$$\text{ꞁ} \xleftarrow[\text{ell sa 1st ord}]{\text{ꞁ}} \mathcal{D}_{\text{ꞁ}} \sqsubset \text{ꞁ} \text{ fermionic}$$

$$\text{ꞁ} = \text{ꞁ}_{\text{pp}} = \frac{{}_k\text{ꞁ}^k}{k \in \mathbb{Z}} \text{ pure point spectrum}$$

$$\eta_s^{\text{ꞁ}} = \sum_{k \neq 0} \frac{\operatorname{sgn}\ {}_k\text{ꞁ}^k}{{}^s\overline{{}_k\text{ꞁ}^k}} = \sum_{k \neq 0} \frac{{}_k\text{ꞁ}^k / \overline{{}_k\text{ꞁ}^k}}{{}^s\overline{{}_k\text{ꞁ}^k}} = \sum_{k \neq 0} \frac{{}_k\text{ꞁ}^k}{\overline{{}_k\text{ꞁ}^k}^{\,s+1}}$$

$$\boxed{\int_{dt}^{0|\infty} t^{(s-1)/2}\ \operatorname{tr}\ \text{ꞁ}\ \mathfrak{e}^{-\overset{2}{\text{ꞁ}}t} = \Gamma_{(s+1)/2}\, \eta_s^{\text{ꞁ}}}$$

$$\operatorname{tr}\ \text{ꞁ}\ \mathfrak{e}^{-\overset{2}{\text{ꞁ}}t} = \sum_k {}_k\text{ꞁ}^k\ \mathfrak{e}^{-{}^2_k\text{ꞁ}^k t} = \sum_{k \neq 0} {}_k\text{ꞁ}^k\ \mathfrak{e}^{-{}^2_k\text{ꞁ}^k t}$$

$$k \neq 0 \Longrightarrow 0|\infty \ni t \xrightarrow[\text{trafo}]{} {}^2_k\text{ꞁ}^k\ t = \tau \in 0|\infty$$

$$\int_{dt}^{0|\infty} t^{(s-1)/2}\ {}_k\text{ꞁ}^k\ \mathfrak{e}^{-{}^2_k\text{ꞁ}^k t} = {}_k\text{ꞁ}^k\ \overline{{}_k\text{ꞁ}^k}^{\,1-s} \int_{dt}^{0|\infty} {}^{(s-1)/2}\left({}^2_k\text{ꞁ}^k t\right) \mathfrak{e}^{-{}^2_k\text{ꞁ}^k t}$$

$$= {}_k\text{ꞁ}^k\ {}^{1-s}\overline{{}_k\text{ꞁ}^k}\ {}^{-2}_{\ k}\text{ꞁ}^k \int_{d\left({}^2_k\text{ꞁ}^k t\right)}^{0|\infty} {}^{(s-1)/2}\overline{{}^2_k\text{ꞁ}^k t}\ \mathfrak{e}^{-{}^2_k\text{ꞁ}^k t}$$

$$= \frac{\overline{{}_k\text{ꞁ}^k}}{{}_k\text{ꞁ}^k}\ {}^{-s}\overline{{}_k\text{ꞁ}^k} \int_{d\left({}^2_k\text{ꞁ}^k t\right)}^{0|\infty} {}^{(s-1)/2}\overline{{}^2_k\text{ꞁ}^k t}\ \mathfrak{e}^{-{}^2_k\text{ꞁ}^k t} = \operatorname{sgn}\ {}_k\text{ꞁ}^k\ {}^{-s}\overline{{}_k\text{ꞁ}^k} \int_{d\tau}^{0|\infty} \tau^{(s-1)/2}\ \mathfrak{e}^{-\tau} = \Gamma_{(s+1)/2} \frac{\operatorname{sgn}\ {}_k\text{ꞁ}^k}{{}^s\overline{{}_k\text{ꞁ}^k}}$$