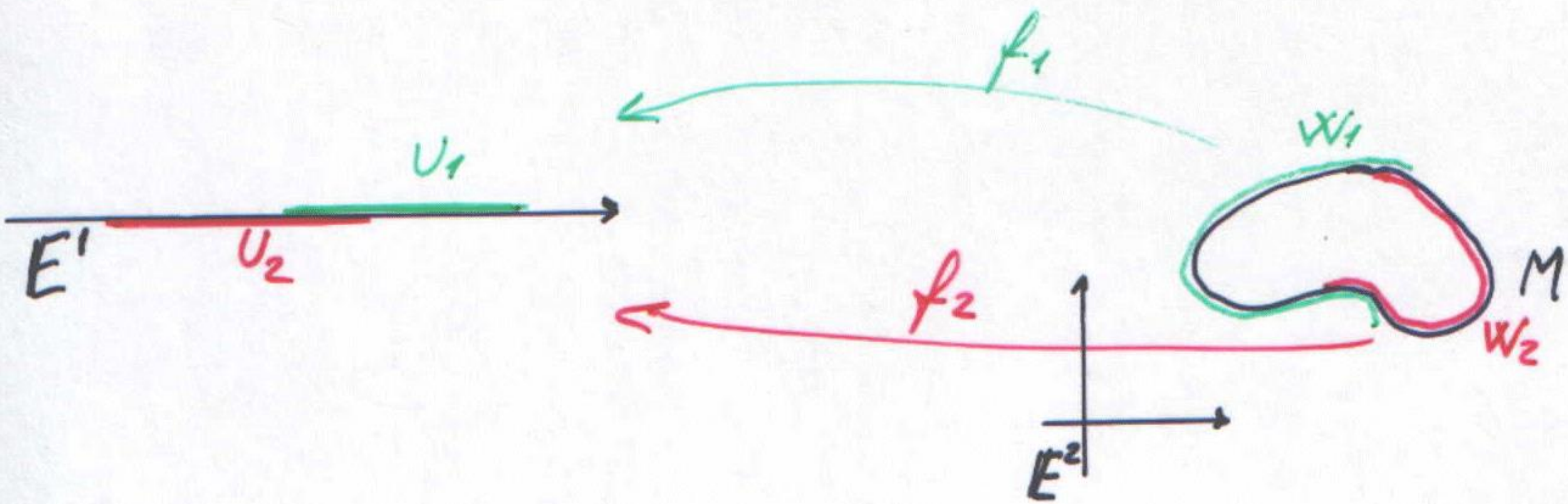
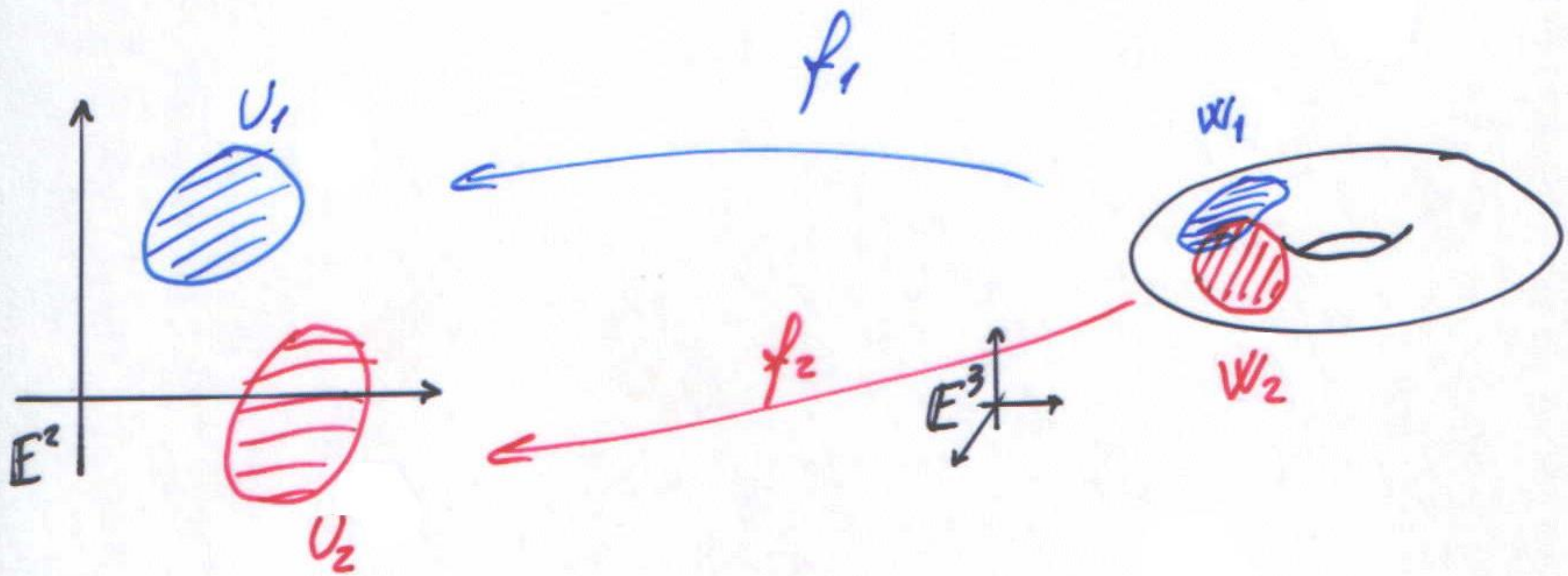
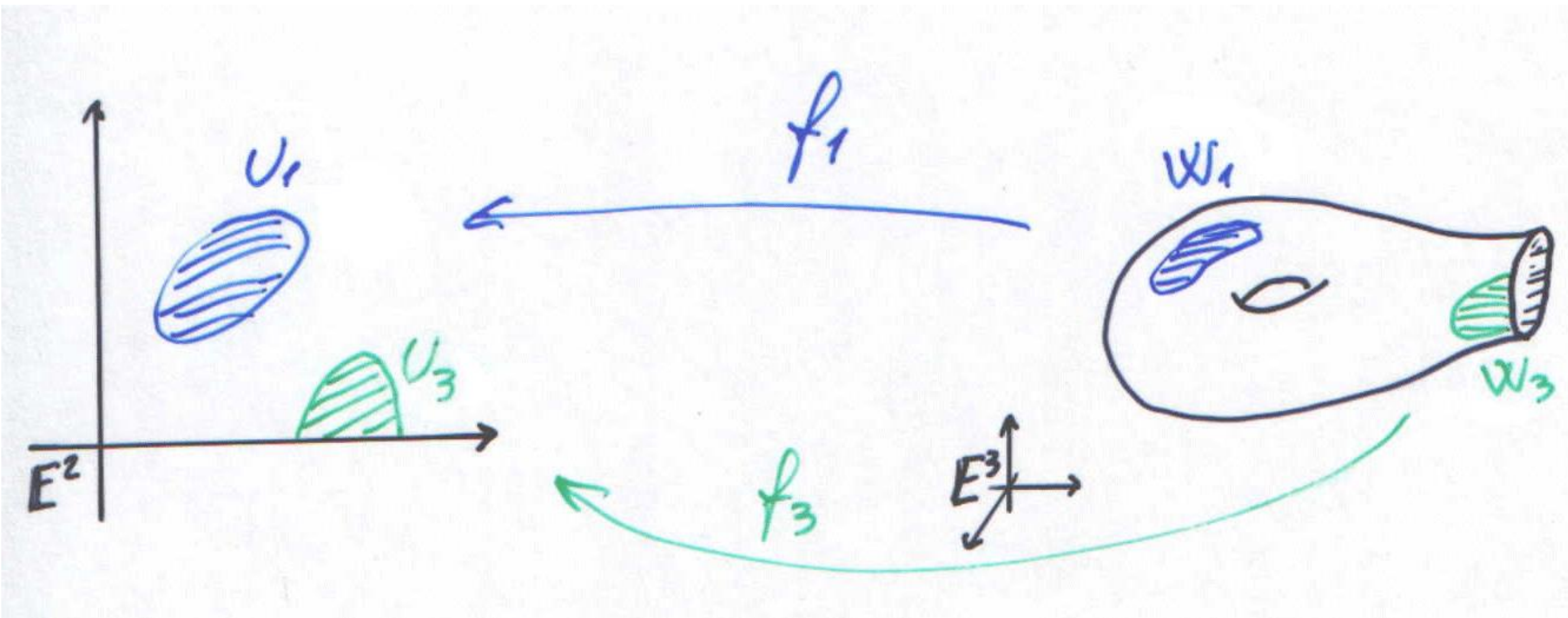
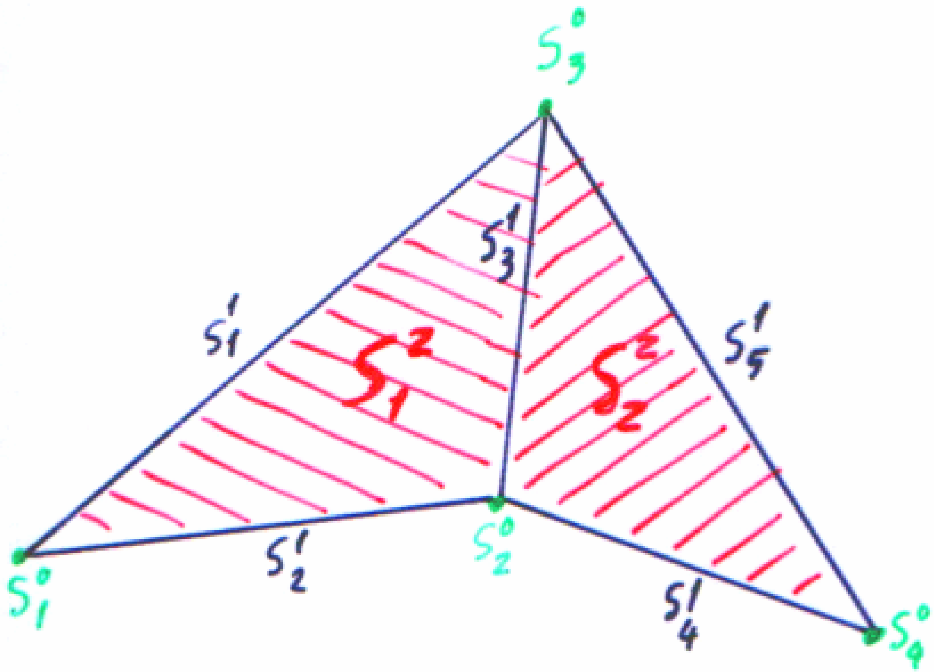

f_1
U_1
W_1
E^1
U_2
f_2
M
W_2
E^2


f_1
U_1
W_1
E^2
f_2
E^3
W_2
U_2



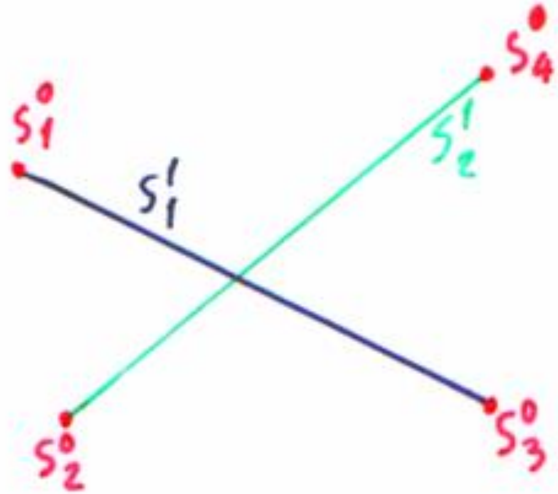
f_1
U_1
W_1
U_3
W_3
E^2
E^3
f_3



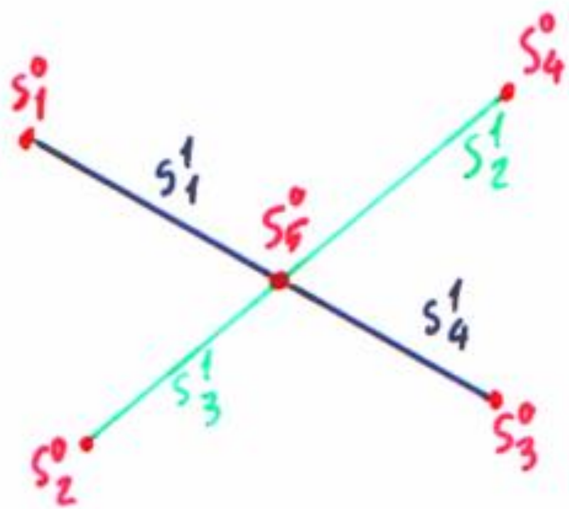
$\{s_1^0, s_2^0, s_3^0, s_4^0,$
$s_1^1, s_2^1, s_3^1, s_4^1, s_5^1,$
$s_1^2, s_2^2\}$ SI`

$\{s_1^0, s_2^0, s_3^0, s_4^0,$
$s_1^1, s_2^1, s_3^1, s_4^1, s_5^1,$
$s_1^2 \}$ SI`

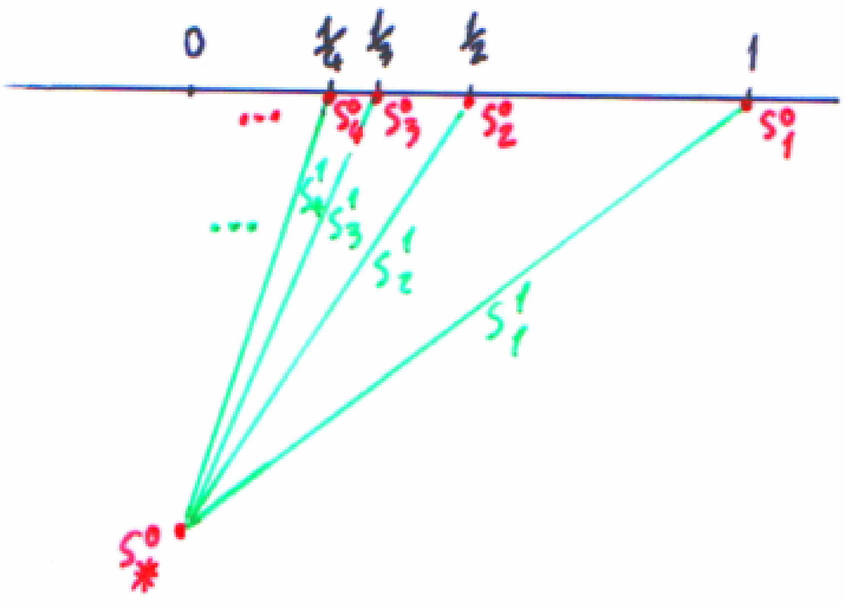
$\{s_1^0, s_2^0, s_3^0,$
$s_1^1, s_2^1, s_3^1, s_4^1, s_5^1,$
$s_1^2, s_2^2\}$ NO



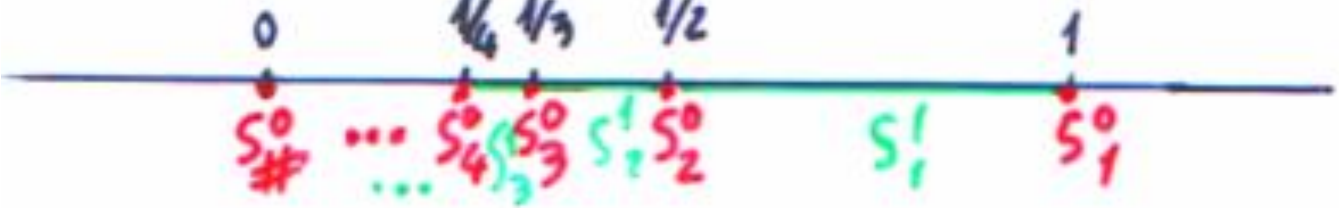
$$\{s_1^0, s_2^0, s_3^0, s_4^0, s_1^1, s_2^1\}$$ NO



$$\{s_1^0, s_2^0, s_3^0, s_4^0, s_5^0, s_1^1, s_2^1, s_3^1, s_4^1\}$$ SI'

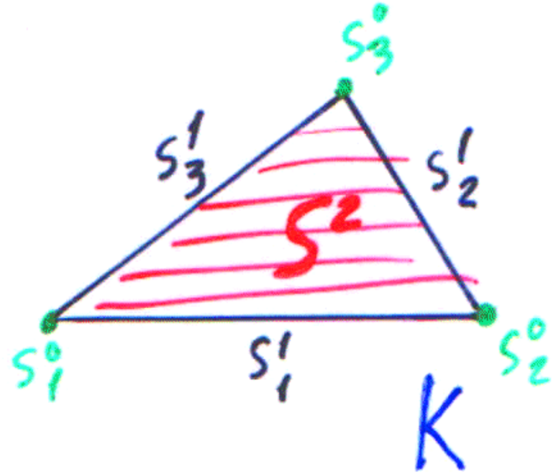


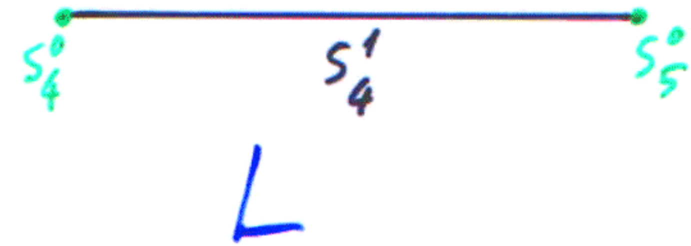
$\{ s_*^0, s_i^0, s_i^1 \mid i \in \mathbb{N} \}$ NO



$$\{s^0_i, s^1_i \mid i \in \mathbb{N}\}$$ SÌ

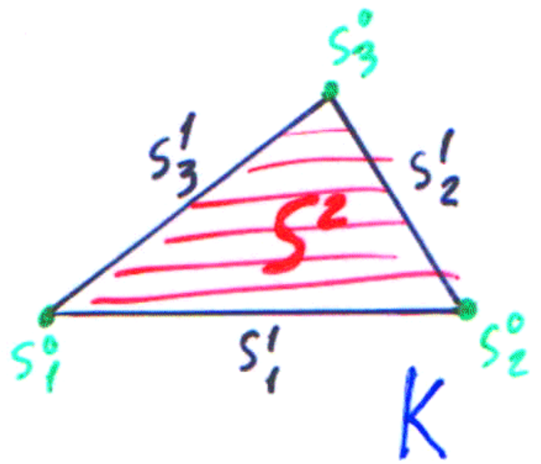
$$\{s^0_\#, s^0_i, s^1_i \mid i \in \mathbb{N}\}$$ NO

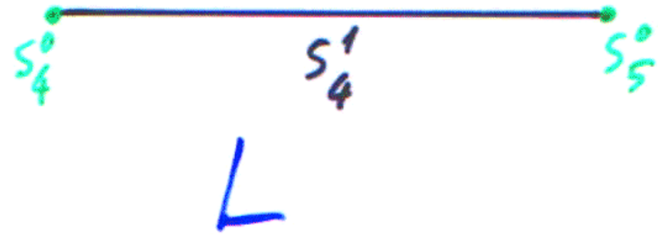




$$s_1^0 \longmapsto s_4^0$$
$$s_2^0 \longmapsto s_4^0$$
$$s_3^0 \longmapsto s_4^0$$
$$s_1^1 \longmapsto s_4^0$$
$$s_2^1 \longmapsto s_4^0$$
$$s_3^1 \longmapsto s_4^0$$
$$s^2 \longmapsto s_4^0$$

SI`





$$s_1^0 \longmapsto s_4^0$$
$$s_2^0 \longmapsto s_5^0$$
$$s_3^0 \longmapsto s_5^0$$
$$s_1^1 \longmapsto s_4^1$$
$$s_2^1 \longmapsto s_5^0$$
$$s_3^1 \longmapsto s_4^1$$
$$s^2 \longmapsto s_4^1$$

S1`

$s_1^0 \longmapsto s_4^0$

$s_2^0 \longmapsto s_5^0$

$s_3^0 \longmapsto s_4^0$

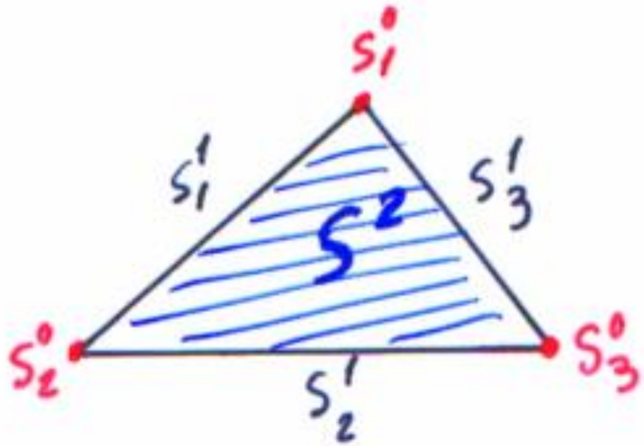
$s_1^1 \longmapsto s_4^1$

$s_2^1 \longmapsto s_5^0$

$s_3^1 \longmapsto s_4^1$

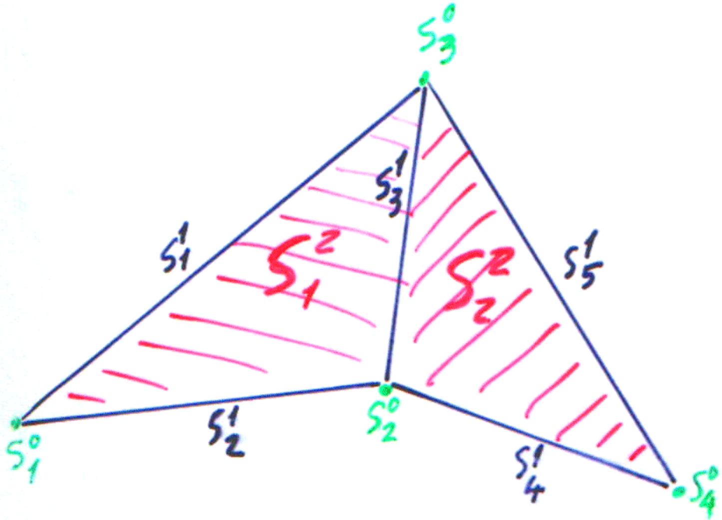
$s^2 \longmapsto s_4^1$

NO



$$\bar{s}^2 = \{ s_1^0, s_2^0, s_3^0,$$
$$s_1^1, s_2^1, s_3^1,$$
$$s^2 \}$$

$$\dot{s}^2 = \bar{s}^2 - \{ s^2 \}$$



$$K = \{ s_1^0, s_2^0, s_3^0, s_4^0, \\ s_1^1, s_2^1, s_3^1, s_4^1, s_5^1, \\ s_1^2, s_2^2 \}$$

$$st(s_2^0, K) = st(s_3^0, K) = st(s_3^1, K) = K$$

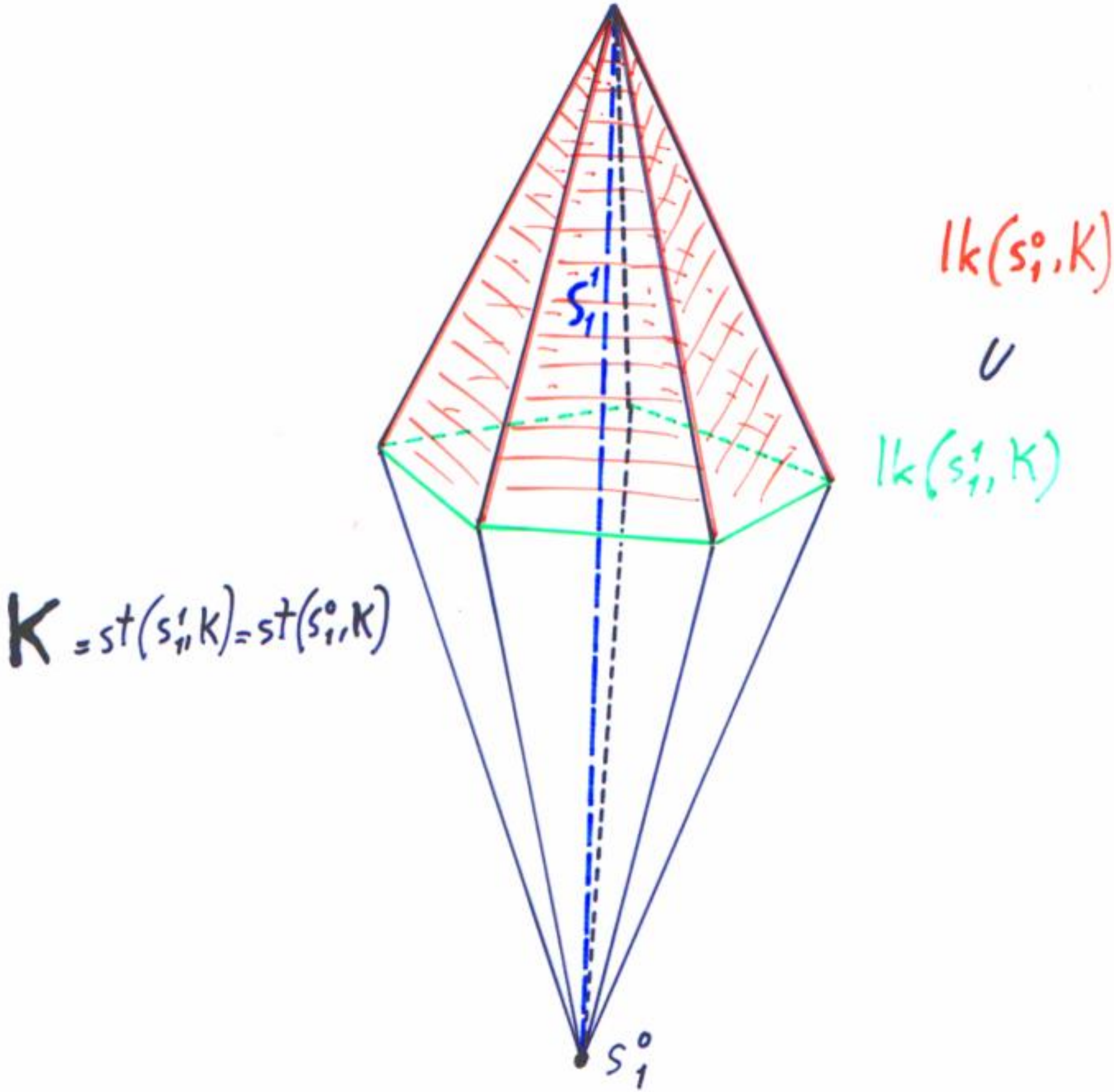
$$st(s_1^0, K) = st(s_1^1, K) = st(s_2^1, K) = st(s_1^2, K) = \bar{s}_1^2$$

$$lk(s_1^0, K) = \bar{s}_3^1 \qquad lk(s_1^1, K) = \bar{s}_2^0 = \{s_2^0\}$$

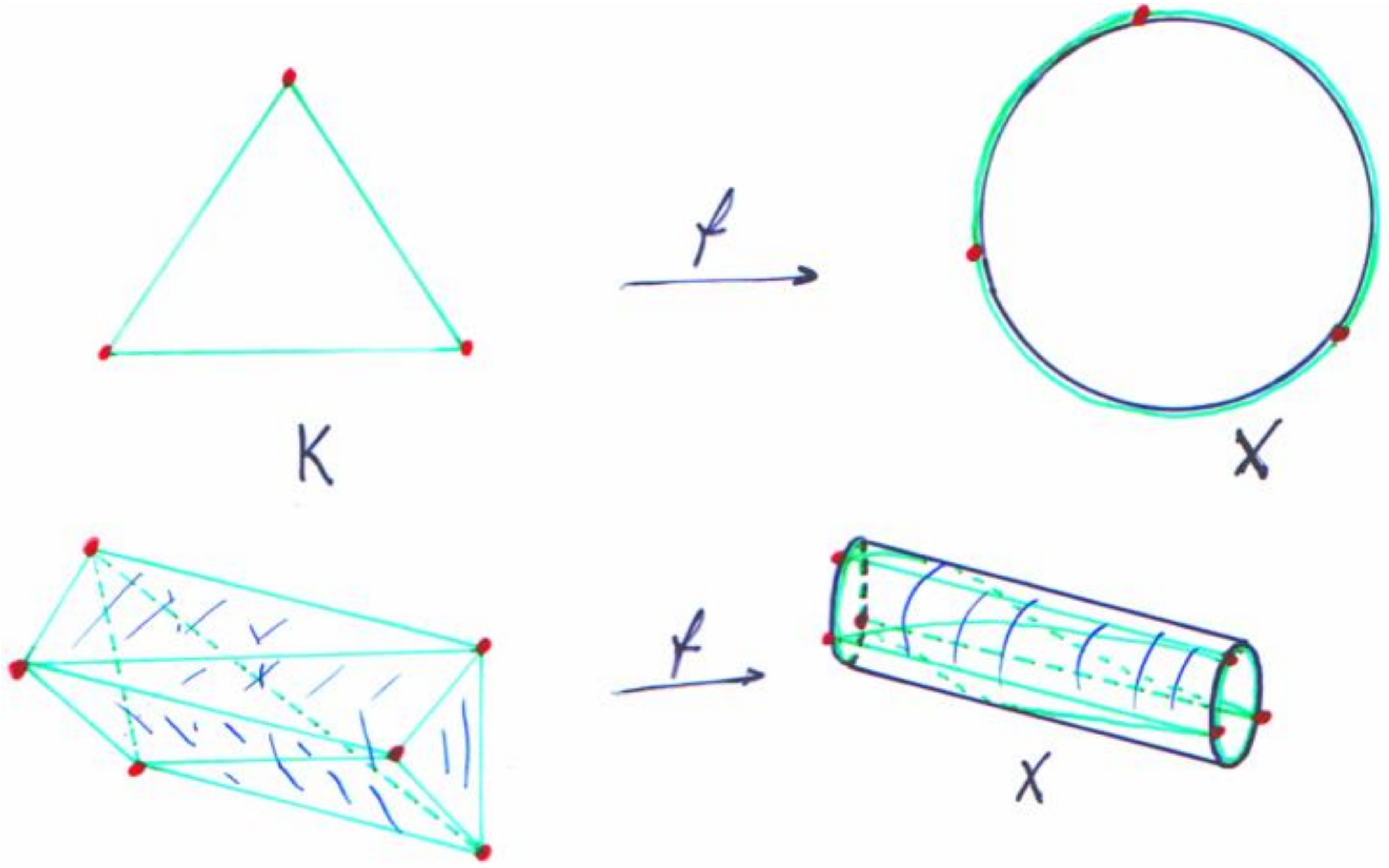
$$lk(s_2^0, K) = \bar{s}_1^1 \cup \bar{s}_5^1 \qquad lk(s_3^1, K) = \{s_1^0, s_4^0\}$$

$$K^2 = K \qquad K^1 = \bar{s}_1^1 \cup \bar{s}_2^1 \cup \bar{s}_3^1 \cup \bar{s}_4^1 \cup \bar{s}_5^1 = K - \{s_1^2, s_2^2\}$$

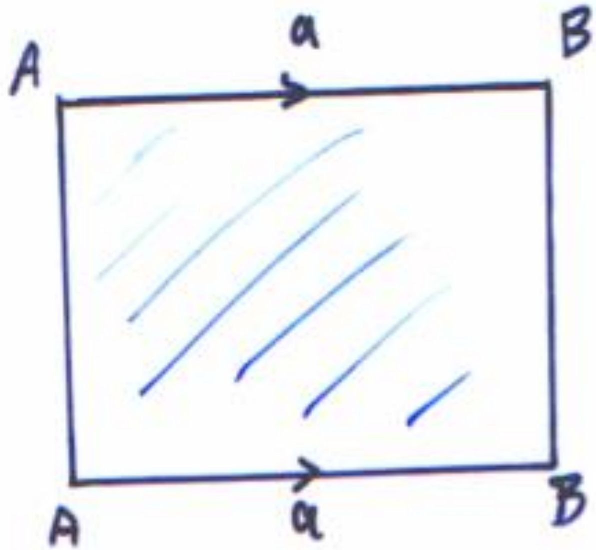
$$K^0 = \{s_1^0, s_2^0, s_3^0, s_4^0\}$$

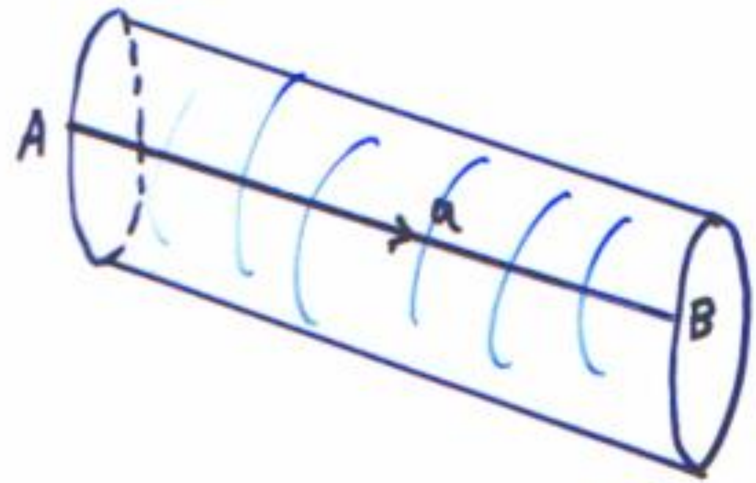


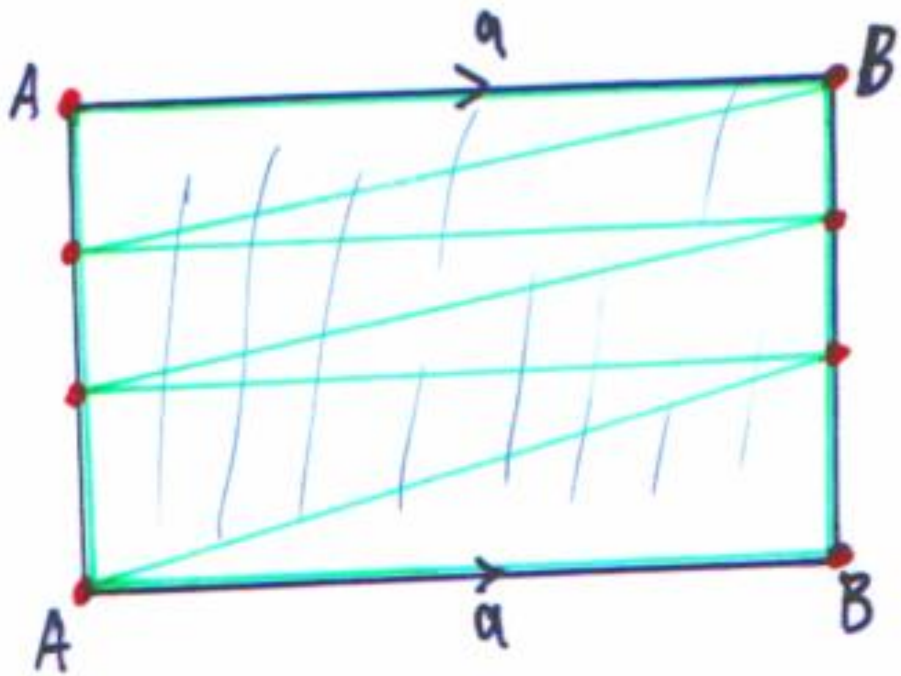
$lk(s_1^0, K)$
$\cup$
$lk(s_1^1, K)$
s_1^1
$K = st(s_1^1, K) = st(s_1^0, K)$
s_1^0

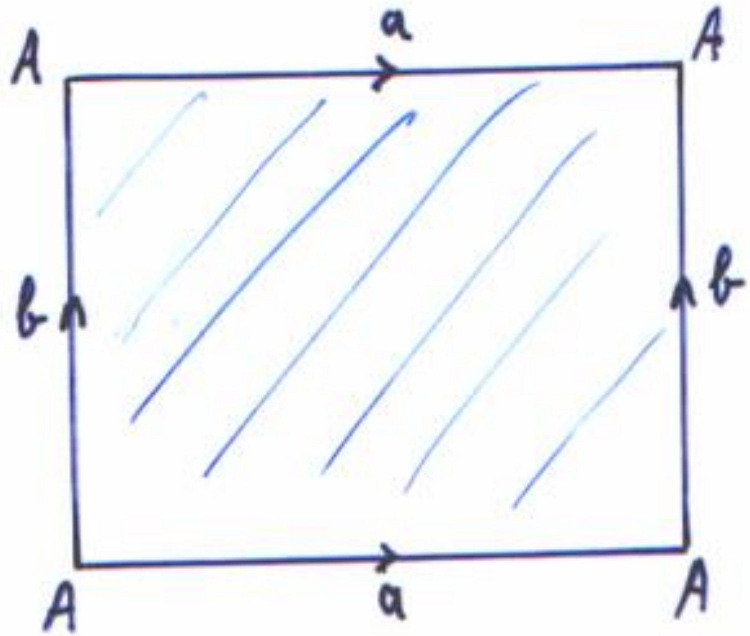


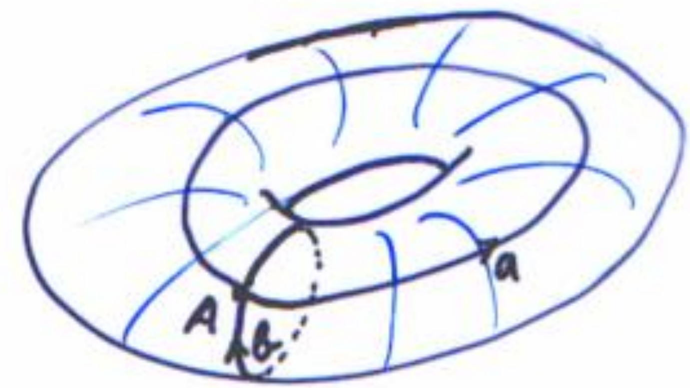
f
K
X
f
X

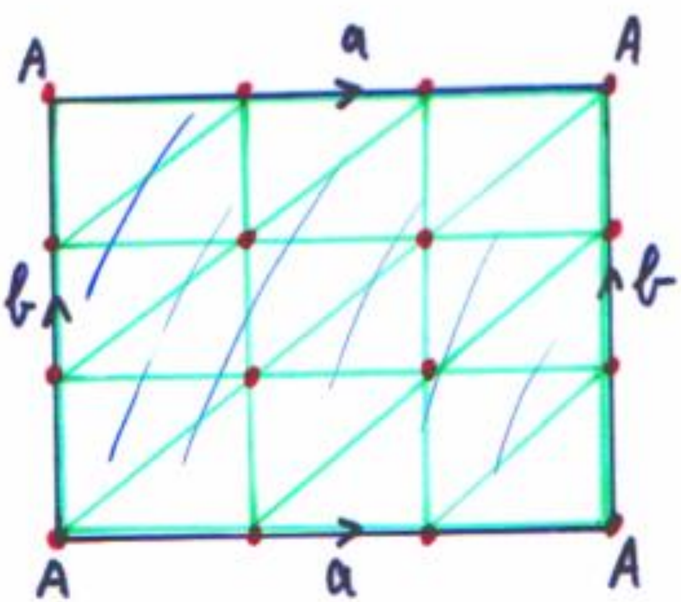

A
a
B
A
a
B


A
a
B

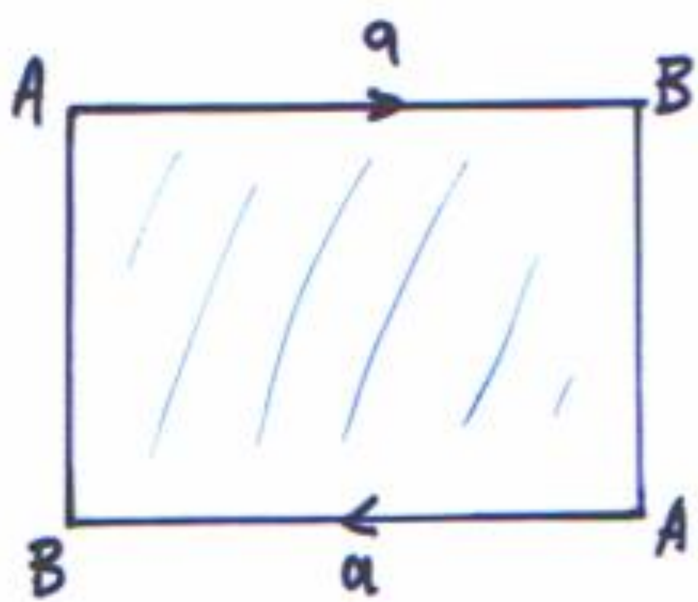

a
A
B
A
a
B



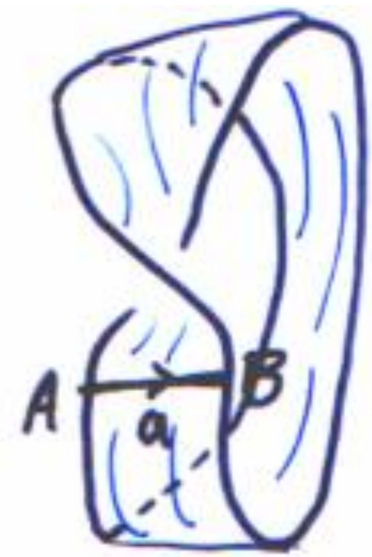


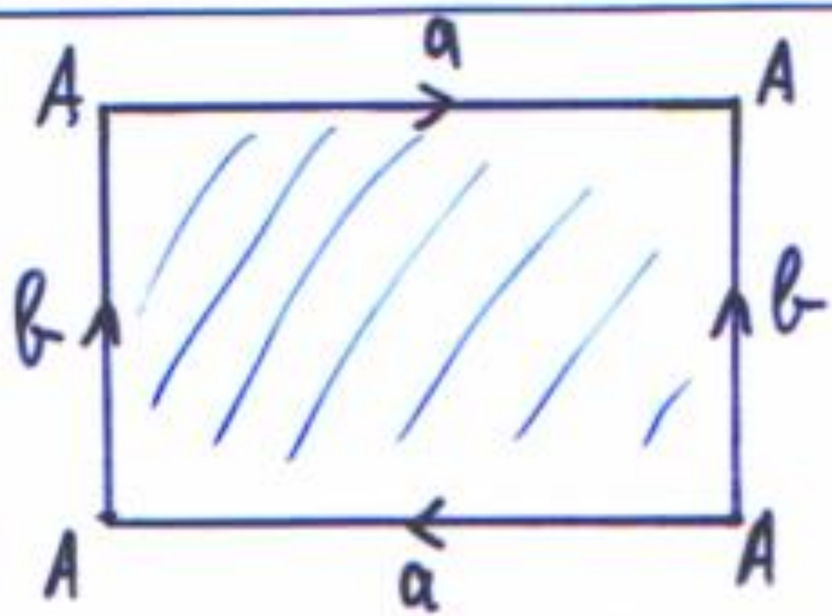


Toro

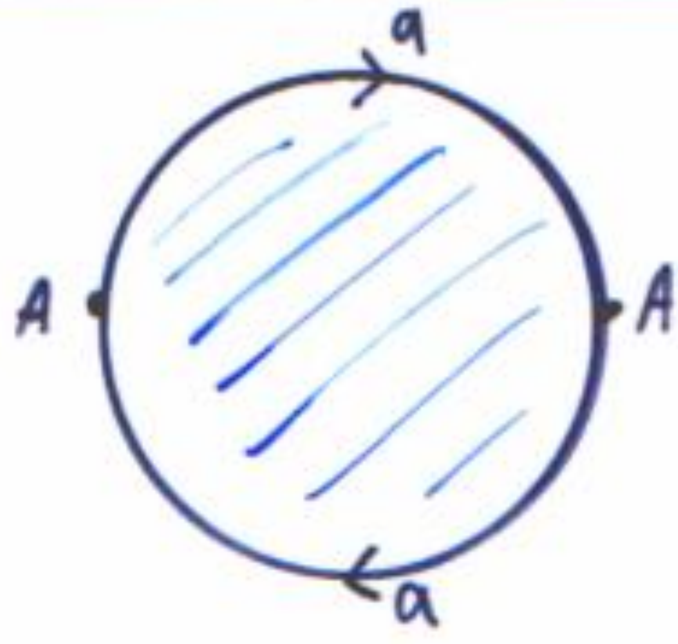


Nastro di Möbius

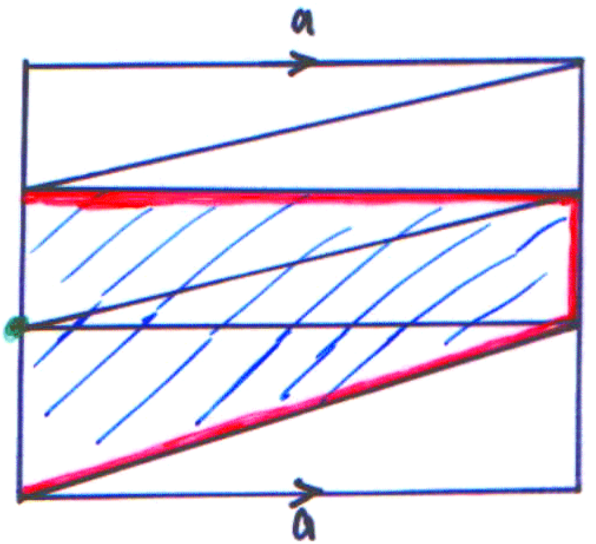




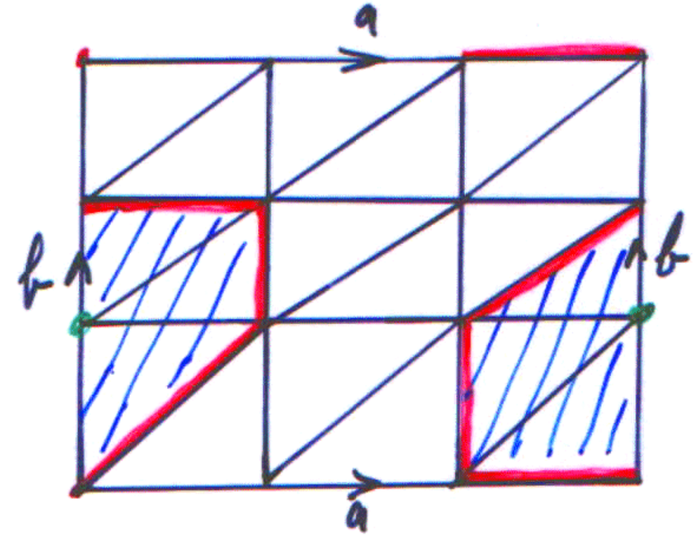
Bottiglia di Klein



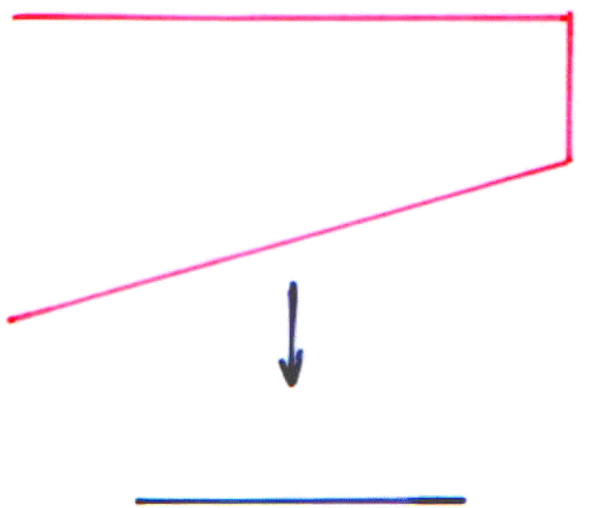
Piano proiettivo

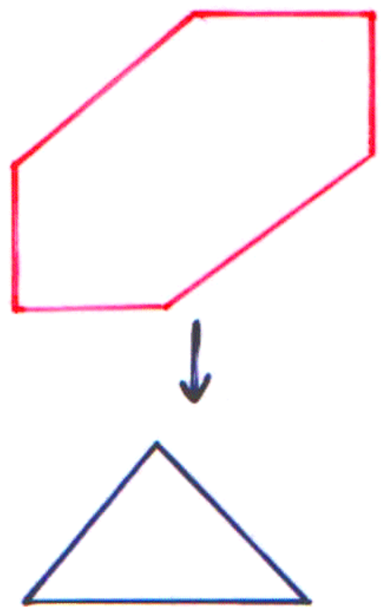


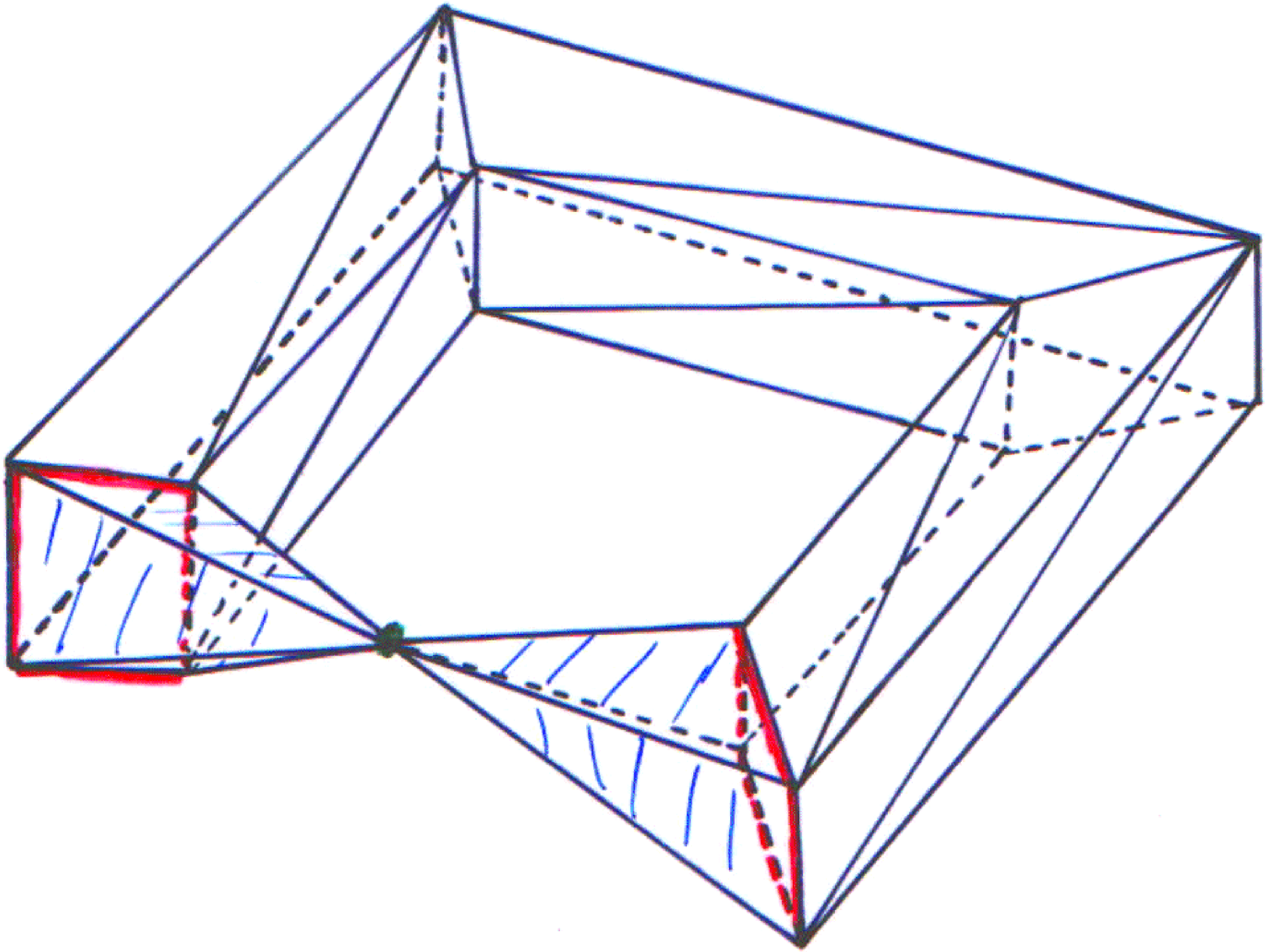
a
a

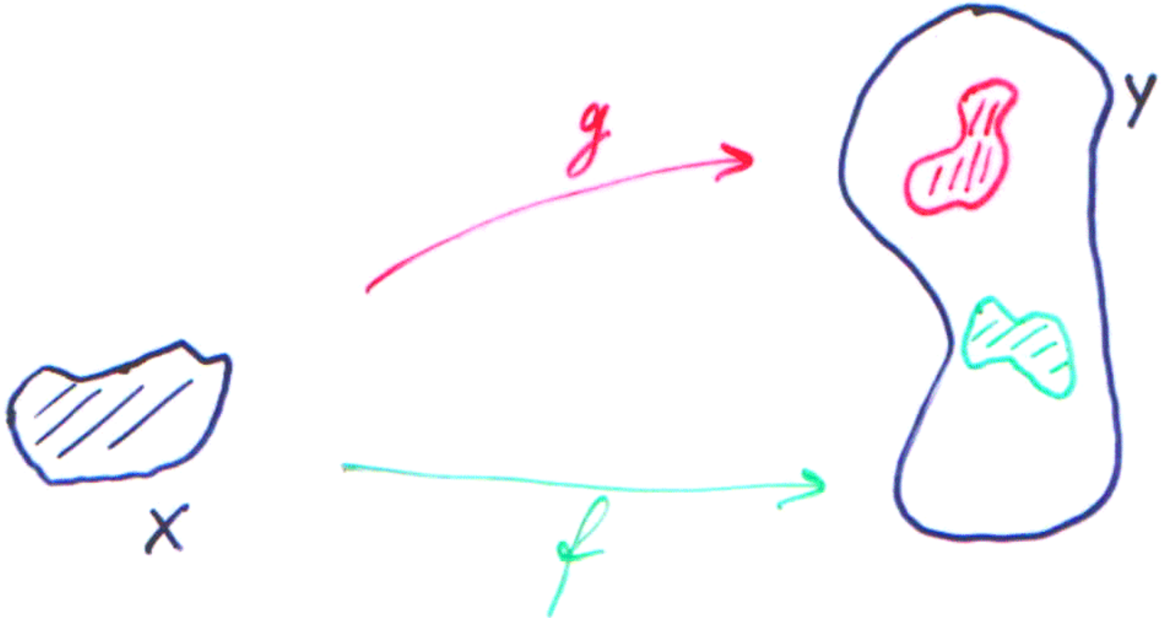


a
b
b
a

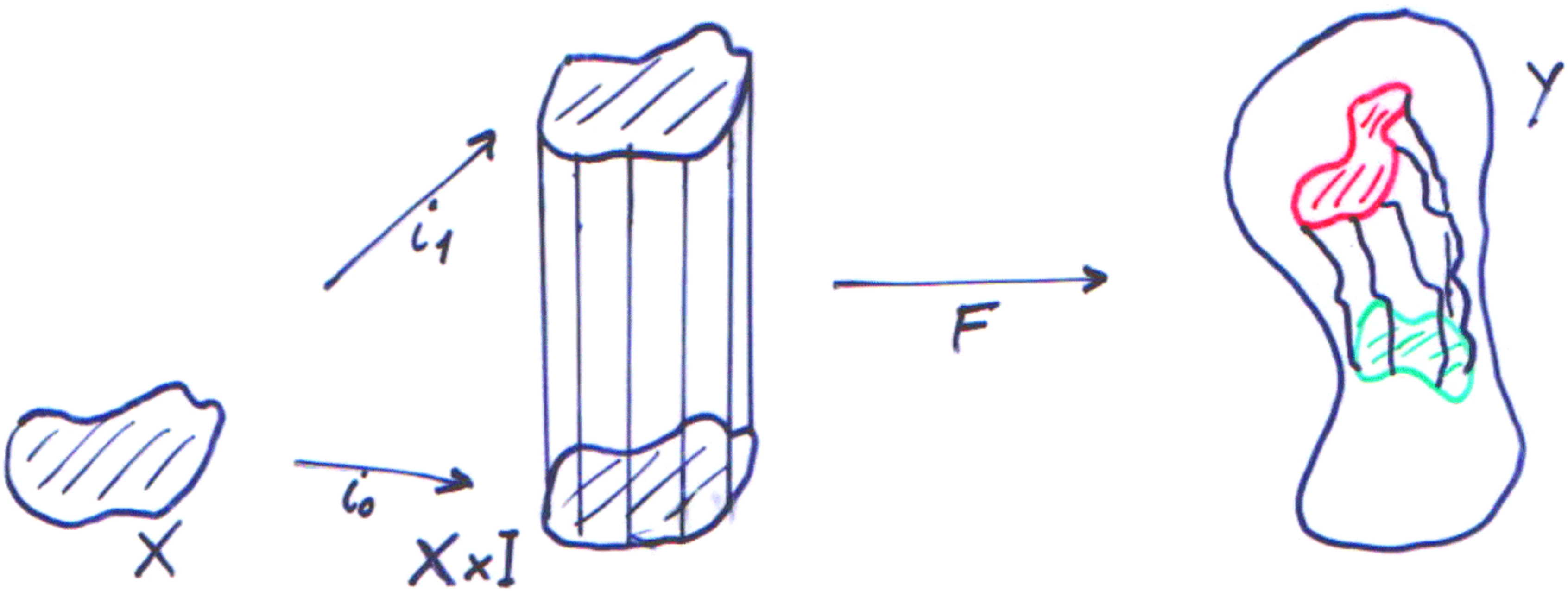




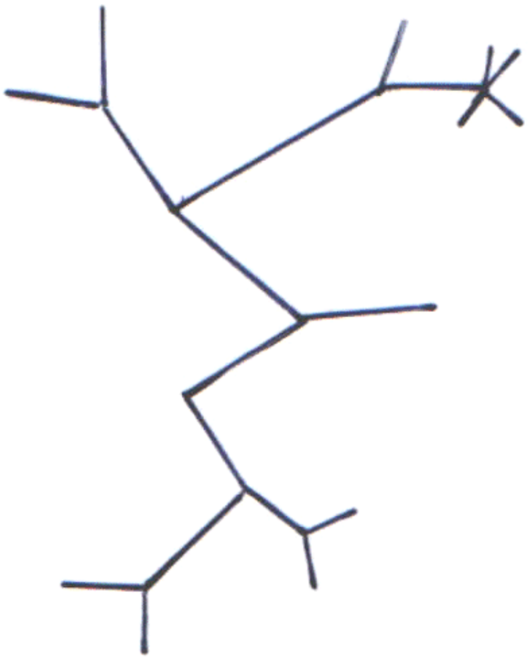


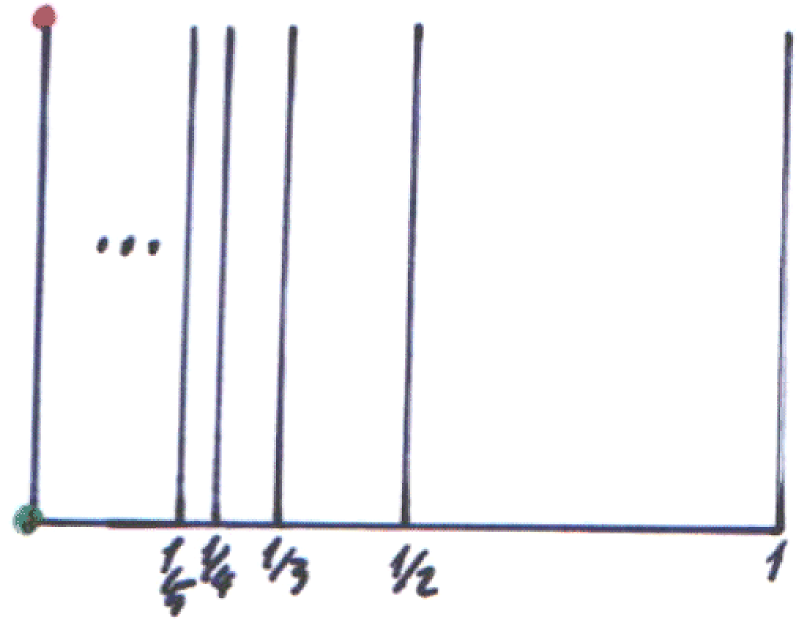


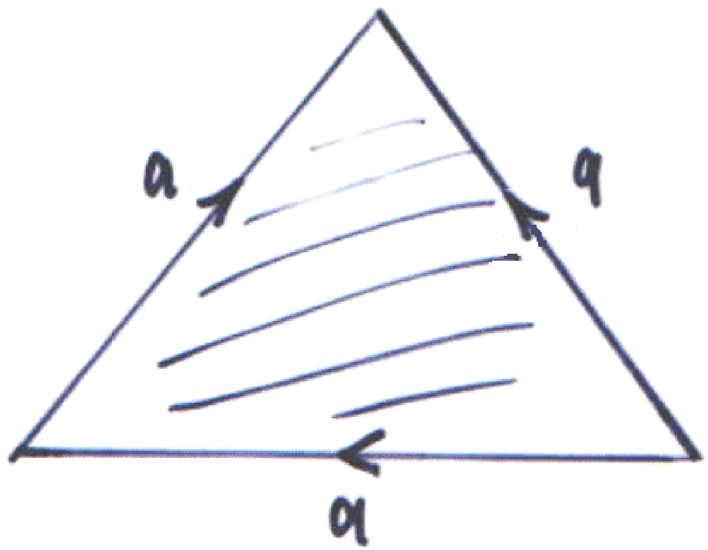
g
Y
X
f

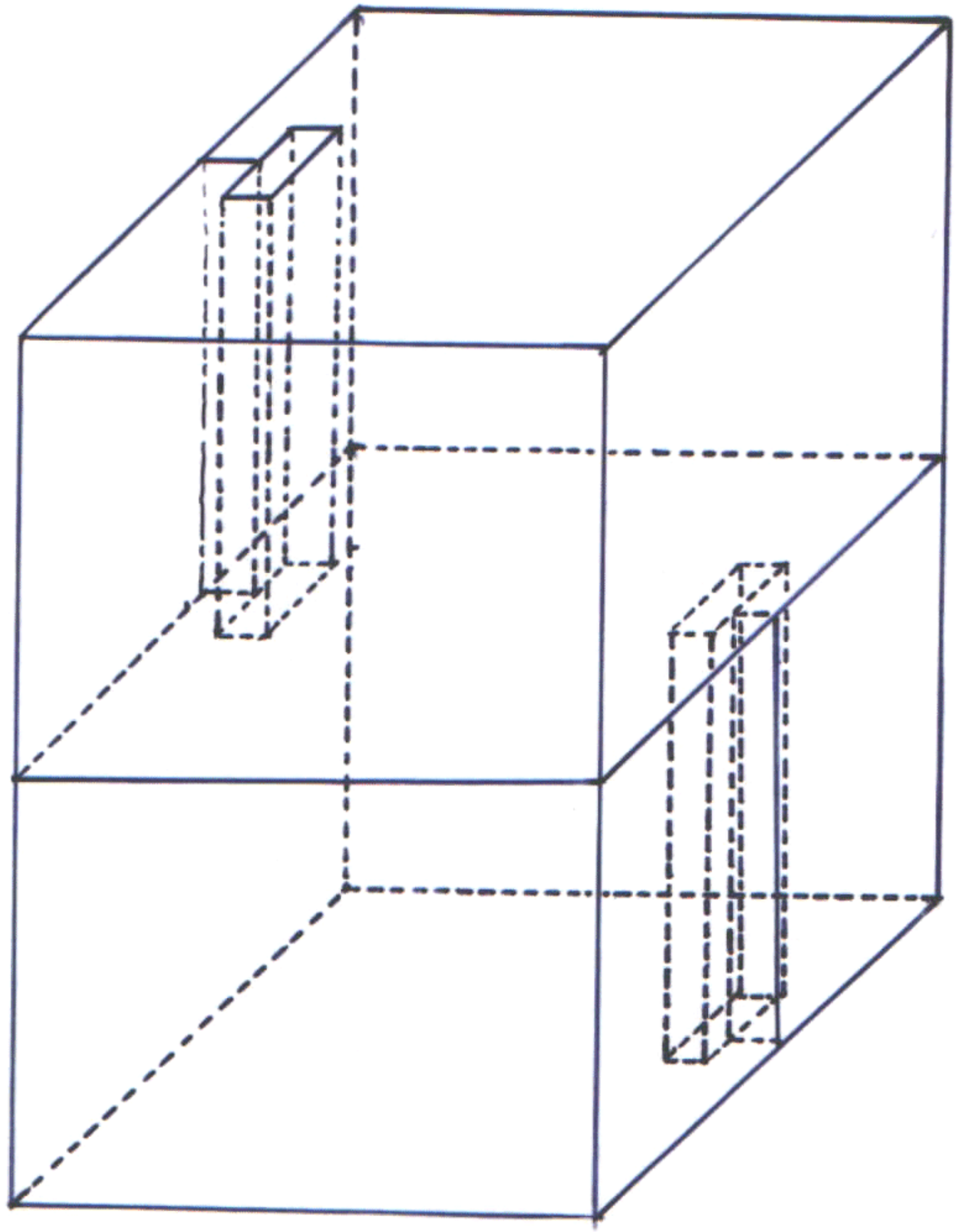


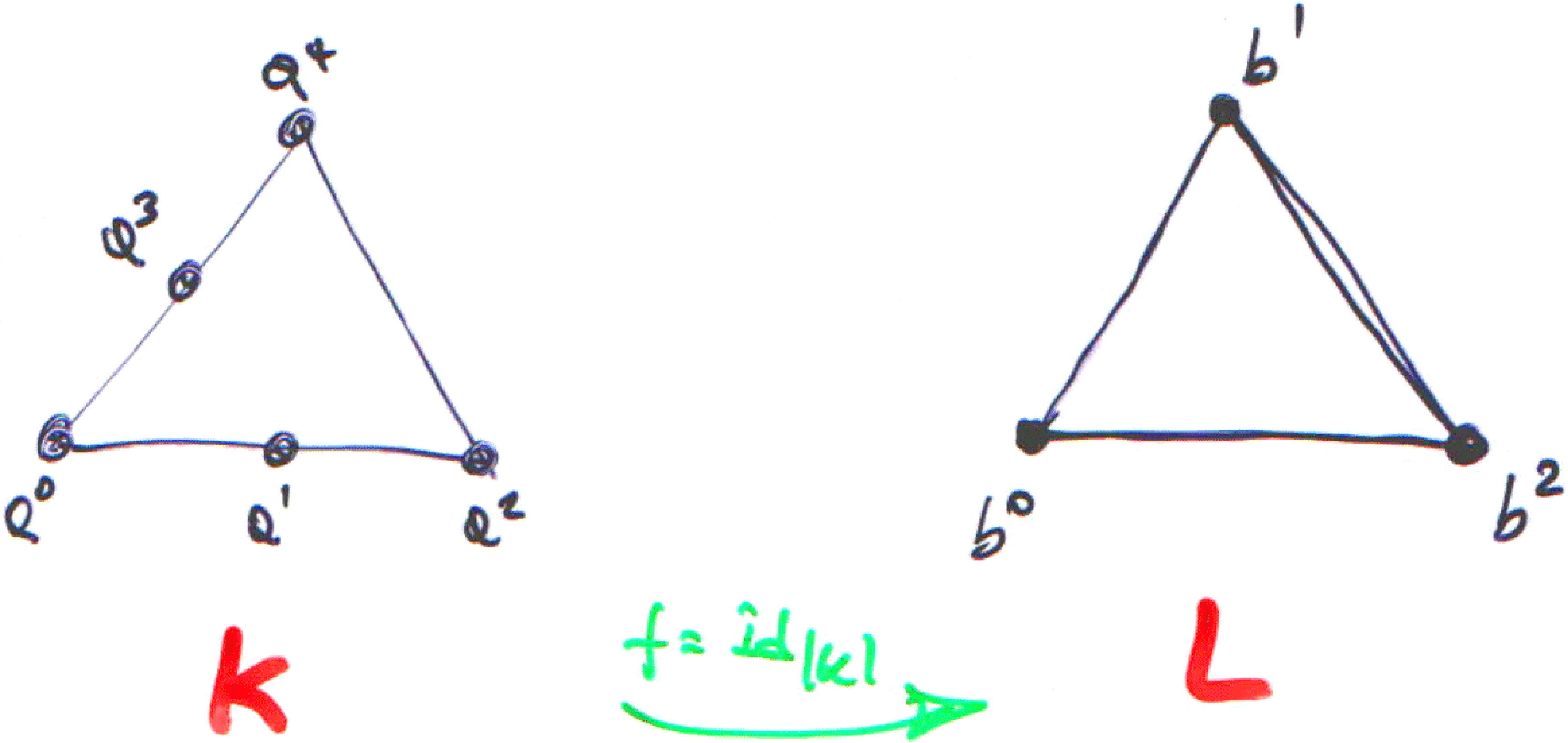
Y
i_1
F
X
i_0
$X \times I$



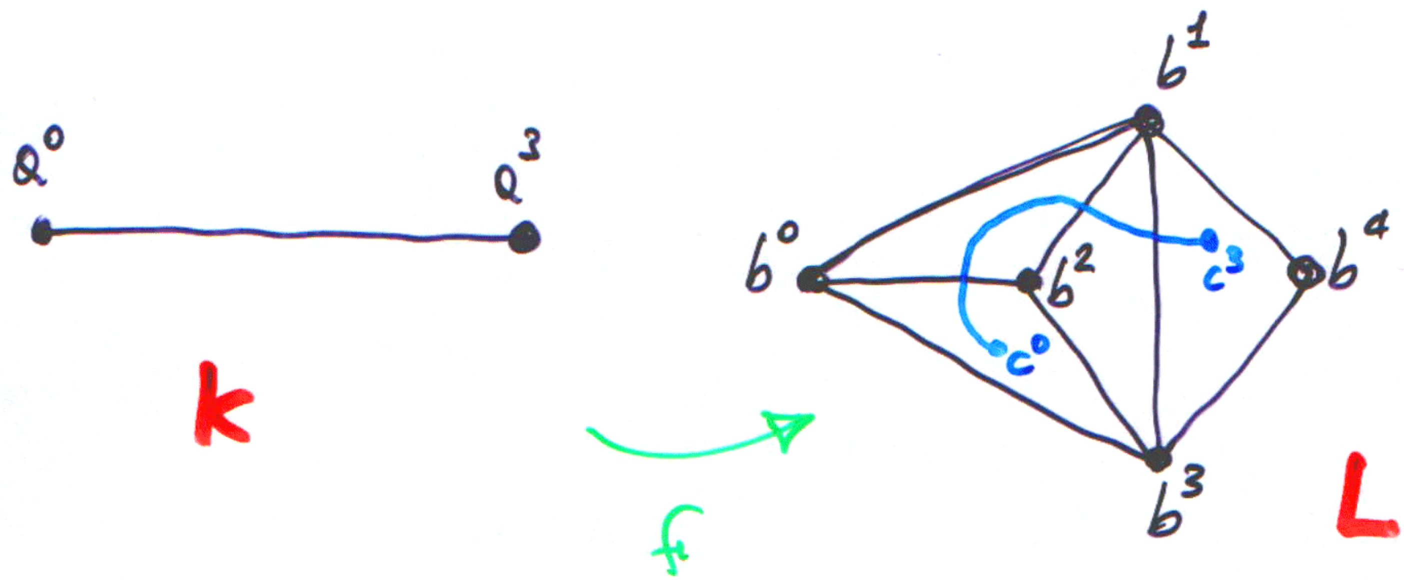

...
1/5
1/4
1/3
1/2
1

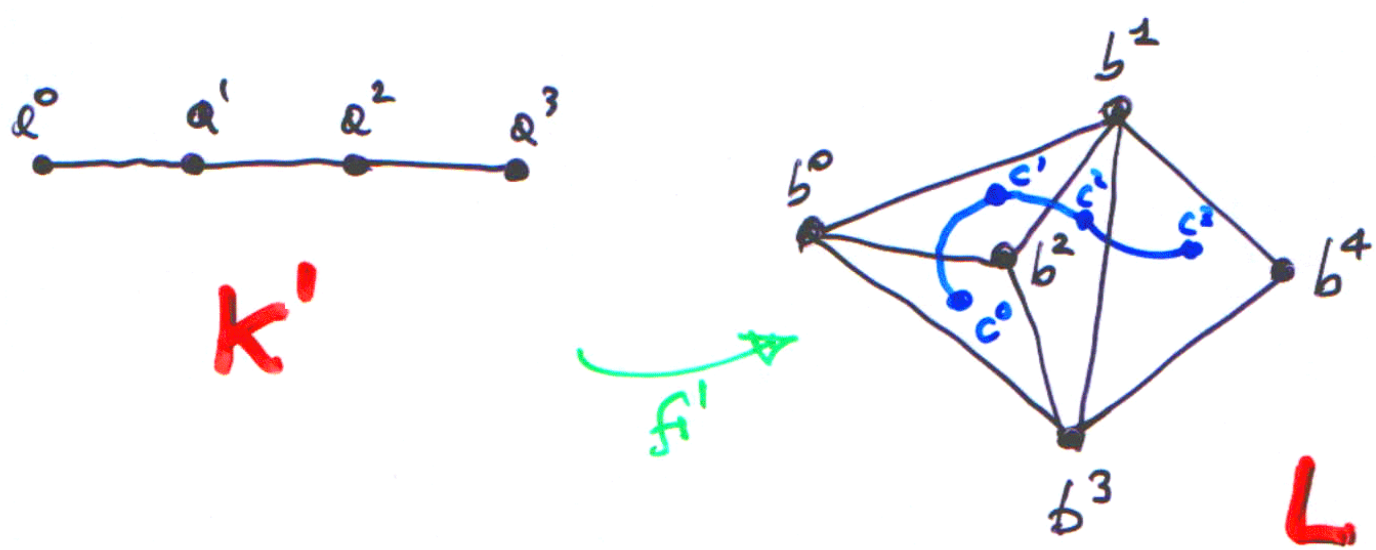

a
a
a

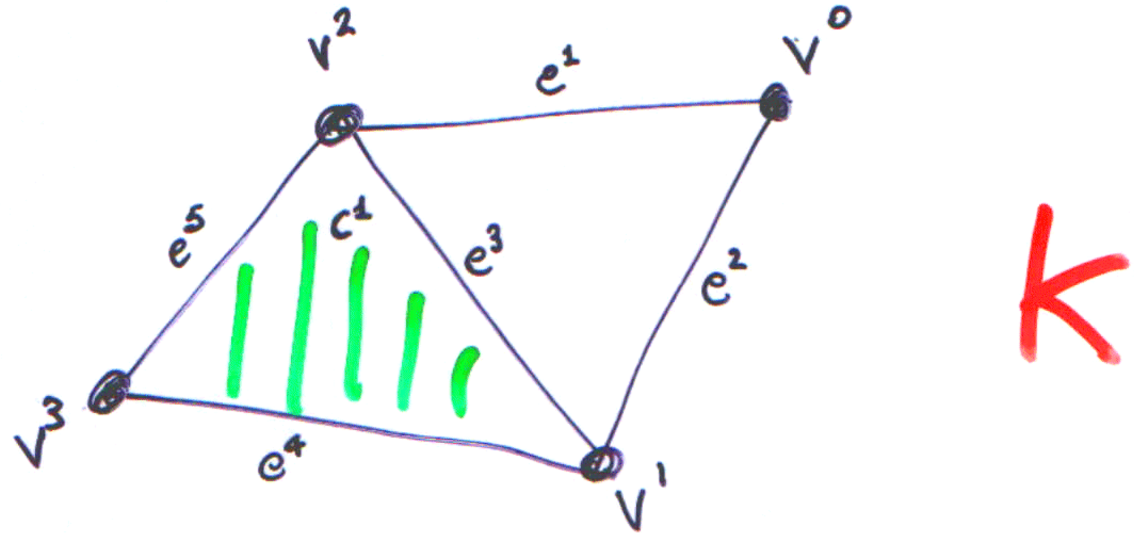


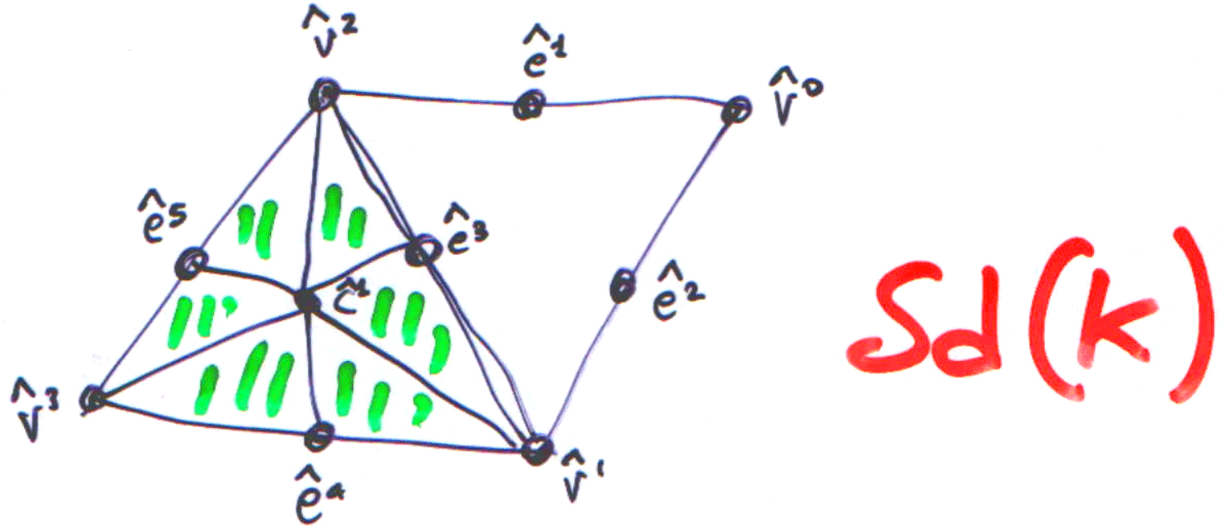


a4
a3
a0
a1
a2
b1
b0
b2
K
f = id|K|
L

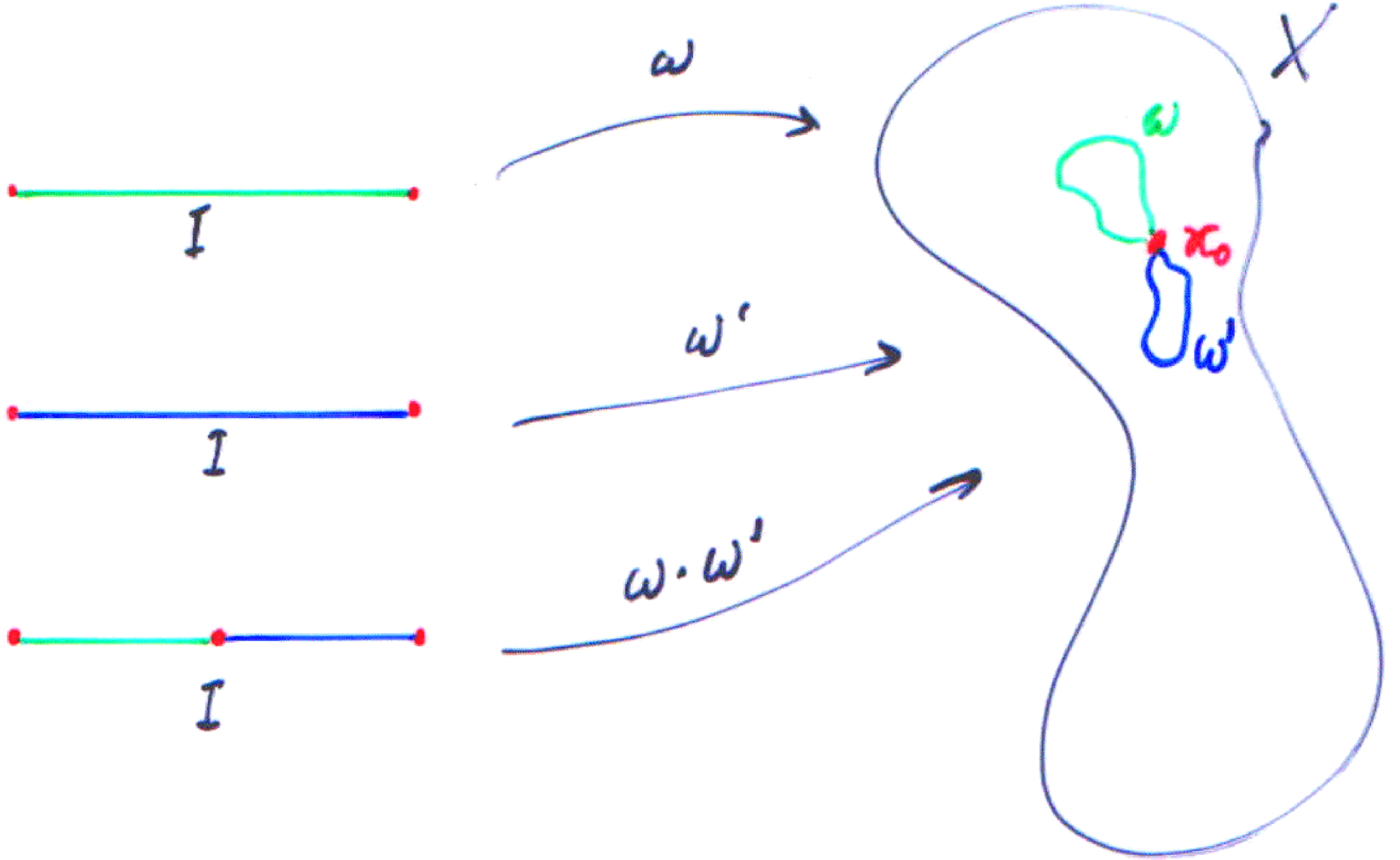

a⁰
a³
K
f
b¹
b⁰
b²
b⁴
b³
c⁰
c³
L


a⁰
a¹
a²
a³
K'
f'
b¹
b⁰
b²
b⁴
b³
c⁰
c¹
c²
c³
L

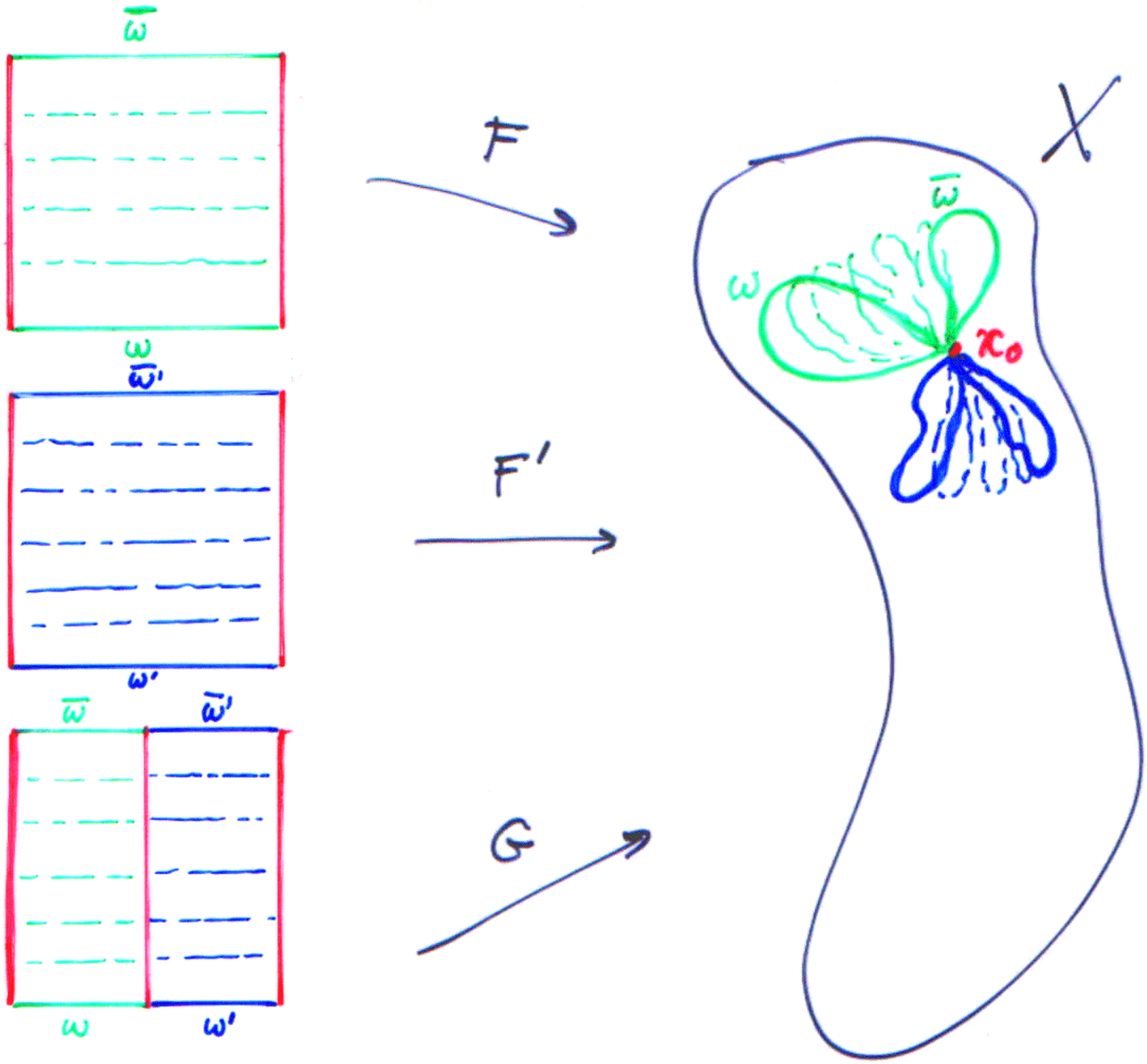




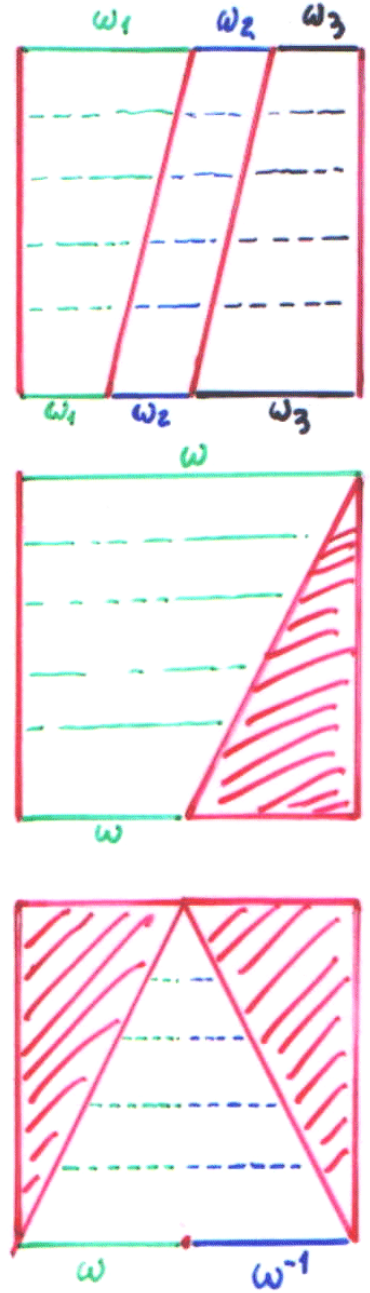
$$v^2 \leq e^3 \leq c^1 \implies \langle \hat{v}^2, \hat{e}^3, \hat{c}^1 \rangle \in Sd(K)$$



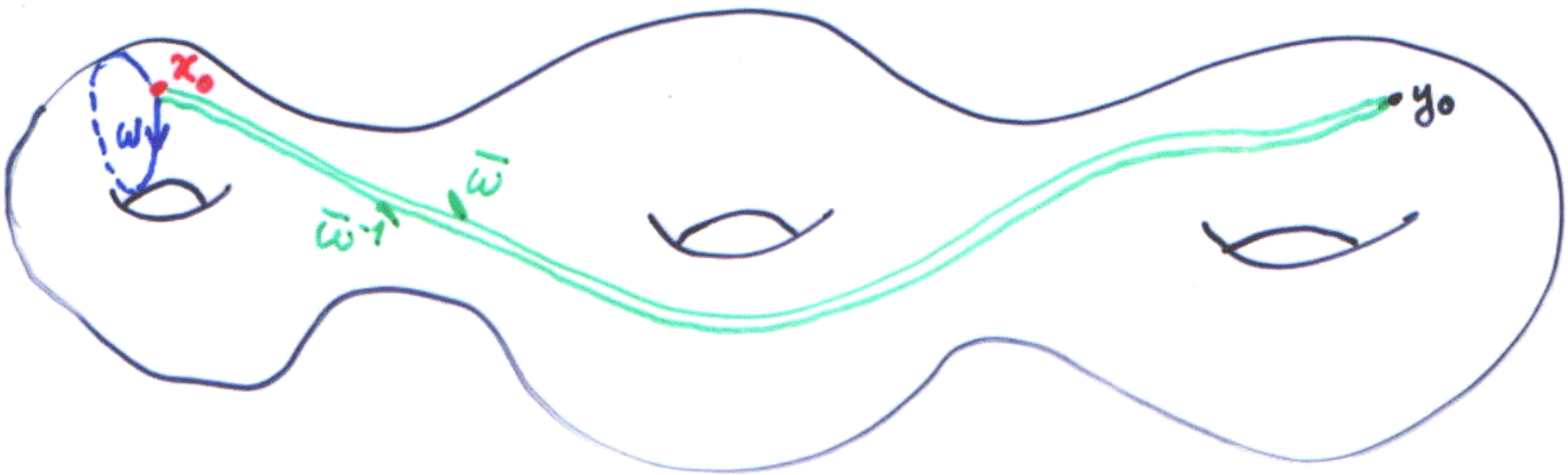
ω
I
ω'
I
ω·ω'
I
X
ω
x_0
ω'

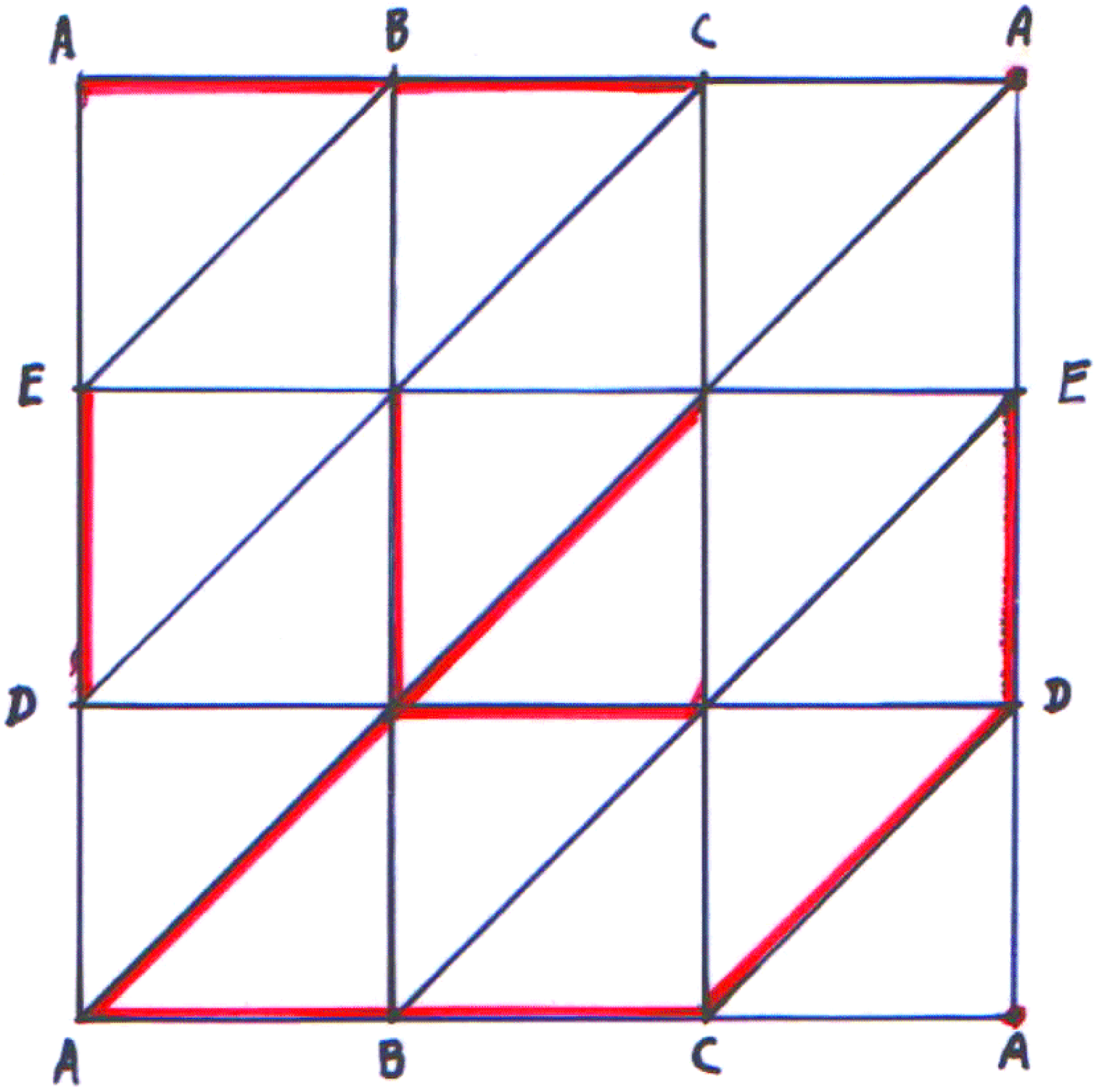


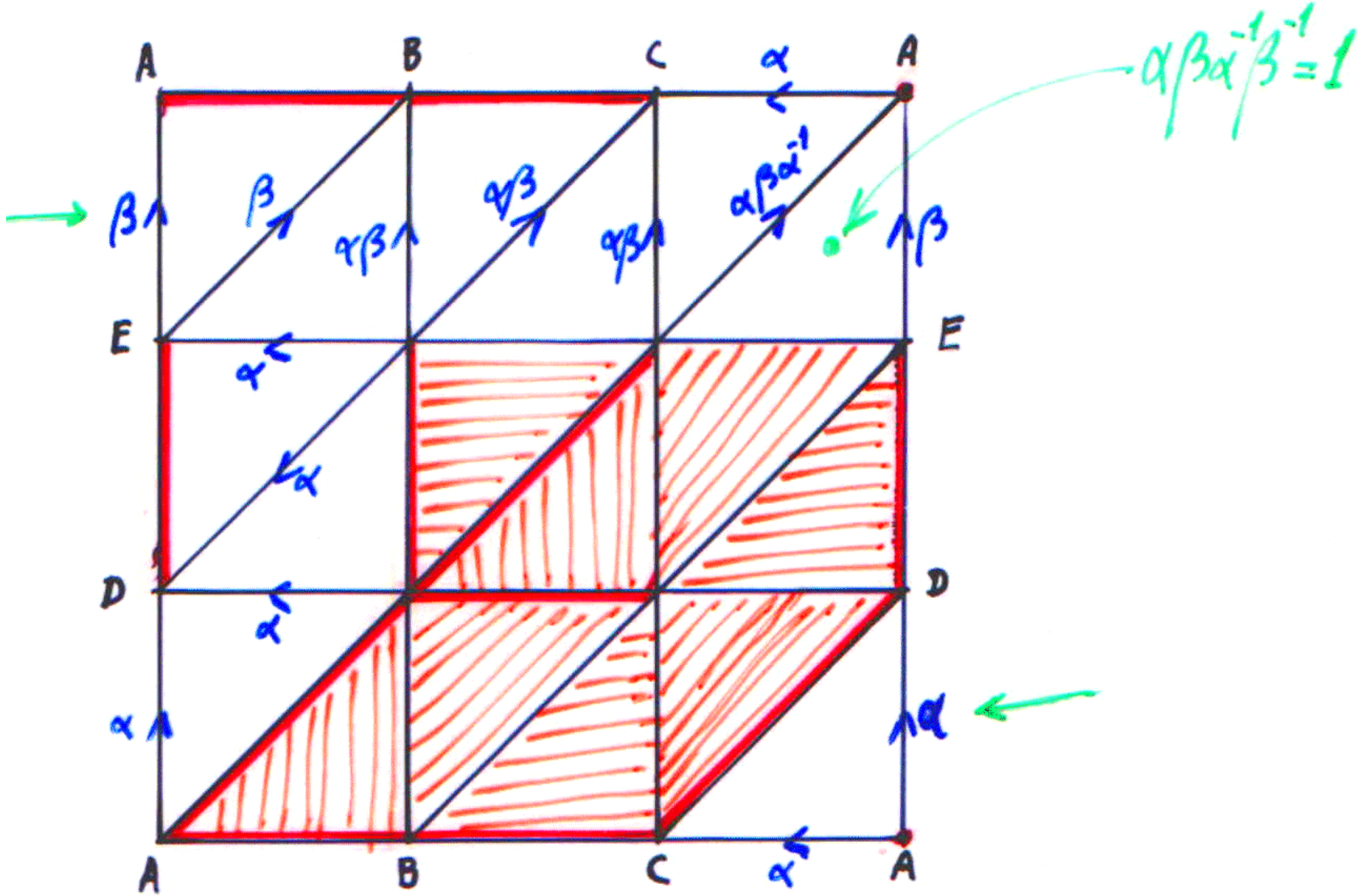
$\bar{\omega}$
ω
$\bar{\omega}'$
ω'
$\bar{\omega}$
$\bar{\omega}'$
ω
ω'
F
F'
G
X
$\bar{\omega}$
ω
x_0


ω1
ω2
ω3
ω1
ω2
ω3
ω
ω
ω
ω^-1

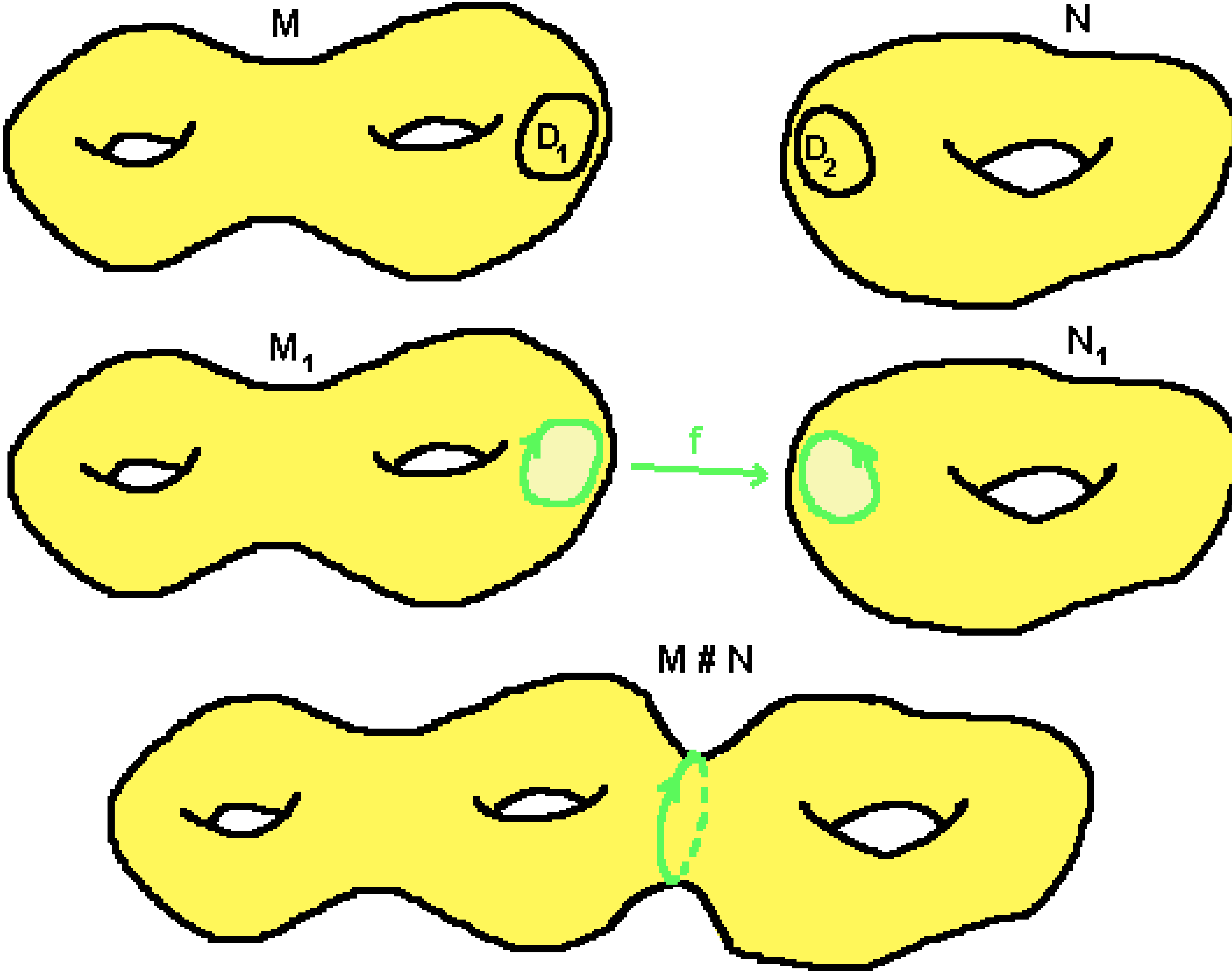

X
x0

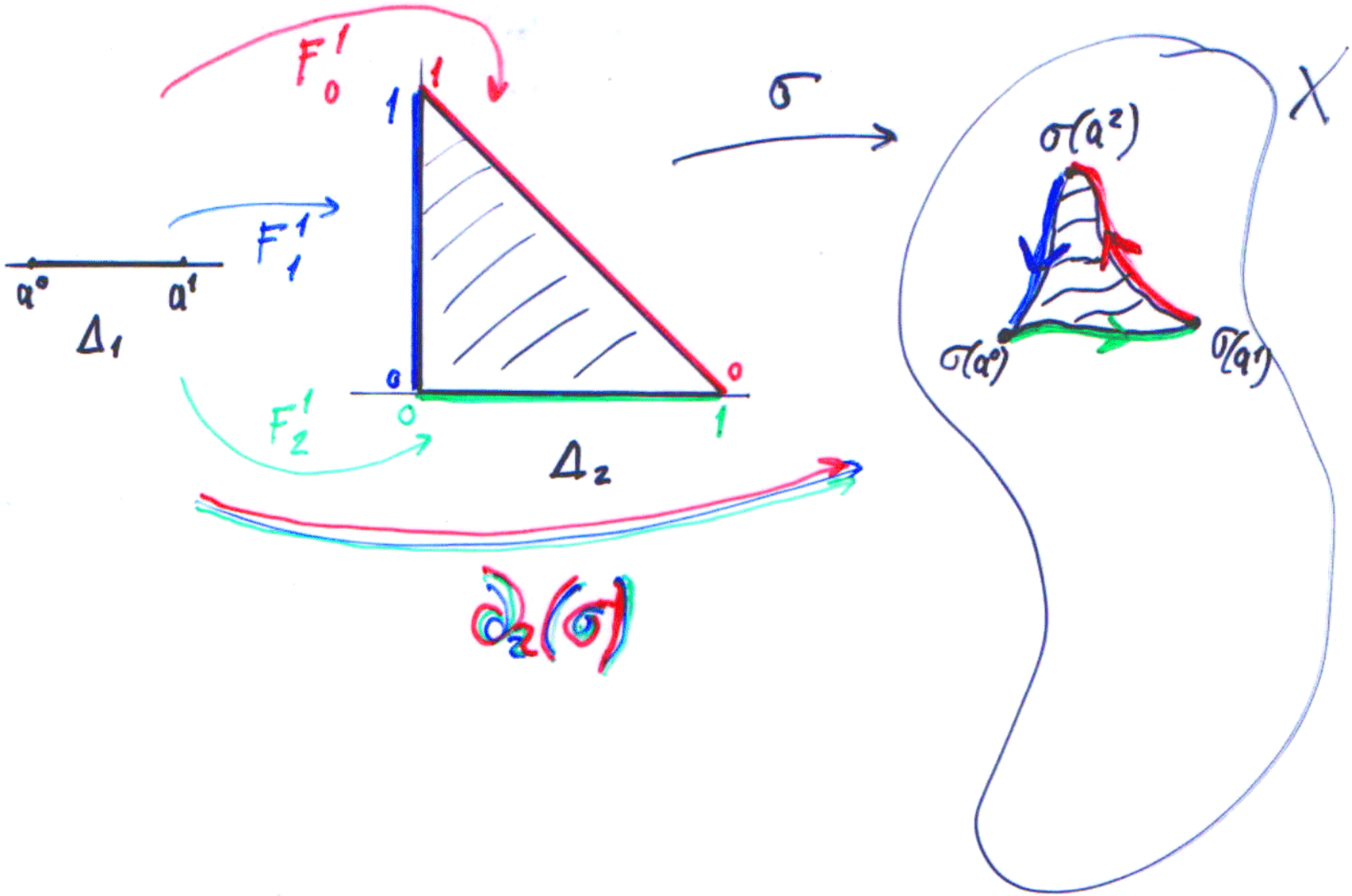

x_0
ω
$\bar{\omega}^{-1}$
$\bar{\omega}$
y_0


A
B
C
A
E
E
D
D
A
B
C
A

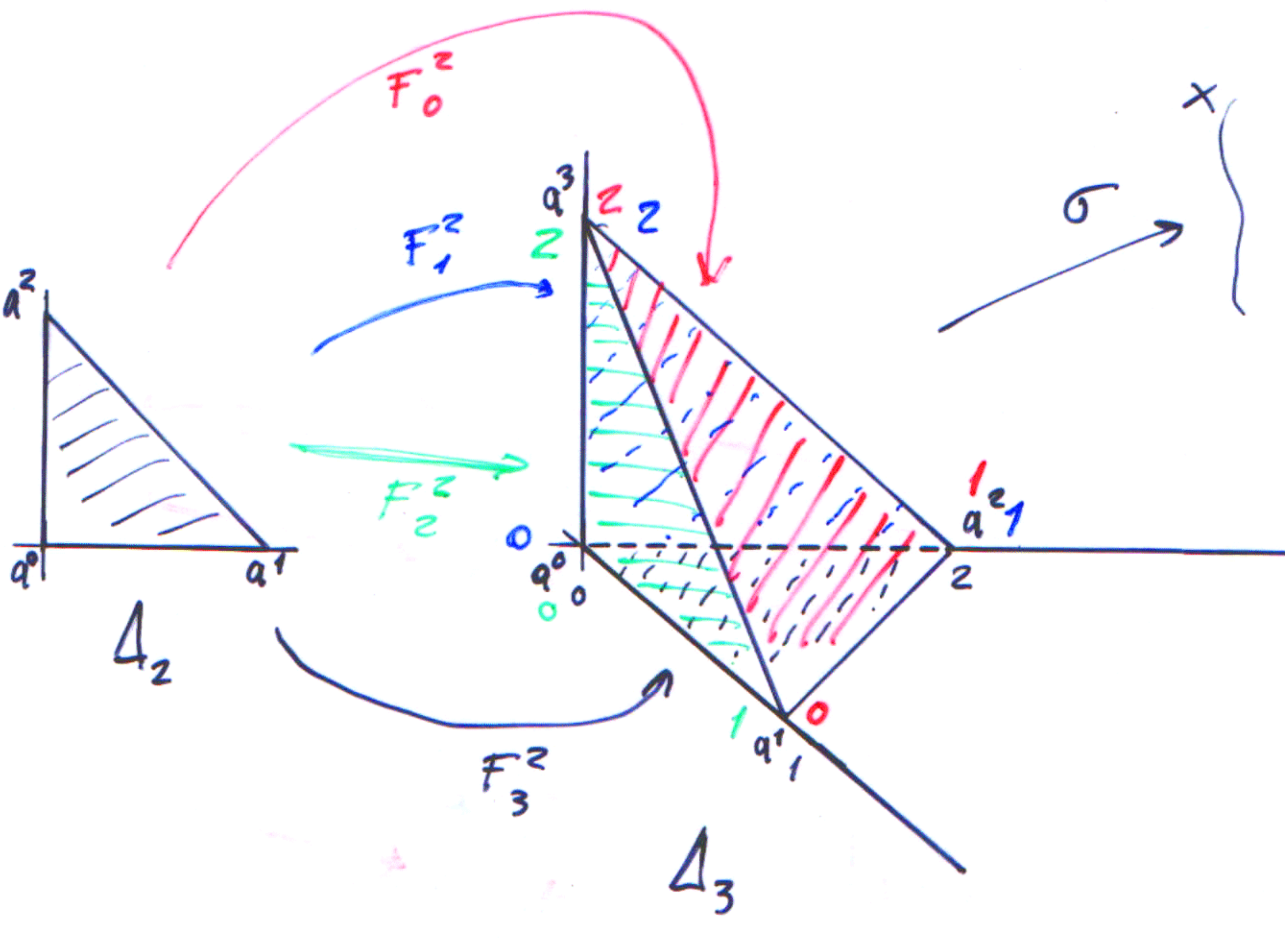


A
B
C
A
E
E
D
D
A
B
C
A
α
β
$\alpha\beta$
$\alpha\beta\alpha^{-1}$
$\alpha\beta\alpha^{-1}\beta^{-1} = 1$


M
N
D_1
D_2
M_1
N_1
f
M # N



F_0^1
F_1^1
F_2^1
a^0
a^1
Δ_1
Δ_2
σ
X
$\sigma(a^2)$
$\sigma(a^0)$
$\sigma(a^1)$
$\partial_2(\sigma)$



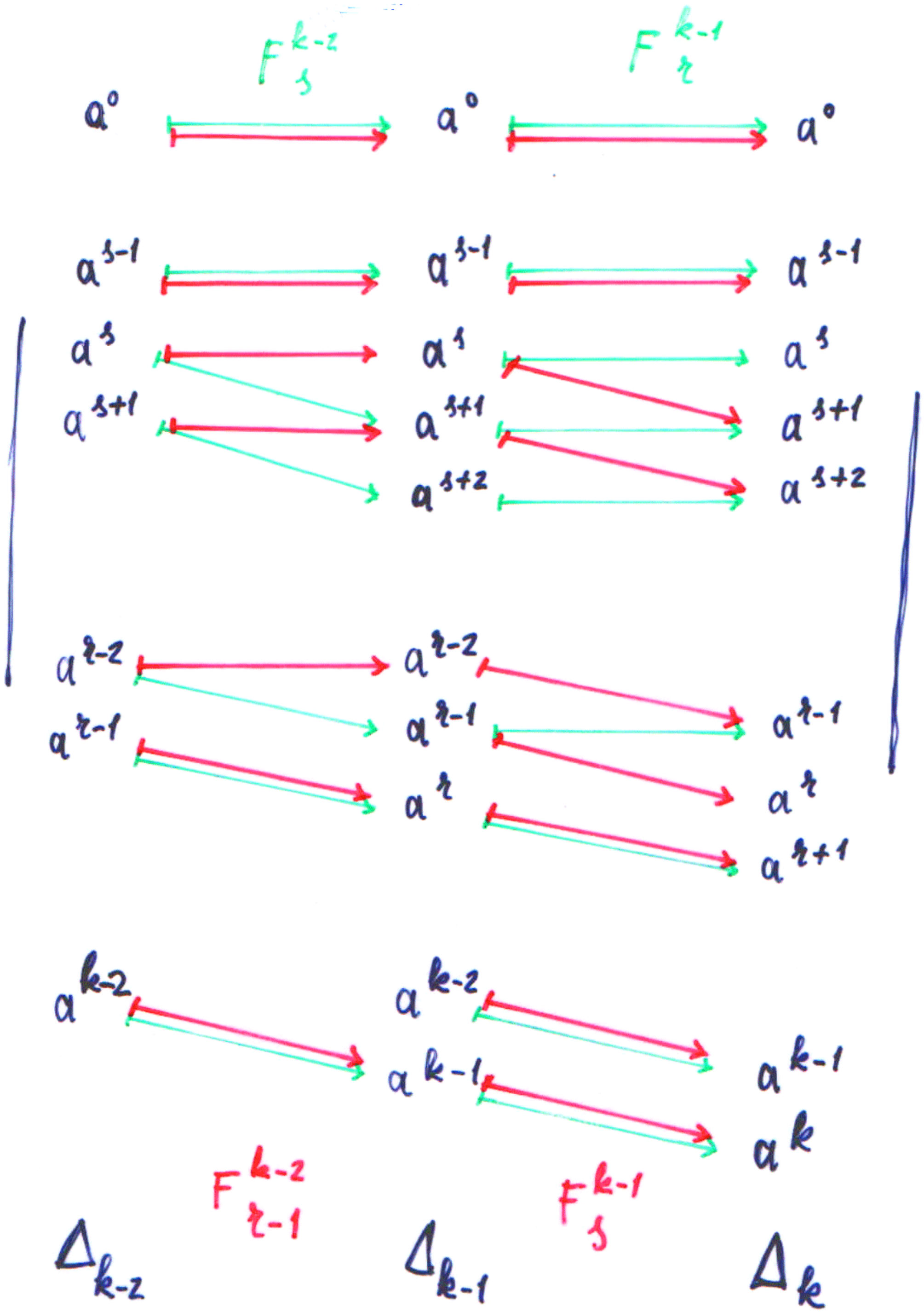
F_0^2
F_1^2
F_2^2
F_3^2
σ
x
q^0
q^1
q^2
q^3
Δ_2
Δ_3

$$\partial_{k-1}\partial_k(\sigma) = \sum_{s=0}^{k-1}(-1)^s\left(\sum_{r=0}^{k}(-1)^r\sigma F_r^{k-1}\right)F_s^{k-2} =$$

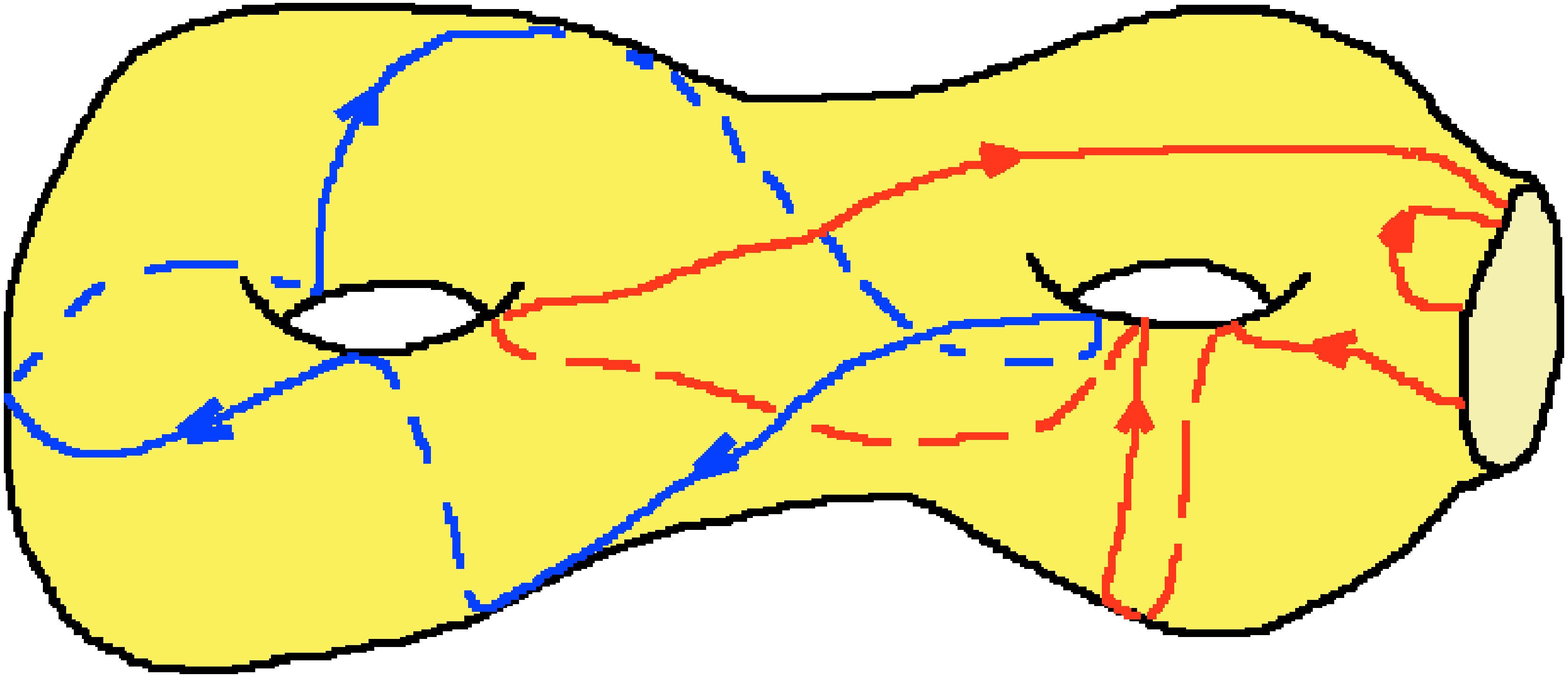
$$= \sum_{s=0}^{k-1}\sum_{r=0}^{k}(-1)^{r+s}\sigma F_r^{k-1}F_s^{k-2} =$$

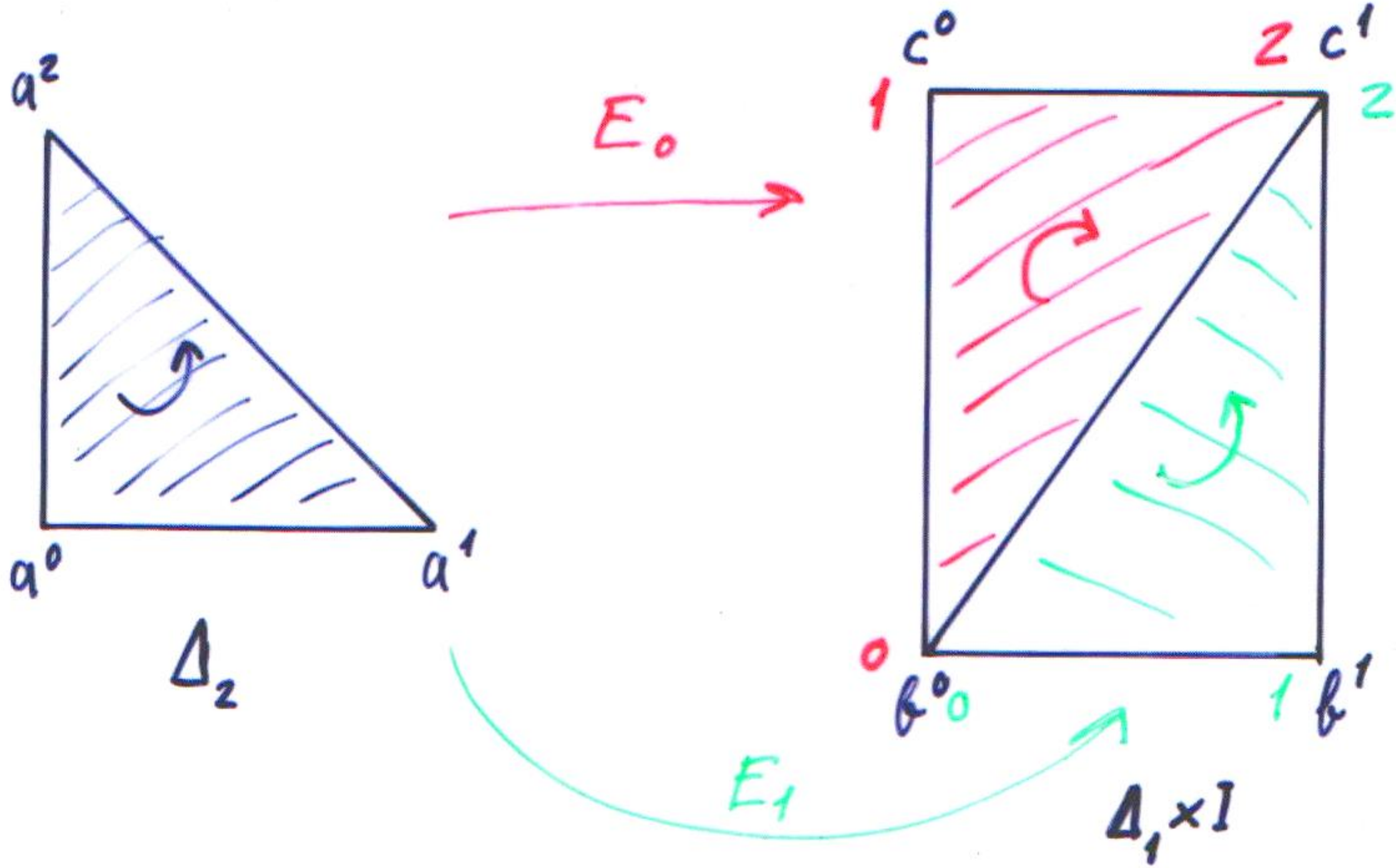
$$= \sum_{s<r}(-1)^{r+s}\sigma F_r^{k-1}F_s^{k-2} + \sum_{r\le s}(-1)^{r+s}\sigma F_r^{k-1}F_s^{k-2} =$$

$$= \sum_{s<r}(-1)^{r+s}\sigma F_s^{k-1}F_{r-1}^{k-2} + \sum_{r\le s}(-1)^{r+s}\sigma F_r^{k-1}F_s^{k-2} = 0$$

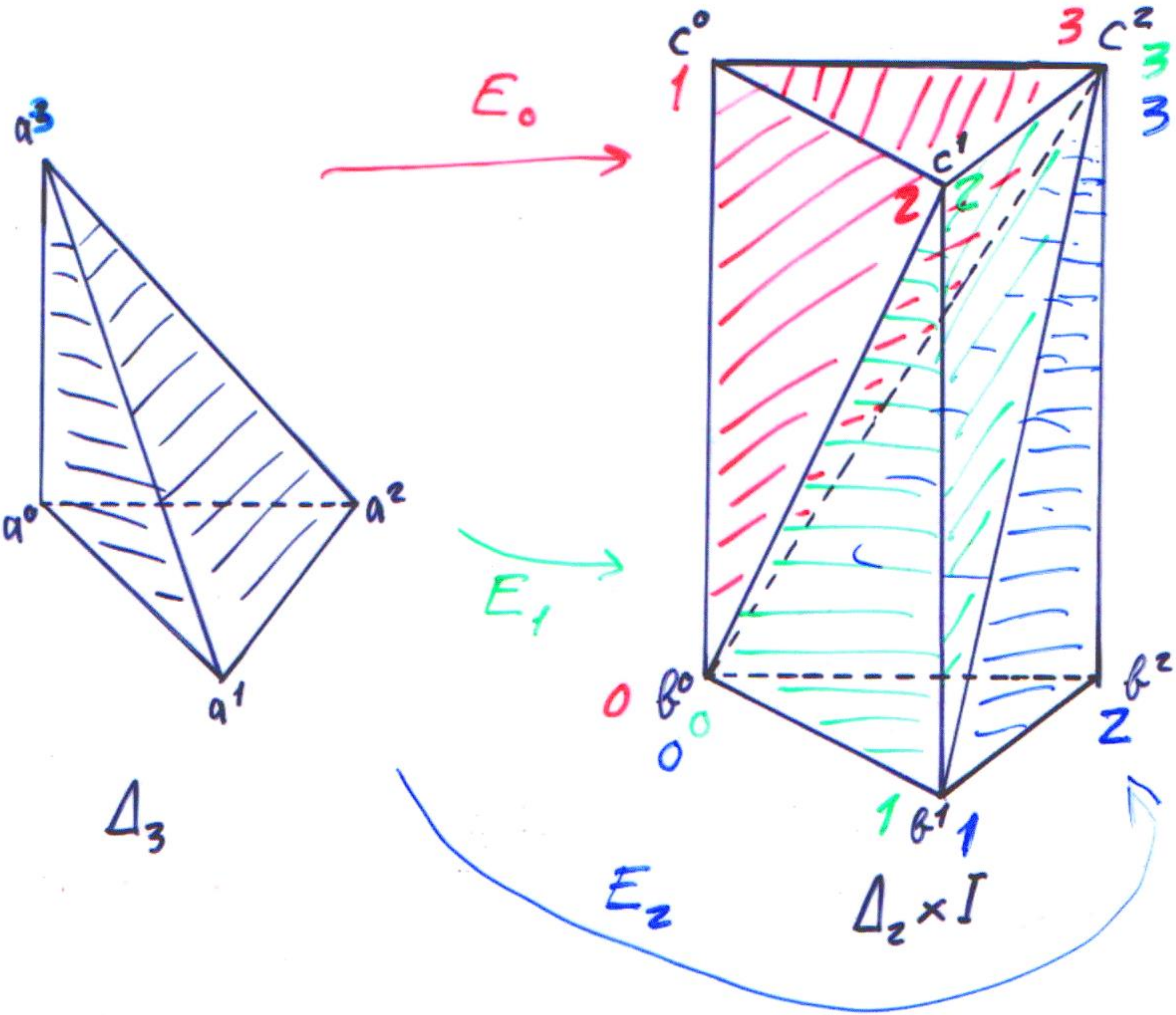


F_s^{k-2}
F_r^{k-1}
a^0 a^0 a^0
a^{s-1} a^{s-1} a^{s-1}
a^s a^s a^s
a^{s+1} a^{s+1} a^{s+1}
a^{s+2} a^{s+2}
a^{r-2} a^{r-2}
a^{r-1} a^{r-1} a^{r-1}
a^r a^r
a^{r+1}
a^{k-2} a^{k-2}
a^{k-1} a^{k-1}
a^k
F_{r-1}^{k-2}
F_s^{k-1}
Δ_{k-2} Δ_{k-1} Δ_k

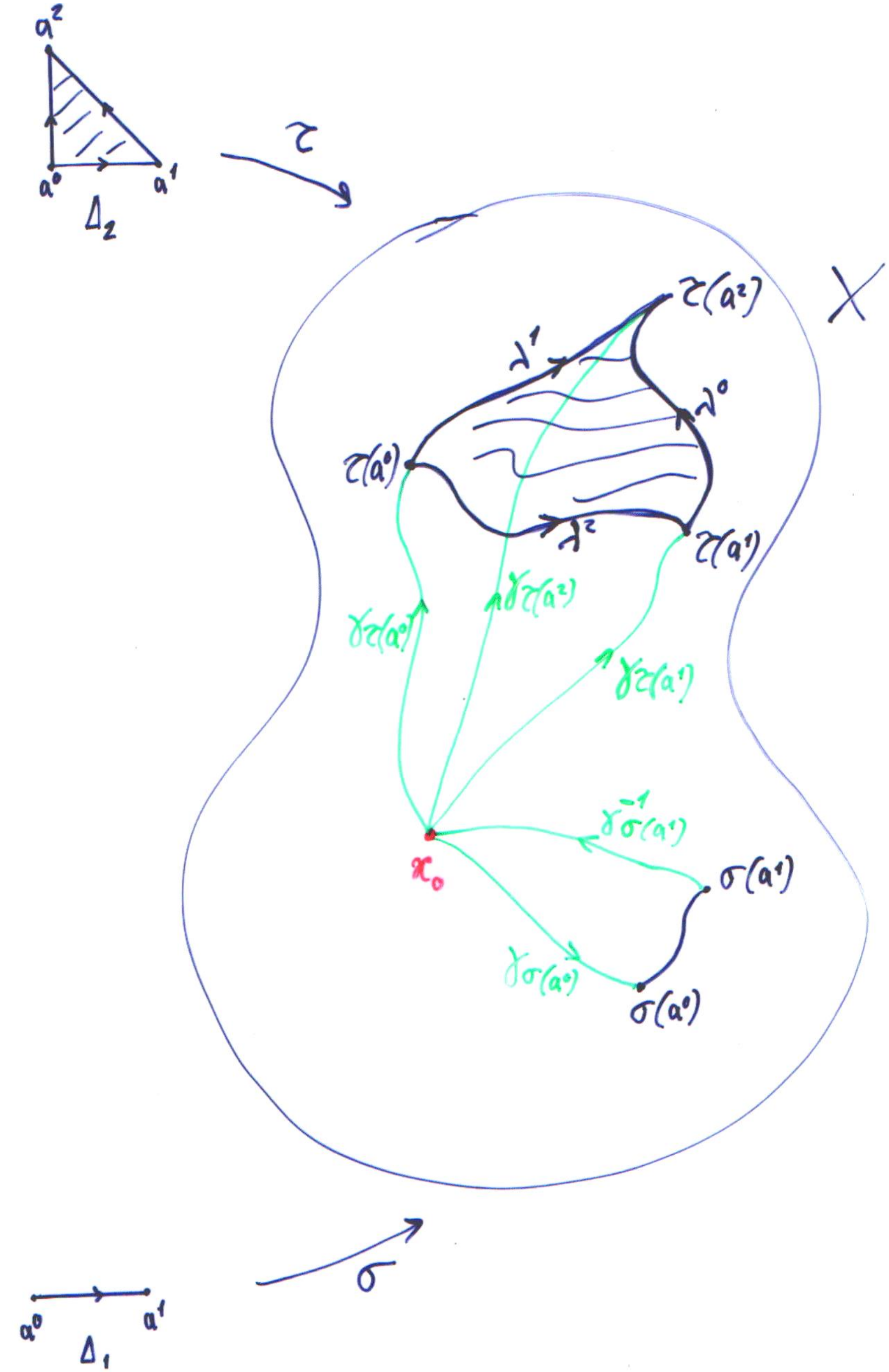


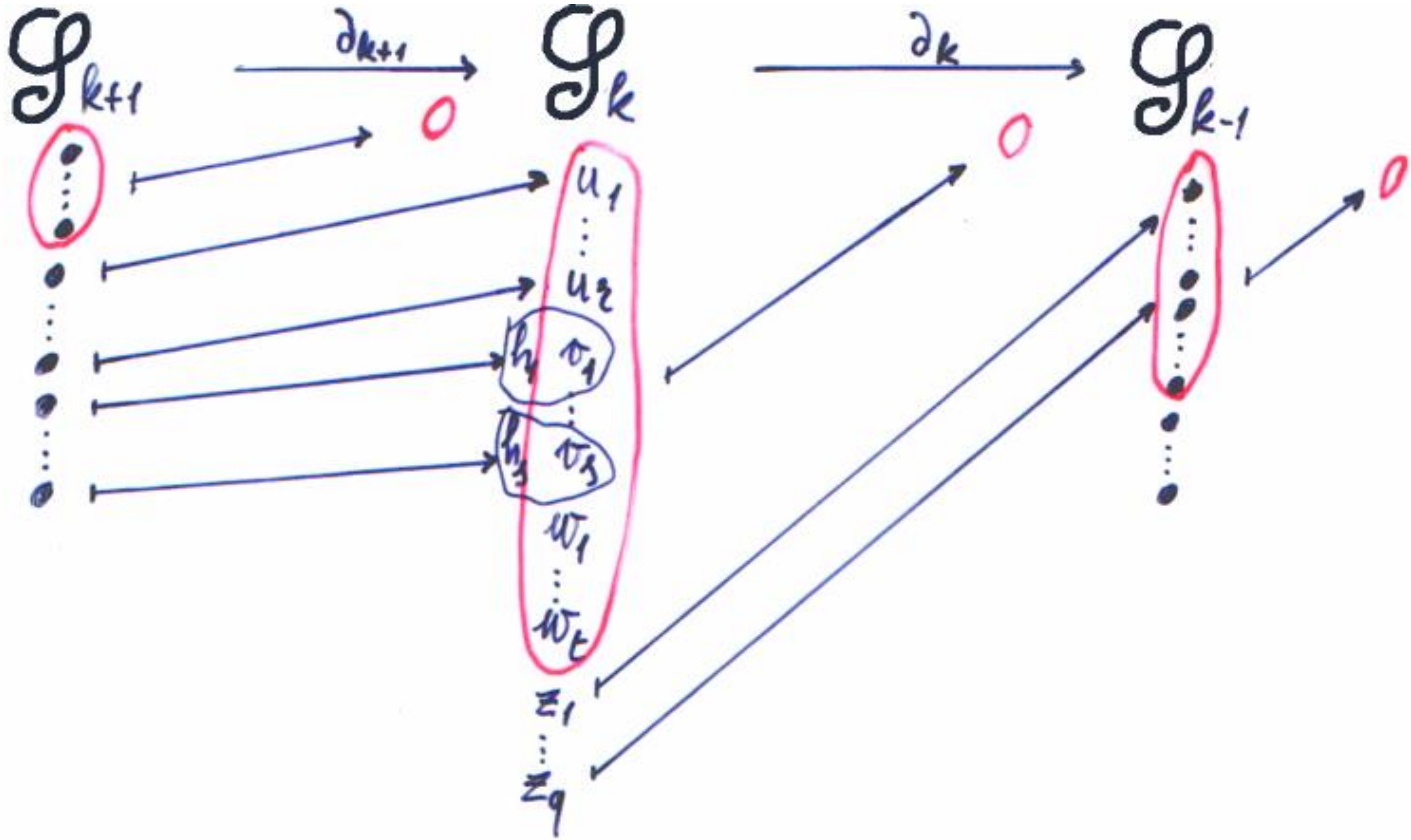


a^2
a^0
a^1
Δ_2
E_0
E_1
c^0
c^1
1
2
2
0
b^0
0
1
b^1
$\Delta_1 \times I$



a^3
a^0
a^2
a^1
Δ_3
E_0
E_1
E_2
c^0
c^1
c^2
b^0
b^1
b^2
$\Delta_2 \times I$


a^2
a^0
a^1
Δ_2
τ
X
$\tau(a^2)$
λ^1
λ^0
$\tau(a^0)$
λ^2
$\tau(a^1)$
$\gamma\tau(a^0)$
$\gamma\tau(a^2)$
$\gamma\tau(a^1)$
$\gamma^{-1}\sigma(a^1)$
x_0
$\sigma(a^1)$
$\gamma\sigma(a^0)$
$\sigma(a^0)$
σ
a^0
a^1
Δ_1



$\mathcal{S}_{k+1}$
∂_{k+1}
$\mathcal{S}_k$
∂_k
$\mathcal{S}_{k-1}$
0
0
0
u_1
u_r
h_1
v_1
h_s
v_s
w_1
w_t
z_1
z_q

$$
{}'E^k = \underbrace{\begin{pmatrix}
 & 1 & & & & & & \\
 & & \ddots & & & & 0 & \\
 & & & 1 & & & & \\
 & & 0 & & h_1 & & & \\
 & & & & & \ddots & & \\
 & & & & & & h_s & \\
 & & & & & & & \\
 & & & & & & &
\end{pmatrix}}_{\alpha^{k+1}}
\begin{array}{l}
\left.\begin{array}{l} \\ \\ \end{array}\right\} r \\
\left.\begin{array}{l} \\ \\ \end{array}\right\} s \\
\left.\begin{array}{l} \\ \\ \end{array}\right\} t+q
\end{array}
\qquad \gamma^k = r+s, \quad \alpha^k = r+s+t+q
$$

$\gamma^k = r+s \qquad \gamma^{k-1} = q \qquad \alpha^k = r+s+t+q \qquad t = \alpha^k - r - s - q = \alpha^k - \gamma^k - \gamma^{k-1}$

$$Z_k = \langle u_1, \dots, u_r, v_1, \dots, v_s, w_1, \dots, w_t \rangle_{ab}$$

$$B_k = \langle u_1, \dots, u_r, h_1 v_1, \dots, h_s v_s \rangle_{ab}$$

$$H_k = \frac{Z_k}{B_k} = \langle v_1, \dots, v_s, w_1, \dots, w_t \mid h_1 v_1, \dots, h_s v_s \rangle_{ab} \cong$$

$$\cong \bigoplus_t \mathbb{Z} \oplus \mathbb{Z}_{h_1} \oplus \cdots \oplus \mathbb{Z}_{h_s}$$

$$E^0 = \begin{array}{c} \\ v_1 \\ v_2 \\ v_3 \end{array} \begin{array}{c} \begin{array}{ccc} s_1 & s_2 & s_3 \end{array} \\ \begin{pmatrix} 0 & -1 & -1 \\ +1 & 0 & +1 \\ -1 & +1 & 0 \end{pmatrix} \end{array} \qquad E^1 = \begin{array}{c} \\ s_1 \\ s_2 \\ s_3 \end{array} \begin{array}{c} t \\ \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix} \end{array}$$

$$E^0 = \begin{array}{c} \\ v_1 \\ v_2 \\ v_3 \end{array} \begin{array}{c} \begin{array}{ccc} s_1 & s_2 & s_3 \end{array} \\ \begin{pmatrix} 0 & -1 & -1 \\ 1 & 0 & 1 \\ -1 & 1 & 0 \end{pmatrix} \end{array} \rightsquigarrow \tilde{E}^0 = \begin{array}{c} \\ \tilde{v}_1 \\ \tilde{v}_2 \\ \tilde{v}_3 \end{array} \begin{array}{c} \begin{array}{ccc} s_1 & s_2 & s_3 \end{array} \\ \begin{pmatrix} 0 & 0 & 0 \\ 1 & 0 & 1 \\ -1 & 1 & 0 \end{pmatrix} \end{array} \begin{array}{l} \mathrm{I}+\mathrm{II}+\mathrm{III} \\ \\ \\ \end{array} \rightsquigarrow$$

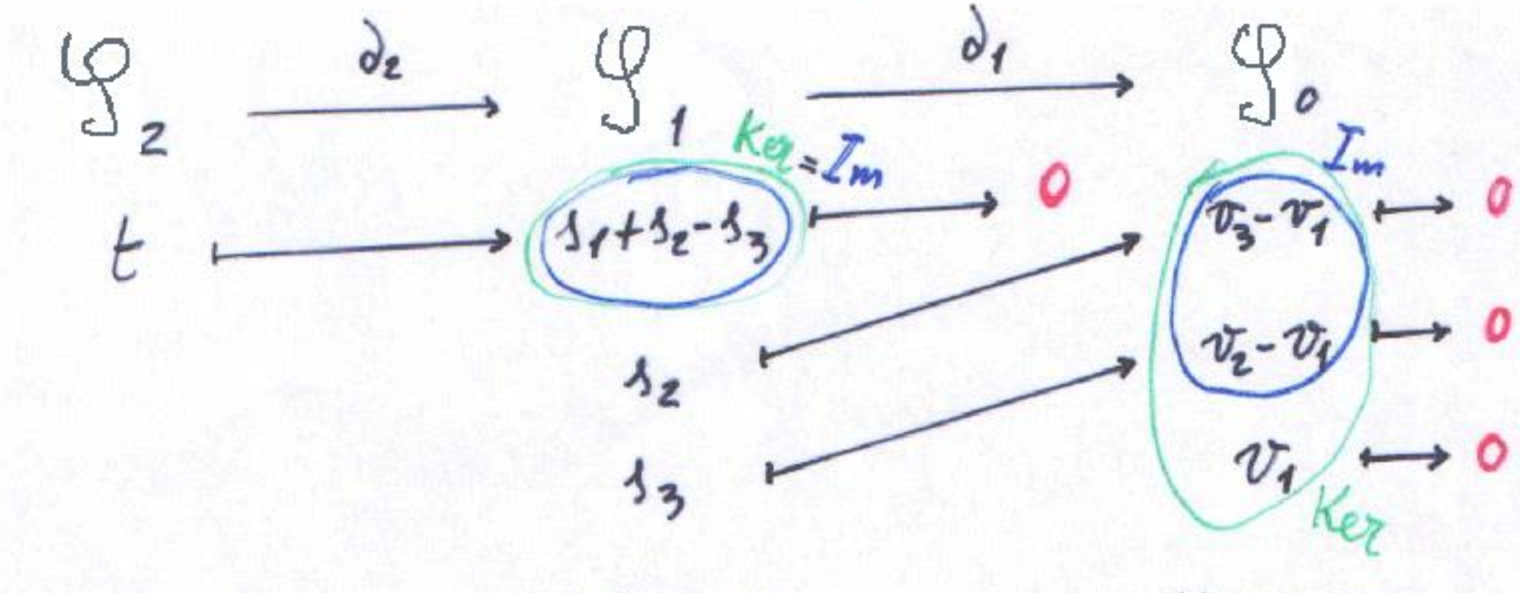
$$\rightsquigarrow \bar{E}^0 = \begin{array}{c} \\ \tilde{v}_1 \\ \tilde{v}_2 \\ \tilde{v}_3 \\ \\ \end{array} \begin{array}{c} \begin{array}{ccc} s'_1 & s'_2 & s'_3 \end{array} \\ \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix} \\ \mathrm{I}+\mathrm{II}-\mathrm{III} \end{array} \rightsquigarrow {}'E^0 = \begin{array}{c} \\ v'_1 \\ v'_2 \\ v'_3 \end{array} \begin{array}{c} \begin{array}{ccc} s'_1 & s'_2 & s'_3 \end{array} \\ \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{pmatrix} \end{array} \begin{array}{l} \\ \mathrm{III} \\ \\ \mathrm{I} \end{array}$$

$$
{}^{\prime}E^{0} = \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} 1 & 1 & 1 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} E^{0} \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & 0 & 1 \end{pmatrix} = \underbrace{\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 1 \end{pmatrix}}_{F} E^{0} \underbrace{\begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ -1 & 0 & 1 \end{pmatrix}}_{G}
$$

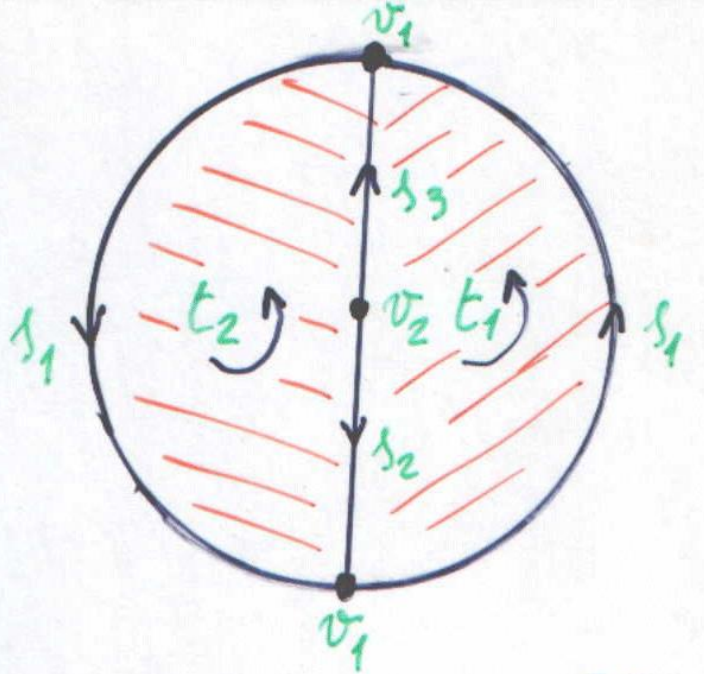
$$
(v_1' \; v_2' \; v_3') = (v_1 \; v_2 \; v_3) \cdot F^{-1} = \big((v_3 - v_1) \; (v_2 - v_1) \; v_1\big)
$$

$$
(s_1' \; s_2' \; s_3') = (s_1 \; s_2 \; s_3) \cdot G = \big((s_1 + s_2 - s_3) \; s_2 \; s_3\big)
$$

$$
{}^{\prime}E^{1} = G^{-1} \cdot E^{1} = \begin{array}{c c} & t \\ \begin{array}{c} s_1' \\ s_2' \\ s_3' \end{array} & \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} \end{array}
$$



$H_2 = 0$ $\qquad$ $H_1 = 0$ $\qquad$ $H_0 \cong \mathbb{Z}$



$$E^0 = \begin{array}{c|ccc} & s_1 & s_2 & s_3 \\ \hline v_1 & 0 & +1 & +1 \\ v_2 & 0 & -1 & -1 \end{array} \qquad E^1 = \begin{array}{c|cc} & t_1 & t_2 \\ \hline s_1 & +1 & +1 \\ s_2 & +1 & -1 \\ s_3 & -1 & +1 \end{array}$$

$$E^0 = \begin{pmatrix} 0 & 1 & 1 \\ 0 & -1 & -1 \end{pmatrix} \rightsquigarrow \begin{pmatrix} 0 & 1 & 1 \\ 0 & 0 & 0 \end{pmatrix}_{\mathrm{II}+\mathrm{I}} \rightsquigarrow \tilde{E}^0 = \begin{array}{c|ccc} & \tilde{s}_1 & \tilde{s}_2 & \tilde{s}_3 \\ \hline v_1' & 0 & 0 & 1 \\ v_2' & 0 & 0 & 0 \\ & & \mathrm{II}-\mathrm{III} & \end{array}$$

$$\tilde{E}^0 = \underbrace{\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix}}_{F} E^0 \underbrace{\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & -1 & 1 \end{pmatrix}}_{G} \qquad \begin{aligned} (v_1' \; v_2') &= (v_1 \; v_2) F^{-1} = ((v_1 - v_2) \; v_2) \\ (\tilde{s}_1 \; \tilde{s}_2 \; \tilde{s}_3) &= (s_1 \; s_2 \; s_3) G = (s_1 \; (s_2 - s_3) \; s_3) \end{aligned}$$

$$\tilde{E}^1 := G^{-1} E^1 = \begin{array}{c|cc} & t_1 & t_2 \\ \hline \tilde{s}_1 & 1 & 1 \\ \tilde{s}_2 & 1 & -1 \\ \tilde{s}_3 & 0 & 0 \end{array} \rightsquigarrow \begin{array}{c|cc} & t_1' & t_2' \\ \hline \tilde{s}_1 & 1 & 2 \\ \tilde{s}_2 & 1 & 0 \\ \tilde{s}_3 & 0 & 0 \\ & \mathrm{I}+\mathrm{II} & \end{array} \rightsquigarrow {}'E^1 = \begin{array}{c|cc|c} & t_1' & t_2' & \\ \hline s_1' & 1 & 0 & \mathrm{II} \\ s_2' & 0 & 2 & \mathrm{I}-\mathrm{II} \\ s_3' & 0 & 0 & \end{array}$$

$$
{}^{1}E^{1} = \underset{L}{\begin{pmatrix} 0 & 1 & 0 \\ 1 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}} \qquad \tilde{E}^{1} \underset{M}{\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}}
$$

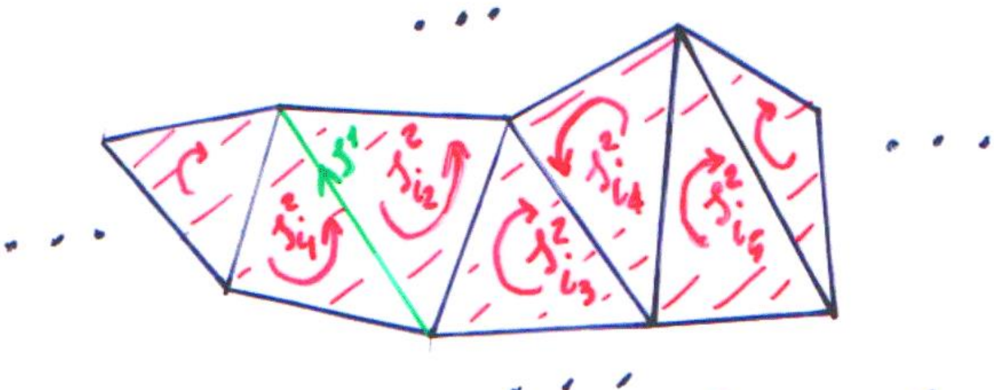
$$
\begin{aligned}
(s'_1\ s'_2\ s'_3) &= (\tilde{s}_1\ \tilde{s}_2\ \tilde{s}_3)\, L^{-1} = \\
&= \big((\tilde{s}_1+\tilde{s}_2)\ \tilde{s}_1\ \tilde{s}_3\big) = \\
&= \big((s_1+s_2-s_3)\ s_1\ s_3\big)
\end{aligned}
$$

$$
{}^{1}E^{0} = \tilde{E}^{0} \cdot L^{-1} = \tilde{E}^{0}
\qquad
(t'_1\ t'_2) = (t\ \ t_2)\, M = \big(t_1\ (t_1+t_2)\big)
$$

$$
\begin{tikzcd}
\mathcal{S}_2 \arrow[r, "\partial_2"] & \mathcal{S}_1 & \arrow[r, "\partial_1"] & \mathcal{S}_0 & \\
 & Im & & Im & \\
t_1 \arrow[r, mapsto] & (s_1+s_2-s_3) & 0 & (v_1-v_2) & 0 \\
(t_1+t_2) \arrow[r, mapsto] & 2 \cdot \qquad s_1 & 0 & v_2 & 0 \\
 & Ker \qquad s_3 & & Ker &
\end{tikzcd}
$$

$(s_1+s_2-s_3) \mapsto 0$, $s_1 \mapsto 0$, $s_3 \mapsto (v_1-v_2)$, $(v_1-v_2) \mapsto 0$, $v_2 \mapsto 0$

$H_2 = 0 \qquad H_1 \cong \mathbb{Z}_2 \qquad H_0 \cong \mathbb{Z}$



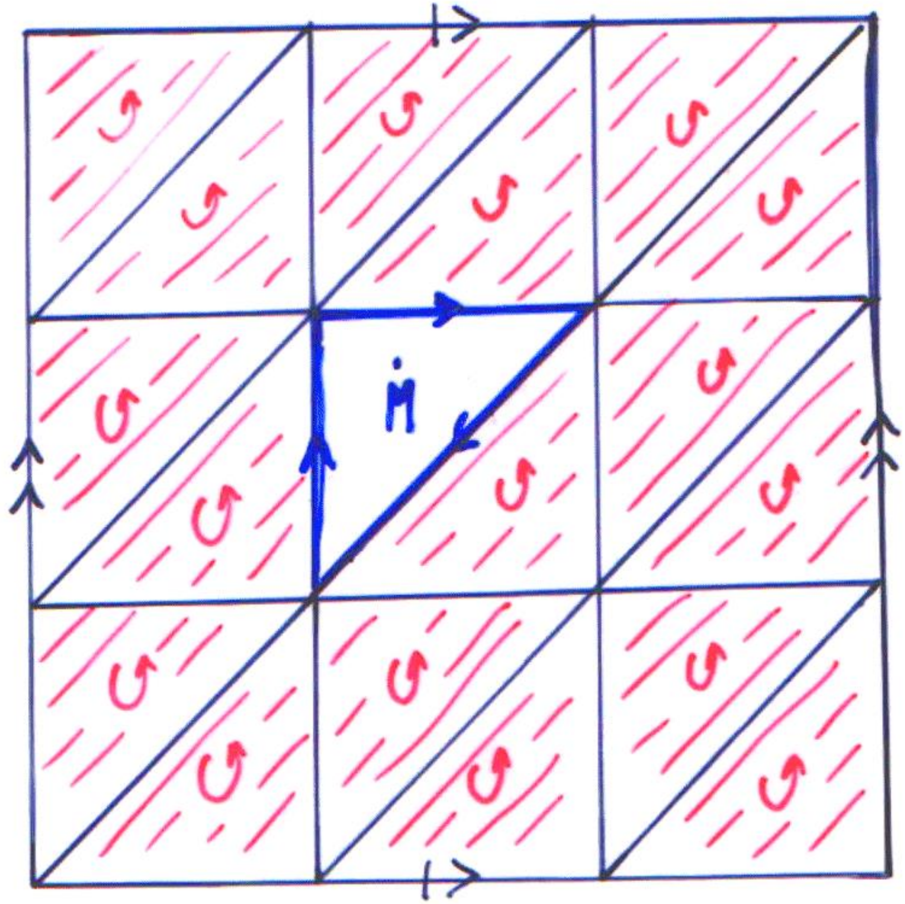
$$c = \cdots + m_1 s^2_{i_1} + m_2 s^2_{i_2} + m_3 s^2_{i_3} + m_4 s^2_{i_4} + m_5 s^2_{i_5} + \cdots$$

$$0 = \partial c = \cdots + m_1 \partial\left(s^2_{i_1}\right) + m_2 \partial\left(s^2_{i_2}\right) + m_3 \partial\left(s^2_{i_3}\right) + m_4 \partial\left(s^2_{i_4}\right) + m_5 \partial\left(s^2_{i_5}\right) + \cdots =$$

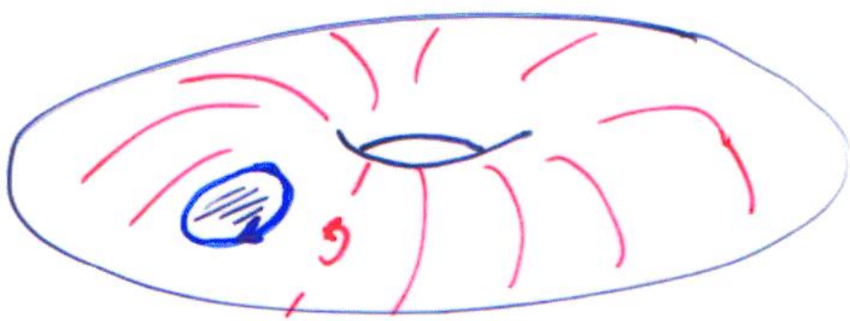
$$= \cdots + (m_1 - m_2)\, s^1 + \cdots$$

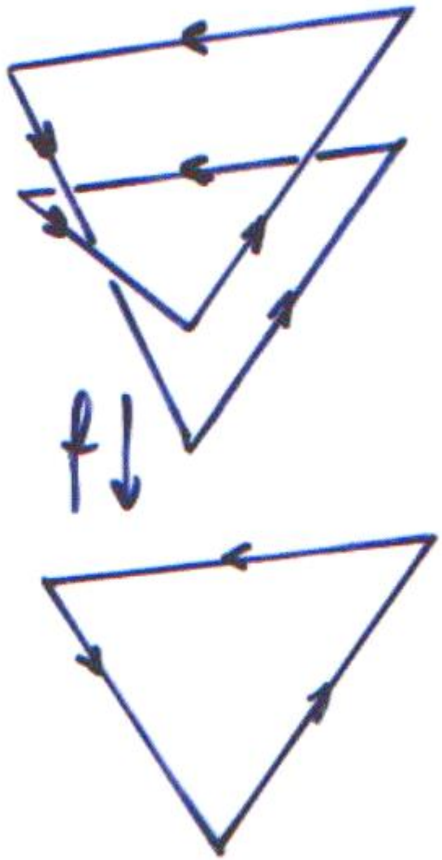
$$\Rightarrow \quad \cdots m_1 = m_2 = -m_3 = m_4 = -m_5 = \cdots$$

$$\Rightarrow \quad c = m\left(\cdots + s^2_{i_1} + s^2_{i_2} - s^2_{i_3} + s^2_{i_4} - s^2_{i_5} + \cdots\right)$$

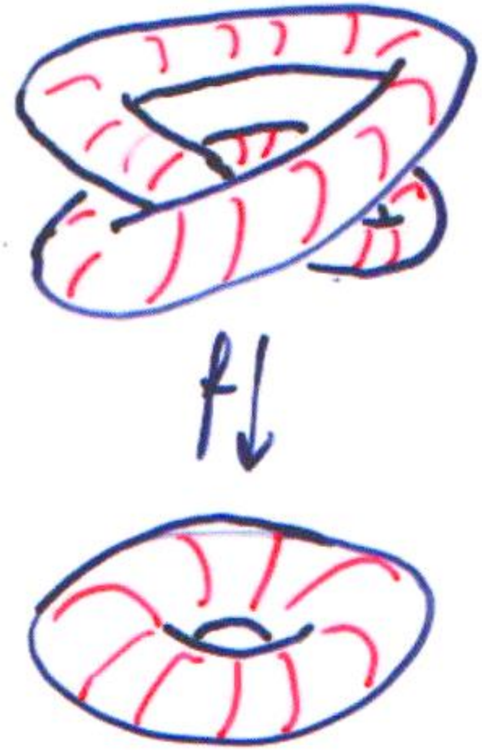


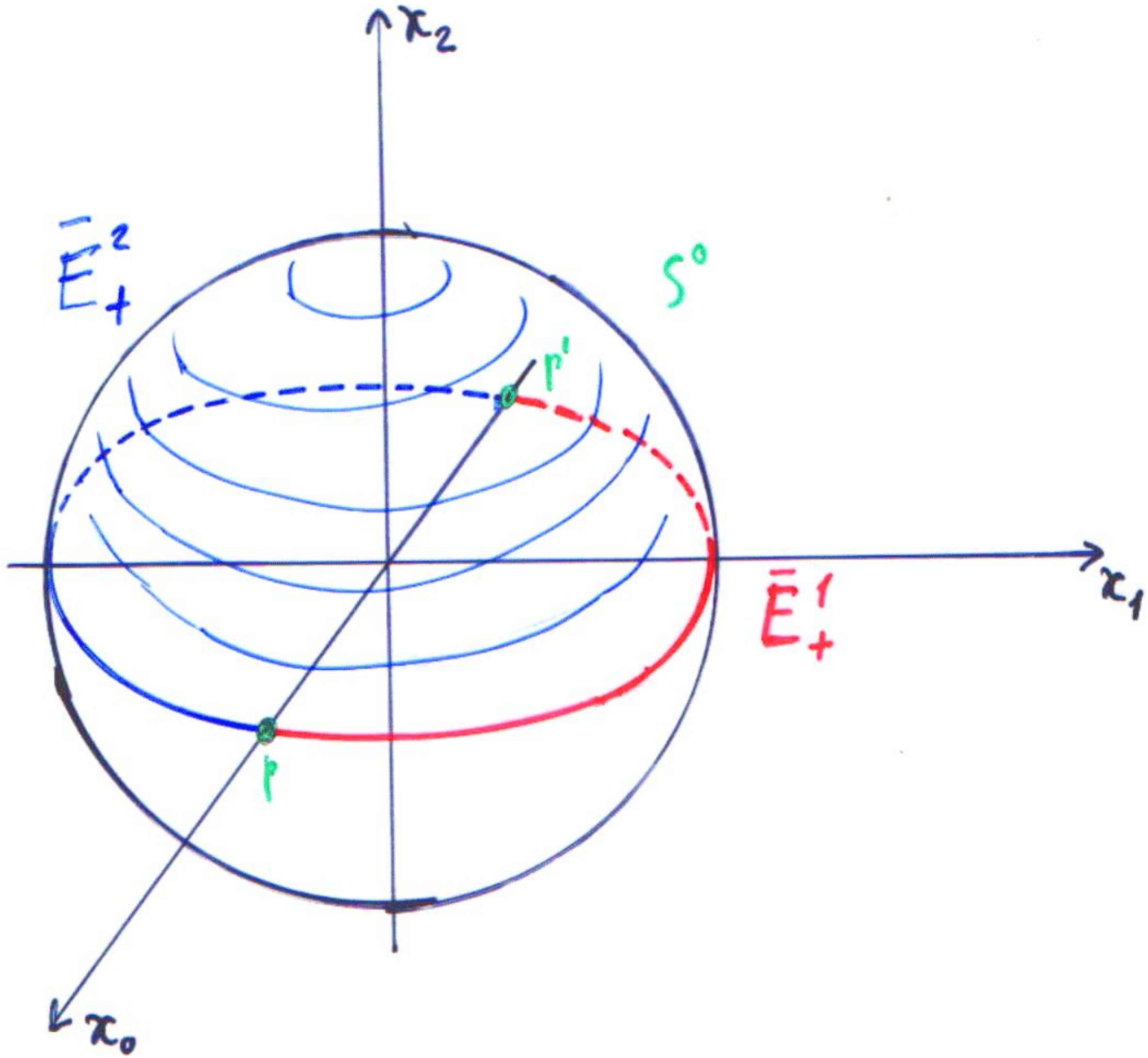
M



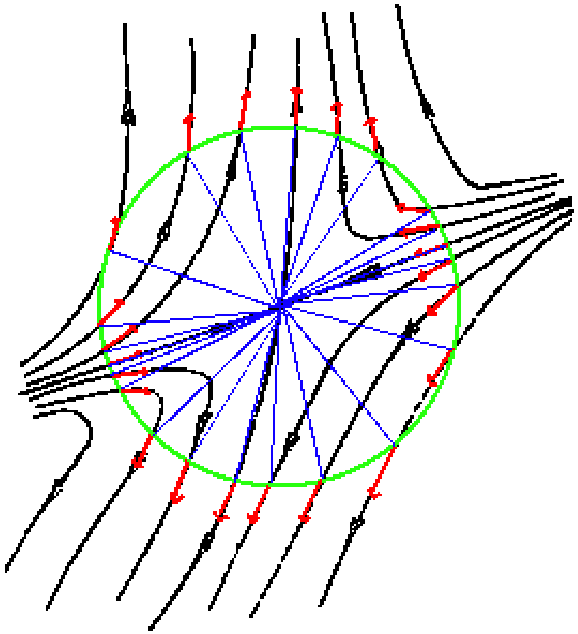


$\deg f = 2$

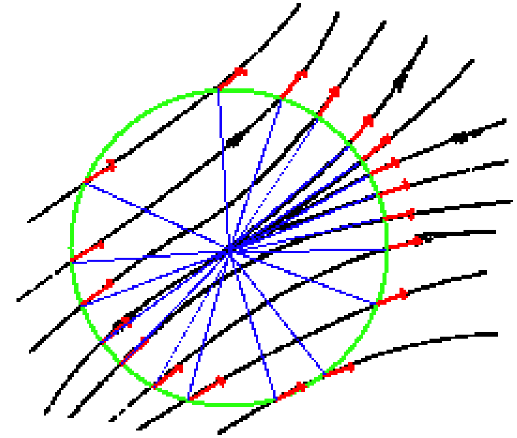




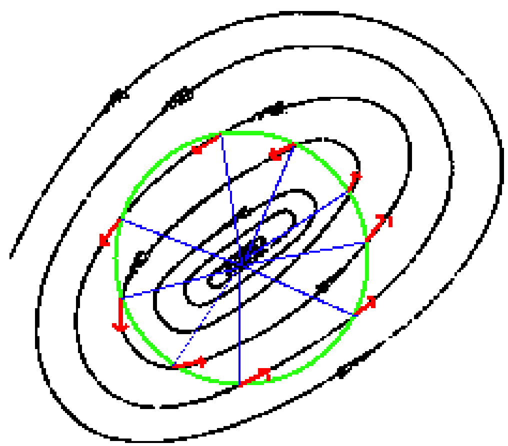
$$f_{0*}(\{p-p'\}) = \{p'-p\} = -\{p-p'\}$$



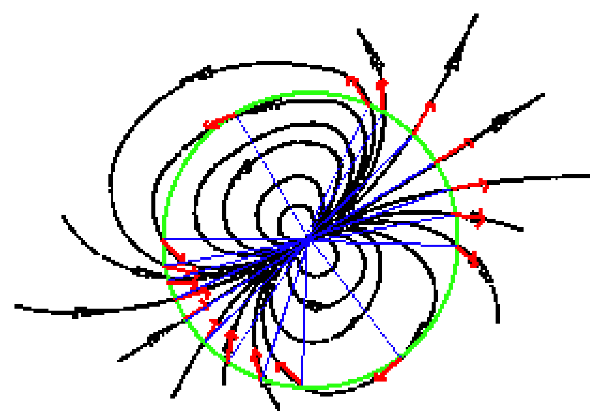
$\iota = -1$



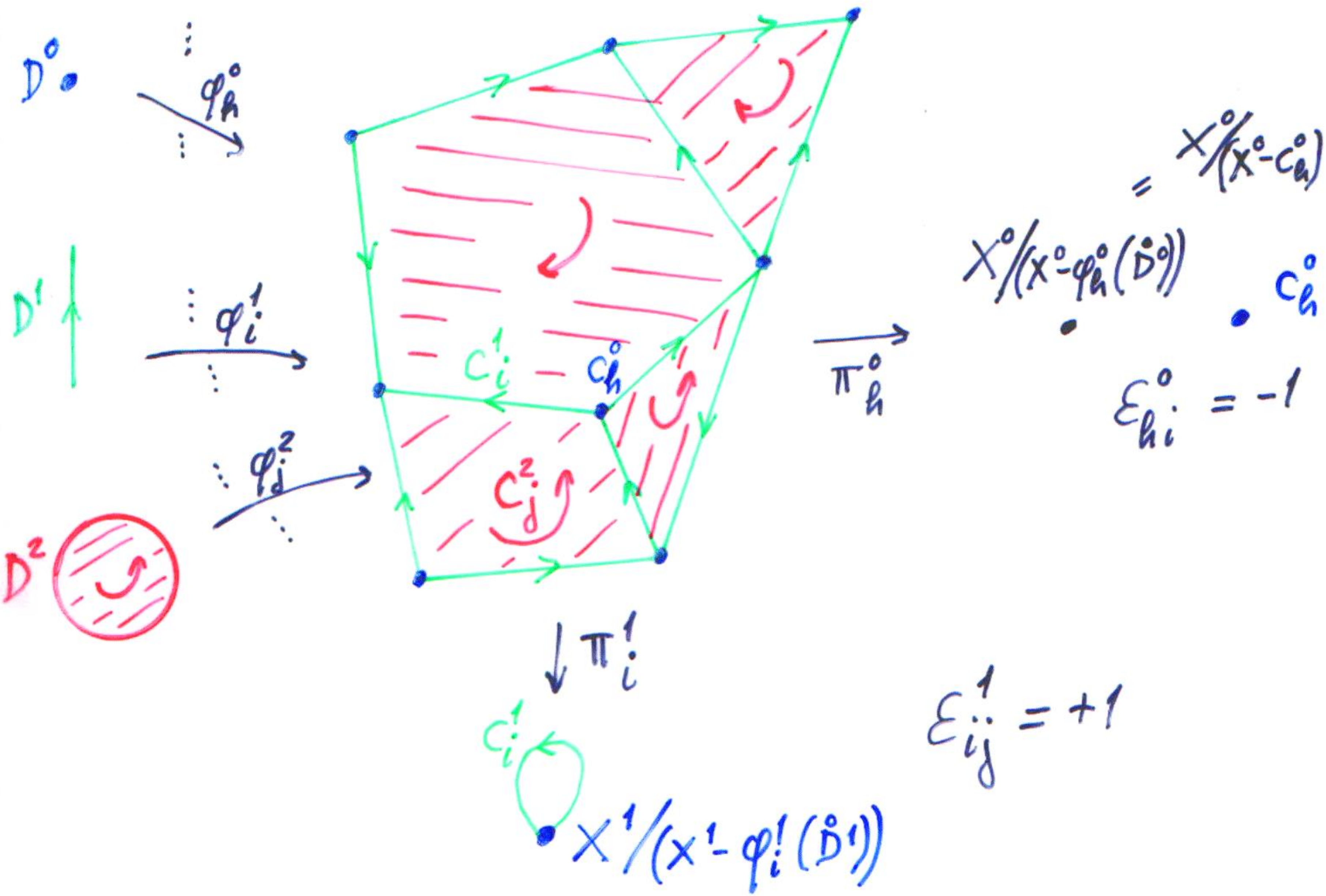
$\iota = 0$



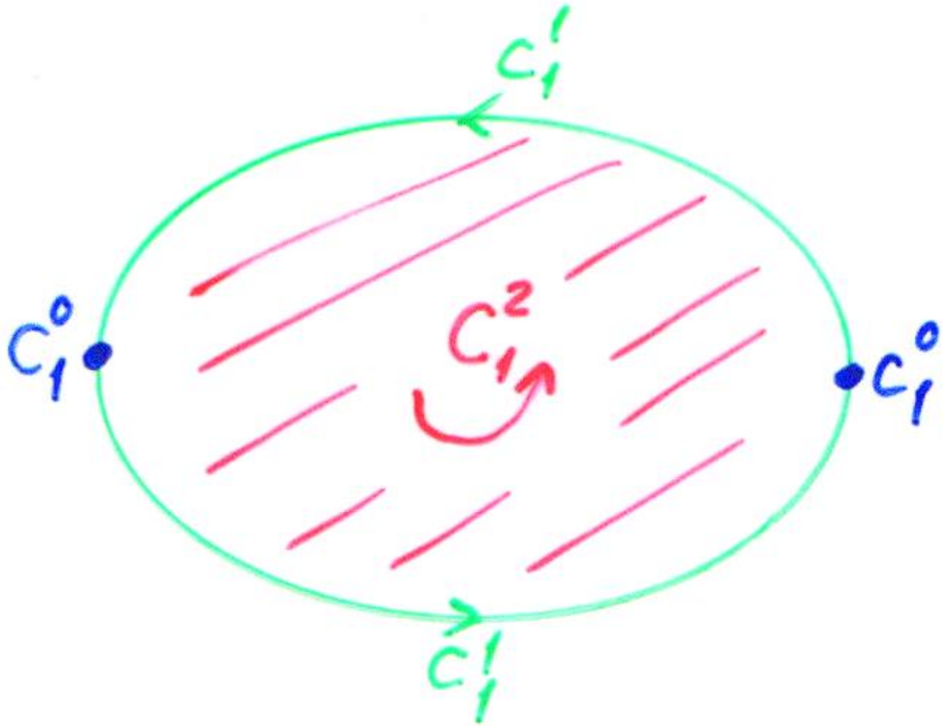
$\iota = +1$

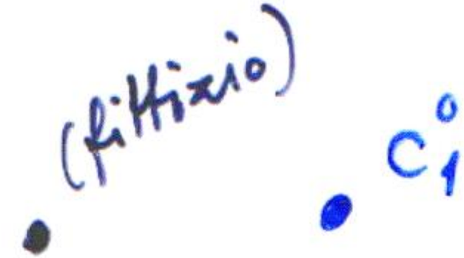


$\iota = +2$



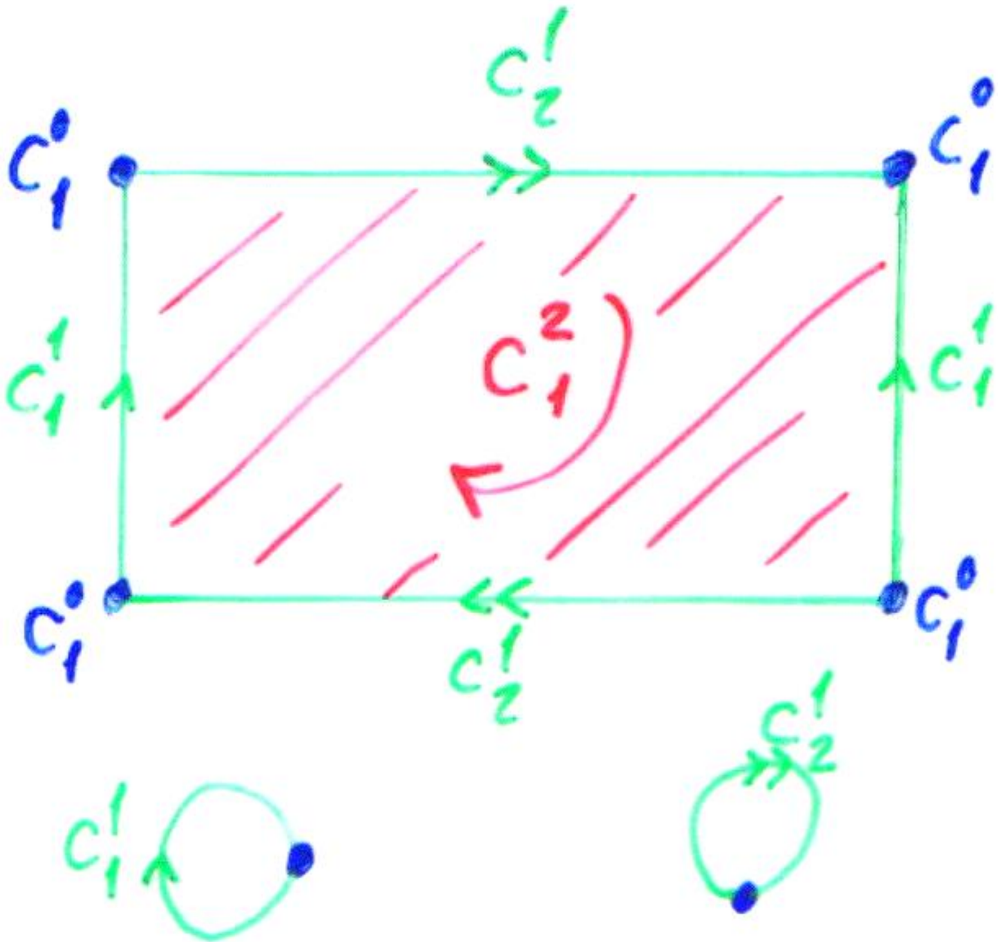
D^0
φ_h^0
D^1
φ_i^1
D^2
φ_j^2
c_i^1
c_h^0
c_j^2
π_h^0
$X^0/(X^0 - \varphi_h^0(\dot{D}^0))$
$= X^0/(X^0 - c_h^0)$
c_h^0
$\varepsilon_{hi}^0 = -1$
π_i^1
c_i^1
$X^1/(X^1 - \varphi_i^1(\dot{D}^1))$
$\varepsilon_{ij}^1 = +1$





$\varepsilon_{11}^0 = 0$ $\quad c_1^0\big(\overset{c_1^1}{0}\big)$

$\varepsilon_{11}^1 = +2$ $\quad c_1^1\big(\overset{c_1^2}{2}\big)$

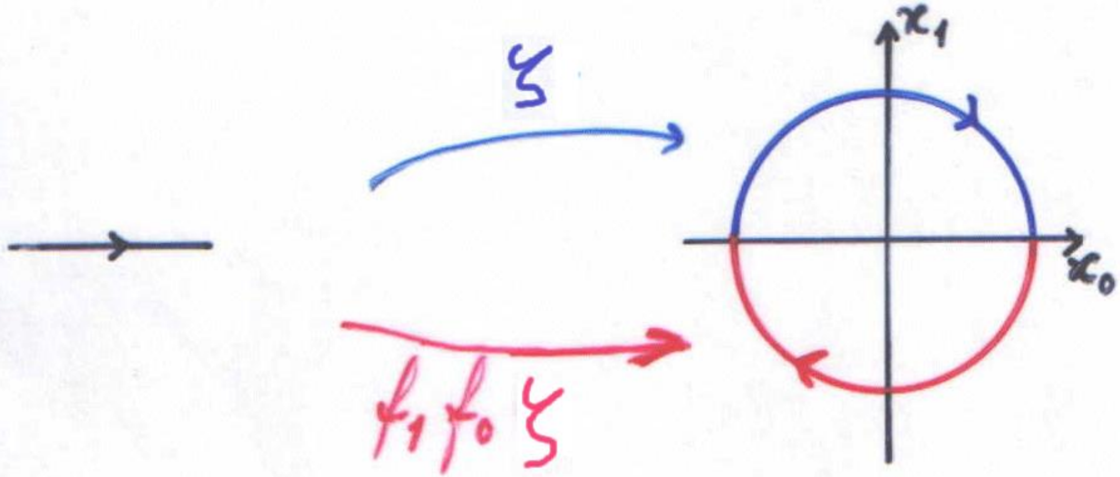


(fittizio)

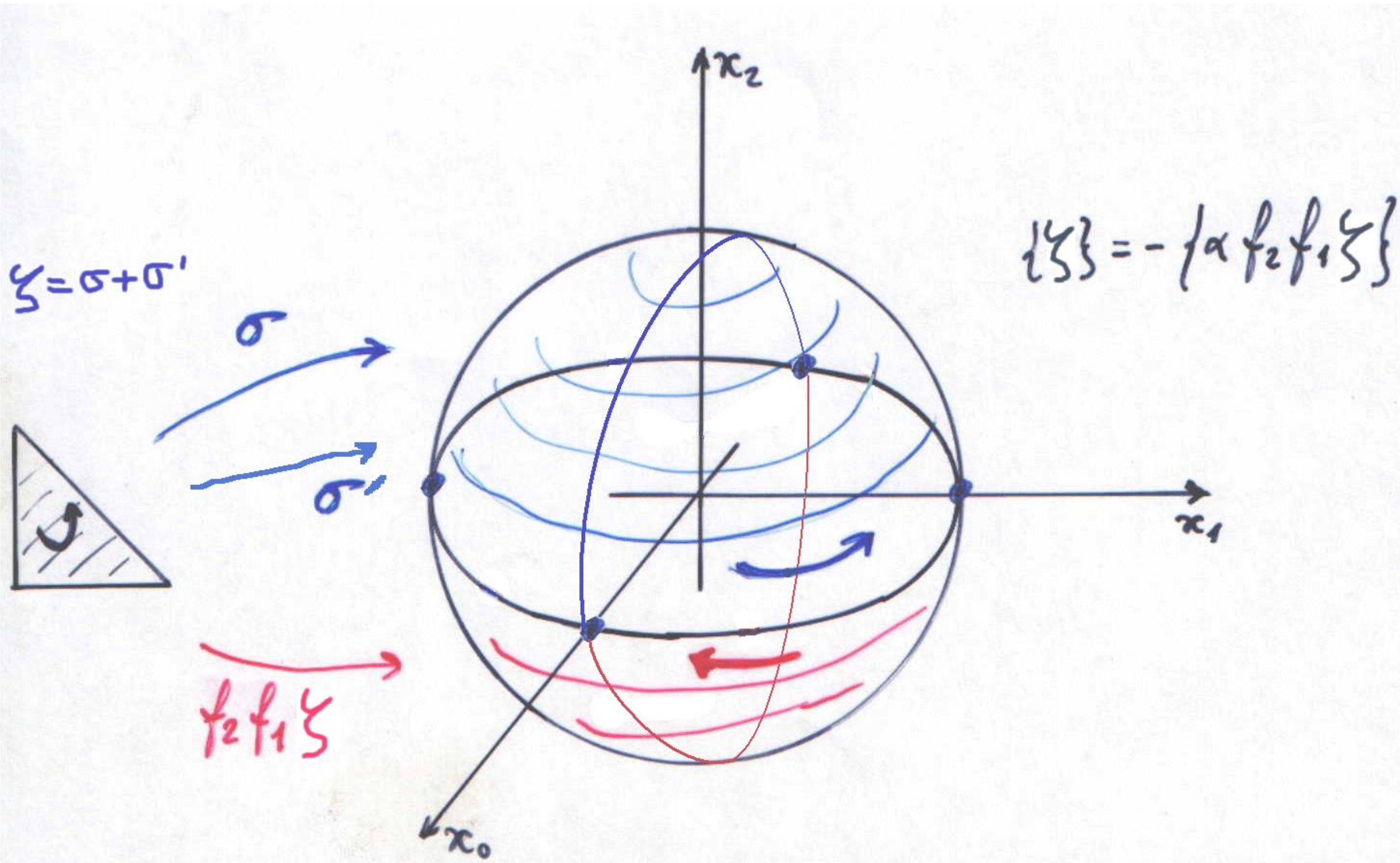
c_1^0

$$\begin{array}{cc} & \begin{array}{cc} c_1^1 & c_2^1 \end{array} \\ c_1^0 & \begin{pmatrix} 0 & 0 \end{pmatrix} \end{array}$$

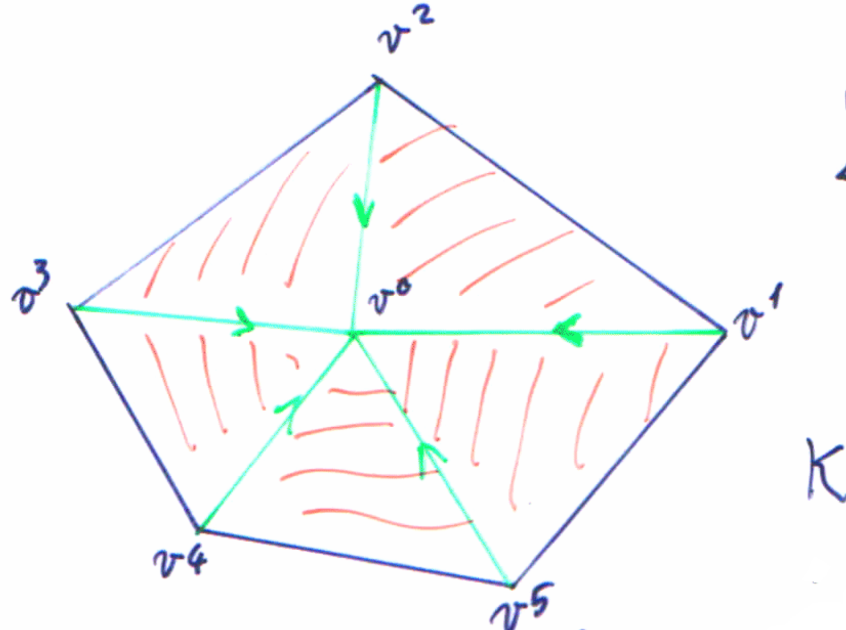
$$\begin{array}{cc} & c_1^2 \\ \begin{array}{c} c_1^1 \\ c_2^1 \end{array} & \begin{pmatrix} 0 \\ 2 \end{pmatrix} \end{array}$$



$$\{\xi\} = \{\alpha f_1 f_0 \xi\}$$


x_2
$\{\zeta\} = -\{\alpha f_2 f_1 \zeta\}$
$\zeta = \sigma + \sigma'$
σ
σ'
x_1
$f_2 f_1 \zeta$
x_0

scrivo
$v^0 \dots v^h$
invece di
$\langle v^0, \dots, v^h \rangle$



$v^{0*} \in \mathcal{G}^0(K) \qquad \delta(v^{0*}) \in \mathcal{G}^1(K)$

$$\langle v^0v^1, \delta(v^{0*}) \rangle = \langle \partial(v^0v^1), v^{0*} \rangle = \langle v^1 - v^0, v^{0*} \rangle =$$
$$= \langle v^1, v^{0*} \rangle - \langle v^0, v^{0*} \rangle = 0 - 1 = -1$$

$\vdots \qquad \vdots$

$$\langle v^0v^5, \delta(v^{0*}) \rangle = \langle \partial(v^0v^5), v^{0*} \rangle = -1$$

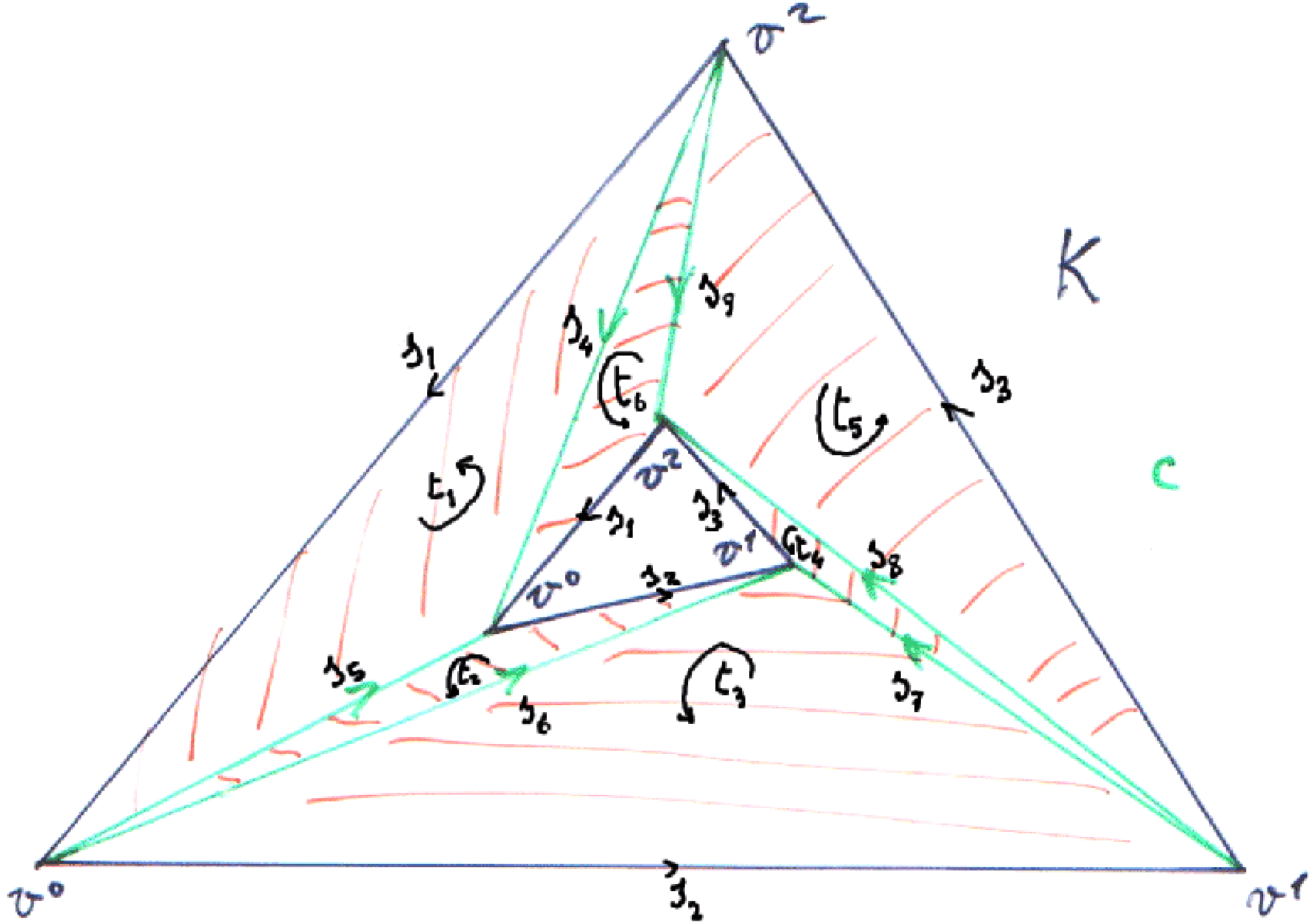
perciò
$$\delta(v^{0*}) = (v^1v^0)^* + (v^2v^0)^* + (v^3v^0)^* + (v^4v^0)^* + (v^5, v^0)^* .$$

Pongo $c^* = \delta(v^{0*})$. $c^* \in \mathcal{C}^1(K)$; cos'è $\delta(c^*) \in \mathcal{C}^2(K)$?

$$\langle v^0v^1v^2, \delta(c^*)\rangle = \langle \partial(v^0v^1v^2), c^*\rangle =$$
$$= \langle v^0v^1 + v^1v^2 + v^2v^0, c^*\rangle =$$
$$= -1 + 0 + 1 = 0$$

$$\langle v^0v^5v^1, \delta(c^*)\rangle = 0$$

perciò $\delta(c^*) = 0 \in \mathcal{C}^2(K)$



Pongo $c^* = \sigma_4^* + \sigma_5^* + \sigma_6^* + \sigma_7^* + \sigma_8^* + \sigma_9^*$

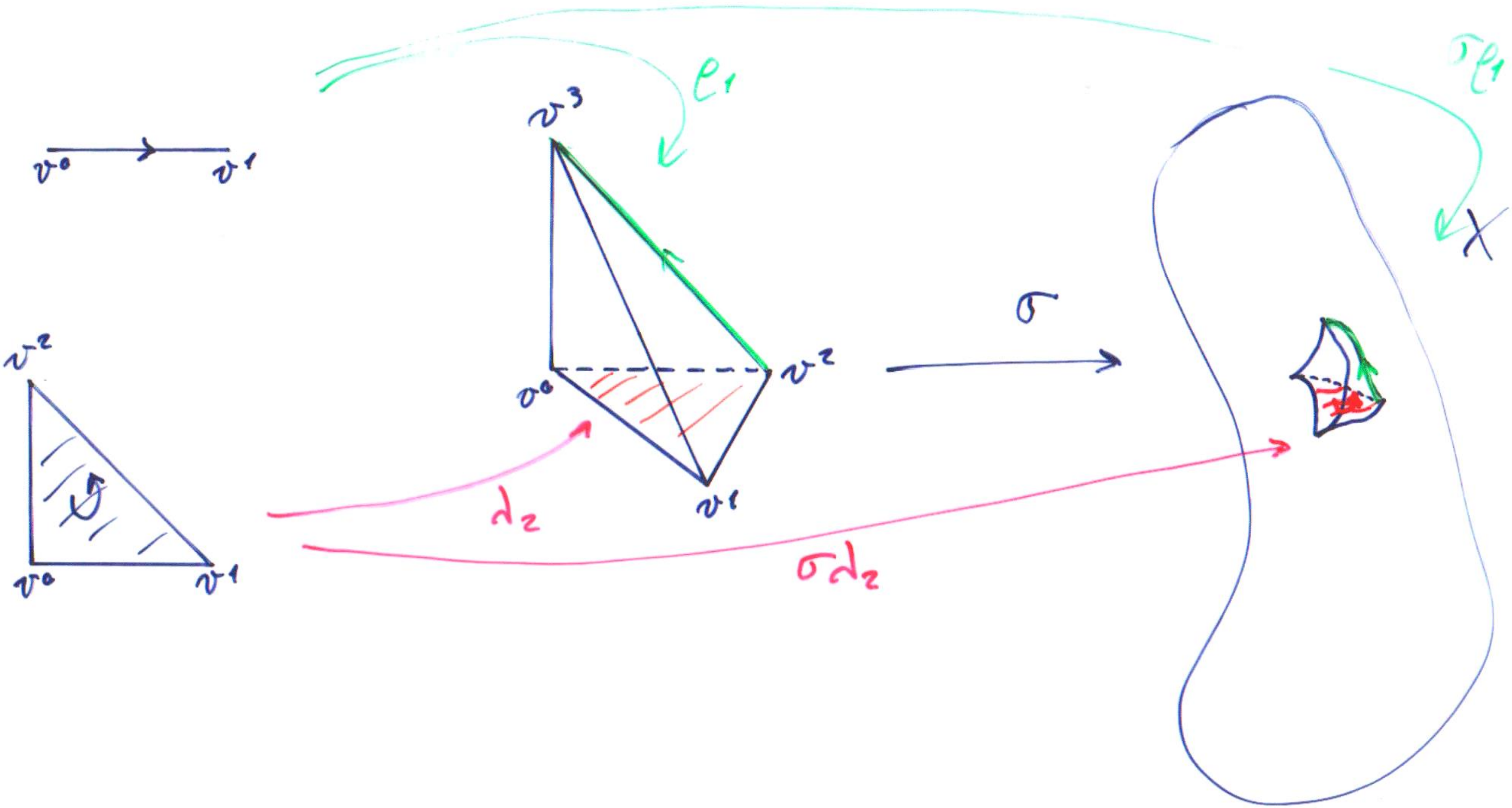
$c^* \in \mathcal{C}^1(K)$. Cos'è $\delta(c^*) \in \mathcal{C}^2(K)$?

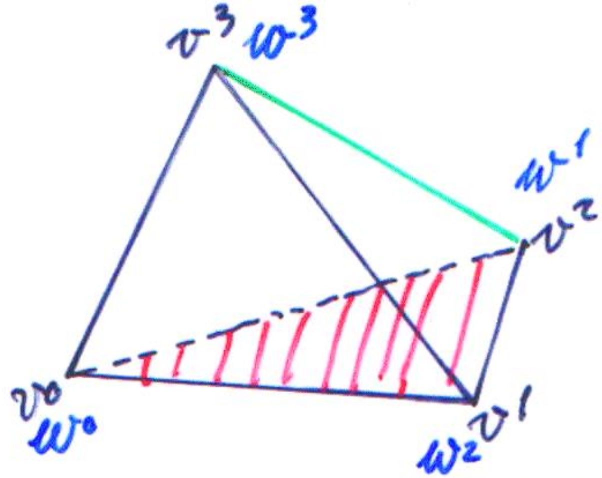
$\langle t_1, \delta(c^*)\rangle = \langle \partial t_1, c^*\rangle = \langle \sigma_1+\sigma_5-\sigma_4, c^*\rangle =$
$= 0+1-1 = 0$

$\vdots$

$\langle t_6, \delta(c^*)\rangle = 0$

dunque $\delta(c^*) = 0 \in \mathcal{C}^2(K)$


e_1
σe_1
v^0
v^1
v^3
X
σ
v^2
v^0
v^2
v^1
d_2
v^0
v^1
σd_2



$(v^0 v^1 v^2)^* \in \mathcal{S}^2(K)$

$(v^2 v^3)^* \in \mathcal{S}^1(K)$

cos'è $C = (v^0 v^1 v^2)^* \cup (v^2 v^3)^* \in \mathcal{S}^3(K)$?

$$< v^0 v^1 v^2 v^3 , (v^0 v^1 v^2 v^3)^* > = 1 =$$

$$= < v^0 v^1 v^2 , (v^0 v^1 v^2)^* > \cdot < v^2 v^3 , (v^2 v^3)^* >$$

dunque $(v^0 v^1 v^2)^* \cup (v^2 v^3)^* = (v^0 v^1 v^2 v^3)^* \in \mathcal{S}^3(K)$

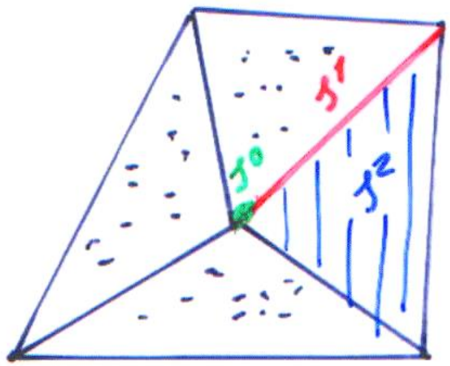
cos'è $\alpha = (w^0 w^1 w^2)^* \cup (w^1 w^3)^* \in \mathcal{S}^3(K)$?

$$< w^0 w^1 w^2 w^3, \alpha > =$$

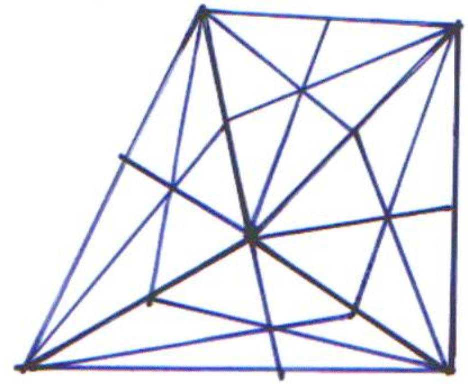
$$= < w^0 w^1 w^2, (w^0 w^1 w^2)^* > \cdot < w^2 w^3, (w^1 w^3)^* > =$$

$$= \quad 1 \cdot 0 = 0$$

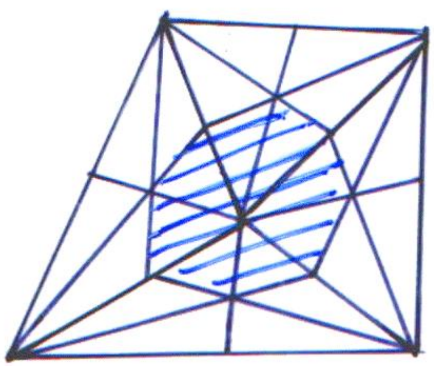
dunque $\alpha = 0 \in \mathcal{S}^3(K)$



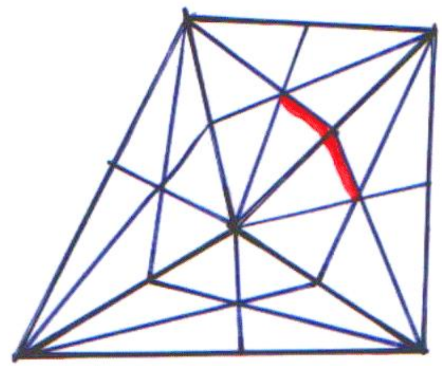
K



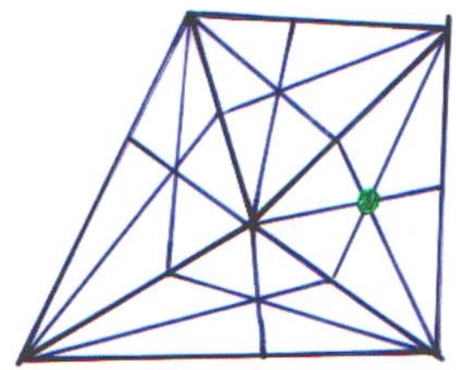
K'



$\tilde{\sigma}^0$

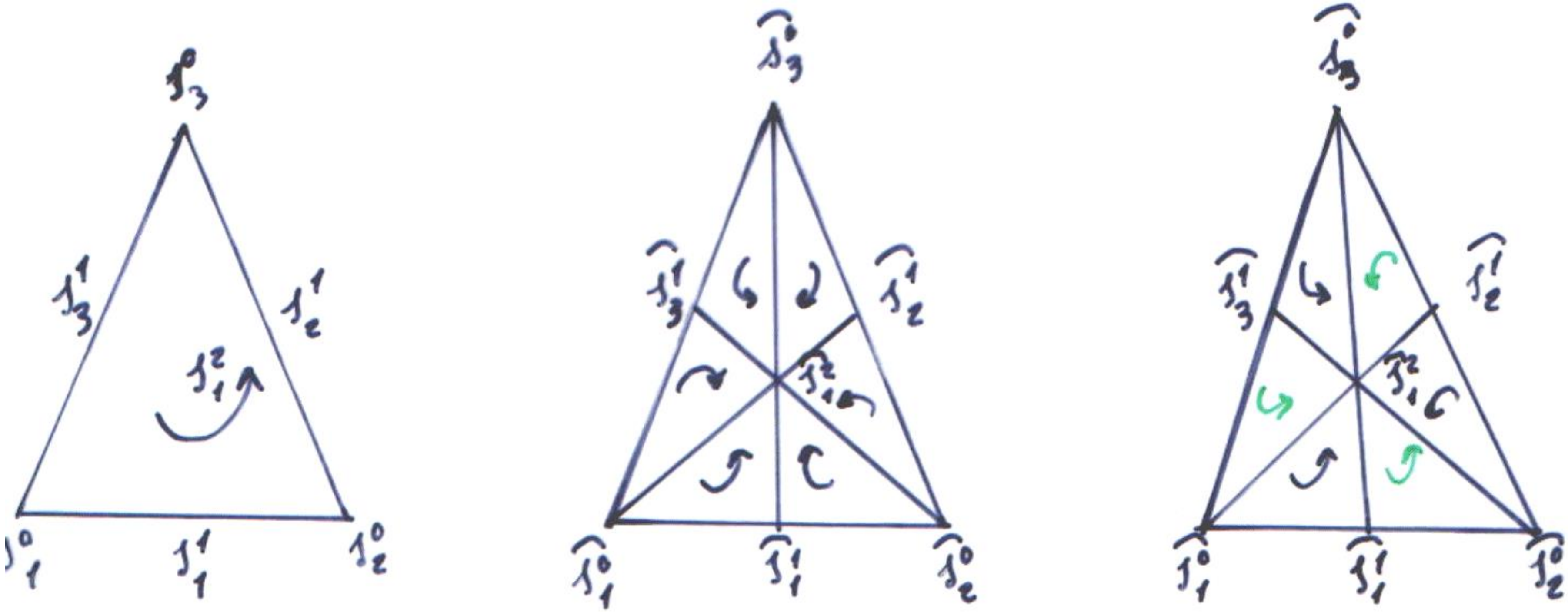


$\tilde{\sigma}^1$



$\tilde{\sigma}^2$

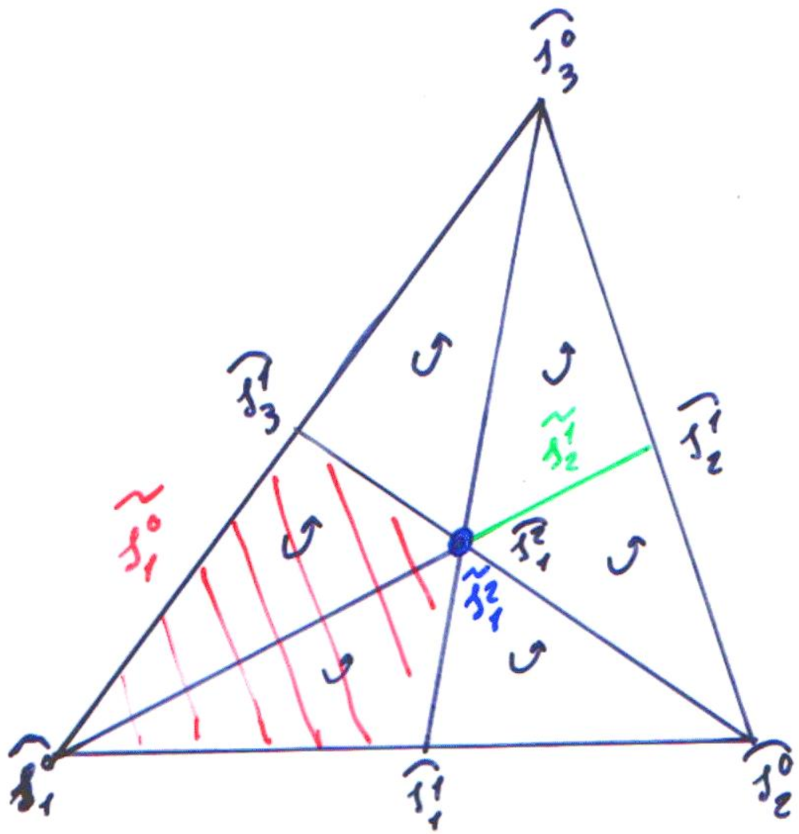
$$\varphi(s_1^1) = \langle \widehat{s_1^0}, \widehat{s_1^1} \rangle - \langle \widehat{s_2^0}, \widehat{s_1^1} \rangle$$



$$\varphi(s_1^2) = \langle \hat{s}_1^0, \hat{s}_1^1, \hat{s}_1^2 \rangle - \langle \hat{s}_2^0, \hat{s}_1^1, \hat{s}_1^2 \rangle +$$

$$+ \langle \hat{s}_2^0, \hat{s}_2^1, \hat{s}_1^2 \rangle - \langle \hat{s}_3^0, \hat{s}_2^1, \hat{s}_1^2 \rangle +$$

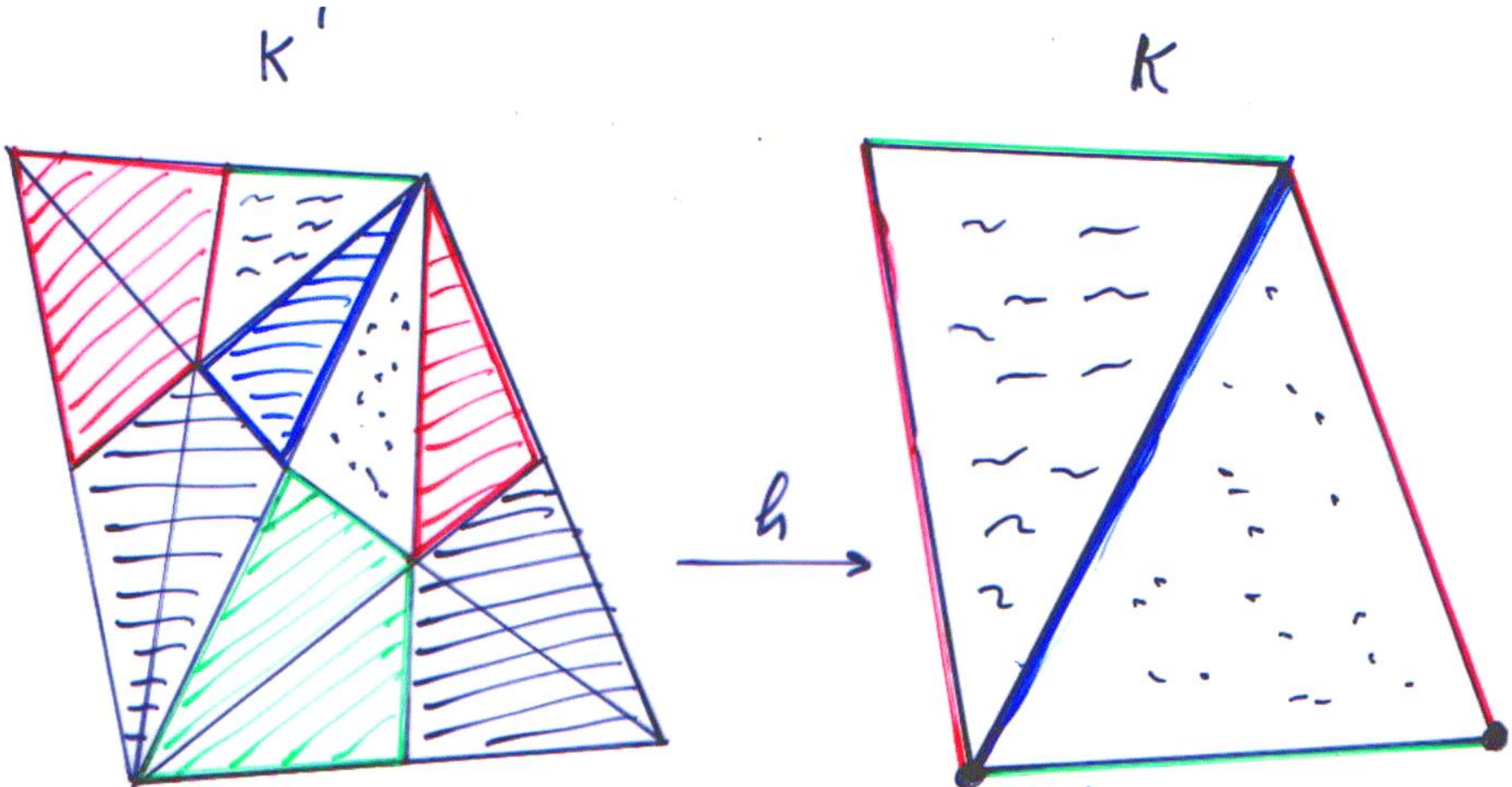
$$+ \langle \hat{s}_3^0, \hat{s}_3^1, \hat{s}_1^2 \rangle - \langle \hat{s}_1^0, \hat{s}_3^1, \hat{s}_1^2 \rangle$$



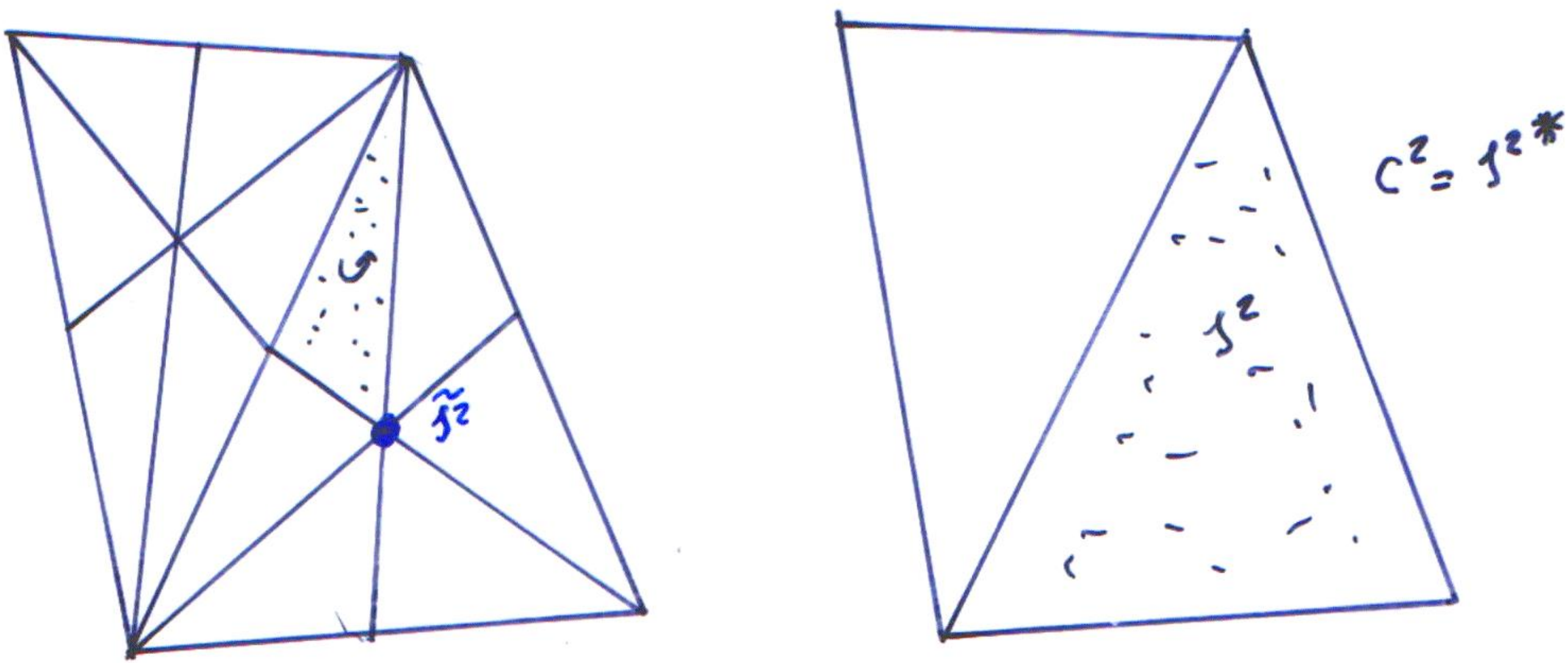
$$\varphi(s_1^2) \frown \left(\langle \hat{s}_1^0 \rangle\right)^* = \langle \hat{s}_1^0, \hat{s}_1^1, \hat{s}_1^2 \rangle - \langle \hat{s}_1^0, \hat{s}_3^1, \hat{s}_1^2 \rangle$$

$$\varphi(s_1^2) \frown \left(\langle \hat{s}_3^0, \hat{s}_2^1 \rangle\right)^* = -\langle \hat{s}_2^1, \hat{s}_1^2 \rangle$$

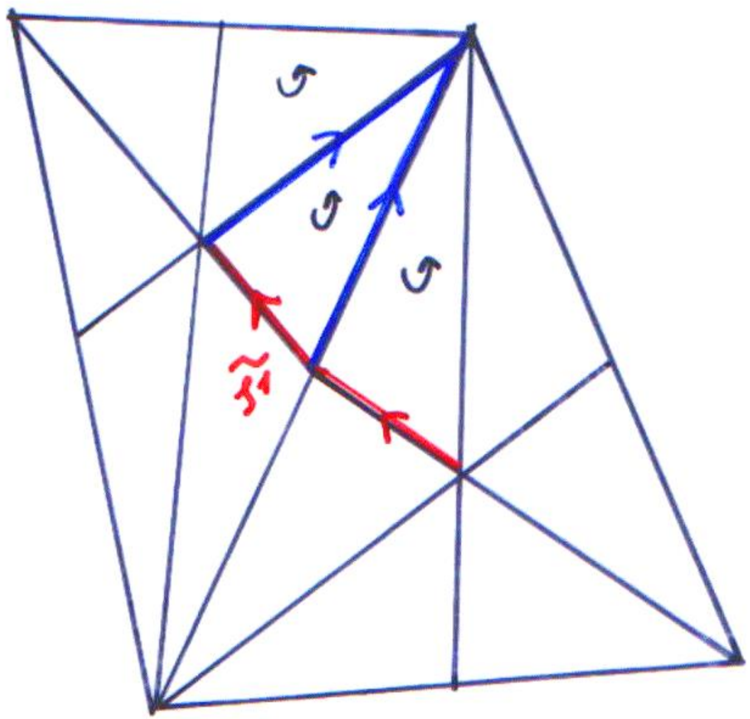
$$\varphi(s_1^2) \frown \left(\langle \hat{s}_2^0, \hat{s}_2^1, \hat{s}_1^2 \rangle\right)^* = \langle \hat{s}_1^2 \rangle$$

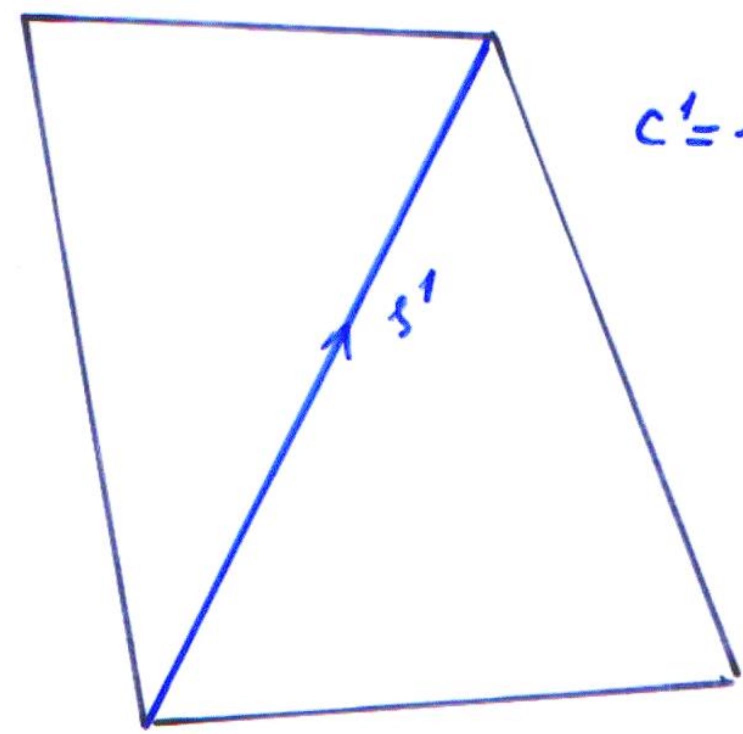


$$1(|st(v,K')|) \subset |st(h(v),K)|$$

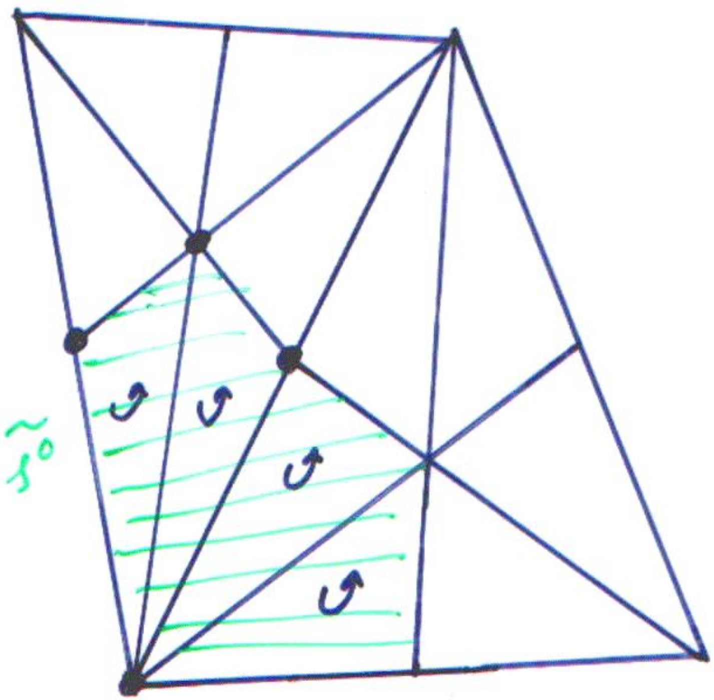


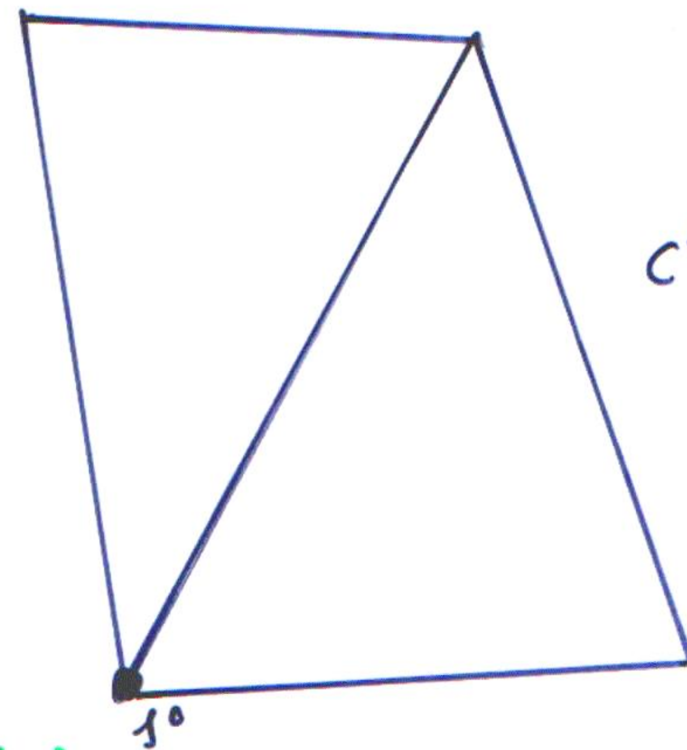
$(\tilde{\sigma}^2) = \varphi(z) \frown \mathrm{Hom}(h, 1_{\mathbb{Z}})(c^2)$





$$(\tilde{s}^1) = \varphi(z) \frown \mathrm{Hom}(h, 1_Z)(c^1)$$





$C^0 = s^{0*}$

$$(\tilde{s}^0) = \varphi(z) \frown \mathrm{Hom}(h, 1_Z)(c^0)$$