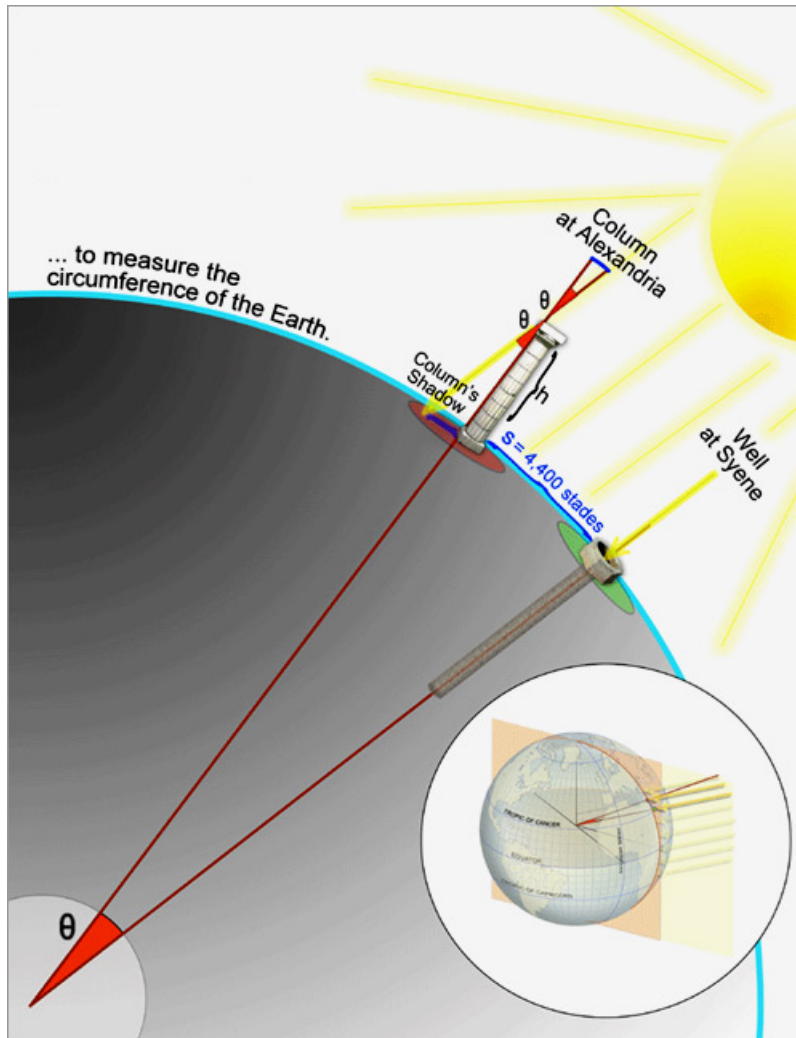


Eratosthenes Measures the Earth

Math 111

In 240 B.C.E., the Greek mathematician Eratosthenes was able to measure the circumference of the Earth. He knew that at noon on the summer solstice, the light from the sun shone straight down to the bottom of a deep well in Syene (now Aswan) in Egypt. In his native Alexandria, Eratosthenes could measure the shadow cast by the sun at noon on the solstice.



Source: NOAA Ocean Service Education

1. Eratosthenes measured the angle θ to be 7.2° . Complete the analogy below:

7.2° is to 360° as _____ is to the circumference of the Earth.

2. Change the analogy from the last problem to a **mathematical proportion** like:

$$\frac{A}{B} = \frac{C}{D},$$

and solve for the circumference of the Earth.

3. A “stades” was an ancient unit for measuring distance. One stades is about 1/10 of a mile. Was Eratosthenes close to the correct value of the circumference of the Earth? (The true value is 24,900 miles.)

4. How close was Eratosthenes to the true value of the circumference of Earth as a percentage of the Earth’s true circumference? Hint: start with a proportion equation based on the analogy:

Eratosthenes’ circumference is to the true circumference as _____ is to 100.

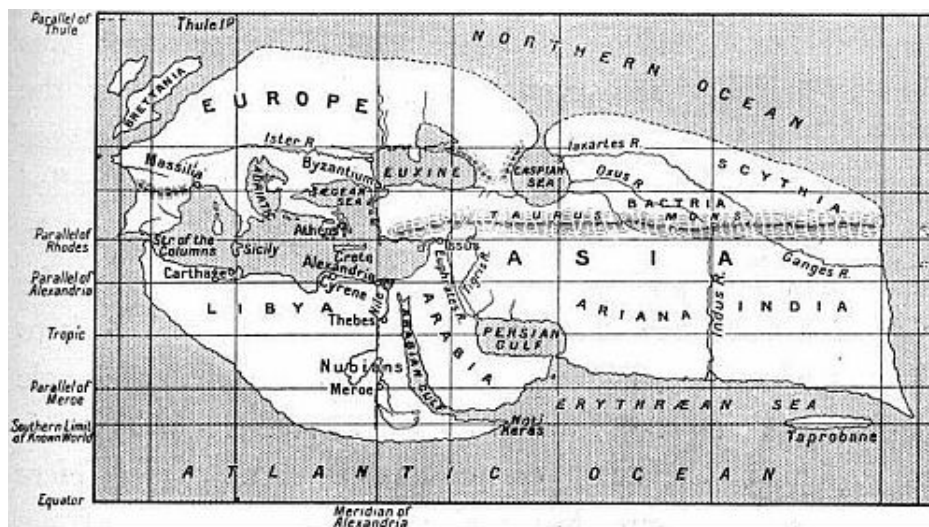


Figure: Eratosthenes' map of the known world