

Blueprint identities for H_3

August 5, 2024

Identity 1

y_{15}

$=$

y_{15}

Identity 2

$-y_{14} + (-y_5 y_{15})$

$=$

$-y_{14} + (-y_{15} y_5)$

Identity 3

$$\begin{aligned} & -(-\psi_{\beta,\epsilon}^\delta((-y_7)^* + (-\psi_{\beta,\epsilon}^\gamma(-(y_2)^*, y_5) + \psi_{\beta,\delta}(-(y_2)^*, -\psi_{\beta,\epsilon}^\delta((y_2)^*, y_5)) + \psi_{\beta,\delta}(-(y_2)^* + \psi_{\alpha,\epsilon}^\beta(y_1, y_5), \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-y_4)^*)) + \psi_{\alpha,\delta}^\gamma(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-y_4)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_1, y_5) + (-y_3))y_{14})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(-(-\psi_{\beta,\epsilon}^\delta((y_2)^*, y_5) + \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-y_4)^*)), y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_1 y_7)^*, y_{14}) + \psi_{\alpha,\epsilon}^\delta(-(-(y_2)^* + \psi_{\alpha,\epsilon}^\beta(y_1, y_5) + \psi_{\alpha,\gamma}(y_1, \psi_{\alpha,\delta}^\gamma(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-y_4)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_1, y_5) + (-y_3)) + \psi_{\alpha,\delta}^\beta(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-y_4)^*)), y_{14}) + \psi_{\gamma,\epsilon}(-y_8, y_{14}) + (-y_{11})^*), y_{15}) + \\ & (-(-((\psi_{\alpha,\delta}^\beta(y_{14}, y_{10}))^* + (-\psi_{\alpha,\epsilon}^\beta(y_{14}, y_1))^* + (-\psi_{\alpha,\gamma}(y_{14}, y_{12}))^* + (-y_{13})^*))^*)) \end{aligned}$$

$=$

$$\begin{aligned} & -(-\psi_{\beta,\epsilon}^\delta((-y_{10})^* + (-y_2 y_{15})^*, -y_{14} + (-y_{15} y_5)) + \psi_{\alpha,\epsilon}^\delta(y_1, -y_{14} + (-y_{15} y_5)) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_4 y_{10})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(y_3, y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}) + \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*), y_{15}) + (-y_{12})^*, -y_{14} + (-y_{15} y_5)) + (-(-((\psi_{\alpha,\delta}^\beta(y_{15}, -(y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)))^* + (-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4))^* + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5 y_{12})))^* + (-y_{13})^*))^*)) \end{aligned}$$

Identity 4

[illegible]

$$\begin{aligned} & \psi_{\beta,\epsilon}^\gamma(-((-y_{10})^* + (-y_2y_{15})^*), -y_{14} + (-y_{15}y_5)) + \psi_{\beta,\delta}(-((-y_{10})^* + (-y_2y_{15})^*), -\psi_{\beta,\epsilon}^\delta(-((-y_{10})^* + (-y_2y_{15})^*), -y_{14} + (-y_{15}y_5))) + \psi_{\beta,\delta}(-((-y_{10})^* + (-y_2y_{15})^*) + \psi_{\alpha,\epsilon}^\beta(y_1, -y_{14} + (-y_{15}y_5)), \psi_{\alpha,\epsilon}^\delta(y_1, -y_{14} + (-y_{15}y_5))) + \psi_{\gamma,\epsilon}(-(\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_4y_{10})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(y_3, y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}) + \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*, y_{15}) + (-y_{12})^*, -y_{14} + (-y_{15}y_5)) + (-((-y_{10})^* + (-y_2y_{15})^*) + \psi_{\beta,\epsilon}^\delta(y_1, -y_{14} + (-y_{15}y_5)) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\delta}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)))^* + (-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4))^* + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5y_{12})))^* + (-y_{13})^*)) + \psi_{\alpha,\delta}^\gamma(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, -y_{14} + (-y_{15}y_5)) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_4y_{10})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(y_3, y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}) + \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*, y_{15}) + (-y_{12})^*, -y_{14} + (-y_{15}y_5)) + (-((-y_{10})^* + (-y_2y_{15})^*) + \psi_{\beta,\epsilon}^\delta(y_1, -y_{14} + (-y_{15}y_5)) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\delta}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)))^* + (-\psi_{\beta,\epsilon}^\beta(y_{15}, y_4))^* + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5y_{12})))^* + (-y_{13})^*)) + \psi_{\alpha,\delta}^\gamma(y_1, -y_{14} + (-y_{15}y_5)) + (-\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_4y_{10})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(y_3, y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}) + \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*, y_{15}) + (-y_{12})^*)) \end{aligned}$$

Identity 5

$$\begin{aligned}
& (-y_{10})^* + (-\psi_{\alpha,\epsilon}^\delta(y_{14}, y_1))^* + (-\psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\gamma(-\psi_{\alpha,\epsilon}^\beta(y_{14}, y_1) + (-\psi_{\alpha,\gamma}(y_{14}, y_{12})) + (-y_{13}), y_1) + (-\psi_{\alpha,\epsilon}^\gamma(y_{14}, y_1)) + y_{12}, y_1))^* + (-\psi_{\beta,\epsilon}^\delta(-\psi_{\alpha,\epsilon}^\beta(y_{14}, y_1) + (-\psi_{\alpha,\gamma}(y_{14}, y_{12})) + (-y_{13}), y_1))^* + \\
& (-y_{15}(-(-(y_2)^* + \psi_{\alpha,\epsilon}^\beta(y_1, y_5) + \psi_{\alpha,\gamma}(y_1, \psi_{\alpha,\delta}^\gamma(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-y_4)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_1, y_5) + (-y_3)) + \psi_{\alpha,\delta}^\beta(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-y_4)^*)))))) \\
& =
\end{aligned}$$

$$\begin{aligned} & -(-((y_{10})^* + (y_{21}y_{15})^*) + \psi_{\alpha,\epsilon}^\beta(y_1, -y_{14} + (-y_{15}y_5)) + \psi_{\alpha,\gamma}(y_1, \psi_{\alpha,\delta}^\gamma(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, -y_{14} + (-y_{15}y_5)) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_4y_{10})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(y_3, y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}) + \\ & \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*), y_{15}) + (-y_{12})^*), -y_{14} + (-y_{15}y_5)) + (-((-\psi_{\alpha,\delta}^\beta(y_{15}, -(y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \\ & \psi_{\gamma,\epsilon}^\beta(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)))^* + (-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4))^* + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5y_{12})))^* + (-y_{13})^*)) + \psi_{\gamma,\epsilon}^\beta(y_1, -y_{14} + (-y_{15}y_5)) + \\ & (-\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_4y_{10})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(y_3, y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}) + \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*), y_{15}) + (-y_{12})^*)) + \psi_{\alpha,\delta}^\beta(y_1, \psi_{\alpha,\epsilon}^\delta(y_1, -y_{14} + (-y_{15}y_5)) + \\ & \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((-y_6)^* + (-y_4y_{10})^*, y_{15}) + \psi_{\alpha,\epsilon}^\delta(y_3, y_{15}) + \psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}) + \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*), y_{15}) + (-y_{12})^*), -y_{14} + (-y_{15}y_5)) + (-((-\psi_{\alpha,\delta}^\beta(y_{15}, -(y_7)^* + \end{aligned}$$

$$\begin{aligned} & \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-(y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-(y_9)^*)))^* + (-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4))^* + \\ & (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5 y_{12})))^* + (-y_{13})^*))^* \end{aligned}$$

Identity 6

[illegible]

$$=$$

$$\begin{aligned} & -((-\psi_{\alpha,\delta}^\beta(-y_{14}+(-y_{15}y_5), -((-y_6)^*+(-y_4y_{10})^*))+\psi_{\alpha,\epsilon}^\beta(y_3, y_{15})+\psi_{\alpha,\gamma}(y_3, \psi_{\alpha,\delta}^\gamma(y_3, \psi_{\alpha,\epsilon}^\delta(y_3, y_{15})+\psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10})+\psi_{\alpha,\epsilon}^\delta(y_5, y_{10})+\psi_{\gamma,\epsilon}(-y_8, y_{10})+(-(y_9)^*, y_{15})+(-(y_{12})^*)))+ \\ & \psi_{\alpha,\epsilon}^\gamma(y_3, y_{15})+(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10})+\psi_{\alpha,\epsilon}^\delta(y_5, y_{10})+\psi_{\gamma,\epsilon}(-y_8, y_{10})+(-(y_9)^*)))+\psi_{\beta,\delta}^\alpha(y_3, \psi_{\alpha,\epsilon}^\delta(y_3, y_{15})+\psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10})+\psi_{\alpha,\epsilon}^\delta(y_5, y_{10})+\psi_{\gamma,\epsilon}(-y_8, y_{10})+(-(y_9)^*, y_{15})+(-(y_{12})^*)))^*+ \\ & (-\psi_{\alpha,\epsilon}^\beta(-y_{14}+(-y_{15}y_5), y_2))^*+(-\psi_{\alpha,\gamma}(-y_{14}+(-y_{15}y_5), -(-\psi_{\beta,\epsilon}^\gamma(-y_7)^*, y_{10})+\psi_{\beta,\delta}(-y_7)^*, -\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}))+\psi_{\beta,\delta}(-y_7)^*+\psi_{\alpha,\epsilon}^\delta(y_5, y_{10}), \psi_{\alpha,\epsilon}^\delta(y_5, y_{10})+\psi_{\gamma,\epsilon}(-y_8, y_{10})+(-(y_9)^*)))+ \\ & \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10})+\psi_{\gamma,\epsilon}(-y_8, y_{10})+(-(y_9)^*)))+\psi_{\alpha,\epsilon}^\gamma(y_5, y_{10})+(-y_8))+(-y_{12}y_4))+(-y_3(-(-\psi_{\alpha,\delta}^\beta(y_{15}, -(y_7)^*+\psi_{\beta,\epsilon}^\alpha(y_5, y_{10})+\psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10})+\psi_{\gamma,\epsilon}(-y_8, y_{10})+ \\ & (-(y_9)^*)))+\psi_{\alpha,\epsilon}^\gamma(y_5, y_{10})+(-y_8))+\psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10})+\psi_{\gamma,\epsilon}(-y_8, y_{10})+(-(y_9)^*)))^*+(-\psi_{\beta,\epsilon}^\alpha(y_{15}, y_4))^*+(-\psi_{\alpha,\gamma}(y_{15}, -y_{11}+(-y_5y_{12}))^*+(-(y_{13})^*))))^*+((-\psi_{\alpha,\delta}^\gamma(y_{15}, -(y_7)^*+ \end{aligned}$$

$$\begin{aligned} & \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*))^* + (-\psi_{\beta,\delta}(-\psi_{\alpha,\delta}^\beta(y_{15}, -y_7)^* + \\ & \psi_{\beta,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*))^*, -y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \\ & \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*))^* + (-\psi_{\beta,\delta}(-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4) + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + \\ & (-y_5 y_{12}))) + (-y_{13}), -y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \\ & (-\psi_{\alpha,\epsilon}^\delta(y_{15}, y_4)))^* + (-\psi_{\beta,\epsilon}^\beta(-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4) + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5 y_{12}))) + (-y_{13}), y_4))^* + (-\psi_{\alpha,\epsilon}^\gamma(y_{15}, y_4))^* + ((-y_{11})^* + (-y_5 y_{12})^*)) \end{aligned}$$

Identity 7

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& (-\psi_{\alpha,\delta}^\gamma(y_{15}, -(y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \\
& (-\psi_{\beta,\delta}(-\psi_{\alpha,\delta}^\beta(y_{15}, -(y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*))) - (y_7)^* + \\
& \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*))) + (-\psi_{\beta,\delta}(-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4) + \\
& (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5 y_{12})))) + (-y_{13}), -(y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + \\
& (-y_9)^*)) + (-\psi_{\alpha,\epsilon}^\delta(y_{15}, y_4)))) + (-\psi_{\beta,\epsilon}^\gamma(-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4) + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5 y_{12})))) + (-y_{13}), y_4)) + (-\psi_{\alpha,\epsilon}^\gamma(y_{15}, y_4)) + (-y_{11} + (-y_5 y_{12}))), y_2)) + (-\psi_{\alpha,\epsilon}^\gamma(-y_{14} + (-y_{15} y_5), y_2)) + \\
& (-(-(\psi_{\beta,\epsilon}^\gamma(-(y_7)^*, y_{10}) + \psi_{\beta,\delta}(-(y_7)^*, -\psi_{\beta,\epsilon}^\delta((y_7)^*, y_{10}))) + \psi_{\beta,\delta}(-(y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}), \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \\
& \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + (-y_{12} y_4)) + (-y_3(-((-\psi_{\alpha,\delta}^\beta(y_{15}, -(y_7)^* + \psi_{\alpha,\epsilon}^\beta(y_5, y_{10}) + \psi_{\alpha,\gamma}(y_5, \psi_{\alpha,\delta}^\gamma(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*)) + \psi_{\alpha,\epsilon}^\gamma(y_5, y_{10}) + (-y_8)) + \psi_{\alpha,\delta}^\beta(y_5, \psi_{\alpha,\epsilon}^\delta(y_5, y_{10}) + \\
& \psi_{\gamma,\epsilon}(-y_8, y_{10}) + (-y_9)^*))))^* + (-\psi_{\alpha,\epsilon}^\beta(y_{15}, y_4))^* + (-\psi_{\alpha,\gamma}(y_{15}, -y_{11} + (-y_5 y_{12})))^* + (-y_{13})^*))))))
\end{aligned}$$

Identity 9

[illegible]

[illegible]

[illegible]

$$=$$

Identity 12

$$\begin{aligned}
& -(\psi_{\beta,\epsilon}^\delta((y_2)^*, y_5) + \psi_{\alpha,\epsilon}^\delta(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-(y_4)^*)) \\
& = \\
& -((\psi_{\alpha,\delta}^\beta(y_5, y_2))^* + (-\psi_{\alpha,\epsilon}^\beta(y_5, y_1))^* + (-\psi_{\alpha,\gamma}(y_5, y_3))^* + (-y_4)^*)
\end{aligned}$$

Identity 13

$$\begin{aligned}
& \psi_{\beta,\epsilon}^{\gamma}(-(y_2)^*, y_5) + \psi_{\beta,\delta}(-(y_2)^*, -\psi_{\beta,\epsilon}^{\delta}((y_2)^*, y_5)) + \psi_{\beta,\delta}(-(y_2)^* + \psi_{\alpha,\epsilon}^{\beta}(y_1, y_5), \psi_{\alpha,\epsilon}^{\delta}(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-(y_4)^*)) + \psi_{\alpha,\delta}^{\gamma}(y_1, \psi_{\alpha,\epsilon}^{\delta}(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-(y_4)^*)) + \psi_{\alpha,\epsilon}^{\gamma}(y_1, y_5) + (-y_3) \\
& = \\
& \quad -(-\psi_{\alpha,\delta}^{\gamma}(y_5, -y_2) + (-\psi_{\beta,\delta}(\psi_{\alpha,\delta}^{\beta}(y_5, y_2), -y_2)) + (-\psi_{\beta,\delta}(-\psi_{\alpha,\epsilon}^{\beta}(y_5, y_1) + (-\psi_{\alpha,\gamma}(y_5, y_3)) + (-y_4), -y_2 + (-\psi_{\alpha,\epsilon}^{\delta}(y_5, y_1)))) + (-\psi_{\beta,\epsilon}^{\gamma}(-\psi_{\alpha,\epsilon}^{\beta}(y_5, y_1) + (-\psi_{\alpha,\gamma}(y_5, y_3)) + (-y_4), y_1)) + (-\psi_{\alpha,\epsilon}^{\gamma}(y_5, y_1)) + y_3)
\end{aligned}$$

Identity 14

$$\begin{aligned}
& -(-(y_2)^* + \psi_{\alpha,\epsilon}^{\beta}(y_1, y_5) + \psi_{\alpha,\gamma}(y_1, \psi_{\alpha,\delta}^{\gamma}(y_1, \psi_{\alpha,\epsilon}^{\delta}(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-(y_4)^*)) + \psi_{\alpha,\epsilon}^{\gamma}(y_1, y_5) + (-y_3)) + \psi_{\alpha,\delta}^{\beta}(y_1, \psi_{\alpha,\epsilon}^{\delta}(y_1, y_5) + \psi_{\gamma,\epsilon}(-y_3, y_5) + (-(y_4)^*))) \\
& = \\
& \quad -((-y_2)^* + (-\psi_{\alpha,\epsilon}^{\delta}(y_5, y_1))^* + (-\psi_{\gamma,\epsilon}(-\psi_{\beta,\epsilon}^{\gamma}(-\psi_{\alpha,\epsilon}^{\beta}(y_5, y_1) + (-\psi_{\alpha,\gamma}(y_5, y_3)) + (-y_4), y_1) + (-\psi_{\alpha,\epsilon}^{\gamma}(y_5, y_1)) + y_3, y_1))^* + (-\psi_{\beta,\epsilon}^{\delta}(-\psi_{\alpha,\epsilon}^{\beta}(y_5, y_1) + (-\psi_{\alpha,\gamma}(y_5, y_3)) + (-y_4), y_1))^*)
\end{aligned}$$

Identity 15

$$\begin{aligned}
& y_1 \\
& = \\
& y_1
\end{aligned}$$