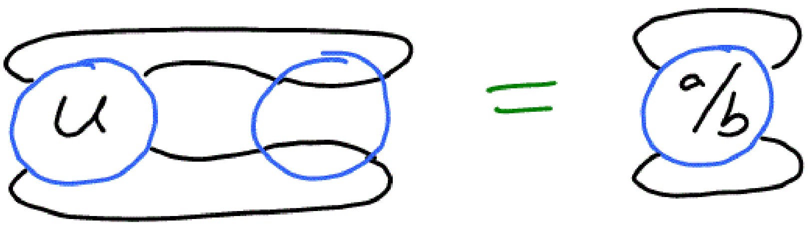
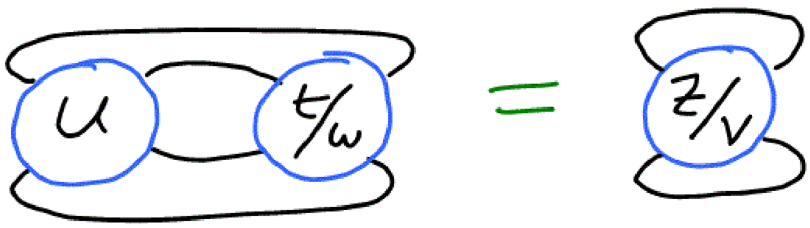
Feb 24

Goal: Given a, b, z, v where b $\in \{0, 1, ..., a - 1\}$, solve the system of 2 equations:





Case I: Suppose U is rational.
Suppose U = j/p. Then

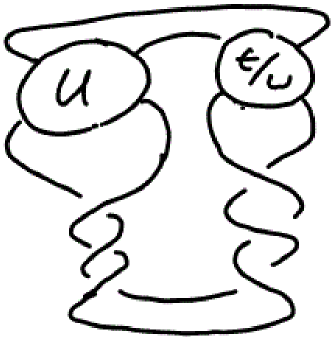
$$\frac{j}{p} = \frac{a}{b+Ka} \quad \text{and} \quad \frac{t}{w} = \frac{zx - a\tilde{v}}{b\tilde{v} - zy - Kt}$$

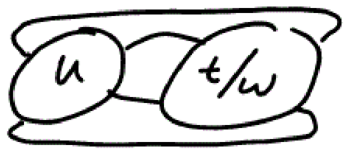
or

$$\frac{j}{p} = \frac{a}{x+Ka} \quad \text{and} \quad \frac{t}{w} = \frac{zb - a\tilde{v}}{x\tilde{v} - zy - Kt}$$

where $\tilde{v}\, v^{\pm 1} = 1 \mod z$

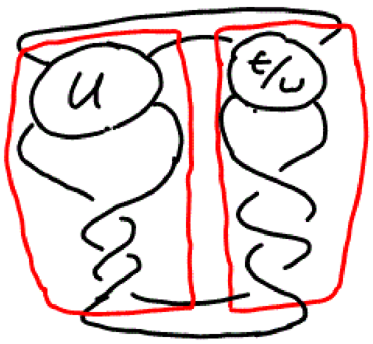
Observe



$=$


$= N\left(U + \frac{t}{w}\right)$

$\parallel$



$=$


$= N\left(U + \frac{t}{w+Kt}\right)$

where $\tilde{u} =$


$-K$

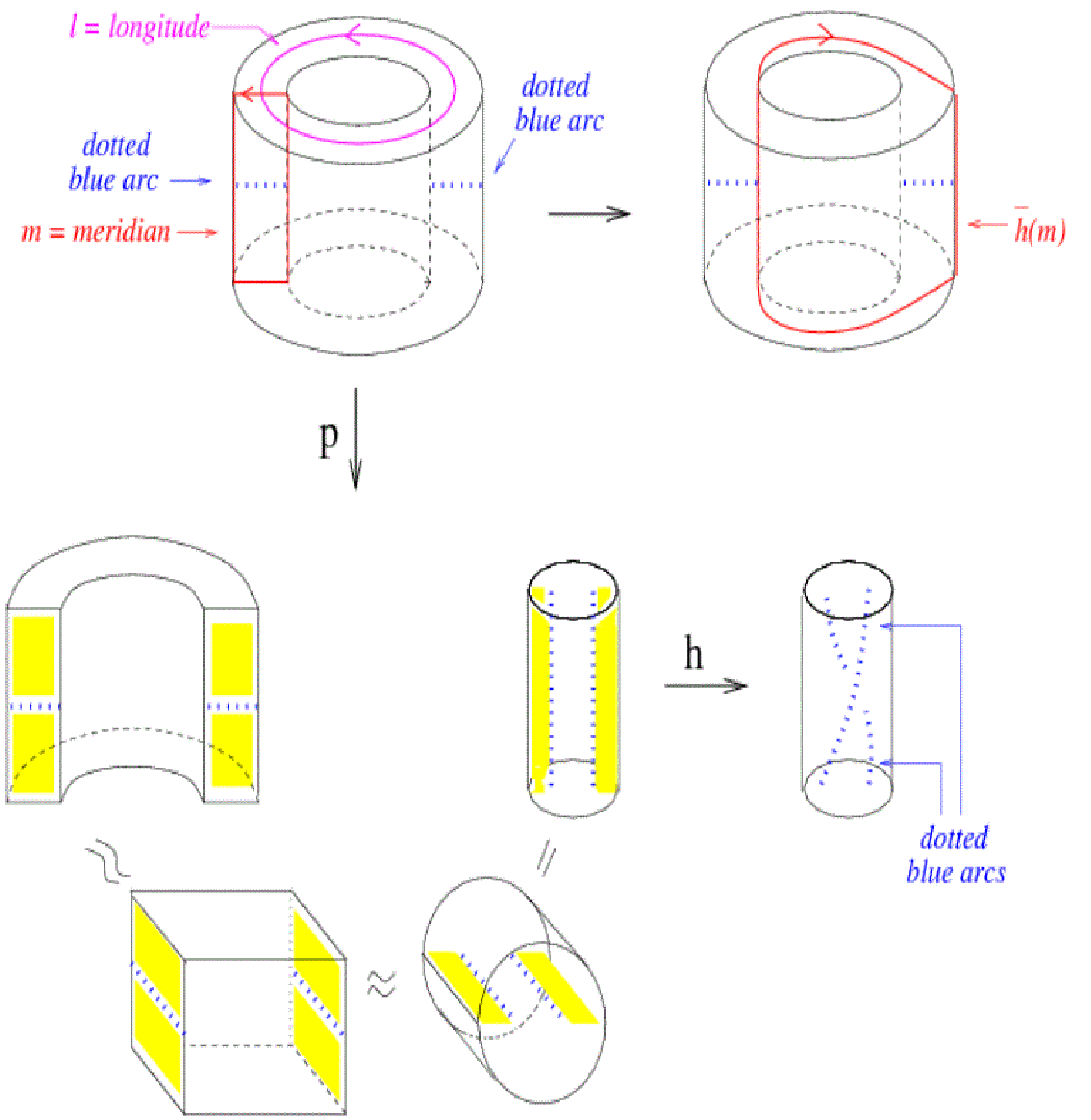
and
K


$= \dfrac{t}{w+Kt} = 0 + \dfrac{1}{K + \frac{1}{t/w}}$

Hence $N\left(u+\frac{0}{1}\right)=K_1$, $N\left(u+\frac{t}{w}\right)=K_2$

has a sol'n iff the following also has a

$N\left(\tilde{u}+\frac{0}{1}\right)=K_1$, $N\left(\tilde{u}+\frac{t}{w+kt}\right)=K_2$



Looking at M - V w/a focus on $\partial(M - V) = \partial V$