

PHYSICS II — 8-20-13

(1)

CHI measurements

are part of scientific method* used in experiments to test a hypothesis.

* page 7 5 steps

(1) facts (unexplained)

(2) hypothesis

(3) consequences

of hypothesis

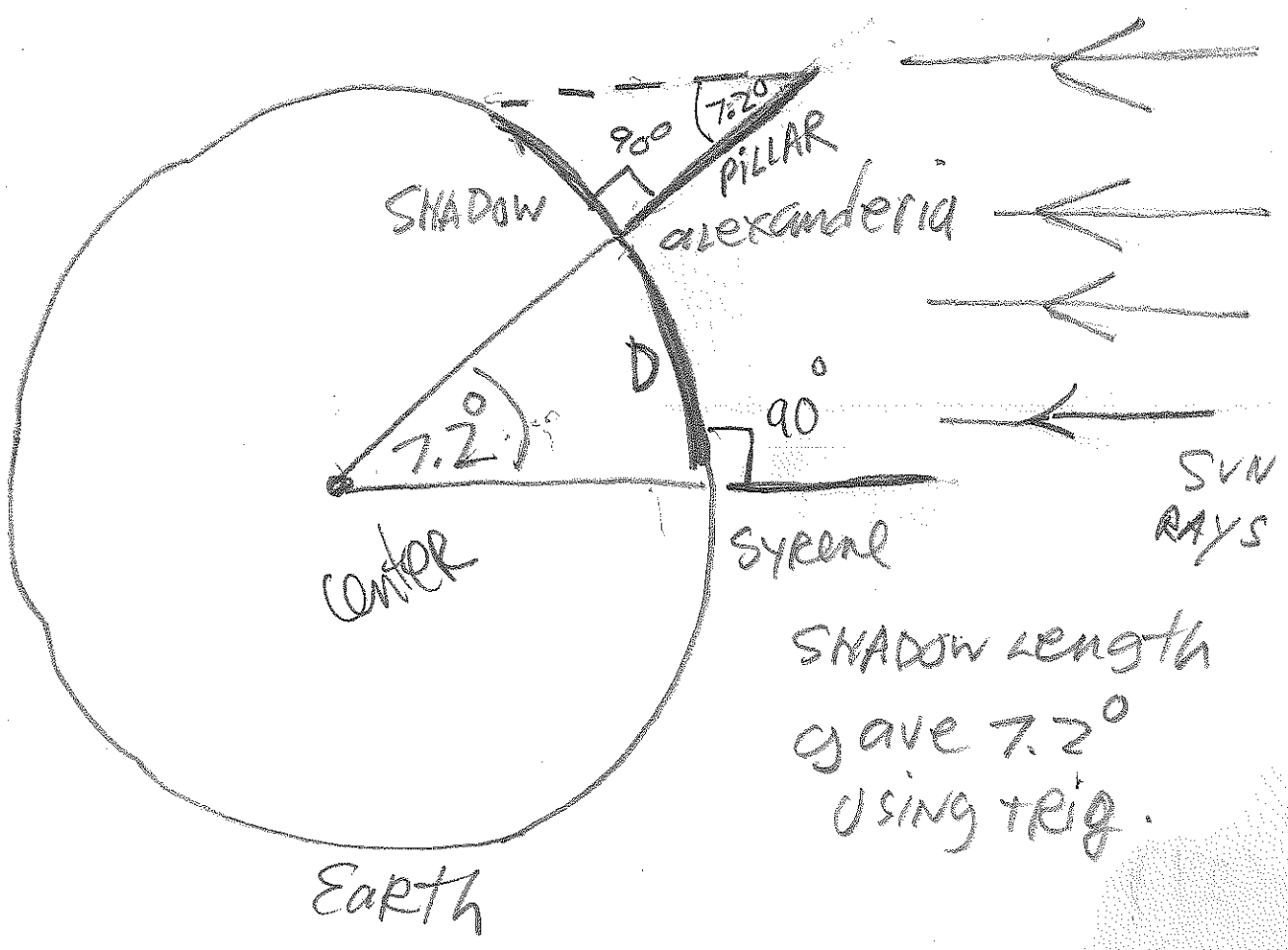
(4) experiments

that use the consequences

(step 3)

(5) general rules, predictions (theory)

A. Example of scientific method: Eratosthenes used a consequence to measure earth's circumference. (235 B.C)



$$\frac{7.2^\circ}{360^\circ} = \frac{D}{\text{CIRCUMFERENCE}}$$

BASIC ALGEBRA
 " GEOMETRY

Google!
 CROSS-MULTIPLY

D = distance between
 Syrene and Alexandria

Solved for circumference = C

D = 5000 stadia ; C = 250,000 STADIA

$$\frac{5000 \text{ stadia}}{800 \text{ km}} = \frac{250,000 \text{ STADIA}}{C}$$

800 km

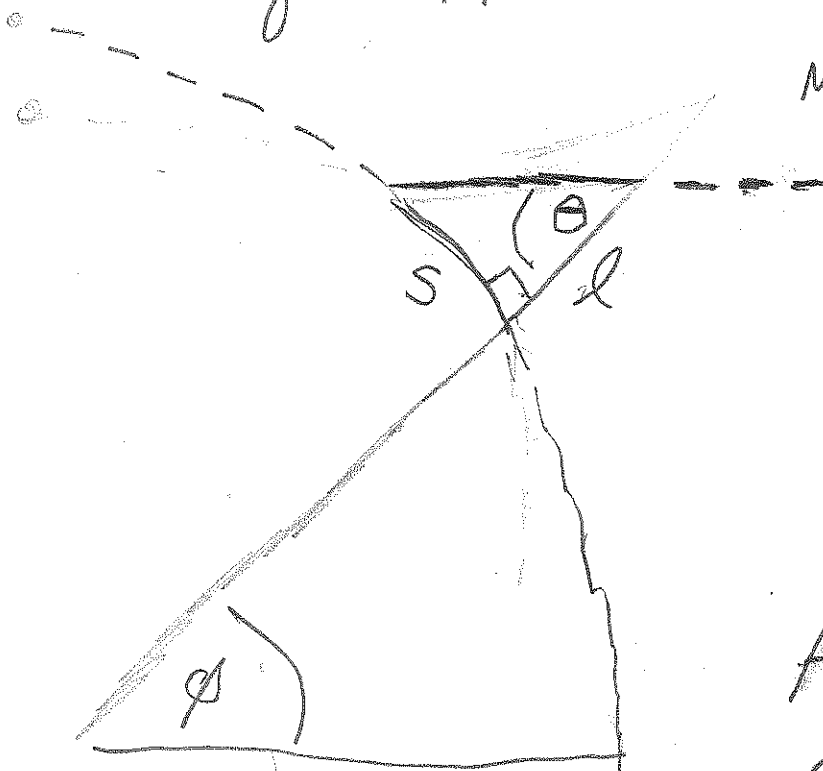
C

Solve for C ≈ 40,000 km

converting
 C TO KM:

Appendix:

~~circumference~~
Circumference
of Earth



$$\frac{s}{l} = \frac{1}{8}$$

from $\theta = \frac{s}{l}$

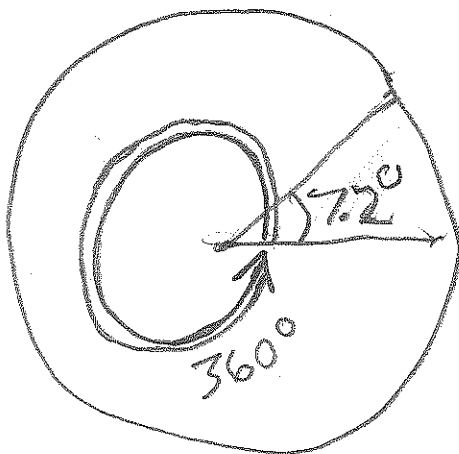
NOTE:
 $\theta \approx \frac{s}{l}$ IF ALL 1.

$$\theta \approx \frac{1}{8}$$

$$\theta = 0.125 \text{ RADIANS}$$

$$\theta = 7.2^\circ$$

From High School
Geometry $\phi = 7.2^\circ$



$$\frac{7.2^\circ}{360^\circ} = \frac{D}{\text{CIRCUMFERENCE}}$$

$$D = 5000 \text{ STADIA} \\ = 800 \text{ KM}$$

$$\frac{7.2}{360} = \frac{1}{50} = \frac{5000}{C}$$

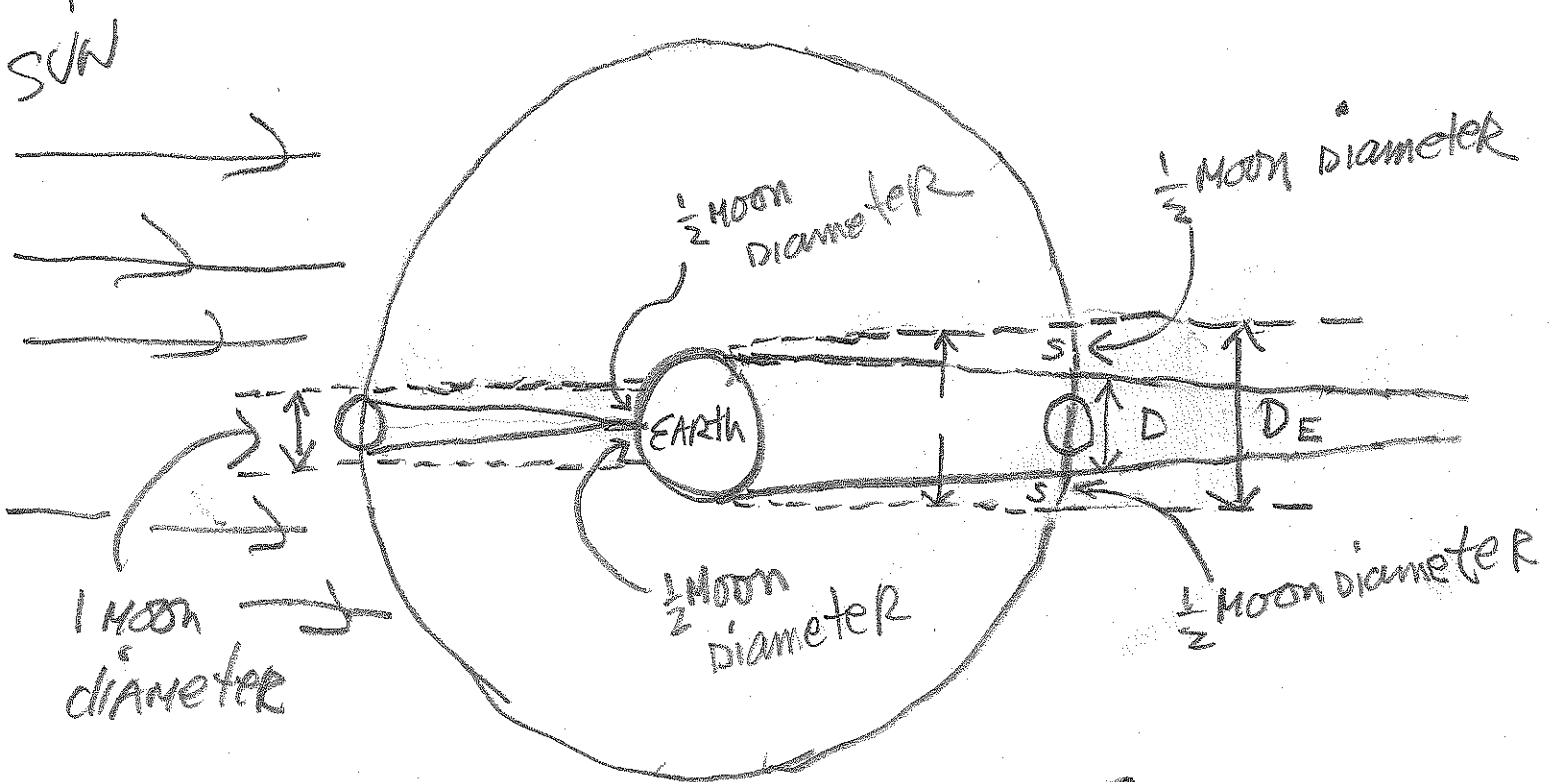
$$\Rightarrow C = 250,000 \text{ STADIA}$$

Measurements: CH1 8-22-19

(B) size of MOON

5

93,000,000 miles away



$$D = 2.5 \text{ Moon diameters}$$

$$S + S = 1 \text{ Moon diameter}$$

$$D + S + S = 3.5 \text{ Moon diameters}$$

$$\text{BUT } D_E = 1 \text{ Earth diameter}$$

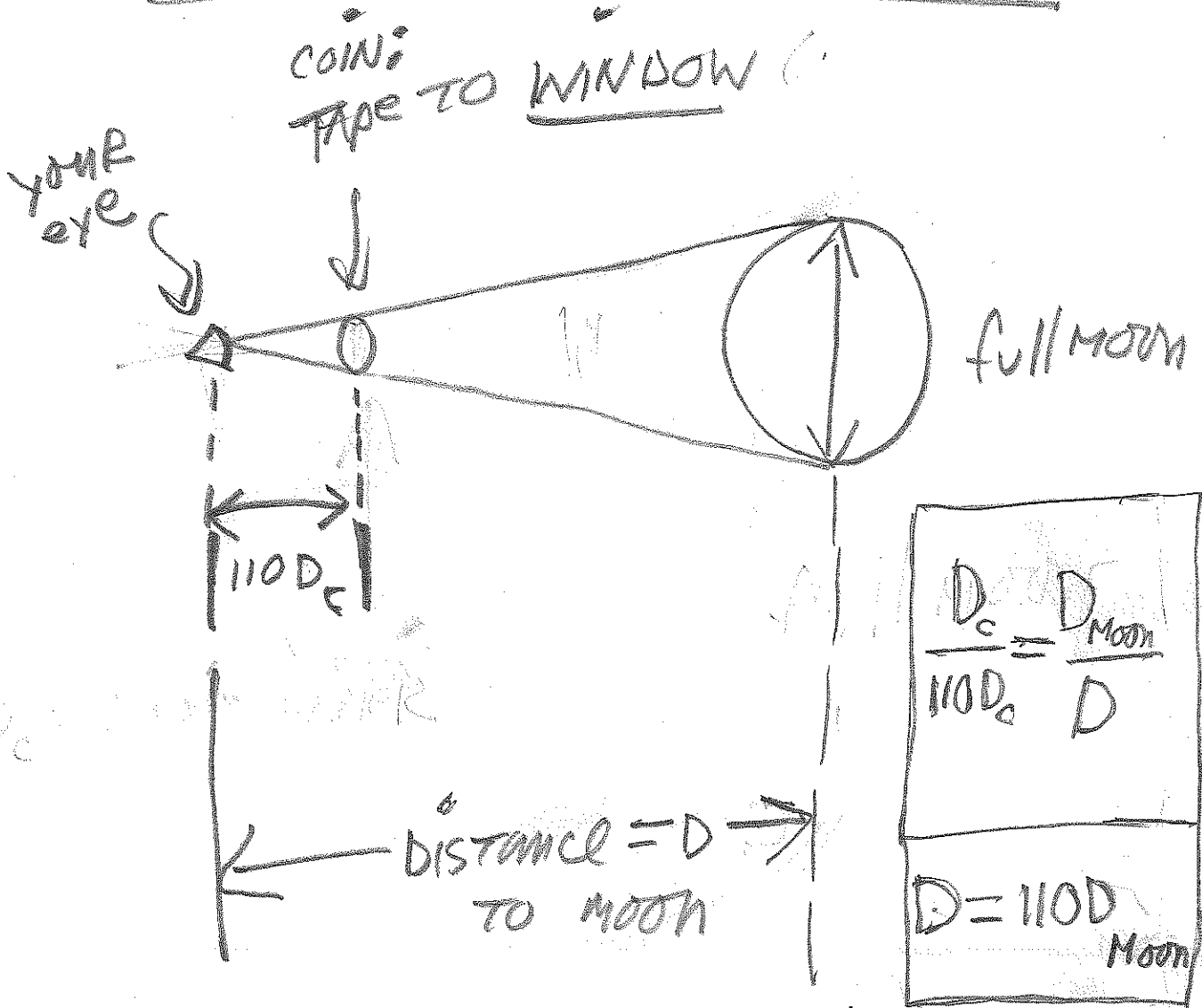
THUS, 1 Earth diameter = 3.5 Moon diameter

THUS: 1 MOON diameter = $\frac{1}{3.5}$ Earth diameters

(C)

DISTANCE TO MOON

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HIGHSCHOOL
GEOMETRY
OR TRIG

