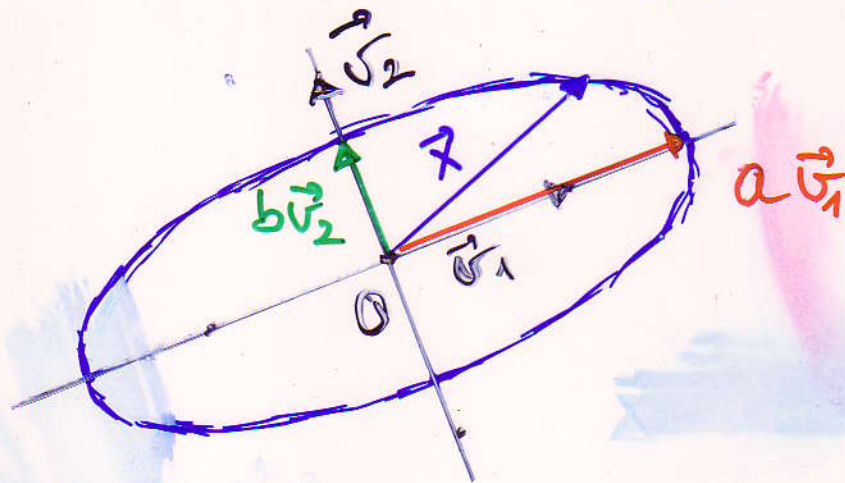


10.7 Ellipsen \vec{v}_1, \vec{v}_2 Orthonormal basis



$$\vec{x}(t) = \underbrace{a \cos t}_{x_1} \vec{v}_1 + \underbrace{b \sin t}_{x_2} \vec{v}_2$$

$$\lambda_1 x_1^2 + \lambda_2 x_2^2 = 1$$

$$\lambda_1 = \frac{1}{a^2} \quad \lambda_2 = \frac{1}{b^2}$$

\vec{v}_1, \vec{v}_2 : Hauptachsenrichtungen

a, b : Halbachsenlängen

$$\max \{ \|\vec{x}(t)\| \mid t \in \mathbb{R} \} = \begin{cases} a = \|\vec{x}(0 + k\pi)\| & a > b \\ b = \|\vec{x}(\frac{\pi}{2} + k\pi)\| & b < a \end{cases}$$

$$\min \{ \|\vec{x}(t)\| \mid t \in \mathbb{R} \} = \begin{cases} b = \|\vec{x}(\frac{\pi}{2} + k\pi)\| & a > b \\ a = \|\vec{x}(0 + k\pi)\| & b < a \end{cases}$$