The orbit of the planet Mercury

It is highly elliptical : aphelion = 0·47 A.U.
perihelion = 0·34 A.U.

$$\text{Eccentricity} = \frac{\text{aphelion} - \text{perihelion}}{\text{mean distance}}$$

$$= \frac{0{\cdot}47 \text{ A.U.} - 0{\cdot}34 \text{ A.U.}}{0{\cdot}40 \text{ A.U.}}$$

} We could, of course, measure this in metres

$$= \frac{0{\cdot}13}{0{\cdot}40}$$

$$\therefore \underline{\underline{0{\cdot}3}}$$

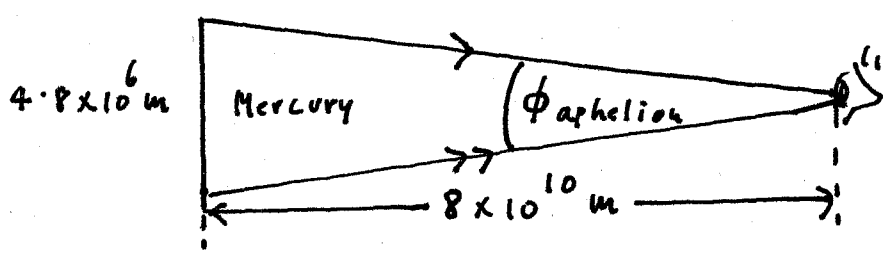
[cf. Venus = 0·007
Earth = 0·017]

The Solar Constant is around 2·5 times greater at perihelion than it is at aphelion. Remember that electromagnetic radiation obeys the inverse-square law: intensity of radiation $\propto \frac{1}{(\text{distance})^2}$

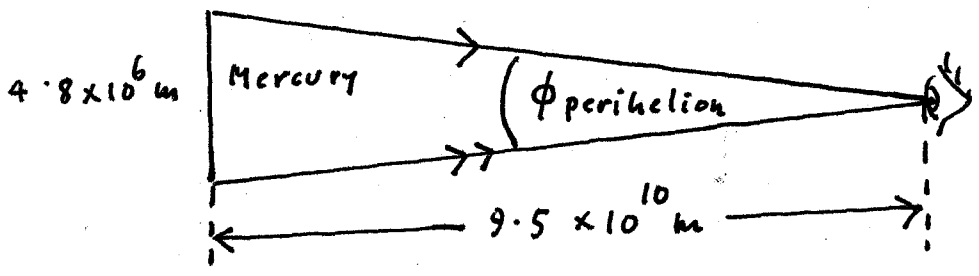
The orbit of Mercury is inclined to ours at an angle of seven degrees
(cf. Venus = 3·4° and Pluto = 17·1°)

$$\text{Diameter}_{\text{Mercury}} = 0{\cdot}38 \times \text{Diameter}_{\text{Earth}}$$

$$= \underline{\underline{4{\cdot}8 \times 10^6 \text{ m}}}$$



Farthest from the Sun.
∴ closest to the Earth at Inferior Conjunction



Closest to the Sun.
∴ farthest from the Earth at Inferior Conjunction.

Calculate ϕ_{aphelion} and $\phi_{\text{perihelion}}$ and express each as a fraction of 0·5°

DF
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