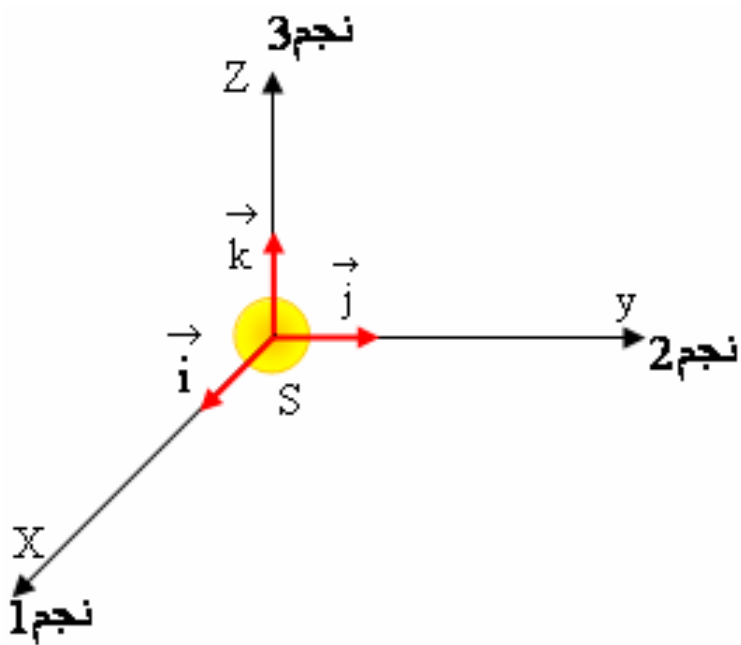


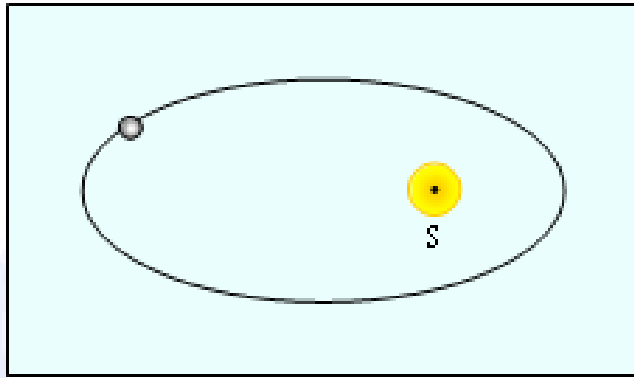


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<http://www.univ-lemans.fr/enseignements/physique/02/meca/planete.html>

-1





) Ellipses

SG

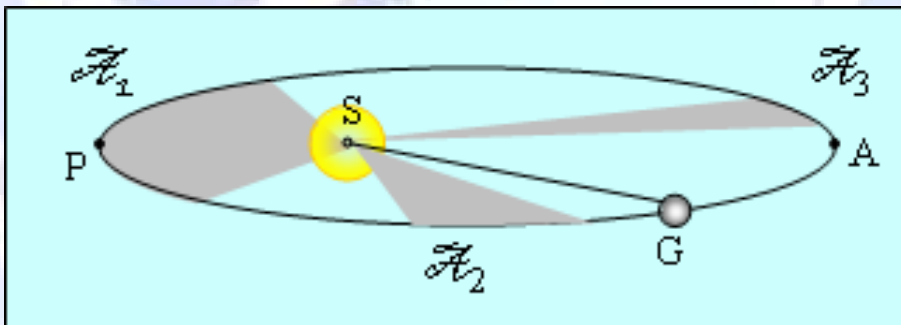
\mathcal{A}

Δt

$$\mathcal{A}_1 = \mathcal{A}_2 = \mathcal{A}_3 :$$

G

SG



Δt

$$\frac{\mathcal{A}}{\Delta t}$$

Δt

\mathcal{A}

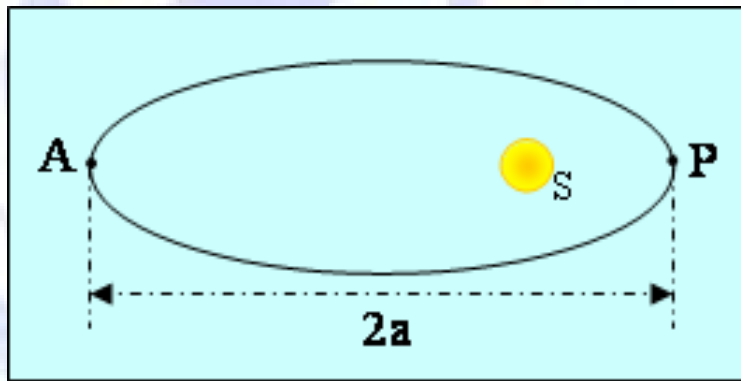
(Aphélie) A

(Périhélie) P

(Période de révolution sidérale) :

) _____ :

(Période orbitale) (Période sidérale)



$$\frac{T^2}{a^3} = K_S$$

K_S

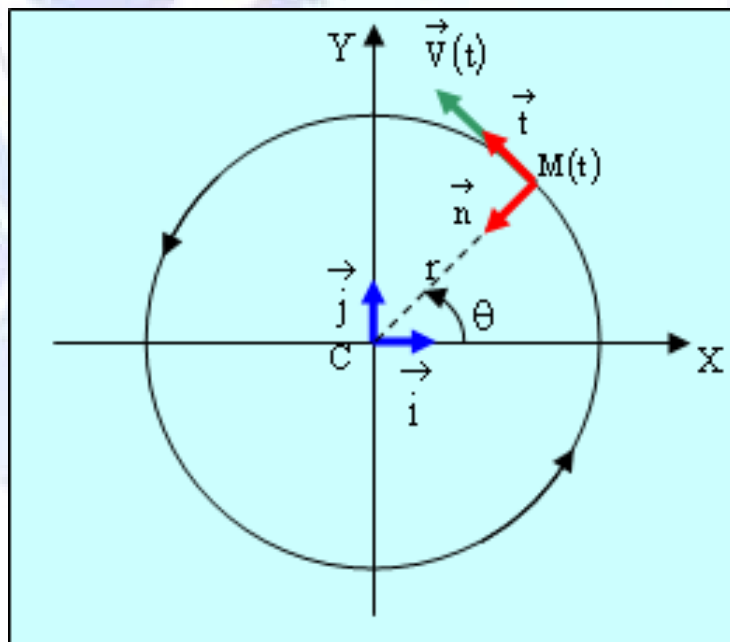
a

(s)

T

s^2/m^3

\vec{r} M .C
M $\left(\vec{C}, \vec{i}, \vec{j} \right)$
 $\theta \left(\vec{i}, \vec{CM} \right)$ M
M : \vec{t} *
 \vec{t} : n *M



/

$$\omega = \frac{d\theta}{dt} = \text{cste} \quad :$$

 \vec{t}
 M
 \vec{V}

$$\vec{V} = r\omega \vec{t}$$

$$T = \frac{2\pi}{\omega}$$

$$(\text{rad/s}) \quad \omega \quad (\text{rad}) \quad \theta$$

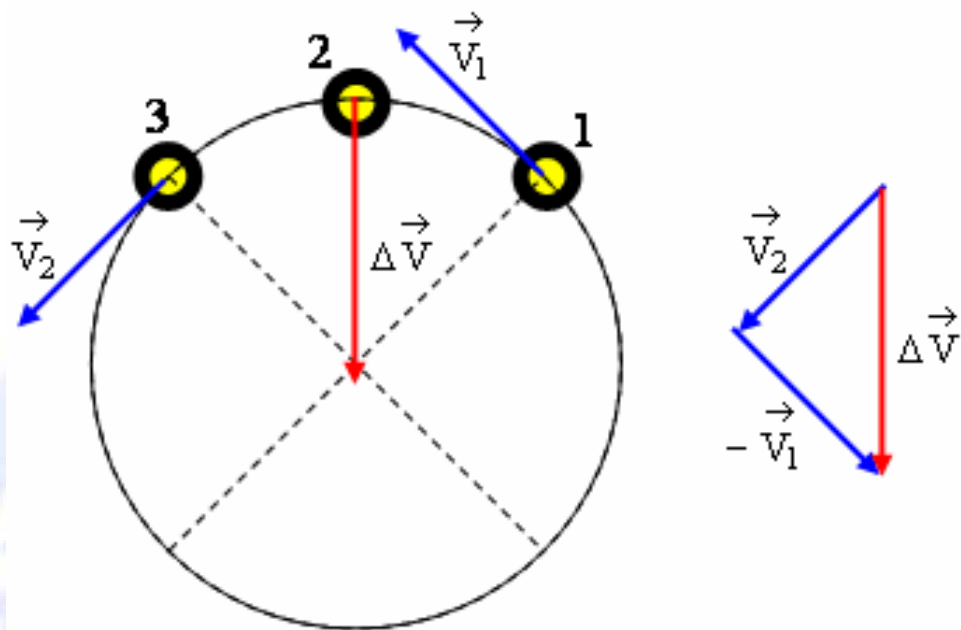
$$d\theta = \omega dt$$

$$\theta = \omega t + \omega_0$$

 $t + \Delta t$
 t
 M
 (s)
 r
 θ

$$S = r \cdot \theta$$

$$\Delta \vec{V} \neq 0$$



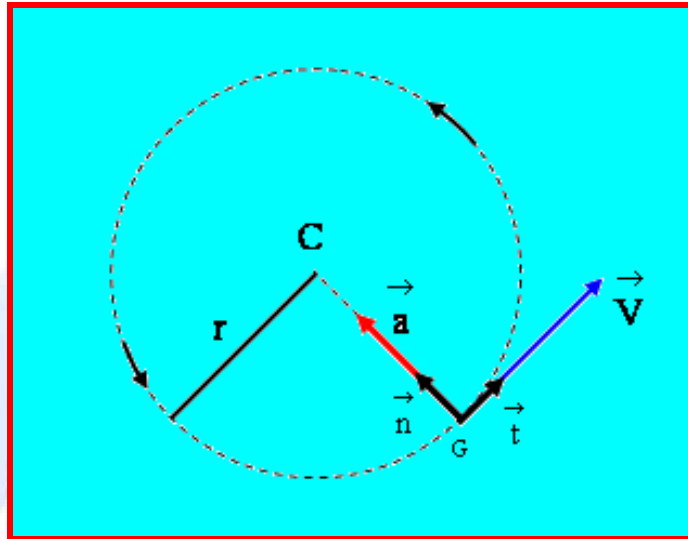
\vec{a}_i

$$\vec{a}_i = \frac{\vec{v}_{i+1} - \vec{v}_{i-1}}{2\tau}$$

$$\vec{a} = \omega^2 r \vec{n}$$

$$\vec{a} = \frac{v^2}{r} \vec{n}$$

C



:

- 3

G m

\vec{F}

$$\vec{F} = m \cdot \vec{a}_G :$$

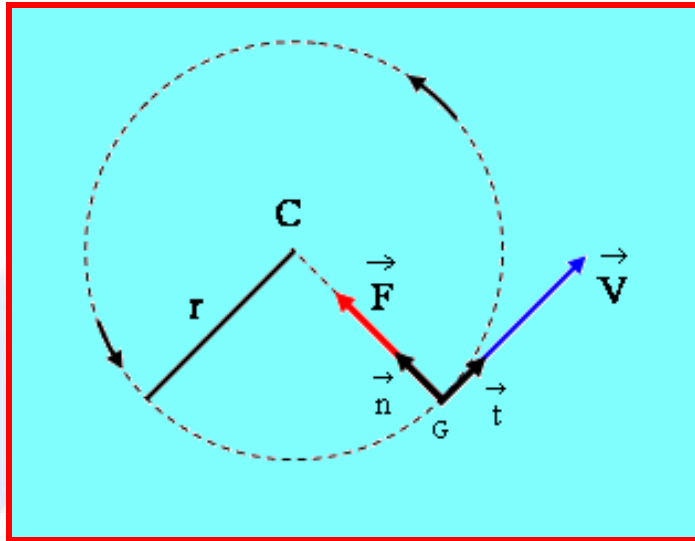
:

$$\vec{F} = m\omega^2 r \cdot \vec{n}$$

$$\vec{F} = \frac{mv^2}{r} \cdot \vec{n}$$

\vec{F}

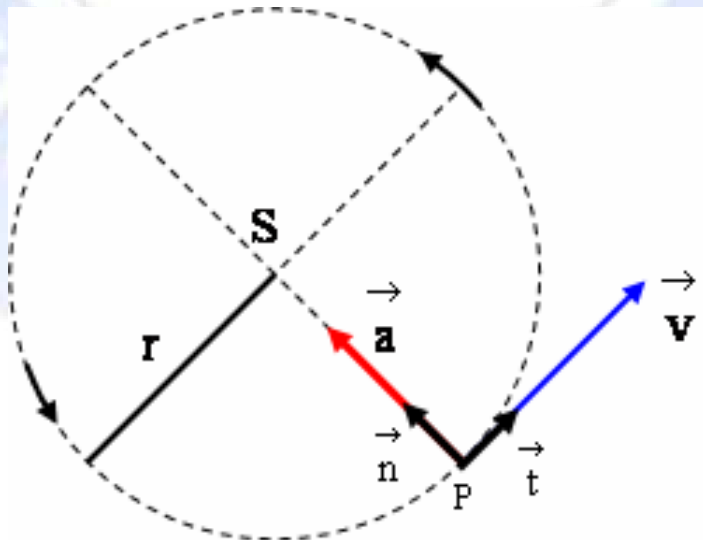
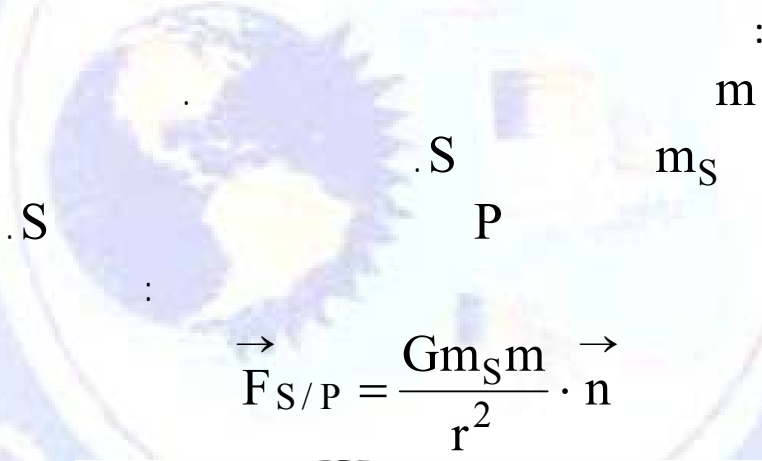
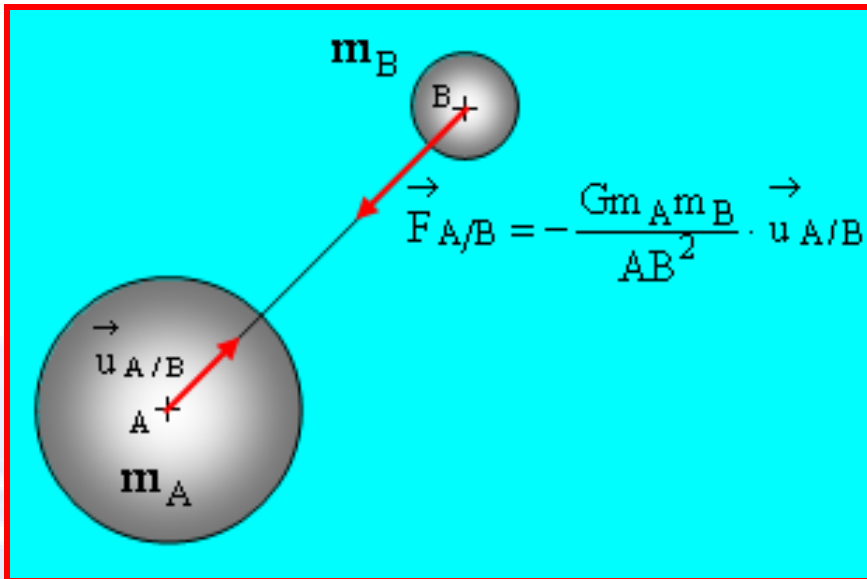
C



- 4

A m_A (A)
 B m_B (B)

AB



$$\vec{a} = \left(\frac{v^2}{r} \right) \cdot \vec{n}$$

v

$$\vec{F}_{S/P} = m \cdot \vec{a}$$

$$\frac{Gm_S m}{r^2} \cdot \vec{n} = m \cdot \vec{a}$$

$$\frac{Gm_S}{r^2} \cdot \vec{n} = \frac{v^2}{r} \cdot \vec{n}$$

$$v^2 = \frac{Gm_S}{r}$$

S

$$v^2 = \frac{Gm_S}{r}$$

$$T^2 = \frac{4\pi^2 r^2}{v^2} \quad ; \quad T = \frac{2\pi r}{v}$$

$$v^2 = \frac{Gm_S}{r}$$

$$\frac{T^2}{r^3} = \frac{4\pi}{Gm_S}$$

K_S

(orbite elliptique)

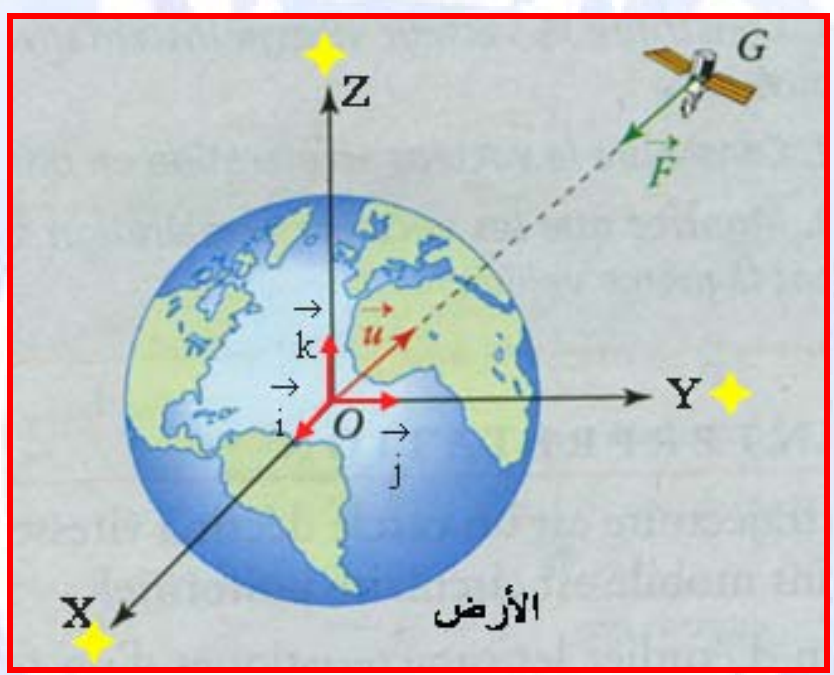
r

$$\frac{T^2}{a^3} = \frac{4\pi}{Gm_S}$$

O



(O) $\left(\vec{O}; \vec{i}, \vec{j}, \vec{k} \right)$

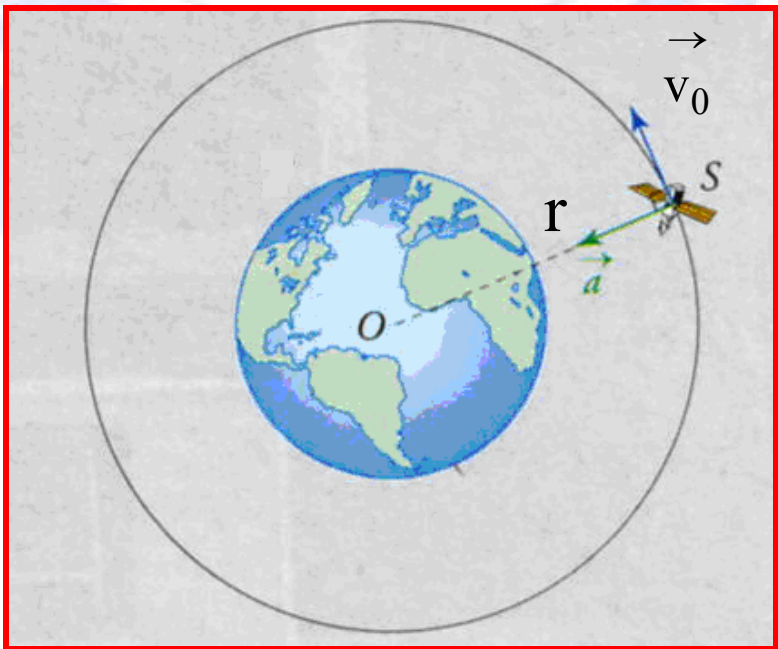


24,0h

O
O

: m_p m_s

$$\frac{T^2}{a^3} = \frac{4\pi}{Gm_p}$$

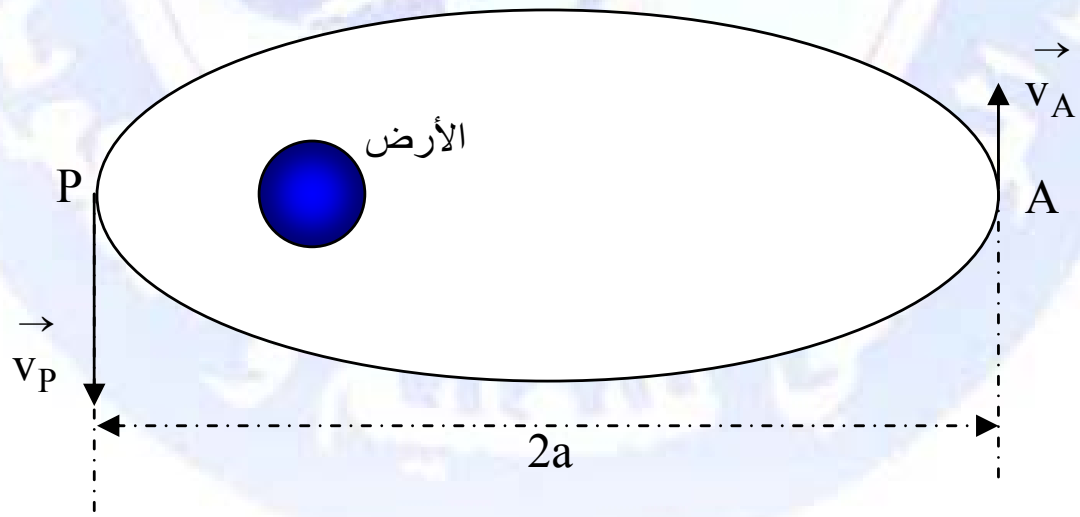


\vec{v}_0

$\cdot OM_0$

$$\frac{G \cdot m_T \cdot m}{r_0^2} \cdot \vec{n} = \frac{m v_0^2}{r_0} \cdot \vec{n}$$

$$v_0 = \sqrt{\frac{G m_T}{r_0}}$$



(périgée)

() P

(apogée)

() A

(période propre)

24,0 h

$r = 42,2 \cdot 10^3 \text{ Km}$

