$$x = \phi^* x' = \Lambda^{-1} x'$$

$$\phi_* \frac{\partial}{\partial x^{\mu}} = \Lambda_{\mu}^{\nu} \frac{\partial}{\partial x^{\nu}} = \frac{\partial}{\partial x'^{\mu}} \text{ or } \eta \Lambda \eta \frac{\partial}{\partial x} = \frac{\partial}{\partial x'}$$

$$\phi^* dx'^{\mu} = \Lambda_{\nu}^{\mu} dx'^{\nu} = dx^{\mu} \text{ or } \Lambda^{-1} dx' = dx$$

$$x(q) = \Lambda^{-1} x(p)$$

$$x'$$

$$e.g. A'^{\mu} (\Lambda x(p)) = \Lambda^{\mu}_{\nu} A^{\nu} (x(p))$$

$$x'(q) = x(p) = \Lambda x(q)$$