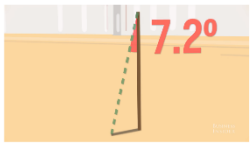
How Eratosthenes calculated the circumference of the Earth

By Shahadat Ullah

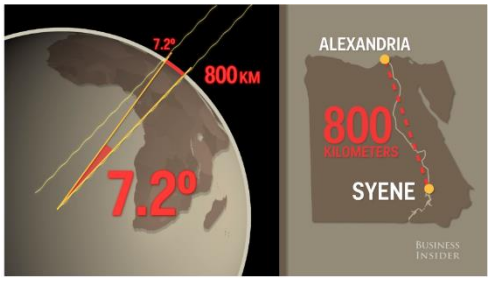
At around 240 BCE, a Greek mathematician named Eratosthenes estimated the circumference of the Earth. He had heard in a town called Syene in Egypt, on the Summer Solstice (June 21st) at noon, the sun didn't cast a shadow.

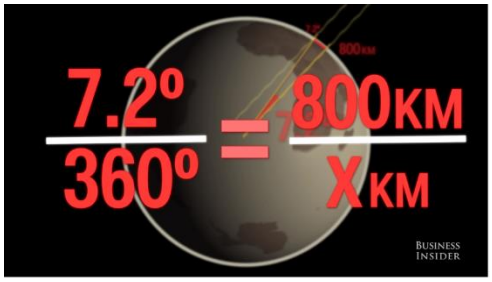


However, in Alexandria, where he live and studied in the library, at the exact same time and day, the sun had cast a shadow, at 7.2 degrees. Eratosthenes already knew the Sun's rays were parallel, thus, the Earth was curved.

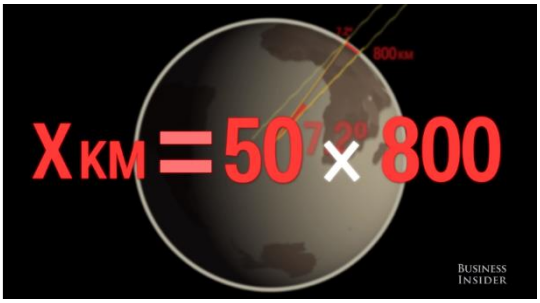
Because the shadow length of Syene and Alexandria is 7.2 degrees apart, it creates an alternate angle, as it has two parallel lines (sun's rays).

The Greek mathematican hired a man to find the distance between the two cities, 800 km apart.





With simple mathematics, 7.2/360 = 800/X, which is 1/50 = 800/X. He can work out the circumference of the Earth.



50 x 800 = 40000

Eratosthenes worked out the circumference of the Earth at <u>40000km</u> using pure mathematics.