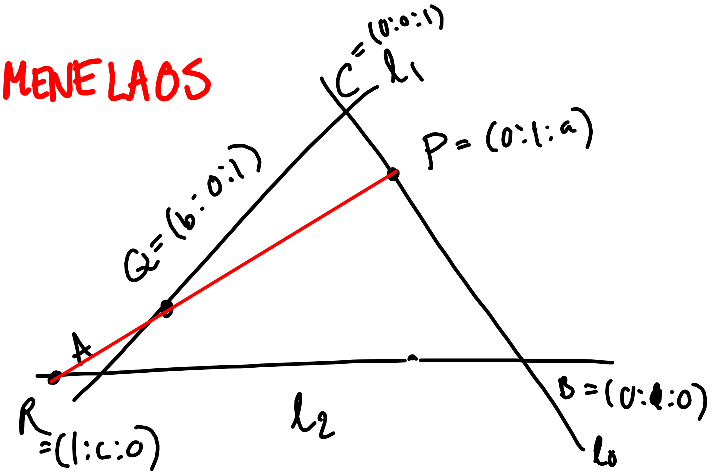
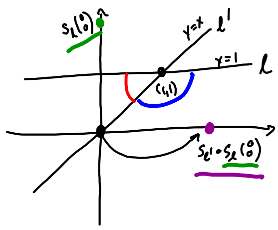
MENELAOS



kollineare ⟺ PQR

$$\frac{\overline{BP}}{\overline{PC}} \cdot \frac{\overline{CQ}}{\overline{QA}} \cdot \frac{\overline{AR}}{\overline{RB}} = -1$$

2011 - 1



s_ℓ , $s_{\ell'}$ speilinger

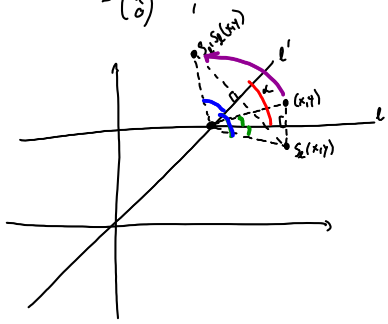
a) $\rho = s_{\ell'} \circ s_\ell$

Oppg. 2.4.11

- $s_{\ell'}$ og s_ℓ er orienteringsreverserende, så ρ er orienteringsbevarende.
- ρ enten translasjon eller rotasjon
- ℓ' er fikspunkt for $s_{\ell'}$
  ℓ er —"— s_ℓ
  $\ell \cap \ell'$ er fikspunkt for $s_{\ell'} \circ s_\ell$
- Så ρ er rotasjon

- fikspunkt er $(1,1)$
- Rotasjonsvinkel er $\frac{\pi}{2}$ siden $\rho\begin{pmatrix}0\\0\end{pmatrix} = \begin{pmatrix}2\\0\end{pmatrix}$

$$\rho\begin{pmatrix}0\\0\end{pmatrix} = s_{\ell'}\circ s_\ell\begin{pmatrix}0\\0\end{pmatrix} = s_{\ell'}\begin{pmatrix}0\\2\end{pmatrix} = \begin{pmatrix}2\\0\end{pmatrix}$$



$$2\beta - 2\gamma = \delta$$
$$\beta - \gamma = \alpha$$

Oppg 2-2b) $\quad s_\ell = t_{\vec a}\, s_{\ell^0}\, t_{-\vec a}$ $\quad \ell \parallel \ell^0$, $\vec a$ ortogonal til ℓ^0

ℓ^0 gjennom origo $\quad \ell$ gjennom $\vec a$

$$s_\ell = t_{\begin{pmatrix}0\\1\end{pmatrix}}\, s_{y=0}\, t_{\begin{pmatrix}0\\-1\end{pmatrix}} \qquad s_{y=0} = \begin{pmatrix}1&0\\0&-1\end{pmatrix}$$

$$s_{\ell'} = \begin{pmatrix}0&1\\1&0\end{pmatrix} \qquad \ell': y=x$$

$$\rho\begin{pmatrix}x\\y\end{pmatrix} = \underbrace{\begin{pmatrix}0&1\\1&0\end{pmatrix}}_{s_{\ell'}}\underbrace{t_{\begin{pmatrix}0\\1\end{pmatrix}}\begin{pmatrix}1&0\\0&-1\end{pmatrix}t_{\begin{pmatrix}0\\-1\end{pmatrix}}}_{s_\ell}\begin{pmatrix}x\\y\end{pmatrix}$$

$$= \begin{pmatrix}0&1\\1&0\end{pmatrix}t_{\begin{pmatrix}0\\1\end{pmatrix}}\begin{pmatrix}1&0\\0&-1\end{pmatrix}\begin{pmatrix}x\\y-1\end{pmatrix}$$

$$= \begin{pmatrix}0&1\\1&0\end{pmatrix}t_{\begin{pmatrix}0\\1\end{pmatrix}}\begin{pmatrix}x\\1-y\end{pmatrix}$$

$$= \begin{pmatrix}0&1\\1&0\end{pmatrix}\begin{pmatrix}x\\2-y\end{pmatrix}$$

$$= \begin{pmatrix}2-y\\x\end{pmatrix} = \begin{pmatrix}2\\0\end{pmatrix} + \begin{pmatrix}-y\\x\end{pmatrix}$$

$$= t_{\begin{pmatrix}2\\0\end{pmatrix}} \cdot \begin{pmatrix}0&-1\\1&0\end{pmatrix}\begin{pmatrix}x\\y\end{pmatrix}$$

F.P. $\begin{pmatrix}2-y\\x\end{pmatrix} = \begin{pmatrix}x\\y\end{pmatrix}$

$$\left.\begin{matrix}x+y=2\\x-y=0\end{matrix}\right\} \quad x=y=1$$

$$\begin{pmatrix}0&-1\\1&0\end{pmatrix} = \begin{pmatrix}\cos\frac{\pi}{2} & -\sin\frac{\pi}{2}\\ \sin\frac{\pi}{2} & \cos\frac{\pi}{2}\end{pmatrix} \qquad \left.\begin{matrix}0=\cos\theta\\1=\sin\theta\end{matrix}\right\} \Rightarrow \theta = \frac{\pi}{2}$$

b) $t = t_{\begin{pmatrix}-2\\0\end{pmatrix}}$

$$t\rho = \underbrace{t_{\begin{pmatrix}-2\\0\end{pmatrix}}t_{\begin{pmatrix}2\\0\end{pmatrix}}}\rho_{0,\frac{\pi}{2}} = \rho_{(0,\frac{\pi}{2})}$$

$$t\rho\begin{pmatrix}0\\0\end{pmatrix} = t_{\begin{pmatrix}-2\\0\end{pmatrix}}\begin{pmatrix}2\\0\end{pmatrix} = \begin{pmatrix}-2+2\\0+0\end{pmatrix} = \begin{pmatrix}0\\0\end{pmatrix}$$, så $(0,0)$ er f.p.

og samme vinkel