How far is the horizon?

Geography and geometry

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1 The motivating question

How far away is the horizon?

Elizabeth Meckes

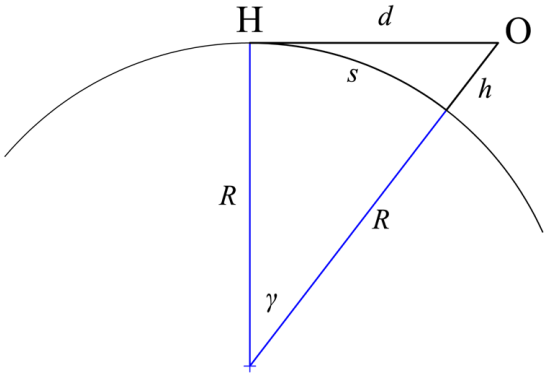
2 The model

To answer the question, we need a *mathematical model*: a simplified description and/or picture of the situation that lets us go from the question our eyes inspire to a question we can try to answer with calculations.

What picture to draw? What assumptions are we making? Do we believe them (completely, sort of, ...)?

3 Knowledge

Now that we have a model, what do we need to know in order to use it?

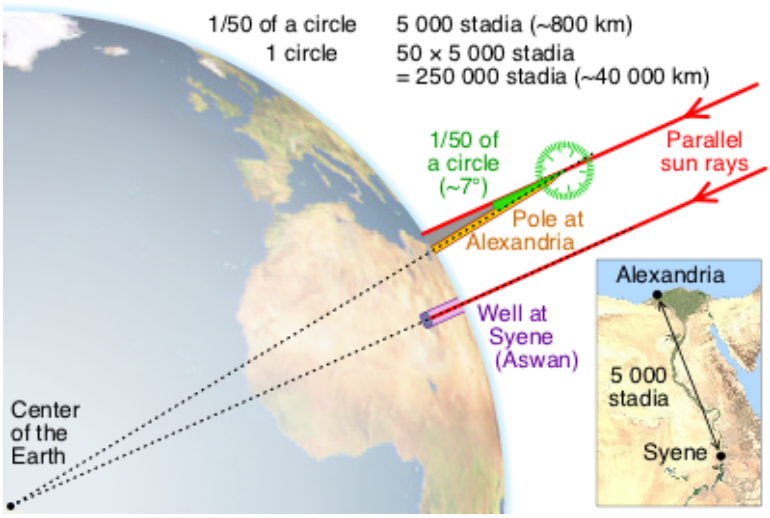


Jeff Conrad

The Pythagorean theorem: $R^2 + d^2 = (R + h)^2$.

4 Eratosthenes

Carl Sagan video.



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5 Turning things around

If you know d and h, you can find R.

Formula:

Then you could find the circumference of the earth: $C = 2\pi R$.

How might you figure out d without knowing R?