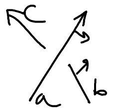
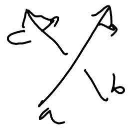
Counting colourings

January-05-11
12:25 AM

1. When presenting the 3-colouring invariant, I should use the "counting" version rather than the T/F-version.



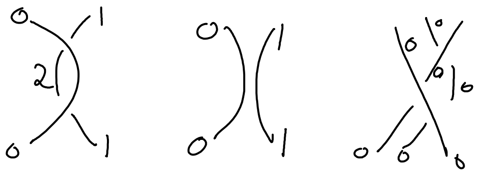
$b-a=c-a$
silly; we not count reps into Abelian groups.



$b+c=2a$

$S_3=\mathbb{Z}_2\ltimes\mathbb{Z}_3=D_3$

$A_4=\mathbb{Z}_3\ltimes(\mathbb{Z}_2\oplus\mathbb{Z}_2)$



$D_n=\mathbb{Z}_2\ltimes\mathbb{Z}_n=\{(\pm 1, 0\le k<n)\}$

$(a,b)\cdot(c,d)=(ac,\ bc+d)$

$(a,b)^{-1}=(a^{-1},-a^{-1}b)$

Conj. classes: $\{(1,0)\}$: the id.
$\begin{pmatrix}\text{odd}\\ n\end{pmatrix}$ $\{(1,a),(1,-a)\}$ $a\neq 0$
$\{(-1,a)\}$

$(a,b)^{-1}(c,d)(a,b)=(a^{-1},-a^{-1}b)\cdot(ac,\ da+b)$

$=(c,-bc+da+b)=(c,(1-c)b+ad)$

$\xrightarrow[a=c=-1]{\text{if}}(-1,\ b+d+b)=(-1,2b-d)$

2. Is the counting version poly-time computable?

Yes, as the solution space is a linear space whose dimension is the rank of a matrix.

3. Is the metabelian counting invariant poly-time computable?