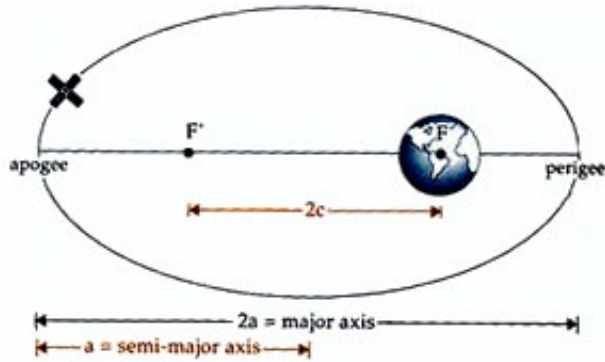




Defining Classical Orbital Elements

1. Semi-major Axis

The size of an orbit is described by the semi-major axis (a), which is one-half the distance across the major (long) axis of the orbit.

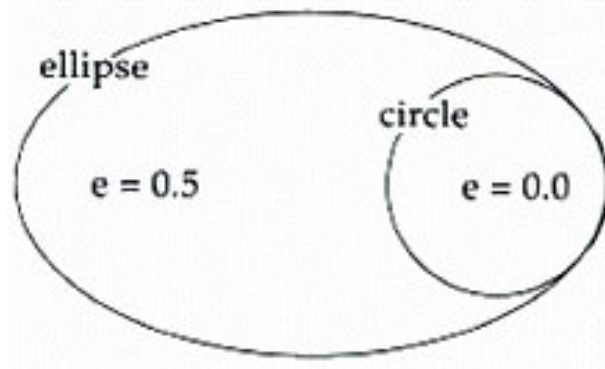


2. Eccentricity

Eccentricity (e) specifies the shape of an orbit and is given by the ratio of the distance between the two foci and the length of the major axis.

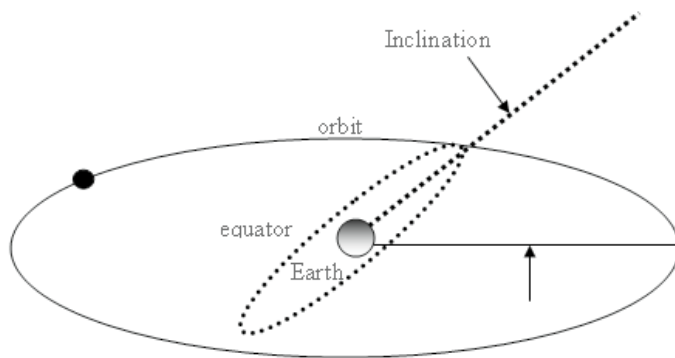
$$e = 2c/2a$$

The eccentricity of a circular orbit is zero. For an ellipse, the eccentricity can range from zero to less than one.



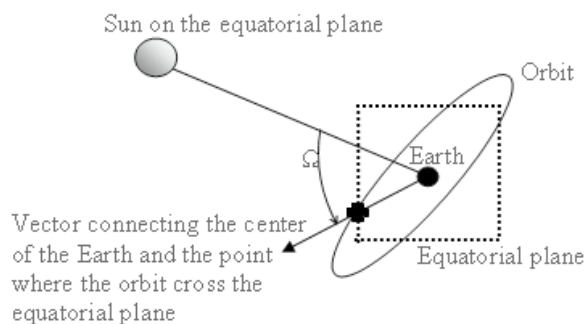
3. Inclination (i) (degrees)

The inclination is the angle between the plane of the equator and the orbital plane.



4. Right Ascension of the Ascending Node (Ω)

The angle between the Sun and the intersection of the equatorial plane and the orbit on the first day of spring in the Northern Hemisphere. The day is called the vernal equinox. Looking down from above the North Pole, the right ascension of the ascending node is positive counter-clockwise.



5. Argument of Perigee (w) (degrees)

The angle between the ascending node and the orbit's point of closest approach to the Earth (perigee).

6. True Anomaly (v) (degrees)

The angle between the perigee and the vehicle in the orbit plane.

