

Virtuose semester 1b

$$\textcircled{1} g(t) = \left( \cos t, \sin t, \frac{1}{\sqrt{2}} t^{\frac{3}{2}} \right)$$

(a) param. oblique

$$t = t(s)$$

$$\frac{dg}{ds} = \frac{dg}{dt} \cdot \frac{dt}{ds} \quad / \|\dots\|$$

$$1 = \|g'(t)\| \cdot \frac{dt}{ds}$$

$$ds = \|g'\| dt$$

$$s = \int \|g'\| dt$$

$$s = \int \sqrt{t+1} dt = \frac{2}{3} (t+1)^{\frac{3}{2}}$$

$$\frac{2}{3} s = (t+1)^{\frac{3}{2}}$$

$$\left(\frac{3}{2}s\right)^{\frac{2}{3}} = t+1$$

$$t = \left(\frac{3}{2}s\right)^{\frac{2}{3}} - 1$$

$$g(s) = \left( \cos \left( \left(\frac{3}{2}s\right)^{\frac{2}{3}} - 1 \right), \sin(\dots), \dots \right)$$

$$g'(t) = (-\sin t, \cos t, \sqrt{t})$$

$$\|g'\| = \sqrt{t+1}$$

$$(b) \int_3^8 \|g'(t)\| dt = \int_3^8 \sqrt{t+1} dt$$

$$= \left[ \frac{2}{3} (t+1)^{\frac{3}{2}} \right]_3^8 = \frac{2}{3} [27 - 8]$$

(c) Bodnosferre, kereg' ~  
 pmoder  $C_1$ :

$$\|g(t)\| = \sqrt{15}$$

$$\sqrt{1 + \frac{4}{9}t^3} = \sqrt{15}$$

$$\frac{4}{9}t^3 = 14$$

$$t^3 = 31.5 \Rightarrow \underline{\underline{t = 3}}$$

Bodnosferre:  $[\cos 3, \sin 3, \frac{2}{3}\sqrt{27}]$

$\Rightarrow$  normál.  
 vektor  $(\cos 3, \sin 3, \frac{2}{3}\sqrt{27})$

teing' vektor  $C_1$   $(-\sin 3, \cos 3, \sqrt{3})$

$$\cos \alpha = \frac{\frac{3}{5} \cdot 9}{\sqrt{1 + \frac{4}{9} \cdot 27} \cdot \sqrt{1 + 3}} = \frac{6}{\sqrt{13} \cdot 2}$$

$$= \frac{3}{\sqrt{13}}$$

Vgl. Edel:  $\frac{\pi}{2} - \arccos \frac{3}{\sqrt{13}}$

②  $f(t) = (\cos t, \sin t, e^t)$

(a)  $f'(t) = (-\sin t, \cos t, e^t)$

$$f''(t) = (-\cos t, -\sin t, e^t)$$

$$f'''(t) = (\sin t, -\cos t, e^t)$$

$$\tau = \frac{\|f' \times f''\|}{\|f'\|^3} = \dots = \frac{\sqrt{2e^{2t} + 1}}{(\sqrt{e^{2t} + 1})^3}$$

$$\tau = \frac{2e^t}{2e^{2t} + 1}$$

$$f(0) = \frac{\sqrt{3}}{(\sqrt{2})^3} \quad c(0) = \frac{N}{3}$$

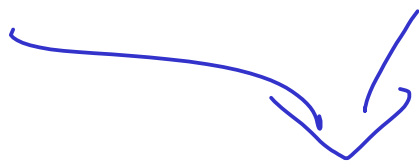
$$(b) \quad \omega = \langle f', f'' \rangle$$

normalizing vector

$$n = f' \times f'' =$$

$$= (e^t(\sin t + \cos t), e^t(\sin t - \cos t), 1)$$

$$n \perp \text{osom} \quad \text{L} \rightarrow (0, 1, 0)$$



$$\sin t = \cos t$$

$$t = \frac{\pi}{4}$$