$\boxed{1}$

$$W_{k,h}(z,\xi) = \sum \varepsilon_\gamma^{-k}(z)\, w_{k,h}(\gamma z, \xi)$$

$$= \sum \overline{\varepsilon_{\gamma^{-1}}(\xi)}^{\,-h}\, w_{k,h}(z, \gamma^{-1}\xi)$$

$$\varepsilon_{\gamma_1}^{-k}(z)\, W_{k,h}(\gamma_1 z, \xi) = \sum \varepsilon_\gamma^{-k}(\gamma_1 z)\, \varepsilon_{\gamma_1}^{-k}(z)\, w_{k,h}(\gamma\gamma_1 z, \xi)$$

$$= \sum \varepsilon^{-}_{\gamma\gamma_1}(z)\, w_{k,h}(\gamma\gamma_1 z, \xi) = W_{k,h}(z,\xi)$$

$$W_{k,h}(\gamma_1 z, \xi) = \varepsilon_{\gamma_1}^{k}(z)\, W_{k,h}(z,\xi).$$

$$W_{k,h}(z, \gamma_1 \xi) = \overline{\varepsilon_{\gamma_1}(\xi)}^{\,h}\, W_{k,h}(z, \xi)$$

$$W_{k,h}(\gamma_1 z, \gamma_2 \xi) = \varepsilon_{\gamma_1}^{k}(z)\, \overline{\varepsilon_{\gamma_2}(\xi)}^{\,h}\, W_{k,h}(z,\xi)$$

$$w_{k,h}(\gamma z, \gamma \xi) = j_\gamma^{k}(z)\, \overline{j_\gamma(\xi)}^{\,h}\, w_{k,h}(z,\xi).$$

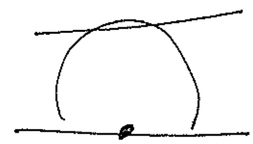
$$w_{k,h}(z,\xi) = \left(\frac{z-\xi}{z-\bar\xi}\right)^{h-k} \left(\frac{\xi-\bar z}{\bar z-\bar\xi}\right)^{k} \quad ; h \geq k$$

$\boxed{2}$

$$\iint k(z,\xi)\, \eta^{s} y^{s}\, d\omega_\xi \, d\omega_z$$

$$\iint k(z,\xi)\, \frac{\eta^{s'} y^{s}}{|z|^{2s}}\, d\omega_\xi \, d\omega_z$$

$$\iint h(r)\, \frac{y^{s'+s-2}}{|z|^{2s}}\, dx\, dy$$



$x = y \cdot t$

$dx = y\, dt$

$$\int\int \frac{y^{\alpha}}{(x^2+y^2)^{s}}\, dx\, dy$$

cannot be done

$$\int_0^\infty \frac{y^{\alpha+1}}{y^{2s}}\, dy$$

$$\iint_{\mathcal{D}} \sum W_{k,h}(z,\xi)\, \overline{W_{k,h}(z',\xi^*)}\, d\omega_\xi$$

$$W_{k,h}(z,\xi) \sum \varepsilon_\gamma^{-h}(\xi)\, W_{k,h}(\cancel{\gamma} z',\gamma\xi)\, d\omega_\xi$$

$$W_{k,h}(z,\gamma\xi)\, \overline{w_{k,h}(z',\gamma\xi)}\, d\omega_\xi$$

$$\iint_S W_{k,h}(z,\xi)\, \overline{w_{k,h}(z',\xi)}\, d\omega_\xi$$

$\boxed{3}$ $W^{*}_{k,k}(z, z')$

$$= \sum \varepsilon_{\gamma}^{-k}(z)\, w^{*}_{k,k}(\gamma z, z')$$

$$w^{*}_{k,h}(\cancel{\gamma z}, z') = \iint_{S} w_{k,h}(z, \xi)\, \overline{w_{k,h}(z', \xi)^{y, s}}\, d\omega_{\xi}$$

$H_1(s)\, y^{s}$ $\quad H_1^2(s)$

$H_k(s)\, \overline{H_h(s)}$

$$W_{k,h}(z, \xi) = \sum H(r)\, u_r^k(z)\, \overline{u_r^h(\xi)}$$

$$W^{*}_{k,k}(z, z') = \sum |H(r)|^2 u_r^k(z)\, u$$

$|H(r)|$ $\quad \varepsilon_r^{h,k}$

$H(r) =$

Kernel

$$\frac{y^s \eta^s}{|z-\bar{\xi}|^{2s}} \left(\frac{z-\xi}{z-\bar{\xi}}\right)^h \left(\frac{\xi-\bar{z}}{z-\bar{\xi}}\right)^\alpha$$

$$\eta^{s'}$$

$\alpha \to k \quad h \to \underline{h-k}$

$h-k-\nu-1$

$s' = \frac{1}{2} + ir$.

$$\frac{4\pi}{2^{2s}} \frac{\Gamma(2s-1)}{\Gamma(2s+h-1)} \sum_{\nu=0}^{h} (-1)^\nu \binom{h}{\nu} \frac{\Gamma(s+s'+\nu-1)\,\Gamma(s-s'+h-\nu-1)}{\Gamma(s+\alpha+\nu)\,\Gamma(s-\alpha-\nu)}$$

$$\frac{4\pi}{2^{2s}} \frac{\Gamma(2s-1)}{\Gamma(2s+h-k-1)} \sum_{\nu=0}^{h-k} (-1)^\nu \binom{h-k}{\nu} \frac{\Gamma(s-\frac{1}{2}+ir+\nu)\,\Gamma(s-\frac{1}{2}-ir+h-k-\nu)}{\Gamma(s+k+\nu)\,\Gamma(s-k-\nu)}$$

$$\frac{\Gamma(s-\frac{1}{2}+ir)\,\Gamma(s-\frac{1}{2}-ir+h-k)}{\Gamma(s+k)\,\Gamma(s-k)} + (-1)^{h-k} \frac{\Gamma(s-\frac{1}{2}+ir+h-k)\,\Gamma(s-\frac{1}{2}-ir)}{\Gamma(s+h)\,\Gamma(s-h)}$$

$$\Gamma(s-\tfrac{1}{2}+ir)\left\{ \frac{\Gamma(s-\frac{1}{2}-ir+h-k)}{\Gamma(s+h)\,\Gamma(s-k)} + (-1)^{h-k} \frac{\Gamma(s-\frac{1}{2}-ir+h-k)}{\Gamma(s+h)\,\Gamma(s-h)} \right\}$$

$$1 - \left|\frac{z-\xi}{z-\bar{\xi}}\right|^2 = \frac{4y\eta}{|z-\bar{\xi}|^2}$$

$s = 1$

$(s-1+\nu)(s+h-k-\nu)$

$\boxed{5}$

$h \geq k; \quad \Delta = h-k$

$$\left(T - \frac{|z-\bar{\xi}|^2}{4\eta}\right)\left(\frac{z-\xi}{z-\bar{\xi}}\right)^{\Delta}\left(\frac{\xi-\bar{z}}{z-\bar{\xi}}\right)^{k}$$

$$\iint\left(T - \frac{(1+\eta)^2+\xi^2}{\eta}\right)\left(\frac{1-\eta+i\xi}{1+\eta+i\xi}\right)^{\Delta}\left(\frac{1+\eta-i\xi}{1+\eta+i\xi}\right)^{k}\eta^{s}\,d\xi\,d\eta$$

$$w = -\frac{\xi-i}{\xi+i} = \frac{1+i\xi}{1-i\xi} \qquad \frac{1+i\bar{\xi}}{1-i\xi};$$

$$1-|w|^2 = 1 - \frac{(1+i\xi)(1-i\bar{\xi})}{(1-i\xi)(1+i\bar{\xi})} =$$

$$= 1 - i\xi + i\bar{\xi} + |\xi|^2 - 1 - i\xi + i\bar{\xi} - |\xi|^2$$

$$-2i(\xi-\bar{\xi}) = \frac{\cancel{4}\eta}{(1+\eta)^2+\xi^2}$$

$$\left(T - \frac{4}{1-|w|^2}\right) w^{\Delta}\left(\frac{1-|w|^2}{|1+w|^2}\right)^{s}\left(\frac{1+w}{1+\bar{w}}\right)^{k}\frac{du\,dv}{(1-|w|^2)^2}$$

$$\eta = \frac{\cancel{i}\,\frac{1-w}{1+w} + \cancel{i}\,\frac{1-\bar{w}}{1+\bar{w}}}{2\cancel{i}}$$

$$w - i\xi w = 1 + i\xi$$

$$1+\bar{w}-w-|w|^2 \qquad 1+w-\bar{w}-|w|^2$$

$$i\xi(1+w) = w-1$$

$$\xi = i\,\frac{1-w}{1+w} \qquad \eta = \frac{1-|w|^2}{|1+w|^2} \qquad \int\frac{ds}{1-s^2}$$

$$\frac{1+\frac{1-\bar{w}}{1+\bar{w}}}{1+\frac{1-w}{1+w}} = \frac{\frac{2}{1+\bar{w}}}{\frac{2}{1+w}} = \frac{1+w}{1+\bar{w}}$$

$\boxed{6}$

$$\iint \left(T - \frac{4}{1-|w|^2}\right) w^{\Delta} \left(\frac{1-|w|^2}{|1+w|^2}\right)^{s} \left(\frac{1+w}{1+\bar{w}}\right)^{k} \frac{du\,dv}{(1-|w|^2)^2}$$

$$\iint \left(T - \frac{4}{1-|w|^2}\right) \frac{(1-|w|^2)^{s-2} \quad w^{\Delta}}{(1+w)^{s-k}\,(1+\bar{w})^{s+k}} \quad du\,dv.$$

$$\left(T - \frac{4}{1-r^2}\right) \frac{(1-r^2)^{s-2}\; r^{\Delta+1} \quad e^{i\Delta\varphi}}{(1+re^{i\varphi})^{s-k}\,(1+re^{-i\varphi})^{s+k}} \quad dr\,d\varphi$$

$$\sum \binom{-s+k}{\nu} \binom{-s-k}{\nu+\Delta} r^{2\nu}$$

$1-r^2 = \frac{4}{T}$

$r^2 = 1 - \frac{4}{T}$

$$\frac{(-s+k)\cdots\cdots(-s+k-\nu+1)\;(-s-k)\cdots(-s-k-\nu+1)}{\nu!^{\,2}}$$

$(-1)^{\Delta}$

$$\frac{(s+k+\nu-1)\cdots\cdots\;(s-k)\cdot(s+\nu-k-1)\cdots(s-k)}{\nu!\;(\nu+\Delta)!}$$

$$\sum_{\nu} \binom{s+k+\nu-1}{\nu+\Delta} \binom{s+\nu-k-1}{\nu} r^{2\nu+2\Delta+1}$$