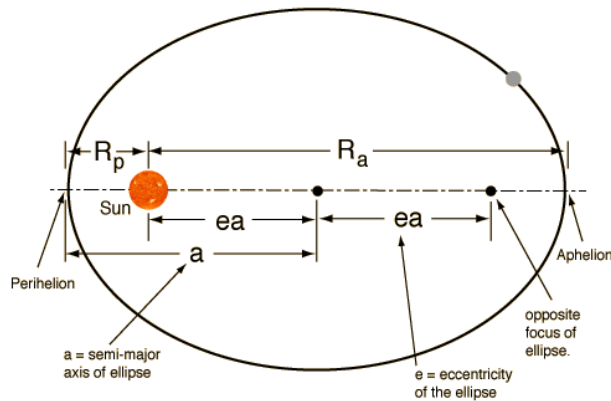


What is the eccentricity of the orbit of a planet whose distance from the sun varies from 180 million to 220 million km? explain please

Scientists use a special term, "eccentricity", to describe how round or how "stretched out" an ellipse is. The eccentricity of an ellipse can be defined as the ratio of the distance between the foci to the major axis of the ellipse



$$R_p = 180 \times 10^6 \text{ km}$$

$$R_a = 220 \times 10^6 \text{ km}$$

The semi-major axis length is

$$a = \frac{R_p + R_a}{2} = \frac{180 + 220}{2} = 200$$

The distance from focus to the center of the ellipse along the semi-major axis length:

$$ea = 200 - 180 = 20$$

Hence, the eccentricity is:

$$e = \frac{20}{200} = 0.1$$