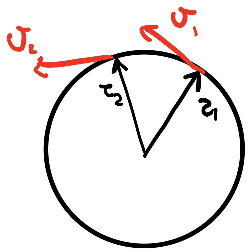
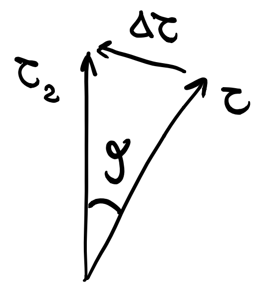
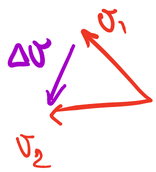
QUIZ MOTO CIRCOLARE

- taglio fune
- velocita angolare costante $v = \omega \cdot r$







$$\Delta v \Longrightarrow \Delta p \Longrightarrow$$

FORZA

ENERGIA

$$\Delta r = r \sin\vartheta \rightsquigarrow \Delta r = r\,\Delta\vartheta$$

$$\frac{\Delta r}{\Delta t} = \bar{v} = r\,\frac{\Delta\vartheta}{\Delta t} = r \cdot \omega$$

giri al secondo

$$\frac{\Delta v}{\Delta t} = \frac{\Delta r}{\Delta t}\,\omega \Rightarrow \bar{a} = v \cdot \omega = \begin{cases} \omega^2 r \\ \dfrac{v^2}{r} \end{cases}$$

$$F_{grav} = - F_{rot} = \frac{\Delta p}{\Delta t} = m \omega^2 \tau = \frac{m v^2}{\tau}$$

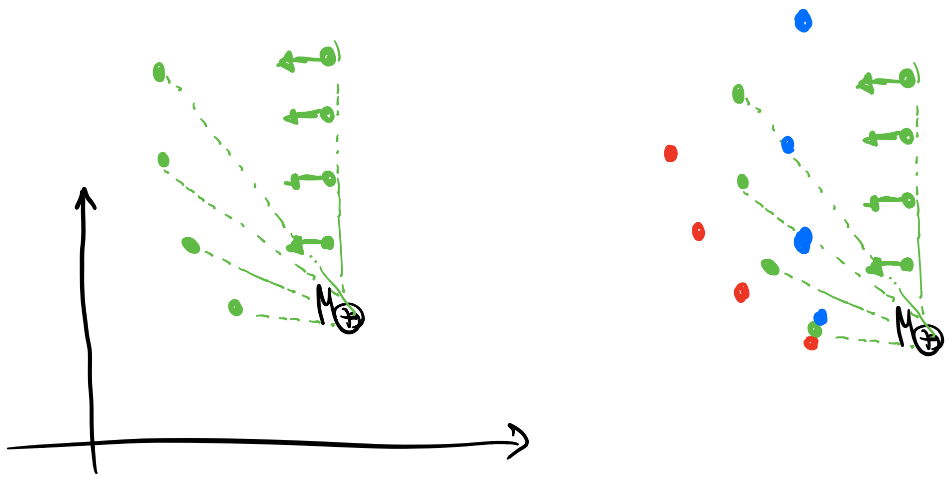
$$\frac{\overbrace{M_\oplus \cdot \cancel{m}}^{\text{simetrico } M_1 \leftrightarrow M_2} \cdot k}{\tau^\alpha} = \frac{\cancel{m} v^2}{\tau}$$

$$v = \sqrt{\frac{M_\oplus \cdot k}{\tau^{\alpha-1}}}$$

$\alpha = 0$ $\quad F \sim \text{cost}$ $\quad v = \sqrt{M_\oplus k \tau}$ $\quad \omega \sim \frac{c}{\sqrt{\tau}}$

$\alpha = 1$ $\quad F \sim \frac{1}{\tau}$ $\quad v = \sqrt{M_\oplus k}$ $\quad \omega = \frac{c}{\tau}$

$\alpha = 2$ $\quad F \sim \frac{1}{\tau^2}$ $\quad v = \sqrt{M_\oplus k \frac{1}{\tau}}$ $\quad \omega = \frac{c}{\tau^{3/2}}$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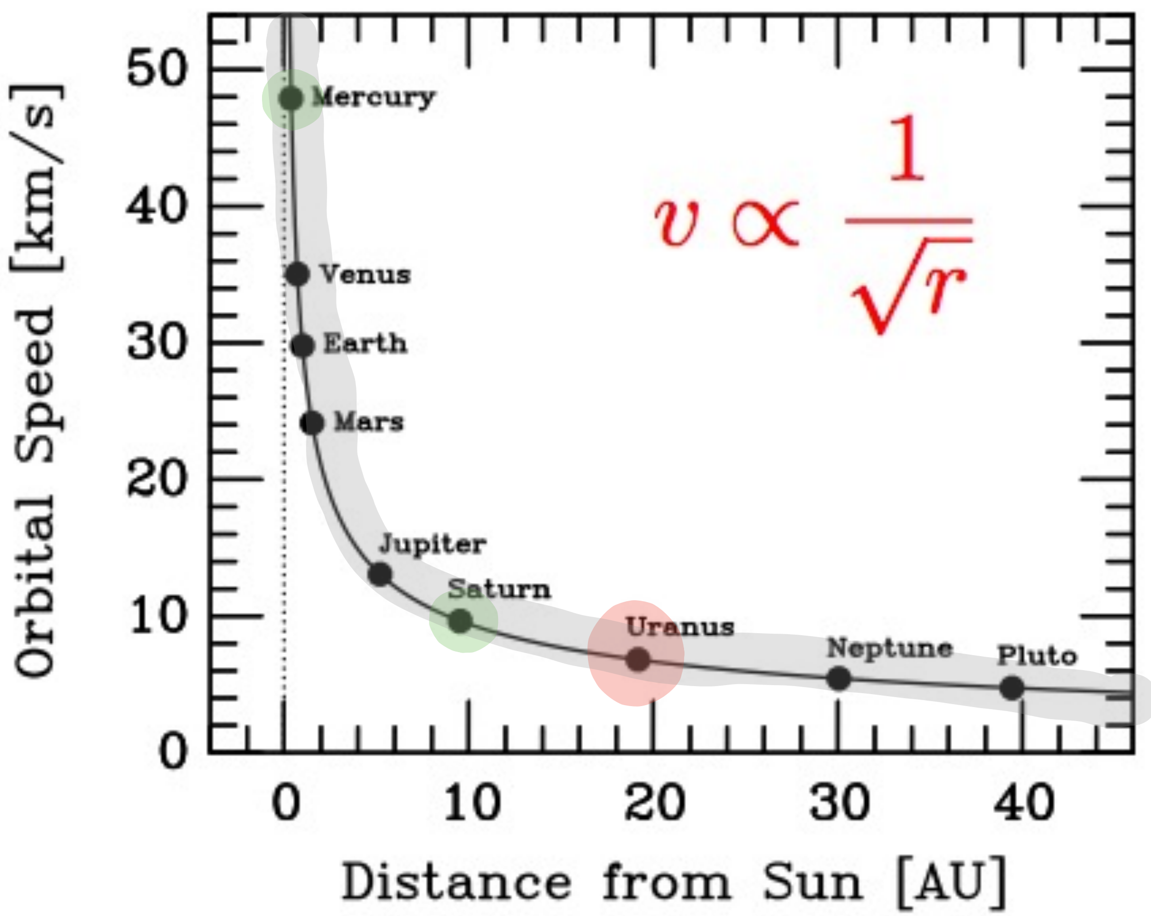
Orbital Speed [km/s]
Distance from Sun [AU]
Mercury
Venus
Earth
Mars
Jupiter
Saturn
Uranus
Neptune
Pluto
$v \propto \frac{1}{\sqrt{r}}$

$R = 6000\ Km =$

$R' = 60 \cdot R = 3.6\ 10^8\ m$

$$\omega = \frac{2\pi}{28d} = \frac{2\pi}{2\ 10^6\ sec} \sim \pi \cdot 10^{-6} s^{-1}$$

$$a = \omega^2 R' = \qquad \frac{m}{s^2}$$

$$a = \frac{[m]}{[s]} \Big/ [s] = \frac{[m]}{[s]^2}$$

$$F \sim \frac{1}{r^2} \qquad F_{R'} \sim \left(\frac{R}{R'}\right)^2 \cdot F_R$$

$$g = \left(\frac{R'}{R}\right)^2 \cdot \omega^2 \cdot R' = 3.6 \times 10^3\ \pi^2\ 10^{-12}\ 3.6 \times 10^8\ \frac{m}{s^2}$$

$$= 9 \quad \frac{m}{s} \Big/ s$$

la luna gira con una velocità tale da generare una accelerazione centrifuga che la mantiene in orbita nonostante la attrazione di gravità.