

Hair Formulas

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9:01 PM

From <http://katlas.math.toronto.edu/drorbn/bbs/show?shot=KAL-081216-150410.jpg>

$$a_{ij} = \begin{matrix} | & \rightarrow & | \\ i & & j \end{matrix} \quad Y_{ijk} = \begin{matrix} | & \rightarrow & | \\ i & & j \end{matrix} \begin{matrix} | \\ k \end{matrix} = [a_{ik}, a_{jk}]$$

$$x_l Y_{ijk} = [a_{lk}, Y_{ijk}]$$

From <http://katlas.math.toronto.edu/drorbn/bbs/show?shot=KAL-081216-125528.jpg>

$$e^{-a} b e^a = e^{-ad_a} b = b + \frac{e^{-ad_a} - 1}{ad_a} [a, b]$$

From <http://katlas.math.toronto.edu/drorbn/bbs/show?shot=KAL-081216-125537.jpg>

(and then fixed  $\rho$ )

$$a_{jo} s(a_{ij}) = a_{jo} + \frac{e^{-ad(a_{ij})} - 1}{ad(a_{ij})} [a_{ij}, a_{jo}]$$

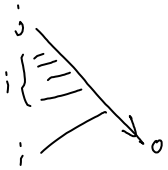
$$= a_{jo} - \frac{e^{-ad(a_{ij})} - 1}{ad(a_{ij})} [a_{io}, a_{jo}]$$

$$= a_{jo} - [a_{io}, \frac{e^{-ad(a_{ij})} - 1}{ad(a_{ij})} a_{jo}]$$

$$= a_{jo} - [a_{io}, \frac{e^{ad(a_{io})} - 1}{-ad(a_{io})} a_{jo}]$$

$$= a_{jo} - \frac{e^{ad(a_{io})} - 1}{-ad(a_{io})} Y_{ijo} = a_{jo} + \frac{e^{x_i} - 1}{x_i} Y_{ijo}$$

$$\begin{aligned} \text{if } [x, y] = 0 \\ [x, [x, [x, [y, z]]]] \\ = [y, [x, [x, [x, z]]]] \end{aligned}$$



$$[x, y] = 0 \Rightarrow [x + y, z] = 0 \Rightarrow [x, [x, [x, z]]] = -[x, [x, [y, z]]] = [x, [y, [x, z]]]$$

$$= [x, [y, [y, z]]] \dots$$