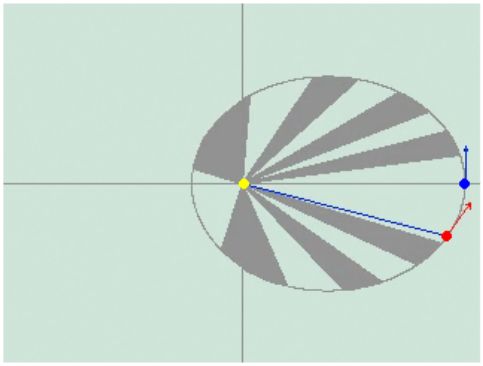
Kepler's 2nd Law

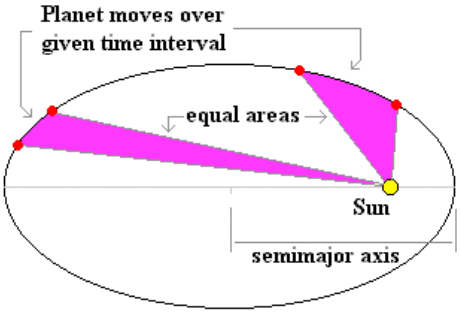
"Since divine goodness has bestowed on us Tycho Brahe the most diligent observer, from whose observations this error of 8 minutes in Ptolemy's calculation for Mars has been deduced; it is right that with grateful minds we acknowledge and profit by God's good gift. ... For if I had thought that those 8 minutes of longitude were to be despised I should (that is by bisecting the eccentricity) already have applied a sufficient correction to the model I devised in Chapter 16. Now, because they could not be despised, these eight minutes, all alone, have opened up the road to reforming the whole of Astronomy, and they have become the material for a large part of this work." - Johannes Kepler (1571 - 1630)

[Source: "The New Astronomy": Astronomia nova (Heidelberg, 1609), 113 - 114; KGW 3, 177 - 178, from School of Mathematics and Statistics, University of St Andrews, Scotland]

Kepler's 2nd Law (Equal Areas in Equal Times: Variable - speed model):

The Law of Equal Areas states that a line joining a planet and its star sweeps out equal areas during equal intervals of time.





- Sun = yellow circle
- Planet = red circle
- Blue arrow = initial condition
- Red arrow = moving planet and is proportional to planet's velocity
- Closer to the sun, the faster the planet passes in its transit orbit
- Further from the sun, the slower the planet passes in its transit orbit

[note: The last two observations hold because of Kepler's 2nd Law of Equal Areas where a planet sweeps out equal areas during equal intervals of time.]

§ See the pdf on the Proof for Kepler's 2nd Law.

§ References:

Kepler's 2nd Law (Equal Areas in Equal Times: Variable-speed Model) "Astronomia Nova", by Johannes Kepler (1571 - 1630)

Kepler's 2nd Law (Equal Areas in Equal Times: Variable-speed Model) "Harmonices Mundi", by Johannes Kepler (1571 - 1630)