and by change of variables in the integral and the usual Cauchy integral formula from Section 1 of Chapter 0,

$$\int_P \omega = \int_{|w_i|=\varepsilon} \frac{G(w)\,K(w)}{J_f(w)} = (2\pi\sqrt{-1})^n \frac{G(0)}{J_f(0)} .$$

Pf

$$f^*\left(\frac{GK}{J}\right) = f^*\left(\frac{G\;K}{J_f(f^{-1}(w))}\right) = \frac{G\circ f(z)\,(f^*K)(z)}{J_f(f^{-1}\circ f(z))}$$

$$= \frac{g(z) \quad J_f(z)\; dz_1\wedge\cdots\wedge dz_n}{J_f(z) \qquad f_1\cdots f_n} = \omega .$$

$$\int_P \omega = \int_P f^*\left(\frac{(GK)(w)}{J_f(f^{-1}(w))}\right) = \int_{|f_i(z)|=\epsilon_i} f^*\left(\frac{GK}{J_f\circ f^{-1}}\right)$$

$$= \int_{|w_i|=\epsilon_i} \frac{GK}{J_f\circ f^{-1}} = \int\!\!\int_{|w_n|=\epsilon_n} \int_{|w_1|=\epsilon_1} \frac{G(w)}{J_f\circ f^{-1}(w)} \; \frac{dw_1\wedge\cdots\wedge dw_n}{w_1\wedge\cdots\wedge w_n}$$

$$= \int\cdots\int_{|w_2|=\epsilon_2} \frac{G(0,w_2,\cdots w_n)}{J_f\circ f^{-1}(0,w_2\cdots w_n)} \; \frac{dw_2\wedge\cdots\wedge dw_n}{w_2\wedge\cdots\wedge w_n} \cdot \qquad (2\pi\sqrt{-1})$$

by Cauchy integral formular for w_1 on P_2.
Continue $\Rightarrow$ $\int_P \omega = (2\pi\sqrt{-1})^n \dfrac{G(0)}{J_f(0,\cdots,0)}$

$$\Rightarrow \left(\frac{1}{2\pi\sqrt{-1}}\right)^n \int_P \omega = \mathrm{Res}_{\{0\}}\,\omega = \frac{G(0)}{J_f(0)} . \qquad \square$$