An extra extra relation?

June-26-15 5:22 PM

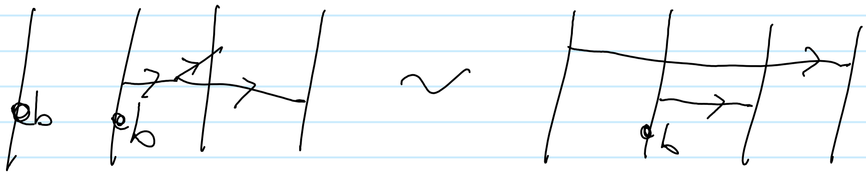
Apply $\mathrm{ad}\, a_{12}$ to $b_2\gamma_{234} = \gamma_{23}a_{24} - \gamma_{24}a_{23}$, get:

```
In[104]:= B[a[1/2, 1, 2], γa[1, 2, 4, 2, 3] // S] - B[a[1/2, 1, 2], γa[1, 2, 4, 2, 3]]
```

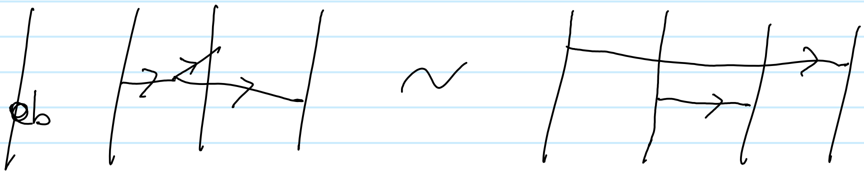
```
Out[104]= γ[b1 b2, 2, 3, 4] + γa[-b2, 2, 3, 1, 4] + γa[b2, 2, 4, 1, 3]
```

/ : maybe

So $b_1\gamma_{234} = \gamma_{23}a_{14} - \gamma_{24}a_{13}$



Perhaps already



$\gamma = \delta a - bc$; $\delta a = \gamma + bc$; so

$[a_{ij}, a_{ik}] = 0 \Rightarrow \delta a_{ij} a_{ik} - \delta a_{ik} a_{ij} = 0$

$\Rightarrow (\gamma_{ij} + b_i c_j) a_{ik} - (\gamma_{ik} + b_i c_k) a_{ij} = 0$

$\Rightarrow \gamma_{ij} a_{ik} - \gamma_{ik} a_{ij} = b_i \gamma_{ijk}$

Also, $[a_{ij}, a_{kl}] = 0$ so

$(\gamma_{ij} + b_i c_j) a_{kl} - (\gamma_{kl} + b_k c_l) a_{ij} = 0$

$\Rightarrow$?

?

$$[a_{12}, a_{13}] + [a_{12}, a_{23}] + [a_{13}, a_{23}] = 0$$

?

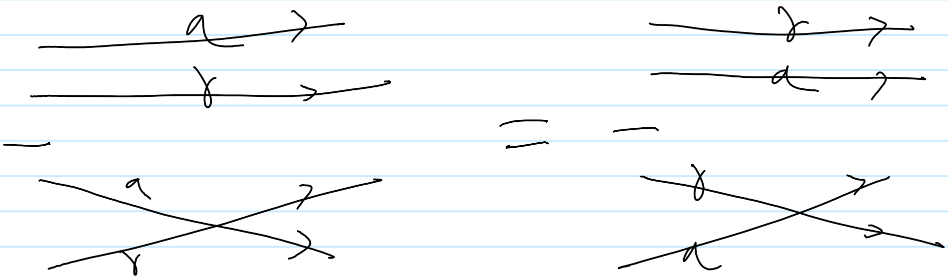
Apply ad a_{12} to $b_2\gamma_{234} = \gamma_{23}a_{24} - \gamma_{24}a_{23}$, by hand:

1 $[a_{12}, b_2\gamma_{234}] = \cancel{b_1 b_2\gamma_{234}} - b_2^2\gamma_{134}$

2 $[a_{12}, \gamma_{23}a_{24}] = \cancel{b_1\gamma_{23}a_{24}} - b_2\gamma_{13}a_{24} + b_1\gamma_{23}a_{24} - b_2\gamma_{23}a_{14}$

3 $[a_{12}, \gamma_{24}a_{23}] = \cancel{b_1\gamma_{24}a_{23}} - b_2\gamma_{14}a_{23} + b_1\gamma_{24}a_{23} - b_2\gamma_{24}a_{13}$

$1-2+3 =$



$(x\otimes y) \longmapsto (ax)\otimes(\gamma y) - (\gamma y)\otimes(ax)$

$(x\otimes x) \longmapsto ax\otimes\gamma x - \gamma x\otimes ax$

Conclusion as of June 30, 2015 at 10:16AM:

It seems that extra-extra does indeed hold, though I still lack a clean justification.