

Dobrý den!

6.10.03 (1)

7. po kružnici

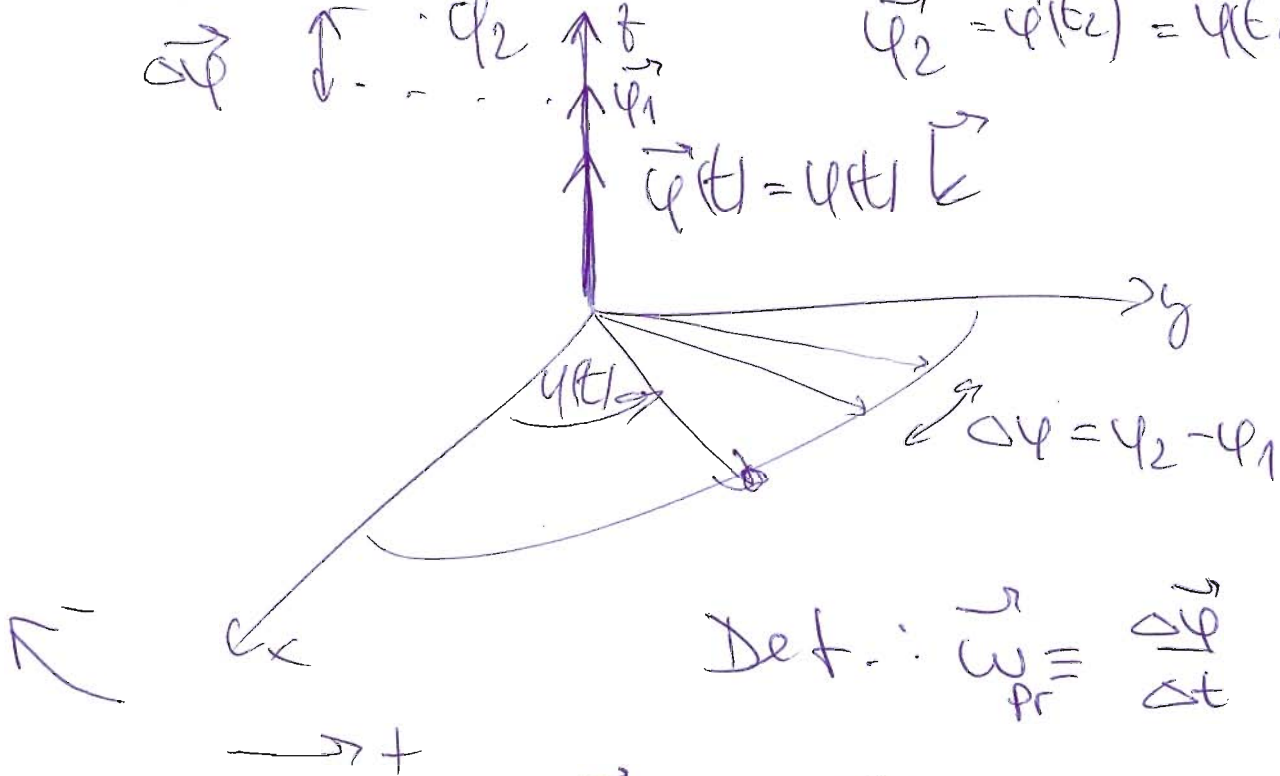
$$\vec{\varphi}_1 = \vec{\varphi}(t_1) = \varphi(t_1) \vec{k}$$

$$\vec{\varphi}_2 = \vec{\varphi}(t_2) = \varphi(t_2) \vec{k}$$

$$\Delta \vec{\varphi} = \vec{\varphi}_2 - \vec{\varphi}_1$$

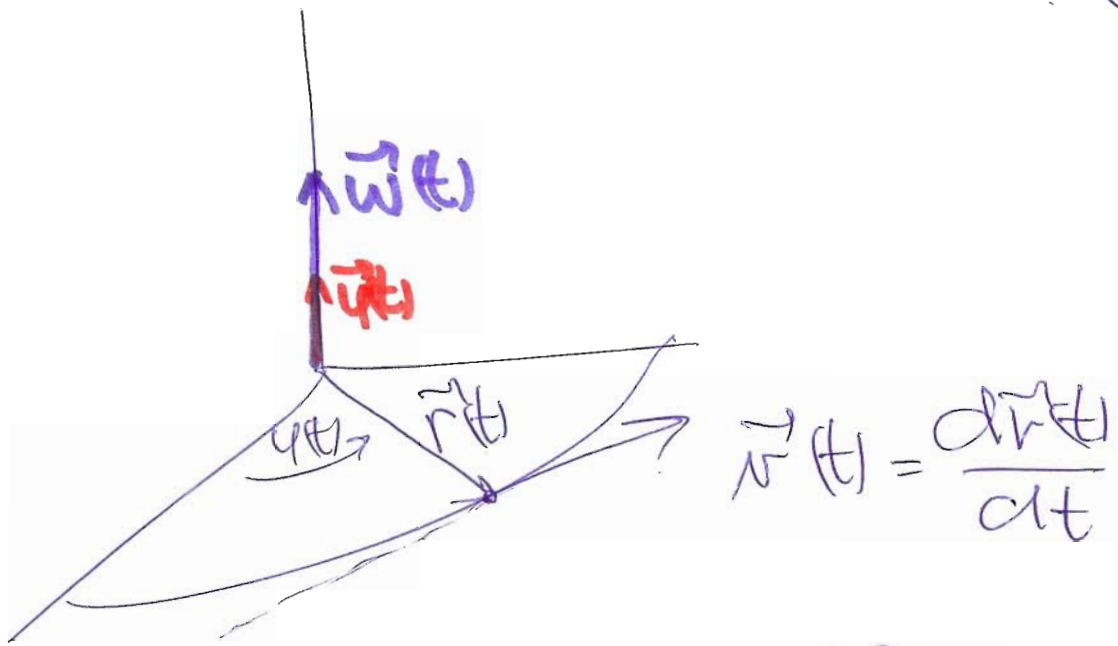
$$\vec{\varphi}_1$$

$$\vec{\varphi}(t) = \varphi(t) \vec{k}$$



Def. $\vec{\omega}_{pr} \equiv \frac{\Delta \vec{\varphi}}{\Delta t}$

$$\vec{\omega}(t) = \lim_{\Delta t \rightarrow 0} \frac{\vec{\varphi}(t + \Delta t) - \vec{\varphi}(t)}{\Delta t} = \frac{d\vec{\varphi}(t)}{dt} = \dot{\vec{\varphi}}(t)$$



1° Vector tang : $\vec{c}'(t) = \frac{\vec{v}(t)}{|\vec{v}(t)|} = \dots$

1° Normal : $\vec{n}(t) = \frac{\vec{c}''(t)}{|\vec{c}''(t)|}$

$\vec{T} \perp \vec{N}$
 $\frac{d}{dt} \vec{T} \perp \vec{T}$
 $\frac{d}{dt} \vec{N} \perp \vec{N}$

$$\vec{c}' \cdot \vec{c}' = 1$$

$$d\vec{c}' \cdot \vec{c}' + \vec{c}' \cdot d\vec{c}' = 0$$

$$2\vec{c}' \cdot d\vec{c}' = 0 \Rightarrow \vec{c}' \perp d\vec{c}' \quad \Downarrow$$

krivost:
 (skalár)

$$\kappa = \theta$$



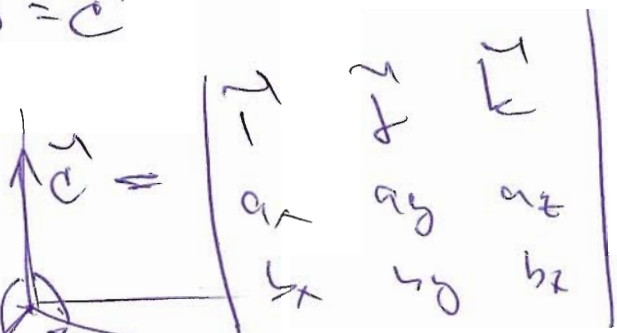
$$\left| \frac{d\vec{c}'}{dt} \right| \frac{dt}{ds}$$

$$\kappa = \frac{\left| \frac{d\vec{c}'}{dt} \right|}{ds/dt} = \frac{|\vec{c}''|}{v(t)}$$

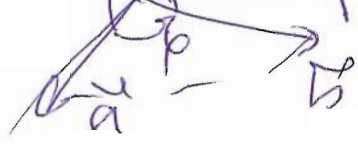
④

↑ NN
e_n
↑ N_r

$$\vec{a} \times \vec{b} = \vec{c}$$



$$|\vec{c}| = ab \sin \varphi$$



$$\vec{c} \perp \vec{a}, \vec{c} \perp \vec{b}$$

$$\vec{l} = \vec{r} \times m \vec{v}$$

(moment by law of)

$$\vec{M} = \vec{r} \times \vec{F}$$

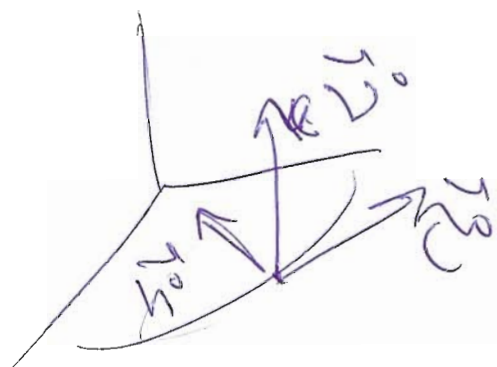
(moment itself)

$$\vec{v}(t) = \vec{\omega}(t) \times \vec{r}(t)$$



↑ NN

binormale: $\vec{r}'(t) = \vec{\omega}' \times \vec{r}'$

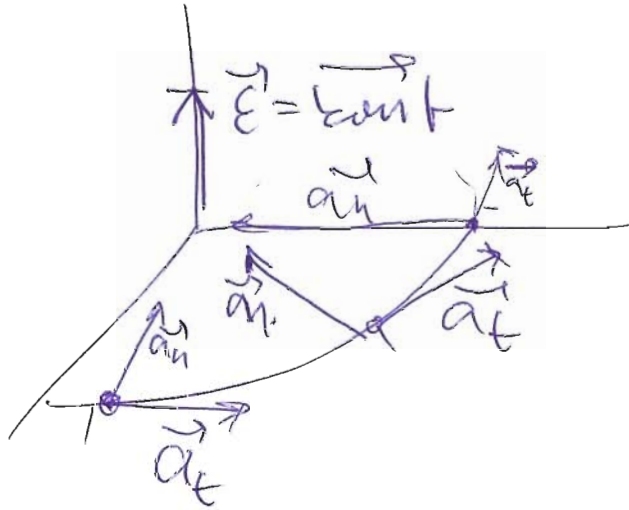


krümmung / polmerkrümmung:

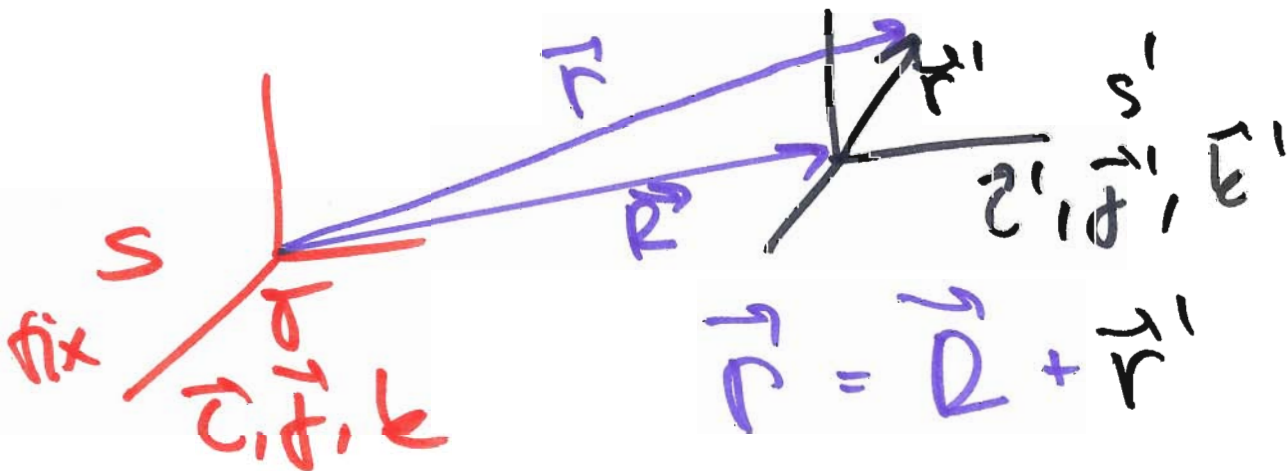
$$\kappa = \frac{1}{R}$$

$$a_n(t) = \omega^2(t) R = \frac{v^2(t)}{R} = v^2(t) k$$

$$a_t(t) = R \dot{\omega}(t)$$



Vztahů soustav

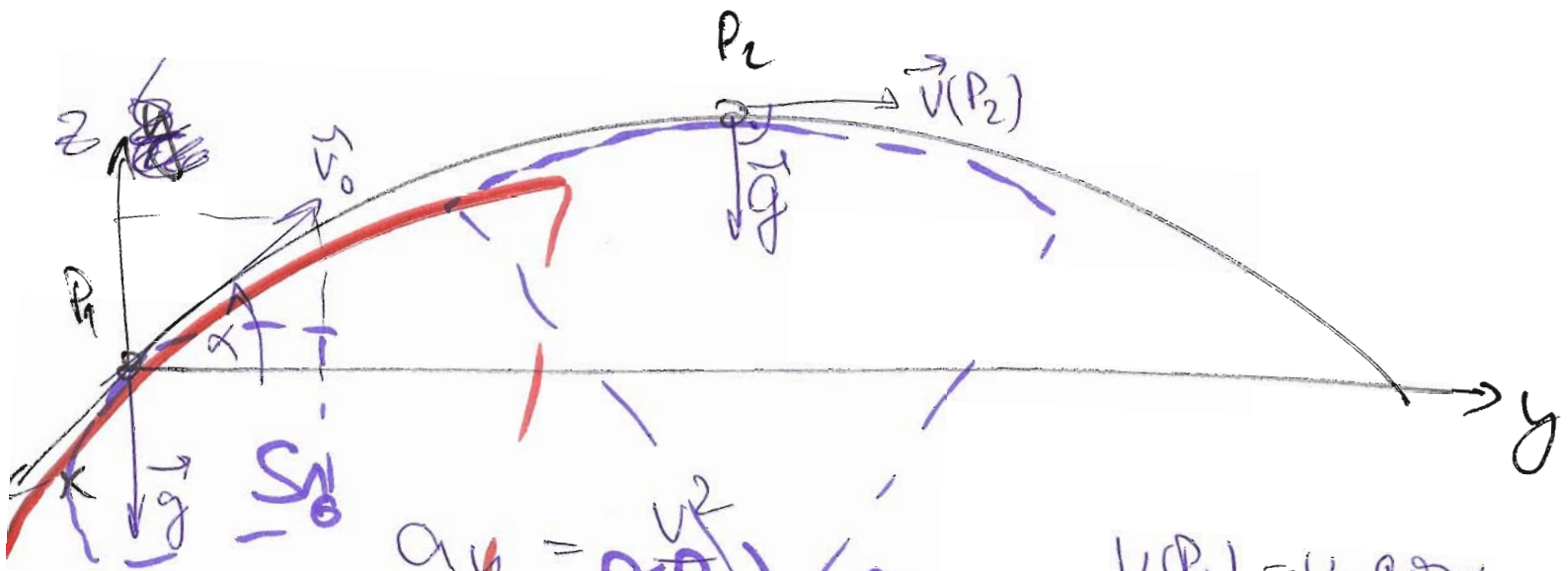


Viz NNNN.pdf

Зпет:

6

↓ g ↓



$$a_{\text{н}} = \frac{v^2}{R(P_2)} = g = \frac{v(P_2)}{R(P_2)} = \frac{v_0^2 \cos^2 \alpha}{R(P_2)} = 1$$

$$v(P_2) = v_0 \cos \alpha$$

$P_2 \rightarrow$

$$R(P_1) > R(P_2)$$

$$R(P_2) = \frac{v_0^2 \cos^2 \alpha}{g}$$

$$\frac{\frac{v_0^2}{g} \cdot \frac{1}{\cos \alpha}}{\frac{v_0^2}{g} \cos^2 \alpha}$$

P_1

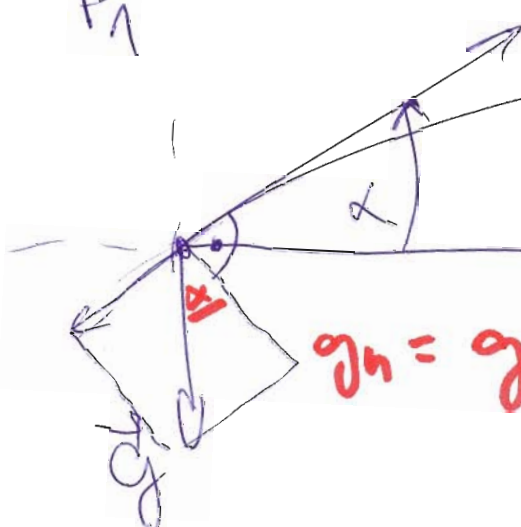
$$\frac{R(P_1)}{R(P_2)} = \cos^2 \alpha$$

$$R(P_1) \cdot \cos^2 \alpha = R(P_2)$$

$$g \cos \alpha = \frac{v_0^2}{R(P_1)}$$

$$g_{\text{н}} = g \cos \alpha$$

$$R(P_1) = \frac{v_0^2}{g} \cdot \frac{1}{\cos \alpha}$$



DYNAMIKA

Proč se pohyb děje FAL,
jak se děje?

Soustava III NPZ:

I. NPZ (první Newtonův
pohybový zákon)

⊙ Existence inerciálních
soustav

⊙ II. NPZ

$$\vec{F}_v = m\vec{a}$$

⊙ III. NPZ

zákon akce a reakce