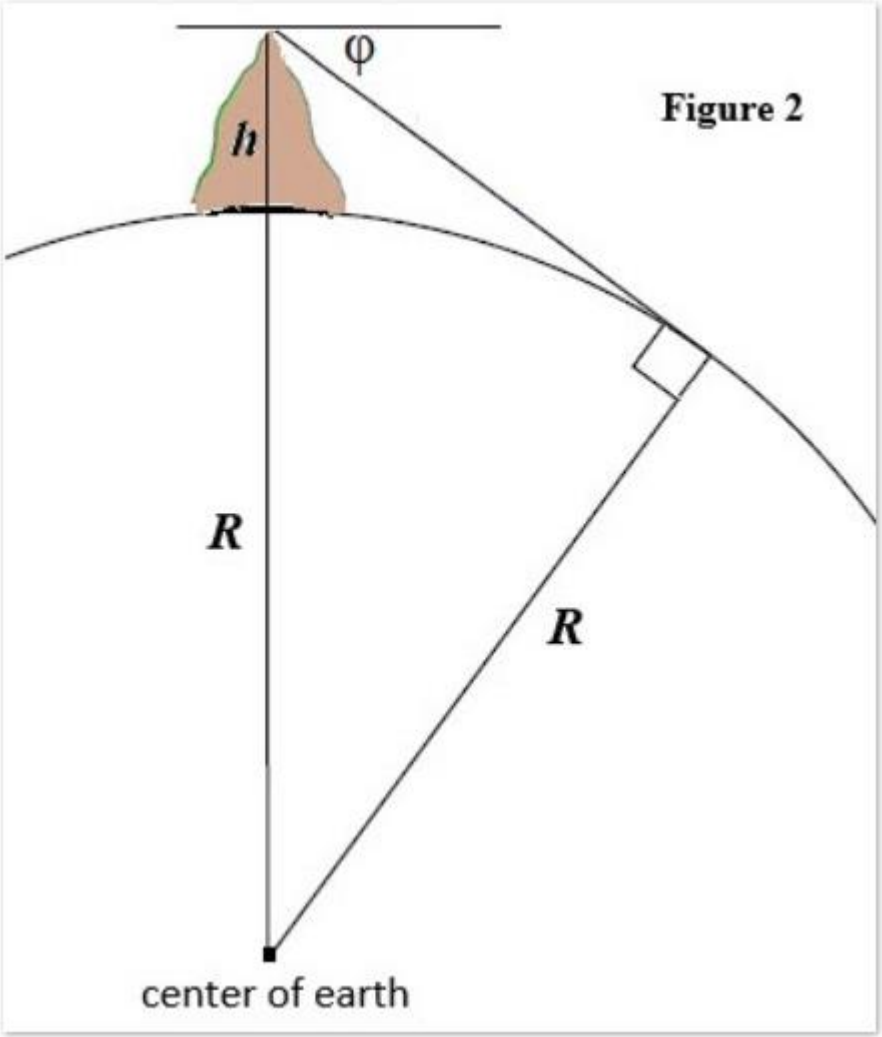
The Silk Roads by Oxford historian Peter Frankopan, in which the reviewer states that the Islamic mathematician and scientist **al-Biruni** (973-1048) was the first to compute the radius of the earth.

https://www.thinkib.net/mathhlsl/blog/19923/measuring-the-earths-radius-1000-years-ago



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

https://www.thinkib.net/mathhlsl/blog/19923/measuring-the-earths-radius-1000-years-ago



$$R = \frac{h\cos\varphi}{1-\cos\varphi}$$

https://www.thinkib.net/mathhlsl/blog/19923/measuring-the-earths-radius-1000-years-ago

- Al-Biruni's computation is *6339 km*(radius of the Earth)/ *39830 km* (the circumference)
- Eratosthenes' calculation of about *39690 km*.

- The mean radius and circumference are *6371.0 km* and *40030 km.*

https://www.thinkib.net/mathhlsl/blog/19923/measuring-the-earths-radius-1000-years-ago