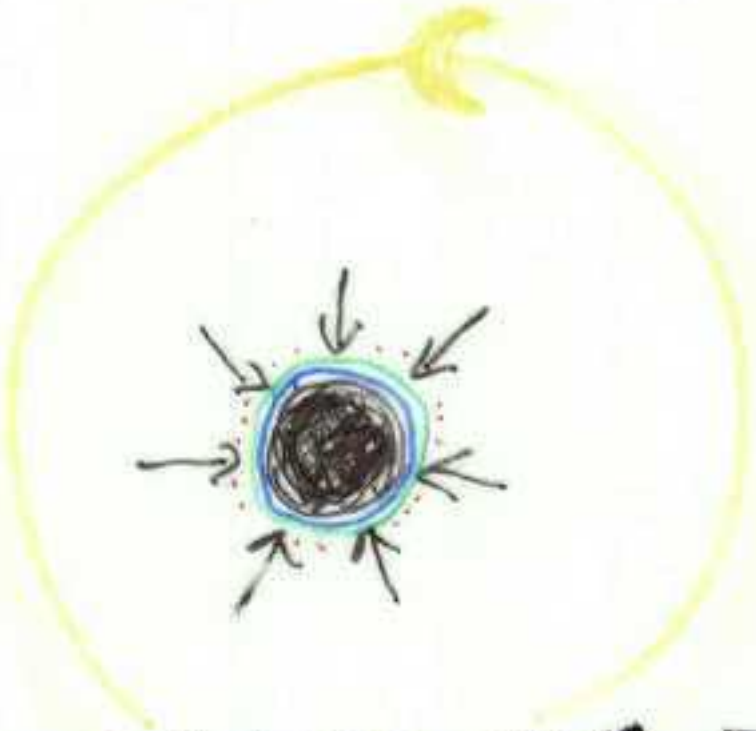


ZORAVORATUMSKA FIZIKA (ARISTOTELOVA)

F > R tone

F < R izranja

($v \sim F/R$)

NEMA PRECIZNIH ZAKONA

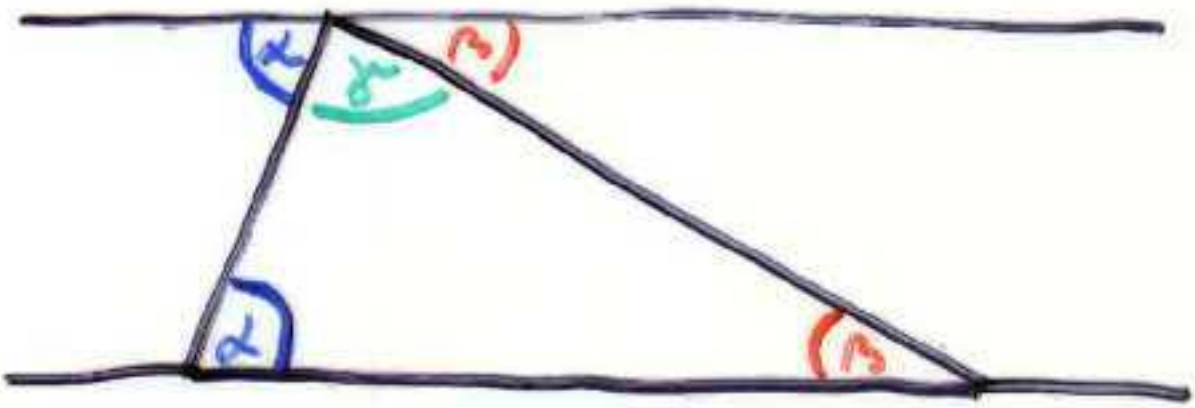
GRUMEN SOLI ●

MOŽE SR I OTOPITI PRIJE

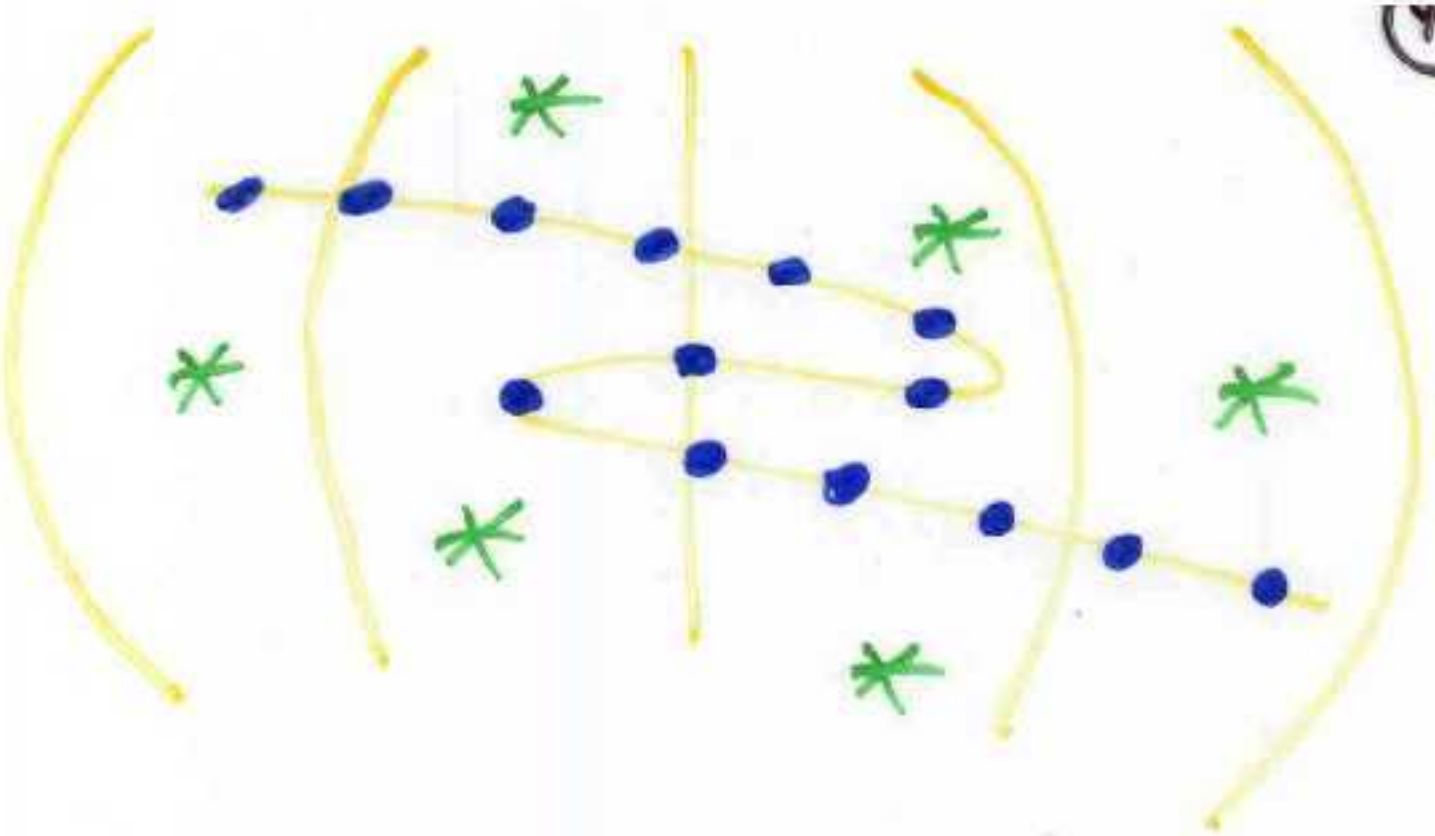
NO STO POTONE ILI IZRONI

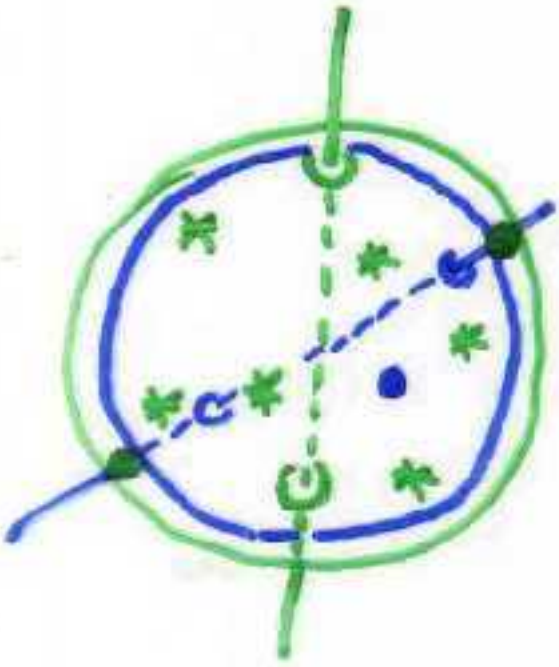
FIZIKA NIJE MATEMATIČKA

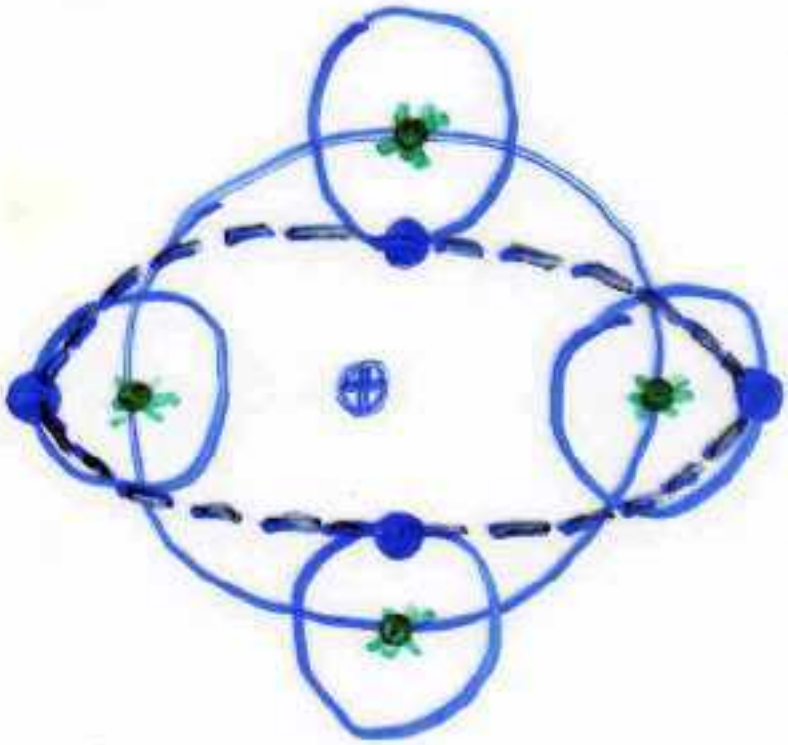
NEPROMJENJENA MATEMATIČKA ZAKONA:



$$\alpha + \beta + \gamma = 180^\circ$$



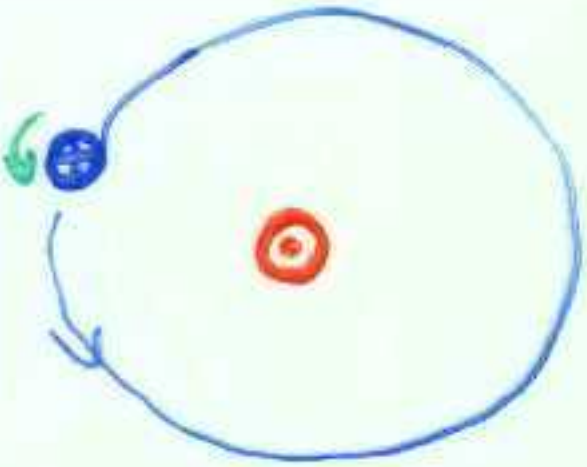




EUDOKSO

PTOLEMEJ

ARISTARH
(-3 pt.)

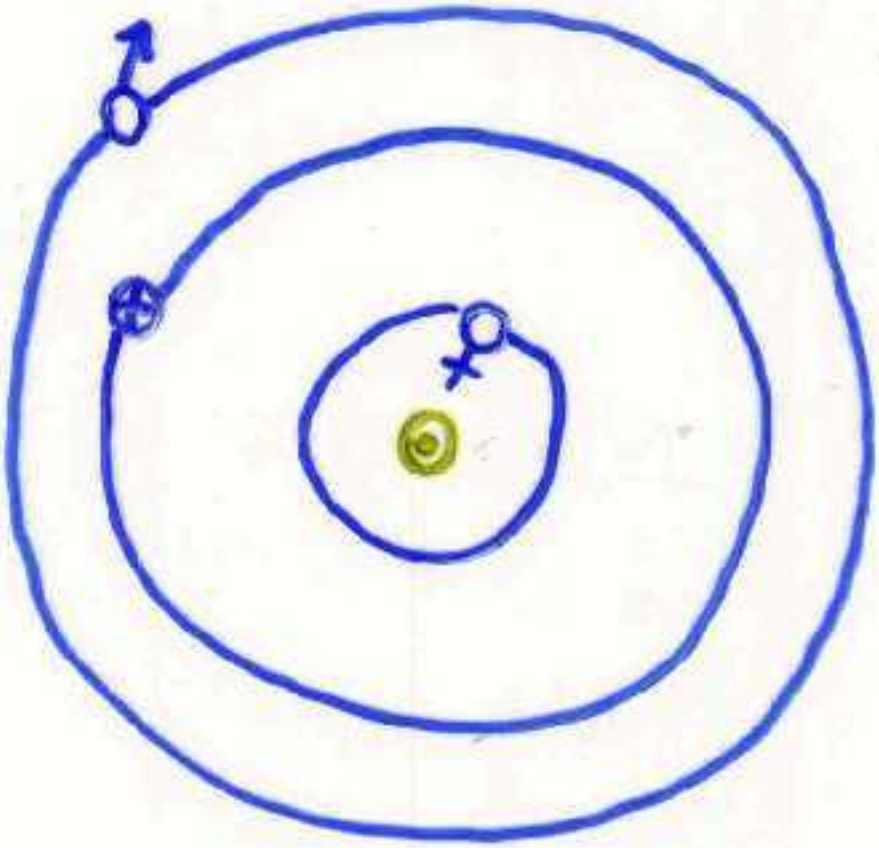


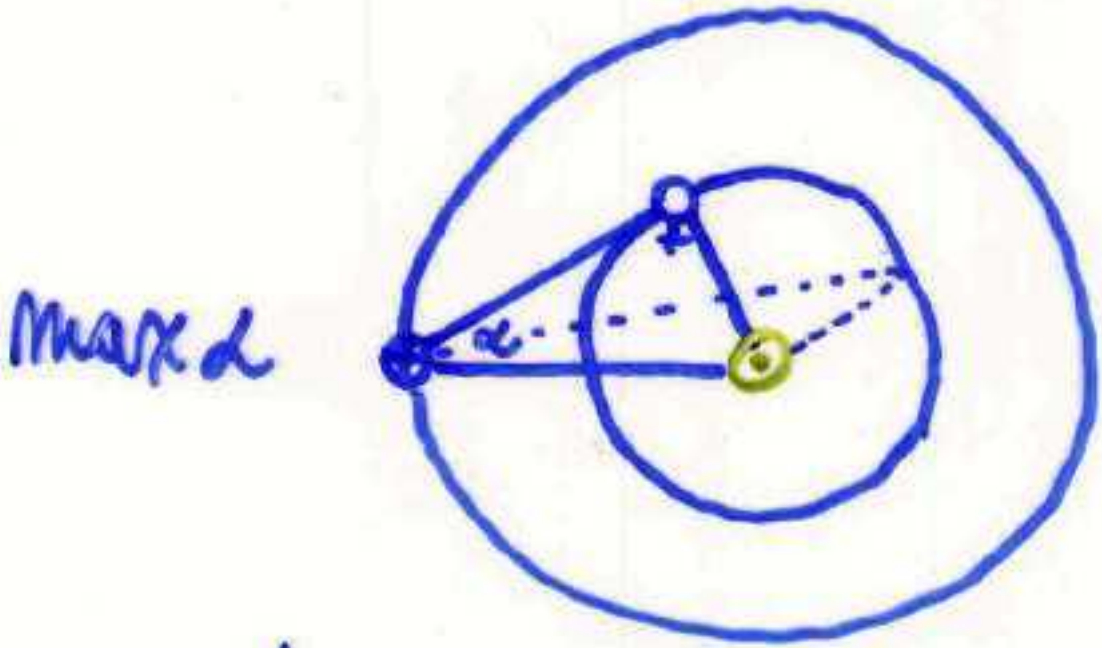
ROTACIJA 500 m/s = 1800 km/h

REVOLUCIJA 30 km/s = 100 000 km/h

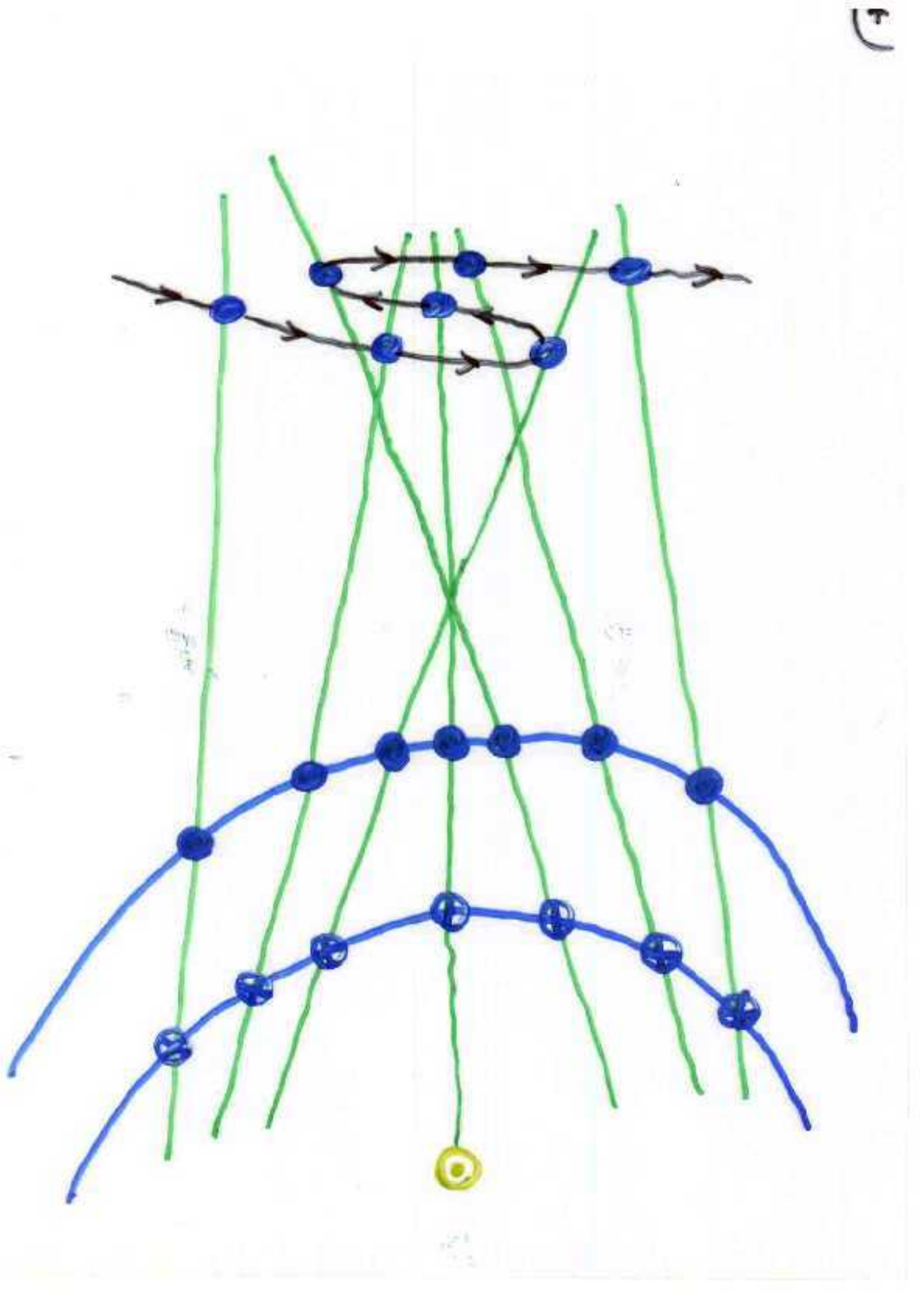
VERTIKALNO TANE, MJESEC, ...

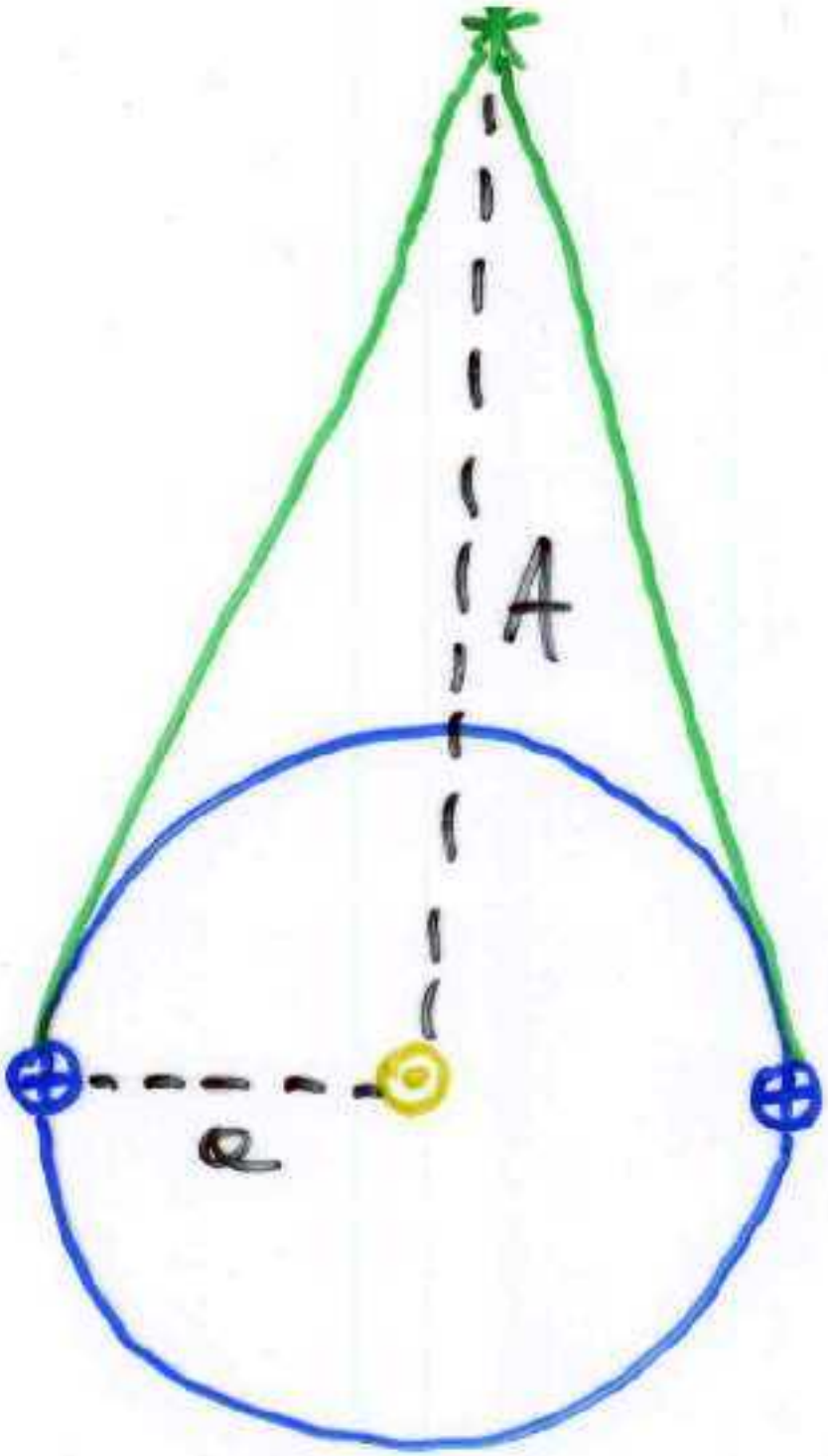
MATEM. KOREKTNI OPIS
FIZIKALNO BESMISLEN





$$d_{\varphi} = \sin\alpha \, d_{\oplus}$$





$A >>> q$

GALILEO:

JEDNOLIKO GIBANJE

MIROVANJE

$(R+x)^2 = R^2 + d^2 \rightarrow x = \ldots$

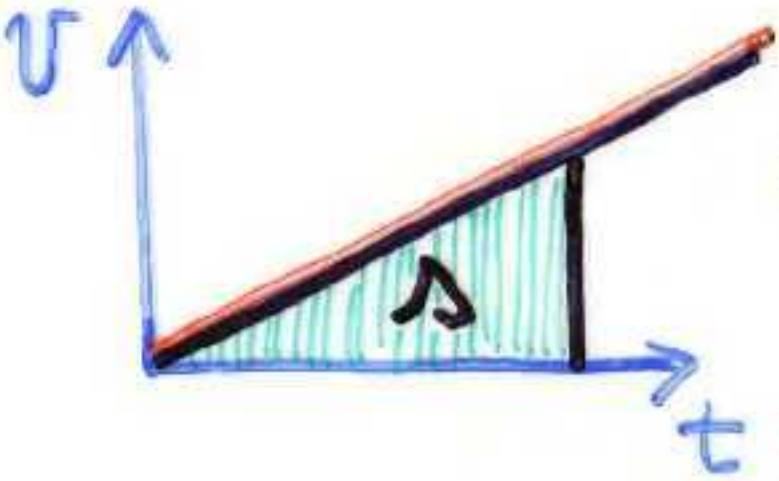
BROD, VLAK, ..

SILA ~ BRZINA

SILA ~ PROM. BRZINE (AKCELERACIJA)

NEWTON: $F = m\,a$

Merton ska & Pariška šola:
(14. st. Dr. PROFUNDUS & N. ORESME)



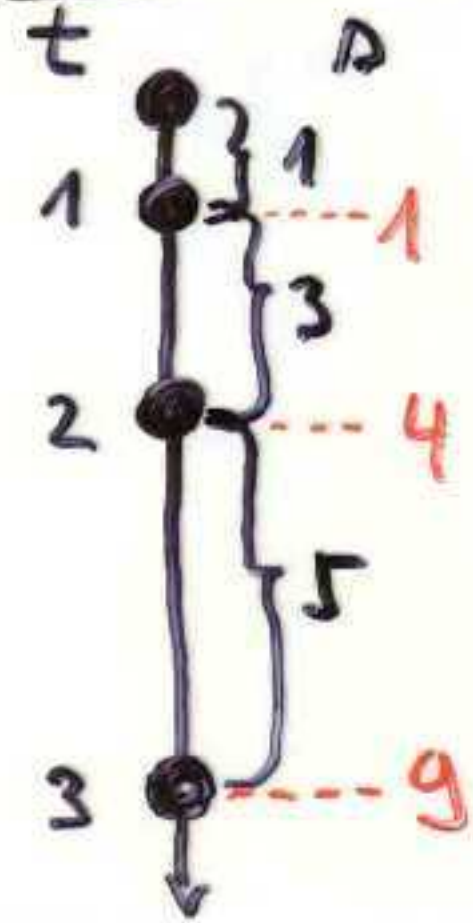
$$v = at$$

(a je kon. akcel.)

$$\Updownarrow$$

$$s = \frac{1}{2}at^2$$

GALILEO (17. st.):



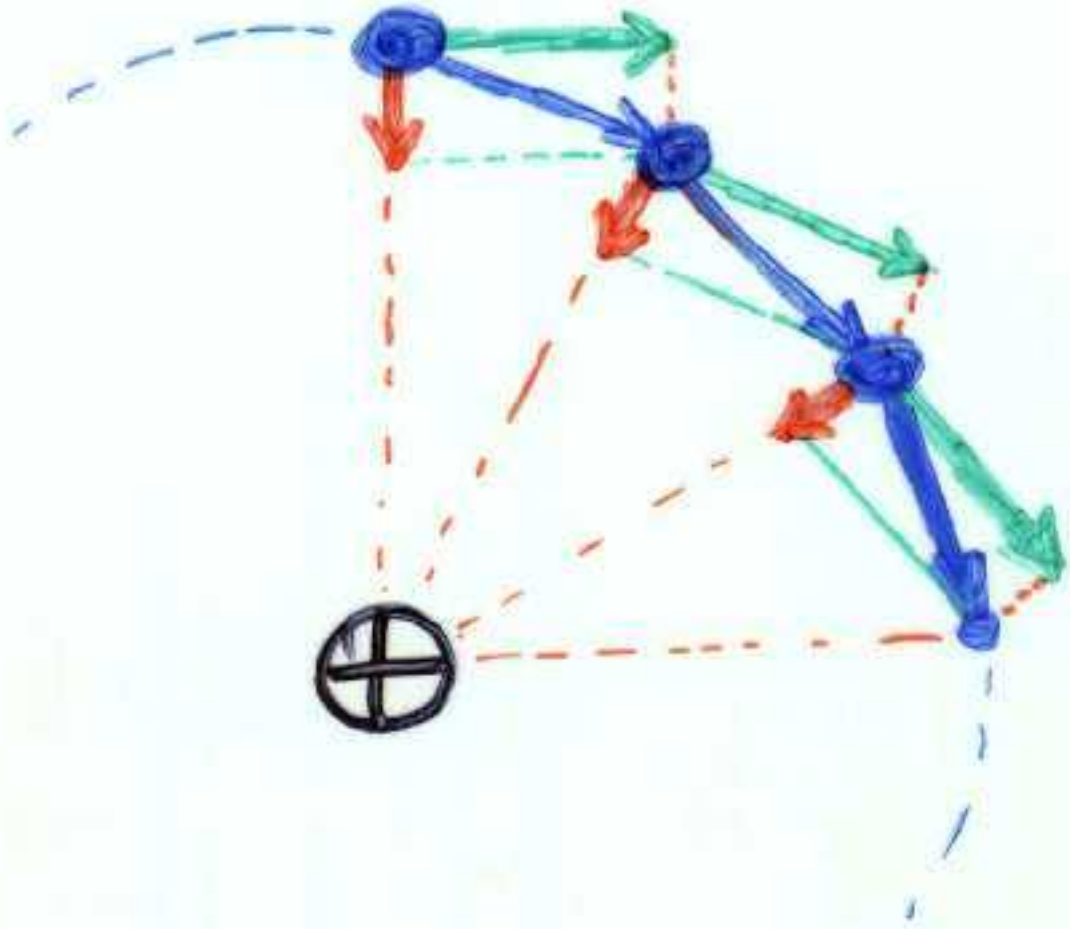
$$s \sim t^2 \Leftrightarrow$$

$$a = \text{const}$$

$$= g$$

$$= 9.81\ m/s^2$$

HOOKEOV "PAD" NA NEBU:



SLOBODNI PAD

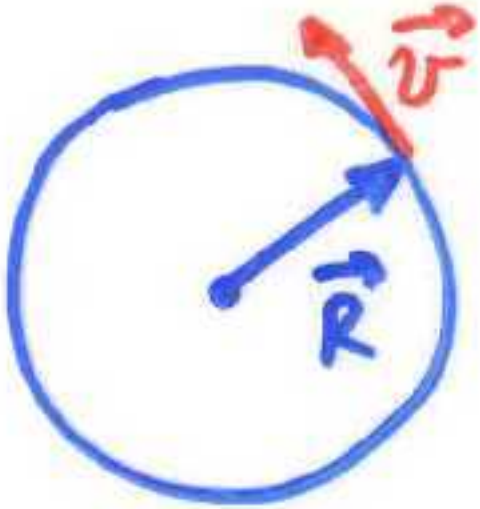
INERCIJA

} PUTANJA

KVALITATIVNO (NE KVANTIT.)

RAČUNI J. NA STANKA ORBITE

JEDNOLIKO KRUŽNO GIBANJE:



$\vec{v} \perp \vec{R}$ $\quad \vec{a} \perp \vec{v}$

$\vec{a} \parallel \vec{R}$

$$v = \frac{2R\pi}{T} \quad a = \frac{2v\pi}{T} \rightarrow a = \frac{4\pi^2 R}{T^2}$$

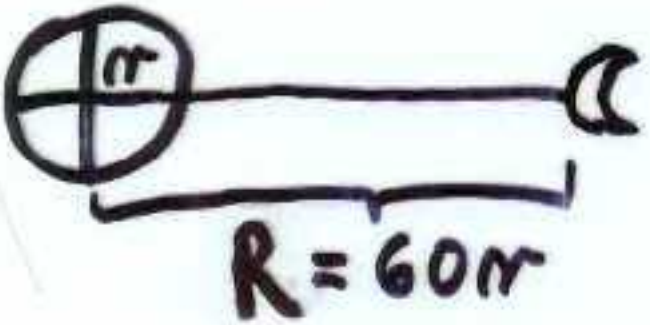
HUYGENS (1673) $a = v^2/R$

HALLEY, HOOKE, HUYG. ;(

$$a = \frac{4\pi^2 R}{T^2} \qquad T^2 \sim R^3 \quad (3K)$$

$$a \sim \frac{1}{R^2}$$

NEWTON:



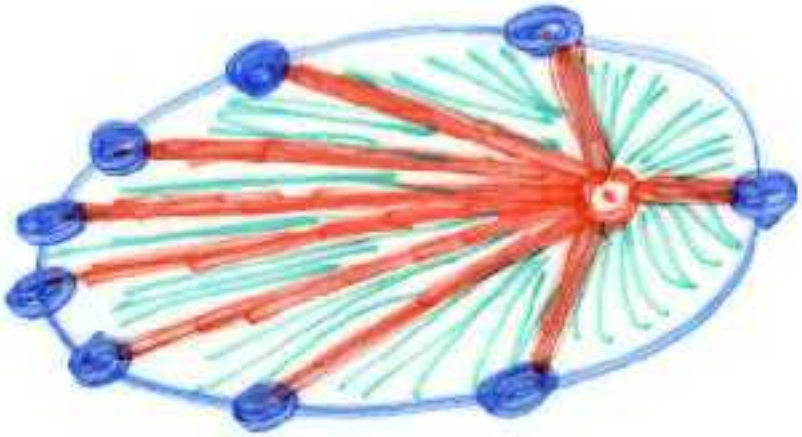
$$a = \frac{g}{60^2}$$

$$T = 2\pi\sqrt{\frac{R}{a}} = 2\pi\sqrt{\frac{60^3 r}{g}}$$

T, r, g = POZNATO

KEPLER:

(1) PUTANJE SU ELIPTIČKE

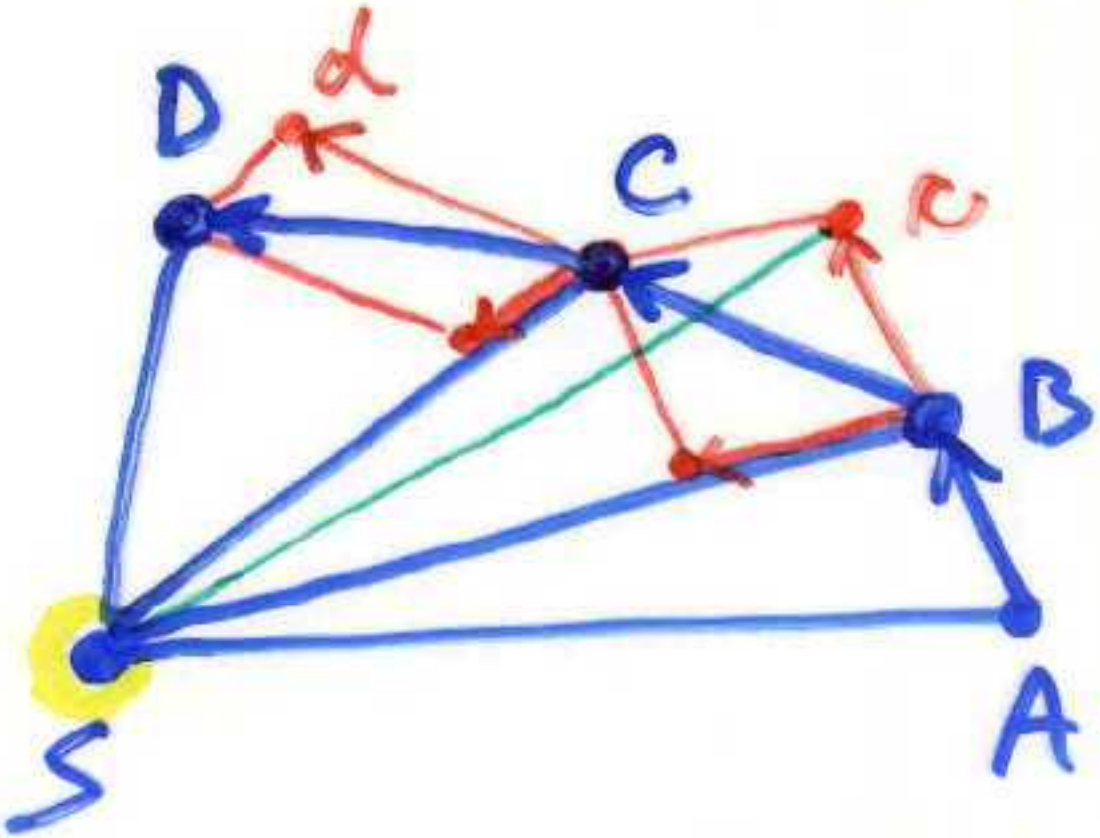


(2) U JEDNAKIM VREMENIMA JEDNAKE POVRŠINE

(3) $R^3 \sim T^2$

PRINCIPIA

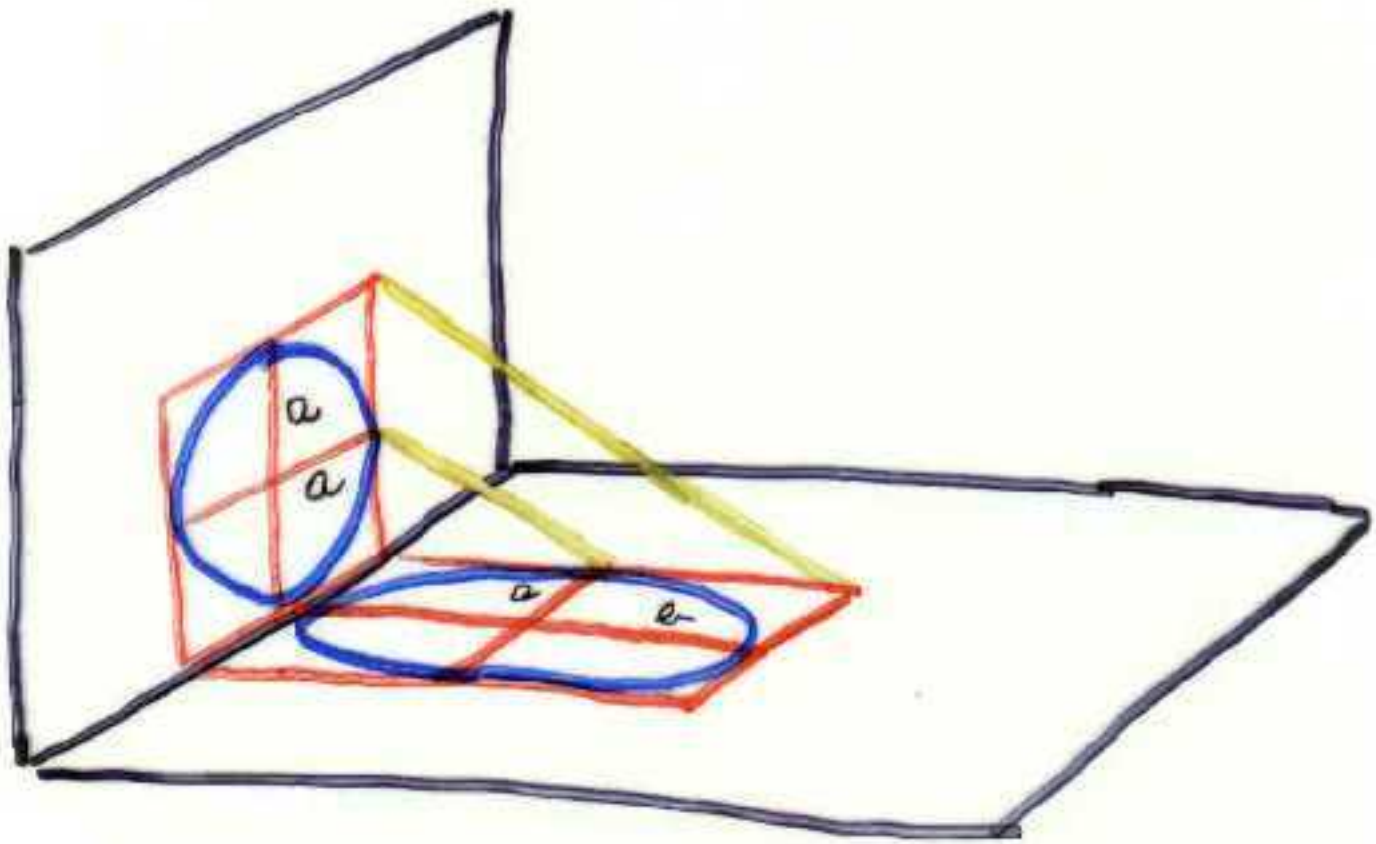
2. KEPL. ⇔ CENTR. SILA



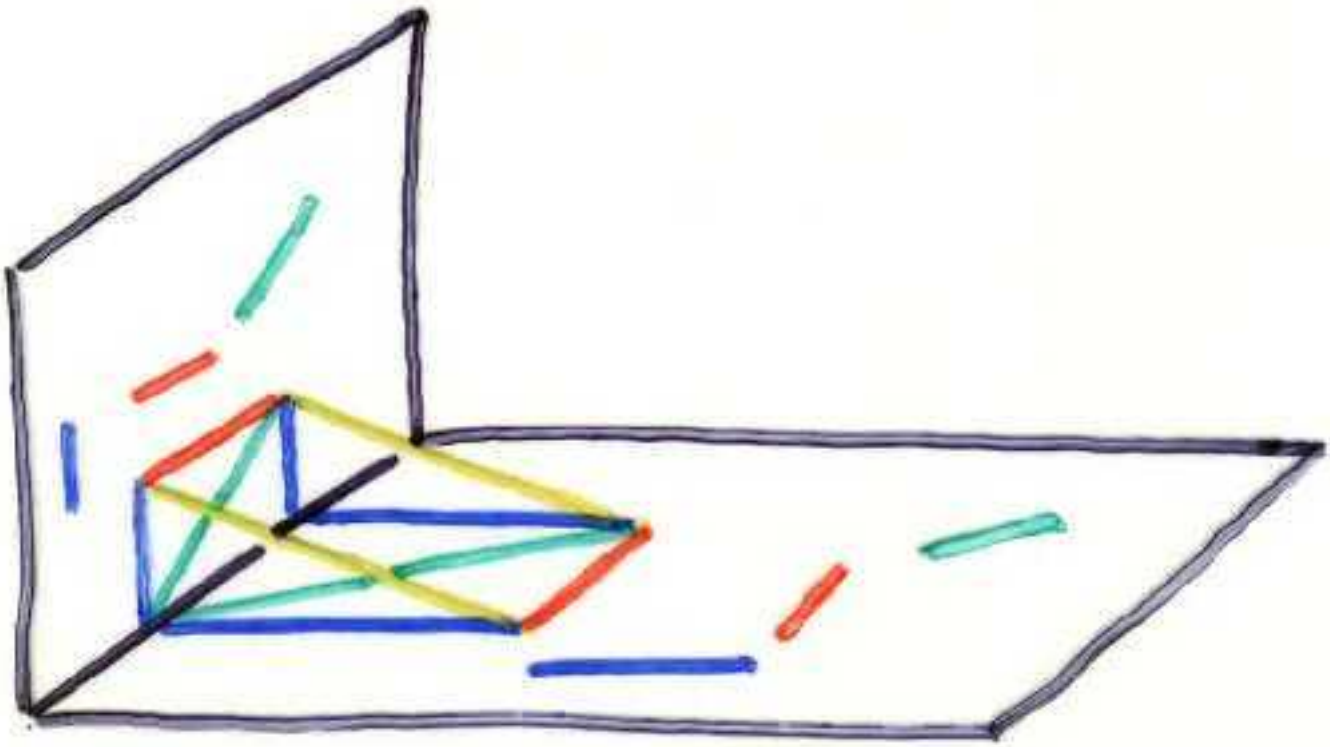
ELIPTIČKE PUTANJE :

(1. KEPLER)

ELIPSA JE KOSA PROJEKCIJA KRUŽNICE



KOSA PROJEKCIJA: (46



FAKTORI RASTEZANJA DUŽINA:

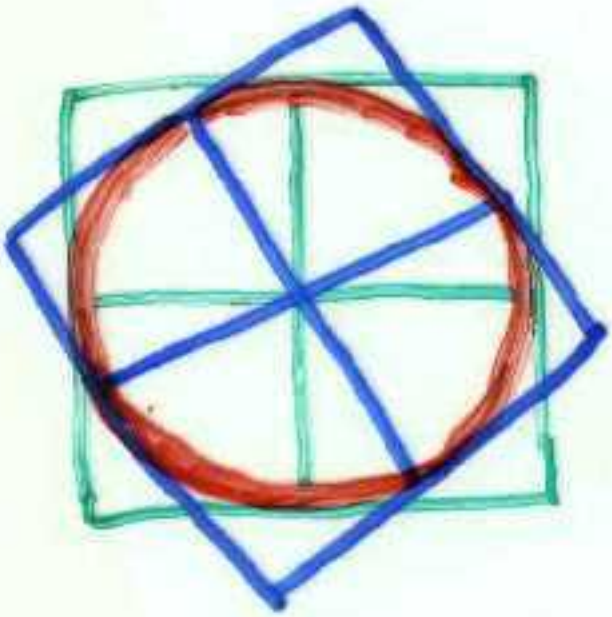
$1 < k < K$ (ISTI ZA || DUŽINE)

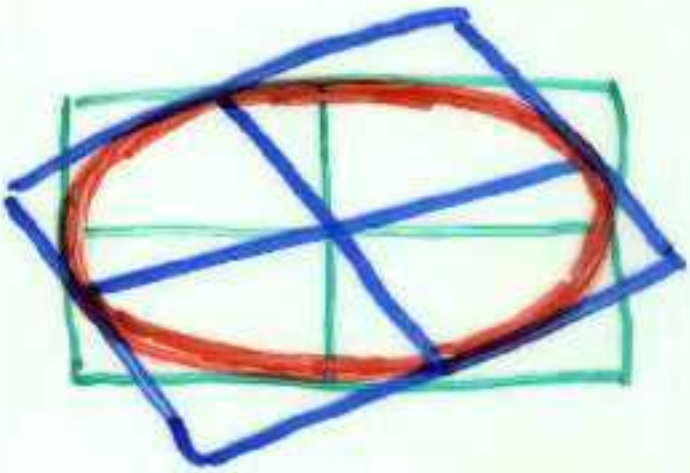
FAKTOR RASTEZANJA POVRŠINA:

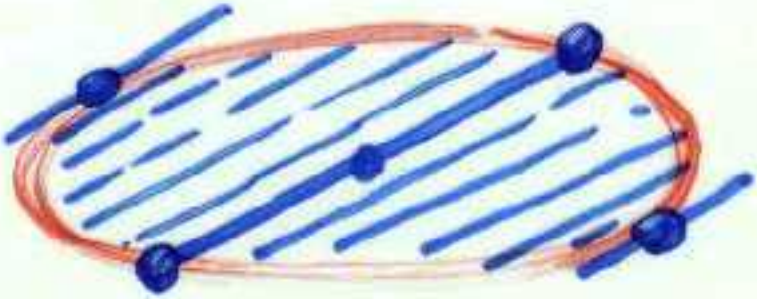
K (ISTI ZA SVE POVRŠINE)

SVOJSTVA ELIPSE

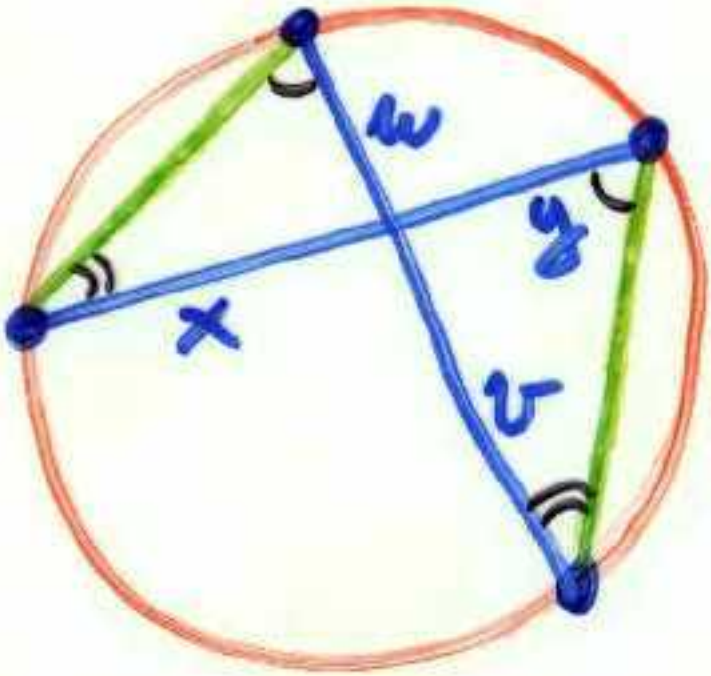
(1) KONJUGIRANI DIJAMETRI ODREĐUJU JEDNAKE POVRŠINE ▱





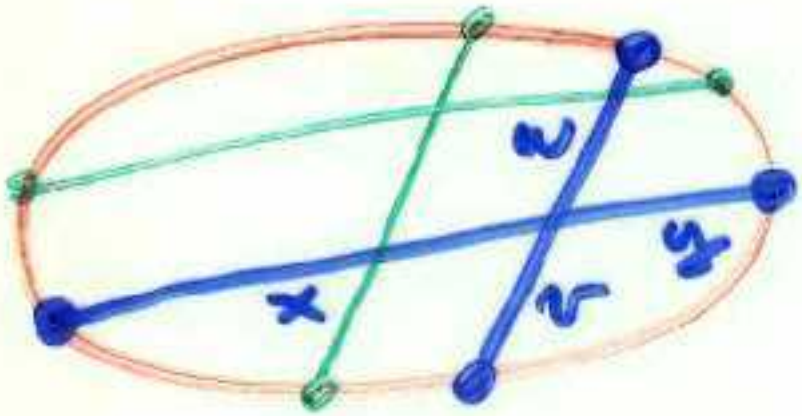


(2)



$$\frac{x}{w} = \frac{v}{y}$$

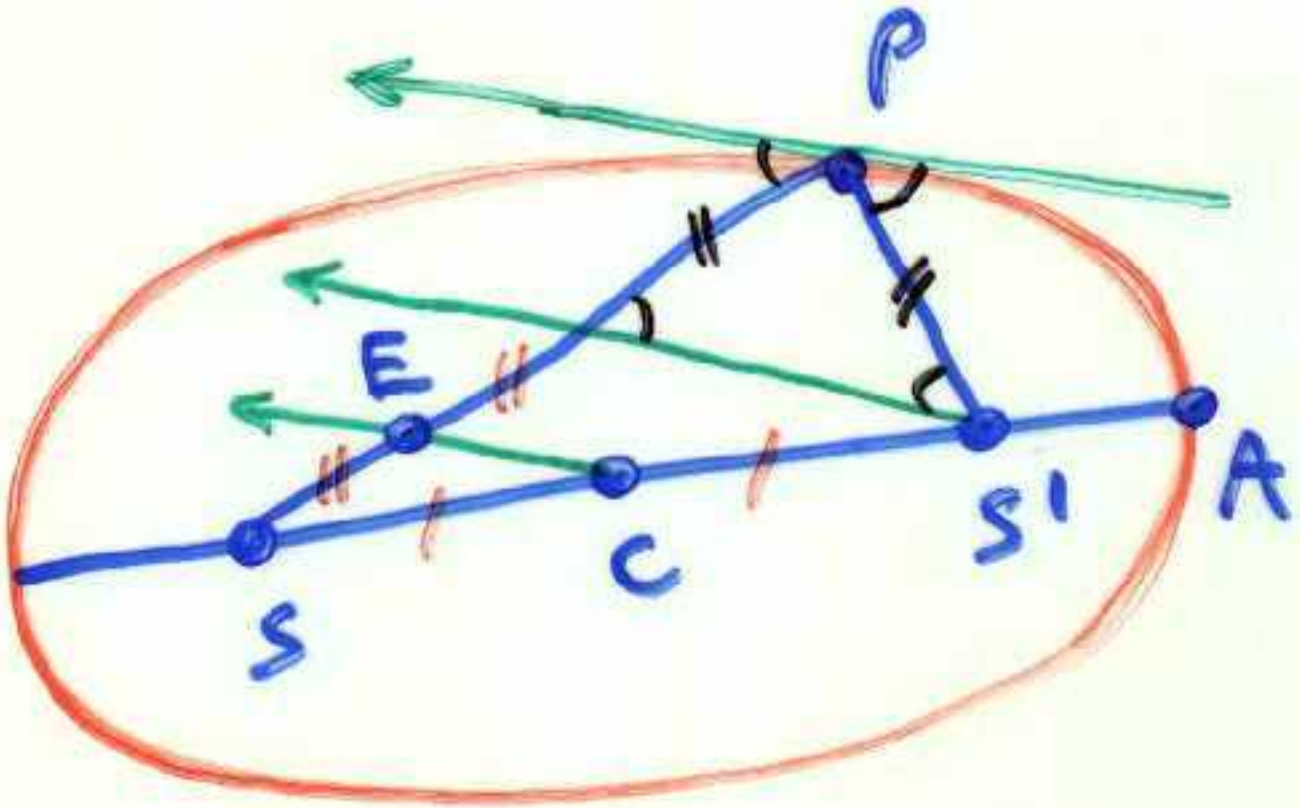
$$\boxed{\frac{xy}{wv} = 1}$$



$$\boxed{\frac{xy}{wv} = k}$$

ČUVA SE PARALELNIM PODACIMA

(3) NEWTONOVO SVOJSTVO



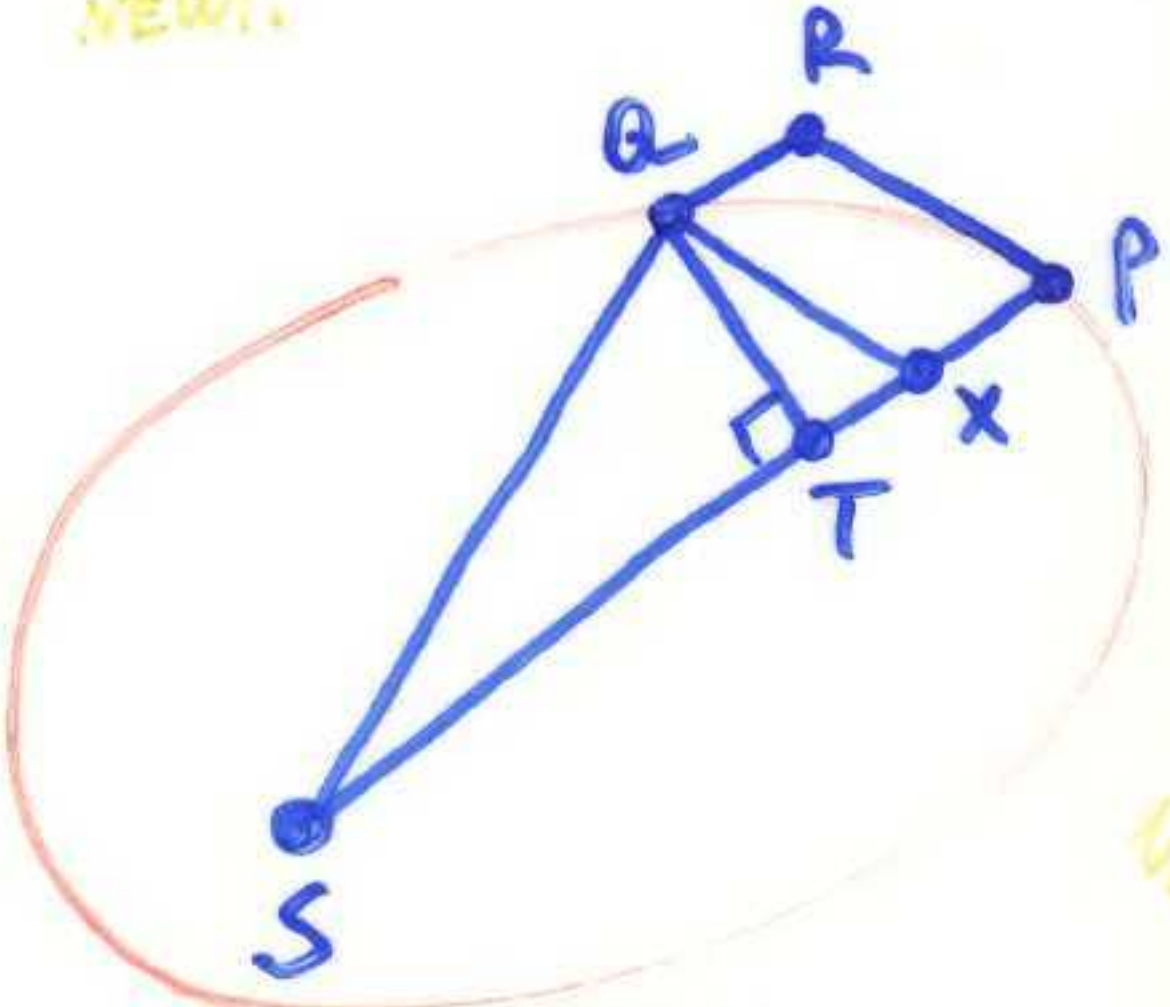
$$PE = \frac{1}{2}(PS + PS') = AC$$

(2) ORBITA SL. PADA (ELIPTIČKA)

→ ZAKON CENT. SILE

$$F \sim a \sim \frac{\Delta}{t^2} \sim \frac{\Delta}{(pov)^2}$$

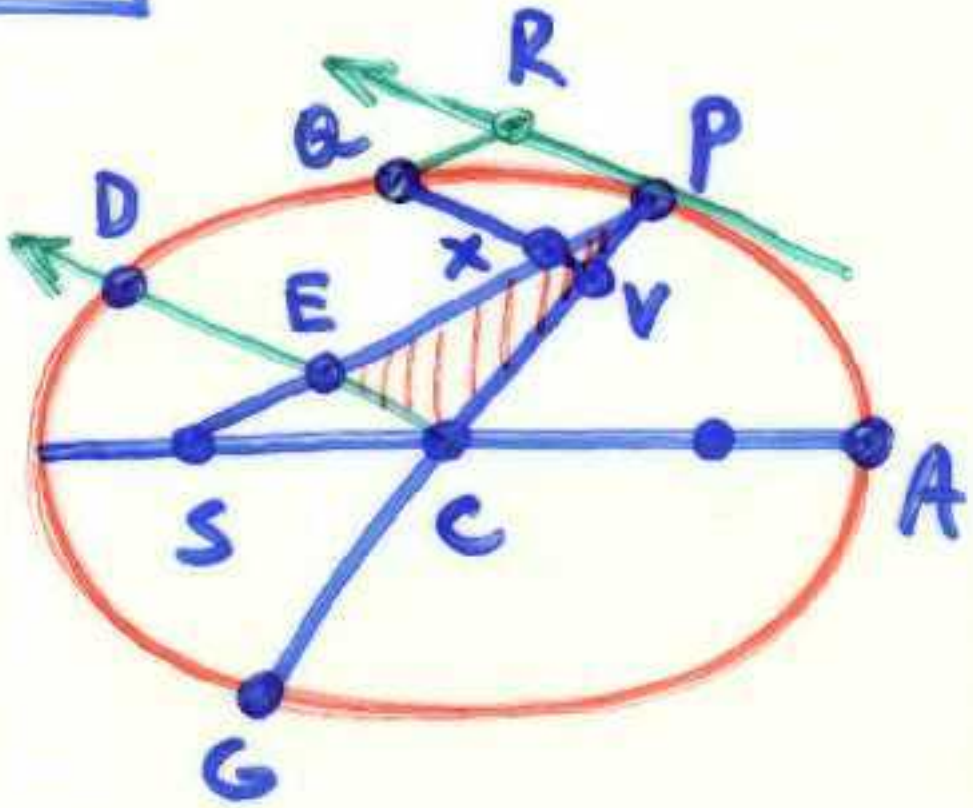
GAL. NEWT. | PLAN. | KEPL.



VELIČINA

$$F \sim \frac{QR}{QT^2 \cdot SP^2}$$

QR

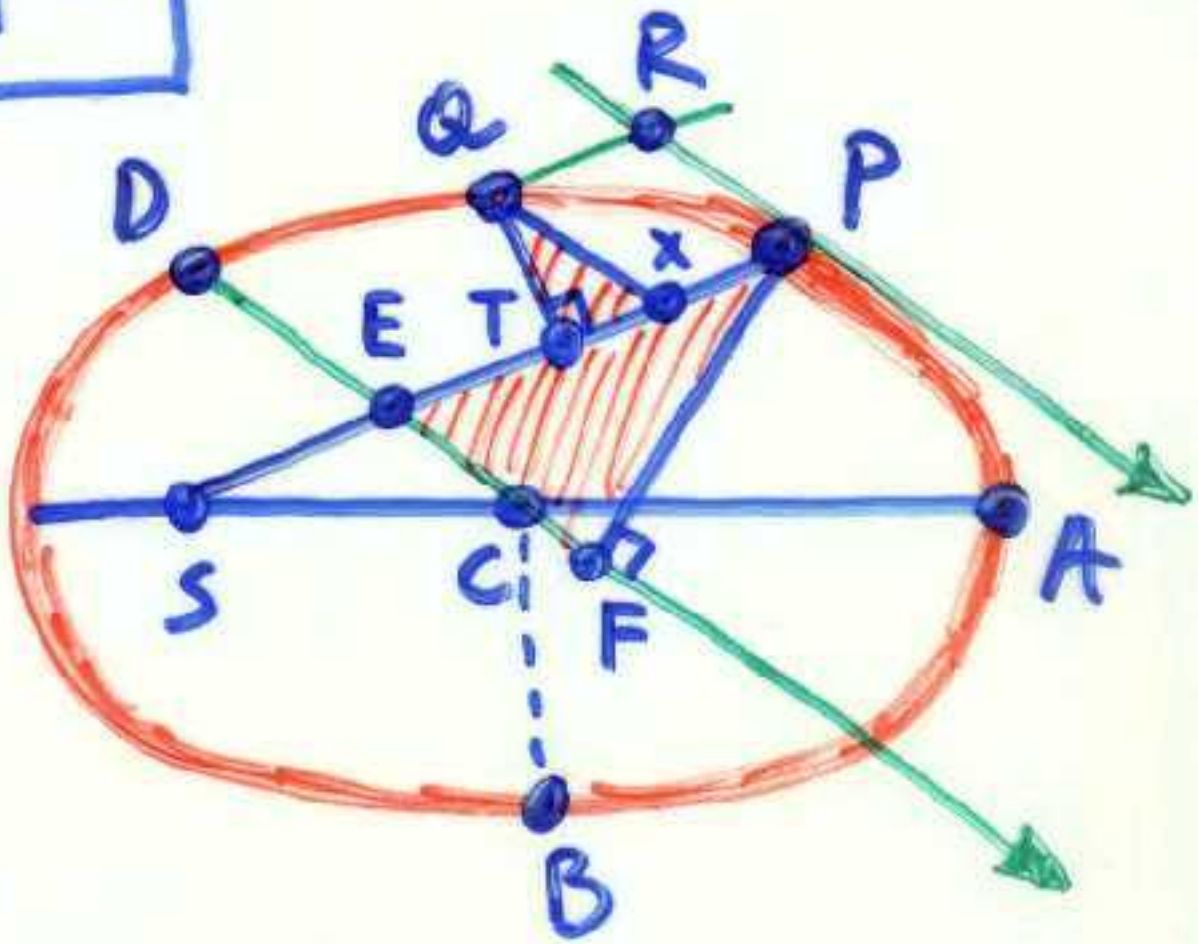


$$\frac{PE}{PC} = \frac{PX}{PV} = \frac{QR}{PV} \rightarrow QR = PV \cdot \frac{AC}{PC}$$

$$\frac{PV \cdot VG}{QV^2} = \frac{PC^2}{DC^2} \rightarrow PV = \frac{QV^2 \cdot PC^2}{GV \cdot DC^2}$$

$$QR = \frac{QV^2 \cdot PC^2}{GV \cdot DC^2} \cdot \frac{AC}{PC}$$

QT^2



$$\frac{QT}{QX} = \frac{PF}{PE} \rightarrow QT = QX \cdot \frac{PF}{AC}$$

$$\rightarrow QT^2 = QX^2 \frac{PF^2}{AC^2} =$$

$$= QX^2 \frac{BC^2}{CD^2}$$

$$\frac{QR}{QT^2} = \frac{QV^2 \cdot PC^2}{GV \cdot DC^2} \cdot \frac{AC}{PC} \cdot \frac{CD^2}{QX^2 \cdot BC^2}$$

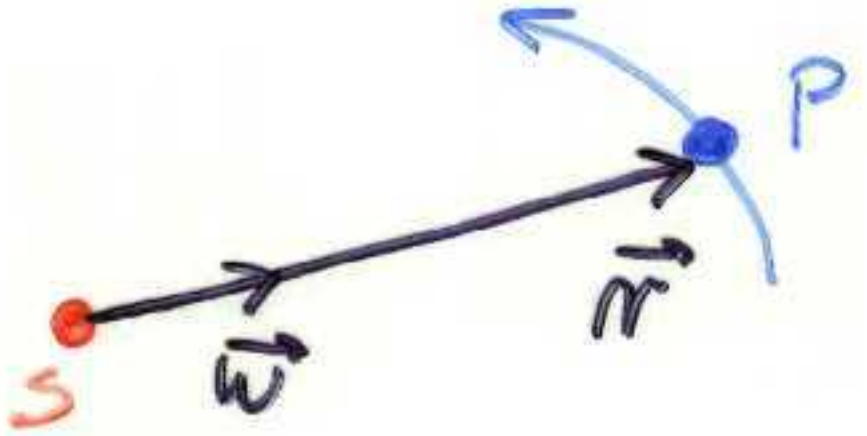
$$= \frac{QV^2}{QX^2} \cdot \frac{PC}{GV} \cdot \frac{AC}{BC^2}$$

$\frac{QV^2}{QX^2} \rightarrow 1$ $\quad$ $\frac{PC}{GV} \rightarrow 1/2$

$(Q \rightarrow P) \Rightarrow (X \rightarrow V)$ & $(V \rightarrow P)$

DAKLE: $QR / QT^2 = \text{const}$

$$\Rightarrow F \sim \frac{1}{SP^2}$$



$$\vec{a} = -\frac{\lambda}{r^2}\vec{w} \qquad \vec{F} = -\frac{\lambda m}{r^2}\vec{w}$$

PRINCIP AKCIJE & REAKCIJE:
(PRINCIP SIMETRIJE)

$$\vec{F} = -\frac{\lambda}{M}\frac{Mm}{r^2}\vec{w}$$

$$\vec{F} = -G\frac{Mm}{r^2}\vec{w}$$