$$\ulcorner\omega\urcorner = -\urcorner\omega\ulcorner$$

$$\ulcorner J\omega\urcorner J = \ulcorner\omega\urcorner$$

$$\ulcorner J\omega\urcorner = -\ulcorner\omega\urcorner J$$

$$\ulcorner (J+i)\,\omega\urcorner = \frac{i}{2}\ulcorner (1-iJ)\,\omega\urcorner\,(1+iJ)$$

$$\ulcorner (1-iJ)\,\omega\urcorner\,(1+iJ) = \overbrace{\ulcorner (1-iJ)\,J}\,\omega\overbrace{\urcorner\,(1+iJ)\,J} = \ulcorner (J+i)\,\omega\urcorner\,(J-i)$$

$$= \ulcorner J\omega\urcorner J + i\ulcorner\omega\urcorner J - i\ulcorner J\omega\urcorner + \ulcorner\omega\urcorner = 2\left(\ulcorner\omega\urcorner - i\ulcorner J\omega\urcorner\right) = -2i\ulcorner (J+i)\,\omega\urcorner$$

$${}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner}_{\omega} = \exp\ulcorner (J+i)\,\omega\urcorner$$

$${}^{J}_{\ulcorner}\mathsf{J} = {}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner}_{\omega/2\pitchfork}\,{}^{J}_{\ulcorner}\tilde{\mathsf{J}}$$

$${}^{J}\mathsf{J}\bowtie{}^{J}\mathsf{F} = \int^{d\upharpoonright}{}^{J*}_{\upharpoonright}\mathsf{J}\,{}^{J}_{\upharpoonright}\mathsf{F} = \int^{d\upharpoonright}{}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner}_{\omega/\pitchfork}\,{}^{J*}_{\upharpoonright}\tilde{\mathsf{J}}\,{}^{J}_{\upharpoonright}\tilde{\mathsf{F}}$$

$${}^{J}_{\ulcorner}\mathsf{J} = \int^{d\upharpoonright}{}^{J}_{\ulcorner}K^{\upharpoonright}\,{}^{J}_{\upharpoonright}\mathsf{J}$$

$${}^{J}_{\ulcorner}K^{\upharpoonright} = {}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner-\upharpoonright}_{\omega/2\pitchfork}\,{}^{J+i}_{\upharpoonright-\ulcorner}\mathfrak{e}^{\upharpoonright}_{\omega/2\pitchfork}$$

$$2\log{}^{J}_{\ulcorner}K^{\upharpoonright} = \ulcorner (J+i)\,\frac{\omega}{\pitchfork}\,(\ulcorner-\upharpoonright) + (\upharpoonright-\ulcorner)\,(J+i)\,\frac{\omega}{\pitchfork}\upharpoonright$$

$${}^{J}_{\ulcorner}\tilde{\mathsf{J}} = \int^{d\upharpoonright}{}^{J+i}_{\upharpoonright}\mathfrak{e}^{\upharpoonright}_{\omega/\pitchfork}\,{}^{J+i}_{\ulcorner}\mathfrak{e}^{\upharpoonright}_{-\omega/\pitchfork}\,{}^{J}_{\upharpoonright}\tilde{\mathsf{J}}$$

$$\ulcorner (J+i)\,\omega\ulcorner + \upharpoonright (J+i)\,\omega\upharpoonright - 2\ulcorner (J+i)\,\omega\upharpoonright = \ulcorner (J+i)\,\omega\,(\ulcorner-\upharpoonright) + (\upharpoonright-\ulcorner)\,(J+i)\,\omega\upharpoonright$$

$$\Longrightarrow {}^{J}_{\ulcorner}\mathsf{J} = {}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner}_{\omega/2\pitchfork}\,{}^{J}_{\ulcorner}\tilde{\mathsf{J}} = {}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner}_{\omega/2\pitchfork}\int^{d\upharpoonright}{}^{J+i}_{\upharpoonright}\mathfrak{e}^{\upharpoonright}_{\omega/\pitchfork}\,{}^{J+i}_{\ulcorner}\mathfrak{e}^{\upharpoonright}_{-\omega/\pitchfork}\,{}^{J}_{\upharpoonright}\tilde{\mathsf{J}} = \int^{d\upharpoonright}{}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner}_{\omega/2\pitchfork}\,{}^{J+i}_{\upharpoonright}\mathfrak{e}^{\upharpoonright}_{\omega/\pitchfork}\,{}^{J+i}_{\ulcorner}\mathfrak{e}^{\upharpoonright}_{-\omega/\pitchfork}\,{}^{J+i}_{\upharpoonright}\mathfrak{e}^{\upharpoonright}_{-\omega/2\pitchfork}\,{}^{J}_{\upharpoonright}\mathsf{J}$$

$$= \int^{d\upharpoonright}{}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner}_{\omega/2\pitchfork}\,{}^{J+i}_{\upharpoonright}\mathfrak{e}^{\upharpoonright}_{\omega/2\pitchfork}\,{}^{J+i}_{\ulcorner}\mathfrak{e}^{\upharpoonright}_{-\omega/\pitchfork}\,{}^{J}_{\upharpoonright}\mathsf{J} = \int^{d\upharpoonright}{}^{J+i}_{\ulcorner}\mathfrak{e}^{\ulcorner-\upharpoonright}_{\omega/2\pitchfork}\,{}^{J+i}_{\upharpoonright-\ulcorner}\mathfrak{e}^{\upharpoonright}_{\omega/2\pitchfork}\,{}^{J}_{\upharpoonright}\mathsf{J}$$

$$2\,\text{Ⅎ}\;{}^{J}_{\ulcorner}\underline{K}^{\text{ᛚ}}\,/\,{}^{J}_{\ulcorner}K^{\text{ᛚ}} = 2\,\text{Ⅎ}\;\underline{{}^{J}\log{}_{\ulcorner}K^{\text{ᛚ}}} = (\Gamma - \text{ᛚ})\;\text{Ⅎ}\,\frac{\omega}{\text{⫛}}\,(\Gamma - \text{ᛚ})$$

$$\text{Ғ}\;{}^{J}_{\ulcorner}\bar{K}^{\text{ᛚ}}\,/\,{}^{J}_{\ulcorner}K^{\text{ᛚ}} = \text{Ғ}\;{}_{\ulcorner}\overline{\log{}^{J}K^{\text{ᛚ}}} = \text{Ғ}\,J\frac{\omega}{\text{⫛}}\Gamma - \text{Ғ}\;(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}$$

$$2\,\text{⫛}\;\;\text{LHS} = \text{Ғ}\;{}_{\ulcorner}\overline{\Gamma\,(J+i)\,\omega\,(\Gamma-\text{ᛚ}) + (\text{ᛚ}-\Gamma)\,(J+i)\,\omega\text{ᛚ}} = \text{Ғ}\;(J+i)\,\omega\,(\Gamma-\text{ᛚ}) + \Gamma\,(J+i)\,\omega\text{Ғ} - \text{Ғ}\;(J+i)\,\omega\text{ᛚ}$$

$$= \text{Ғ}\,J\omega\Gamma + i\text{Ғ}\,\omega\Gamma - \text{Ғ}\,J\omega\text{ᛚ} - i\text{Ғ}\,\omega\text{ᛚ} + \Gamma J\omega\text{Ғ} + i\Gamma\omega\text{Ғ} - \text{Ғ}\,J\omega\text{ᛚ} - i\text{Ғ}\,\omega\text{ᛚ} = 2\text{Ғ}\,J\omega\Gamma - 2\text{Ғ}\,J\omega\text{ᛚ} - 2i\text{Ғ}\,\omega\text{ᛚ}$$

$$\text{₣}\,\text{Ғ}\;{}^{J}_{\ulcorner}\bar{\bar{K}}^{\text{ᛚ}}\,/\,{}^{J}_{\ulcorner}K^{\text{ᛚ}} = \text{Ғ}\,J\frac{\omega}{\text{⫛}}\text{₣} + \underbrace{\text{₣}J\frac{\omega}{\text{⫛}}\Gamma - \text{₣}\,(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}}\,\underbrace{\text{Ғ}J\frac{\omega}{\text{⫛}}\Gamma - \text{Ғ}\,(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}}$$

$$\text{₣}\,\text{Ғ}\;{}^{J}_{\ulcorner}\bar{\bar{K}}^{\text{ᛚ}} = \text{₣}\;{}_{\ulcorner}\overline{\text{Ғ}\,{}^{J}\bar{K}^{\text{ᛚ}}} = \text{₣}\;{}_{\ulcorner}\overline{{}^{J}_{\ulcorner}K^{\text{ᛚ}}\underbrace{\text{Ғ}J\frac{\omega}{\text{⫛}}\Gamma - \text{Ғ}\,(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}}}$$

$$= \text{₣}\;{}^{J}_{\ulcorner}\bar{K}^{\text{ᛚ}}\,\underbrace{\text{Ғ}J\frac{\omega}{\text{⫛}}\Gamma - \text{Ғ}\,(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}} + {}^{J}_{\ulcorner}K^{\text{ᛚ}}\,\text{₣}\;{}_{\ulcorner}\overline{\text{Ғ}J\frac{\omega}{\text{⫛}}\Gamma - \text{Ғ}\,(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}}$$

$$= {}^{J}_{\ulcorner}K^{\text{ᛚ}}\,\underbrace{\text{₣}J\frac{\omega}{\text{⫛}}\Gamma - \text{₣}\,(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}}\,\underbrace{\text{Ғ}J\frac{\omega}{\text{⫛}}\Gamma - \text{Ғ}\,(J+i)\,\frac{\omega}{\text{⫛}}\text{ᛚ}} + {}^{J}_{\ulcorner}K^{\text{ᛚ}}\,\text{Ғ}\,J\frac{\omega}{\text{⫛}}\text{₣}$$

$$\text{Ғ}\,{}^{J}_{\ulcorner}\bar{\mathsf{J}} = \text{Ғ}\,J\frac{\omega}{\pitchfork}\Gamma\,{}^{J}_{\ulcorner}\mathsf{J} - \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\,{}^{J}_{\upharpoonleft}\mathsf{J}\,\text{Ғ}\,(J+i)\,\frac{\omega}{\pitchfork}\upharpoonleft$$

$${}^{J}_{\ulcorner}\mathsf{J} = \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\,{}^{J}_{\upharpoonleft}\mathsf{J} \implies \text{ LHS } =\pitchfork \int^{d\upharpoonleft} \text{Ғ}\,{}^{J}_{\ulcorner}\bar{K}^{\upharpoonleft}\,{}^{J}_{\upharpoonleft}\mathsf{J} = \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\underbrace{\text{Ғ}\,J\frac{\omega}{\pitchfork}\Gamma - \text{Ғ}\,(J+i)\,\frac{\omega}{\pitchfork}\upharpoonleft}\,{}^{J}_{\upharpoonleft}\mathsf{J}$$

$$= \text{Ғ}\,J\frac{\omega}{\pitchfork}\Gamma \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\,{}^{J}_{\upharpoonleft}\mathsf{J} - \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\,\text{Ғ}\,(J+i)\,\frac{\omega}{\pitchfork}\upharpoonleft\,{}^{J}_{\upharpoonleft}\mathsf{J} = \text{ RHS}$$

$$\text{ǂ}\,\text{Ғ}\,{}^{J}_{\ulcorner}\bar{\bar{\mathsf{J}}} = \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\overbrace{\text{Ғ}\,J\frac{\omega}{\pitchfork}\text{ǂ} + \underbrace{\text{ǂ}\,J\frac{\omega}{\pitchfork}\Gamma - \text{ǂ}\,(J+i)\,\frac{\omega}{\pitchfork}\upharpoonleft}\underbrace{\text{Ғ}\,J\frac{\omega}{\pitchfork}\Gamma - \text{Ғ}\,(J+i)\,\frac{\omega}{\pitchfork}\upharpoonleft}}\,{}^{J}_{\upharpoonleft}\mathsf{J}$$

$$= \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\overbrace{\text{Ғ}\,J\frac{\omega}{\pitchfork}\text{ǂ} + \underbrace{\text{ǂ}\,J\frac{\omega}{\pitchfork}(\Gamma - \upharpoonleft) - i\text{ǂ}\frac{\omega}{\pitchfork}\upharpoonleft}\underbrace{\text{Ғ}\,J\frac{\omega}{\pitchfork}(\Gamma - \upharpoonleft) - i\text{Ғ}\frac{\omega}{\pitchfork}\upharpoonleft}}\,{}^{J}_{\upharpoonleft}\mathsf{J}$$

$$= \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\overbrace{\text{Ғ}\,J\frac{\omega}{\pitchfork}\text{ǂ} + \underbrace{\text{ǂ}\,J\frac{\omega}{\pitchfork}(\Gamma - \upharpoonleft) - i\text{ǂ}\frac{\omega}{\pitchfork}\upharpoonleft}\underbrace{\text{Ғ}\,J\frac{\omega}{\pitchfork}(\Gamma - \upharpoonleft) - i\text{Ғ}\frac{\omega}{\pitchfork}\upharpoonleft}}\,{}^{J}_{\upharpoonleft}\mathsf{J}$$

$${}^{J}_{\ulcorner}\mathsf{J} = \int^{d\upharpoonleft} {}^{J}_{\ulcorner}K^{\upharpoonleft}\,{}^{J}_{\upharpoonleft}\mathsf{J} \implies \text{ LHS } = \int^{d\upharpoonleft} \text{ǂ}\,\text{Ғ}\,{}^{J}_{\ulcorner}\bar{\bar{K}}^{\upharpoonleft}\,{}^{J}_{\upharpoonleft}\mathsf{J} = \text{ RHS}$$