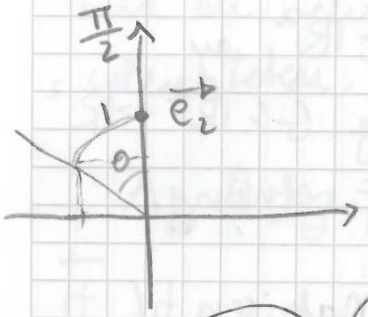
$$\vec{T}(\vec{e}_2) = \vec{T}\left(\underbrace{\begin{bmatrix} 0 \\ 1 \end{bmatrix}}_{\text{lengde 1, vinkel } \frac{\pi}{2}}\right) = \begin{bmatrix} 2\cos\left(\frac{\pi}{2}+\theta\right) \\ 2\sin\left(\frac{\pi}{2}+\theta\right) \end{bmatrix}$$



$$= \begin{bmatrix} -2\sin\theta \\ 2\cos\theta \end{bmatrix}$$

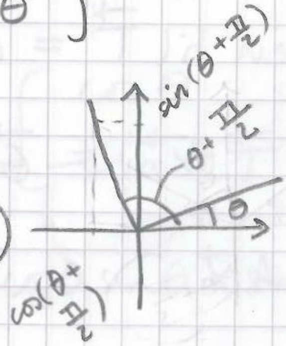
$\sin(x+y) = \sin x\cos y + \sin y \cos x$

$\cos(x+y) = \cos x \cos y - \sin x \sin y$

sum av vinkel formel

eller

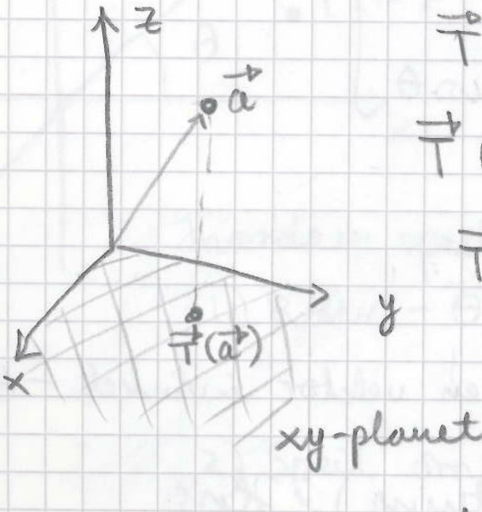
sum " koordinatsystem



$$\Rightarrow \text{Matrisen til } \vec{T} \text{ er } A = \begin{bmatrix} 2\cos\theta & -2\sin\theta \\ 2\sin\theta & 2\cos\theta \end{bmatrix}$$

$$= 2\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$$

7.) $\vec{T}: \mathbb{R}^3 \to \mathbb{R}^3$, vektor på projeksjon ned i xy-plan:



$$\vec{T}(\vec{e}_1) = \vec{T}\left(\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}\right) = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

$$\vec{T}(\vec{e}_2) = \vec{T}\left(\begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}\right) = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

$$\vec{T}(\vec{e}_3) = \vec{T}\left(\begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}\right) = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$\Downarrow$

Matrisen til $\vec{T}$ er:

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$