

Kepler's Laws of Orbital Motion

1st Law

* Planets follow elliptical orbits with the sun at one focus of an ellipse

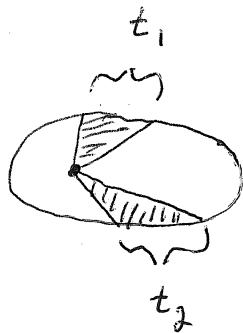
⇒ closed orbits must be elliptical or circular

⇒ open orbits must be parabolic or hyperbolic

- In this case the object passes by, never to return

2nd law

As a planet moves it sweeps an equal area in an equal time.



If $t_1 = t_2$

Then $A_1 = A_2$

3rd Law

$$T = (\text{constant}) r^{3/2}$$

$T = \text{period}$

$r = \text{radius of orbit}$

(mean distance)

$$\text{constant} = \frac{2\pi}{\sqrt{GM_s}}$$

$G = \text{gravitation constant}$

$M_s = \text{mass of sun}$