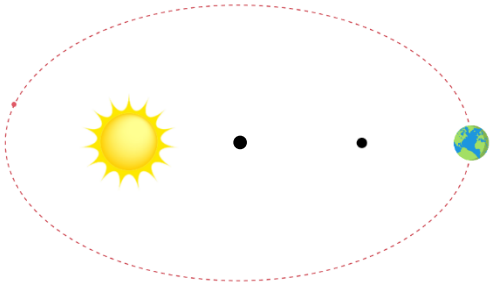
CONCEPT: Kepler's Laws

● Kepler noticed all orbits (stars, planets, satellites) obeyed three laws:

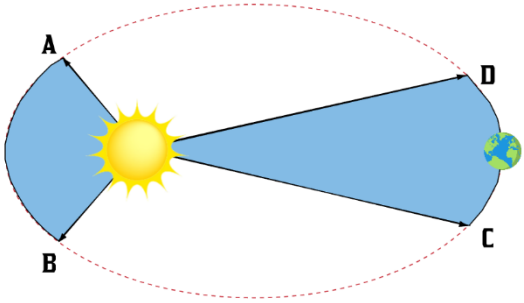
1) Kepler's First Law: All orbits (even circular) are _____ with the Sun at one focus.

- No planet or physical object at center or other focus.



- Eccentricity → # between 0 and 1, how _____ the orbit is.
  - Near 0 is very (circular/elliptical)
  - Near 1 is very (circular/elliptical)

2) Kepler's Second Law: In an orbit, equal areas of the orbit are swept out in equal times.



3) Kepler's Third Law: The square of the period **"T"** is proportional to the cube of the radius **"r"** of the orbit.

- For 2 satellites orbiting mass M, the ratio _____ is constant.