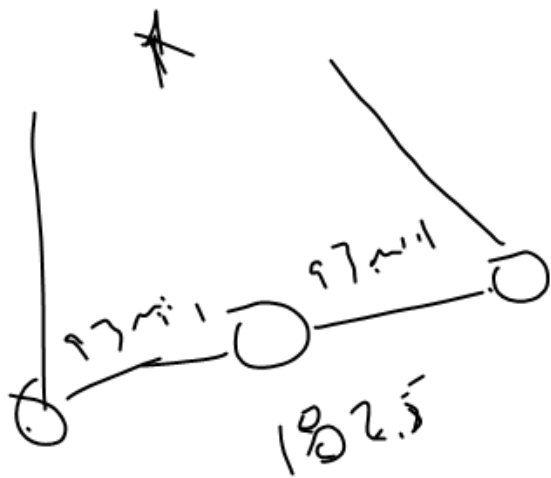
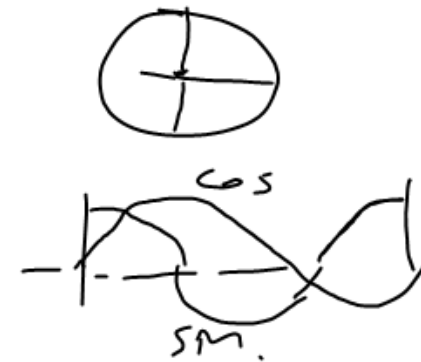


SOh CAH TOA

$$\sin \alpha = \frac{\text{opp}}{\text{hyp}}$$

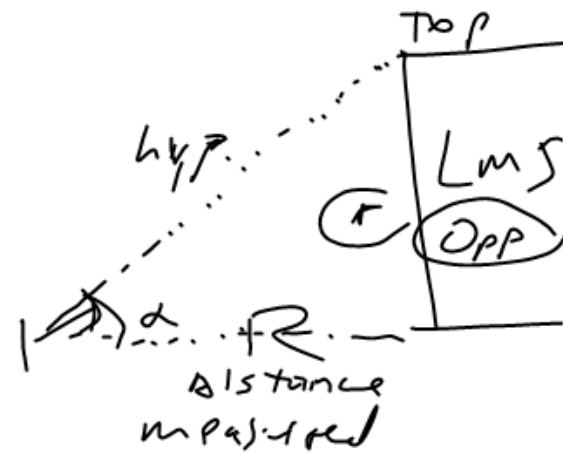
$$\cos \alpha = \frac{\text{adj}}{\text{hyp}}$$

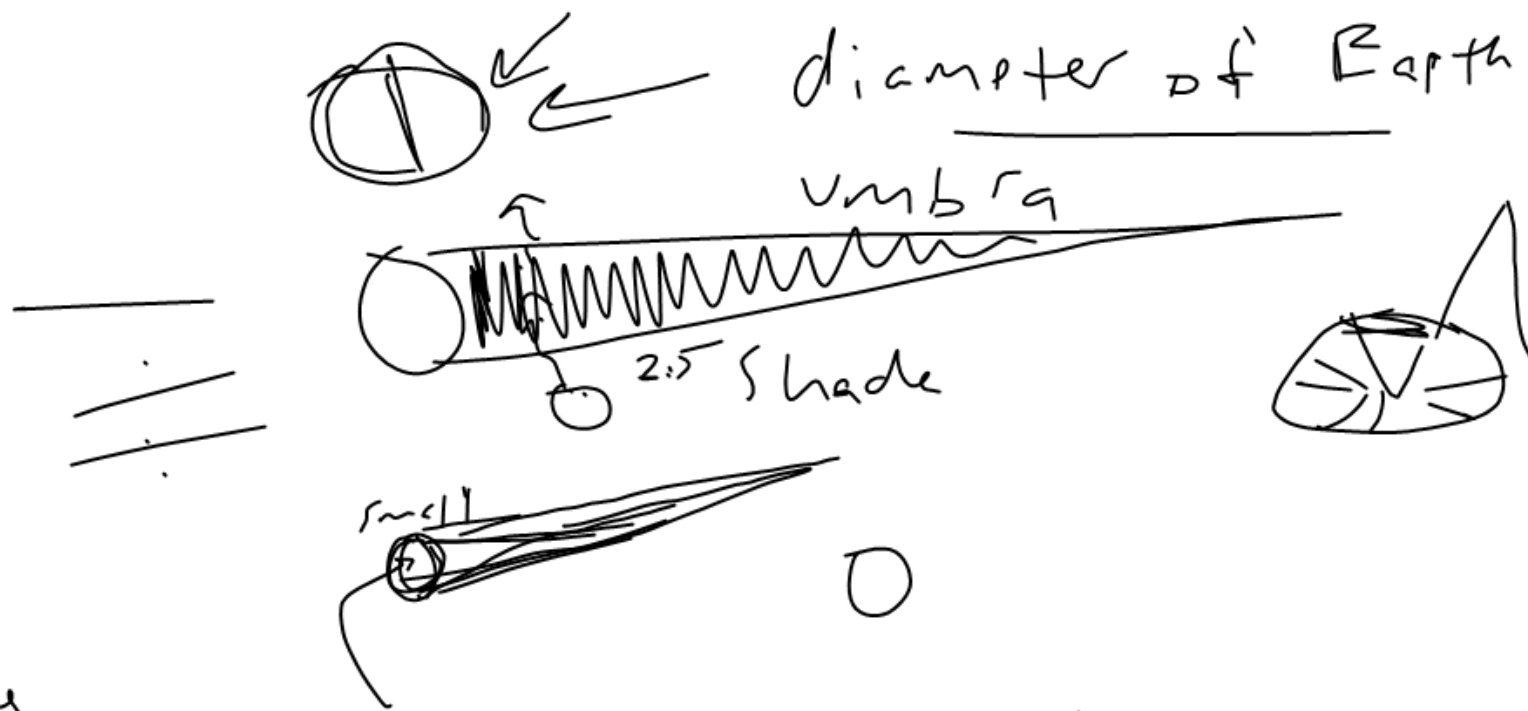
$$\tan \alpha = \frac{\text{opp}}{\text{adj}}$$



$$\tan \alpha (\text{Adj}) = \text{opp}$$

$$\tan \alpha (R) = r$$



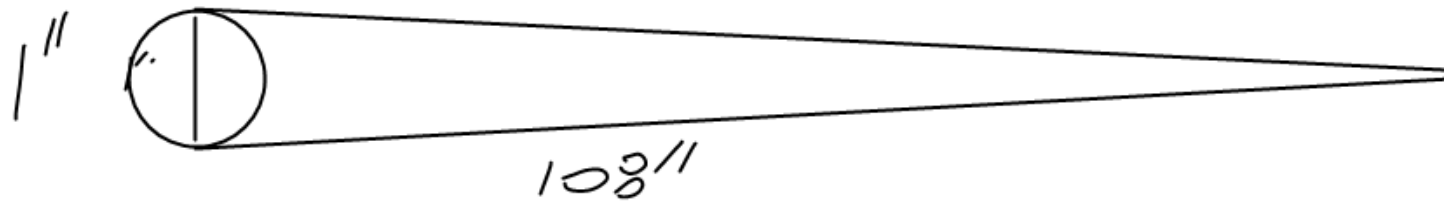


measure

$$\frac{1''}{\left( \frac{\text{Umbra length}}{108''} \right)}$$

Dia. Earth

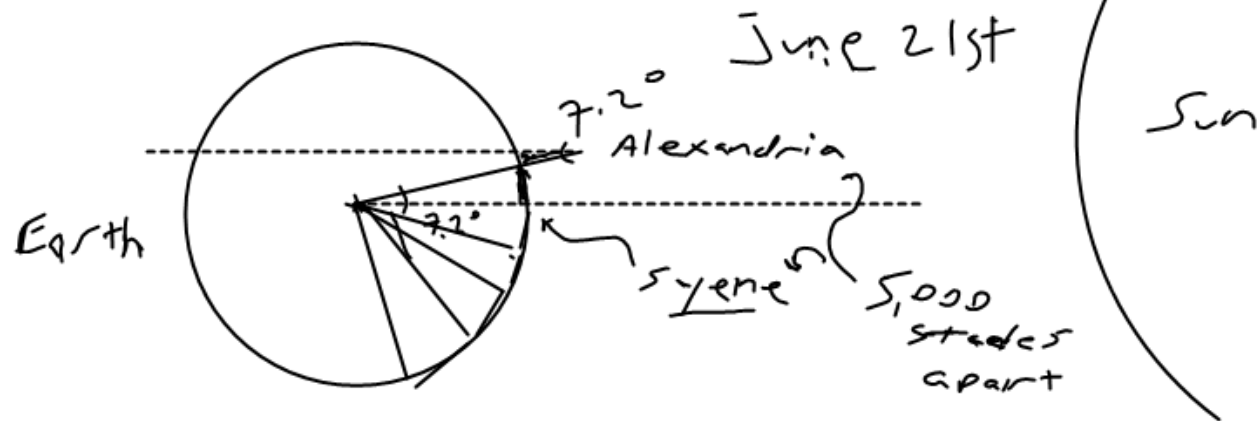
Umbra length Earth

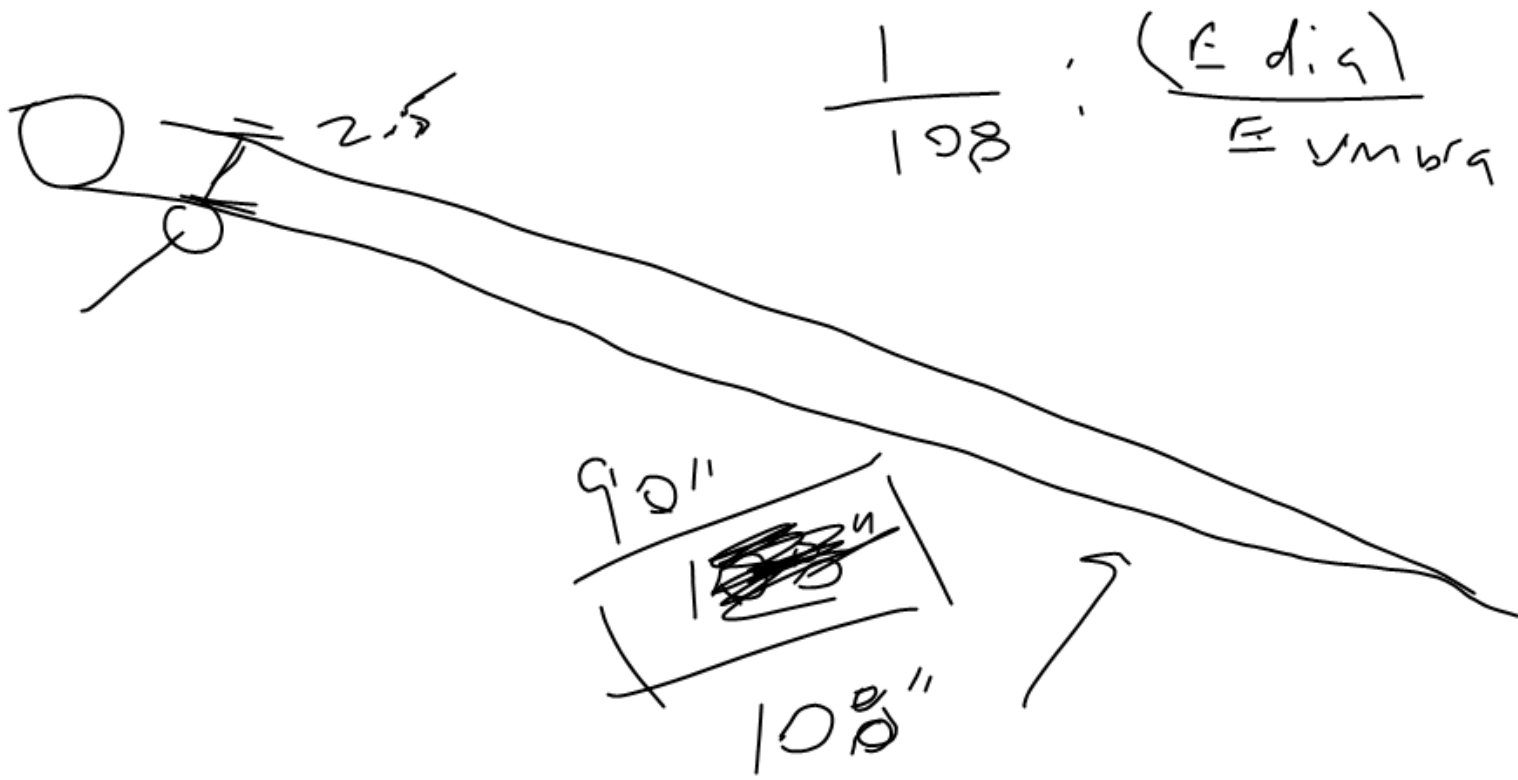


$$\frac{1}{108} : \frac{\text{Earth's Dia}}{\text{Umbra Length}}$$

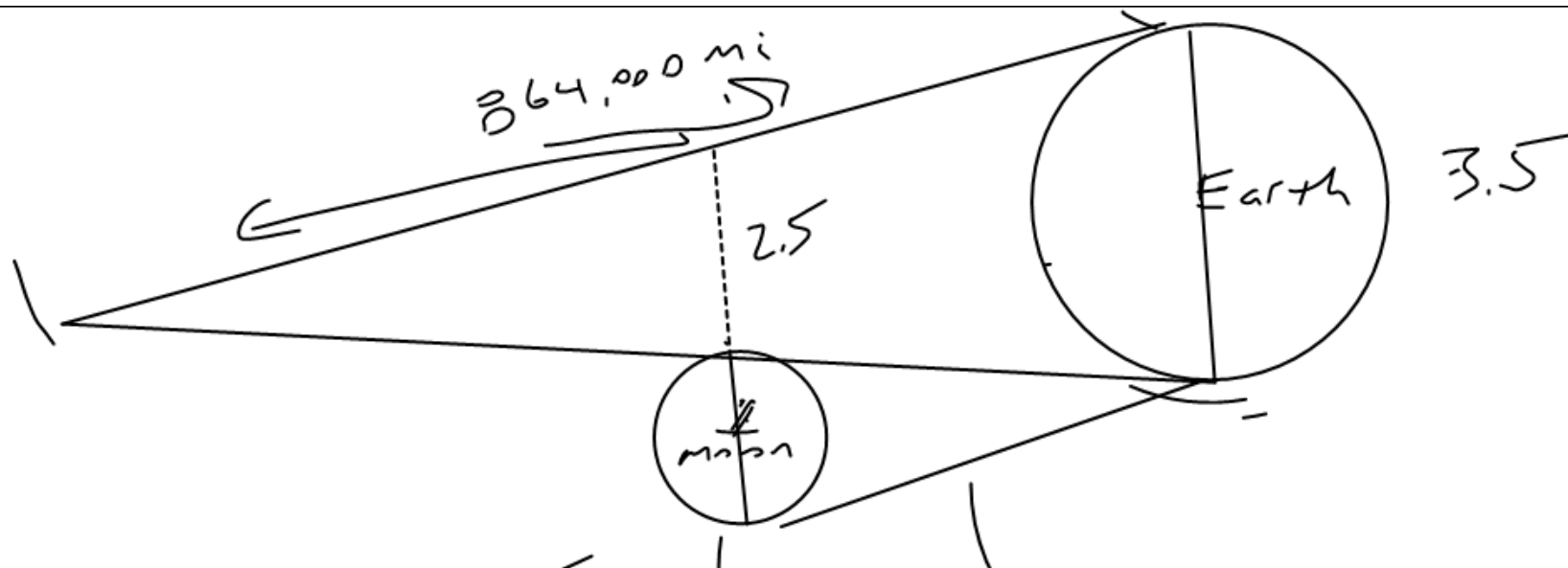
$$\frac{360^\circ}{7.2} = 50$$

Eratosthenes, Greek 300 BC









$$\frac{1}{108} \cdot \frac{8,800 \text{ mi}}{(\text{Umbra})} = 864,000 \text{ mi}$$

$$\frac{864,000}{3.5} = \underline{\underline{240,000 \text{ mi}}}$$