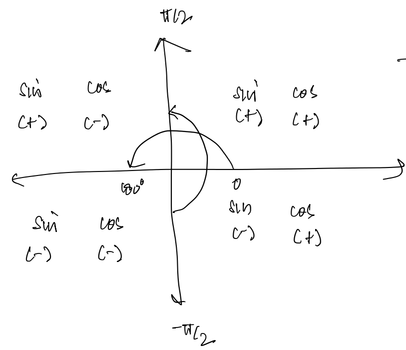
LECTURE 5 NOTES

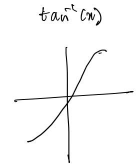
Tuesday, January 28, 2025 10:26 AM

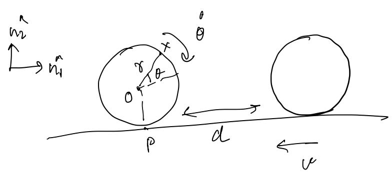
$2-1-3 \longrightarrow (\alpha, \beta, \gamma)$

$\{\hat{b}\} = [BN]\{\hat{n}\}$

$$[BN] = \underbrace{[M_3(\gamma)]}_{[BB'']}\ \underbrace{[M_1(\beta)]}_{[B''B']}\ \underbrace{[M_2(\alpha)]}_{[B'N]}$$







$\| v_{O/N} \| = -v + \dot{\theta} r$

$\frac{2\cancel{\pi} r}{2\cancel{\pi}} \times \theta$

$\underline{v}_{P/N} = -v\,\hat{n}_1$

$d = \underline{r\theta}$

PROPER ORTHOGONAL

$[A]^{-1} = [A]^T$ Determinant +1

$|A| = +1$

$$\delta\dot{\omega} = \frac{{}^N d}{dt}\,\delta\underline{\omega} = \frac{{}^B d}{dt}(\delta\underline{\omega}) + \underline{\omega}_{B/N} \times \delta\underline{\omega}$$

$\frac{d}{dt}{}^B(\delta\underline{\omega}) \longrightarrow$ Just the $\frac{d}{dt}$ of the components.

$\{\hat{b}\} = [PK]\{\hat{k}\}$ $\{\hat{f}\} = [FB]\{\hat{b}\}$

$$\begin{array}{c|ccc} & {}^P\hat{k}_1 & {}^P\hat{k}_2 & {}^P\hat{k}_3 \\ \hline {}^K\hat{p}_1 \rightarrow & & & \\ {}^K\hat{p}_2 \rightarrow & & & \\ {}^K\hat{p}_3 \rightarrow & & & \end{array}$$

$$[PK] = \begin{bmatrix} {}^P\hat{k}_1 & {}^P\hat{k}_2 & {}^P\hat{k}_3 \end{bmatrix} = \begin{bmatrix} {}^K\hat{p}_1^T \\ {}^K\hat{p}_2^T \\ {}^K\hat{p}_3^T \end{bmatrix}$$