$$\det \left[\right] = \sum_{\pi \in \mathcal{S}_n} \overset{\pi}{-}1 \left[{}_1 \right]^{\pi_1} \cdots \left[{}_n \right]^{\pi_n}$$

$$\int^{dg} \overline{\det g}^{-n} \left[{}^g \right] \text{ inv}$$

$$\overline{\det \gamma}^{n} \int^{d\acute{g}} \left[{}^{\acute{g}} J \right]^{\acute{g}} = \overline{\det \gamma}^{n} \int^{dg} \left[{}^{g} J \right]^{\gamma g} = \int^{dg} \left[{}^{\gamma^{-1}\gamma g} J \right]^{\gamma g} \overline{\det {}^{g} L_{\gamma}} = \int^{d\acute{g}} \left[{}^{\gamma^{-1}\acute{g}} J \right]^{\acute{g}}$$

$$\Leftrightarrow \overline{\det \gamma}^{n} {}^{\acute{g}} J = {}^{\gamma^{-1}\acute{g}} J \Leftrightarrow {}^{\gamma g} J = \overline{\det \gamma}^{-n} {}^{g} J \Leftrightarrow {}^{g} J = \overline{\det g}^{-n}$$